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The tale of two international phenomena: International migration and global imbalances*

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Abstract

Following the dynamics of globalization, international migration has increased dramatically since the 1990s. Given that these migrations may obscure the natural demographic structure of nations, they are likely to explain a significant part of global imbalances. This paper tackles this issue by investigating the role played by international migration in the dynamics of global imbalances. To this end, we rely on an overlapping generations model to derive the theoretical relationship between international migration and current account position. Through a series of robust estimates, we empirically investigate this relationship by relying on a panel of 157 developed and developing countries over the period 1990-2014. Our results point to substantial effects of international migration. Specifically, we show that an increase in migration improves national savings and the current account balance in the destination country, while it has opposite impacts in the origin country. These effects are particularly pronounced in developing economies, explaining the structural current account deficits that most of them face.

Keywords: International migration, current account, global imbalances, remittances.

JEL classification: F22, F32, O55, C33.

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1 Introduction

The sustained dynamics of globalization since the 1990s has been accompanied by worsening global imbalances and a dramatic increase in international migration. These two phenomena are probably among the most complex topics of contemporary international economics faced by economists and decision-makers. Several recent contributions have been devoted to analyzing both international migration (see e.g., Ortega and Peri, 2014; Bosetti et al., 2015; Aubry et al., 2016) and global imbalances (Dong, 2012; Lane and Milesi-Ferretti, 2012; Barattieri, 2014; Chinn et al., 2014; Eugeni, 2015). Surprisingly, these dynamics have been investigated separately and the link between international migration and global imbalances has received no particular attention in the literature. However, the analysis of global imbalances can not obscure the issue of international migration which could play a crucial role as a factor amplifying or alleviating these discrepancies.

Indeed, life cycle theory allows to conjecture the existence of a direct link between the saving and investment rates of a country and its demographic structure. This relationship has been widely investigated in the literature,[1] and empirical studies on the medium- and long-term determinants of current accounts emphasize the importance of demographic factors in explaining their dynamics.[2] As an example, Cooper (2008) argues that the large US current account deficit at play from the early 1990s to the 2008 financial crisis is the natural result of two major forces in the world economy, namely the globalization of financial markets and the demographic evolution—two factors that could maintain these imbalances over a long period of time. Using a multi-country overlapping generations model, Backus et al. (2014) show that demographic differences between countries, affecting both individual saving decisions and the age composition of the population, can have a significant impact on capital flows around the world.

If demographic changes are important in explaining the dynamics of current accounts and, in turn, global imbalances, it is obvious that international migration plays a leading role. Indeed, international migration has a structural or permanent component that contributes to changing the normal pattern of demographic structure in both emigration and immigration countries.[3] In general, high-income countries are

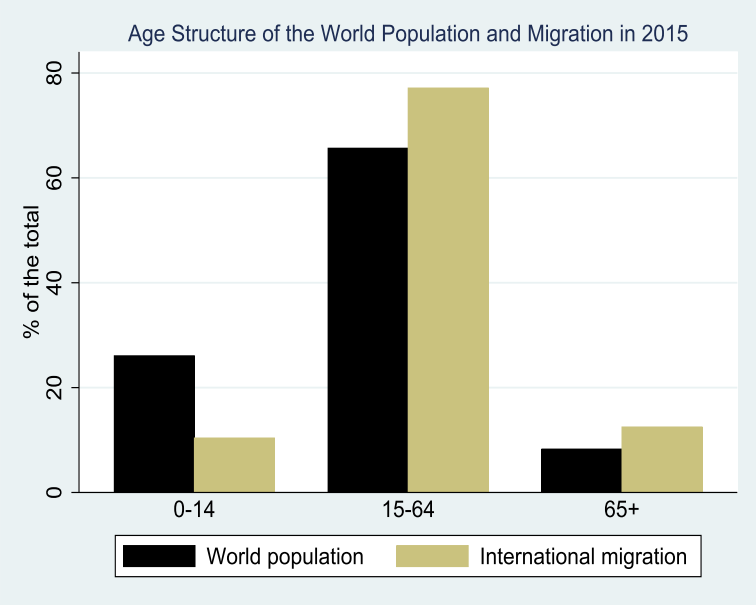
[1] See e.g., Leff (1969), Kelley and Schmidt (1996), Higgins and Williamson (1996, 1997), Higgins (1998), and Bloom et al. (2007).

[2] See Debelle and Faruqee (1996), Henriksen (2002), Chinn and Prasad (2003), Chinn and Ito (2007), Gruber and Kamin (2007), Lane and Milesi-Ferretti (2012), and Backus et al. (2014).

[3] Even programs to attract temporary workers (e.g., the Braceros program in the United States or the Gastarbeit program in Germany) often result in permanent migration (see Spilimbergo, 2011).

characterized by increasing net immigration, while low-income countries are marked by emigration of the same trend. This decomposition of demography in the world can exacerbate or alleviate global imbalances by altering the demographic structure and, consequently, the age dependency ratios. Indeed, more than the world population, international migration mainly consists of working-age persons—the latter amounting to about 77% in 2015 (see Figure 1). Through its impact on the natural demographic structure of countries, international migration can influence the medium- and long-term evolution of their current accounts and, in turn, the dynamics of global imbalances. Figure 2 clearly suggests the existence of such a link, highlighting a positive nexus between migration and current account which mainly operates through the saving rate. The role of international migration in the path followed by global imbalances is all the more likely as its evolution is heterogeneous both between countries of emigration and countries of immigration.

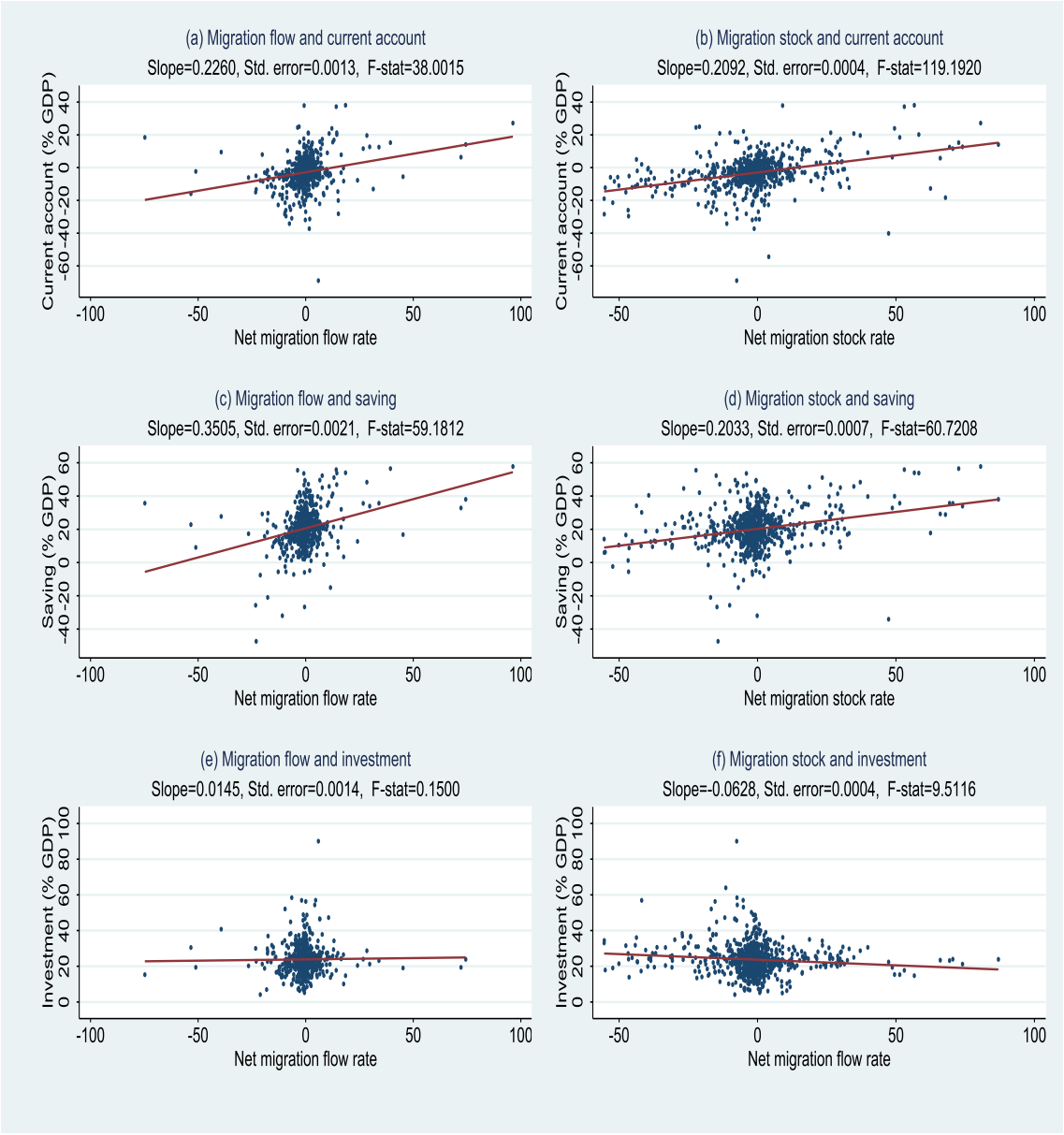
Figure 1: Age distributions of world population and international migration (in 2015)



Notes: International migrants are defined as the foreign-born population.
Source: United Nations (Department of Economic and Social Affairs, Population Division).

Several tracks have been suggested in the literature to explain global imbalances. Among them, the saving-glut hypothesis was widely shared (Bernanke, 2005; Clarida, 2005; Greenspan, 2005; Gruber and Kamin, 2007), but other explanations exist such as the twin deficit hypothesis (Chinn, 2005; Erceg et al., 2005), the role of exchange rates and exchange-rate regimes (Obstfeld and Rogoff, 2005; Taylor, 2006;

Figure 2: International migration, current account balance, saving and investment



Notes: International migrants are defined as the foreign-born population. Each scatter plot shows observations by country and by 5-year period (1990 to 2014). The list of countries is displayed in Appendix. Source: Authors' calculations based on data from the following databases: United Nations (Department of Economic and Social Affairs, Population Division), Abel and Sander (2014), and IMF World Economic Outlook (WEO).

Gnimassoun and Mignon, 2014), and the role of valuation effects in net foreign asset positions (Lane and Milesi-Ferretti, 2007b; Gourinchas and Rey, 2007; Devereux and

Sutherland, 2009). Even in the forensic investigation of global imbalances conducted by Chinn et al. (2014), the path of international migration has not been explored. In the best-case scenario, the influence of international migration is treated indiscriminately from that of the natural demographic factors of countries.

