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Emigration and origin country economic institutions

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Abstract
This paper empirically examines the impact of emigration to OECD countries on 132 origin countries' economic institutions, as measured by the economic freedom index. We utilize public choice theory to explore how emigration can affect origin country economic freedom through voice and exit via absence, diaspora, prospect, and return channels. We then estimate the association between accumulated emigrant stocks and the subsequent changes in economic freedom and the association between contemporaneous emigrant flows and changes in economic freedom and investigate how these associations vary by emigrant skill. We find that for all skill levels, larger emigrant stocks are consistently positively associated with larger subsequent improvements in economic freedom but that at high levels of emigrant stocks these improvements diminish.

Keywords Emigration · Institutions · Economic freedom · Immigration · Diaspora

JEL Classification J1 · J6 · P1

1 Introduction

Migration between countries has the potential to shift the preferences of median voters in both origin and destination countries. The loss of tax base through out-migration, or the potential to gain tax base from in-migration can impact the incentives of policymakers in sending and receiving countries. A significant amount of public choice scholarship has examined how immigration can impact institutional change in destination countries. Considerably less public choice scholarship has examined how emigration can impact institutional change in origin countries. This paper will use public choice theories to explore how emigration might impact origin country economic institutions and will then empirically

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investigate the association between emigration and subsequent changes in origin country economic freedom.

Borjas (2014, 2015) and Collier (2013) articulated what came to be known as the "new economic case for immigration restrictions." This theory asserts that immigrants may bring with them some of the cultural beliefs, traits, and habits that are responsible for the poor formal and informal institutions in their origin countries and that if immigrants come in large enough numbers, they could degrade these same institutions in their destination countries, thus lowering the standard gains economists project from more open migration. Numerous studies have since examined how immigration impacts institutions in destination countries.[1] That literature, in general, finds immigration does not impact institutions much in destination countries or sometimes finds that greater immigration improves institutions in destination countries. The literature finds little empirical support for the new economic case for immigration restrictions.

There is a large literature examining how the international flow of migrants impacts origin countries but most of it does not focus on how immigrants impact formal institutions. Much of that literature focuses on the loss of high-skilled workers to origin countries when they emigrate, so-called "brain drain," and whether other factors associated with emigration of high-skilled workers offset the loss of human capital in origin countries. Origin countries could benefit from emigration if the prospect of migration induces greater human capital formation ("brain gain"); if emigration leads to more remittances that enable investment in human and physical capital or more entrepreneurship[2]; if return migration brings back human capital acquired while abroad; if a larger population abroad induces greater international trade and FDI with the origin country; or if emigration creates scientific networks that result in the import of foreign technology (See Docquier and Rapoport (2012) and Batista et al. (2025) for surveys of this vast literature). Our study is more closely related to a more recent and relatively small literature studying how emigration impacts origin country institutions.

There are a few papers that empirically estimate the impact of emigration on origin country institutions across a large sample of countries.[3] Li et al. (2017) examines how skilled migrant flows impact the Polity II measure of democracy and a measure of economic institutions. They examine how domestic human capital stocks and emigrant human capital stocks residing in OECD countries impact institutions in approximately 180 origin countries in a five-year panel spanning between 1980 and 2005. Their measure of human capital is the fraction of the population (domestic or emigrant) with a tertiary education. They measure economic institutions using the International Country Risk Guide's measures 'corruption' and 'law and order' and estimate OLS and a variety of IV specifications. They consistently find that a high-skilled emigrant stock positively impacts origin countries' political institu-

[1] Empirical investigations that focus on how immigration impacts economic freedom in destinations countries include Clark et al. (2015), Powell et al. (2017), Padilla and Cachanosky (2018), Nowrasteh et al. (2019), Yao et al. (2021), Bedi et al. (2025). Nowrasteh and Powell (2020) is the most comprehensive empirical assessment of the new economic case for immigration restrictions.

[2] See Bedi et al. (2023) for a paper that empirically estimates that remittances promote early-stage business development. The finding is particularly true for female opportunity driven entrepreneurs and entrepreneurs with a secondary education and that come from a middle-class background.

[3] See Baudasse et al. (2018) for a survey of the broader literature on the relationship between migration and institutions.

tions. Most of their results indicate no statistically significant effect of high-skilled emigration on economic institutions but in some cases find a negative impact.

Beine and Sekkat (2013) examine how both skilled and unskilled emigrant stocks in 1990 impact the change in institutions between 1994 and 2004 using four of Kaufmann et al. (1999)'s measures of institutions, while employing OLS and IV specifications. They find that emigration generally improves measures of government effectiveness, regulatory quality, and corruption, and that it harms voice and accountability, in origin countries. The magnitude of the effects is generally larger for skilled emigrants than unskilled.

Our study differs from these prior studies in that we examine how emigration impacts a broader measure of economic institutions using the *Economic Freedom of the World Annual Report* (Gwartney et al. 2023). This index has the advantage of being a more comprehensive measure of institutions that still includes aspects of the rule of law, corruption, and regulation but also includes taxing and spending, trade regulation, and monetary policy. This index has been used as an independent variable in hundreds of empirical studies measuring a variety of developmental outcomes. In a survey, Hall and Lawson (2014) assessed the findings in 402 papers using the EFW index as an independent variable and found that economic freedom is associated with "good" economic outcomes (growth, income, life expectancy, literacy, etc.) in more than 2/3rds of the studies, while economic freedom is associated with "bad" outcomes (such as inequality) in fewer than 4 percent of the studies. In a more recent quantitative survey, Lawson et al. (2023) analyze over 2,000 point estimates published in scholarly journals and find that economic freedom is positively associated with growth, income, and investment, but it does not have a significant direct impact on inequality. The economic freedom index has also been widely used as the measure of economic institutions when studying the impact of immigration on destination country institutions. If emigration impacts economic institutions, as measured by the EFW index, it has the potential to impact developmental outcomes in origin countries.

This paper investigates how emigration impacts origin country economic freedom. There are only two other papers that we are aware of that have examined how aspects of emigration can impact origin country economic freedom. Hall (2016) examines how a measure of "exitability" influenced the evolution of economic freedom as a dependent variable from 1980 to 2010 across 100 countries. His measure of exitability is the sum of land borders and coastline divided by the total geographic area of a country, rather than the number of emigrants. He finds that countries with low levels of initial economic freedom that had greater exitability converged more rapidly to higher levels of economic freedom than other countries. Exitability is obviously a proxy for the potential to emigrate, but Hall never directly investigates emigration's impact on economic freedom. Docquier et al. (2016) is the only other paper that we are aware of that includes specifications examining how emigration impacts institutions, as measured by the economic freedom index in a cross-country setting, though most of their focus is on how emigration impacts democratic institutions.[4] They examine emigration to 20 OECD destination countries with OLS and IV specifications using 5-year panel data from 1985 to 2010 and find that higher emigration stocks are positively associated with Freedom House's measures of Political Rights and Civil Liberties, and the EFW index but are not related to Polity 2 scores.

