Skilled Migration and the Growth of Caribbean Nations

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Abstract

This note explores the conditions under which skilled migration can facilitate the growth of small nations. A simplified model is developed to link migration and growth through two key mechanisms: the evolution of domestic skilled labor and the contribution of foreign earnings to local demand and investment. A review of existing evidence in the Caribbean reveals substantial frictions in both channels. Future research can help alleviate these frictions by gathering data on remittances and migration from sending countries, as well as evaluating policies that encourage return migration.

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Introduction

Joseph is a student in Saint Kitts. His parents both work in the tourism industry, the largest by far on the island, but Joseph has always loved science. He is an avid runner and dreams of combining his passions to become a sports doctor. The medical school on the island is excellent, and Joseph has managed to earn a scholarship to offset the expensive tuition. American hospital systems recruit at the school, and Joseph soon receives an offer for sports medicine in nearby Miami. Joseph would rather open his own clinic close to home, but the Miami offer is lucrative, and the small island population can only sustain a handful of specialty doctors. The recruiter tells Joseph that Miami is one of the fastest growing healthcare markets in the United States, and he wonders if this growth is the key to achieving his dreams.

The migration of Joseph and other skilled workers links the growth of small island nations like St Kitts to fluctuations in destination markets like Miami. What determines whether small island nations share in the growth of destination markets? Does Joseph's story end in "brain drain" or "brain gain?" These are first order questions for Caribbean nations, which experience high outmigration rates of skilled workers in addition to low economic growth and diversification. In Jamaica, for instance, an estimated 80% of nurses emigrate. Meanwhile, the local economy is dominated by tourism and agriculture, growing just 1-2% per year over the past decade.

This note explores the conditions under which skilled migration can facilitate the growth of small island nations. Section 1 outlines a conceptual model of skilled migration adapted from Khanna et al. (2022). The model captures the major channels linking growth of sending nations to economic shocks in destination markets, such as remittances and costs of education. Section 2 summarizes our general understanding of each channel based on frontier research in economics. Section 3 examines each channels's importance in the Caribbean context, drawing on a broader body of evidence, including from health and sociology. Section 4 examines policies to strengthen some of these channels, such as remittance taxes and skills partnerships. Section 5 charts a path for the research agenda on skilled migration and local growth in the Caribbean. Section 6 concludes.

1 Model of skilled migration

This section presents a simplified model linking migration and growth of sending nations, adapted from Khanna et al. (2022).

1.1 Modelling migration decisions

The earnings of worker i vary based on their origin market o, destination market d, the skill level s (high-skilled or unskilled), and the year t. Workers consider wages, migration costs, and idiosyncratic preferences for each destination. They choose the destination that provides the highest indirect utility, which may be the origin. The model is static, although it is can be interpreted as the steady state of a dynamic model in which workers choose a destination each period to maximize expected lifetime utility.

Mathematically, the indirect utility V of worker i with skill level $s = \{h, u\}$ migrating from origin o to destination d in year t is:

$$V_{iodst} = w_{dst}\epsilon_{odt}R_{dt}q_{id}$$

- w is the (real) wage at the destination, expressed in destination currency units

- ϵ is any factor affecting the earnings of workers in the destination. This can include both factors that increase worker productivity, such as a common language and a large diaspora, and migration costs, such as immigration procedures and travel.

- R is the exchange rate

- q is the worker's idiosyncratic preference for the destination, such as family connections. These are assumed to follow a Frechet distribution with parameter θ. The higher is θ, the more substitutable are destinations from the point of view of workers, and the more sensitive migration decisions will be to earnings. This could be the case if family connections are not important, for instance.

The Frechet assumption delivers a gravity equation for the share of workers with skill level s migrating from origin o to destination d in year t:

$$\pi_{odst} = \frac{(w_{odst}R_{dt})^{\theta}}{\sum_k (w_{okst}R_{kt})^{\theta}}$$

where $w_{odst} = w_{dst}\epsilon_{odt}$ is the wage of migrants, net of migration costs. This expression suggests that a large share of Caribbean workers should migrate to the USA, where wages are better (high w_{dst}), the language barrier is low (high ϵ_{odt}), and idiosyncratic preferences are not important (high θ).

1.2 Linking migration and growth

Following Khanna et al. (2022), we consider the impact of a shock to exchange rates at the destination (R_{dt}) on the income of workers who remain at the origin. The results hold for any shock to earnings at the destination, as long as the shock is exogenous from the point of view of the origin. This includes fluctuations in the growth rate of large destination markets.

