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# Assessing the Impact of Restricting Skilled and Unskilled Migration: A General Equilibrium Approach

Prepared by Alina Carare, Metodij Hadzi-Vaskov, Jessie Nabulambo Kilembe, and Felipe Leal*

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# Assessing the Impact of Restricting Skilled and Unskilled Migration: A General Equilibrium Approach

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**ABSTRACT:** We augment the two-country DSGE model from Mandelman and Zlate (2012) with endogenous migration of both skilled and unskilled labor, and analyze the economic impact of restricting migration for each type of labor on the migrants' source and host countries. We calibrate the model with data for Guatemala and the U.S. as the source and host countries respectively. Restricting unskilled immigration has a more severe contractionary impact on the host economy than restricting skilled migration—reducing aggregate output by approximately 1 percent and consumption by 0.6 percent compared to the steady state—, given that in the steady state a lot more unskilled migrants are needed in the production function. Restricting unskilled immigration impacts negatively skilled immigration flows, but not vice-versa, and it has a significant overall impact on the source economy, with aggregate consumption and income declining (mostly due to a fall in remittances). Our findings also highlight a key policy trade-off for the host economy: while a restrictive immigration policy (especially for unskilled labor) could reduce wage inequality by compressing the skill premium—raising host-country unskilled wages by 8 percent while lowering skilled wages by 1 percent compared to the steady state—, and could increase output per capita, it comes at the cost of lower overall economic activity and aggregate consumption. Moreover, by increasing the wage gap for unskilled labor between host and source economies, it also raises incentives for immigration, despite the increased cost of migration.



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|---|---|
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# 1 Introduction

International immigration plays an important role in shaping labor markets, output, and welfare in migrants' countries of origin—or *source economies*—and their destinations—or *host economies*. In recent years, immigration policies in major host economies have tightened overall, becoming increasingly skill-selective through mechanisms such as visa caps, point-based admission systems, and enforcement measures that target specific groups. These policies tend to influence the volume as well as the composition of immigration flows (OECD 2025). Moreover, these policies alter the allocation of labor across countries, both for skilled and unskilled workers, and therefore, affect their respective wages. Furthermore, given that remittances depend on immigration flows, changes in immigration policies influence broader macroeconomic outcomes in the source and host economies.

The macroeconomic effects of changes in immigration policy depend on how forward-looking decisions respond to policy frictions and how changes in the composition of migrants or in the composition of the factors of production more generally (such as capital, skilled and unskilled labor, technology) transmit through wages, production, and cross-border transfers. Although the empirical literature analyzes how immigration policy—and in particular enforcement of such policies—affects immigration flows and labor market outcomes, there is more limited knowledge on the general equilibrium effects of skill-selective immigration policies, especially in the case when both migration and remittances are decided endogenously.

This paper addresses this gap in the literature by augmenting a two-country dynamic stochastic general equilibrium (DSGE) model with endogenous migration of both skilled and unskilled labor and remittances. Migration decisions are forward-looking and respond to wage differentials and skill-specific policy frictions, as in the seminal work of Mandelman and Zlate (2012). However, while the focus of Mandelman and Zlate (2012) is on restrictions to unskilled labor only, in our model immigration policy in the host economy is modeled through skill-specific migration costs, allowing host economy policy changes to influence the scale as well as the composition of migrant inflows. In this setup, remittances arise endogenously and adjust both through the extensive margin (number of migrants) as well as the intensive margin (remittances per migrant), thereby linking labor market outcomes in the host economy to income dynamics in the source economy.

Our paper contributes to the literature by enhancing two-country DSGE models with endogenous migration and remittances to allow for skill-heterogeneity restrictions across migrant types. In turn, such a framework allows us to analyze the differential responses of skilled and unskilled labor to immigration policy shocks, even when that particular labor segment is not directly targeted by the corresponding policy. As a result, the analysis also

evaluates the effects of policy-induced changes in the migrant skill composition transmitting to macroeconomic outcomes in both migrants' source and host economies.

Calibrating the model to the United States (as the host economy) and Guatemala or Mexico (as the source economy), the paper finds that skill-selective immigration policies result in asymmetric macroeconomic effects. When the model is calibrated to the specific data of these countries, whereby the unskilled account for most of the migrants, restricting unskilled migration leads to a more severe downturn in the host country compared to restricting skilled migration. Restrictions to unskilled migration also significantly affect the source economy, inducing an increase in capital to match the relatively larger labor pool, which results in higher aggregate output, but lower output per capita. Moreover, as the decline in migrants implies lower aggregate remittances, aggregate consumption in the source economy also falls. On the other hand, restricting skilled migration does not lead to a decline in aggregate remittance flows because the increase in remittances per worker more than offsets the decline in the number of migrants. Overall, the impact of restrictions to skilled migration on the source and host country aggregates is more limited, since in the steady state unskilled migrants account for most of the migration flows from the source country (Guatemala or Mexico) to the host country (the U.S.).[1]

These findings underscore a central policy trade-off: although restricting unskilled migration may alleviate wage inequality in the host country, by compressing the skill premium, it does so at the cost of lower overall economic activity and aggregate consumption. The distributional effect aligns with theoretical work showing that restrictions on low-skilled immigration can reduce the skill premium (Guerreiro et al. 2020). The contractionary effect aligns with recent U.S. evidence that restrictions on firms' access to low-skilled immigrant workers can reduce production (Clemens and Lewis 2026). Moreover, by widening the wage gap for unskilled labor between the host and source economies, the policy partly offsets the dampening effect of higher migration costs by increasing the incentives to migrate, consistent with evidence that international migration responds to cross-country income and earnings differentials (Mayda 2010; Grogger and Hanson 2011).

The remainder of the paper is organized as follows: Section 2 reviews the related literature. Section 3 describes the model, while Section 4 presents the results of calibrating the model for U.S. and Guatemala, and puts them into perspective. Section 5 provides some concluding remarks, and the Appendix presents results from calibrating the model to the U.S. and Mexico.

1. The relatively muted impact on restrictions to skilled migration primarily reflects the dominant role of unskilled in overall migrations between Guatemala or Mexico and the U.S. In addition, the impact of skilled migration on productivity and output could be more substantial if the model accounted for innovation and knowledge spillovers associated with skilled workers. For instance, see Lizarazo (2026).

## 2 Literature Review

This paper is based on several strands of the migration and remittances literature. Broadly speaking, the literature looks at (i) migration flows, (ii) the role of changes in immigration policy in affecting migration flows and labor and macroeconomic outcomes, and (iii) determinants of remittances and their impact on source countries.

Empirical research finds that immigration patterns are influenced by wage differences, the intensity of immigration enforcement measures, and that immigration impacts labor market outcomes in host economies by altering the skill composition of the labor force. The literature based on structural macroeconomic models often incorporates endogenous migration or remittances within general equilibrium frameworks, allowing for richer dynamics. However, these papers tend to be focused on one segment of the labor market.

More recent studies introduce skill-heterogeneity in migration choices in a general equilibrium setting. That being said, many models either still focus on restricting a single skill category, treating immigrants as a homogeneous group, not including remittance behavior, or limiting their analysis to one side of the migration corridor (host or source country). not analyzing the impact of restricting migration on both economies. Consequently, they tend to not capture jointly the impact of skill-selective immigration policies, skill heterogeneity, and endogenous remittances in both countries (source and host) in a general equilibrium framework.

The earlier studies found that tightening immigration policy affects migration flows by altering the benefits, costs, and risks associated with labor migration across borders, but focusing primarily on irregular (illegal) migration, which tends to be low skilled. For example, Hanson and Spilimbergo (1999) uses variation in U.S. border apprehension and enforcement intensity to assess how attempted illegal migration responds to relative wages across countries (U.S. and Mexico) and find that U.S. apprehensions of illegal immigrants is highly correlated with real wages, increasing as U.S. real wages or when Mexican real wages declined. They also found that the effectiveness of border enforcement may rise with the level of enforcement. Going further, Chiquiar and Hanson (2005) show that migrants are not disproportionately drawn from the bottom of the skill-distribution, and that migration reflects differences in returns to skill and migration costs. This suggests that shifts in immigration policy can alter not only the scale but also the skill composition of migrant flows.

Another strand of literature focuses on labor market outcomes in destination countries. By altering the size and composition of migrant inflows, immigration policies affect labor supply, wages, and employment. Borjas (2003) uses the variation in immigrant inflows across workers defined by education-experience groups and finds that increases in immigrant labor

supply within these narrowly defined groups decrease the wages of competing native workers in the host country. In contrast, Ottaviano and Peri (2012) estimate a production framework with imperfect substitution between natives and immigrants across education-experience groups, showing that wage effects depend on substitution elasticities and complementarities across skill groups. Furthermore, more recent work shows that tighter immigration policies in one destination country redirects migrant flows to alternative destinations rather than decreasing aggregate migration, resulting in heterogeneous macroeconomic effects across receiving countries (International Monetary Fund 2025).

Immigration policy also affects remittances by altering migrants' income risk and legal uncertainty. Tightening immigration policy increases deportation risk and income instability, particularly for undocumented migrants. Amuedo-Dorantes and Pozo (2006) show that remittances serve an insurance role, and as the risk of losing the income in the host country rises, both the likelihood of remitting and the share of income sent home increases. Undocumented immigrants, facing greater labor market uncertainty and limited access to formal insurance, remit a larger share of their income. Amuedo-Dorantes and Puttitanun (2014) finds that stricter immigration enforcement reduces the share of migrants who remit, but that migrants who continue to remit, particularly legal migrants, increase the amount sent to the source (home) countries, raising average remittances per migrant, consistent with precautionary responses to elevated enforcement-related uncertainty. More recent evidence shows that rising deportations are associated with shifts in the financial behavior of undocumented immigrants, leading them to reallocate savings away from the host-country toward remittances, while the remitting and savings behavior of documented migrants remains largely unchanged (Weber and Massey 2023).

However, in early models remittances are exogenous income transfers or shocks, impacting household consumption in small open economies ((Acosta et al. 2009; Durdu and Sayan 2010)). Although these studies highlight the stabilizing role of remittances over the business cycle, migration decisions are not modeled explicitly, and remittance flows do not respond endogenously to policy changes or labor market conditions. More recent papers using a general equilibrium model, and modeling migration and remittances endogenously, like Lim et al. 2023 which focuses on the macroeconomic and welfare implications for the source country, abstracts from skill-heterogeneity and do not include skill-selective immigration policy or asymmetric restrictions across skill groups.