[4] I'm aware of a working paper by Bedi and Jia (2025) that has preliminary results that uses a synthetic control case study of Moldova and finds that its economic freedom increased when emigration surged following a change in E.U. immigration restrictions.

Our study uses the same panel data set on emigration as Docquier et al. (2016). We differ from them in examining whether the impact of emigration is non-linear, such that larger emigration stocks have a different impact on institutions than smaller emigration stocks, by looking at short-run flows of emigrants, rather than just stocks accumulated abroad over decades, and by separately analyzing the impact of high-skill and low-skill emigration on economic institutions. Each of these advances is tied to public choice theories in the following section. The third section of this paper explains our empirical method, ties that method to the theory, and describes the data in greater detail. Section 4 contains our main results. The final section concludes.

2 Theory

Emigration impacts both the composition of a country's population and the information and preferences that those people have. The classic "exit-voice" framework is useful when thinking about the ways in which emigration can impact institutions (Hirschman 1970). In that framework, people who are disgruntled with the institutions they live under can exercise voice by participating in the political process in an attempt to change their institutions. Voting is one obvious way to exercise voice in democratic countries, but voice can also be exercised more informally through speech, protest, education, and civil society activities, to varying degrees, in both democratic and authoritarian countries. Alternatively, people could exit the polity with institutions they dislike, and move to another country whose institutions better fit their preferences. The acts of both exercising voice or exiting can impact the incentives and information held by politicians, bureaucrats, and remaining citizens in ways that could induce institutional change. Li et al. (2017) identifies four channels through which emigration may impact origin country institutions: the absence channel, the prospect channel, the diaspora channel, and the return channel. Each of these channels can be usefully analyzed in an exit-voice framework with the aid of additional public choice models.

2.1 Absence channel

The absence channel could impact origin country institutions when people who are disgruntled with their country's institutions exercise their exit option and move to another polity. However, somewhat counterintuitively, origin country institutions would be impacted by the voice mechanism, rather than the exit mechanism, through the absence channel. The absence of emigrants from an origin country's polity is likely to shift who is the country's median voter. Emigrants' institutional preferences are not random. Compared to the overall polity, emigrants are more likely to be systematically biased against the country's current institutions and more likely to prefer the institutions of their destination country. Emigration tends to flow from less economically free countries to more economically free countries (Ashby 2010). The absence channel could then cause a country to become less economically free if the median voter's preferences play a role in shaping a country's institutions (Black 1958; Downs 1957) because those citizens who could exercise their voice in favor of greater economic freedom are precisely those citizens who exit the polity.

Although emigration will change who the median voter is, it need not necessarily translate into institutional change. Choosing to exit can guarantee an individual a change in

institutional quality but exercising voice faces collective action problems and may not result in any institutional change (Olson 1965). So, just because a citizen chooses to exit a polity, it does not imply that it would have been cost–benefit efficient for them to exercise voice, had they stayed. Thus, origin countries may remain unchanged despite emigration changing the preference of a median voter. Furthermore, many origin countries are authoritarian in ways that hamper the exercise of voice both through democratic processes and informal civil society.

If median voter preferences play an important role in determining a country's institutions, and the effect of emigration on origin countries' economic institutions operates primarily through the absence channel, we should expect countries to become less economically free over time when they have a larger percentage of their population living abroad as emigrants. If, however, collective action problems, or other barriers, undermine the effectiveness of voice, then origin country institutions would be unaffected by emigration through the absence channel.

2.2 Prospect channel

People exiting a polity, or the prospect of people exiting, acts as a form of economic voice through the prospect channel. When people emigrate, the government of the origin country usually loses the ability to extract resources from the emigrants through taxation. If origin country rulers and policy makers value the lost tax revenue, it could induce them to reform their economic institutions to retain more people to ensure a larger tax base. This economic incentive for reform does not depend on the benevolence, or lack thereof, of government officials. Autocratic rulers pursuing a Brennan and Buchanan (1980) leviathan tax strategy to maximize their own ability to extract resources as a stationary bandit (Olson 2000) would be incentivized to reform in order to maximize their own take. Similarly, benevolent politicians trying to optimally finance and provide public goods would be incentivized to reform through this form of Tiebout competition (1956) because the loss of tax base would raise the average fixed cost of public goods for the remaining citizens.[5]

We should expect emigration to be positively related to increases in economic freedom if the prospect channel is the primary way that emigration impacts origin country economic institutions. However, the competitive pressure through the prospect channel incentivizes the retention of the tax base, not people per se. Thus, governments would likely be more sensitive to the loss of people who generate more tax revenue than those who generate little. The prospect channel is also likely to impact rulers' incentives relatively quickly as people emigrate and the prospect of more people leaving looms large. Thus, the prospect channel is most likely to operate through short-run outflows of high-skill migrants.

2.3 Diaspora channel

When an emigrant exits their origin country, they can still exercise voice in that country both directly and indirectly through the diaspora channel. Emigrants can influence the views and values of people who remained in the origin country, they can empower those people to better exercise their voice, and they can voice themselves directly to origin country govern-

[5] See Caplan (2001) and Powell (2004) for arguments about how the capitalization of inefficient taxes into land values can limit Tiebout competition.

ments or through international organizations that may put pressure on political leaders in those countries.

As mentioned previously, emigrants are likely to self-select as those who are least satisfied with their origin country institutions and are most likely to prefer the institutions in destination countries. But social learning also occurs once they emigrate. They learn more about the formal institutions and informal institutions, norms, and culture in their destination country. They may assimilate to these formal and informal institutions in destination countries and incorporate this into their own world view such that their assimilated beliefs about how societies should function are even more like those in their destination country than when they first emigrated. It is these partially assimilated views that can be transferred back via the diaspora channel.

Social remittances are "the ideas, behaviors, identities, and social capital that flow from receiving- to sending-country communities" (Levitt 1998: 927). Social remittances can occur when emigrants return to visit their homeland or members of their family travel to visit them in their destination country. They can occur via phone calls, emails, social media, the sharing of popular culture, or numerous other informal channels. These social remittances can shift the views of people in the origin country and eventually shift the preference of the median voter, who remained behind, by changing norms and beliefs in the origin country in the direction of those who emigrated. These social remittances can also empower people in origin countries to exercise voice more effectively through adopting methods learned by emigrants abroad.