Total income per capita (including income earned abroad by migrants and domestically by non-migrants) can be written as follows:

$$Y_{ot} = \sum_{s=\{h,u\}} \left[l_{ost} \sum_d (\pi_{odst} w_{odst} R_{dt}) \right]$$

where l is the share of workers of each skill type. Domestic income per capita is given by the terms of this expression where $d = o$:

$$W_{ot} = l_{oht} \pi_{ooht} w_{ooht} + l_{out} \pi_{oout} w_{oout}$$

Following a shock to the destination market, we can decompose the change in domestic income into four components:

$$\Delta W_{ot} = \sum_s \Delta l_{ost}(w_{os0}\pi_{oos0}) + \sum_s \Delta w_{ost}(l_{os0}\pi_{oos0}) + \sum_s \Delta \pi_{oost}(w_{os0}l_{os0}) - \text{indirect effects}$$

- Changes in the skill distribution, captured by Δl: Returns to migration are typically higher for skilled workers. This means that higher destination wages increase the returns to education, and therefore the share of skilled workers. Some of these workers stay behind and earn the skill premium at the origin

- Changes in wages at the origin, captured by Δw: A portion of migrant income is spent at the origin. Higher wages at the destination therefore increase demand and wages for workers of both skill types who stay behind.

- Changes in migration outflows, captures by $\Delta \pi$: Since wages at the origin rise, the return to staying behind also rises, and fewer workers may leave.

- Indirect migration effects: A shock to earnings at any given destination raises the return to migrating to that destination, which indirectly lowers the share of workers who stay behind and hence domestic income. We assume these indirect effects are small and ignore them from now on. However, these forces influence wages in general equilibrium, as discussed below.

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Using (a) the fact that an increase in the share of skilled workers corresponds to a decrease in the share of unskilled workers and (b) the expression for migration shares as a function of wages above, we can simplify the decomposition:

$$\Delta W_{ot} = \Delta l_{oht}(w_{oh0}\pi_{ooh0} - w_{ou0}\pi_{oou0}) + (1+\theta)\sum_s l_{os0}\pi_{oos0}\Delta w_{ost}$$

This simplified expression reveals two key intermediate outcomes: Δl_{oht} and Δw_{ost}. The first, Δl_{oht}, summarizes the change in the share of skilled workers at the origin.[1] This is a function of the change in income per capita induced by the shock, under the assumption that increases in income either raise the returns to education and/or ease liquidity constraints for investing in education:

$$\Delta l_{oht} = \psi \Delta Y_{ot}$$

where ψ is the effect of income shocks on the share of high-skilled workers. A low value of ψ could reflect high costs of education.

The second, Δw_{ost}, summarizes the change in wages of each skill type at the origin.[2] These equilibrium objects react to changes in aggregate demand, investment in local businesses, and the price of local goods:

$$l_{os0}\pi_{oos0}\Delta w_{ost} = \zeta_s \Delta Y_{ot}$$

where ζ_s is the demand or investment multiplier. A high value of ζ_s could reflect strong investment in local businesses. The parameter is indexed by s to indicate that the link between migrant income and local wages may differ across skill types. For example, differences in labor mobility can lead local skilled wages to be more responsive to international shocks, so that $\zeta_u < \zeta_h$. On the other hand, unskilled wages may be more sensitive to aggregate demand if investments are concentrated in tourism, so that $\zeta_u > \zeta_h$. Finally, ζ_s also includes effects that are common across skill types, such as changes in local prices.

Using the definition of Y_{ot}, we can write the change in per capita income induced by the exchange rate shock as a shift-share instrument:

$$\Delta Y_{ot} = \sum_s l_{ost} \sum_d \pi_{odst}w_{odst}\Delta R_{dt} = \sum_d \Delta R_{dt}\frac{\sum_s L_{odst}w_{odst}}{L_{ot}} = \sum_d \Delta R_{dt}\omega_{odt}$$

- ΔR_{dt} is the exchange rate shock — the "shift" in a shift-share design.

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[1] This is determined by production function for skilled labor.

[2] These are determined in equilibrium by the labor market clearing condition, which equalizes the supply of labor (which depends on migration decisions across all destinations) and the demand for labor (which depends on firm decisions at the origin).

- ω_{odt} is migrant income per capita at the destination — the exposure weight or "share" in a shift-share design.