This paper aims at filling this gap by determining the role played by international migration in the dynamics of current accounts and, in turn, in the evolution of global imbalances. To this end, we rely on an overlapping generations model to derive the theoretical relationship between migration and the current account in the context of an open economy with mobility of goods, capital and people. This theoretical framework gives us the legitimacy to then carry out a series of robust econometric investigations to deeply analyze and assess the influence of international migration on global imbalances. Relying on a panel of 157 developed and developing countries over the period 1990-2014, our findings corroborate the theoretical prediction that net migration improves the current account position in the host country, while exerting the opposite effect in the home country. Specifically, we show that this impact on the current account reflects the positive (negative) effect of immigration (emigration) on the saving rate. This result confirms the theoretical prediction that international migration mainly consisting in working-age persons leads to an increase (decrease) in the saving rate in the host (home) country, by rising (lowering) its support ratio. We also find a mixed impact of net migration on the investment rate, reflecting the compensatory effect between (i) the negative impact of emigration on the investment rate of the home country through labor force emigration, and (ii) the positive influence of emigration on the home country's investment rate through remittances. Finally, we underline that the impact of net migration on the current account balance and savings is particularly acute for developing countries comparatively to developed economies. Our findings hold after various sensitivity analyzes.

Our contribution not only provides a key piece in the puzzle on world discrepancies, but also delivers a more global dimension to the geography of current account imbalances. Indeed, in the previous literature, global imbalances are often presented as coming from some surplus countries—mainly the Asian emerging economies, Germany, Japan and the oil countries—and some large deficit countries—in particular the United States and the United Kingdom. Although this assertion is correct, it *de facto* excludes the role played by developing countries, which, however, are characterized by increasing structural deficits. Given that international migration is a phenomenon that links both developing and developed countries with a certain degree of heterogeneity, accounting for it provides a more global dimension to the analysis of world imbalances. It also helps in explaining the chronic deficits experienced by the developing countries, whose evolution questions the principle of

external sustainability. Moreover, disregarding international migration despite its key role in current accounts' evolution, is likely to erroneously assess the magnitude of global imbalances and, most importantly, to distort the diagnosis by confusing the influence of migration with that of the natural demographic dynamics of countries.

The rest of the paper is organized as follows. Section 2 briefly sets out the theoretical framework used to derive the relationship between international migration and the current account balance. Section 3 describes our empirical strategy and the data. We present and discuss our main results in Section 4, and provide some robustness checks and sensitivity analyzes in Section 5. Finally, Section 6 concludes the paper.

2 Theoretical framework

In this section, we present a simple overlapping generations (OLG) model for a small open economy, that brings out the relationship between international migration and international capital flows. Our specification is inspired from the three-period OLG model for a small open economy developed by Higgins and Williamson (1996, 1997), in which we explicitly introduce migration. As mentioned in Higgins and Williamson (1996, 1997), adding a third period of life-childhood allows to highlight the effect of changes in youth as well as elderly dependency ratios.[4]

2.1 Demographics

The population dynamics, particularly migration, is set exogenously. The demographic structure allows for three periods of life: youth, middle age and old age. Specifically, the population at each time t consists of N_t^y dependent young, N_t^m middle-aged adults in the labor force, and N_t^o retired elderly persons. Middle-aged adults are endowed with one unit of time that is inelastically supplied to the labor force, and have a fertility rate denoted by n. Between youth age (period t) and middle age (period $t+1$), migration flow (positive for immigration and negative for emigration) arrives at the given rate m for each young cohort. For simplicity, as

[4]The model of Higgins and Williamson (1996, 1997) provides an adequate theoretical framework for understanding the Coale and Hoover (1958)'s dependency hypothesis by underlining the youth as well as elderly dependency effects. It is the three-period small open economy version of two-period OLG model (Samuelson, 1958; Diamond, 1965; Auerbach and Kotlikoff, 1987, chap. 2). The two-period small open economy version was used by Krueger and Ludwig (2007) to analyze the impact of demographic transition on international capital flows. The reader may refer to Börsch-Supan et al. (2006) and Gollin and Lange (2013) for introducing migration in OLG models.

in Barro and Sala-i-Martin (2003, chap. 9), migrants are assumed to arrive before reproducing, and they adopt the same behavior of consumption and fertility as the resident population. The number of retirees in period t is equal to the number of workers in the preceding period. Thus, the dynamics of demography is characterized by the following system:

$$\begin{aligned} N_t^y &= (1+n)N_t^m \\ N_t^m &= (1+m)N_{t-1}^y \\ N_t^o &= N_{t-1}^m \end{aligned} \tag{1}$$

Therefore, the labor force growth rate (N_t^m/N_{t-1}^m) is equal to the inverse of the old dependency ratio (N_t^o/N_t^m), and is given by:

$$\frac{N_t^m}{N_{t-1}^m} = \frac{1}{N_t^o/N_t^m} = (1+n)(1+m) \tag{2}$$

2.2 Consumption and saving decisions

Each middle-aged household has a lifetime utility function given by:

$$U(c_t^y, c_t^m, c_{t+1}^o) = log(c_t^m) + \beta log(c_{t+1}^o) + \gamma(n) log(c_t^y) \tag{3}$$

where c_t^m and c_{t+1}^o respectively stand for consumption during middle and old ages, and c_t^y denotes children's consumption. The parameter β is the discount factor, and $\gamma(n)$ is altruistic weight parents attach to children's consumption, with $\gamma(0) = 0$ and $\gamma'(.) > 0$.

In the middle age, agents work for a wage w_t, and when old in the third period they retire. Therefore, the representative middle-aged household maximizes its lifetime utility subject to the following budget constraints:

$$\begin{aligned} c_t^m + (1+n)c_t^y + s_t &= w_t \\ c_{t+1}^o &= (1+r)s_t \end{aligned} \tag{4}$$

where s_t is the amount of savings, and r denotes the world real interest rate that is exogenously given.

The optimal levels of consumption and savings are given by:

$$\begin{aligned} c_t^y &= \frac{\gamma(n)/(1+n)}{1+\beta+\gamma(n)} w_t \\ c_t^m &= \frac{1}{1+\beta+\gamma(n)} w_t \\ c_{t+1}^o &= \frac{\beta(1+r)}{1+\beta+\gamma(n)} w_t \\ s_t &= \frac{\beta}{1+\beta+\gamma(n)} w_t \end{aligned} \tag{5}$$

2.3 Firm behavior

The economy has a single production sector that is assumed to behave competitively, and uses capital (K_t) and labor (N_t^m) as inputs with a constant-returns-to-scale technology. The production function (Y_t) is assumed to be Cobb-Douglas with labor-augmenting technological progress:

$$Y_t = K_t^\alpha (A_t N_t^m)^{1-\alpha} \tag{6}$$

where $A_t = (1+g)^t$ is the exogenous technological progress growing at rate g.

For the sake of simplicity, capital depreciates fully after production, and there is no capital installation nor adjustment costs. Hence the profit is given by $\Pi_t = K_t^\alpha (A_t N_t^m)^{1-\alpha} - (1+r)K_t - w_t N_t^m$, and its maximization implies:

$$\alpha k_t^{\alpha-1} = 1 + r \tag{7}$$

$$(1-\alpha) A_t k_t^\alpha = w_t \tag{8}$$

where $k_t = K_t / A_t N_t^m$ denotes capital per efficiency unit of labor.

2.4 National accounting and equilibrium

By definition, gross investment (I_t^g) equals net investment ($I_t^n = K_{t+1} - K_t$) plus the replacement of depreciated capital. With the assumption of fully depreciation, we get:

$$I_t^g = I_t^n + K_t = K_{t+1} \tag{9}$$

Equivalently, gross national saving (S_t^g) is related to net national saving (S_t^n) by:

$$S_t^g = S_t^n + K_t \tag{10}$$

Since the increase in national wealth equals net national saving, gross national saving can be expressed as follows:

$$S_t^g = S_t^n + K_t = (B_{t+1} - B_t) + K_t \tag{11}$$

where $B_{t+1} = N_t^m s_t$ represents savings carried by middle-aged adults at time t, which correspond to their assets when old at time $t+1$.

The net foreign asset position at the beginning of period $t+1$ (or the end of period t), denoted as F_{t+1}, is given by:

$$F_{t+1} = B_{t+1} - K_{t+1} = N_t^m s_t - A_{t+1} N_{t+1}^m k_{t+1} \tag{12}$$

As a result, the current account (i.e., the change in net foreign asset position) can be written as follows:

$$CA_t = F_{t+1} - F_t = (B_{t+1} - B_t) - (K_{t+1} - K_t) = S_t^n - I_t^n = S_t^g - I_t^g \tag{13}$$

From Equation (7), assuming a constant world real interest rate, the equilibrium level of capital per efficiency unit of labor is a constant given by:

$$k_t = k = \left(\frac{\alpha}{1+r}\right)^{1/(1-\alpha)} \tag{14}$$

Using Equation (8), the equilibrium real wage can, in turn, be expressed as:

$$w_t = (1-\alpha) A_t k^{\alpha} \tag{15}$$

Therefore, with constant fertility and migration rates, gross national saving and investment rates of our small open economy are time-invariant and given by:

$$\begin{aligned} sav = \frac{S_t^g}{Y_t} &= \frac{(B_{t+1} - B_t) + K_t}{Y_t} = \frac{(N_t^m s_t - N_{t-1}^m s_{t-1}) + K_t}{Y_t} \\ &= (1-\alpha)\frac{\beta}{1+\beta+\gamma(n)}\left(1 - \frac{1}{(1+g)(1+n)(1+m)}\right) + k^{1-\alpha} \end{aligned} \tag{16}$$

$$inv = \frac{I_t^g}{Y_t} = \frac{K_{t+1}}{Y_t} = (1+g)(1+n)(1+m)k^{1-\alpha} \tag{17}$$

Finally, the current account to GDP ratio is expressed as follows:

$$\begin{aligned} ca = sav - inv =& (1-\alpha)\frac{\beta}{1+\beta+\gamma(n)}\left(1 - \frac{1}{(1+g)(1+n)(1+m)}\right) + k^{1-\alpha} \\ & - (1+g)(1+n)(1+m)k^{1-\alpha} \end{aligned} \tag{18}$$

Equation (16) contains two distinct channels through which demographic changes impact the saving rate (Higgins and Williamson, 1996, 1997), i.e., youth and elderly dependency effects. The youth dependency effect is captured in the saving rate by $\beta/[1+\beta+\gamma(n)]$, and indicates that higher fertility decreases the saving rate by increasing youth dependency burden. The elderly dependency effect, which is captured by $1-1/[(1+g)(1+n)(1+m)]$, stresses that a rise in fertility rate or migration rate promotes saving by increasing the labor force relative to retired elderly who dissave.

Concerning the effect of demography on the investment rate, Equation (17) states that investment rises in response to higher future labor-force growth given by $(1+n)(1+m)$. Specifically, higher fertility (natural augmentation in labor force) and migration rates, by increasing future labor force (or decreasing future old dependency ratio), raise investment needs. Therefore, the investment rate will be related to youth dependency ratio through fertility that creates a connection between future old dependency (labor-force growth) and youth dependency ratios.

Equation (18) shows the effect of the demographic profile on the saving-investment balance (current account). Higher youth dependency ratio (fertility rate) is expected to deteriorate the current account balance by lowering the saving rate and boosting the investment rate. Higher old dependency ratio excluding migration (or lower rate of natural increase in labor force) should produce a tendency toward current account deficit by decreasing the saving rate. A higher migration rate would improve the current account balance if its increasing impact on the saving rate (labor force) dominates that on the investment rate (future labor force).

