
Demographics, Pensions, and Current Accounts

An empirical assessment using the IMF EBA current account model

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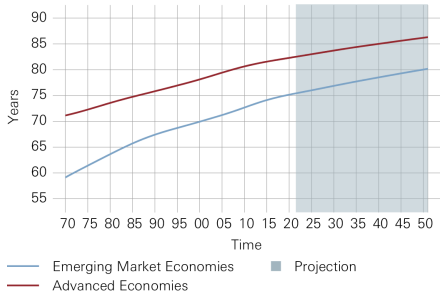
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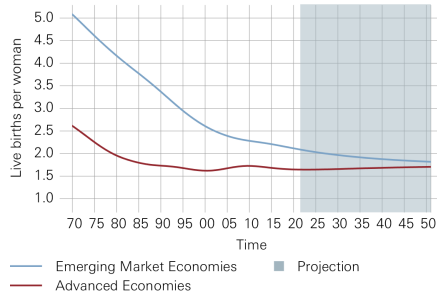
Significant demographic transition is underway

LIFE EXPECTANCY AT BIRTH, EBA COUNTRIES



Projections assume the medium fertility variant. Country classification based on IMF.
Source: United Nations World Population Prospects 2019.

FERTILITY RATE, EBA COUNTRIES



Projections assume the medium fertility variant. Country classification based on IMF.
Source: United Nations World Population Prospects 2019.

What we do

- We propose two refinements to the IMF External Balance Assessment (EBA) current account (CA) model:
 - ▶ New demographic variables
 - ▶ New pension variables
- EBA CA model estimates level of global imbalances that is warranted by fundamentals and optimal policies (healthy vs excessive imbalances)
- Our refinements may identify additional CA drivers

What we do not do

- Assess optimal level of private (pension) savings
- Examine transition from PAYG to fully-funded pensions
- Assess sustainability of pension systems

Key findings

- New variables generate economically intuitive predictions:
 - ▶ Demographic effect negative for young, positive for old countries
 - ▶ Fully-funded pension systems significantly increase CA
- New specification does not alter core EBA CA model results
- New specification better fits the majority of countries' CA balances

The role of demographics

Demographics affect savings

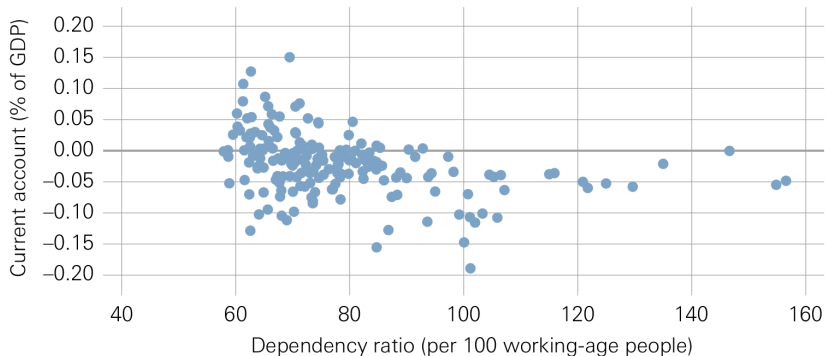
- Modigliani and Brumberg (1954): People at different ages save at different rates
- Countries with large youthful populations tend to save less, countries with large-working age populations tend to save more
- Changes in the age structure of populations affect savings (Deaton and Paxson 1997, Higgins 1998, Lane and Milesi-Ferretti 2001)

Measuring demographics not straightforward

- Strong non-linear effect of demographics
(Depending on considered age group, direction of effect can be positive or negative)
- Across age groups, effects may cancel each other out
- Demographic effect may largely depend on researcher's modelling choice

Relation between CA and dependency ratios

CORRELATION BETWEEN CURRENT ACCOUNT AND DEPENDENCY RATIO, OECD COUNTRIES, 1961 - 2005



Source: Sachverständigenrat 2011

Demographic polynomial by Fair and Dominguez (1991)

- Demographic measure should account for all population age groups
- How? Restrict age-group coefficients to lie on polynomial, limiting differences between estimated effects of consecutive age groups
- Why? To minimise number of estimated parameters, while allowing identification of full demographic effect