Mandelman and Zlate 2012 makes an important contribution to the literature by developing a two-country DSGE model with endogenous labor migration and rule-based remittances linked to relative wages, the focus is on unskilled migration. Migration is modeled as a forward-looking decision influenced by wage differentials between host and home countries

of unskilled labor and constrained by a sunk migration cost that captures enforcement intensity, calibrated using U.S.-Mexico border apprehension data to capture policy-induced frictions affecting migration flows. Immigration policy operates through changing this enforcement-related migration costs. Consequently, migration responds endogenously to cyclical conditions and policy induced changes in enforcement intensity. Remittances are modeled endogenously through a rule-based mechanism to reflect the insurance and altruistic motives of remittance behavior observed in micro-data. Transfers increase when host-country wages rise or when home-country income falls. Remittances act as substitutes for formal insurance and respond endogenously to macroeconomic shocks in both the host and home countries, smoothing consumption across migrant and non-migrant households. Therefore, the model jointly determines immigration flows, remittances, and external dynamics within a general equilibrium. However, migration is limited to a single labor type (unskilled).

This paper contributes to the literature by augmenting the two-country DSGE framework of Mandelman and Zlate (2012), with endogenous migration of both skilled and unskilled workers, alongside endogenous remittances. The model incorporates skill heterogeneity in migrants' decisions and allows immigration policies to restrict skilled and unskilled labor flows, allowing for changes in skill composition of the flows. Migration decisions respond endogenously to wage differentials and skill-specific policy frictions, while remittances adjust along both extensive (number of migrants) and intensive (remittances per migrant) margins. By jointly modeling migration and endogenous remittances in a general equilibrium, this framework enables the assessment of how changes in skill-selective immigration policies affect migration flows, remittances, wages, and welfare in both origin and destination. Moreover, distinguishing between changes in skilled and unskilled immigration policies it allows to assess the asymmetric macroeconomic effects of skill-selective immigration policies by impacting migrant flows differently by skill level, including when immigration policies do not target that particular type of skills.

# 3 Model

The model considers four types of households, based on skill level (skill and unskilled) and country (home and foreign, referring to host/destination and origin/source of migrants respectively). International markets are incomplete. Only skilled households in each country are able to trade free-risk assets (unskilled labor does not trade any asset). Skilled households can trade either home or foreign bonds. Unskilled households in foreign could choose to migrate and send remittances.

## 3.1 Home

There is a continuum of two types of infinitely lived households indexed by $j \in \{s, u\}$ for skilled and unskilled, that maximizes

$$\max_{c_{j,t}, l_{j,t}, i_{j,t}, k_{j,t+1}} \mathbb{E}_t \sum_{\tau=t}^{\infty} \beta^{\tau-t} \left\{ \varepsilon_t^b \left( \ln c_{j,\tau} - \chi_j \frac{l_{j,\tau}^{1+\psi}}{1+\psi} \right) \right\}$$

where $\beta$ is the discount factor, $\psi$ is the inverse Frisch elasticity of labor supply and $\varepsilon_t^b$ is an intertemporal demand shock.

**Skilled households.** The budget constraint is defined as

$$\begin{aligned} & w_{s,t} l_{s,t} + r_{s,t} k_{s,t} + (1 + r_t^b) b_{h,t} + (1 + r_t^{b*}) Q_t b_{f,t} + T_{s,t} \\ & \geq c_{s,t} + i_{s,t} + b_{h,t+1} + \frac{\pi}{2} (b_{h,t+1})^2 + Q_t b_{f,t+1} + \frac{\pi}{2} Q_t (b_{f,t+1})^2 \end{aligned}$$

where $w_s$ denotes the wage for the skilled workers, $l_s$ is labor supply, $r_s$ is the gross rental rate of capital (return on capital), k and i are the capital and investment of the skilled household, $b_h$ and $b_f$ are the bond holdings (home and foreign country, respectively), while $r^b$ and $r^{b*}$ are the interest rates that those bonds pay (expressed in units of home composite good), Q is the real exchange rate, $\frac{\pi}{2}(b_{h,t+1})^2$ and $\frac{\pi}{2} Q_t (b_{f,t+1})^2$ are adjustment costs of bonds holdings, while $T_{s,t}$ is the adjustment cost rebated to skilled households. These adjustment costs are necessary to avoid non-stationarity.

**Unskilled households.** The budget constraint is defined as

$$w_{u,t} l_{u,t} + r_{u,t} k_{u,t} \geq c_{u,t} + i_{u,t} \tag{1}$$

**Production.** For both type of households, the law of motion of capital is identical and defined by

$$k_{j,t+1} = (1 - \delta) k_{j,t} + \varepsilon_t^i i_{j,t} \tag{2}$$

where $\delta$ is the depreciation rate.

The total output is defined by a nested CES of both skilled and unskilled workers

$$\tilde{Y}_t = \left\{ \gamma^{\frac{1}{\theta}} Y_{1,t}^{\frac{\theta-1}{\theta}} + (1-\gamma)^{\frac{1}{\theta}} Y_{2,t}^{\frac{\theta-1}{\theta}} \right\}^{\frac{\theta}{\theta-1}} \tag{3}$$

where $Y_{1,t}$ is the production carried out by unskilled workers from home, which is combination of perfectly substitutable unskilled native labor ($L_{u,t}$) and immigrant labor ($L^i_{u,t}$) :

$$Y_{1,t} = L_{u,t} + L^*_{u,t} \tag{4}$$

and $Y_{2,t}$ is the production carried out by imperfect substitute skilled workers from home ($L_{s,t}$) and the foreign ($L^*_{s,t}$) country, complemented by capital as follows:

$$Y_{2,t} = \left\{ \lambda^{\frac{1}{\eta}} K_t^{\frac{\eta-1}{\eta}} + (1-\lambda)^{\frac{1}{\eta}} \left( \lambda_L^{\frac{1}{\eta_L}} L_{s,t}^{\frac{\eta_L-1}{\eta_L}} + (1-\lambda_L)^{\frac{1}{\eta_L}} L^{i\ \frac{\eta_L-1}{\eta_L}}_{s,t} \right)^{\frac{\eta_L(\eta-1)}{\eta(\eta_L-1)}} \right\}^{\frac{\eta}{\eta-1}} \tag{5}$$

where $K_t = \left\{ \lambda_k^{\frac{1}{\eta_k}} K_{s,t}^{\frac{\eta_k-1}{\eta_k}} + (1-\lambda_k)^{\frac{1}{\eta_k}} K_{u,t}^{\frac{\eta_k-1}{\eta_k}} \right\}^{\frac{\eta_k}{\eta_k-1}}$

The main parameters governing the home production structure are: $\gamma$, the share of unskilled labor in production; $s$, the share of skilled households in the home economy; $\lambda$, the share of capital in the capital-skill composite; $\zeta$, which captures the relative productivity of skilled compared with unskilled labor; $\theta$, which governs the elasticity of substitution between the unskilled labor composite and the capital-skilled labor composite; $\eta$, the elasticity of substitution between capital and skilled labor; and $\eta_L$, the elasticity of substitution between native and immigrant skilled labor.

## 3.2 Foreign

There is a continuum of two types of infinitely lived households indexed by $j \in \{s, u\}$ for skilled and unskilled, that maximizes

$$\max_{c^*_{j,t}, l^*_{j,t}, i^*_{j,t}, k^*_{j,t+1}} \mathbb{E}_t \sum_{\tau=t}^{\infty} \beta^{\tau-t} \left\{ \varepsilon_t^b \left( \ln c^*_{j,\tau} - \chi_j \frac{l^{*1+\psi}_{j,\tau}}{1+\psi} \right) \right\}$$

where $\beta$ is the discount factor, $\psi$ is the inverse Frisch elasticity of labor supply and $\varepsilon_t^b$ is an intertemporal demand shock.

**Skilled households.** In a departure from Mandelman and Zlate 2012 we introduce cross-border mobility for skilled foreign labor, allowing it to work in the home country as

immigrant labor. Each skilled household can supply labor in the foreign country $l^*_{s,t}$ or in the home country, as immigrants ($l^i_{s,t}$). Therefore, the portion of skilled labor working in the foreign country is ($l^*_{s,t} - l^i_{s,t}$).

This migration dynamic is defined by

$$l^i_{s,t} = (1 - \delta^e_s)(l^i_{s,t-1} + l^e_{s,t-1}) \tag{6}$$

where $\delta^e_s$ is the exogenous portion of immigrant labor returning to the foreign country every period (voluntarily or involuntarily).

The budget constraint is defined as

$$\begin{aligned} &w^*_{s,t}(l^*_{s,t} - l^i_{s,t}) + w^i_{s,t}Q^{-1}_t l^i_{s,t} + r_{s,t}k^*_{s,t} + (1 + r^b_t)Q^{-1}_t b^*_{host,t} + (1 + r^{b*}_t)b^*_{source,t} \\ &\geq c^*_{s,t} + f^e_{s,t}w^i_{s,t}Q^{-1}_t l^e_{s,t} + i^*_{s,t} + Q^{-1}_t b^*_{host,t+1} + \frac{\pi}{2}Q^{-1}_t(b^*_{host,t+1})^2 + b^*_{source,t+1} + \frac{\pi}{2}(b^*_{source,t+1})^2 \end{aligned}$$

where $w^*_s$ denotes the wage for the skilled labor in the foreign country, $l^*_s$ is labor supplied locally, $r_s$ is the return on capital own by skilled household, $b^*_h$ and $b^*_f$ are the bond holdings from home and foreign country, respectively, $r^b$ and $r^{b*}$ are the interest rates that those bonds pay, $\frac{\pi}{2}Q^{-1}_t(b^*_{h,t+1})^2$ and $\frac{\pi}{2}(b^*_{f,t+1})^2$ are adjustment costs, similar to $T^*_{s,t}$ which is rebated to skilled households.

**Unskilled households.** Each unskilled worker supply $l^*_{u,t}$ of which some migrate to home ($l^i_{u,t}$) and other stay at foreign ($l^*_{u,t} - l^i_{u,t}$). This migration dynamic is defined by

$$l^i_{u,t} = (1 - \delta^e_u)(l^i_{u,t-1} + l^e_{u,t-1}) \tag{7}$$

where $\delta^e_u$ is the exogenous portion returning to foreign country every period.

