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Demographics, Old-Age Transfers and the Current Account

by Mai Chi Dao and Callum Jones

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Demographics, Old-Age Transfers and the Current Account[1]

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Abstract

Building on the evolving literature on the topic, this paper reviews the relationship between demographics and long-run capital flows in both theory and in the data. For this purpose, we develop a two region overlapping generations model where countries differ in their population growth and mortality risk. Besides exploring the implications of demographics for saving and the current account over the long-run, we also study how these might be affected by differences in the coverage and sustainability of old-age transfer schemes. The model predicts that population structure and life expectancy (which affects the need to save to meet old age consumption) affect current account levels, and that while countries with more generous unfunded transfer schemes tend to have lower saving and more capital inflows over the long-run, this effect may be dampened by natural limits (on taxation) of these schemes. The key predictions of the model are generally supported by a rich panel dataset.

JEL Classification Numbers: E2, J1

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1 Introduction

According to standard life cycle theory, demographics affects aggregate saving both through compositional and behavioral effects. Because saving needs vary over the lifecycle, changes in the population age distribution (i.e. the relative size of worker and elderly cohorts), underpinned by past and current fertility, immigration and longevity trends, can affect aggregate savings with implications for the equilibrium wages and interest rates. Beyond the compositional effects, changes in mortality risk can affect aggregate savings as saving needs increase with the expected years in retirement.

This paper studies the relationship between key demographic characteristics and capital flows in theory and in the data, and how this relationship may be affected by differences in the coverage and generosity of old-age transfers. To do so, we develop a two-country overlapping generations model, drawing on the work of Eggertsson, Mehrotra, and Robbins (2017), to understand the relationship between demographics, saving and capital flows over the long-run. In the model, households live for three periods at middle age households receive an endowment, which are used to finance consumption at old age and when young. There is free capital mobility and the world interest adjusts to balance the world supply and demand for saving. As such, the model provides insights into the long-run capital flows implications of differences in the demographic transition process across countries, and how these predictions may be affected by differences in old-age transfer schemes.

Our simple framework has the following key predictions.

1. **Baby boom-bust**. A sudden and temporary increase in fertility in one country, all else equal, results in an increase in the share of young borrowers, a rise in the demand for saving relative to its supply and capital inflows. When this larger cohort enters middle-age, there is an increase in the supply of saving relative to demand, which results in capital outflows or a current account surplus.

2. **Rising longevity**. For given levels of fertility and population structure, a permanent increase in life expectancy relative to the rest of the world results in increased saving at middle age to finance old-age consumption, and more capital outflows in steady-state.

3. **Old-age transfers**. The introduction of public old-age transfers, in the form of an unfunded pay-as-you-go scheme, would lead to a decrease in aggregate saving, although this impact will much depend on the coverage and generosity of the scheme. An increase in unfunded transfers to the old would raise the demand for savings relative to its supply

and result in a current account deficit.[1] However, a projected rise in old-age dependency brought about by, for example, a decline in fertility, coupled with limits on taxation for old-age transfers would reduce the negative aggregate saving effects from unfunded pensions. In particular, middle-aged cohorts would save more in light of expected declines in old-age transfers, making the current account more sensitive to longevity in the presence of unfunded pensions.

In the second part of the paper, we test these theoretical predictions in a panel of 49 countries over the last three decades, corresponding to the sample used in the IMF's External Balance Assessment (EBA) exercise.[2] We find that the theoretical models predictions are generally supported by the data, namely that current account balances increase with life expectancy and the share of middle aged cohorts (proxied by the share of workers ages 45-64), yet falls with the share of elderly and young (proxied by old-age dependency and population growth, respectively). Consistent with the notion that changes in demographic structures represent an important, slow-moving fundamental behind countries saving-investment balances, variation in our model-implied demographic indicators can explain a substantial share of current account distribution across countries over the long run. This explanatory power is further improved with the addition of an interaction term between longevity and the future old-age dependency ratio, which captures the nonlinearities associated with life expectancy when limits are introduced in the expansion of old-age transfer schemes.

Literature There is a large literature studying the relationship between demographics on domestic savings and on international capital flows. Brooks (2003) examines the link between population changes and international capital flows in a multi-region overlapping generations model. The calibrated model predicts the emergence of EU countries and Japan as capital exporters as their populations age, while regions with younger populations (North America, Africa) become capital importers. Backus, Cooley, and Henriksen (2014) use a multiregion overlapping generations model to study whether differences in demographics, mainly in the form of fertility and longevity, can explain persistent current account balances in the US, China, Japan, and Germany. They find that the calibrated model can explain some of the broad trends in current account balances, including China gradually becoming a capital exporter and the US remaining a capital importer.

[1] This situation can persist indefinitely in the overlapping generations framework, with steady-state non-zero net foreign asset positions that are covered by new generations: see Backus et al. (2014) and Eugeni (2015).

[2] See Phillips et al. (2013), and IMF (2018).

More recent work has explored how differences in pension systems might affect these capital flow dynamics induced by demographics. Attanasio, Kitao, and Violante (2006) use a two-region overlapping generations model to explore how differences in demographic transition and coverage of pay-as-you-go pension systems between developed and less developed economies affect international global interest rates, capital flows and welfare of the different country groups. The model is calibrated to take into account differences in longevity, fertility, and female labor force participation trends as well as coverage on pay-as-you-go schemes. They find that by making pay-as-you schemes in advanced economies less burdensome on future generations, would help to increase capital flows from developed to developing economies. Similarly, Eugeni (2015) shows in a simple two period OLG model that countries with a less generous pay-as-you-go pension systems have higher saving, lower returns to capital, and in an open economy setting, tend to import capital from the rest of the world. The predictions of the model are supported by cross-country data such that countries with lower pay-as-you pension coverage tend to have, on average, higher current accounts.

In more recent work, Barany, Coeurdacier and Guibaud (2018) develop a multi-country lifecycle model to study demographic trends and capital flows, where in addition to heterogeneity in fertility and longevity risk, countries also differ in the coverage and generosity of their old-age transfer systems as well as the degree of financial development. They find that differences in the stage of demographic transition and institutional features can explain why capital has been flowing from emerging countries to richer countries, as the negative effects on saving from more generous old-age transfer systems and developed credit markets in richer countries can outweigh pure demographic effects. Amaglobeli et al. (2018) studied similar issues, looking at the fiscal and private saving implications arising from different pension system design features, although they do not address the capital flow implications of differential pension systems.

Our paper builds on the existing literature by (i) studying the implications for capital flows of introducing endogenous limits to the expansion of unfunded old-age transfer schemes in a two-country OLG framework; and (ii) empirically verifying the main theoretical predictions of the two-country model using a rich panel dataset covering key advanced and emerging economies over the past three decades. Consistent with our theory, we find that the relative variation in demographic trends across countries correlates strongly with current account balances, both through population composition and longevity channels, as well as through their interaction with a measure of the natural limits to the expansion of unfunded old-age transfer schemes.

2 Baseline One-Country Closed Economy Model

The baseline one-country model builds off the framework of Eggertsson, Mehrotra and Robbins (2017). In the model, households live for three periods and interact through savings and borrowing markets. They receive an endowment in one period only, when they are middle-aged. When young, households must, therefore, borrow off the middle-aged to finance consumption when young. The middle-aged use their lending to the young to finance consumption when they are old. In the closed economy setting, the level of aggregate saving affects the economy's return to capital.

Demographics The population dynamics are governed by time-varying longevity risk and population growth. Longevity is modeled with a survival probability between middle-age and old-age between periods $t-1$ and t of γ_t. Defining n_t^s as the size of the generation born in period s at time t, the survival probability implies:

$$n_{t+1}^{t-1} = \gamma_{t+1} n_t^{t-1}.$$

For simplicity, unintentional bequests are redistributed to those of the same generation, which is consistent with assuming the presence of full annuity markets. This simply scales the return on savings by $\frac{1}{\gamma_t}$. Meanwhile, fertility shocks are introduced by exogenous changes in the initial population size n_t^t. Defining the total size of the population as $n_t = n_t^t + n_t^{t-1} + n_t^{t-2}$, total population growth is defined as n_t/n_{t-1}.

Household Problem The household's optimization problem is given by:

$$\max_{\left\{c_t^t, c_{t+1}^t, c_{t+2}^t\right\}} \mathbb{E}\left[\log c_t^t + \log c_{t+1}^t + \gamma_{t+2} \log c_{t+2}^t\right].$$

subject to a budget constraint when young:

$$c_t^t \leq b_t^t,$$

a budget constraint when middle-aged:

$$c_{t+1}^t \leq y_{t+1}^t - (1+r_t) b_t^t + b_{t+1}^t,$$

and a budget constraint when old:

$$c_{t+2}^t \leq -\frac{(1+r_{t+1})}{\gamma_{t+2}} b_{t+1}^t.$$

The borrowing of the young is assumed to be constrained by a borrowing limit:

$$b_t^t \leq \frac{d_t}{1+r_t},$$

which we will also assume is binding for the young for simplicity. At any one time period, there are n_t^s members of a generation born in period s. Aggregate consumption is:

$$C_t = n_t^t c_t^t + n_t^{t-1} c_t^{t-1} + n_t^{t-2} c_t^{t-2}.$$

Total output is simply $n_t^{t-1} y$. Total borrowing is:

$$B_t = n_t^t b_t^t + n_t^{t-1} b_t^{t-1}.$$

The baseline economy is closed, so that, across generations, bonds B_t are in net zero supply, giving the market clearing condition on bonds as:

$$-n_t^t b_t^t = n_t^{t-1} b_t^{t-1}.$$

To solve for the model's equilibrium, impose the debt limit on the young. This pins down borrowing when young and consumption when old. The borrowing demand by generation t in time t is:

$$n_t^t b_t^t = n_t^t \frac{d_t}{1+r_t},$$

while optimal consumption growth between middle age and old age is determined from optimal borrowing:

$$\frac{c_{t+2}^t}{c_{t+1}^t} = 1 + r_{t+1},$$

so that consumption by generation $t-1$ in time period t is:

$$c_t^{t-1} = \frac{1}{1+\gamma_{t+1}} \left(y_t^{t-1} - d_{t-1} \right),$$

and that total savings by generation $t-1$ in time period t is:

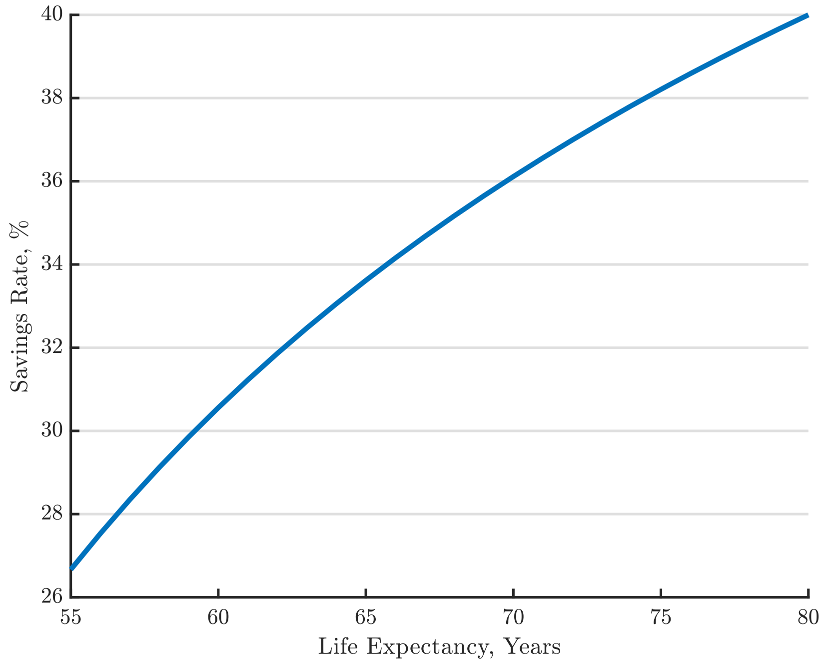
$$-n_t^{t-1} b_t^{t-1} = n_t^{t-1} \frac{\gamma_{t+1}}{1+\gamma_{t+1}} \left(y_t^{t-1} - d_{t-1} \right). \tag{1}$$

Equation (1) is an equilibrium condition showing that total savings increases with the size and composition of the population, expressed through the size of the middle-aged (prime-age savers) n_t^{t-1}, and future life expectancy, expressed through γ_{t+1}. Equating savings and borrowing demand, and rearranging gives the expression for the equilibrium interest rate as:

$$1 + r_t = \frac{n_t^t}{n_t^{t-1}} d_t \left[\frac{\gamma_{t+1}}{1+\gamma_{t+1}} \left(y_t^{t-1} - d_{t-1} \right) \right]^{-1}. \tag{2}$$

In the closed economy setting, saving increases and interest rates decrease with population growth, the endowment of the middle-aged, as well as with the survival probability which is equivalent to households valuing the future more.

Figure 1: Savings and Life Expectancy



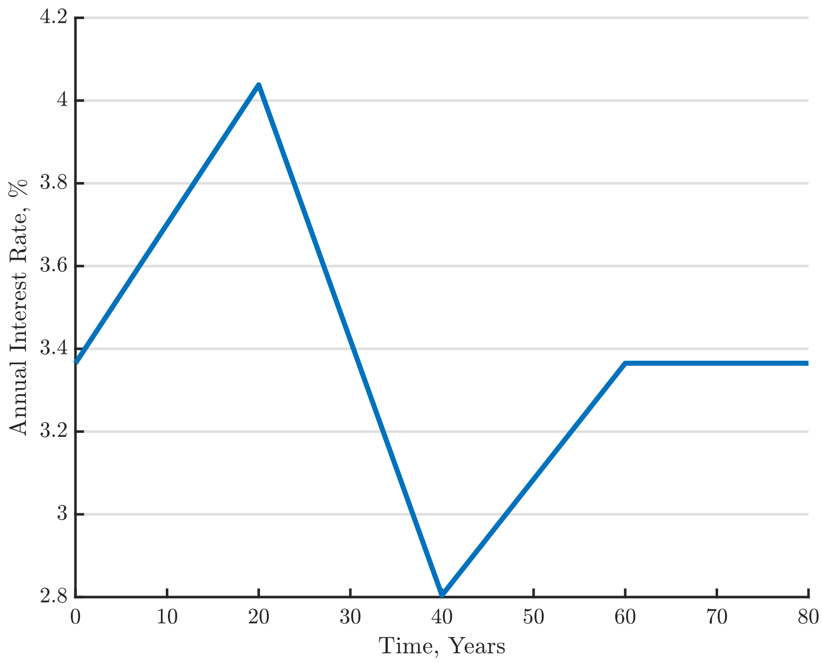
Demographics and Saving. The two main forces driving demographic change around the world are first, the broad-based increase in life expectancy across countries (although at different speeds and from initial levels); and second, changes in fertility, which give rise to country-specific baby booms and busts, affecting current and future population composition. We calibrate the model's key parameters and simulate the impact of changes in life expectancy and fertility on the steady-state saving rate.[3] We find that a permanent increase in longevity risk results in higher aggregate saving as households save more for a longer expected period of retirement (Figure 1). Meanwhile, we find that a temporary increase in population growth will first lead to an increase in the share of borrowers relative to savers, reducing aggregate saving and increasing the interest rate (Figure 2). When the baby boomer generation reaches its prime saving age at middle-age, saving would increase and interest rates fall as the share of savings relative to borrowers rises.

We summarize the key predictions of the one-country baseline closed-economy model in the following two results.

Result 1 (Life Expectancy)**.** *An increase in life expectancy increases savings of the prime-aged, and leads to a higher steady-state aggregate saving rate, despite there being a higher*

[3] We set the time period to 20 years, normalize the endowment to 1, and set borrowing constraints to be $d = 0.2$, so that the individual can borrow, at most, 20% of her endowment when young. Given the time period, it is straightforward to compute the life expectancy in years implied by different values of γ.

Figure 2: Baby Boom and Interest Rate



share of the elderly.

Result 2 (Population Growth)**.** *A one-time increase in fertility leads to an initial fall and then an increase in the aggregate saving rate as the baby boom cohort ages.*

3 Old-Age Transfers

In this section, we add to the model a role for contemporaneous transfers from the middle-aged to the old, resulting from the introduction of an unfunded pay-as-you-go old-age transfer system. Almost all advanced economies have old-age social security benefits that operates through pay-as-you-go transfers, to varying degrees. Furthermore, many developing countries have been introducing or expanding coverage as their population ages, national income rises, and intra-family support weakens (see various editions of the Social Security Administration's *Social Security Programs Throughout the World* publication). We model the government budget constraint for the pay-as-you-go transfer system as being balanced every period, so that the public sector does not save. We do so to focus on the implications of the pay-as-you-go transfer system for private saving.[4]

We capture contemporaneous transfers by taxing the middle age at a set lump sum rate of

[4]See Amaglobeli et al. (2018) for an assessment of the public savings implications of pension systems.

τ_t to finance *immediate* payments to the old at time t which cover $\lambda < 1$ of their endowment received in the previous period y_{t-1}^{t-2}. Under this system the budget constraints are, when young:

$$c_t^t \leq b_t^t,$$

and when middle-aged:

$$c_{t+1}^t \leq y_{t+1}^t - (1+r_t)b_t^t + b_{t+1}^t - \tau_{t+1},$$

and when old:

$$c_{t+2}^t \leq -\frac{(1+r_{t+1})}{\gamma_{t+2}} b_{t+1}^t + \lambda y_{t+1}^t.$$

Total old-age transfers or benefits are equivalent to the taxes paid by the middle-aged, such that the government budget is balanced at period t:

$$n_t^{t-1}\tau_t = \lambda n_t^{t-2} y_{t-1}^{t-2}.$$

Optimal consumption growth is unchanged under the transfers as they are determined by preferences. But now, from the budget constraint of the old:

$$b_{t+1}^t = -\frac{\gamma_{t+2}}{1+r_{t+1}}\left[(1+r_{t+1})c_{t+1}^t - \lambda y_{t+1}^t\right].$$

Substituting in b_{t+1}^t to the middle aged budget constraint:

$$c_{t+1}^t = \frac{1}{1+\gamma_{t+2}}\left[y_{t+1}^t - d_t + \lambda\frac{\gamma_{t+2}}{1+r_{t+1}} y_{t+1}^t - \tau_{t+1}\right],$$

and imposing the government budget balance constraint:

$$c_{t+1}^t = \frac{1}{1+\gamma_{t+2}}\left[y_{t+1}^t - d_t + \lambda\frac{\gamma_{t+2}}{1+r_{t+1}} y_{t+1}^t - \lambda\frac{n_{t+1}^{t-1}}{n_{t+1}^t} y_t^{t-1}\right].$$

Therefore, the individual savings of those born in $t-1$ are:

$$-b_t^{t-1} = \frac{\gamma_{t+1}}{1+\gamma_{t+1}}\left(y_t^{t-1} - d_{t-1} - \lambda\frac{n_t^{t-2}}{n_t^{t-1}} y_{t-1}^{t-2} - \frac{\lambda y_t^{t-1}}{1+r_t}\right).$$

In steady-state, when the endowment and mortality risk are not time-varying, individual saving are given by:

$$-b_t^t = \frac{\gamma}{1+\gamma}\left[y - d - \lambda y\left(\gamma + \frac{1}{1+r}\right)\right]. \tag{3}$$

The key result on the interaction between savings rates and transfer system generosity is summarized next.