2.5 The role of international remittances

It is worth mentioning that the above discussion disregards international remittances. In general, migrants remit to home country and thus consume a smaller part of their income than natives. Migrants' remittances would induce capital flows

from host to home country, and therefore reinforce the negative impact of migration on the current account balance through increasing investment. As a result, the influence of net migration flows on the current account balance should be different from that of the natural increase in labor force. Particularly, the impact of immigration on the current account balance of highly developed OECD countries will be as less improving as remittances sent to developing countries are important. Conversely, the potential adverse impact of emigration on the current account balance of developing countries will be as low as remittances received from developed countries are high. More importantly, remittances received in developing countries allow households and entrepreneurs to overcome credit constraints and provide an alternative way to finance investment (Giuliano and Ruiz-Arranz, 2009). Therefore, at the global level, net emigration may result in an increase in the investment rate of home country if the promoting impact through remittances exceeds the negative effect of the reduction in labor force caused by emigration.

3 Empirical model and data

Based on the theoretical background developed above, we now aim at empirically assessing the influence of international migration on the current account balance.

3.1 Empirical model

Since our focus is on the influence of international migration on long-run saving-investment balances, we rely on the standard empirical model of medium-term current account determination (as in Chinn and Prasad, 2003; Chinn and Ito, 2007; Gruber and Kamin, 2007; Lane and Milesi-Ferretti, 2012). Therefore, our empirical strategy emphasizes the role of medium-term determinants of the current account, rather than factors influencing its short-run dynamics. In this regard, we concentrate on current account variations that are not caused by cyclical factors or that do not result from the influence of nominal rigidities. To allow higher frequency variations in current account balances while focusing on current-account medium-term variations, we construct a panel that contains non-overlapping 5-year averages of data for each country (as in Chinn and Prasad, 2003; Chinn and Ito, 2007; Lane and Milesi-Ferretti, 2012). Averages are constructed over 1990-1994, 1995-1999, 2000-2004, 2005-2009, 2010-2014, giving us five period observations for each cross-sectional unit.

Based on Equations (17)-(18), we consider the following empirical specification:

$$y_{it} = \alpha m_{it} + \beta demo_{it} + \sum\nolimits_k \gamma^k X_{it}^k + \varepsilon_{it} \tag{19}$$

where i and t respectively stand for country and time period indices, y_{it} is either saving, investment or current account (expressed as ratios to GDP) of country i at period t, m_{it} denotes net migration flows arrived at the beginning of period t (i.e., between $t-1$ and t) expressed as share of host population, $demo_{it}$ stands for the demographic characteristics of natives at period t, X_{it}^k are control variables, and ε_{it} stands for the error term.

3.2 Data

3.2.1 Dependent variable

As stressed above, our dependent variable is either saving, investment or current account (expressed as percentage of GDP). The corresponding data are taken from the IMF World Economic Outlook (WEO) database. Investment—or gross capital formation—refers to the total value of gross fixed capital formation and changes in inventories and acquisitions less disposals of valuables for a unit or sector. National saving is gross national saving measured by gross disposable income less final consumption expenditures after accounting for pension funds' adjustment.

3.2.2 Migration and demographic variables

We rely on the global bilateral migration stock database of United Nations (UN, 2015) for 232 countries. Since stock data are more widely available than flows, a growing number of empirical studies use bilateral migrant stock data to explain changes in contemporary migration patterns (see for example, Beine et al., 2011; Ortega and Peri, 2014; Docquier et al., 2016; Alesina et al., 2016). To proxy for migration flows, other studies (Docquier et al., 2014a; Docquier et al., 2014b) rely on the difference between successive bilateral stock matrices. This measure understates the inflow of new migrants because between the two periods some migrants present at the first period may die, return or migrate toward another country. To overcome this drawback, Abel (2013) and Abel and Sander (2014) propose a new flow-from-stock approach to estimate global bilateral migration flows using changes in published bilateral migrant stock data. This method is based on an algorithm that estimates migrant transition flows between two sequential migrant stock tables, using data on population, i.e., the number of births and deaths. In the present paper, we rely

on the data computed by Abel and Sander (2014) using this methodology on the global bilateral migration stocks of the United Nations over four five-year periods between 1990 and 2010. We thus compute net migration flow rates given by the difference between immigration flows and emigration flows per thousand population of host country and expressed as an annual rate. In the regressions, we also consider net migration stock rates, computed as the difference between immigration and emigration stocks as percentage of host country population.

In line with our theoretical model, we capture the demographic characteristics of natives by the natural rise in labor force that is proxied by the rate of natural increase in population (the rate of population change in the absence of migration). Alternatively, we account for the demographic characteristics of natives using the total age dependency ratio (the ratio of young and old population to the working-age population) or the vector of the young-age and old-age dependency ratios. Following Lane and Milesi-Ferretti (2012), we add to dependency ratios the aging rate that measures the expected change in the old-age dependency ratio in the future. Countries with higher aging rates (faster aging population) are expected to save more.

Data regarding demographic variables (except migration and aging rate) are taken from the World Bank World Development Indicators (WDI) database. The rate of natural increase in population, which is equal to the rate of population change in the absence of migration, is obtained by the difference between the death and birth rates expressed in percentage. The total age dependency ratio is computed as the ratio of dependents (people younger than 15 or older than 64) to the working-age population (population between 15 and 64), expressed as a percentage. In the same way, the young-age and old-age dependency ratios are respectively given by the percentage of population younger than 15 and the percentage of population older than 64 to the working-age population. Based on United Nations population projections, the aging rate is constructed as the difference between the projected age dependency ratio in year $t + 20$ and the actual age dependency ratio in year t.

3.2.3 Control variables

The selection of control variables follows the literature on the medium-term determinants of the current account (see Chinn and Prasad, 2003; Chinn and Ito, 2007; Gruber and Kamin, 2007; Lane and Milesi-Ferretti, 2012). Following this literature, where appropriate, variables for each country i are measured relatively to a weighted-average of the corresponding variables of country i's trading partners, since the current account should be influenced only by idiosyncratic shifts in fundamen-

tals. Migration being expressed in net terms, it does not enter in relative terms, since migration partner countries are generally trading partners.

The set of control variables includes:

- *Fiscal balance* (expressed as percentage of GDP and in relative terms): it is used to capture the Ricardian equivalence hypothesis, and its influence on the current account position is expected to be positive. Corresponding data are extracted from the IMF WEO database.

- *Net foreign asset* (NFA) position (as share of GDP, lagged value): a country receiving income issued from foreign direct investment is experiencing an improvement in its current account. We consider the lagged value to avoid correlation with the dependent variable—the NFA position being the accumulation of past current account balances. NFA data are collected from the updated and extended version of the dataset constructed by Lane and Milesi-Ferretti (2007a).

- *Real GDP per capita* (adjusted by PPP exchange rates, 2011 USD, expressed in relative terms and in logs): this variable, taken from WDI, aims at capturing the stage of economic development hypothesis according to which when a country is at the beginning (end) of its development process, it must run current account deficits (surpluses) due to important capital imports (exports).

- *GDP growth rate* (expressed in relative terms): this variable is introduced to account for the influence of an income shock on the current account balance. Its impact depends on whether high growth rates are perceived as transitory or permanent by households: the current account improves in response to a transitory positive shock, but it worsens following a permanent positive shock. GDP growth rate data are taken from WDI.

- *Trade openness* (ratio of exports plus imports of goods and services to GDP): this variable, extracted from WDI, is used as a proxy for trade liberalization that promotes flows of goods and services. Since countries most exposed to international trade tend to be more attracted to foreign capital, the relationship between openness to trade and the current account is expected to be negative.

- *Financial development*: it is proxied by domestic credit to the private sector as share of GDP. This variable is used to account for the influence of financial market development and to capture the ability of the financial sector to support the economy (King and Levine, 1993; Levine et al., 2000). This measure of financial depth, taken from the World Bank Global Financial Development

Database (GFDD), refers to the financial resources provided to the private sector, such as loans, non-equity securities, and trade credits and other account receivables that establish a claim for repayment. As highlighted by Chinn and Prasad (2003) and Chinn and Ito (2007), the impact of financial market development on the current account is ambiguous. On the one hand, this variable measures the depth and sophistication of the financial system, and could therefore enhance saving. On the other hand, it also reflects the borrowing constraints faced by individual agents, and could reduce the need for precautionary saving and, in turn, lower the saving rate.

- *Financial openness*: it is measured by Chinn and Ito (2006)'s index of capital account openness, and is used to capture the influence of financial liberalization policies on current account balances through the impact on saving and investment decisions. As for financial development, this variable could have two opposite effects on the current account position (Chinn and Prasad, 2003; Chinn and Ito, 2007). On the one hand, countries with high capital controls are expected to have relatively limited access to international capital and, therefore, could experience smaller current account deficits. On the other hand, capital controls could reflect the desire to impede capital flight caused by past current account deficits.

- *Dummy for oil-exporting countries*: as in Chinn and Prasad (2003), Chinn and Ito (2007) and Chinn et al. (2014), this dummy variable is used to account for the fact that oil-exporting countries have on average more favorable current account positions.

- *Terms of trade (TOT)* (ratio of export prices to import prices, in logarithmic variation): this variable captures the Harberger-Laursen-Metzler effect based on the hypothesis that an improvement in terms of trade raises income, and as spending increases less than income, saving will necessarily increase. Terms of trade data are taken from the United Nations Conference on Trade and Development (UNCTAD) database.

- *Crisis dummy*: this dummy variable takes the value 1 in year t if the considered country is experiencing a major economic crisis. It is included to capture the disruption in access to capital markets during major economic crises (see Lane and Milesi-Ferretti, 2012) and its impact is expected to be positive. The crisis dates are drawn from the database of Laeven and Valencia (2013).

3.3 Time period and sample of countries

Based on the availability of data in the different databases considered, our sample covers 180 countries over the period 1990-2014.[5] Table A-1 in Appendix displays summary statistics for all variables. Regarding our main variable of interest, the average annual net migration flow rate per thousand population has a mean of -0.35 and ranges from -74.75 for Kuwait during the period 1990-1995 to 96.32 for Qatar during the period 2005-2010. For the net migration stock rate, the mean, the minimum and the maximum values respectively amount to -1.50%, -55.40% (for Grenada in 2000) and 86.99% (for United Arab Emirates in 2010).

4 Results

Following the literature dealing with the medium-term variations in the current account balance,[6] Equation (19) does not include country-specific fixed effects. Indeed, as shown by Chinn and Prasad (2003), changes in the current account are attributable to cross-section rather than time-series variation, for both advanced and developing countries. Therefore, the empirical specification in Equation (19) aims at explicitly accounting for the contribution of migration on both the cross-sectional and time-series variation in current account balances.

4.1 Results using migration flows

Table 1 reports the estimation results of Equation (19) obtained by pooled OLS, considering migration expressed in terms of flows. Regarding first demographic and control variables, only the aging rate exerts a significant effect (at the 10% level) on the current account. This positive impact was expected since the aging rate reflects the anticipated change in the old-age dependency ratio in the future: countries displaying high aging rates tend to same more, thus improving the current account position.

Fiscal balance, the net foreign asset position, and the variable GDP per capita adjusted by PPP exchange rates exert positive significant effects on the current account. As expected, an improvement in the fiscal balance tends to ameliorate the current account, while a worsening in the former would be detrimental for the latter.