Substituting into the expression for changes in domestic income yields the change in domestic income as a function of the shock and model parameters:

$$\Delta W_{ot} = \psi\beta\Delta Y_{ot} + (1+\theta)(\zeta_u + \zeta_h)\Delta Y_{ot} = [\psi\beta + (1+\theta)(\zeta_u + \zeta_h)]\sum_d \omega_{odt}\Delta R_{dt}$$

where $\beta = w_{oh0}\pi_{ooh0} - w_{ou0}\pi_{oou0}$ is the domestic skill premium.[3]

2 Discussion of mechanisms

In this section, we discuss the channels linking migration and local growth, summarizing the state of the academic literature.[4]

To simplify the discussion, assume there is only one destination, d, and define $\zeta = \zeta_u + \zeta_h$ The change in domestic income is now:

$$\Delta W_{ot} = [\psi\beta + (1+\theta)\zeta)]\omega_{odt}\Delta R_{dt}$$

The two components in brackets represent the two key channels linking shocks at migration destinations, ΔR_{dt}, to growth in domestic income at the origin, ΔW_{ot}.

2.1 Skills channel

The first term in brackets captures how incomes abroad change the local distribution of skills and therefore the income of skilled workers. We refer to this as the skills channel.

- ψ represents the relationship between migration opportunities and the share of skilled labor. A low value could indicate barriers to education, such as poor public education and liquidity constraints to better private education.

  - Gibson and McKenzie (2012) survey skilled workers in Micronesia, Tonga, and Papua New Guinea. The majority of them moved abroad to complete their higher education, indicating some barriers to local education.

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[3]Note that β, ζ_s, and ω_{odt} all depend on the distribution of labor across skill types.
[4]See Gibson and McKenzie (2011a) for an in-depth review.

- Bhargava et al. (2011) find that higher returns to migration for physicians do increase the number of locally-trained physicians across 69 origin countries. However, this does not result in a net brain gain, suggesting that domestic returns for skilled workers are low.

- β is the wage premium for skilled workers in the domestic economy. For a given shift in the skill share, a low value could indicate a lack of job opportunities for skilled workers in the domestic economy.

  - The low skill premium in developing countries is well-documented. Gibson and McKenzie (2011b) further document that long-term non-pecuniary career concerns, such as leadership opportunities, are important drivers of skilled migration from small islands.

  - Using data on skilled migrants from more than 150 origin countries, Docquier et al. (2007) calculate brain drain rates — the share of skilled workers from each origin living abroad. The strongest predictor of brain drain is the population of sending countries, with small nations experiencing the highest rates. This suggests a particular lack of opportunity in small labor markets.

2.2 Demand channel

The second term in brackets captures how incomes abroad change overall demand in the local economy and therefore the income of all workers. We call this the demand channel.

- ζ represents the aggregate demand multiplier. A low value could indicate low levels of spending or re-investment in the local economy.

  - Gibson and McKenzie (2012) estimate that return migration rates are high for small island nations. However, this does not translate to greater involvement of migrants in trade, FDI, local entrepreneurship, or government.

  - Similarly, remittance rates are high for small island nations (Gibson and McKenzie, 2012), but it is unclear whether these remittances are spent on basic necessities or long-term investments (Yang, 2006).

  - Taxing remittances has a negative direct effect on aggregate demand (lower ζ), but reinvesting these taxes in local education (raising ψ) or business (raising ζ) may more than offset the lost income. Gibson and McKenzie (2012) calculate that remittances to small island nations are of the same order of magnitude as fiscal losses, so the elasticity of local investments to tax revenue is crucial.

- This channel can also capture externalities to skilled migration, such as reduced availability of healthcare providers. Gibson and McKenzie (2012) estimate low production externalities in small island nations. Similarly, Bhargava et al. (2011) find no evidence of externalities from medical brain drain on child mortality and vaccinations.

- Finally, this channel captures changes to local prices. If the consumption basket contains goods whose prices change as a result of shocks at the destination – such as imported goods or skilled services – this will offset increases to aggregate demand. Narayan et al. (2011) show that remittances generate inflation in a sample of 54 developing countries.

- θ represents the sensitivity of migration decisions to wages in any given location. In this case, lower sensitivity means that few workers return to the origin following the boost in local demand, possibly because of idiosyncratic location preferences.

  - Recall that ω contains $w_{odst} = w_{dst}\epsilon_{odt}$, so that systematic factors reducing migrant earnings at the destination, such as migration costs, enter outside of the brackets. Gibson and McKenzie (2011b) find low levels of migration despite large differences in wages, indicating high migration costs. Return migration rates are driven by family and lifestyle concerns rather than wage changes, further indicating non-monetary costs of moving.

3 Evidence from the Caribbean

Shocks to foreign labor markets affect domestic income through the skills channel and the demand channel. The strength of the skills channel is governed by the local education response, ψ, and the local skill premium, β. The strength of the demand channel is governed by the local demand multiplier, ζ, and the responsiveness of return migration, θ. Together, these four parameters determine how migrant income translates to local growth. In this section, we examine evidence on these parameters specifically in the Caribbean context.