The diaspora channel can also influence origin country institutions through traditional monetary remittances. Global remittances now total more than $740.5 billion annually, or around 0.7% of world GDP (World Bank, n.d.), and disproportionately flow from emigrants in high income countries to people in the lower income countries that they left behind. Ratha et al. (2024) estimate that remittances to Low- and Middle-Income countries were about $656 billion in 2023. These remittances provide resources that can empower people in origin countries to better exercise their voice through political participation, media, campaigns, campaign contributions, etc., in manners that could change origin country institutions to be more like destination country institutions.[6]

Finally, emigrants may exercise their own voice, now enhanced with higher incomes, to directly pressure origin country governments. They can also exercise voice in their destination country to get that government to engage in international diplomacy in ways that could impact origin country institutions. They could also exercise their voice, and/or financially contribute, to international agencies and NGO's that operate in their origin country.

The diaspora channel essentially enables emigrants who exit to retain their voice in origin countries both directly and indirectly. It also influences the content of that voice to more closely resemble ideas and beliefs in the destination country over time. Thus, since emigrants tend to flow from countries with low economic freedom to those with higher economic freedom, we should expect origin country economic freedom to increase over time through the diaspora channel. However, this is a long-run transmission process. Social learning in destination countries takes time. Earnings accumulate over time for greater monetary remittances. Voice in destination countries grows as emigrants become citizens. Social remittances "are part-and-parcel of an ongoing process of cultural diffusion. Gradual trans-

[6] However, remittances could also hinder the legitimacy of democracy, in the minds of recipients, if leaders treat them as a substitute for government expenditure on public goods (see Konte 2016).

mission sets the stage for future remittances transfers" (Levitt 1998: 937). Thus, the positive transmission of institutions between destination countries and origin countries is more likely to occur between long-run stocks of emigrants living abroad, rather than short-run outflows of emigrants.

2.4 Return channel

Emigrants can also regain their voice in origin countries after exiting via the return channel. This returned voice can be shaped by the social learning that occurred in the destination country and can be amplified by, financial, educational, and social resources, acquired while abroad.

The return channel is most prominently exhibited through students who obtain their education abroad and then return to their origin countries. Spilimbergo (2009) used a dataset on foreign students spanning more than 50 years and found that foreign-educated students promote democracy in their home countries, when they acquire their education in democratic countries. Mercier (2016) assembled an original dataset of 932 politicians who were heads of the executive power in developing countries between 1960 and 2004 and found that leaders of autocratic countries, who were educated in high-income OECD countries, tended to increase their country's democracy score while in power.

Although education is one obvious way that the return channel can operate, it can also happen more generally as normal emigrants acquire culture, beliefs, and financial resources and then return home with a changed and amplified voice. We expect return migration would increase economic freedom in origin countries over time.

3 Empirical methodology and data

The 10-year change in an origin country's economic freedom index score is our main variable of interest. Economic freedom scores come from the *Economic Freedom of the World Annual Report* (Gwartney et al. 2023) and are available in 5-year increments up until 2000 and annually after that. The EFW score is measured on a 1 to 10 scale (with 10 being the most economically free) across five equally weighted areas; Size of Government, Legal System and Security of Property Rights; Sound Money; Freedom to Trade Internationally; and Regulation; that are comprised of 45 individual measures. To score high on the EFW index, a nation must keep taxes and government spending low, protect private property rights, maintain stable money, practice free trade and be open to foreign investment, and exercise regulatory restraint. Economic institutions, as measured by the EFW index, tend to change relatively slowly, so we follow much of the literature using EFW as a dependent variable by examining 10-year EFW score changes (Lawson et al. 2020).

Emigration from origin countries to 20 OECD destination countries is our main explanatory variable. The Institute for Employment Research's Brain Drain Data (Brücker et al. 2013) covers 20 OECD destination countries and classifies emigrants by gender, origin, and educational attainment. This database shows the total number of emigrants from 152 origin countries living in the 20 destination countries from 1980 to 2010 in 5-year intervals. We eliminate the 20 destination countries as origin countries in our data set to better examine the effect of emigration from less developed and less economically free countries to rela-

tively richer and freer countries, leaving us with emigration data from 132 origin countries. As mentioned in the introduction, low economic freedom in origin countries tends to work as a push factor for out-migration and high economic freedom in destination countries tends to work as a pull factor for in-migration.[7] Not surprisingly, the 20 OECD destination countries generally have much higher levels of economic freedom than the origin countries. The 20 destination countries average almost two points higher (7.7 vs 5.8) in economic freedom than the origin countries and, in fact, the minimum EFW score for any destination country (5.7), in any year, is nearly as high as the mean score for all origin countries in the panel.

We measure emigration in two ways. First, we use the emigration stock to capture the effects of total accumulated emigration and adjust this number to account for the size of the origin country to measure how the percentage of people who have left, rather than the raw number, affects origin countries institutions:

$$Emigration\ Stock = \frac{Total\ number\ of\ people\ living\ in\ a\ destination\ country}{Total\ origin\ country\ population + numerator}$$

The accumulated percentage loss of an origin country's population could influence the evolution of economic institutions. But these stocks accumulate over decades. It's also possible that origin countries may adjust their economic institutions in response to short-run outflows of emigrants. So, our second measure of emigration is the ten-year emigration flow as a percent of the population. It is calculated from the panel data as:

$$\text{Emigration flow}_{t \to t+10} = \text{Emigration stock}_{t+10} - \text{Emigration stock}_{t}$$

These two measures of emigration allow us to tie our exploratory investigation into the association between emigration and changes in economic freedom with the theories outlined above. The emigrants in this data set are overwhelmingly moving from lower economic freedom countries to higher economic freedom countries. The association between accumulated emigrant stock and economic freedom should be negative, if the absence channel dominates as the people most likely to prefer economic freedom will be those who emigrate. However, if the diaspora channel or return channel are stronger these emigrants are more likely to transmit norms pushing for greater economic freedom back to their origin countries, so the association should be positive. It is also possible that which of these channels dominates could depend on how large the emigrant stock is, so we include specifications that include the quadratic transformation of the emigration variable. This way, we can test

[7] There are a few studies that examine how economic freedom in origin or destination locations impacts migration flows. Ashby (2010) examines bilateral immigration flows between 58 countries and finds that differences in economic freedom are a significant determinant of immigration flows between countries, while controlling for differences in income, political factors, and distance between countries. He finds a lack of economic freedom pushes emigrants out of countries, while greater economic freedom pulls immigrants in. Aarhus and Jakobsen (2019) examine how differences in origin countries' economic freedom across 142 countries impact the migration of moderately-skilled and highly-skilled workers. They find that higher economic freedom in origin countries is associated with lower levels of brain drain from poor countries to wealthier countries. Similarly, Meierrieks and Renner (2017) examine international migration from 91 emerging market economies to 20 OECD countries and find that higher levels of economic freedom in origin countries discourages high-skilled migration but does not discourage low-skilled migration. At the domestic level, differences in economic freedom between states (Ashby 2007), and between metro areas (Arif et al. 2020) have also been shown to be positively associated with migration flows.

if there exists a U-shaped relationship between emigration and economic freedom. Furthermore, emigrants of different skill levels could be better or worse at transmitting social learning back to origin countries via the diaspora and return channel, or the importance of their absence from the median voter pool could differ based on skill levels. So, we separately examine low, medium, and high-skilled emigrant stocks are associated with changes in origin country economic freedom. We examine emigrant flows to investigate the association with the prospect channel. It is particularly important here to separate by skill level because the prospect channel is more likely to influence institutional change when origin countries experience an outflow of high-skill people who represent greater potential tax revenue.