[5] The list of countries is displayed in Appendix.

[6] See Chinn and Prasad (2003) and Lane and Milesi-Ferretti (2012) among others.

Table 1: Pooled OLS estimates using flows

Variables	Saving			Investment			Current account		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Net mig. flow	0.086**	0.082*	0.078*	-0.067*	-0.072*	-0.076*	0.078**	0.073*	0.070*
	(0.041)	(0.045)	(0.044)	(0.040)	(0.043)	(0.043)	(0.036)	(0.038)	(0.037)
Nat. increase	-0.163			0.158			-0.716		
	(0.798)			(0.665)			(0.690)		
Dep. ratio		-0.013			-0.046			0.000	
		(0.052)			(0.044)			(0.043)	
Old dep. ratio			-0.083			-0.115			-0.047
			(0.090)			(0.081)			(0.090)
Young dep. ratio			-0.006			-0.039			0.005
			(0.054)			(0.046)			(0.043)
Aging rate		0.099	0.134		-0.080	-0.045		0.190*	0.214*
		(0.126)	(0.138)		(0.103)	(0.111)		(0.102)	(0.109)
Fiscal bal.	0.737***	0.745***	0.736***	-0.095	-0.101	-0.108	0.648***	0.658***	0.652***
	(0.104)	(0.103)	(0.106)	(0.134)	(0.134)	(0.136)	(0.144)	(0.143)	(0.145)
Lag. NFA	1.560**	1.499**	1.451**	-0.388	-0.469	-0.518	1.285***	1.265***	1.248***
	(0.644)	(0.658)	(0.660)	(0.525)	(0.548)	(0.552)	(0.407)	(0.407)	(0.406)
GDP Growth	0.552***	0.551***	0.548***	0.827***	0.811***	0.809***	-0.515**	-0.504**	-0.505**
	(0.158)	(0.157)	(0.157)	(0.187)	(0.189)	(0.190)	(0.208)	(0.207)	(0.207)
Ln(GDP p.c.)	3.081***	2.913***	3.076***	2.528***	2.277***	2.443***	1.425**	1.441**	1.550**
	(0.761)	(0.734)	(0.800)	(0.833)	(0.794)	(0.874)	(0.656)	(0.645)	(0.692)
Trade open.	-0.009	-0.009	-0.009	0.017	0.017	0.017	-0.023***	-0.023***	-0.023***
	(0.008)	(0.009)	(0.009)	(0.011)	(0.011)	(0.011)	(0.007)	(0.007)	(0.007)
TOT change	0.070	0.068	0.068	0.103	0.103	0.103	-0.059	-0.066	-0.066
	(0.083)	(0.083)	(0.083)	(0.087)	(0.089)	(0.088)	(0.076)	(0.077)	(0.077)
Financial open.	-0.375	-0.374	-0.240	-1.489	-1.128	-1.003	0.356	0.107	0.187
	(1.358)	(1.405)	(1.412)	(1.362)	(1.395)	(1.379)	(1.145)	(1.154)	(1.152)
Financial dev.	-0.017	-0.020**	-0.019*	0.002	0.003	0.003	-0.024**	-0.029***	-0.028***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)
Oil exp. dummy	3.530***	3.618***	3.439***	1.115	1.227	1.046	4.296***	4.235***	4.112***
	(1.271)	(1.278)	(1.289)	(1.517)	(1.525)	(1.529)	(1.572)	(1.591)	(1.584)
Crisis	22.750	23.275	23.171	-5.443	-5.228	-5.316	19.720***	20.281***	20.237***
	(14.903)	(14.495)	(14.146)	(11.566)	(11.859)	(11.429)	(7.320)	(6.660)	(6.656)
Constant	8.523**	9.121*	9.060*	9.048**	12.964***	12.894***	-3.536	-5.218	-5.251
	(3.797)	(5.228)	(5.247)	(3.744)	(4.700)	(4.697)	(3.260)	(4.414)	(4.432)
Observations	489	489	489	490	490	490	505	505	505
R-squared	0.562	0.563	0.563	0.272	0.274	0.275	0.503	0.505	0.505
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5% and 1% confidence level, respectively.

This result is in line with overlapping generations models (Obstfeld and Rogoff, 1996) and Blanchard (1985)'s finite-horizon model according to which deterioration in the fiscal balance has a similar effect on the current account as it involves income redistribution from future to present generations. Turning to the NFA to GDP ratio, its positive effect on the current account was expected as well: (i) countries with large net foreign asset positions also generally display important current account surpluses, since (ii) an improvement in the NFA position translates into a rise in net investment income. Finally, the variable GDP per capita adjusted by PPP exchange rates aims at capturing the stage of economic development of countries. At the beginning of their development process, countries experience current account deficits

coming from large capital imports. Once they reach a higher stage of economic development, they face current account surpluses to export capital and reimburse accumulated debt. By showing that the current account improves with the level of development, the positive sign obtained for this variable confirms the "stage of development" hypothesis.

As expected, GDP growth rate positively impacts saving and investment rates, while negatively affecting the current account. In other words, the increasing GDP growth rate influence on the investment rate dominates that on the saving rate. As previously mentioned, from a theoretical viewpoint, the economic growth impact on the current account depends on whether individuals perceive high growth rates as transitory or persistent. Trade openness also negatively affects the current account. This result, in line with Chinn and Prasad (2003) among others, is explained by the fact that openness may be viewed as a proxy for trade liberalization. In this sense, it accounts for some characteristics such as trade barriers which obviously impede flows of goods and services, contributing to deteriorating the current account. Financial deepening also exerts a negative effect on the current account, as well as on the saving rate. This result is not surprising if we consider that financial development may be seen as diminishing excessive savings: a high degree of financial depth tends to be associated with more efficient financial markets which, in turn, reallocate saving surpluses into domestic spending. This impact of spending may be amplified if higher developed financial systems reduce the need for precautionary saving through removing borrowing constraints. Overall, the impact on the current account is negative, in line with the findings of Gruber and Kamin (2007).

Finally, turning to the two dummy variables, their effect is positive on the current account, as expected. Indeed, the positive link between the dummy for oil-exporting countries and the current account reflects the fact that such economies generally experience more favorable current account positions. Similarly, the more countries deficient in oil are, the more the deficit in the current account. The crisis dummy accounting for the disruption in access to financial markets, it positively affects the current account.

Let us now turn to our main variable of interest, namely net migration. Our findings show (i) a positive impact of net migration flows on the saving rate at the 10% significance level (5% if we introduce the rate of natural increase in population in the estimated specification), and (ii) a negative impact on investment that is significant at the 10% level. The positive impact on saving and the negative effect on investment influencing the current account (saving-investment balance) in the same direction, there is an overall positive effect of migration flows on the current account position—significant at the 10% level (5% if the rate of natural increase in population is accounted for). The positive impact of net migration flows on the saving rate

confirms the theoretical prediction that international migration mainly consisting in working-age persons leads to an increase (decrease) in the national saving rate in host (home) country, by rising (lowering) the labor force (who save) to retired elderly (who dissave). This result is not surprising since, as shown in Figure 1, international migration mainly consists in working-age persons, i.e., people who are more inclined to save. The non positive (negative) impact of net migration (immigration minus emigration) on the investment rate reported in Table 1 likely represents the positive influence of emigration on the investment rate of origin country which operates through remittances (as conjectured in Subsection 2.5). This effect attenuates or surpasses the negative impact on the investment rate through declining labor force (caused by emigration).

Clearly, these findings underline the interest of accounting for international migration when investigating the current account dynamics, showing that the former contributes for a significant part to explain the latter. However, while interesting and informative, it is worth mentioning that dealing with migration flows does not allow us to account for remittances and, in turn, to capture their impact on the current account position. To overcome this limit, let us now consider migration stocks instead of migration flows.

4.2 Results using migration stocks

As stressed above, since former migrants may continue to remit to their home country, relying on migration stocks rather than flows is more relevant to reflect the influence of such remittances on the current account. Indeed, remittances are more appropriately accounted for using stocks as it involves the settlement of migrants in host countries over a relatively long period. We thus estimate the same model as before, by replacing migration flows with stocks. The corresponding results obtained by pooled OLS are reported in Table 2.

Regarding our main variable of interest,[7] it is worth noticing that the impact of net migration stocks on the current account balance is highly significant (1% statistical level). Looking at the two components of the current account, this strong positive effect is associated with a significant decline in the saving rate and a significant increase in the investment rate reflecting the importance of remittances in promoting investment in origin countries.

[7]The results related to the demographic and control variables are quite similar to those previously obtained. The main differences concern the fiscal balance and the crisis dummy whose effects on the current account are still positive but non significant.

Table 2: Pooled OLS estimates using stocks

Variables	Saving			Investment			Current account		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Net mig. stock	0.079**	0.080**	0.073**	-0.139***	-0.135***	-0.140***	0.158***	0.152***	0.149***
	(0.037)	(0.036)	(0.036)	(0.033)	(0.031)	(0.032)	(0.030)	(0.030)	(0.031)
Nat. increase	-0.290			0.844			-1.082*		
	(0.783)			(0.623)			(0.641)		
Dep. ratio		-0.088*			-0.019			-0.049	
		(0.046)			(0.041)			(0.043)	
Old dep. ratio			-0.226**			-0.128			-0.115
			(0.093)			(0.085)			(0.094)
Young dep. ratio			-0.074			-0.009			-0.042
			(0.047)			(0.042)			(0.042)
Aging rate		-0.048	0.020		-0.161	-0.108		0.107	0.140
		(0.125)	(0.137)		(0.100)	(0.105)		(0.102)	(0.108)
Fiscal bal.	-0.010	-0.007	-0.012	-0.053***	-0.051***	-0.055***	0.071	0.072	0.069
	(0.072)	(0.070)	(0.069)	(0.015)	(0.015)	(0.015)	(0.059)	(0.059)	(0.058)
Lag. NFA	1.640**	1.435**	1.354**	-0.013	-0.042	-0.105	1.124***	1.105***	1.089***
	(0.691)	(0.688)	(0.685)	(0.484)	(0.506)	(0.511)	(0.423)	(0.414)	(0.412)
GDP Growth	0.473**	0.449**	0.444**	0.810***	0.793***	0.789***	-0.491*	-0.491*	-0.493*
	(0.227)	(0.222)	(0.220)	(0.176)	(0.180)	(0.182)	(0.289)	(0.291)	(0.290)
Ln(GDP p.c.)	3.479***	3.061***	3.371***	2.723***	2.487***	2.731***	1.437**	1.365**	1.509**
	(0.757)	(0.717)	(0.774)	(0.763)	(0.719)	(0.789)	(0.630)	(0.604)	(0.644)
Trade open.	-0.001	-0.002	-0.002	0.018*	0.018*	0.018*	-0.016**	-0.016**	-0.016**
	(0.008)	(0.008)	(0.008)	(0.010)	(0.010)	(0.010)	(0.007)	(0.007)	(0.007)
TOT change	0.079	0.074	0.073	0.117*	0.118	0.117	0.018	0.014	0.013
	(0.075)	(0.074)	(0.074)	(0.071)	(0.072)	(0.072)	(0.064)	(0.064)	(0.064)
Financial open.	-0.267	0.059	0.363	-0.229	0.022	0.253	-0.302	-0.319	-0.187
	(1.382)	(1.401)	(1.417)	(1.219)	(1.249)	(1.245)	(1.102)	(1.121)	(1.129)
Financial dev.	-0.024**	-0.024**	-0.023**	0.004	0.008	0.009	-0.030***	-0.033***	-0.033***
	(0.011)	(0.011)	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Oil exp. dummy	8.001***	7.926***	7.545***	1.417	1.532	1.238	6.480***	6.287***	6.106***
	(1.344)	(1.337)	(1.355)	(1.245)	(1.256)	(1.270)	(1.544)	(1.561)	(1.571)
Crisis	-2.358	-1.197	-1.084	-4.304	-3.996	-3.919	1.130	1.838	1.897
	(19.546)	(19.474)	(19.016)	(9.097)	(9.592)	(8.980)	(10.807)	(10.975)	(10.952)
Constant	5.141	11.641**	11.592**	6.658*	10.217**	10.191**	-4.086	-2.485	-2.486
	(3.795)	(5.044)	(5.031)	(3.477)	(4.417)	(4.377)	(3.118)	(4.469)	(4.479)
Observations	537	537	537	538	538	538	553	553	553
R-squared	0.480	0.484	0.486	0.303	0.303	0.305	0.435	0.437	0.437
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Robust standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5% and 1% confidence level, respectively.