Result 3 (Generosity of Transfers)**.** *In steady-state, a country with more generous old-age transfer systems have lower aggregate saving rates.*

Result 4. *Aggregate saving rates are more sensitive to changes in life expectancy when the old-age transfer system is less generous.*

The idea is that workers save more not only when they expect to live longer, but also when they expect to rely less on future generations for support, including via formal government pay-as-you-go old-age transfer schemes (Auerbach and Kotlikoff, 1987; Samwick, 2000).[5]

Conceptually, workers could stay in the workforce for longer following improvements in life expectancy so that retirement financing requirements are little changed. In practice, however, retirement ages barely keep pace with changes in life expectancy, leading to an increased need for life-cycle savings (Bloom et al, 2007). Aging therefore could have important implications for the sustainability of PAYG schemes. Assuming tax rates are fixed at the level τ, we could link the generosity of the transfer λ to demographics through the balanced budget equation:

$$\lambda_t = \tau \frac{n_t^{t-1}}{n_t^{t-2}} \frac{1}{y_{t-1}^{t-2}}.$$

The expected transfer (or generosity) of the system, which is the quantity that affects current saving, is then given by:

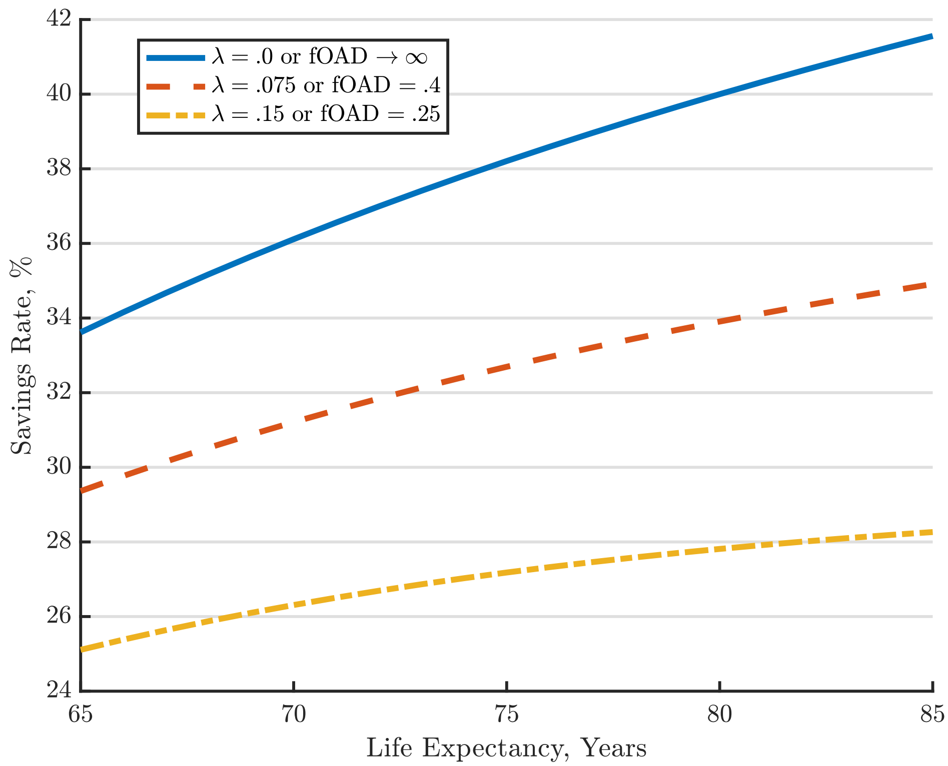
$$\lambda_{t+1} = \tau \frac{n_{t+1}^{t}}{n_{t+1}^{t-1}} \frac{1}{y_t^{t-1}}. \tag{4}$$

Assuming no changes in fertility and defining the inverse old age dependency ratio next period as $\frac{n_{t+1}^{t}}{n_{t+1}^{t-1}}$, then the inverse old age dependency ratio is $1/\gamma_{t+1}$. Holding fixed the endowment and the rate rate on the middle-aged, there is an inverse relationship between the future old-age dependency ratio and the future generosity of the transfer system. Intuitively, the higher the future share of the old, the lower the benefits they would receive since the fixed tax rate will constrain the extent of transfers to the elderly. Hence, those that expect to receive lower benefits from future workers would save more to compensate.

In Figure 3 we calibrate the generosity parameter λ to values between 0 and .15 to illustrate its affect on savings across life expectancy. To translate the calibration of λ to the future old age dependency ratio according to (4), we calibrate the tax τ to about 4% of the endowment, roughly the percentage of US GDP spent on social security, and for simplicity

[5] Lee and Mason (2017) show that saving increases when the reliance on intra-family transfers is reduced. One could argue that in less developed economies, there is an implicit social contract, where the young are required to transfer to the old, and that this implicit contract becomes strained when demographics become less favorable.

Figure 3: Savings Rate and Life Expectancy Across Transfer Generosity



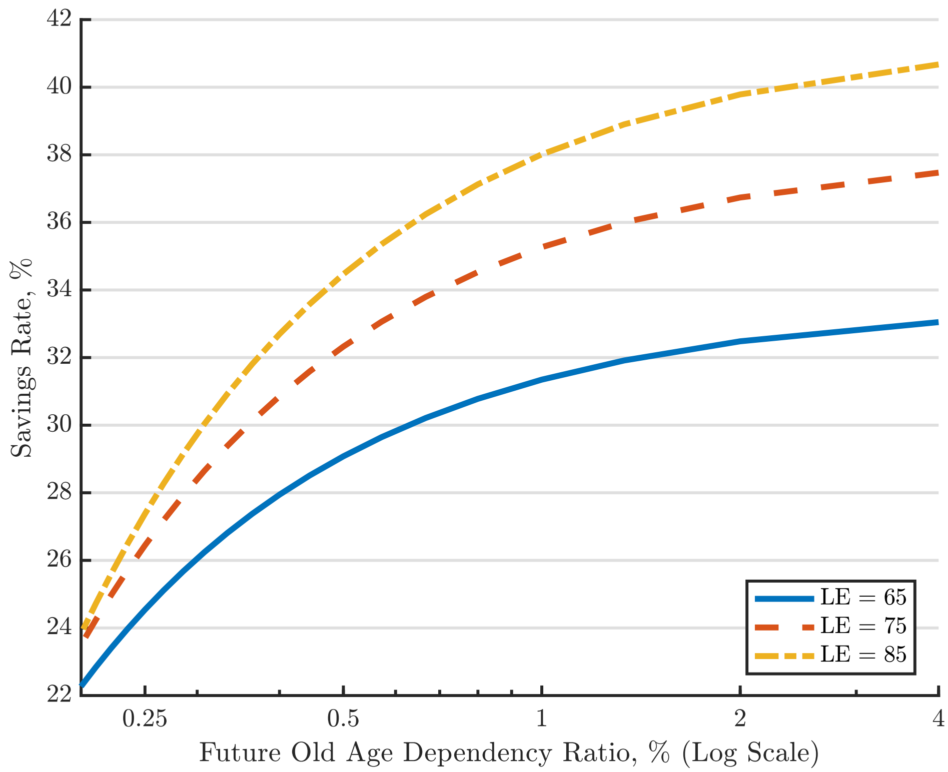
fix the annual interest rate to 5%. Savings rates increase with life expectancy, but decline as individuals expect more generous future transfers.

In Figure 4 we plot savings rates along the dimension of transfer generosity λ, translated into the future old age dependency ratio, for different life expectancies. The relative effect on savings is nonlinear and the relative effect is increasing in life expectancy. That is, the relative increase in savings rates in $1/\lambda$ (our proxy for the old-age dependency ratio) for a given life expectancy is higher the longer is life expectancy.

Result 5 (Limits to the Old-Aged Transfer System)**.** *Holding fixed individual contributions to the formal or informal transfer system, the generosity of transfers from the prime-age cohort to the elderly can be proxied by the future old-age dependency ratio.*

It is worth clarifying that the design of pension systems go well beyond the simple tax and replacement rate parameters, and that these features evolve over time. Across many AEs, pension systems have been reformed, with changes ranging from parametric modifications to reduce the generosity of PAYG schemes, to shifting towards fully-funded (FF) schemes. As such, assessing in practice the implication of pensions design on aggregate saving is a complex undertaking (see Engen and Gale, 1997, and Samwick, 2000). For example, while

Figure 4: Savings Rate and Future Old Age Dependency Ratio (Transfer Generosity)



reforms that rationalize the parameters governing the generosity of a PAYG scheme (e.g. reducing replacement rates) may lead to an increase in aggregate saving, the overall effect of moving from a PAYG to a FF scheme on overall savings depends on how the transition is designed and financed (e.g. to what extent the acquired rights under the PAYG scheme are respected and how the government finances changes in the pension system). In addition, assumptions about credit and government budget constraints, the role of intergenerational linkages (bequest) and the extent to which certain risks (longevity, income, health) are insurable are critical in assessing the overall implications for saving.

4 Two Country Open Economy Model

In this section, we expand the model to two countries to study, in a stylized framework, how demographics can affect cross-country capital flows over the long-run. We first look at the steady-state implications of demographics, and then assess transition dynamics in the model under different scenarios for demographics, and interact that with the extent of generosity of unfunded old-age transfer schemes.

4.1 Two-Country Extension

The key difference to the model above is that the interest rate market clearing condition is now that total savings across the two regions equals total borrowing across the two regions. To make this clear, denote by $\star$ the variables of one country, and the non-starred variables as those of another country. The demand for borrowing in the starred country is:

$$n_t^{t\star} b_t^{t\star} = n_t^{t\star} \frac{d_t^\star}{1+r_t},$$

and supply of savings is $-n_t^{t-1\star} b_t^{t-1\star}$. With equivalent expressions for the non-starred economy and equating demand and supply, we get that the interest rate is the price that clears the global savings and borrowing market:

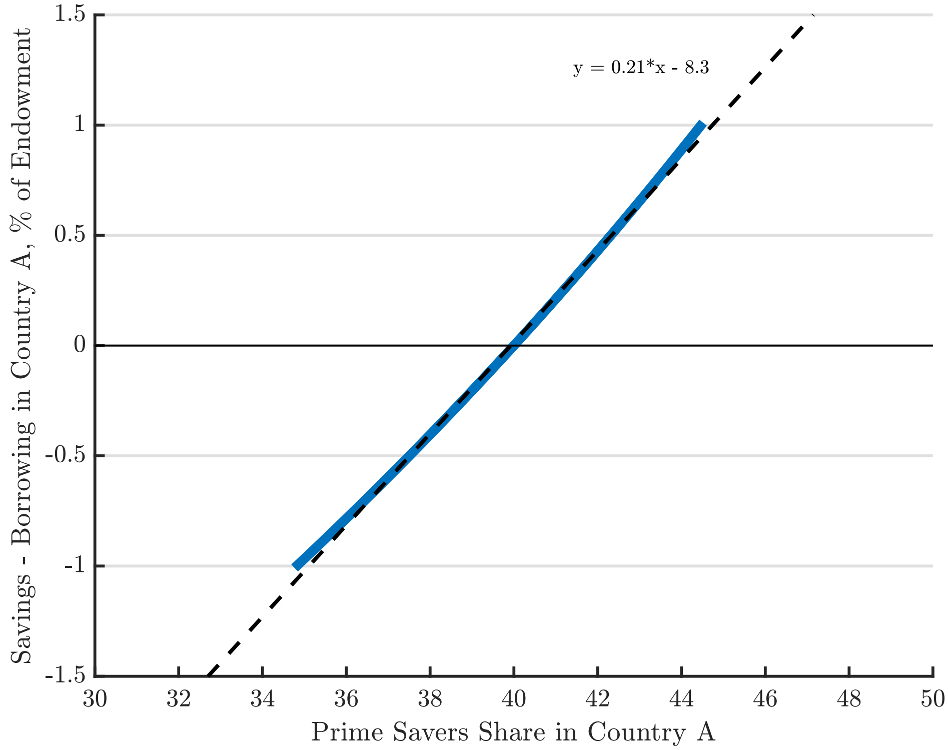
$$1 + r_t = \left[n_t^{t\star} d_t^\star + n_t^t d_t\right] \left[-n_t^{t-1\star} b_t^{t-1\star} - n_t^{t-1} b_t^{t-1}\right]^{-1}.$$

Capital flows from region to region are defined as simply the difference between savings demand and supply at the world equilibrium interest rate.