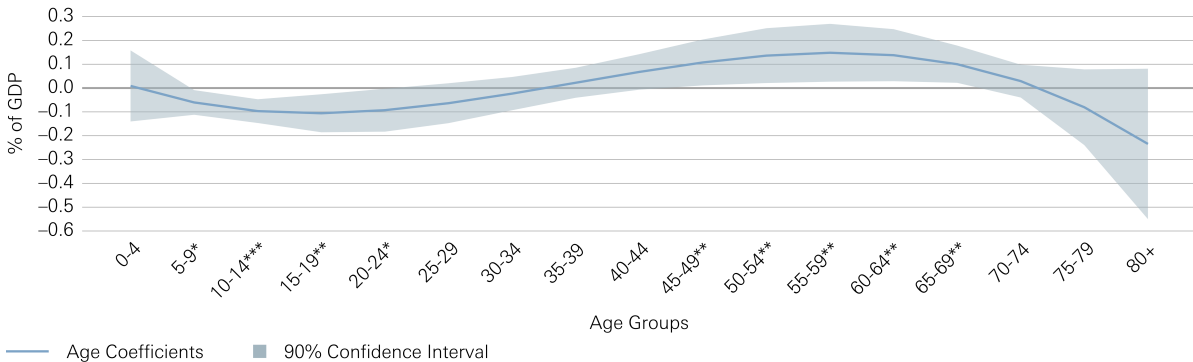


Regression results

Demographic contribution by age group

IMPACT OF POPULATION AGE STRUCTURE ON CURRENT ACCOUNT, MARGINAL EFFECTS

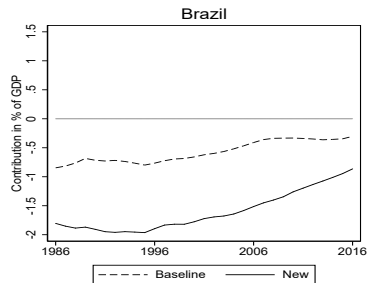
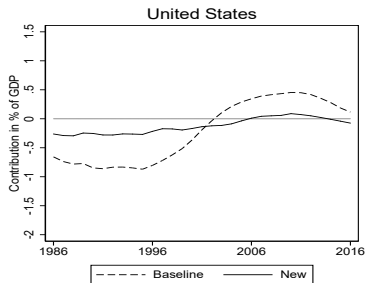
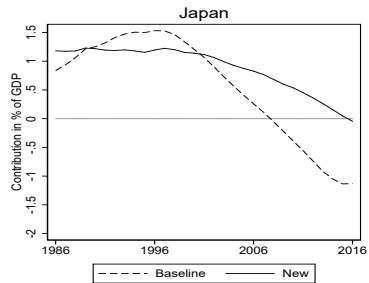
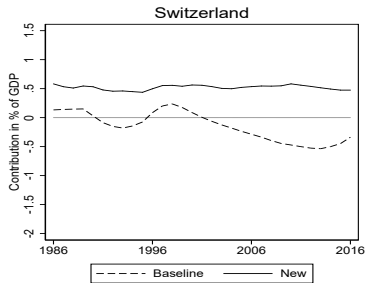
Relative to world average



***, **, * correspond to p-values smaller than 0.01, 0.05, 0.1 respectively.

Source: SNB

Demographic contribution by country





The role of pensions

Pension systems affect savings

- Life-cycle model: people save during working life, dissave during retirement
- Pension systems to institutionalise this behaviour
- Why? To prevent myopic individuals from ending up in poverty in old age

A taxonomy of pension systems

- Pay-as-you-go (PAYG) systems use current contributions to pay current benefits
- Fully-funded systems use current contributions to accumulate assets to pay future benefits
- ▶ Design differences may lead individuals to differently adjust their economic behaviour, affecting saving and CA

[Alternative taxonomy: defined benefit (DB) and defined contribution (DC) plans]

Measuring pensions not straightforward

- Following Bloom et al. (2007)
 - ▶ Replacement rate, i.e. ratio of annual pension to annual salary of a representative worker
 - ▶ Two measures; replacement rate in PAYG and in fully-funded systems
- Additionally, coverage measure, i.e. percentage of working age population contributing to pensions

Pension systems and pension coverage in EBA countries

TYPES OF PENSION SYSTEMS, EBA COUNTRIES IN 2016



- PAYG only; **63.3%**
- Fully-funded only; **14.3%**
- Both PAYG and fully-funded; **22.4%**

Source: SNB.

COVERAGE RATE, EBA COUNTRIES, LATEST AVAILABLE VALUE



- <25% of workers; **24.5%**
- 25% - 50% of workers; **22.4%**
- 50% - 75% of workers; **40.8%**
- >75% of workers; **12.2%**

Source: World Bank Pension database.