4.3 Accounting for endogeneity: Pooled 2SLS estimates

In the pooled OLS regressions reported in Tables 1 and 2, we assume that migration is exogenous with respect to the current account position. However, there may be a simultaneity bias between the two variables. For instance, a risky country attracts less capital flows and should experience more emigration. More generally, institutional quality is likely to matter for current account balance and the desire to emigrate, since countries with better governance tend to attract more capital and migration inflows. To take into account this potential simultaneity bias issue, we use the two-stage least squares (2SLS) estimation strategy.

This 2SLS estimation approach follows recent developments in international migration literature (Ortega and Peri, 2014; Alesina et al., 2016; Docquier et al., 2016) inspired from trade studies (Frankel and Romer, 1999). In line with Ortega and Peri (2014), we apply the 2SLS strategy on migration stocks instead of migration flows, since the stock of bilateral migration is well fitted by gravity-type models. Specifically, we rely on a pseudo-gravity regression to construct a geography-based prediction of bilateral migration stocks. To deal with negative values of net migration rate in the log-gravity model, we follow the literature (Beine et al., 2016) and consider two separate gravity models for net-immigration countries (countries with positive net migration by excluding negative net migration) and net-emigration countries (countries with negative net migration by excluding positive net migration). As Alesina et al. (2016) and Docquier et al. (2016), we use the following pseudo-gravity models that allow for time-varying bilateral relationships in a panel setting:

$$\begin{aligned} ln\ immig_{ij,t} =& a_1 ln\ Pop_{1960,i} + a_{2t} ln\ Dist_{ij} + a_3 Border_{ij} + a_4 Colony_{ij} \\ &+ a_5 OffLang_{ij} + a_6 EthLang_{ij} + \psi_{j,t} + \tau_t + e_{ij,t} \end{aligned} \tag{20}$$

$$\begin{aligned} ln\ emig_{ji,t} =& b_1 ln\ Pop_{1960,j} + b_{2t} ln\ Dist_{ji} + b_3 Border_{ji} + b_4 Colony_{ji} \\ &+ b_5 OffLang_{ji} + b_6 EthLang_{ij} + \psi_{i,t} + \tau_t + e_{ji,t} \end{aligned} \tag{21}$$

where $immig_{ij,t}$ is the bilateral net-immigration rate received in destination i (difference between the stock of migrants born in country j and living in country i and the stock of migrants born in country i and living in country j) at period t, expressed in terms of the population of destination country i; $emig_{ji,t}$ denotes the bilateral net-emigration rate from origin j (difference between the stock of migrants born in country j and living in country i and the stock of migrants born in country i and living in country j) at period t, expressed in terms of the population of origin country j; $Pop_{1960,i}$ and $Pop_{1960,j}$ are respectively the destination and origin population sizes in 1960; $Dist_{ij}$ is the weighted distance that is equal to the distance between destination country i and origin country j based on bilateral distances between the biggest cities of the two countries; $Border_{ij}$ is a dummy variable to indicate whether countries i and j share a common border; $Colony_{ij}$ is a dummy for colonial relationship; and $OffLang_{ij}$ and $EthnoLang_{ij}$ are respectively a dummy for sharing common official and ethnic minority languages (if language spoken by at least 9% of population in both countries). In this gravity model, the migration costs are captured by geographic variables (such as $Dist$, $Border$), linguistic and colonial ties ($OffLang$, $EthLang$, $Colony$). Following Feyrer (2009) and Docquier et al. (2016), to account for time-varying dimension in a panel setting, Equations (20) and (21) include interactions between geographic distance and time dummies (a_{2t} and b_{2t},

respectively). This allows the effect of geographic distance to be time-varying, and thus to capture reduction in migration costs, for example caused by improvements in aircraft technology. Finally, as in Alesina et al. (2016) we include time fixed effects τ_t and origin-time (destination-time) fixed effects $\psi_{j,t}$ ($\psi_{i,t}$) to account for multilateral resistance in destination (origin) countries reflecting the reaction of bilateral migration of a given origin-destination pair to time-varying common origin (destination) shocks which matter for migrants' destination. To ensure the exogeneity of gravity-based instruments, the gravity model for net immigration (emigration) does not include destination-time (origin-time) fixed effects because the latter may be linked to the current account (saving or investment) through unobserved factors (Docquier et al., 2016).

Data on geographic, ethnic, linguistic and colonial variables are from the CEPII's Gravity database described in Head et al. (2010).[8] The estimation results of gravity models are reported in Table A-2 in Appendix. For both net immigration and net emigration, the gravity model has high explanatory power, and all variables are significant with the expected signs: (i) population at destination (origin) in 1960 negatively impacts bilateral migration, (ii) sharing common border and common language or having a colonial tie positively impact bilateral migration, and (iii) bilateral distance has a negative influence with a magnitude that decreases on average between 1990 and 2010, reflecting the reduction in migration costs. Figure A-1 in Appendix compares the predicted net migration rates with the actual values: as shown, the predicted and actual values are highly correlated with an estimated slope coefficient around unity.

The results of 2SLS models are reported in Table 3. Let us first check the relevance of the gravity-based instruments. Based on Kleibergen and Paap (2006)'s rk Wald F-stat test, we reject the null hypothesis of weak identification—the test statistic for weak identification being above the Stock and Yogo (2005)'s critical value at 10% max IV size (16.38). The 2SLS regression results show a significant positive impact of net migration on the current account, while the effect on the investment rate remains negative but non significant. The significant positive impact on the current account is very close to the previously estimated effect from the OLS regression. As before, the improving effect of net migration on the current account reflects (i) the positive (negative) impact of immigration (emigration) on the saving rate of host (home)

[8]We estimate the gravity model by the Poisson Pseudo Maximum Likelihood (PPML) non-linear approach. As argued by Silva and Tenreyro (2006), contrary to the log-linearized model estimation by OLS, PPML estimation allows to address issues related to (i) the presence of zero values in the observations of the dependent variable, and (ii) heteroscedasticity. We rely on Silva and Tenreyro (2010)'s procedure to deal with the identification problem of the (pseudo) maximum likelihood estimates of Poisson regression models with non-negative values of the dependent variable (bilateral migration) and a large number of zeros on some regressors.

country, and (ii) the positive impact of emigrant's remittances on the investment rate of home country that compensates the negative effect of emigration on investment due to labor force loss. Therefore, accounting for potential endogeneity does not alter our findings about the improving impact of net migration on the external balance of host countries.

Table 3: Pooled 2SLS estimates using stocks

Variables	Saving			Investment			Current account		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Net mig. stock	0.152***	0.154***	0.154***	-0.069	-0.069	-0.069	0.166***	0.164***	0.163***
	(0.052)	(0.051)	(0.050)	(0.055)	(0.054)	(0.054)	(0.047)	(0.047)	(0.047)
Nat. increase	-0.786			0.419			-1.124*		
	(0.790)			(0.665)			(0.648)		
Dep. ratio		-0.090*			-0.021			-0.048	
		(0.046)			(0.040)			(0.042)	
Old dep. ratio			-0.191**			-0.095			-0.106
			(0.094)			(0.082)			(0.093)
Young dep. ratio			-0.081*			-0.014			-0.042
			(0.048)			(0.041)			(0.041)
Aging rate		0.008	0.061		-0.124	-0.086		0.115	0.146
		(0.121)	(0.134)		(0.100)	(0.105)		(0.101)	(0.106)
Fiscal bal.	-0.012	-0.011	-0.014	-0.055***	-0.054***	-0.056***	0.071	0.071	0.069
	(0.068)	(0.066)	(0.065)	(0.015)	(0.015)	(0.015)	(0.058)	(0.057)	(0.057)
Lag. NFA	1.399**	1.194*	1.122*	-0.182	-0.195	-0.246	1.111***	1.088***	1.070***
	(0.629)	(0.626)	(0.620)	(0.496)	(0.514)	(0.517)	(0.415)	(0.404)	(0.401)
GDP Growth	0.507**	0.490**	0.489**	0.830***	0.817***	0.816***	-0.488*	-0.486*	-0.487*
	(0.228)	(0.224)	(0.222)	(0.173)	(0.177)	(0.178)	(0.283)	(0.283)	(0.283)
Ln(GDP p.c.)	3.064***	2.732***	2.940***	2.349***	2.218***	2.371***	1.390**	1.320**	1.438**
	(0.758)	(0.719)	(0.769)	(0.755)	(0.708)	(0.774)	(0.638)	(0.603)	(0.640)
Trade open.	-0.001	-0.001	-0.001	0.019*	0.019*	0.019*	-0.015**	-0.015**	-0.015**
	(0.007)	(0.008)	(0.008)	(0.010)	(0.010)	(0.010)	(0.007)	(0.007)	(0.007)
TOT change	0.070	0.064	0.063	0.111	0.111	0.110	0.017	0.013	0.012
	(0.075)	(0.074)	(0.074)	(0.070)	(0.071)	(0.071)	(0.063)	(0.064)	(0.064)
Financial open.	-0.925	-0.700	-0.522	-0.876	-0.661	-0.539	-0.403	-0.476	-0.390
	(1.441)	(1.465)	(1.483)	(1.368)	(1.409)	(1.416)	(1.192)	(1.219)	(1.232)
Financial dev.	-0.022**	-0.024**	-0.023**	0.004	0.007	0.008	-0.030***	-0.033***	-0.033***
	(0.011)	(0.010)	(0.010)	(0.009)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Oil exp. dummy	7.744***	7.550***	7.250***	1.215	1.242	1.027	6.445***	6.226***	6.054***
	(1.361)	(1.365)	(1.376)	(1.260)	(1.294)	(1.284)	(1.539)	(1.564)	(1.565)
Crisis	-3.922	-2.914	-2.931	-5.978	-5.708	-5.742	0.972	1.568	1.569
	(19.716)	(19.595)	(19.296)	(9.403)	(9.679)	(9.298)	(10.750)	(10.958)	(10.957)
Constant	7.641*	13.273***	13.333***	9.086**	11.802***	11.864***	-3.783	-2.297	-2.262
	(3.968)	(5.147)	(5.122)	(3.668)	(4.416)	(4.377)	(3.425)	(4.501)	(4.508)
Observations	537	537	537	538	538	538	553	553	553
R-squared	0.475	0.479	0.480	0.295	0.296	0.297	0.435	0.437	0.437
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
K-P F-stat	32.66	27.70	31.98	32.67	28.01	32.58	36.93	32.85	37.82
SY 10% max IV size	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38
SY 25% max IV size	5.530	5.530	5.530	5.530	5.530	5.530	5.530	5.530	5.530

Notes: Robust standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5% and 1% confidence level, respectively. K-P F-stat is the Kleibergen and Paap (2006) rk Wald F-stat test of weak identification that has to be compared with Stock and Yogo (2005) critical values (SY 10% /25% max IV size).