As in Mandelman and Zlate 2012, there is cross-border mobility for the unskilled household in the foreign country, whose members have the option to work in the home country for a higher wage than in the foreign country, but subject to a sunk emigration cost $f^e_{u,t}$. Each unskilled household supplies $l^*_{u,t}$ units of labor every period, of which some members reside and work abroad (in the home country) while the rest work in the country of origin (the foreign country).

The calibration ensures that the unskilled wage is higher in the home country ($w^i_{u,t}$) than in the country of origin ($w^*_{u,t}$), so that the incentive to emigrate from the foreign to the home country exists every period. However, a fraction of the foreign unskilled labor always remains in the foreign country, as the sunk cost of migration limits entry. The macroeconomic shocks

are small enough for these conditions to hold every period.

The budget constraint is defined as

$$w^*_{u,t}(l^*_{u,t} - l^i_{u,t}) + w^i_{u,t}Q_t^{-1}l^i_{u,t} + r^*_{u,t}k^*_{u,t} \geq c^*_{u,t} + f^e_{u,t}w^i_{u,t}Q_t^{-1}l^e_{u,t} + i^*_{u,t} \tag{8}$$

**Production.** For both type of households, the law of motion of capital is identical and defined by

$$k_{j,t+1} = (1-\delta)k_{j,t} + \varepsilon^i_t i_{j,t} \tag{9}$$

where $\delta$ is the depreciation rate.

The total output at foreign is defined by a nested CES of both skilled and unskilled workers

$$\tilde{Y}^*_t = \left\{ {\gamma^*}^{\frac{1}{\theta^*}} {Y^*_{1,t}}^{\frac{\theta^*-1}{\theta^*}} + (1-\gamma^*)^{\frac{1}{\theta^*}} {Y^*_{2,t}}^{\frac{\theta^*-1}{\theta^*}} \right\}^{\frac{\theta^*}{\theta^*-1}} \tag{10}$$

where $Y^*_{1,t}$ is the production carried out by unskilled workers from foreign ($L^*_{u,t}$) minus those that are working at home ($L^i_{u,t}$) country

$$Y^*_{1,t} = L^*_{u,t} - L^i_{u,t} \tag{11}$$

and $Y^*_{2,t}$ is the production carried out by skilled workers from foreign ($L^*_{s,t}$) combined with capital as follows:

$$Y^*_{2,t} = \left\{ {\lambda^*}^{\frac{1}{\eta^*}} {K^*_t}^{\frac{\eta^*-1}{\eta^*}} + (1-\lambda^*)^{\frac{1}{\eta^*}} \left(L^*_{s,t} - L^i_{s,t}\right)^{\frac{\eta^*-1}{\eta^*}} \right\}^{\frac{\eta^*}{\eta^*-1}} \tag{12}$$

The foreign-country parameters $\gamma^*$, $\lambda^*$, $\theta^*$, $\eta^*$, and $s^*$ play analogous roles to their home-country counterparts. Wages in the foreign country are determined by marginal products. The skilled wage in the foreign country, $w^*_{s,t}$, is the marginal product of skilled labor remaining in the foreign country ($L^*_{s,t} - L^i_{s,t}$), while the unskilled wage $w^*_{u,t}$ is the marginal product of unskilled labor remaining in the foreign country ($L^*_{u,t} - L^i_{u,t}$). In the home country, immigrant wages $w^i_{s,t}$ and $w^i_{u,t}$ are determined by the marginal products of immigrant skilled and unskilled labor, respectively. The wage gap between the home and foreign country—$w^i_{j,t}/Q_t$ versus $w^*_{j,t}$ for each skill type $j$—drives migration and remittance decisions.

## 3.3 Current Account and Remittances

Firms can export and import goods produced in each country. The composite good in foreign country will be defined as

$$\tilde{Y}_t^* = \left\{ \omega^{*\frac{1}{\mu^*}} Y_{f,t}^{*\frac{\mu^*-1}{\mu^*}} + (1-\omega^*)^{\frac{1}{\mu^*}} Y_{h,t}^{*\frac{\mu^*-1}{\mu^*}} \right\}^{\frac{\mu^*}{\mu^*-1}} \tag{13}$$

where $\tilde{Y}_t^* = C_{s,t}^* - C_{s,t}^i Q_t^{-1} + C_{u,t}^* - C_{u,t}^i Q_t^{-1} + I_{s,t}^* + I_{u,t}^* + f_{s,t}^e Q_t^{-1} L_{s,t}^e + f_{u,t}^e Q_t^{-1} L_{u,t}^e$

The labor income of immigrants—both skilled and unskilled—can only be consumed or sent as remittances (not invested in capital nor in buying bonds). For each skill type $j \in \{s, u\}$:

$$w_{j,t}^i l_{j,t}^i = Q_t \tilde{G}_{j,t} + c_{j,t}^i \tag{14}$$

where $\tilde{G}_{j,t}$ are the total remittances per household that migrants of type $j$ send from home to foreign (in units of foreign composite good). The remittances per unit of labor are $g_{j,t} = \frac{\tilde{G}_{j,t}}{l_{j,t}^i}$. Aggregate remittances for unskilled migrants are $G_{u,t} = (1-s^*)\tilde{G}_{u,t}$ and for skilled migrants $G_{s,t} = s^* \tilde{G}_{s,t}$. Aggregate immigrant consumption is $C_{u,t}^i = (1-s^*)c_{u,t}^i$ and $C_{s,t}^i = s^* c_{s,t}^i$.

**Remittances as consumption smoothing mechanism.** In steady state, remittances per unit of immigrant labor equal the difference between the immigrant wage and immigrant consumption. Given that the immigrant stock does not adjust immediately to shocks, a gap can emerge between the wage of immigrants in the home country and the wage of workers of the same skill type in the foreign country. Remittances vary depending on this gap through an altruistic compensation mechanism. For the unskilled:

$$g_{u,t} = \left( \frac{w_{u,t}^i}{w_{u,t}^*} \right)^{\varphi} \bar{g}_u \tag{15}$$

An analogous rule governs skilled remittances per worker, $g_{s,t}$. When the host-country wage for a given skill group rises relative to the corresponding foreign-country wage, migrants of that group increase per-worker transfers to the foreign country, and vice versa. The parameter $\varphi$ governs the sensitivity of remittances to the wage gap.

### 3.4 Understanding the optimization process

1. Each household optimizes as a unified unit: both skilled and unskilled at home and at foreign country.

    - Home choice variables:
        - Skilled: total consumption ($c_{s,t}$), total labor supply ($l_{s,t}$), investment ($i_{s,t}$), bonds ($b_{f,t+1}$ and $b_{h,t+1}$).
        - Unskilled: consumption ($c_{u,t}$), total labor supply ($l_{u,t}$), investment ($i_{u,t}$).
    - Foreign choice variables:
        - Skilled: total consumption ($c^*_{s,t}$), total labor supply ($l^*_{s,t}$), migrants ($l^e_{s,t}$), investment ($i^*_{s,t}$), bonds ($b*_{f,t+1}$ and $b_{h*,t+1}$).
        - Unskilled: consumption ($c^*_{u,t}$), total labor supply ($l*_{u,t}$), migrants ($l^e_{u,t}$), investment ($i_{u,t}$).

2. Given this, the stock variables will be: capital ($k_{j,t+1}$) and stock of migrants ($l^i_{j,t}$).

3. After finding the optimal allocation over these variables, some other variables are still not defined (e.g., remittances).

4. Remittances are an outcome variable defined by a rule (equations defined above), with the labor income of immigrant workers ($w^i_{j,t} l^i_{j,t}$) split between remittances ($Q_t \tilde{G}_{j,t}$) and migrant consumption ($c^i_{j,t}$). The amount remitted per worker is determined by the altruistic compensation mechanism described above, which links remittances to the wage gap between the host and source countries for each skill group.

# 4 Results

We present the baseline results for the model calibrated with data from the U.S. and Guatemala. United States is the home (host) economy and Guatemala the foreign (source) economy. We also report the results for an alternative foreign economy, Mexico, in the Appendix.

To analyze the dynamic impact of a restrictive immigration policy, we simulate a sudden, temporary, and unanticipated increase in the sunk cost of migration. In the model, this is represented by a positive, one-standard-deviation shock to the sunk cost parameter[2], either

2. This modeling approach follows the established literature (e.g., Mandelman and Zlate (2012)). The sunk cost serves to rationalize various real-world enforcement measures, visa barriers, and frictions that increase

for unskilled migrant flows $\epsilon_t^{fu}$ or for the skilled migrant flows $\epsilon_t^{fs}$ . These shocks are designed to mimic real-world policy changes that make migration more difficult or costly, such as increased border enforcement, higher visa fees, or greater legal barriers. When presenting the results below, we will show the results for one shock at a time (either restrictive immigration policy for skilled labor, or for the unskilled).

To discipline the quantitative implications of the model, we first calibrate it to match a set of key moments for a baseline configuration. Table 1 reports the parametrization of technology, preferences, trade elasticities, and migration frictions, and explains the source of the parameters.

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the difficulty of migrating. In the extreme case, as this cost approaches infinity, it forces migration flows to zero, effectively operating as a binding quantity constraint.