To measure skill specific immigrant stocks, these rates are calculated as the ratio of emigrants with a given skill level to the total population of that same skill level in the origin country (both emigrants and residents). The numerator represents emigrants with a specific educational attainment, while the denominator accounts for the total population in that same skill category. In our data set low-skilled emigrants have lower secondary, primary, and no schooling, medium-skilled emigrants have a high-school certificate or equivalent, and high-skilled emigrants have any higher education than high school (Brücker et al. 2013, p. 4).

Our control variables come directly from the literature studying economic freedom as a dependent variable. Lawson et al. (2020) survey that literature and find that initial levels of economic freedom, inequality, and political/civil freedoms are the variables most consistently related to changes in economic freedom. Most importantly, initial levels of economic freedom at time t need to be controlled for because virtually all studies using EFW as a dependent variable find that the higher a country's initial score, the harder it is for the country to improve its score. Also, since the diaspora and return channels depend on transmitting norms and beliefs about institutions from destination countries back to the origin countries, we interact initial levels of economic freedom with the emigration stock, to see if this effect is larger for countries where the gap in economic freedom between origin and destination countries is larger.

There is some evidence in the literature that inequality is inversely related to EFW. So, we control for the Gini Index from the "WID—World Inequality Database " (n.d.), in period t. This index is inverted, meaning that a bigger value indicates more equality. Thus, the coefficient for this variable indicates the effect of an increase in equality.

The literature has also found that political and civil freedoms are correlated with economic freedoms. We control for the Civil Liberties Index from Freedom House (*Freedom in the World* n.d.) at period t. The Civil Liberties Index has a maximum value of 60 and encompasses questions about four areas: freedom of expression and belief, associational and organizational rights, rule of law, and personal autonomy and individual rights.

Additionally, in a more recent paper studying "jumps" in economic freedom, Grier and Grier (2021) find that higher levels of education help to predict large increases in economic freedom. Prior studies examining emigration and democracy have also found measures of education to be significant. So, we use Penn World Tables' (Feenstra et al. 2015) Human Capital Index to control for education levels and outcomes. This index is estimated using data on years of education from Barro and Lee (2013), and returns on education (Psacharopoulos 1994). There is no lower and upper bound, but it typically ranges from 1.0, when there is very limited education and returns to education, and only has values higher than 3.5 for countries with very high levels of education and greater returns. Table 1 contains descriptive statistics.

Table 1 Descriptive statistics

Variables	Observations	Mean	Standard deviation	Minimum	Maximum
EFW change t to t+10	752	0.463	0.792	-2.600	3.680
Emigration stocks					
Total	752	4.777	7.575	0.0111	48.76
Low skill	729	4.06	7.71	.00122	52.1
Medium skill	729	4.64	7.26	0.0269	45.3
High skill	729	17.7	20.0	0.0817	99.5
Emigration Flow t to t+10	499	0.857	1.962	-3.646	12.69
EFW (origin countries)	752	5.876	1.337	1.870	9.280
Gini	738	0.408	0.0961	0.219	0.779
Civil	745	3.715	1.662	0	7
Education (Human Capital)	703	2.134	0.643	1.020	3.636
EFW (destination countries)	126	7.77	0.629795	5.7	8.9

The dataset consists of a 132-origin-country panel, with 752 observations. To test the relationship between economic freedom and emigration, we use a two-way fixed effects estimation, which includes time and region fixed effects. For each of the variables and specification being evaluated, both an uncontrolled and controlled model are presented. The statistical models for both main independent variables are as follows:

$$EFW_{t\to t+10} = cons\tan t + \delta_1 stock_t + \delta_2 stock_t^2 + X'\beta + e$$

$$EFW_{t\to t+10} = \text{constant} + \gamma_1 \text{emigration flow}_{t\to t+10} + \gamma_2 \text{emigration flow}^2_{t\to t+10} + X'\beta + e$$

where the deltas, gammas, and theta are the coefficients of interest, and beta is the vector of control variable coefficients.

Endogeneity is clearly a concern. While people leaving an origin country could impact origin country institutions, it is also the case that changes in origin country institutional quality could impact the number of people emigrating. This endogeneity is less of a concern for our measure of beginning period emigrant stocks, which have accumulated over decades, on a subsequent 10-year change in institutional quality. But endogeneity concerns loom larger for contemporaneous flows of emigrants and changes in institutions. To address this concern, we employ an instrumental variables approach using a shift-share instrument to better examine the impact of contemporaneous emigration flows on changes in economic freedom. We employ the same modified shift-share instrument used in previous immigrations studies that exploits the cross-sectional variation in immigrant stocks from the origin countries to project the expected inflow of new immigrants into destination countries based on time-series variation in the origin countries (Card 2001; Peri 2012; and Basso and Peri

2015). In this case, we want to model the change in emigration stocks for any country. To do so, we estimate the shift-share instrument to get the stocks and the difference, starting with the share:

$$sh_{i,o,t_0} = \frac{M_{i,o,t_0}}{\Sigma_k M_{i,k,t_0}}$$

sh_{i,o,t_0} represents the proportion of migrants from country *o* to country *i* at period t_0, over the total migration to country *i* from all origin countries (*k*). The share is then multiplied by the total number of people that migrated to country *i* at period *t* to *t+10,* which gives us estimated emigration stocks for the two periods. Our instrument consists of the difference between the emigration stock in *t+10* and the emigration stock in *t*. It models the total change in the emigration stocks, based on the initial distributions of immigrants in the destination country.

$$\widehat{Emigration\ stock}_{o,t} = \frac{\Sigma_i \left(sh_{i,o,t_0} * Total\ immigrants_{i,t}\right)}{Population_{o,t}}$$

$$Z_o = \widehat{Emigration\ stock}_{o,t+10} - \widehat{Emigration\ stock}_{o,t}$$

The validity of this instrument hinges on the fact that diaspora dynamics lead earlier period immigrant stocks by origin country to correlate with the proportion of future inflows coming from that same origin country but for the earlier period stock to not directly impact the dependent variable itself. The emigrant stock in 1980 is the first available year in the (Brücker et al. 2013) data set used in our study. So, to instrument we instead use the World Bank Global Bilateral Migration Data that has emigrant stocks in 1960 (t_0) to then instrument for emigrant flows in a one-decade cross-section spanning 2000 (t) to 2010 ($t + 10$) in the Brücker et al. (2013) dataset. The validity of this instrument hinges on the fact that the emigrant stock in each destination country in 1960 would have been accumulated over the previous decades and by 40 to 50 years later most of these emigrants would either have deceased or become elderly and less likely to directly affect changes in origin country institutions. Upon running the 2SLS regression, statistical tests revealed the instrument is strong (with F tests higher than 10), and that the model is properly identified. However, there was not enough unique variation in the data to be able to instrument for both an immigration flow variable and its quadratic term simultaneously, while passing a weak instruments test. So, we only include linear specifications when instrumenting (Table 2).