We explore the model's implications for a country's savings-borrowing differential across the relative size of the prime-age savers cohort. In Figure 5, we calibrate two countries to the same parameters and demographic characteristics, and then adjust the size of the middle-aged cohort in one country (country A). We then compute the desired borrowings in each country and the resulting equilibrium capital flows. The figure shows that the higher is the prime-age savers cohort in country A, the greater are the savings made by individuals in country A. Consistent with the intuition of Figure 2, since the interest rate is determined globally, following a baby boom and an increase in the prime-age savers share, there is an excess of savings to desired borrowing in country A, so that capital flows from country A to B. The slope of a linear plot of excess savings as a fraction of the endowment to the prime savers share is about 0.21, which is consistent with the empirical evidence that we present and discuss below.

Next, in Figure 6a, we calibrate the life expectancy of country A, say, to 80 years, and adjust the life expectancy of country B between 75 years and 90 years, and plot the difference between savings and borrowing as a percent of the endowment of one unit. In this simulation, there are no formal or informal intergenerational transfers in either country other than transfers through the bond market. The simulation shows how capital flows from the country with the higher life expectancy to the lower life expectancy country, reflecting the higher savings made by those who expect to live for longer. Put another way, when country A has a life expectancy of 80 and country B has a life expectancy of 75, the global interest

Figure 5: Capital Flows Across Prime-Age Savers



rate is higher than the interest rate that would have arisen in country A if it was closed to the global bond market, incentivizing capital flows from country A to B.

Finally, we study the sensitivity of capital flows to the generosity of formal or informal intergenerational transfers introduced in Section 3. In Figure 6b, we plot the implied cross-country capital flows in steady-state against life expectancy in the country B, and for which both country A and B have an equally generous system of transfers from the middle-aged to the old, with $\lambda = \lambda^{\star} = 0.15$. Compared to the steady-state profiles in Figure 6a, savings within a country are less sensitive to changes in life expectancy and, as a consequence, cross country capital flows are less sensitive to differences in life expectancy across countries.

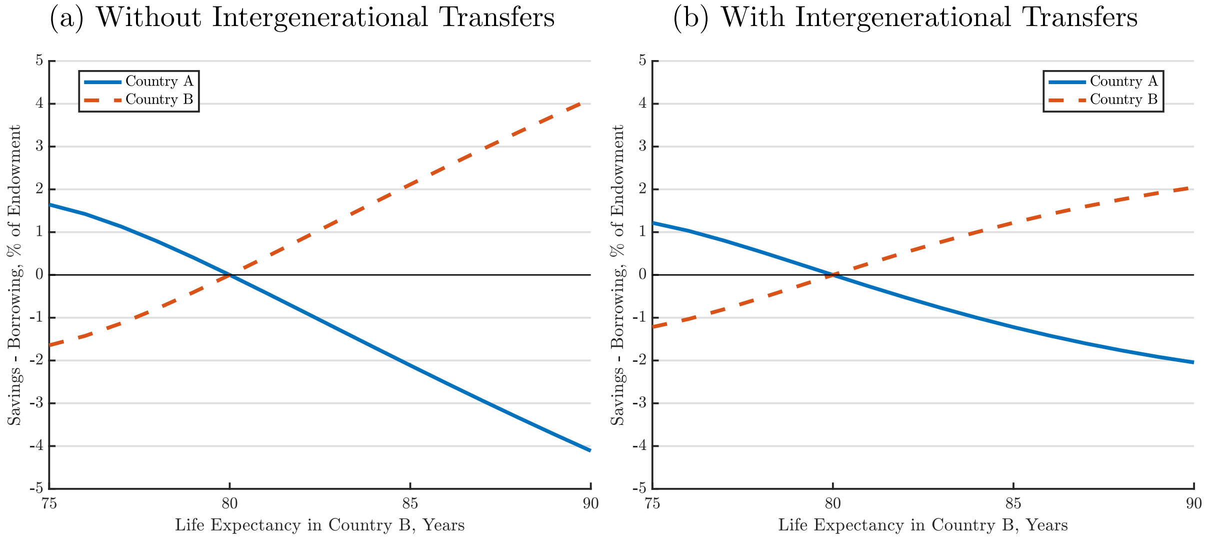
The implications of the multi-country model can be summarized in the following results.

Result 6 (Capital Flows and Life Expectancy)**.** *Capital flows from countries with higher life expectancy and savings rates to those with lower life expectancy and savings rates.*

Result 7 (Capital Flows and Prime-Age Share)**.** *Capital flows from countries with a relatively larger share of prime-age savers, as those countries also have higher relative savings rate.*

Result 8 (Capital Flows and Transfer Generosity)**.** *The sensitivity of cross-country capital*

Figure 6: Cross-Country Capital Flows and Life Expectancy



flows to life expectancy decreases with an increasing generosity of the formal and informal transfer system.

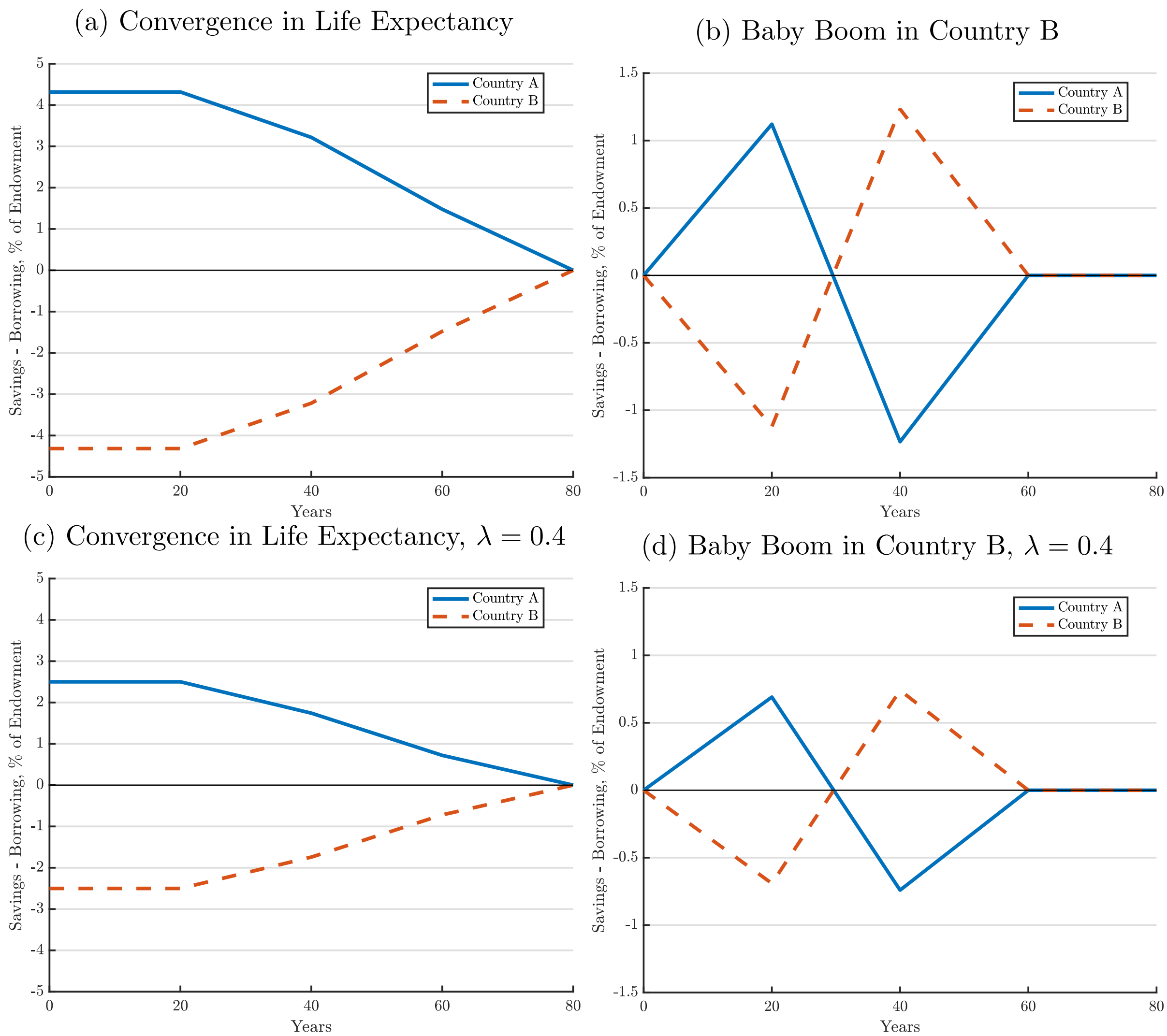
4.2 Transition Dynamics

Next, we examine the model's transition dynamics under demographic calibrations that differ across countries. in Figure 7, we examine the dynamics of the current accounts of two countries that are identical except for temporary changes in their population structures. In Panel 7a, country A has a constant life expectancy of 80 while country B starts with a life expectancy of 75. Country B's life expectancy then gradually increases to 80 over 40 years, roughly the pace of the increase in the life expectancy of the US over time. As a result of its lower life expectancy, country B saves less than country A, so that country B initially runs a current account deficit. Over time, as the life expectancy of both countries converges, the gap between savings needs and borrowing demand narrows in both countries.