Table 1: Calibration

| Parameter | Definition | Value | Source |
|---|---|---|---|
| ***A. Host Country Parameters*** | | | |
| $\gamma$ | Share of unskilled labor in production | 0.08 | Mandelman and Zlate (2012) |
| $s$ | Share of skilled households | 0.92 | Mandelman and Zlate (2012) |
| $\lambda$ | Share of capital in capital-skill composite | 0.36 | Mandelman and Zlate (2012) |
| $\lambda_k$ | Weight of skilled-household capital in K-aggregator | 0.96 | Data[a] |
| $\lambda_L$ | Weight of native skilled labor in skilled-L aggregator | 0.90 | Data[a] |
| $\zeta$ | Relative productivity of skilled labor | 8.36 | Mandelman and Zlate (2012) |
| $\psi_s, \psi_u$ | Inverse Frisch elasticity for labor (skilled, unskilled) | 1.61 | Mandelman and Zlate (2012) |
| $\omega$ | Home bias in consumption basket | 0.85 | Mandelman and Zlate (2012) |
| ***B. Source Country Parameters*** | | | |
| $\gamma^*$ | Share of unskilled labor in production | 0.40 | Mandelman and Zlate (2012) |
| $s^*$ | Share of skilled households | 0.30 | Data[b] |
| $\lambda^*$ | Share of capital in capital-skill composite | 0.55 | Data[c] |
| $\lambda_k^*$ | Weight of skilled-household capital in K-aggregator | 0.93 | Data[c] |
| $\zeta^*$ | Relative productivity of skilled labor | 4.95 | Mandelman and Zlate (2012) |
| $\psi_s^*, \psi_u^*$ | Inverse Frisch elasticity for labor (skilled, unskilled) | 1.61 | Mandelman and Zlate (2012) |
| $\omega^*$ | Home bias in consumption basket | 0.75 | Mandelman and Zlate (2012) |
| ***C. Common and Elasticity Parameters*** | | | |
| $\beta, \beta^*$ | Discount factor | 0.99 | Mandelman and Zlate (2012) |
| $\delta$ | Capital depreciation rate | 0.025 | Mandelman and Zlate (2012) |
| $\pi$ | Bond adjustment cost parameter | 0.45 | Mandelman and Zlate (2012) |
| $\theta$ | Elast. of subst. K, unskilled | 0.93 | Mandelman and Zlate (2012) |
| $\theta^*$ | Elast. of subst. K, unskilled | 0.96 | Mandelman and Zlate (2012) |
| $\eta$ | Elast. of subst. (capital vs. skilled labor, Host) | 0.907 | Mandelman and Zlate (2012) |
| $\eta^*$ | Elast. of subst. (capital vs. skilled labor, Source) | 0.76 | Mandelman and Zlate (2012) |
| $\eta_L$ | Elast. of subst. (native vs. migrant skilled, Host) | 0.80 | Calibration[d] |
| $\eta_k, \eta_k^*$ | Elast. of subst. (skilled vs. unskilled capital) | 1.5 | Mandelman and Zlate (2012) |
| $\mu, \mu^*$ | Elast. of subst. (domestic vs. foreign goods) | 2.34 | Mandelman and Zlate (2012) |
| ***D. Migration-Specific Parameters*** | | | |
| $f_{e,u}$ | Sunk cost of unskilled migration | 2.8 | Calibration[e] |
| $\delta_u^e$ | Return probability for unskilled migrants | 0.07 | Mandelman and Zlate (2012) |
| $f_{e,s}$ | Sunk cost of skilled migration | 1.5 | Calibration[e] |
| $\delta_s^e$ | Return probability for skilled migrants | 0.01 | Calibration[f] |

[a] Computed from U.S. Bureau of Economic Analysis capital stock data by education group, using the share of capital owned by skilled (college-educated) households in total private capital.

[b] Share of the Guatemalan labor force with tertiary education, based on ILO/World Bank education attainment data.

[c] Calibrated to match the capital-output ratio and the skill composition of capital ownership in Guatemala, using World Bank and national accounts data.

[d] Set to match the estimated elasticity of substitution between native and immigrant skilled workers in the U.S. labor market, broadly consistent with estimates in the range of Ottaviano and Peri (2012).

[e] Chosen jointly to match the steady-state migrant share of the labor force and the remittances-to-GDP ratio in the targeted moments.

[f] Set to reflect the lower return rate of skilled migrants relative to unskilled, consistent with evidence that skilled migrants have higher retention rates in host countries.

Table 2 shows the targeted data moments and their model counterparts. The calibration pins down, among others, the relative productivity of skilled labor, the share of unskilled

workers in production, and the sunk costs and return probabilities that govern migration dynamics for each skill group.

Table 2: Targeted Moments: Data vs. Model (Guatemala)

| **Variable** | **Data** | **Model** |
|---|---|---|
| Wage Premium (Host) | 2.20 | 2.56 |
| Wage Premium (Source) | 3.50 | 5.31 |
| Migrant Share of Labor Force | 0.10 | 0.27 |
| Remittances/GDP (Source) | 0.19 | 0.31 |

The model does a reasonable job of reproducing cross-country wage premia, migrant shares, and remittance ratios, albeit with some discrepancies that are informative about the structure of migration and remittance behavior. The host-economy wage premium is close to its empirical counterpart, while the source-economy wage premium and migrant share are overstated by the model.

As the migrant share is overstated by the model, it means that the number of people sending remittances in the steady state (migrant stock) is also overstated. Moreover, in steady state the large wage differential between the U.S. and Guatemala generates high per-worker remittances. As a result, the model-implied ratio of total remittances (shown here as a percent of source-country GDP) is larger than in the data: the steady-state ratio for Guatemala is 0.31 (31%), compared to an observed value of about 19% in 2025.

The Impulse Response Functions (IRFs) presented in the figures below trace the dynamic path of key economic variables as they react to this shock and return to their long-run equilibrium. All Impulse Response Functions (IRFs) are plotted as the percentage deviation from the model's steady state (% Dev. from SS). The "steady state" (SS) is the long-run equilibrium of the model's economy, where all variables are constant and there are no shocks. Therefore, the y-axis in the graphs should be interpreted as follows: a value of 0 means the variable is at its normal, long-run steady-state level, while a negative value means the variable has temporarily fallen to a level that is below its steady-state value of (for example -2 means 2 percent below the steady state value), while a positive value means the variable has temporarily risen to a level that is above its steady-state value. The IRFs show the impact of restricting immigration policy for unskilled labor on a certain variable, as the blue dotted lines in the figures ("unskilled shock"), and the impact of restricting immigration policy for skilled labor on a certain variable, as the red dotted lines ("skilled shock").

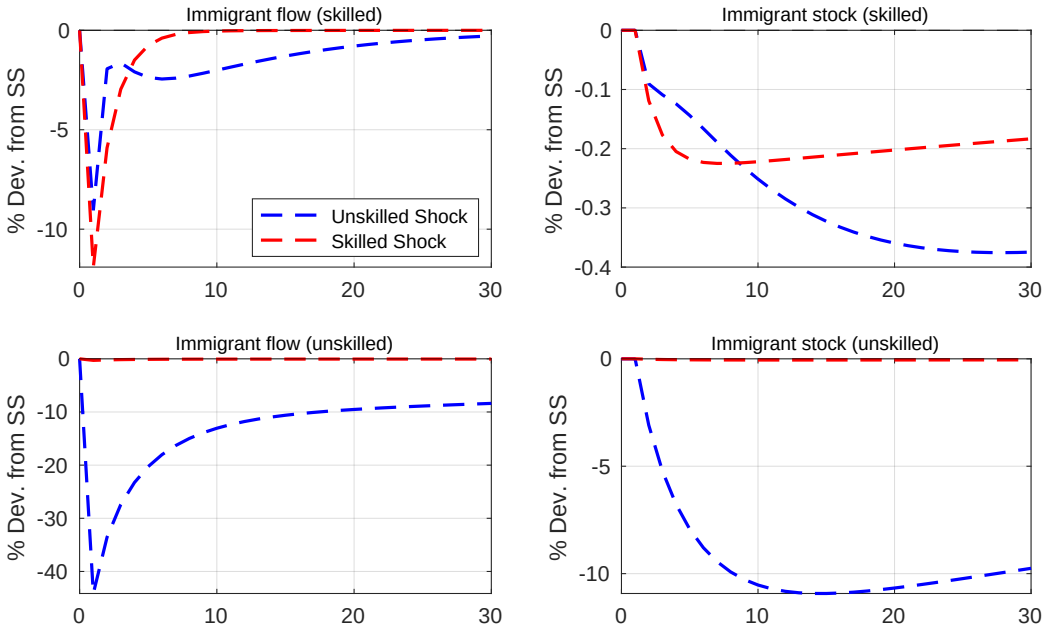
## 4.1 Immigration flows and stocks

Figure 1 plots immigration flows and stocks for skilled and unskilled workers in response to an increase in the sunk cost of unskilled migration (unskilled shock) or skilled migration (skilled shock) by one standard deviation (which represents roughly a 40 percent increase in this cost). A restriction on unskilled immigration causes a large and immediate fall in unskilled inflows of immigrants—dropping by roughly 40 percent on impact compared to the steady state—with a very slow transition to the steady state (bottom left chart Figure 1, blue line; after 30 quarters the immigrant inflows is still 10 percent below its steady state). While a recovery in immigration flows eventually occurs with the adjustment in the labor market, the pronounced decline in the stock of unskilled migrants also persists (about 10 percent below steady state (bottom right chart Figure 1, blue line), as the higher entry cost sharply reduces new arrivals, even though the wage gap across countries increases (see below). The shocks are modeled to restrict new inflows; the return probability to the source country remains the same rate as before.

The same shock (restricting inflows of unskilled labor) also reduces the flow and stock of skilled migrants, even though the change in immigration policy does not directly target them. This is because the capital-skilled labor needs unskilled labor to be productive. With the decline in the unskilled immigrant stock, and therefore available unskilled labor, output contracts leading to lower demand for skilled labor. The skilled labor wages also fall in the host economy due to the decline in labor demand, further weakening the incentive for skilled workers to migrate, adjusting the labor supply.

By contrast, a policy restricting skilled migration (red line in same Figure 1) has less impact overall on immigration flows and stocks. Even though in this case both skilled workers and unskilled migration flows and stocks will be affected, as capital needs both type of labor to be productive, the decline in unskilled immigration flows and stocks are less pronounced and much less persistent (top charts of Figure 1, red line), reflecting the smaller stock share of skilled immigrant pool in the baseline and the weaker general-equilibrium effect of skilled-migration policy on unskilled labor demand. Overall, Figure 1 shows that policies aimed at unskilled migrants have broad spillovers across both skill groups, whereas policies aimed at skilled migrants are largely confined to the skilled margin.