Table 2 Weak instrument and under-identification tests

Regression number	(9)	(10)
Weak instrument (Cragg-Donald Wald F statistic)	10.89	12.29
	✓ (at 15%)	✓ (at 15%)
Under-identification (Anderson canon. corr. LM statistic)	0.0008	0.0003
	✓	✓

4 Results

4.1 Emigration stocks

Table 3 reports our results for the effect of the accumulated emigration stock as a percent of origin country population for the full panel of countries and years. We find that larger stocks of emigrants as a percentage of origin country populations are positively related to subsequent 10-year improvements in economic freedom and are statistically significant, while only controlling for initial levels of economic freedom. Once we control initial levels of inequality, civil freedom, human capital, and the interaction between economic freedom and emigration stocks, the impact of emigrant stocks remains significant. The interaction between emigrant stocks and initial levels of economic freedom is negative and significant, indicating that for a given size emigrant stock, the associated increase in economic freedom is larger the lower the initial level of economic freedom in an origin country. These associations are consistent with norms surrounding desires for economic freedom being transmitted from emigrants in higher economic freedom destination countries to lower economic freedom origin countries via the diaspora and return channels. Among the control vari-

Table 3 Emigration as a % of total population

Variables	EFW change t to t+10			
	(1)	(2)	(3)	(4)
	OLS			
Emigration stock	0.00691*	0.0605***	0.0484***	0.103***
	(0.00367)	(0.0221)	(0.0100)	(0.0243)
Emigration stock^2			−0.00125***	−0.00124***
			(0.000281)	(0.000308)
Emigration stock * EFW		−0.00878**		−0.00895***
		(0.00342)		(0.00338)
EFW	−0.343***	−0.398***	−0.362***	−0.409***
	(0.0237)	(0.0306)	(0.0238)	(0.0303)
Gini (Inverted)		0.429		0.246
		(0.447)		(0.444)
Civil		−0.101***		−0.0912***
		(0.0222)		(0.0221)
Education (Human Capital)		0.138*		0.148*
		(0.0793)		(0.0784)
Constant	2.733***	2.695***	2.706***	2.661***
	(0.249)	(0.436)	(0.246)	(0.431)
Time dummies	YES	YES	YES	YES
Region FE	YES	YES	YES	YES
Observations	752	682	752	682
R-squared	0.384	0.424	0.400	0.438

Standard errors in parentheses
***$p<0.01$, ** $p<0.05$, *$p<0.1$

ables, initial levels of economic freedom were highly significant and negatively correlated with subsequent changes in economic freedom, as expected. The Gini Index coefficient was insignificant, while higher initial levels of civil freedoms are correlated with smaller improvements in economic freedom, and higher human capital was correlated with larger increases in economic freedom.

The difference in the impact of very large emigration as a percent of an origin country's population from a more moderate emigration is apparent when we add a squared term to our regressions. When we add the squared transformation, both the coefficient on emigrant stock and the squared term are highly statistically significant in both the controlled and uncontrolled regressions. These results indicate that at lower levels of emigration, a larger emigrant population abroad was associated with larger increases in economic freedom up until an inflection point when the effect of a larger emigrant stock becomes negatively associated with subsequent changes in economic freedom. Our results indicate the "inflection point" is at 20.3 percent of the population living abroad. Out of the 752 observations in the sample, there are 46 instances in 12 countries where the stock reached levels higher than this point. Thus, for most countries and observations in our sample, a larger emigrant stock living abroad is associated with larger improvements in economic freedom in their origin countries. The non-linear nature of the association is consistent with a trade-off between the positive impact of the diaspora and return channels, which at first dominates, but that eventually the absence channel undermines this positive association as the emigrant stock abroad gets very large and a greater number of people have self-selected out of the origin country's polity.

The previous papers examining the relationship between emigration and origin country institutions had not explored the non-linear nature of this relationship. Docquier et al. (2016) found a positive association between emigrant stocks and five-year changes in economic freedom. In unreported regressions we replicated their positive and statistically significant result for five-year periods and then established the same positive association for longer-run 10-year changes in economic freedom, as most of the literature studying economic freedom as a dependent variable does (Lawson et al. 2020). We expand on the prior literature by finding a statistically significant inverted U-shaped association of emigration stocks on 10-year changes in economic freedom. In terms of magnitude, an emigrant stock of 10 percent is associated with a 0.76 point higher economic freedom score when all the other variables are at the mean. At a stock of 20.3 percent it reaches a maximum of 0.90 and then decreases until it reaches a negative total effect at a 47.4 percent emigrant stock (Fig. 1). Fewer than 10 percent of countries have any year where their emigrant stock exceeds 20.3 percent and only Guyana has years where it exceeds 47.4 percent. Thus, for most countries and years increased emigration is associated with increased economic freedom. We also expand on the prior literature by finding a significant negative association when initial levels of economic freedom are interacted with the emigrant stock. The destination countries are overwhelmingly more economically free than the origin countries in our sample. Our findings indicate that the lower the initial level of economic freedom in an origin country, the larger quantitative positive association between any given emigrant stock and subsequent improvements in economic freedom is. However, in terms of magnitude, the effect is small. The positive association between the emigrant stock and subsequent improvement in economic freedom only increases by 0.01 points for each full point lower an origin country's initial economic freedom score is.

