

Promised and Affordable Replacement Rates in LAC Pension Systems in 2015 and 2100:

Methodology and Determinants

Solange Berstein
Mariano Bosch
María Laura Oliveri

Department of Research and
Chief Economist

TECHNICAL
NOTE N°
IDB-WP-964

Promised and Affordable Replacement Rates in LAC Pension Systems in 2015 and 2100:

Methodology and Determinants

Solange Berstein
Mariano Bosch
María Laura Oliveri

Inter-American Development Bank

April 2016



Cataloging-in-Publication data provided by the
Inter-American Development Bank
Felipe Herrera Library

Berstein, Solange.

Promised and affordable replacement rates in Latin American and Caribbean pension systems in 2015 and 2100: methodology and determinants / Solange Berstein, Mariano Bosch, Maria Laura Oliveri.

p. cm. — (IDB Technical Note ; 964)

Includes bibliographic references.

1. Pensions-Latin America. 2. Retirement income-Latin America. I. Bosch, Mariano. II. Oliveri, Maria Laura. III. Inter-American Development Bank. Department of Research and Chief Economist. IV. Title. V. Series.

<http://www.iadb.org>

Copyright © 2016 Inter-American Development Bank. This work is licensed under a Creative Commons IGO 3.0 Attribution-NonCommercial-NoDerivatives (CC-IGO BY-NC-ND 3.0 IGO) license (<http://creativecommons.org/licenses/by-nc-nd/3.0/igo/legalcode>) and may be reproduced with attribution to the IDB and for any non-commercial purpose. No derivative work is allowed.

Any dispute related to the use of the works of the IDB that cannot be settled amicably shall be submitted to arbitration pursuant to the UNCITRAL rules. The use of the IDB's name for any purpose other than for attribution, and the use of IDB's logo shall be subject to a separate written license agreement between the IDB and the user and is not authorized as part of this CC-IGO license.

Note that link provided above includes additional terms and conditions of the license.

The opinions expressed in this publication are those of the authors and do not necessarily reflect the views of the Inter-American Development Bank, its Board of Directors, or the countries they represent.



Abstract

This note, originally prepared as an appendix for the 2016 Development in the Americas Report, *Saving for Development*, surveys the methodology and assumptions used in the discussion of replacement rates for pension systems in Latin America and the Caribbean.

JEL classifications: E23, H55

Keywords: Pension systems, Replacement rates, Latin America and the Caribbean

This note presents the methodology used to assess the impact of demography in the affordability of the benefits of PAYG/DB pension systems in Latin America and the Caribbean. We generate three indicators in the form of replacement rates (monthly pension benefit relative to the worker's last wage): i) the promised replacement rate, ii) the affordable replacement rate in a sustainable PAYG/DB system in equilibrium and iii) a counterfactual affordable replacement rate if a fully funded, individual capitalization system. We calculate each of the indicators for 2015 and 2100. They represent the respective benefits that a person with the average formal wage who is retiring in 2015 (or 2100) will obtain having contributed every month from the age of 25 until retirement. All three indicators are calculated using the existing rules in each country as of 2015. Although we compute the indicators separately for men and women, for simplicity we average the indicator within countries.

Promised replacement rate for the average worker. The promised replacement rate is the pension benefit (relative to the wage) that the current PAYG/DB system is expected to provide with existing rules, and it is obtained as follows:

1. Calculate the monthly pension benefit according to the PAYG/DB benefit rules formula in each system. We assume that system rules do not change between 2015 and 2100, and hence the promise replacement rate is the same in both periods.
2. Divide the benefit by the last wage before retirement.

Affordable replacement rate with a PAYG system for the average worker. The affordable replacement rate in a PAYG/DB system is the pension benefit (relative to wage) that the system could provide if pension contributions were to cover pension outlays, and it is obtained as follows:

1. Capitalize the contributions of workers' lives at the rate of the country-specific wage bill growth. This is proxied by population growth in the respective period of the specific country (2010-2015 and 2095-2100) plus 1 percent wage growth (assumed to be common for all countries).

2. Obtain the equivalent monthly pension resulting from a fair annuity using the country-specific mortality tables in the respective period (2010-2015 and 2095-2100).
3. Divide the benefit by the last wage before retirement.

Affordable replacement rate with an FF system for the average worker. The affordable replacement rate in an FF system is obtained as follows:

1. Capitalize workers' lifetime contributions at a constant interest rate of 3.5 percent.
2. Obtain the equivalent monthly pension resulting from a fair annuity using the country-specific mortality tables in the respective period (2010-2015 and 2095-2100).
3. Divide the benefit by the last wage before retirement.

Basic assumptions common to all countries

- *Annual real growth of wages:* 1 percent.
- *Cost of disability and survival coverage:* 1 percent
- *Start working age:* 25 years old.
- *Contribution density:* 100 percent.
- *Interest rate:* 3.5 percent
- *There are no income taxes included in the calculations.*

Basic assumptions specific to each country

- *Last reference wage:* Wage of salary workers in the formal sector (based on IDB, Sistema de Indicadores Laborales y de Seguridad Social), differentiating by gender.
- *Life expectancy, population growth and mortality tables:* 2010-2100 United Nations Mortality tables were used in calculations.
- *Pension system* including i) legal retirement age; ii) vesting period required for contribution rates for workers; firms and the State, iii) contribution base (maximum and minimum); iv) maximum and minimum pension; v) accrual rate among others according to each country's 2015 legislation.