Figure 1: Immigration flows and stocks (percent deviation from steady state)




**Note: This figure shows the model-implied dynamics of immigration flows and stocks for skilled and unskilled workers under the estimated sequence of shocks.**

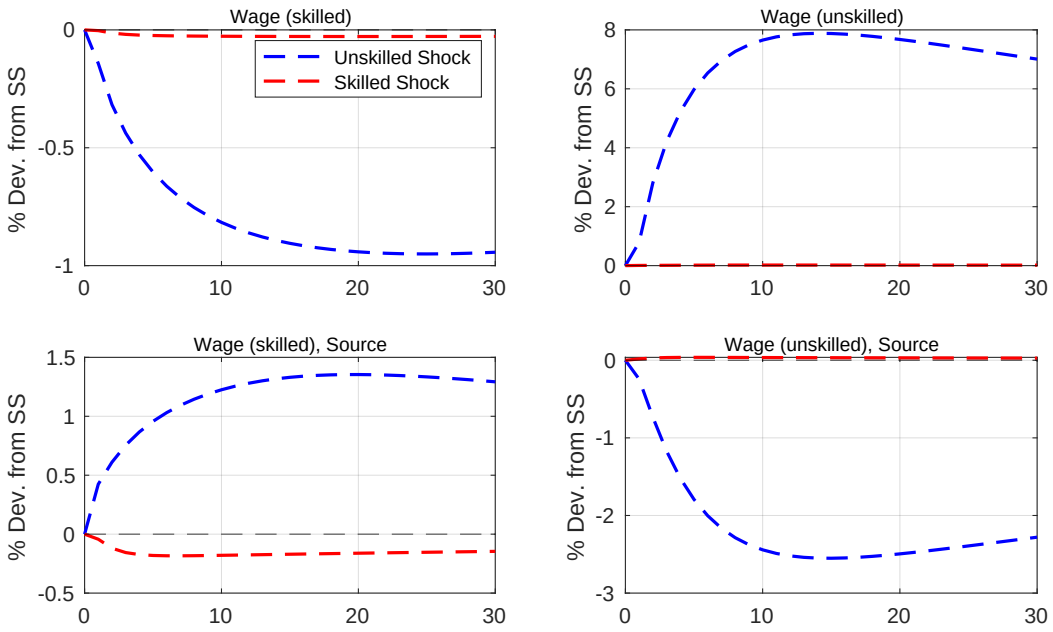
## 4.2 Labor market outcomes (wages)

Figure 2 reports the responses of skilled and unskilled wages in the home (host) country under the same two shocks. Wage dynamics are governed by the nested CES structure in which unskilled labor is a complement to a capital–skilled-labor composite. A restriction on unskilled migration (blue line) makes unskilled workers scarcer, which raises the unskilled wage by about 8 percent above steady state while also reducing output and the marginal product of skilled labor and capital. This leads to a decline in skilled wages by roughly 1 percent. The combination of higher unskilled wages and lower skilled wages compresses the skill premium in the home economy, even though the policy restricts only unskilled immigration.

A restriction on skilled immigration (red line) operates differently. By removing migrant skilled workers from the capital–skill composite, it reduces the number of skilled workers in the home country overall, and therefore it reduces the productivity of capital and native skilled labor, leading to a decline in the skilled wage of about 0.5 percent and a compression of the skill premium, but with a negligible impact on unskilled wages. The latter reflects the

fact that the skilled immigrant pool is small and its contraction has only minor implications for the demand for unskilled labor.

Figure 2: Host-country wages (percent deviation from steady state)




Note: This figure shows skilled and unskilled wages in the host country following shocks to unskilled (blue) and skilled (red) migration costs.

## 4.3 Remittances

Figure 3 displays remittances per migrant and total remittances by skill group under the two policy shocks. Remittances per worker (the intensive margin) respond to changes in the host–source wage gap for each skill group, in line with the altruistic compensation rule embedded in the model. When the wage gap between the home and foreign country rises for the same group of workers (skilled or unskilled), migrants increase their transfers to their own foreign country households.

A restriction on unskilled migration (blue line) leads to a rise in unskilled wages in the home (host) country rise and fall in wages in the foreign (source). This widens the wage gap between countries for the unskilled labor not only because wages in the home country rise, but also because wages of unskilled labor in the foreign country fall, due to a higher labor supply. Since the model does not have unemployment, at the end of each period labor demand should equal labor supply, leading to a change in wages in each country. The widening of the wage

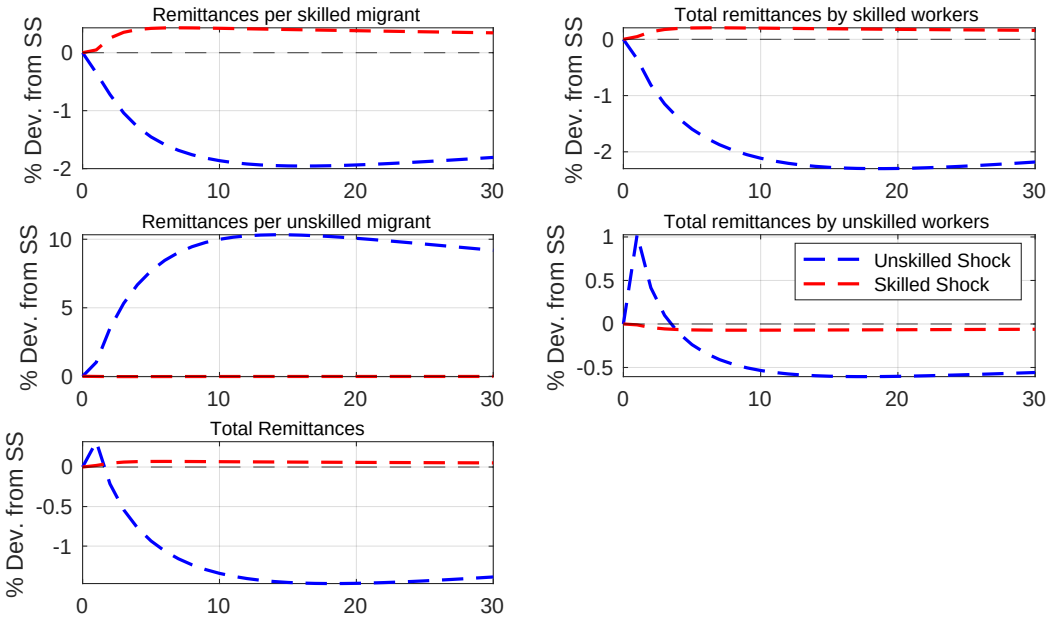
gap for the unskilled labor (between home and foreign economies) leads to an increase in remittances per unskilled worker, proportional to this wage gap increase, and also according to the parameter $\varphi$, which governs the sensitivity of remittances to the wage gap. As a result of the shock, remittances per unskilled worker increase by about 10 percent above steady state, a higher increase than the rise in unskilled labor wages in the home country.

As the stock of unskilled immigrants (the extensive margin) falls sharply in this case, this effect dominates the increase in the intensive margin, especially as the stock of immigrants in the home country continue declining, leading to a decline in total remittances transferred by unskilled labor to the foreign country (middle right chart figure 3, blue line).

Although the restriction to immigration is for unskilled labor, this shock also transmits to the skilled labor. As we have seen above, the contraction in activity due to the decline in unskilled labor reduces skilled wages and the remittances transferred per skilled worker by about 2 percent (top chart figure 3, blue line). Combined with the lower skilled migrant stock, total skilled remittances decline roughly 2 percent below the steady state level. Overall, aggregating total remittances level transferred by all immigrants in the home country decline by about 1.5 percent compared to the steady state level (see bottom chart figure 3, blue line).

Under a restriction on skilled migration, the response is limited. The wage gap widens because although skilled labor wages in the home country fall, the fall in wages of skilled labor in the foreign country is larger. The widening wage gap for skilled labor increases remittances per skilled worker (top left chart, red line). This effect dominates the modest decline in the skilled migrant stock, leading to a small increase in total remittances transferred by skilled labor (top right chart, red line). For unskilled migrants, restricting skilled migration has only minor negative effects on both per-worker and total remittances, consistent with the limited impact on unskilled wages and unskilled migration documented in Figures 1 and 2 (see middle charts, red line). Aggregating across skill groups, total remittances show only a very limited increase in remittances overall (bottom chart, red line).

Figure 3: Remittances (percent deviation from steady state)



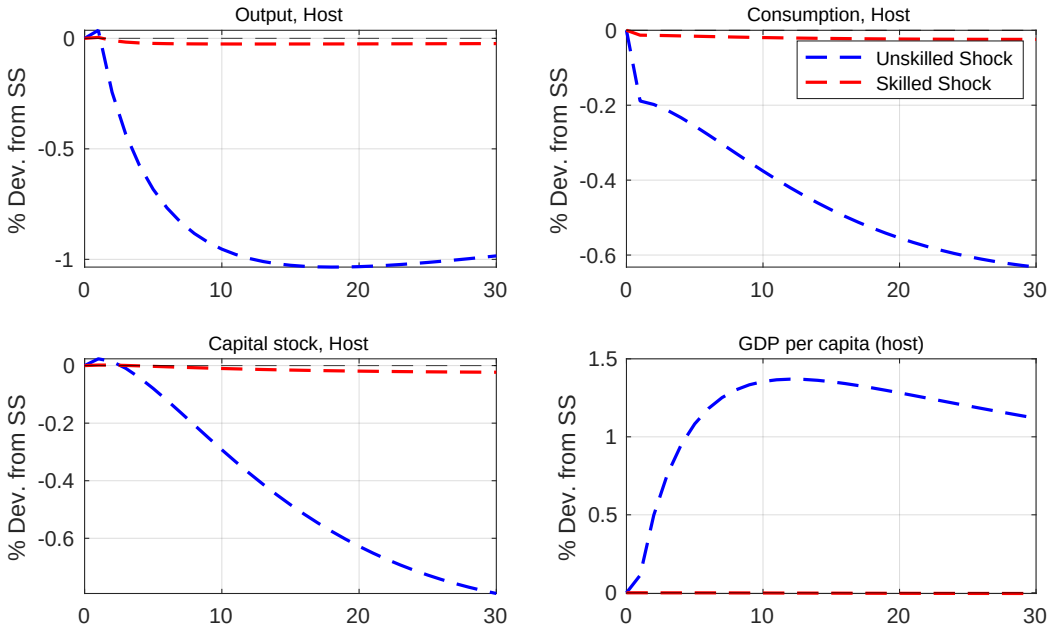

Note: This figure shows remittances per migrant and total remittances for skilled and unskilled workers following shocks to unskilled (blue) and skilled (red) migration costs.

## 4.4 Macroeconomic Aggregates in the Home/Host Country

Figure 4 shows the responses to the two migration policy shocks on the host-country (the U.S.) aggregates: output, consumption, capital, and GDP per capita. Both restrictions in immigration are contracting output, aggregate consumption, and the capital stock, because they remove productive labor from the mix, reducing the efficiency of the capital–labor composite. The contraction is larger and more persistent under an unskilled-migration restriction (blue line)—with output falling by about 1 percent, consumption by roughly 0.6 percent, and the capital stock by about 0.6 percent—reflecting the fact that unskilled immigrants account for a bigger share of effective labor input and are strongly complementary to capital and skilled labor.

GDP per capita rises as the reduction in the immigrant unskilled population is proportionally larger than the fall in aggregate GDP. This result is consistent with (International Monetary Fund 2025) . When skilled migration is restricted (red), GDP falls almost in the same amount as the fall in the immigrant stock, leading to a roughly unchanged GDP per capita.