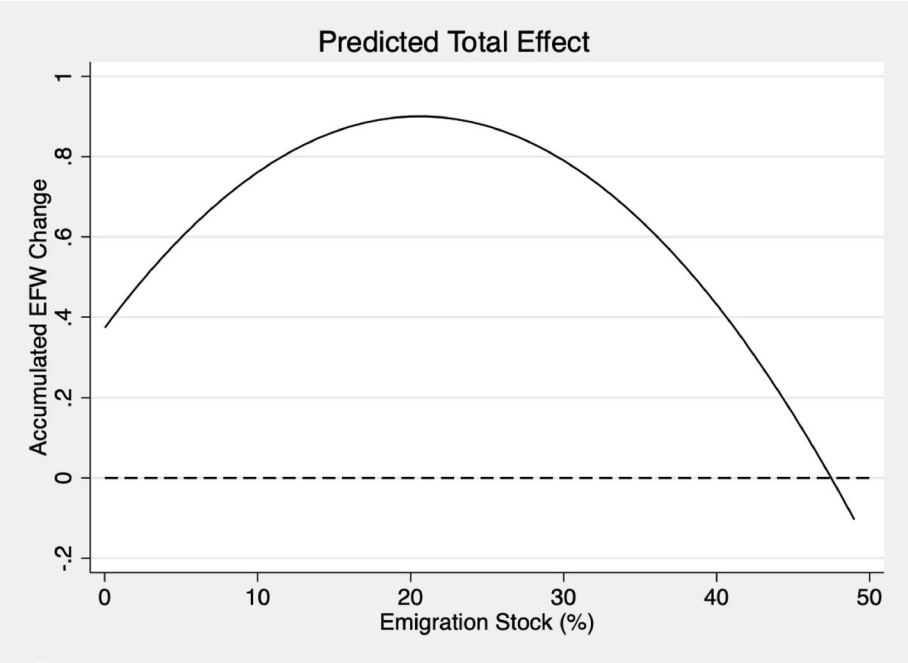

Fig. 1 Emigrant Stock and Changes in Economic Freedom

4.2 Emigration flows

While emigrant stocks, that accumulate over decades, may eventually lead to institutional change in origin countries, it is also possible that short-run emigration outflows could induce institutional reforms. Shorter-run flows seem more likely to impact the prospect channel via competition when governments observe an outflow of emigrants to countries with better institutions. So, next, unlike the previous literature, we examine how emigration flows impact the evolution of economic freedom. The first four columns of Table 4 contain the OLS results for the full panel of countries. We find that simultaneous outflows do not significantly affect changes in economic freedom. Across regressions 5 through 8, emigration flows stay statistically insignificant, and even change sign in the first two specifications. Nor do we find a non-linear relationship associated with the squared term. As with emigration stocks, initial levels of economic freedom remained negatively correlated with subsequent changes and statistically significant, inequality was insignificant, greater initial levels of civil freedoms were statistically significant and negatively associated with subsequent increases in economic freedom, and higher levels of human capital were significant and positively related to increases in economic freedom.

The lack of any significant relationship between emigrant flows and contemporaneous changes in economic freedom could stem from endogeneity problems. To address the problem, we employ two stage least squares regressions in regressions 9 and 10 replacing the actual inflow with our instrument described above. This limits our sample to a cross-section of 109 countries examining the change in economic freedom from 2000 to 2010. In these two regressions where the instruments were both strong and valid the instrumented flow was

Table 4 Emigration Flows

Variables	EFW change t to t+10					
	(5)	(6)	(7)	(8)	(9)	(10)
	OLS			IV 2SLS		
Emigration flow t to t+10	−0.00648	0.00374	0.00833	0.0285	0.0379	0.0130
	(0.0181)	(0.0193)	(0.0379)	(0.0412)	(0.105)	(0.0961)
Flow^2			−0.00186	−0.00295		
			(0.00418)	(0.00433)		
EFW	−0.387***	−0.488***	−0.388***	−0.490***	−0.243***	−0.327***
	(0.0299)	(0.0348)	(0.0299)	(0.0349)	(0.0575)	(0.0702)
Gini (Inverted)		0.647		0.693		0.158
		(0.606)		(0.610)		(1.071)
Civil		−0.103***		−0.104***		−0.106**
		(0.0293)		(0.0295)		(0.0514)
Education (Human Capital)		0.375***		0.375***		0.0135
		(0.115)		(0.115)		(0.171)
Constant	3.131***	2.476***	3.123***	2.444***	1.845***	2.563**
	(0.323)	(0.575)	(0.324)	(0.577)	(0.597)	(1.072)
Time dummies	YES	YES	YES	YES	Cross section	
Region FE	YES	YES	YES	YES	YES	YES
Observations	499	457	499	457	109	101
R-squared	0.358	0.411	0.359	0.411	0.332	0.376

Standard errors in parentheses

***$p<0.01$, ** $p<0.05$, *$p<0.1$

not statistically significant. Out of all the control variables, only EFW shows any significant effect on the EFW changes. This is some indication that the insignificance of flows in our OLS specifications was not caused solely by endogeneity.

4.3 Emigrant human capital

Prior studies (Spilimbergo 2009; Beine and Sekkat 2013; and Li et al. 2017) examined how high-skilled emigration impacts other measures of institutions but the one paper using the economic freedom index to measure institutions did not separate emigrants by their level of human capital (Docquier et al. 2016). So, in our final sets of regressions, in Table 5, we examine how emigration from groups with different skill levels impact changes in economic freedom. Regressions 11 to 14 focus on the low-skill emigration stock, regressions 15 to 18 on the medium-skill emigration stock, and 19 to 22 on the high-skill emigration stock. We report partially controlled and fully controlled specifications, with initial levels of EFW being the only variable controlled for in the partially controlled regressions.

Low-skill emigration stock has no significant effect on changes in economic freedom without controlling for the quadratic relationship or the interaction with EFW, as in regressions 12 and 13. However, in the fully controlled regression 20, when both the quadratic term and the interaction are added, the quadratic term ceases to be significant, while the interaction between economic freedom and stocks remains significant. This indicates that, while we might see an inverted U-shaped curve in overall stocks and other skill-specific stocks, the low-skill emigration stock's effect on economic freedom doesn't robustly exhibit