In Panel 7b, country B has an unexpected and temporary 20% increase in its population size, while country A's population is fixed. Under this shock, the borrowing demand by country B is high in the period that the new population enter. As a result, country B runs a current account deficit, and makes up its shortfall in savings by borrowing off households in country A. When the larger cohort in country B reaches the age of prime-age saving, its large savings requirements lead it to import capital from country A, thereby running a current account surplus. When the large cohort exits the economy, both countries settle at their steady-state values.

In Panels 7c and 7d, we run the same two exercises as in the first two panels, except that

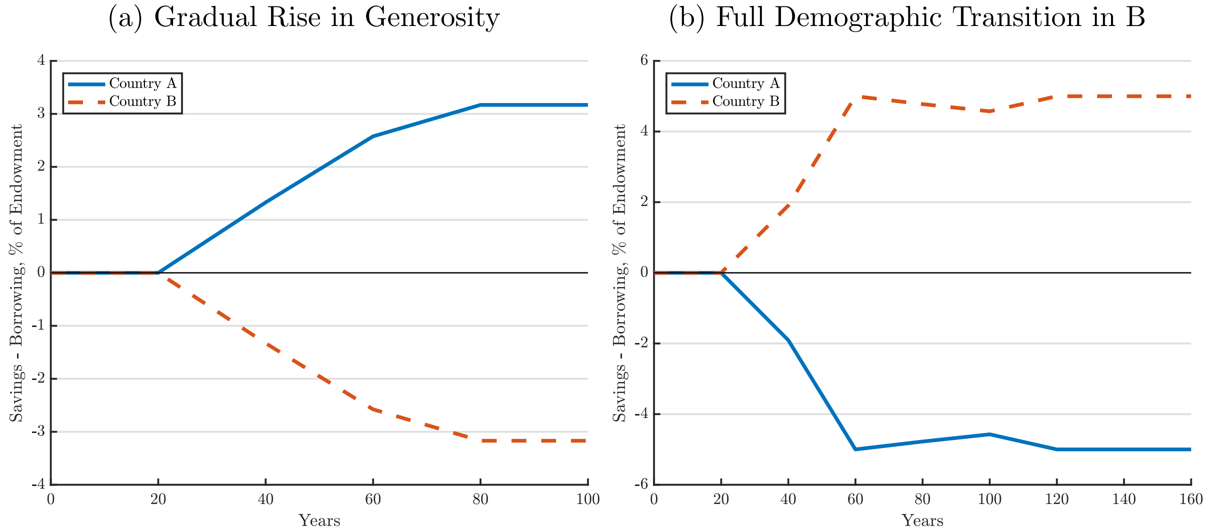
Figure 7: Dynamics of Population Shocks in Multiple-Country Model



both countries operate unfunded pay-as-you-go old-age transfer schemes that are calibrated to generosity parameters of $\lambda = 0.4$. Consistent with the steady-state results presented in Figure 6, we find that the magnitudes of capital flows are muted when old-age transfer schemes are in place, as the sensitivity of savings to demographic changes falls.

In our final transition dynamics experiment, we examine the implications of having only one country introduce the old-age transfer scheme (or on the converse assuming that one country offers zero coverage under a transfer scheme). In Panel 8a, both country A and country B have the same demographic parameterization, with life expectancy set to 80 years and no fertility shocks. After 40 years, country B introduces a pay-as-you-go old-age transfer system, financed by taxes on the middle-aged, with generosity gradually rising to $\lambda = 0.5$ over 40 years, where it remains. The simulation shows that country B becomes a net borrower, as aggregate saving declines following the windfall transfer to the initial old generation. In

Figure 8: Introduction of PAYG System



Panel 8b, we study the implications of increasing the generosity of old-age transfers from $\lambda = 0.1$ to $\lambda = 0.3$ for country B, who also experiences an increase in life expectancy from 70 to 80, and a decline in fertility relative to country A, whose demographics are unchanged. In this scenario, the higher relative savings needs induced by the rise in life expectancy and the decline in fertility cause country B to become a net lender, even despite the increase in PAYG generosity. Ultimately, the overall effect on the country's saving/borrowing imbalance depends the interplay between demographic trends and coverage and generosity of the old-age transfers.

5 Empirics

In the following, we examine whether the model-implied predictions derived above regarding the effect of various demographic variables on aggregate saving and international capital flows are consistent with the empirical relationships between current accounts and demographic indicators across countries and time. To estimate the average relationship across a sample of countries with large enough variation in demographics and current account balances, we use the sample underlying the IMF's External Balance Approach (EBA) current account model (see Phillips et al. 2013). The choice of the set of countries balances two competing considerations: on the one hand, we want to capture a large and diverse set of countries to maximize the variation across all demographic dimensions, and at the same time, need to limit heterogeneity along non-demographic characteristics such as commodity exporting status, access to global capital markets, and other special considerations that can contaminate the relationships of interest. Our sample strikes a balance between these competing demands by including data for 49 countries, both advanced and emerging economies, that encompass about 90 percent of global GDP (as of 2017), which at the same time have sizable access to global capital markets, and are geographically diverse. The time period for most countries covers the years 1986-2016.[6]

5.1 Prime-saver Share and the Current Account

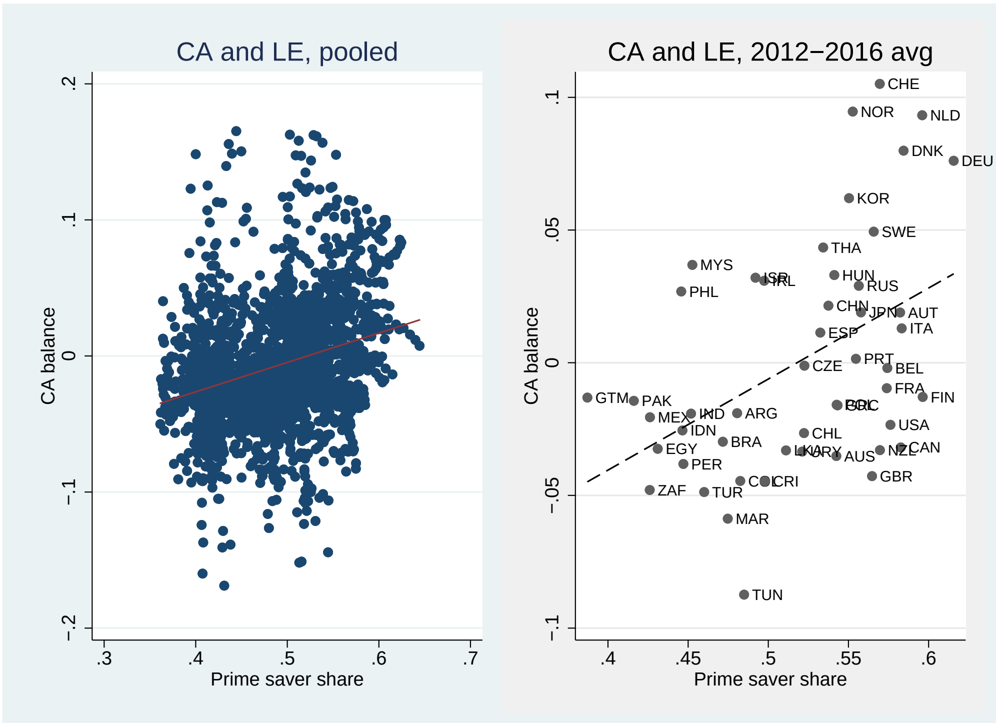
To test the model prediction (presented in Figure 5 and Result 7) that temporary shifts in the composition of working age population (driven by past spikes in fertility) can have important impacts on current accounts, we examine the share of prime-aged savers (ages 45-64) to total working age population (ages 30-64), recognizing that cohorts ages 45-64 typically have the highest saving rates.[7] The latter observation is the direct result of the life-cycle model and the hump-shaped earnings and savings profiles, so that a higher share of prime-age savers should imply a higher aggregate saving rate (see theoretical underpinnings in e.g. Lisack et al. 2017, Jones, 2018). The idea is to capture relative differences in the demographic transition across countries that go beyond the old age dependency. The prime-saver share will help account for differences in cohort sizes within the working age population across countries and time, for example, as populations born in episodes of past baby booms and busts transition through the age distribution.

Figure 9 plots the cross-section scatter plot of the current account balance and the prime-saver share, both pooled over the EBA sample as well as in the cross-section averaged over the last five years in the EBA sample (2012-2016). In both dimensions of variation, there is a strong positive correlation between the prime-saver share and the current account balance. The magnitude of the positive correlation is also economically significant and closely match the slope predicted by our model (see Figure 5). The slope coefficient is around 0.2 to 0.3 (and the R-squared between 8 and 20 percent in the pooled data and cross-section respectively), implying that a standard deviation change in the prime-saver share of 5.6 percent is associated with a 1.1 to 1.7 percent higher current account balance.

[6] Source for current account data is the IMF WEO database and for demographic data is the UN World Population Prospects database, 2017 revision. See Appendix B and C for details.

[7] Although official working-age starts earlier than age 30, the convention in EBA has been to consider age 30 as the start of work life that gives rise to saving (as younger workers tend to borrow/have low saving).