5 Sensitivity analysis and heterogeneous effects

In this section, we check the robustness of our results while investigating heterogeneity in different dimensions: excluding oil-exporting countries, comparing advanced countries with developing countries, and comparing net-immigration countries with net-emigration countries.[9]

5.1 Excluding oil-exporting countries

In the above regressions, we used a dummy variable for oil-exporting countries to account for the evidence that these economies have on average more favorable current account positions. As it is well known that some oil-exporting countries (e.g., Qatar, Saudi Arabia, United Arab Emirates) attract more emigrants, we check the sensitivity of our findings by excluding oil-exporting economies from our panel. The corresponding regression results are reported in Table A-3. They confirm our previous conclusions with a strong positive effect of net migration on the current account position, highlighting the robustness of our findings to the exclusion of oil exporters.

5.2 Advanced vs. developing countries

For the sake of completeness, we also investigate whether migration heterogeneously affects the current account position, depending on the type—advanced or developing—of the considered countries. To this end, we estimate our model by distinguishing two samples of countries: a panel of 32 advanced economies, and a panel comprising 125 developing countries.[10] The results are displayed in Tables A-4 and A-5 in Appendix.

Focusing on advanced countries, the results in Table A-4 show that migration does not significantly impact the current account position. This illustrates the fact that the influence of immigration on the current account of developed countries is weakened by the importance of remittances sent to the origin countries. For developing countries, the results in Table A-5 show a significant positive impact of net migration on the current account. Specifically, the effect of net migration on the saving rate is significantly positive, while it is negative but non significant on the investment

[9] To save space, we only report (i) the most relevant regression results using net migration stocks, and (ii) the estimations obtained using the 2SLS procedure. Results using OLS are similar to those obtained with 2SLS and are available upon request to the authors.

[10] See Appendix for the corresponding lists of countries.

rate. Since developing economies are generally net-emigration countries, the non positive impact of net migration on investment may reflect the positive influence of net emigration on investment in home developing countries; this effect passing through remittances and attenuating or exceeding the negative impact exerted by labor force emigration on the investment rate. Overall and in line with our previous conclusions, our findings emphasize that remittances play a key role in enhancing investment of developing countries.

5.3 Net-immigration vs. net-emigration countries

As a final robustness check, we directly assess our conjecture that the non positive impact of net migration on the investment rate reflects the positive effect of emigration on investment in the home country passing through remittances—this effect compensating or exceeding the negative impact of labor force emigration on investment needs. To this end, we estimate regressions on net-immigration and net-emigration countries separately. For the sake of precision, we exclude countries whose net migration is close to being balanced. We thus classify as "net-immigration countries" economies with immigration stock rate exceeding emigration stock rate by one per thousand persons and, similarly, "net-emigration countries" include nations with emigration stock rate exceeding immigration stock rate by one per thousand persons.[11]

The regression results, reported in Tables A-6 and A-7, are in line with our previous findings. As for advanced countries, we find no significant impact of net migration on the current account of net-immigration countries: likely due to the importance of remittances sent to the origin countries, the significant positive impact on savings is compensated by the significant positive effect on the investment rate. Focusing on net-emigration countries, our results clearly show that emigration has a significant deteriorating effect on the current account balance of origin countries. This adverse impact is associated with a significant decline in the saving rate and a significant positive effect on the investment rate. This reflects that the positive impact of net emigration dominates the negative effect of labor force emigration on the investment rate of home countries.

[11] Our findings are robust to the choice of the threshold. They are indeed insensitive to any threshold value greater than one per thousand persons.

6 Conclusion

This paper contributes to the recent literature on two highly topical subjects in international macroeconomics, namely global imbalances and migration. While previous studies address these two phenomena separately, we aim at investigating their dynamics in a unified framework. Specifically, relying on a theoretical relationship derived from an overlapping generations model, we assess the role played by international migration in the evolution of global imbalances.

Considering a panel of 157 developed and developing economies, we show that net migration significantly improves the current account position of the host country, while having the opposite effect in the home country. Furthermore, we highlight that this impact of net migration on the current account operates through the positive (negative) effect of immigration (emigration) on the saving rate of the host (home) country with a mixed influence on investment due to remittances.

To deepen the analysis, we decompose our whole panel between advanced and developing countries to apprehend a potential heterogeneous effect of migration depending on the economies' level of development. We then find that the impact of net migration on the current account balance and savings is particularly acute for developing countries comparatively to developed economies.

On the whole, our results emphasize that international migration has to be accounted for when studying the dynamics of global imbalances. Since a current account surplus (deficit) reflects a nation's financing capacity (need), our findings underline the key role played by international migration in driving capital flows around the world.

Appendix

List of countries

Advanced countries (32 countries): Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Estonia, Finland, France, Greece, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Malta, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovak Republic, Slovenia, South Korea, Spain, Sweden, Switzerland, United Kingdom, United States.

Developing countries (125 countries): Afghanistan, Albania, Algeria, Angola, Argentina, Azerbaijan, Bahrain, Bangladesh, Belarus, Belize, Benin, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Chile, China, Colombia, Comoros, Congo, Costa Rica, Cote d'Ivoire, Croatia, Democratic Republic of Congo, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Georgia, Ghana, Grenada, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hungary, India, Indonesia, Iran, Iraq, Jamaica, Jordan, Kazakhstan, Kenya, Kuwait, Kyrgyz Republic, Laos, Lebanon, Lesotho, Liberia, Libya, Madagascar, Malawi, Malaysia, Maldives, Mali, Mauritania, Mauritius, Mexico, Moldova, Mongolia, Morocco, Mozambique, Myanmar, Namibia, Nepal, Nigeria, Oman, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Qatar, Romania, Russia, Rwanda, Saint Lucia, Saint Vincent and the Grenadines, Samoa, Sao Tome and Principe, Saudi Arabia, Senegal, Sierra Leone, Solomon Islands, South Africa, Sri Lanka, Sudan, Suriname, Swaziland, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, United Arab Emirates, Uruguay, Vanuatu, Venezuela, Vietnam, Zambia, Zimbabwe.

Oil-exporting countries (23 countries, based on IMF classification in which oil-exporting countries—or fuel-exporting countries—include countries that have mineral fuels, lubricants, and related materials comprising over 50 percent of their exports): Algeria, Angola, Azerbaijan, Bahrain, Chad, Congo, Ecuador, Equatorial Guinea, Gabon, Iran, Iraq, Kazakhstan, Kuwait, Libya, Nigeria, Norway, Oman, Qatar, Russia, Saudi Arabia, Trinidad and Tobago, United Arab Emirates, Venezuela.

Table A-1: Summary statistics

	Mean	**Std. Dev.**	**Min.**	**Max.**
Current account balance (as % of GDP)	-3.25	9.31	-68.98	38.1
Saving (in % of GDP)	20.16	11.6	-47.36	57.78
Investment (in % of GDP)	23.76	8.37	4.15	90.07
Net migration flow rate (per 1,000)	-0.35	10.26	-74.75	96.32
Net migration stock rate (in %)	-1.50	16.32	-55.40	86.99
Natural increase rate (in %)	1.57	1.07	-0.72	3.60
Dependency ratio (in %)	66.5	19.67	16.9	108.86
Old-age dependency ratio (in %)	11.03	6.89	0.93	38.87
Young-age dependency ratio (in %)	55.47	24.22	15.89	103.04
Aging rate (in %)	4.21	5.15	-3.86	27.64
Fiscal balance (as % of GDP)	-2.52	12.66	-300.81	32
Net Foreign Assets (as % of GDP)	-0.44	1.58	-20.09	11.77
GDP growth rate (in %)	-0.09	4.32	-34.89	47.4
Ln(GDP per capita (PPP, 2011 USD))	-1.32	1.17	-4.06	1.66
Trade openness (as % of GDP)	46.35	54.68	-24.21	440.74
Terms of trade (change in %)	0.58	4.25	-27.05	27.25
Financial openness index	0.49	0.35	0	1
Financial dev. (credit as % of GDP)	43.99	42.35	0.62	261.54

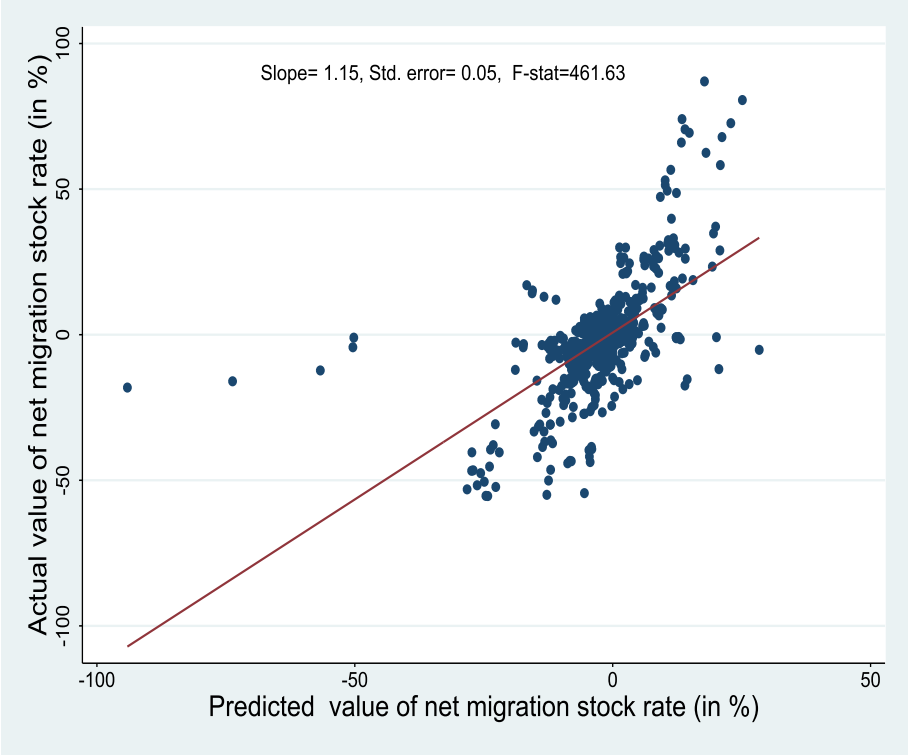
Source: Authors' computations based on data from the following databases: United Nations, Department of Economic and Social Affairs, UNCTAD, WDI, WEO, PWT, GFDD, Chinn and Ito (2006), and Lane and Milesi-Ferretti (2007a).