Figure 4: Host-country aggregates (percent deviation from steady state)




Note: This figure shows output, consumption, capital, and GDP per capita in the host country following shocks to unskilled (blue) and skilled (red) migration costs.

Since the average income among remaining residents increases despite the overall output contraction, consumption per capita of native and immigrant population increases. However, due to the large decline in the unskilled immigrant stock (and skilled immigrant stock) in the case of restricting immigration of unskilled labor, aggregate consumption falls. Moreover, the contraction in aggregate consumption is lower than the contraction in output (0.6 percent rather than 1 percent), as wages to the unskilled rise, cushioning the overall fall in consumption. While the fall in output reaches is through after 15 quarters, the fall in aggregate consumption continues, even after 30 quarters, since consumption is also affected by the decline in the return of the capital stock, thereby reducing a source of income.

## 4.5 Macroeconomic Aggregates in Source Country

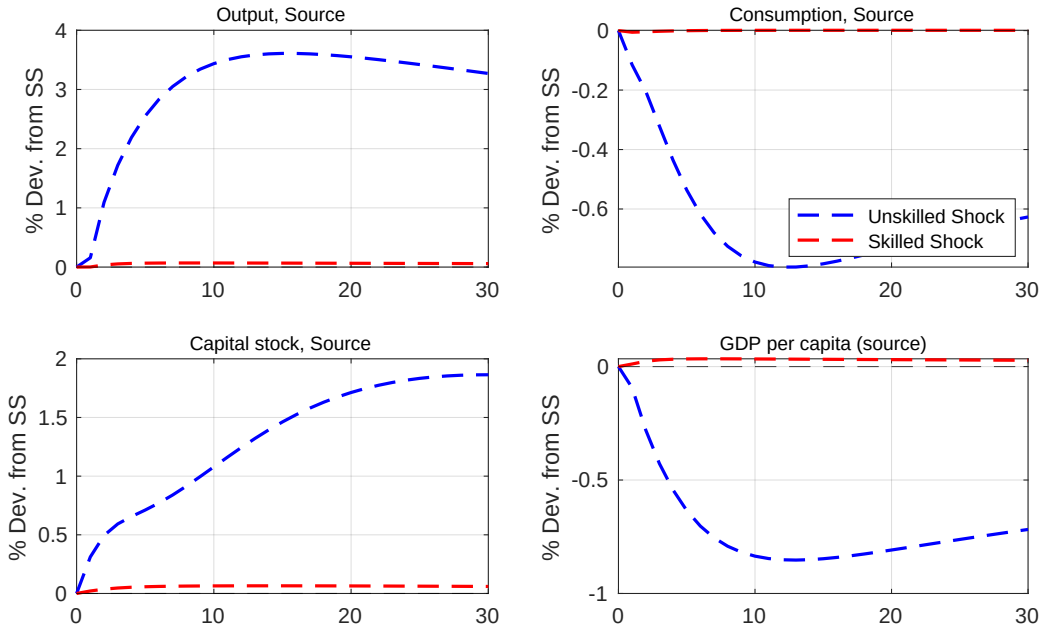
Figure 5 reports aggregate output, aggregate consumption, capital, and GDP per capita for the foreign/ source country (Guatemala). A restriction on unskilled migration (blue lines) keeps a large pool of unskilled workers in the foreign country, depressing foreign unskilled wages. However, more available unskilled labor increases the return to capital, triggering an increase in capital accumulation by about 2 percent and raises output by roughly 3.5 percent

above steady state.

Despite the output increase, restricting immigration of unskilled labor leads to a fall in GDP per capita in the foreign country by about 0.8 percent (right charts figure 5, blue line) as population grows more than production compared to the steady state levels. Moreover, consumption also falls by about 0.8 percent, as the average wage of the unskilled declines, in addition to a decline in received remittances.

A restriction on skilled migration (red) has only modest aggregate effects in the source country. Since the skilled migrant pool is small, the shock barely changes the resident labor force and has limited impact on capital, and thereby on output and consumption. GDP per capita shows only a small decline, as the main channel through which this shock operates—changes in remittances—has a limited aggregate effect on per-capita income.

Figure 5: Source-country aggregates (percent deviation from steady state)




Note: This figure shows output, consumption, capital, and GDP per capita in the source country following shocks to unskilled (blue) and skilled (red) migration costs.

**Results interpretation and comparison with literature**

Again, as in the case of the home country results, it is important to caveat these results, which depend on the complementarity of unskilled labor to the capital-labor composite.

Since in this model, as in Mandelman and Zlate 2012, there are no labor market frictions (no unemployment), restricting immigrant labor reduces labor supply in the home country,

pushing up wages, as labor demand adjusts to the labor supply. In a model with unemployment as vacancies could be filled from the pool of unemployed labor, the increase in wages (especially of the unskilled) might be more limited, thereby limiting the increase in income, and per capita GDP and consumption. However, the decline in aggregate consumption in the home country also might be larger than implied by the model.

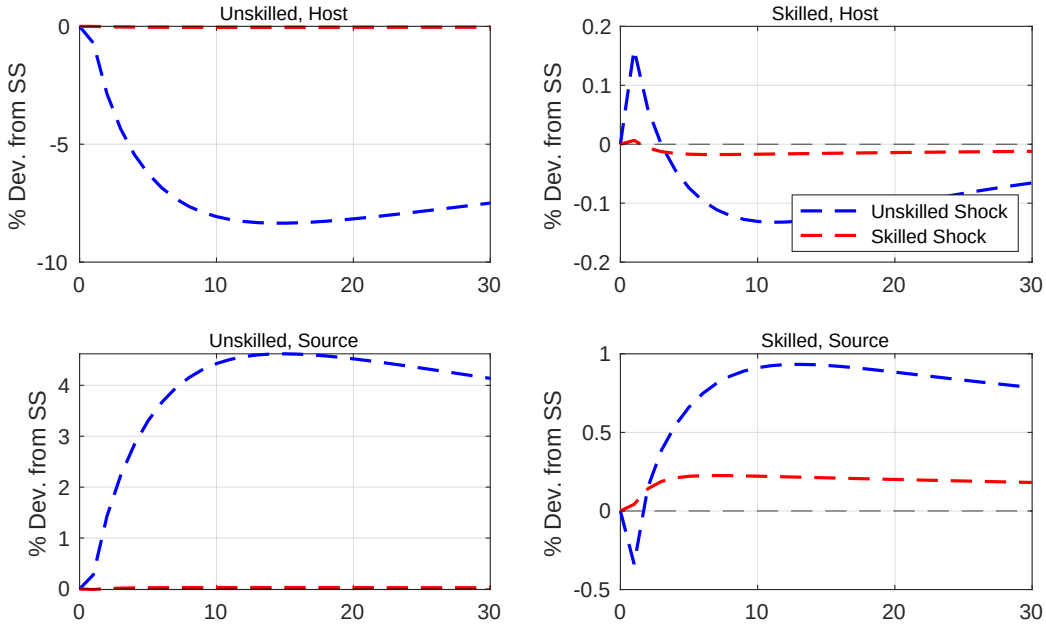
On the other hand, the impact on aggregate consumption in the source country may also be more limited than implied by the model, since wages in the source country may fall more, due to the abundance of labor (including from the unemployed pool).

As a result the wage gap across countries may change less, leading to a lower decline in remittances, a source of income for foreign households.

Furthermore, the model implies a rise in output in the source country, due to a rapid accumulation of capital, as labor complements capital, and less labor migrates, leading to an increase in employment (see figure below). These types of models do not take into account inefficiency in capital allocation. In the presence of such constraints the increase in output in the foreign country would be lower, and the loss of aggregate consumption and output per capita would be larger, as investment will be lower.

Nevertheless, it is important to note that the results in these DSGE models with endogenous immigration and skill heterogeneity are primarily driven by the assumption of complementarity between unskilled and skilled-labor capital composite. For example, even in models with labor market frictions (e.g. Oikonomou (2023)) results are similar (the decline in capital if the stock of labor decline).

Figure 6: Total Workers (percent deviation from steady state)



# 5 Conclusion

The model proposed here further bridges the existing gap between the international macroeconomics literature and immigration theory by allowing for labor mobility across countries, both for skilled and unskilled labor. The households' decision to emigrate is endogenous, and involves an inter-temporal trade-off between the sunk emigration cost and the wage benefits from labor migration. The framework allows to examine the macroeconomic effects of restricting skilled and/or unskilled migration on immigration flows and stocks, wages, output, capital, consumption and remittances.

The model is estimated using immigration data and macroeconomic indicators from the U.S. (as host country) and Guatemala, or Mexico respectively (as source country). The paper finds that skill-selective immigration policies result in asymmetric macroeconomic effects, impacting both the host and source countries of immigration. When the model is calibrated to the specific data of these countries, whereby the unskilled account for most of the migrants, restricting unskilled migration leads to a more severe downturn in the host country (and a decline in capital and aggregate consumption) compared to restricting skilled migration. Restricting unskilled migration also narrows the wage premium between skill groups in the home country, and increases average incomes and output per capita.

Conversely, restrictions in unskilled migration significantly affects the source country, by leading to a higher capital accumulation than in the steady state due to more available unskilled labor, which complements the capital skilled-labor composite. This leads to an increase in aggregate output. However, restricting immigration leads to a decline in remittances, and a fall in wages in the source country, leading to a fall in aggregate consumption. Despite an increase in aggregate output, output per capita falls, since the increase in output is not proportional to the increase in population.

Restricting skilled migration does not lead to a decline in aggregate remittance flows because the increase in remittances per worker more than offsets the decline in the number of migrants. Overall, the impact on the home and foreign country aggregates are more limited, since in the steady state our foreign country (Guatemala or Mexico), tends to be a source of unskilled migration in the home country (the U.S.).

The findings highlight a key policy trade off. While restrictions on unskilled migration may reduce wage inequality and increase output and consumption per capita in the host economy, they also lower aggregate output, consumption, and capital accumulation by reducing the supply of a productive input. This result is consistent with recent U.S. evidence that greater access to low-skilled immigrant workers increases firms' production without reducing aggregate employment among U.S. workers (Clemens and Lewis 2026). In addition,

by increasing wages for unskilled workers in the host economy relative to the source economy, such restrictions widen cross-country earnings differentials and strengthen incentives to migrate, partly off-setting the direct deterrent effect of higher migration costs.