Table 5 Emigration stocks by skill levels

Stock subdivision:	Low-Skill				Medium-Skill				High-Skill			
	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
	OLS				OLS				OLS			
Dependent Variable for all regressions: EFW change t to t+10												
Emigration stock	0.00443	0.0819***	0.0323***	0.0805***	0.00790**	0.0599***	0.0302***	0.111***	0.00258*	0.0153**	0.0198***	0.0317***
	(0.00395)	(0.0271)	(0.0101)	(0.0271)	(0.00392)	(0.0186)	(0.00999)	(0.0225)	(0.00133)	(0.00720)	(0.00412)	(0.00805)
Emigration stock ^2			−0.000805***	−0.000490			−0.000710**	−0.00126***			−0.000219***	−0.000234***
			(0.000269)	(0.000423)			(0.000293)	(0.000318)			(4.95e−05)	(5.42e−05)
Emigration stock *		−0.0110***		−0.00865**		−0.00882***		−0.0106***		−0.00203*		−0.00175
EFW		(0.00384)		(0.00433)		(0.00306)		(0.00306)		(0.00120)		(0.00119)
EFW	−0.353***	−0.405***	−0.361***	−0.410***	−0.350***	−0.393***	−0.356***	−0.403***	−0.352***	−0.395***	−0.359***	−0.411***
	(0.0249)	(0.0299)	(0.0249)	(0.0303)	(0.0247)	(0.0308)	(0.0247)	(0.0306)	(0.0247)	(0.0347)	(0.0245)	(0.0344)
Gini (Inverted)		0.250		0.212		0.386		0.260		0.334		0.109
		(0.454)		(0.455)		(0.451)		(0.447)		(0.457)		(0.454)
Civil		−0.101***		−0.0986***		−0.101***		−0.0938***		−0.108***		−0.108***
		(0.0224)		(0.0225)		(0.0224)		(0.0222)		(0.0223)		(0.0220)
Education		0.121		0.121		0.134*		0.222***		0.120		0.151*
(Human Capital)		(0.0806)		(0.0806)		(0.0806)		(0.0828)		(0.0808)		(0.0801)
Constant	2.812***	2.872***	2.730***	2.846***	2.761***	2.708***	2.720***	2.442***	2.810***	2.722***	2.746***	2.744***
	(0.256)	(0.443)	(0.256)	(0.444)	(0.257)	(0.446)	(0.257)	(0.446)	(0.256)	(0.469)	(0.253)	(0.463)
Time dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	729	670	729	670	729	670	729	670	729	670	729	670
R-squared	0.383	0.424	0.390	0.425	0.385	0.426	0.390	0.440	0.385	0.423	0.401	0.439

Standard errors in parentheses

***$p<0.01$, **$p<0.05$, *$p<0.1$

the same shape. The positive linear association would be consistent with norms being transmitted to origin countries through the diaspora and return channel, but the absence channel not mattering regardless of the size of the emigrant stock.

Highly-skilled and medium-skilled emigrant stocks are positively and statistically significantly associated with larger increases in economic freedom across all specifications. However, in both cases the empirical magnitude and/or statistical significance of this association increases once the quadratic relationship is also controlled for, and, as in prior regressions, the quadratic term is negative and significant, further supporting the inverted U-shape relationship observed in prior regressions. For medium-skilled emigrant stocks, the interaction between economic freedom and stocks is statistically significant, but for high-skilled emigration, it is not. This is some indication that while all emigrants transmit some social remittances home via the diaspora and return channels, that it is important to have some number of mid and high-skilled people in the origin country to receive and make use of these social remittances in ways that can influence institutional change. If too many high- and mid-skill people are absent perhaps, there are not enough potential social entrepreneurs to receive and act on social remittances to origin countries.

Overall, the trend across skill levels varies around the pattern seen in the total emigration stocks: larger emigrant stocks living abroad are associated with larger subsequent improvements in economic freedom, but these are either decreasing with stocks (the squared term is significant), or decreasing with higher levels of economic freedom (the interaction of economic freedom and stocks is significant). As for the control variables, initial levels of EFW and civil freedoms remained highly significant and negative, the Gini index showed no significance, and human capital had a significant positive effect only in the medium and high skilled specifications.

Figure 2 illustrates the predicted total effects of the skill-specific emigrant stocks on economic freedom. Among the three, the low-skilled emigrant stock exhibits the largest estimated effect, reaching a maximum association of a 0.9 point higher economic freedom score at a stock of 30.22 percent and then decreasing but not turning negative for the relevant range. However, the quadradic variable was not statistically significant. Approximately 94 percent of countries always had low-skill emigrant stocks lower than 30.22 percent. Medium-skilled emigration has a similar association, reaching a maximum of 0.86 points at a 19.6 percent emigrant stock. Approximately 92 percent of countries always had medium-skill emigrant stocks lower than 19.6 percent. The positive association between high-skill emigrant stocks and subsequent increases in economic freedom grows more slowly, reaches a lower maximum, but also remains positive for the whole range of possible emigration stock values. The marginal effect of additional emigrant stock remains positive until the stock reaches 45.9 percent where it is associated with a 0.78 point higher economic freedom score. Approximately 87 percent of countries always had high-skill emigrant stocks lower than 45.9. Then, although the marginal effective additional high-skill emigrant stock turns negative, no high-skill emigrant stock in our data is large enough to turn the total association negative.

We also examined how contemporaneous emigrant flows impacted changes in economic freedom while differentiating between different emigrant skill levels, since the prospect channel is more likely to impact government officials' incentives when they are losing high-skill high-tax population. Like the overall relationship between emigrant flows and economic freedom, in additional (unreported) regressions, we found no significant relation-

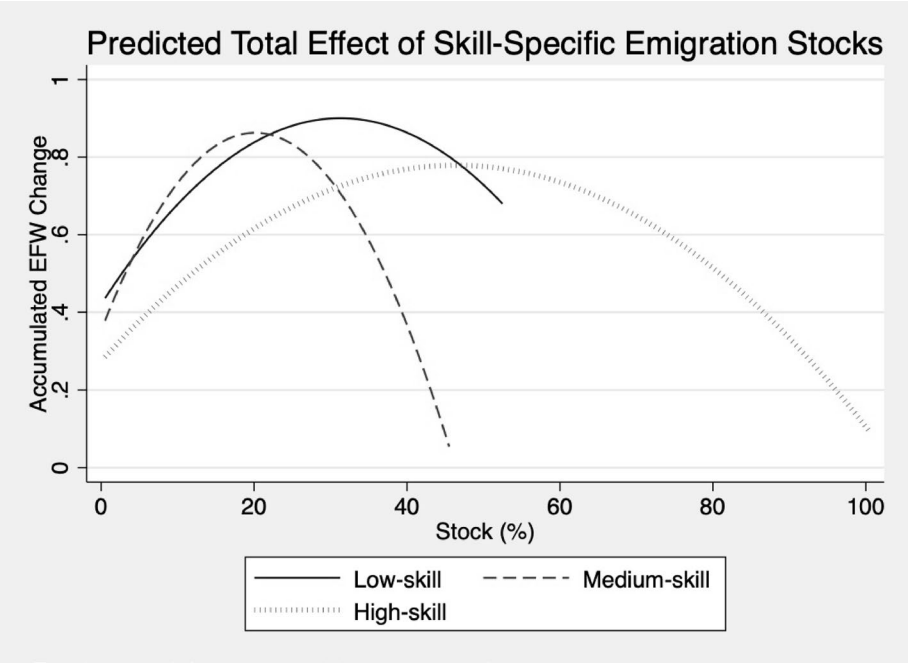

Fig. 2 Emigrant Stock by Skill and Changes in Economic Freedom

ship between low-skill or medium-skill emigrant flows and economic freedom. However, the results differ when examining the impact of only high-skill emigrant flows. Table 6 indicates a negative and statistically significant association between contemporaneous high-skill emigrant flows and increases in economic freedom in all specifications. Specifically, a 1 percentage point increase in high-skill emigration flow corresponds to a decrease of 0.023 to 0.025 in a country's EFW score. Regarding control variables, EFW and civil freedoms showed high levels of significance while being negative, the Gini index had no significance, and education was significant and positive, aligning with previous regressions.