3.1 Skills channel

Shocks to skilled wages abroad can increase the returns to schooling and ease liquidity constraints for education. As long as some of these newly skilled workers stay behind, migration can lead to brain gain.

Elasticity of skilled workers to skilled wages, ψ:

- In the Caribbean, there is some evidence that barriers to education prevent the skilled workforce from growing. Jamaican nursing schools cannot train nurses quickly enough to stop the shortages driven by migration (Salmon et al., 2007). In Haiti, migration can have a positive impact on educational attainment, but only in communities that already have access to good schools (Amuedo-Dorantes et al., 2010). Overall, the relative educational attainment of Caribbean workers has declined over the past 30 years (Rivera-Batiz, 2007; Docquier and Rapoport, 2009), despite heavy subsidies of tertiary education (Mishra, 2007).

Domestic skill premium, β:

- Low domestic returns to education represent an even greater challenge than lack of access. Despite the shortage of nurses in Jamaica, wages remain low because healthcare services generate little revenue (Carpio and Bench, 2015). A Jamaican nurse would make four times as much working in the USA, even after adjusting for differences in cost of living (George et al., 2019). As a result, an estimated two-thirds of nurses trained in Jamaica over the past 30 years have emigrated (Lowell and Findlay, 2001). A survey of healthcare workers across the Caribbean revealed that most migrants left for higher salaries and better working conditions (Almeida, 2019). Most workers who stayed behind said they would leave if given the opportunity. These patterns hold beyond the healthcare sector: an estimated 70% of the tertiary-educated labor force has left the Caribbean for OECD countries (Mishra, 2007).

3.2   Demand channel

Shocks to skilled wages abroad can boost aggregate demand at home, even without any change in the skill composition of the workforce. Remittances can fuel the creation of local businesses, and migrants can transfer knowledge as entrepreneurs.

Aggregate demand multiplier, ζ:

- Evidence on migrant income and entrepreneurship in the Caribbean is mixed. Some surveys suggest that return migrants are more likely to start small businesses and introduce innovations (Gmelch, 1987; Chevannes and Ricketts, 1996). Other studies note that entrepreneurship is concentrated in tourism and other services, with limited impacts on productivity (Plaza, 2008). Finally, the majority of returning migrants are retired (Thomas-Hope, 1999).

- The link between remittances and local demand seems definitively weak. Caribbean migrants only remit about 1.5% of their income on average (Bidawi et al., 2022).

Although these remittances are typically not taxed, they face transaction costs of more than 6% (Beaton et al., 2017). The majority of remittances are used to pay for basic necessities, limiting the potential for investment (Orozco, 2004). In some cases, remittances are even associated with declines in local demand and investment (Jaupart, 2023). At a macroeconomic level, estimated spending multipliers for remittances are low (Economics, 2021), and remittance flows are countercyclical (Beaton et al., 2017). Other capital flows from migrants, such as Foreign Direct Investment, have declined in recent years (Mishra, 2007).

- There is some evidence that remittances increase inflation in the Caribbean (Beaton et al., 2017). Given the weak link between remittances and local demand, inflation is likely cost-based. One possibility is that changes in remittances are correlated with changes to the skilled wage, which in turn raises the price index.

Elasticity of migration to wages, θ:

- Migration from the Caribbean is characterized by persistent, high outflows to the United States, as well as return flows concentrated among retired workers (Jaupart, 2023). Together with the geographic proximity, language similarities, and large diaspora, this suggests a limited role for migration costs and migration elasticities relative to other contexts.

3.3 Other factors

A few additional factors can act to reinforce the above channels:

- β, ζ, and ω all depend on the baseline skill distribution. Large differences in mobility lead to skill-biased migration. As a result, fewer workers are exposed to the domestic skill premium at baseline (β), to equilibrium changes in the skilled wage (ζ_h), and the shock at the destination (ω).

- Indirect equilibrium effects could be large in the Caribbean context. Even if shocks at the destination increase the share of skilled workers, local demand, and return migration, the overall impact on local growth may be mitigated by new outmigration.

- Because remittances are countercyclical with respect to the origin, the correlation between shocks at the destination and shocks at the origin is an important determinant of local growth rates. This means that the parameters ζ_s may depend on the shocks themselves.

4 Migration policies in the Caribbean

The previous section highlights four barriers interrupting the link between skilled migration and local economic growth in the Caribbean context: reduced availability of schooling; low domestic skill premia; limited involvement in entrepreneurship; and modest impacts of remittances on local demand. Several migration policies in the region have attempted to overcome these barriers, but results have been mixed (Jaupart, 2023).