There are several directions that could potentially enrich the analysis presented in this paper. One possible extension would be to incorporate unemployment and richer labor market dynamics. In this context, automation, offshoring, and training, following Mandelman and Zlate (2022) could be a fruitful venue for future research. Another dimension may be extending it to incorporate cases where skilled migrants take unskilled jobs or introducing the presence of informal labor in source countries and their specific wage dynamics.

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# A Mexico Case

This appendix presents results from calibrating the model to U.S. as home country and Mexico as foreign country. Relative to the Guatemala baseline, the Mexico calibration differs in two key source-country parameters: the share of unskilled labor in production ($\gamma^*$) and the share of skilled households ($s^*$). Mexico's labor force has a larger share of skilled workers and a production structure that is less reliant on unskilled labor relative to Guatemala. All other parameters, including those governing the host country, migration frictions, and elasticities,

are held at their baseline values. Table 3 compares the targeted moments for the Mexico calibration.

Table 3: Targeted Moments: Data vs. Model (Mexico)

| **Variable** | **Data** | **Model** |
|---|---|---|
| Wage Premium (Host) | 2.20 | 1.99 |
| Wage Premium (Source) | 2.50 | 2.31 |
| Migrant Share of Labor Force | 0.10 | 0.25 |
| Remittances/GDP (Source) | 0.04 | 0.14 |

The Mexico calibration produces a source-country wage premium (2.31) that is substantially lower than in the Guatemala case (5.31), consistent with Mexico's larger pool of skilled workers compressing the returns to education. Similarly, the model-implied remittances-to-GDP ratio (0.14) is less than half the Guatemala value (0.31), reflecting Mexico's more diversified economy and lower dependence on remittances as a share of national income. As with Guatemala, the model overstates remittances relative to the data. Mandelman and Zlate 2012 do not report the steady-state level of remittances as a share of GDP; instead, they match the standard deviation of remittance growth, making a direct comparison of remittance levels difficult.

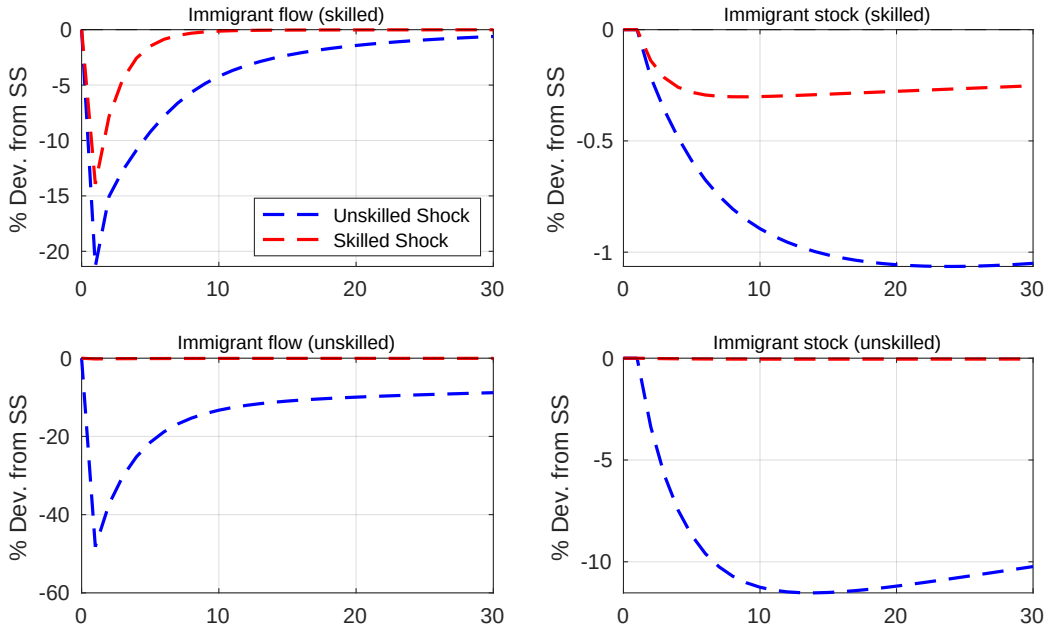
Overall, the impulse response functions for the Mexico calibration are qualitatively similar to those in Mandelman and Zlate 2012, which also uses the U.S. as the home country and Mexico as the foreign country, but with some notable differences in magnitudes. These differences reflect the richer structure of our model, which includes endogenous skilled migration alongside unskilled migration. It is important to note that Mandelman and Zlate 2012 report IRFs in units of $10^{-3}$ (i.e., 0.1 percent) rather than in percent, so their immigrant flow response of approximately $6 \times 10^{-4}$ corresponds to 0.06 percent—substantially smaller than our 60 percent decline. This difference in scale arises because our shock is calibrated as a one-standard-deviation increase in the sunk cost (roughly a 40 percent increase), whereas their shock size and the resulting responses are smaller. In terms of remittance dynamics, Mandelman and Zlate 2012 find that total unskilled remittances initially rise before declining, qualitatively similar to our results, though their trough is about 1 percent (in their units) compared to our decline of about 0.5 percent in total unskilled remittances. Below we describe the main differences relative to the Guatemala calibration.

## A.1 Immigration flows and stocks

Figure 7 plots immigration flows and stocks for the Mexico calibration. As in the Guatemala case, a restriction on unskilled migration produces the largest effects, causing unskilled inflows to plunge by roughly 60 percent on impact (similar to Mandelman and Zlate 2012, but larger than in the case of Guatemala, 40 percent), reflecting Mexico's larger baseline unskilled migrant pool relative to the skilled pool. The unskilled migrant stock declines by about 10 percent below steady state.

Skilled inflows also decline under the restricted migration to unskilled labor, by about 20 percent—roughly double the spillover observed in the Guatemala calibration (10 percent)—because Mexico's larger baseline share of skilled migrants amplifies the general-equilibrium feedback from unskilled to skilled labor demand.

Figure 7: Immigration flows and stocks – Mexico (percent deviation from steady state)



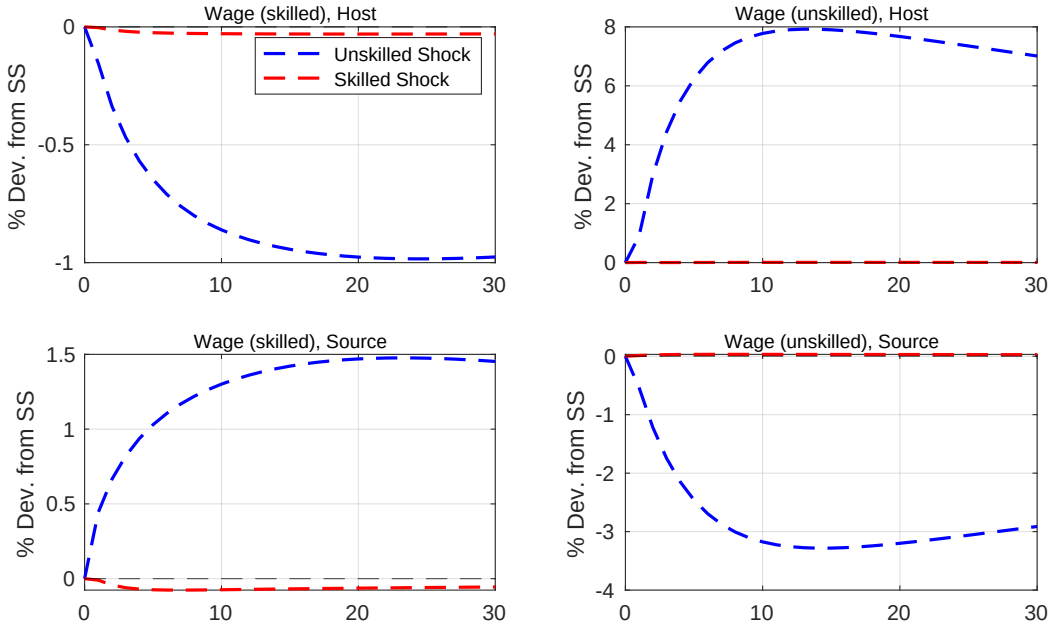

Note: This figure shows the model-implied dynamics of immigration flows and stocks for skilled and unskilled workers under shocks to unskilled (blue) and skilled (red) migration costs, calibrated to the U.S.–Mexico corridor.

## A.2 Labor market outcomes (wages)

Figure 8 reports wage responses in the host country for the Mexico calibration. The qualitative patterns are essentially identical to the Guatemala case. The similarity in wage responses

across the two calibrations reflects the fact that host-country production parameters are held constant; the wage dynamics are driven primarily by the host-country CES structure rather than by source-country characteristics.

Figure 8: Host-country wages – Mexico (percent deviation from steady state)



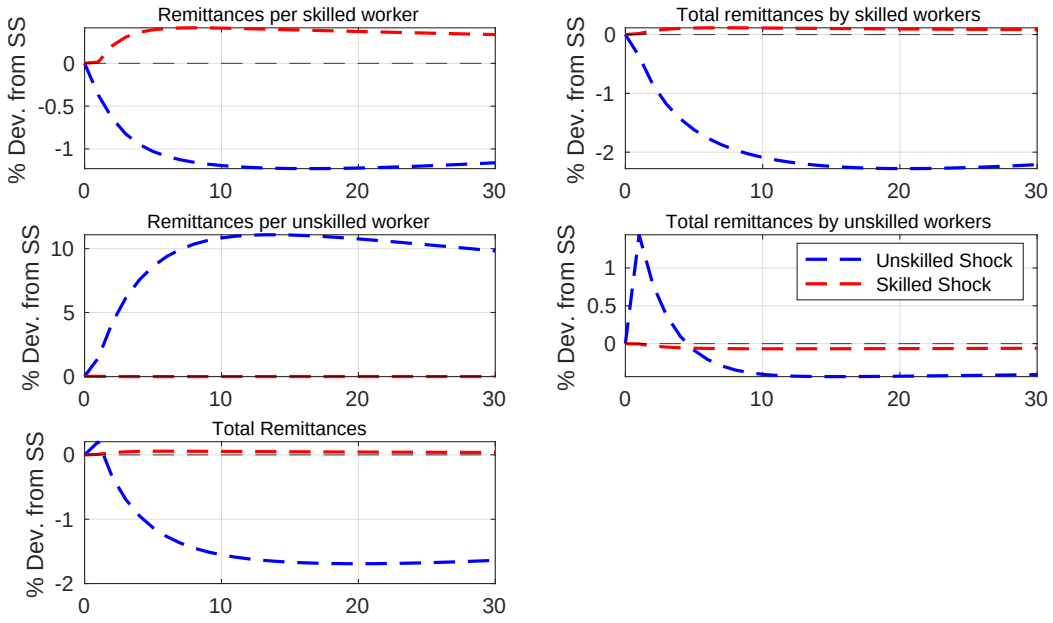

Note: This figure shows skilled and unskilled wages in the host country following shocks to unskilled (blue) and skilled (red) migration costs, calibrated to the U.S.–Mexico corridor.