Figure 9: CA and Prime-saver Share, Pooled Data and Cross-section

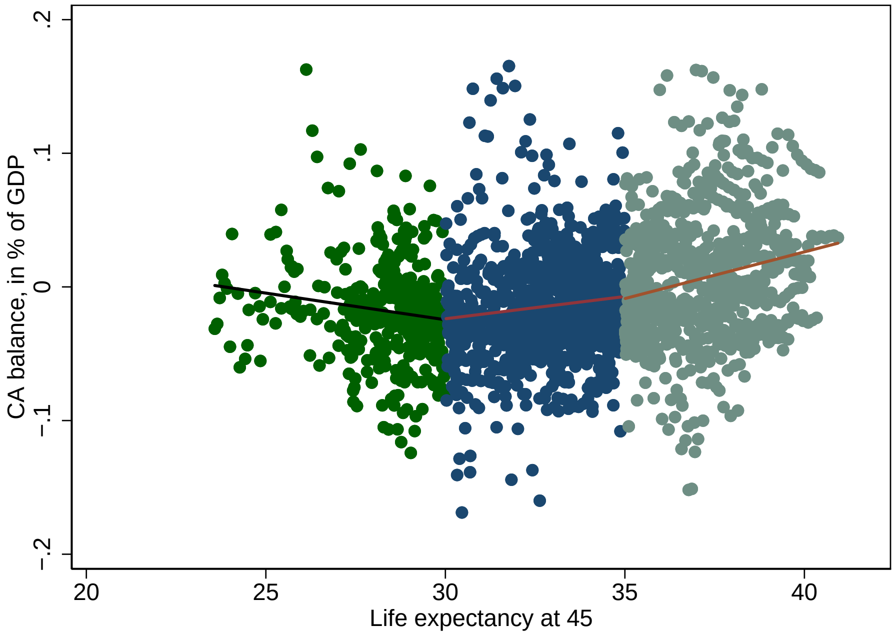


5.2 Life Expectancy and the Current Account

Next, we plot a simple scatter plot between current account balances and the key theoretical variable – life expectancy at prime age (that is, between age 45-50) – to see if there is indeed a positive relationship as implied by Results 1 and 6.

We observe that at low levels of life expectancy (mostly low-income countries and emerging markets), an improvement in prime-age life expectancy is associated with lower current accounts, while the relationship turns gradually positive as we move to countries with higher initial life expectancy (all of which are advanced economies). Our model provides two mechanisms for this non-linearity: countries with higher life expectancy tend to have disproportionately higher end-of-life costs for medical and long-term care, which, as shown in section 4.1, introduces a non-linear (and under certain assumptions, quadratic) relationship between saving and life expectancy. At the same time, countries with lower initial life expectancy also tend to have weaker institutions and financial development, which, as shown in section 4.2, weakens the life-cycle relationship between life expectancy and saving. Both features represent important structural characteristics of countries at various stages of economic development in the EBA sample, and are likely to lie behind the non-linear, positive

Figure 10: CA and Life Expectancy, Pooled Across EBA Sample



relationship observed for countries on the right side of the life expectancy distribution.

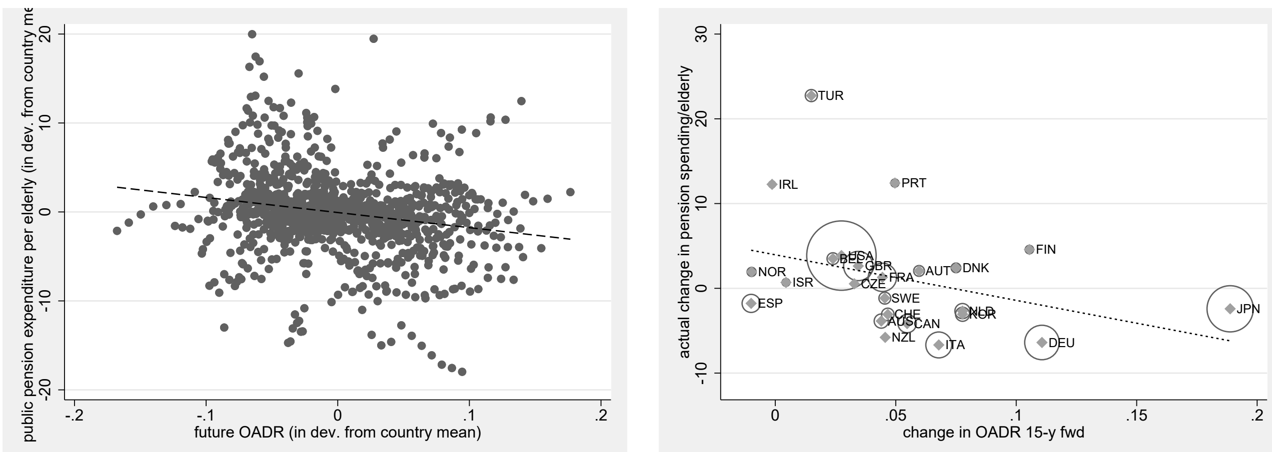
For countries at the lower end of the life expectancy distribution in Figure 10, the negative correlation is consistent with the positive effect of gains in adult life expectancy on health outcomes of the working population, higher labor force productivity and participation, especially among women (see Soares and Falcao, 2008; Jayachandran and Lleras-Muney, 2009), all of which contribute to higher human capital investment and consumption (e.g. Bils and Klenow, 2000; Kalemli-Ozcan et al. 2000), as well as physical capital investment and FDI (Alsan et al. 2006). Demographic transitions in developing countries may therefore exert an overall negative effect on current accounts. In addition, countries with the lowest life expectancy also have the highest mortality risk, incentivizing more precautionary savings in response to unanticipated health shocks (Deaton, 1992; Gertler and Gruber, 2002), further contributing to the negative correlation between the current account and life expectancy.

5.3 Old-Age Transfers, Life Expectancy and the Current Account

To test the model prediction in Results 3 and 5, we first ascertain that future old-age dependency ratios are related to the level of generosity of the public pay-as-you-go pension benefit. Although data on such benefit is only available for a subset of OECD countries over a shorter time period than our sample, we can explore the correlation within this subsample.

The left panel of Figure 11 documents that indeed variation in future old-age dependency ratios within countries of our sample is negatively correlated with the level of generosity of public pension schemes, measured as the public pension spending per elderly relative GDP per worker (correlation coefficient about -0.2). Moreover, as illustrated in the right panel of Figure 11, expected shifts of population age compositions in the future are associated with decreases of public pension generosity over the same horizon, supporting our model's prediction that prospective demographic composition determine the sustainable level of the intergenerational transfer.

Figure 11: Correlation Between Prospective Old-age Dependency Ratio and Public Pension Benefit Ratio

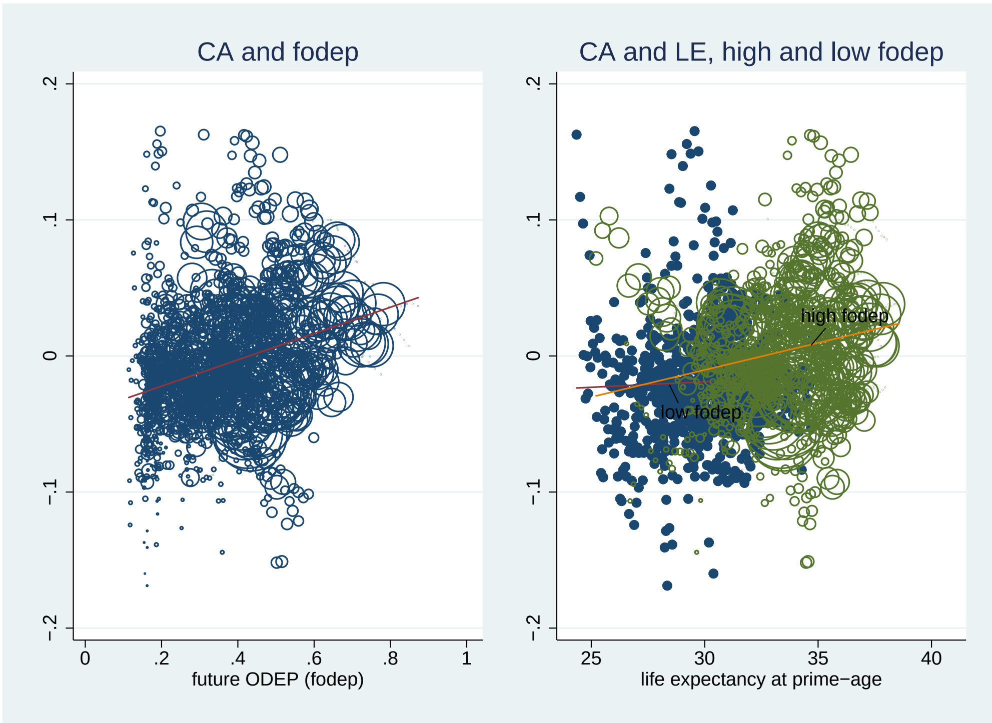


Source: OECD Pension at a Glance and UN Population Prospects 2017 vintage. Pension spending/elderly is computed as total government spending on public old-age pension in cash divided by the population over age 65, scaled by nominal GDP per worker.

Next, we plot the simple correlation between the current account and the future old-age dependency ratio (proxying for the future generosity of inter-generational transfer schemes). The future old-age dependency ratio is computed as a moving average of the old-age dependency ratio 15 to 25 years forward, reflecting the time horizon for retirement of a prime age worker. The model predicts a positive correlation driven by a higher need to rely on life-cycle saving, which is exactly what we find in the left panel of Figure 12.

Moreover, as predicted by the model in Results 5 and 8, the sensitivity of current accounts to variations in life expectancy also increases with higher future dependency ratio, due to stronger need to rely on life-cycle saving. This is exactly what the data bears out in the right panel of Figure 12, which shows that the slope for the correlation between the current account and life expectancy is strongly positive for countries with high future dependency ratios (that is, a future old-age dependency ratio above the sample median) while essentially

Figure 12: Current Account and the Future Old-age Dependency Ratio



Note: High future old-age dependency ratio observations are those at or above median, low fodep below median. Bubble size proportionate to nominal GDP.

flat for countries with below median future old-age dependency ratios.

5.4 Putting it All Together

Overall, while simple and parsimonious, our model produces sharp empirical predictions that are strongly borne out by the data when viewed in a bivariate setting. Do they maintain statistical significance when modeled jointly and how much of the actual variation in current accounts across countries can they explain? In the following, we combine all demographic variables into a multivariate regression model. To maintain multilateral consistency, all demographic explanatory variables as expressed in deviations from world averages, that is, demographic variables should only affect current accounts to the extent that they evolve differently across countries (see Phillips et al. 2013). Table 1 summarizes the results.