Table A-2: Gravity regression

VARIABLES	(1) Net immig.	(2) Net emig.
Ln 1960 population at destination	-0.379***	
	(0.012)	
Ln 1960 population at origin		-0.218***
		(0.013)
Ln Distance*I(1990)	-1.068***	-1.419***
	(0.085)	(0.158)
Ln Distance*I(1995)	-1.062***	-1.460***
	(0.086)	(0.110)
Ln Distance*I(2000)	-1.046***	-1.455***
	(0.086)	(0.098)
Ln Distance*I(2005)	-1.033***	-1.397***
	(0.085)	(0.089)
Ln Distance*I(2010)	-1.037***	-1.397***
	(0.088)	(0.086)
Border	0.480***	0.545***
	(0.094)	(0.128)
Colonial ties	1.319***	1.588***
	(0.143)	(0.101)
Common official language	0.280**	0.762***
	(0.125)	(0.101)
Common ethnic language	0.882***	0.562***
	(0.141)	(0.124)
Constant	7.001***	6.268***
	(0.948)	(1.454)
Observations	37,261	172,645
R-squared	0.436	0.283
Origin-time dummies	Yes	No
Destination-time dummies	No	Yes
Year dummies	Yes	Yes

Notes: Robust standard errors clustered by destination country are in parentheses. *** denotes significance at the 1% confidence level.

Figure A-1: Observed and predicted values of net migration stock rate



Notes: Predicted values are issued from the estimation of Equations (20) and (21) (see Table A-2).

Table A-3: Pooled 2SLS estimates using stocks, excluding oil-exporting countries

Variables	Saving			Investment			Current account		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Net mig. stock	0.247***	0.253***	0.240***	0.021	0.027	0.019	0.192***	0.189***	0.182***
	(0.049)	(0.049)	(0.047)	(0.063)	(0.062)	(0.060)	(0.051)	(0.050)	(0.050)
Nat. increase	-0.755			0.397			-0.989**		
	(0.679)			(0.515)			(0.469)		
Dep. ratio		-0.096**			-0.039			-0.045	
		(0.046)			(0.037)			(0.032)	
Old dep. ratio			-0.279***			-0.155**			-0.136*
			(0.089)			(0.077)			(0.079)
Young dep. ratio			-0.088*			-0.035			-0.041
			(0.047)			(0.037)			(0.032)
Aging rate		0.001	0.120		-0.191**	-0.117		0.123	0.180*
		(0.119)	(0.140)		(0.097)	(0.103)		(0.091)	(0.099)
Fiscal bal.	0.679***	0.687***	0.661***	0.172	0.176	0.157	0.353**	0.353**	0.340**
	(0.121)	(0.121)	(0.126)	(0.145)	(0.145)	(0.149)	(0.168)	(0.165)	(0.167)
Lag. NFA	1.560*	1.485*	1.286	0.140	0.215	0.082	1.165**	1.151**	1.120**
	(0.839)	(0.844)	(0.851)	(0.493)	(0.498)	(0.511)	(0.460)	(0.450)	(0.445)
GDP Growth	1.266***	1.152***	1.138***	1.135***	1.075***	1.065***	-0.100	-0.135	-0.144
	(0.208)	(0.223)	(0.222)	(0.156)	(0.165)	(0.164)	(0.118)	(0.129)	(0.130)
Ln(GDP p.c.)	1.309*	0.734	1.259	0.935	0.675	1.008	0.742	0.610	0.869
	(0.749)	(0.722)	(0.805)	(0.655)	(0.645)	(0.701)	(0.513)	(0.489)	(0.534)
Trade open.	0.004	0.005	0.004	0.022**	0.023**	0.023**	-0.012	-0.012	-0.012
	(0.007)	(0.007)	(0.007)	(0.011)	(0.010)	(0.011)	(0.008)	(0.008)	(0.008)
TOT change	0.012	0.025	0.020	0.099	0.101	0.098	-0.043	-0.037	-0.039
	(0.082)	(0.083)	(0.082)	(0.077)	(0.077)	(0.076)	(0.058)	(0.060)	(0.060)
Financial open.	-1.620	-1.407	-0.771	-1.405	-1.128	-0.732	-0.363	-0.394	-0.086
	(1.498)	(1.502)	(1.429)	(1.456)	(1.438)	(1.398)	(1.061)	(1.072)	(1.072)
Financial dev.	0.014	0.008	0.007	0.020*	0.023**	0.022**	-0.010	-0.016*	-0.016*
	(0.012)	(0.011)	(0.011)	(0.010)	(0.011)	(0.011)	(0.009)	(0.009)	(0.009)
Constant	15.407***	23.097***	21.813***	16.027***	21.051***	20.268***	-1.881	-0.234	-0.808
	(3.943)	(5.715)	(5.870)	(2.885)	(4.238)	(4.211)	(2.524)	(3.619)	(3.617)
Observations	463	463	463	464	464	464	476	476	476
R-squared	0.401	0.407	0.417	0.197	0.198	0.206	0.291	0.295	0.299
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
K-P F-stat	25.75	25.78	24.95	26.01	26.09	25.39	29.62	29.93	28.74
SY 10% max IV size	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38
SY 25% max IV size	5.530	5.530	5.530	5.530	5.530	5.530	5.530	5.530	5.530

Notes: Robust standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5% and 1% confidence level, respectively.

Table A-4: Pooled 2SLS estimates using stocks, advanced countries

Variables	Saving			Investment			Current account		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Net mig. stock	0.025	0.036	0.040	-0.034	0.018	0.012	0.056	0.016	0.023
	(0.084)	(0.094)	(0.081)	(0.087)	(0.077)	(0.069)	(0.086)	(0.092)	(0.077)
Nat. increase	0.041			-0.502			0.393		
	(1.160)			(1.226)			(1.354)		
Dep. ratio		0.008			-0.383***			0.397***	
		(0.090)			(0.090)			(0.092)	
Old dep. ratio			-0.009			-0.356***			0.366***
			(0.121)			(0.107)			(0.116)
Young dep. ratio			0.020			-0.402***			0.419***
			(0.101)			(0.097)			(0.107)
Aging rate		0.249*	0.259*		-0.151*	-0.168*		0.412***	0.432***
		(0.144)	(0.144)		(0.088)	(0.088)		(0.136)	(0.139)
Fiscal bal.	0.868***	0.906***	0.899***	0.437***	0.319***	0.330***	0.441***	0.599***	0.586***
	(0.113)	(0.110)	(0.113)	(0.096)	(0.071)	(0.076)	(0.112)	(0.108)	(0.114)
Lag. NFA	3.478***	2.848***	2.833***	0.435	-0.425	-0.401	3.017**	3.245***	3.217***
	(1.004)	(1.021)	(1.014)	(0.889)	(0.722)	(0.705)	(1.229)	(1.076)	(1.062)
GDP Growth	0.077	0.173	0.158	0.582**	0.236	0.261	-0.544**	-0.093	-0.122
	(0.270)	(0.301)	(0.294)	(0.231)	(0.289)	(0.291)	(0.268)	(0.280)	(0.282)
Ln(GDP p.c.)	6.232***	6.295**	6.110***	-1.038	-2.769	-2.471	7.069***	8.783***	8.443***
	(2.133)	(2.515)	(2.175)	(2.123)	(2.314)	(2.099)	(2.370)	(2.542)	(2.080)
Trade open.	-0.007	-0.010	-0.010	-0.006	0.005	0.004	-0.001	-0.015	-0.014
	(0.009)	(0.010)	(0.010)	(0.009)	(0.008)	(0.008)	(0.011)	(0.010)	(0.010)
TOT change	-0.837***	-0.716***	-0.719***	-0.403*	-0.393**	-0.389**	-0.460**	-0.348*	-0.352*
	(0.193)	(0.191)	(0.187)	(0.212)	(0.184)	(0.184)	(0.202)	(0.192)	(0.188)
Financial open.	-2.053	-2.058	-1.765	-2.064	1.049	0.579	-0.141	-3.199	-2.664
	(2.327)	(2.274)	(2.672)	(2.837)	(2.155)	(2.511)	(2.329)	(2.007)	(2.475)
Financial dev.	-0.043***	-0.045***	-0.045***	-0.005	-0.007	-0.007	-0.038***	-0.038***	-0.039***
	(0.011)	(0.010)	(0.010)	(0.008)	(0.007)	(0.008)	(0.013)	(0.012)	(0.012)
Constant	-0.799	-4.387	-3.736	32.072***	58.162***	57.117***	-31.519**	-61.308***	-60.117***
	(11.432)	(14.751)	(13.771)	(10.697)	(14.225)	(13.547)	(12.369)	(14.546)	(13.020)
Observations	98	98	98	98	98	98	98	98	98
R-squared	0.777	0.793	0.794	0.398	0.541	0.539	0.631	0.698	0.698
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
K-P F-stat	46.89	27.72	59.63	46.89	27.72	59.63	46.89	27.72	59.63
SY 10% max IV size	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38
SY 25% max IV size	5.530	5.530	5.530	5.530	5.530	5.530	5.530	5.530	5.530

Notes: Robust standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5% and 1% confidence level, respectively. K-P F-stat is the Kleibergen and Paap (2006) rk Wald F-stat test of weak identification that has to be compared with Stock and Yogo (2005) critical values (SY 10% /25% max IV size).