## A.3 Remittances

Figure 9 displays remittances per migrant and total remittances for the Mexico calibration. The intensive-margin responses are qualitatively similar to Guatemala: remittances per unskilled worker rise by roughly 10 percent under the unskilled shock (blue), driven by the widening host–source wage gap, while remittances per skilled worker fall by about 1 percent.

At the aggregate level, the key difference from Guatemala emerges in total remittances. Under the unskilled shock (blue), total remittances decline by about 2 percent—roughly a third larger decline observed in the Guatemala case (1.5 percent). This larger aggregate drop reflects Mexico's higher baseline share of skilled workers, which implies that the unskilled extensive-margin contraction accounts for a proportionally larger share of total remittance flows.

Figure 9: Remittances – Mexico (percent deviation from steady state)



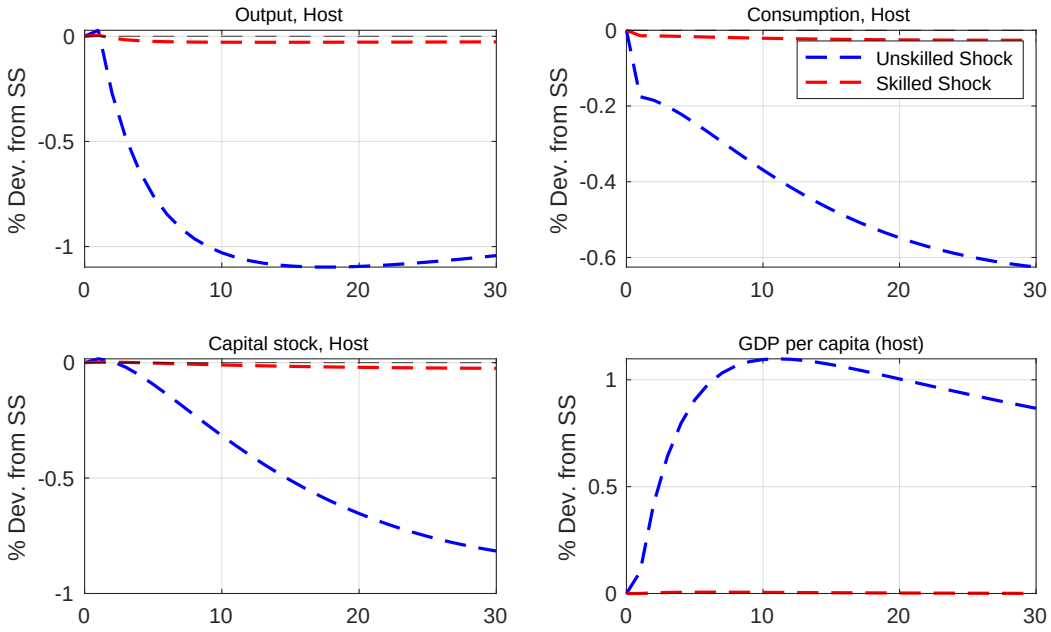

Note: This figure shows remittances per migrant and total remittances for skilled and unskilled workers following shocks to unskilled (blue) and skilled (red) migration costs, calibrated to the U.S.–Mexico corridor.

## A.4 Macroeconomic Aggregates in Host Country

Figure 10 shows host-country aggregates for the Mexico calibration. Both policy shocks are contractionary, with the unskilled restriction (blue) producing larger declines: output falls by about 1 percent, consumption by roughly 0.6 percent, and the capital stock by approximately 1 percent. The capital stock decline is somewhat larger than in the Guatemala case (1 versus 0.6 percent), reflecting the stronger complementarity between unskilled labor and capital accumulation when the source country supplies a larger pool of unskilled workers.

GDP per capita rises by about 1 percent under the unskilled restriction (blue), less than in the Guatemala case (1.5 percent), because the proportional reduction in the immigrant population relative to the GDP decline is smaller. Under the skilled restriction (red), GDP per capita falls modestly, as in Guatemala, because the loss of productive skilled workers reduces output by more than it reduces the resident headcount.

Figure 10: Host-country aggregates – Mexico (percent deviation from steady state)



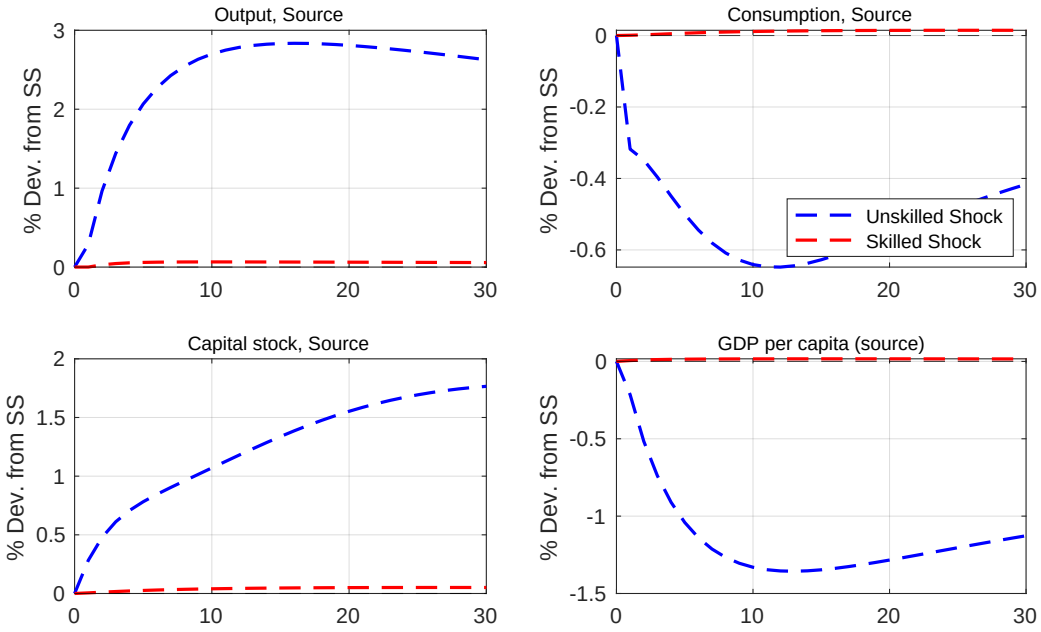

Note: This figure shows output, consumption, capital, and GDP per capita in the host country following shocks to unskilled (blue) and skilled (red) migration costs, calibrated to the U.S.–Mexico corridor.

## A.5 Macroeconomic Aggregates in Source Country

Figure 11 reports source-country aggregates for Mexico. A restriction on unskilled migration (blue) triggers a capital accumulation increase qualitatively similar to Guatemala: output rises by about 3 percent and the capital stock by approximately 2 percent, while consumption falls by roughly 0.6 percent. The output boom is somewhat smaller than in Guatemala (3 versus 4 percent), reflecting Mexico's less unskilled-intensive production structure ($\gamma^*$ lower than Guatemala's), which implies that the return of unskilled workers to the domestic labor market has a proportionally smaller impact on total output.

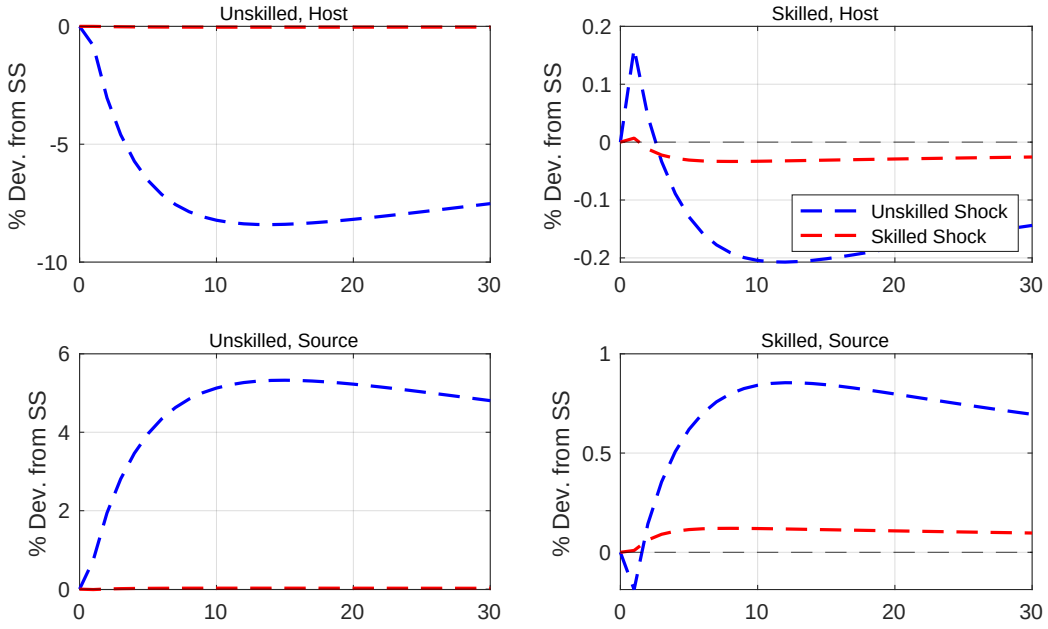
The most notable difference from Guatemala appears in GDP per capita, which falls by about 1.5 percent under the unskilled restriction—more than the 1 percent decline in the Guatemala case. This larger per-capita income loss reflects the fact that Mexico's larger share of skilled workers ($s^*$) amplifies the income effect on labor supply: a larger fraction of the resident population increases labor supply in response to the consumption decline, swelling the denominator of GDP per capita and producing a more severe drop in average income despite the output expansion.

Figure 11: Source-country aggregates – Mexico (percent deviation from steady state)




Note: This figure shows output, consumption, capital, and GDP per capita in the source country (Mexico) following shocks to unskilled (blue) and skilled (red) migration costs.

Figure 12: Total Workers (percent deviation from steady state)





PUBLICATIONS

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