In columns 1 to 5, we add the demographic variables one by one to a pooled regression of current account balances using the same sample as in the current EBA framework, controlling for the compositional variables as a starting point for the specification (that is, the old-age dependency ratio and population growth variables). As in the bivariate correlation, life

Table 1: Demographic Determinants of the Current Account

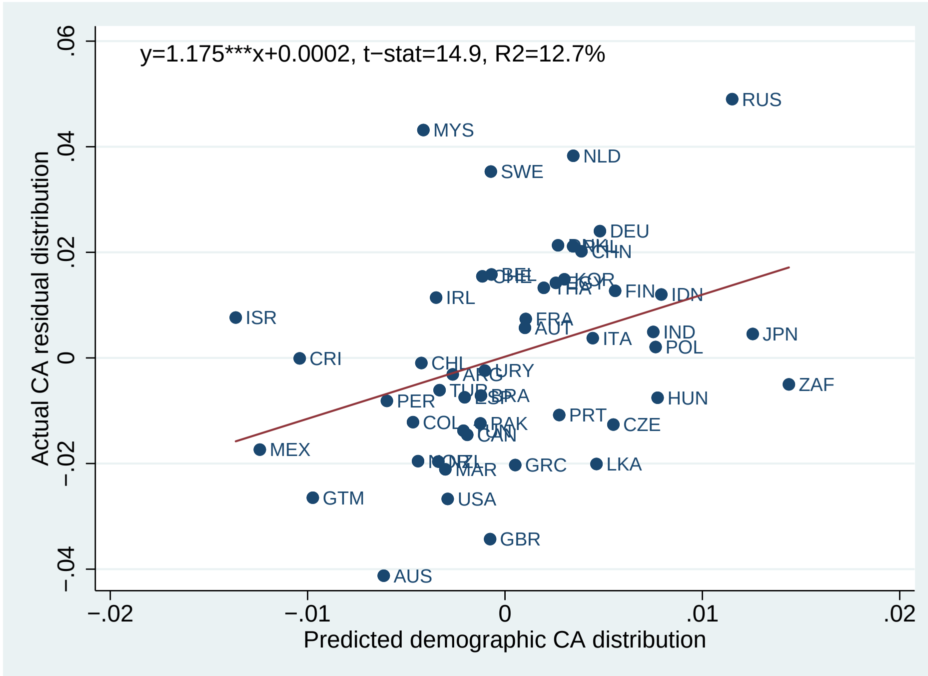
	Dependent Variable: CA balance (% of GDP)				
	(1)	(2)	(3)	(4)	(5)
Old-age dependency	0.044**	-0.008	-0.058**	-0.074***	-0.074***
	(0.022)	(0.022)	(0.027)	(0.027)	(0.028)
Population growth	-0.643***	-1.044***	-0.824***	-1.025***	-1.024***
	(0.201)	(0.204)	(0.210)	(0.203)	(0.201)
Life expectancy	0.000	-0.037***	-0.035***	-0.007	-0.006***
	(0.001)	(0.006)	(0.006)	(0.011)	(0.001)
Life exp squared		0.001***	0.001***	0.000	
		(0.000)	(0.000)	(0.000)	
Prime-saver share			0.132***	0.196***	0.198***
			(0.037)	(0.040)	(0.036)
Life exp × Future old-age dep				0.023***	0.024***
				(0.006)	(0.003)
Constant	-0.001	-0.004***	-0.003**	-0.004***	-0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
N	1495	1495	1495	1495	1495
R^2	0.037	0.058	0.064	0.077	0.077

Notes: Significance levels: *, 10%; **, 5%; ***, 1%. Sample is 1986 to 2016. Variables are expressed in deviation from world averages. Sources in Appendix B.

expectancy does not appear to have a linear effect on the current account and instead, by the strongly significant positive squared term, only has a positive effect on the current account at relatively high levels of life expectancy, consistent with the stylized facts and model predictions above. The prime-saver share continues to have a strong positive effect on the current account in the joint specification, with similar coefficient estimates as in the bivariate correlation.

Finally, the interaction term between life expectancy and future old-age dependency ratio enters with a strong positive sign, consistent with the model prediction of a stronger need to rely on own saving given natural limits to future intergenerational transfers. Importantly, this non-linear effect of life expectancy renders the squared term insignificant, suggesting that most of the non-linear effect is accounted for by the mechanism of the model. In particular, the combination of the life expectancy standalone and interaction terms capture the non-linearity discussed above and illustrated in Figure 10 (negative slope for low life expectancy EMs, turning positive for AEs facing unfavorable old-age support ratios). Finally, in column

Figure 13: Role of Demographics: Predicted and Actual CA residuals (1986-2016 average)



Note: Predicted demographic current account distribution is the cross-section of current account levels predicted by regressing current account residuals (from the EBA model without any demographic variables) on the demographic variables in column 5 of Table 1. Vertical axis measures the actual mean current account residual conditional on all other (non-demographic) regressors in the EBA current account model.

5, we show that the model without the squared term achieves the same fit and allows each coefficient estimate to be statistically significant and comply with our economic prior.

The demographic indicators included in the pooled regression of column 5 of Table 1 are not only statistically, but also economically significant. Jointly, they are able to explain almost 13 percent of the cross-country variation in current account balances over the long run (see Figure 13). This magnitude is consistent with the literature, where demographic forces generated by calibrated structural models explain between 13 and 27 percent of current account variation across major advanced economies (see Domeij and Floden, 2006; see also Brooks, 2003; Backus et al. 2014).

In Table 2 we subject the baseline regression to some robustness checks. In column 1, we further add country fixed effects and show that the demographic mechanisms identified also operate within countries, thus addressing concerns of slow-moving demographic indicators spuriously capturing country-specific time-invariant factors. In addition, time fixed effects are added in column 2, removing any common trends that can potentially co-move with demographics across countries. As many of the slow-moving demographic variables are likely auto-correlated, column 3 estimates the baseline model using the Prais-Winsten regression that allows for panel-specific heteroskedasticity and auto-correlation (see Greene, 2012). Finally, the estimated coefficients are robust in magnitude and statistical significance when we introduce other EBA explanatory variables into the current account regression, thereby controlling for country-specific fundamentals which may correlate with demographics, such as income per capita, level of public health spending, and so on (see IMF, 2018). All demographic coefficients retain similar magnitudes and statistical significance, indicating empirical salience and stability of the identified mechanisms.

6 Conclusion

This paper explores the relationship between the current account balance and demographics, in theory and in the data. We develop an open economy overlapping generations model with mortality risk, population growth, and introduce old-age pay-as-you transfer systems. The model is used to illustrate the main mechanisms whereby demographics affect aggregate saving and capital flows. Despite being simple and parsimonious, our model is able to deliver sharp empirical predictions that are supported by a panel of 49 countries, comprising both advanced and emerging economies, over the sample period of the last 30 years. The key predictions are that saving and capital flows are affected by differences in life expectancy, as well the share of savers vis-à-vis dissavers, which in turn depend on fertility and longevity trends. The capital flow implications of differences in the stage of demographic transition, can also be affected by differences in the coverage and generosity of old-age transfer schemes and that non-linearities can arise when there limits to elderly tax-transfer mechanisms.

Finally, while our model suggests that countries with smaller and less generous old-age transfer schemes tend to have higher overall saving and current accounts, the relationship between pension systems and the current account is complicated by the fact that pension systems differ vastly across many dimensions. Most countries today have a diverse mix of private fully-funded retirement saving schemes and unfunded pay-as-you-go old-age transfer schemes, with different parameters, population coverage and system maturity. Furthermore, the parameters and design of these systems have evolved substantially over time. Distilling these features into simple time-varying parameters is a challenging task (see also Amaglobeli et al. 2018). Moreover, even if one can relate the coverage and generosity of old-age transfer schemes to the current account, it is unclear whether the resulting saving-investment balance would necessarily represent something "desirable" from each country's welfare perspective.

Table 2: Robustness of Demographic Determinants

	Dependent Variable: CA balance (% of GDP)			
	(1)	(2)	(3)	(4)
Old-age dependency	-0.205***	-0.190***	-0.050	-0.100**
	(0.043)	(0.043)	(0.055)	(0.045)
Population growth	-2.136***	-1.673***	-1.205***	-0.951**
	(0.269)	(0.291)	(0.433)	(0.374)
Life expectancy (at prime-age)	-0.005***	-0.007***	-0.006***	-0.005***
	(0.002)	(0.002)	(0.002)	(0.001)
Prime saver share	0.145***	0.172***	0.138**	0.115**
	(0.036)	(0.037)	(0.069)	(0.058)
Life exp.*Future old-age dep.	0.030***	0.027***	0.024***	0.011**
	(0.005)	(0.005)	(0.006)	(0.005)
$(\text{NFA/Y})_{t-1}$				0.029***
				(0.006)
$(\text{NFA/Y})_{t-1}$ if $(\text{NFA/Y})_{t-1} < -60\%$				-0.018
				(0.012)
$(Y/\text{worker})_{t-1}$, rel. to top 3 economies				0.019
				(0.020)
$(Y/\text{worker})_{t-1} \times$ Capital Openness				0.037*
				(0.021)
Oil, Natural Gas $\times$ Resource Temp.				0.312***
				(0.090)
GDP growth forecast in 5 years				-0.175*
				(0.100)
$(\text{Public Health Spending/GDP})_{t-1}$				-0.462***
				(0.138)
$(\text{VIX} \times \text{Cap. Open.})_{t-1}$				0.045***
				(0.014)
$(\text{VIX} \times \text{Cap. Open.} \times \text{Reserves Share})_{t-1}$				-0.087
				(0.063)
Own currency's share in world reserves				-0.032***
				(0.012)
Output gap				-0.368***
				(0.031)
Commodity ToT gap $\times$ Trade Openness				0.203***
				(0.034)
Detrended private credit/GDP				-0.108***
				(0.013)
Constant	-0.006*	-0.001	-0.004	-0.005*
	(0.003)	(0.005)	(0.003)	(0.003)
Country FE	Y	Y	N	N
Time FE	N	Y	N	N
N	1495	1495	1495	1372
R^2	0.063	0.102	0.023	0.304

Notes: Significance levels: *, 10%; **, 5%; ***, 1%. Sample is 1986 to 2016. Most explanatory variables are expressed in deviation from world averages. Sources in Appendix B.