Table A-5: Pooled 2SLS estimates using stocks, developing countries

Variables	Saving			Investment			Current account		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Net mig. stock	0.155***	0.146***	0.145***	-0.079	-0.074	-0.069	0.165***	0.149***	0.141***
	(0.056)	(0.053)	(0.055)	(0.061)	(0.058)	(0.061)	(0.050)	(0.051)	(0.054)
Nat. increase	-1.051			0.624			-1.440**		
	(0.949)			(0.744)			(0.734)		
Dep. ratio		-0.075			0.053			-0.092*	
		(0.059)			(0.049)			(0.048)	
Old dep. ratio			-0.102			0.154			-0.231
			(0.157)			(0.133)			(0.148)
Young dep. ratio			-0.075			0.052			-0.090*
			(0.059)			(0.050)			(0.048)
Aging rate		0.003	0.010		0.018	-0.008		-0.040	-0.005
		(0.208)	(0.217)		(0.176)	(0.183)		(0.165)	(0.164)
Fiscal bal.	-0.022	-0.020	-0.020	-0.059***	-0.061***	-0.059***	0.065	0.067	0.065
	(0.059)	(0.058)	(0.058)	(0.015)	(0.015)	(0.016)	(0.054)	(0.053)	(0.052)
Lag. NFA	1.182*	1.084	1.073	-0.282	-0.218	-0.181	1.033***	1.030***	1.007***
	(0.670)	(0.659)	(0.660)	(0.534)	(0.556)	(0.559)	(0.394)	(0.383)	(0.379)
GDP Growth	0.494**	0.488**	0.488**	0.815***	0.820***	0.821***	-0.502*	-0.508*	-0.508*
	(0.245)	(0.243)	(0.243)	(0.183)	(0.182)	(0.181)	(0.300)	(0.298)	(0.296)
Ln(GDP p.c.)	2.777***	2.660***	2.697***	2.217***	2.326***	2.184**	1.238*	1.165*	1.351*
	(0.819)	(0.769)	(0.832)	(0.841)	(0.799)	(0.873)	(0.691)	(0.641)	(0.690)
Trade open.	0.003	0.003	0.003	0.025**	0.025**	0.025**	-0.016**	-0.016**	-0.017**
	(0.008)	(0.008)	(0.008)	(0.011)	(0.011)	(0.011)	(0.008)	(0.008)	(0.008)
TOT change	0.123	0.115	0.115	0.141*	0.146**	0.148**	0.046	0.038	0.035
	(0.077)	(0.077)	(0.077)	(0.072)	(0.072)	(0.073)	(0.064)	(0.064)	(0.064)
Financial open.	-0.915	-0.945	-0.935	-0.604	-0.607	-0.640	-0.583	-0.649	-0.616
	(1.686)	(1.704)	(1.704)	(1.467)	(1.508)	(1.517)	(1.304)	(1.321)	(1.323)
Financial dev.	0.005	0.001	0.001	0.043**	0.047**	0.047**	-0.034**	-0.037**	-0.036**
	(0.021)	(0.021)	(0.021)	(0.018)	(0.020)	(0.020)	(0.016)	(0.017)	(0.017)
Oil exp. dummy	7.888***	7.634***	7.577***	1.453	1.602	1.814	6.406***	6.060***	5.767***
	(1.481)	(1.475)	(1.502)	(1.407)	(1.426)	(1.436)	(1.669)	(1.660)	(1.652)
Crisis	1.807	2.837	3.066	-1.742	-2.375	-3.211	3.558	5.064	6.276
	(22.893)	(22.726)	(22.811)	(11.248)	(11.466)	(12.132)	(12.557)	(12.717)	(12.732)
Constant	6.744	10.588*	10.799*	7.362*	4.319	3.491	-2.972	1.677	2.799
	(4.172)	(6.306)	(6.212)	(3.926)	(5.412)	(5.339)	(3.501)	(4.938)	(5.182)
Observations	439	439	439	440	440	440	455	455	455
R-squared	0.460	0.463	0.463	0.325	0.325	0.324	0.419	0.421	0.422
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
K-P F-stat	96.08	98.44	98.09	90.74	93.53	93.50	129.5	130.6	128.7
SY 10% max IV size	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38
SY 25% max IV size	5.530	5.530	5.530	5.530	5.530	5.530	5.530	5.530	5.530

Notes: Robust standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5% and 1% confidence level, respectively. K-P F-stat is the Kleibergen and Paap (2006) rk Wald F-stat test of weak identification that has to be compared with Stock and Yogo (2005) critical values (SY 10% /25% max IV size).

Table A-6: Pooled 2SLS estimates using stocks, net-immigration countries

Variables	Saving			Investment			Current account		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Immig. stock	0.513***	0.485***	0.520***	0.391**	0.317**	0.354**	0.133	0.155	0.169
	(0.186)	(0.173)	(0.185)	(0.167)	(0.133)	(0.145)	(0.132)	(0.128)	(0.138)
Nat. increase	-3.042			-4.716**			0.437		
	(2.250)			(1.967)			(1.605)		
Dep. ratio		-0.002			-0.108			0.127	
		(0.106)			(0.075)			(0.089)	
Old dep. ratio			0.334			0.267			0.255
			(0.263)			(0.174)			(0.213)
Young dep. ratio			-0.047			-0.157*			0.110
			(0.106)			(0.081)			(0.087)
Aging rate		0.182	0.124		-0.129	-0.198		0.439***	0.416**
		(0.180)	(0.197)		(0.119)	(0.132)		(0.166)	(0.167)
Fiscal bal.	0.418***	0.386***	0.443***	-0.061	-0.159	-0.102	0.736***	0.777***	0.797***
	(0.129)	(0.134)	(0.140)	(0.134)	(0.136)	(0.136)	(0.111)	(0.104)	(0.114)
Lag. NFA	1.295	1.277	1.535*	-1.298	-0.907	-0.567	2.045**	1.995**	2.090**
	(0.894)	(0.865)	(0.893)	(0.906)	(0.804)	(0.811)	(0.961)	(0.876)	(0.885)
GDP Growth	0.773*	0.843**	0.856**	0.265	0.327**	0.333**	0.022	0.031	0.032
	(0.449)	(0.409)	(0.418)	(0.162)	(0.157)	(0.156)	(0.156)	(0.146)	(0.147)
Ln(GDP p.c.)	-3.787	-1.742	-3.696	-8.009***	-5.751***	-7.910***	1.521	2.277	1.543
	(2.946)	(2.295)	(3.159)	(2.182)	(1.593)	(2.093)	(2.176)	(1.655)	(2.373)
Trade open.	-0.040**	-0.036**	-0.035**	-0.014	-0.012	-0.011	-0.023*	-0.019	-0.019
	(0.016)	(0.015)	(0.016)	(0.013)	(0.012)	(0.013)	(0.013)	(0.012)	(0.012)
TOT change	-0.406*	-0.337	-0.398*	-0.288	-0.213	-0.276	-0.197	-0.152	-0.174
	(0.230)	(0.235)	(0.236)	(0.179)	(0.176)	(0.176)	(0.149)	(0.140)	(0.147)
Financial open.	-10.625***	-11.474***	-11.570***	-10.712***	-11.578***	-11.574***	-6.763*	-6.791*	-6.809*
	(3.624)	(3.834)	(3.713)	(3.295)	(3.151)	(3.209)	(4.022)	(3.963)	(3.904)
Financial dev.	-0.030**	-0.035**	-0.025	-0.018	-0.024*	-0.014	-0.009	-0.011	-0.007
	(0.015)	(0.016)	(0.019)	(0.013)	(0.013)	(0.014)	(0.013)	(0.015)	(0.017)
Oil exp. dummy	11.867***	10.699***	12.376***	9.115***	7.121***	8.983***	1.777	2.081	2.715
	(2.982)	(2.600)	(3.232)	(2.311)	(2.023)	(2.327)	(2.011)	(1.800)	(2.366)
Constant	56.253***	43.957***	46.954***	75.775***	71.446***	74.632***	2.272	-13.186	-12.080
	(16.483)	(16.882)	(17.248)	(12.686)	(11.994)	(12.720)	(13.151)	(10.097)	(10.791)
Observations	115	115	115	115	115	115	118	118	118
R-squared	0.695	0.701	0.694	0.099	0.167	0.144	0.769	0.782	0.781
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
K-P F-stat	10.09	12.85	13.97	7.275	10.19	11.25	10.91	13.60	15
SY 10% max IV size	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38
SY 25% max IV size	5.530	5.530	5.530	5.530	5.530	5.530	5.530	5.530	5.530

Notes: Robust standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5% and 1% confidence level, respectively. K-P F-stat is the Kleibergen and Paap (2006) rk Wald F-stat test of weak identification that has to be compared with Stock and Yogo (2005) critical values (SY 10% /25% max IV size).

Table A-7: Pooled 2SLS estimates using stocks, net-emigration countries

Variables	Saving			Investment			Current account		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Emig. stock	-0.179	-0.208*	-0.208*	0.278***	0.246***	0.256***	-0.329***	-0.321***	-0.327***
	(0.125)	(0.118)	(0.113)	(0.091)	(0.085)	(0.082)	(0.075)	(0.080)	(0.075)
Nat. increase	-2.684*			-0.209			-1.518		
	(1.511)			(1.112)			(1.240)		
Dep. ratio		-0.170*			-0.072			-0.080	
		(0.091)			(0.070)			(0.076)	
Old dep. ratio			-0.174			0.058			-0.207
			(0.193)			(0.191)			(0.175)
Young dep. ratio			-0.170*			-0.071			-0.078
			(0.089)			(0.070)			(0.076)
Aging rate		-0.088	-0.087		-0.309	-0.329		0.108	0.127
		(0.267)	(0.282)		(0.221)	(0.224)		(0.196)	(0.198)
Fiscal bal.	-0.044	-0.037	-0.037	-0.044**	-0.040**	-0.038**	0.022	0.024	0.021
	(0.039)	(0.040)	(0.040)	(0.017)	(0.018)	(0.018)	(0.018)	(0.020)	(0.020)
Lag. NFA	0.875	0.729	0.727	0.244	0.314	0.376	0.797***	0.793***	0.783***
	(0.889)	(0.884)	(0.884)	(0.769)	(0.780)	(0.787)	(0.300)	(0.296)	(0.296)
GDP Growth	0.134	0.157	0.157	0.895***	0.877***	0.871***	-0.901***	-0.883***	-0.876***
	(0.196)	(0.193)	(0.192)	(0.229)	(0.234)	(0.234)	(0.318)	(0.311)	(0.311)
Ln(GDP p.c.)	2.520*	2.421*	2.427*	2.277	2.352	2.111	0.943	0.759	1.006
	(1.356)	(1.311)	(1.383)	(1.492)	(1.431)	(1.540)	(1.167)	(1.141)	(1.215)
Trade open.	0.020**	0.021**	0.021**	0.030**	0.030**	0.031**	-0.004	-0.003	-0.003
	(0.009)	(0.010)	(0.010)	(0.014)	(0.013)	(0.013)	(0.012)	(0.012)	(0.012)
TOT change	0.098	0.060	0.060	0.073	0.063	0.064	0.024	0.008	0.006
	(0.106)	(0.109)	(0.109)	(0.090)	(0.090)	(0.090)	(0.089)	(0.090)	(0.090)
Financial open.	-2.319	-1.764	-1.754	-1.638	-1.324	-1.671	-0.455	-0.394	-0.074
	(2.471)	(2.487)	(2.450)	(2.448)	(2.449)	(2.532)	(1.820)	(1.789)	(1.861)
Financial dev.	-0.040*	-0.034	-0.034	-0.009	0.006	0.003	-0.037*	-0.044**	-0.041*
	(0.024)	(0.022)	(0.022)	(0.023)	(0.024)	(0.024)	(0.021)	(0.021)	(0.021)
Oil exp. dummy	10.012***	9.487***	9.472***	1.796	2.063	2.545	9.373***	8.994***	8.540***
	(2.413)	(2.290)	(2.317)	(2.468)	(2.490)	(2.440)	(2.932)	(2.940)	(2.833)
Constant	12.453*	20.416**	20.448**	8.062	13.826*	13.004*	1.044	4.045	4.697
	(6.832)	(9.748)	(9.293)	(6.525)	(7.896)	(7.815)	(5.714)	(8.094)	(8.047)
Observations	226	226	226	230	230	230	239	239	239
R-squared	0.355	0.350	0.350	0.337	0.351	0.349	0.401	0.408	0.407
Region dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
K-P F-stat	14.44	10.92	15.45	13.87	10.28	15.61	17.13	13.58	20.22
SY 10% max IV size	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38	16.38
SY 25% max IV size	5.530	5.530	5.530	5.530	5.530	5.530	5.530	5.530	5.530

Notes: Robust standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5% and 1% confidence level, respectively. K-P F-stat is the Kleibergen and Paap (2006) rk Wald F-stat test of weak identification that has to be compared with Stock and Yogo (2005) critical values (SY 10% /25% max IV size).

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