As with prior OLS emigrant flow regressions, endogeneity remains a concern. We suspect the negative association is driven by the fact that contemporaneous decreases in economic freedom act as a push factor for high-skill outmigration rather than a rejection of the prospect channel. To address this concern, we again use an instrumental variable approach. Specifically, we instrument the high-skilled emigration flow using the 1960 shares of total migrants (across all skill levels) in destination countries. The instrument has mixed results for relevance tests, as seen in Table 7. The Cragg-Donald Wald F-statistic for regression 25 is 7.03, above the critical value only for a 20% maximal IV size, and in regression 26, this F-statistic is 5.21, so the instrument is not considered strong under any significant threshold. Additionally, the Anderson LM statistic confirms the model is not under-identified in both specifications (p-values < 0.05), supporting the strength and relevance of the instrument. High-skill emigrant outflows lose their statistical significance in these IV regressions. This is some indication that endogeneity was the reason for the negative association in contemporaneous regressions, though we are limited in what we can conclude from the weakness of the instruments.

Table 6 Emigration flow of high-skilled individuals

Variables	EFW change t to t+10			
	(23)	(24)	(25)	(26)
	OLS		IV 2SLS	
Emigration flow t to t+10 (high skill)	−0.0249***	−0.0228***	−0.0144	−0.0188
	(0.00507)	(0.00532)	(0.0398)	(0.0449)
EFW	−0.402***	−0.485***	−0.254***	−0.336***
	(0.0304)	(0.0343)	(0.0633)	(0.0783)
Gini (Inverted)		0.533		0.292
		(0.593)		(1.155)
Civil		−0.0915***		−0.112**
		(0.0286)		(0.0567)
Education (Human Capital)		0.344***		−0.00440
		(0.113)		(0.175)
Constant	3.248***	2.610***	1.988***	2.665**
	(0.321)	(0.568)	(0.663)	(1.179)
Time dummies	YES	YES	YES	YES
Region FE	YES	YES	YES	YES
Observations	490	453	107	99
R-squared	0.390	0.435	0.289	0.323

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7 Weak instrument and under-identification tests for high-skilled 2SLS

Regression number	(25)	(26)
Weak instrument (Cragg-Donald Wald F statistic)	7.03	5.21
	✓ (at 20%)	X
Under-identification (Anderson canon. corr. LM statistic)	0.0059	0.0150
	✓	✓

5 Conclusion

This paper examined how total accumulated emigrant stocks, emigrant outflows, and various skill levels of these emigrant stocks and flows, are associated with changes in economic institutions, as measured by the economic freedom index, in origin countries. Our general findings are: that larger emigrant stocks living abroad are associated with larger subsequent improvements in economic freedom; that the positive impact of larger emigrant stocks diminishes and eventually turns negative at high levels; that these two findings are true at most skill levels; that the size of contemporaneous emigrant flows generally do not impact economic freedom. Our findings are relevant for the broader literature on brain drain, the economic gains from emigration, and allow us to make informed speculations about the relevant channels through which emigration impacts economic institutions.

Our finding that emigrant stocks create a positive institutional externality in origin country economic freedom adds one more way in which human capital loss that could adversely impact origin country prosperity is offset by other factors. Clemens' (2011) provocatively titled article "Economics and Emigration: Trillion-Dollar Bills on the Sidewalk?" surveyed estimates of the potential global gains in economic output if barriers to emigration were eliminated. These estimates ranged from 50 to 150 percent of global GDP and were orders of magnitude larger than gains from eliminating all remaining barriers to the international flow of goods and capital. However, those estimates all held institutions in origin and destination countries constant. Our results indicate that, for most countries, an increase in emigrants living abroad would be associated with an increase in economic freedom. Given the large literature associating economic freedom with positive developmental outcomes, this indicates that the already large "trillion-dollar bills" associated with emigration could be even larger once the impact on origin country institutions is accounted for. The policy implication is that allowing greater emigration from low-economic freedom countries to high-economic freedom countries could promote development in poorer countries, while providing an even bigger boost to global output than previously estimated.

One can pick out individual cases of countries exhibiting different individual channels through which emigration can impact an origin country's economic institutions. In Guyana the absence channel seems to dominate. Nearly 50 percent of the population emigrated and as many as 93 percent of people from Guyana with a tertiary education live abroad. Guyana's economic freedom score has not only failed to improve but it has deteriorated significantly over the last 20 years. The Republic of Georgia illustrates the return channel. Mikhail Saakashvili left Georgia and earned his law degree in the United States. When he returned to Georgia and became President, he ushered in economic reforms that led Georgia to increase its economic freedoms to nearly the level of the United States. Uganda illustrates both the prospect channel and the diaspora channel. When high-skill emigration surged to 25 percent in the 1990 s Uganda reformed its economic institutions and more than doubled its economic freedom score over the decade. The reforms reversed the outflow of high-skill workers, so that there was a net two percent inflow in the decade after the reforms. Uganda then created the "Diaspora Services Department" in 2007 to "develop programmes to enhance diaspora participation in the country's economic and technical development."[8] Since that time Uganda has maintained levels of economic freedom closer to OECD countries levels than to the economic freedom levels of most other African countries.

Rather than singling out individual cases, our cross-country results allow us to observe generalized associations of how emigration might impact economic institutions through the various channels. The main positive relationship between emigrant stocks and subsequent increases in economic freedom is a long-run association. Emigrant stocks build up over decades. This positive long-run association would be consistent with the diaspora and return channel influencing the spread of ideas about the benefits of destination country institutions back to those remaining in origin countries and/or empowering those pushing for institutional change in the origin country with resources from abroad. The quadratic nature of this relationship is also consistent with the idea that eventually the absence channel may lead to too many of the people who can use voice for institutional change in origin countries to have left, but that positive benefits of the diaspora/return channel dominate the absence channel up until high levels of total emigration.

[8] https://diasporafordevelopment.eu/wp-content/uploads/2024/05/CF_Uganda-v.1.pdf

Our cross-country study's findings are necessarily exploratory. We find associations that are consistent with public choice theories of how emigration can impact origin country economic freedom through voice and exit but we cannot make causal empirical claims. This is an area ripe for future research that identifies event studies suitable for causal inference methods. This is particularly relevant for examinations of the prospect channel and contemporaneous emigrant outflows with changes in economic institutions. Other future research could examine how emigration impacts each of the five sub-indexes of economic freedom in origin countries.

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Declarations

Competing interests The authors declare no competing interests.

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