Arriving at a normative view would require going a step further and defining benchmark or desirable old-age transfer policies. These are promising areas for further research.

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A Further Considerations

A.1 Discount Factor Proxy for Financial Development

In the following, we consider how the introduction of a discount factor could proxy for the level of financial development, and subsequently, how that could affect the sensitivity of savings to longevity. So, attach a discount factor β to the utility of old age only. The idea is that if the financial sector of an economy is more developed, then that could proxy for there being more and accessible vehicles for savings to old age. So now, the lifetime utility function of individuals is:

$$\max_{\left\{c_t^t, c_{t+1}^t, c_{t+2}^t\right\}} \mathbb{E}\left[\log c_t^t + \log c_{t+1}^t + \beta\gamma_{t+2} \log c_{t+2}^t\right].$$

Without the PAYG pension system, savings of the middle age in steady-state is:

$$-b_t^{t-1} = \frac{\beta\gamma}{1+\beta\gamma}(y-d)$$

The level of savings is increasing in γ:

$$\frac{\partial - b_t^{t-1}}{\partial \gamma} = \frac{\beta}{(1+\beta\gamma)^2}(y-d)$$

Because individuals value the future more as their probability of survival increases, they want to save more. Notice that this is increasing in β. So the sensitivity of savings to changes in life expectancy is increasing in β, the proxy for financial development. We can think of β as proxying for the level of financial development because it is a reduced form way to model changes in the risk premia embedded in the rate of return.

A.2 Expenses for End-of-Life Care

End-of-life care expenses can be significant. De Nardi, French, Jones, and McCauley (2016) find that medical expenses double between the ages of 70 and 90. Furthermore, they find that, for the US, government programs pay for about 65 per cent of the elderly's medical expenses, and so a sizeable burden of medical costs fall on individuals.

For this reason, in this section we introduce end-of-life expenses, which is modeled as an exogenous cost κ which is increasing in the survival probability, closest to the specification of De Nardi, French and Jones (2010). We ignore the transfer system discussed above for convenience and model the budget constraint in the last period of life as:

$$c_{t+2}^t + \gamma_{t+2}\kappa \leq -\frac{(1+r_{t+1})}{\gamma_{t+2}} b_{t+1}^t.$$

The end-of-life expense does not enter into the utility function, so that optimal consumption growth over the lifetime is the same as in the baseline formulation.[8] Optimal consumption when middle aged becomes:

$$c_{t+1}^{t} = \frac{1}{1+\gamma_{t+2}} \left[y_{t+1}^{t} - d_t - \frac{\kappa}{1+r_{t+1}} \gamma_{t+2}^{2} \right].$$

The end-of-life expense acts to reduce resources available for saving and consumption. The cost is increasing nonlinearly with the survival probability γ_{t+2}. Therefore substituting in consumption into the budget constraint when middle aged shows that savings is increasing in the cost $\frac{\kappa^2}{1+r}\gamma^2$. As a result, individuals put aside resources to cover the expected end-of-life expense while maintaining their optimal consumption growth profile.

In Figure 14 we calibrate $\kappa = 0.1$, so that there is a substantial end-of-life health cost paid in the last period of life. As life expectancy increases, it becomes more likely that this cost will be paid. Because the probability that the health care cost is incurred is increasing in the survival probability, savings increases with life expectancy, but the relationship is nonlinear.

A.3 Borrowing Constraints as a Proxy for Financial Development

We model a borrowing constraint on the young, limiting how much they can receive from the middle aged and therefore how much they can consume. Eggertsson, Mehrotra and Robbins (2017) model a tightening of financial conditions as a *decrease* in d_t, where $c_t^t \leq b_t^t$ is the budget constraint of the young, where the borrowing constraint is $b_t^t \leq \frac{d_t}{1+r_t}$.

As derived above (Equation (1)), the savings by an individual of working age in steady-state is:

$$-b_t^{t-1} = \frac{\gamma}{1+\gamma} (y - d).$$

Suppose that individuals can only borrow a fraction of their future endowment so that $d = \theta y$, and assume that θ is low enough so that the borrowing constraint continues to bind.

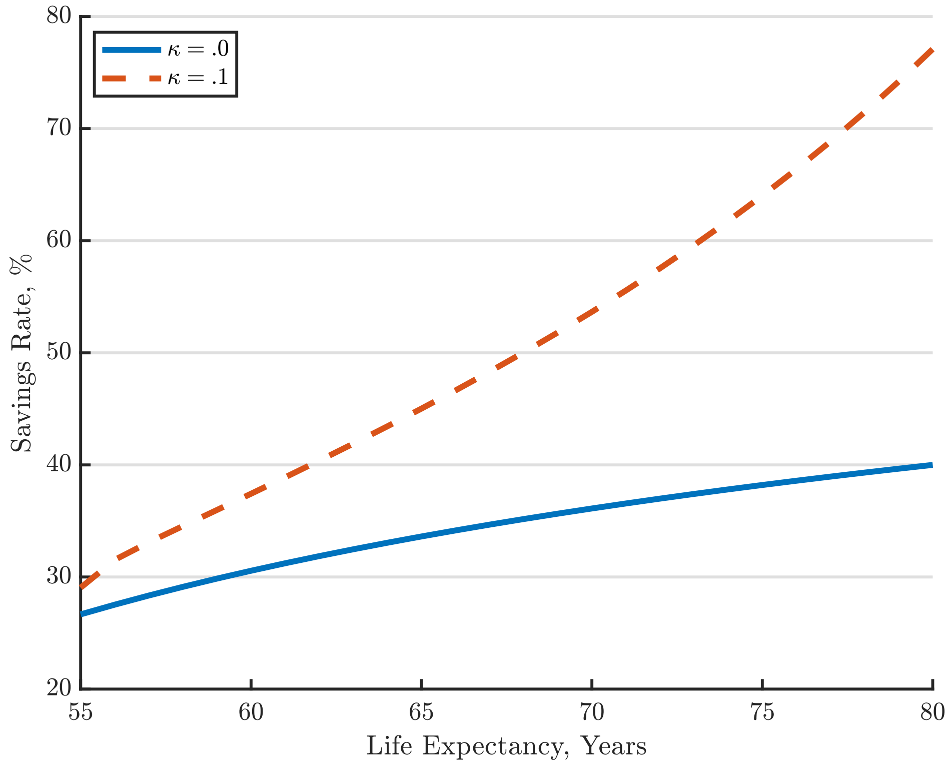
[8] Another way to model end-of-life care costs is as a utility cost which the consumer would like to avoid:

$$\max_{\{c_t^t, c_{t+1}^t, c_{t+2}^t, x\}} \mathbb{E} \left[\log c_t^t + \log c_{t+1}^t + \gamma_{t+2} \log c_{t+2}^t - \gamma_{t+2} \left(x_{t+2}^t - \kappa \right)^2 \right].$$

This says that the consumer expects to be hit with a utility cost $(x_{t+2}^t - \kappa)^2$ which is increasing in the survival probability γ_{t+2}. The interpretation is that the consumer would like to spend resources on x to get as close as possible to κ. Those resources x_{t+2}^t are paid in period $t+2$ when old so that the budget constraint when old is:

$$c_{t+2}^t + x_{t+2}^t \leq -\frac{(1+r_{t+1})}{\gamma_{t+2}} b_{t+1}^t.$$

Figure 14: Savings Against Life Expectancy With Health Care Costs



Then the savings of an individual in steady-state becomes:

$$-b_t^{t-1} = \frac{\gamma}{1+\gamma} y \left(1-\theta\right).$$

We can therefore proxy, in a simple and stylized way, developing countries as those with lower levels of per-capita output y and therefore a tighter borrowing constraint θy. With lower y, the *sensitivity* of the change in savings to changes in life expectancy, parameterized through γ, decreases.

B Data Sources

The following lists the data sources for the variables used in the empirical section of the paper.

- Net Foreign Assets: Lane and Milesi-Ferretti (2001)
- Output Per Worker: World Economic Outlook
- Capital Openness: Quinn Database

- Oil and Natural Gas Trade Balance, Resource Temporariness: World Economic Outlook, WITS and BP Statistical Review
- GDP growth, forecast in 5 years: World Economic Outlook
- Public Health Spending/GDP: OECD, WDI, CEPAL, FAD, and ADB
- VIX: Haver
- Own Currencys Share in World Reserves: COFER
- Output Gap: World Economic Outlook
- Commodity Terms of Trade and Trade Openness: World Economic Outlook
- Detrended Private Credit/GDP: BIS (Credit statistics) and
- Cyclically adjusted Fiscal Balance: World Economic Outlook
- (Δ Reserves)/GDP $\times$ Capital Controls: World Economic Outlook, Lane and Milesi-Ferretti (2001), and Data Template on International Reserves and Foreign Currency Liquidity
- Prime Savers Share: UN World Population Prospects
- Life Expectancy at Prime Age: UN World Population Prospects
- Life Expectancy at Prime Age: UN World Population Prospects
- Population Growth: UN World Population Prospects
- Old-age Dependency Ratio: UN World Population Prospects

C Summary Statistics

Table 3 presents the variable definitions and their summary statistics.

Table 3: Definitions and Summary Statistics of Demographic Variables

Indicator	Definition	Obs.	Mean	Std. Dev.	Min	Max
Old-age dependency ratio	population 30-64/population 65+	1519	0.249	0.094	0.106	0.579
Population growth	Annual growth rate of total population	1519	0.010	0.008	-0.005	0.037
Life expectancy at prime age	Avg. life expectancy at 45 to 50 years old	1519	31.296	3.183	22.299	37.873
Prime-saver share	Population 45-64/population 30-64	1519	0.482	0.059	0.361	0.624
Future old-age dependency ratio		1519	0.336	0.142	0.114	0.782
Pension per elderly (in %)	(Public expenditure on old-age pension /Population 65+)/(GDP/Working-age population)	775	25.600	9.633	0	59.809

Source: UN Population Prospects, OECD Pension at a Glance database, authors' calculations.