Regression results

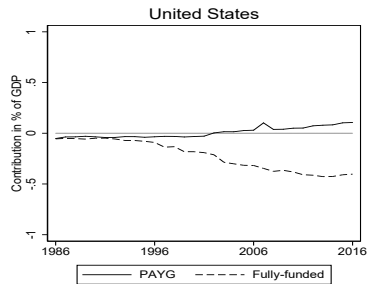
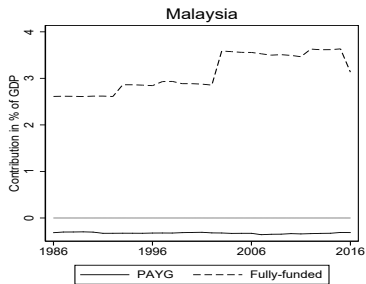
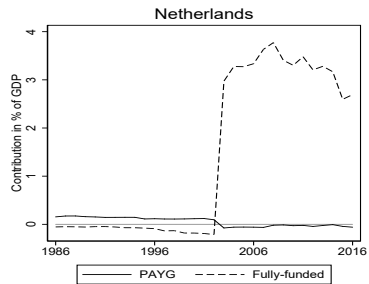
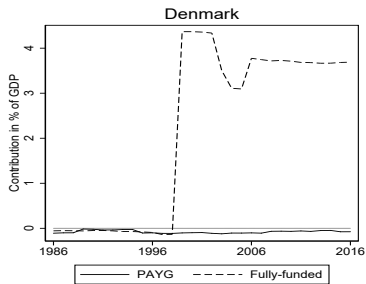
EBA regression results with pension indicators

	Preferred	Universal	ILO	Separate
Replacement rate, FF * coverage share #	0.076*** (0.000)			
Replacement rate, PAYG * coverage share #	0.010 (0.348)			
Replacement rate FF if universal coverage #		0.029*** (0.001)		
Replacement rate PAYG if universal coverage #		-0.001 (0.776)		
Replacement rate, FF * ILO coverage #			0.085*** (0.000)	
Replacement rate, PAYG * ILO coverage #			0.012 (0.198)	
Replacement rate fully funded #				0.030*** (0.000)
Replacement rate PAYG #				0.006 (0.277)
Coverage share #				0.040** (0.012)
R-squared fit	0.592	0.579	0.620	0.585
Observations	1,367	1,367	1,274	1,367

Regressions include the full set of the baseline IMF variables. Coefficients are not reported.

p -values in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Pension contributions by country





Conclusion

Conclusion

- Two refinements to the empirical specification of the EBA CA model
 - ▶ Demographic variables show smooth, multilaterally consistent contribution
 - ▶ Pension variables show positive contribution for countries with fully-funded pension systems
- New specification tends to close CA gaps, improving existing model
- Past build-up of surpluses possibly reasonable given demographic challenge

Thank you for your attention.



Appendix

Combined contribution, EBA estimation

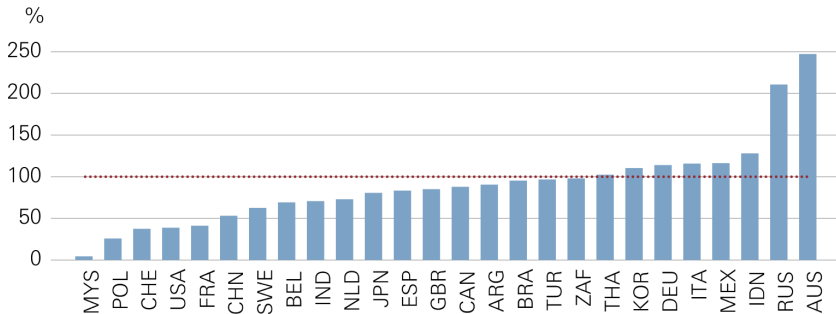
	New Demographics and Pensions
Replacement rate, FF * coverage share #	0.074*** (0.000)
Replacement rate, PAYG * coverage share #	0.007 (0.500)
Demographics 1 #	-0.098 (0.322)
Demographics 2 #	0.018 (0.211)
Demographics 3 #	-0.001 (0.175)
EBA variables, without static demographics	YES
R-squared fit	0.591
Observations (Countries)	1,367 (49)

p-values in parentheses; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

CA gap with new specification vs IMF baseline

CLOSING THE CURRENT ACCOUNT GAP

Ratio of current account gaps (new specification / IMF baseline)



Current account gap is the difference between actual current account value and the norm. New specification takes into account the contributions of the refined demographics and pensions to the current account.

Source: SNB

Robustness check: IMF variables

	Preferred	No ICRG	No Fiscal	No Health	No ICRG, Fiscal and Health
Replacement rate, FF * coverage share #	0.0760*** (0.000)	0.0751*** (0.000)	0.0792*** (0.000)	0.0752*** (0.000)	0.0769*** (0.000)
Replacement rate, PAYG * coverage share #	0.00998 (0.348)	0.00905 (0.397)	0.00767 (0.476)	0.00847 (0.428)	0.00522 (0.632)
Health	Yes	Yes	Yes	No	No
Institutional Quality	Yes	No	Yes	Yes	No
Fiscal Balance	Yes	Yes	No	Yes	No
R-squared fit	0.592	0.586	0.562	0.582	0.546
Observations	1,367	1,367	1,372	1,367	1,372

Regression includes the full set of the baseline IMF variables, including the baseline demographics block. Coefficients are not reported. p -values in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$