4.1 Skills channel

Bonding policies have been implemented in Jamaica in 2009 and in Trinidad and Tobago in 2013. These policies heavily subsidize the cost of higher education under the condition that skilled workers remain in the local labor market for a given amount of time. The penalty for breaking this contract is a hefty fee. However, lack of contract enforcement, as well as offers to pay the fee by hiring firms abroad, have limited the impact of the policies. St Vincent and the Grenadines attempted to formalize this policy through an agreement with the USA, which would have required recruiters to pay fees.

The Managed Migration Program, established in 2001, explored more nuanced strategies for managing the mobility of nurses. Jamaican Nurses were permitted to practice part-time in Miami, providing an alternative to fully staying or fully leaving. Unfortunately, this program was never evaluated and has since been discontinued.

Several countries have implemented policies to encourage return migration. These policies typically provide tax breaks and other incentives for workers returning from abroad. Incentives are typically restricted to retired individuals, limiting their potential (Bristol, 2010). Their impact on local demand and investment has not been evaluated.

4.2 Demand channel

Some countries have attempted to funnel remittances into local investment. Jamaica implemented a compulsory savings program for migrants. Employers in the USA and Canada placed a portion of migrant income in a savings account that could be accessed only upon returning to Jamaica. Although this program only applied to temporary workers in the agricultural sector, survey results found that it was associated with higher investment. As above, the program was never evaluated and has since been discontinued.

In 2011, the Haitian government imposed a tax on remittances and international calls with the goal of investing tax revenue in local education. The program has generated substantial revenue since its inception, but little is known about the use of these funds.

Additional policies have been proposed to amplify this channel. Stimulating competition among financial service providers, e.g. through the entry of fintech firms, could reduce the cost of sending remittances (Jaupart, 2023). In parallel, Central Banks have proposed the creation of financial products linked to migrant income (Castro-Leal and Méndez Maddaleno, 2021). Examples include loans collateralized by remittances and so-called "diaspora bonds," which are purchased by migrants and used for specific development projects.

5 Future research in the Caribbean

Future research on skilled migration and local growth in the Caribbean should aim to fill several important data and knowledge gaps.

5.1 Data gaps

Data on Caribbean migrants faces two key limitations. First, the majority of systematic data on migrants is gathered from sources in the destination country, such as the American Community Survey (ACS). Such sources help establish the size of migration and remittance flows, as well as the characteristics of migrants. However, they are silent on the uses of remittances and the drivers of migration. Second, what little data exists on these topics is typically either outdated, limited in scope, or narrowly focused on one country and profession such as nurses in Jamaica (Rolle Sands et al., 2020). Collecting novel microdata on remittance utilization and migration decisions across multiple countries or professions is an important first step toward strengthening both the skills and demand channels.

5.2 Knowledge gaps

Knowledge of the skills channel can benefit from the evaluation of existing policies and the measurement of novel outcomes. Policies encouraging return migration are widespread in the region, but have not been formally evaluated. Although these policies are targeted at retired individuals, they can yield important insights about the elasticity of return migration to financial incentives, as well as the elasticity of local demand to return migration. Bonding policies have had limited success, but evidence suggests that the bonds are "mispriced." These bonds should take into account not only the cost of higher education but also the net impact of migration on local growth through the skills channel. If properly priced, they can become an asset to the region, rather than a liability.

The demand channel suffers from both a lack of suitable data on mechanisms and a lack of innovative policies to evaluate. Our discussion of the demand channel in Section 4

encompasses several distinct mechanisms linking foreign shocks to local growth, including entrepreneurship and knowledge transfer by return migrants; local spending and investment of remittances; and direct and indirect taxes. The net effect of these mechanisms is captured by the parameter ζ but the size of each component is crucial for designing policy. Several policies aim to overcome individual mechanisms, but none have gained traction. Carefully decomposing the demand channel could help focus the policy debate. This requires gathering data on remittance flows and fees from migrants, as in Gibson and McKenzie (2012), or data on local income and spending from nonmigrants, as in Khanna et al. (2022). The importance of each mechanism can then be estimated using appropriate shift-share instruments.

6   Conclusion

Whether Joseph's story ends in brain drain or brain gain for Saint Kitts depends on several forces, including the sensitivity of the skilled labor force to foreign wages and the link between remittances and local investment. Existing evidence suggests that these forces are weak, but there remain important data and knowledge gaps in the region. Novel micro data, together with frontier migration models and shift-share instruments, can help bridge the gap and guide the design of the next generation of migration policies.

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