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Basic Satisfaction Levels for Retirees

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America is dynamic continent that requires an additional metric to compare pension benefits for economically active workers planning retirement. Some reasons:

- System performance comparison
- Benefit projection planning
- Retirement tourism
- Transparency
- Public policy



Country:

A

B

C

D

Analogy:

For Defined Contribution plans, the annuitization process at retirement is like buying ice-cream. In this analogy, the funds saved for retirement, purchase different ice-cream sizes and flavors (instead of annuities).



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The Organisation for Economic Co-operation and Development (OECD) reports the **actual** replacement rates for its members. In America, only Canada, Chile, Mexico and U.S. are members.

Gross pension replacement rates*

Pension entitlement as percentage of pre-retirement earnings, single persons

Percentage of pre-retirement earnings

	Male			Female		
	Gross Replacement Rate			Gross Replacement Rate		
	Low earner	Average earner	High earner	Low earner	Average earner	High earner
Canada	80.1	45.4	30.2	80.1	45.4	30.2
Chile	57.3	41.9	37.3	48.3	33	27.9
Mexico	55.5	28.5	27.2	55.5	27.7	25.1
United States	49.5	38.3	33.4	49.5	38.3	33.4
OECD - Total	70.6	54.5	48.4	70	53.8	47.8

Source: OECD (2014)

**The gross replacement rate is defined as gross pension entitlement divided by gross pre-retirement earnings. It is a measure of how effectively a pension system provides income during retirement to replace earnings, the main source of income prior to retirement.*



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- The Traditional Replacement Rate (TRR) uses the final salary or pre-retirement earnings (S_t) as a parameter of the main source of income prior to retirement.

$$TRR_t = \frac{f_t}{\ddot{a}_y^{(12)} S_t}$$

- The Basic Satisfaction Level (BASAL) uses a deterministic projection of the Consumer Price Index (CPI) and Basic Basket (PB_t) to determine how effectively a pension provides income retirement to purchase the Basic Basket.

$$BASAL_t = \frac{f_t}{\ddot{a}_y^{(12)} PB_t}$$



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- The $BASAL_t = \frac{f_t}{\ddot{a}_y^{(12)} PB_t}$ uses the following parameters:

f_t is the accumulated fund for accumulation period t

PB_t is the projected basic market basket for the accumulation period (t)

Where t is the difference between the entry age (x) and retirement age (y)

$$f_{i+1} = f_i \left[(1 - y_i) e^{\mu i} + y_i e^{\lambda i} \right] e^{-\delta i} + S_i (c - \beta) (1 + s) \left[(1 - y_i) e^{\frac{\mu i}{2}} + y_i e^{\frac{\lambda i}{2}} \right] e^{-\frac{\delta i}{2}}$$



c is the contribution percentage over the pre-retirement salary S_i at year i , and β is the commission charged on the value of the contributions, the factor s is the real salary increase, y_i is the percentage allocated to fix return instruments, μ and δ the investment returns for the respective portfolios during the annual interval $(i, i+1)$, δ is the commission over investment.

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- Below is a comparative table with information from 9 countries who are permanent or have been guest members of the OECD:

America	Country Name	Total Population in Millions ¹	Percent of people age 65 and older	Mortality Table Name ²	Annuity Factor ³
North	Canada	33	14.80%	ICA2020	14.11
	México	110	6.20%	EMSS 97	11.87
	United States	312	13.30%	2008 PY IRC 430 Static	13.7
Central	Costa Rica	3	5.60%	SP-2005	13.08
	El Salvador	7	5.20%	SP-2005	13.08
	Colombia	47	6.70%	Ren ISS 80-89	11.87
South	Brazil	190	6.50%	AT 83	13.92
	Chile	17	9.40%	MI-2006	11.95
	Uruguay	3	13.50%	MI-2006	11.95

Source: Gómez-Hernández, Ramírez de Jurado (2014). Argentina is not included because moved away from DC model in 2008



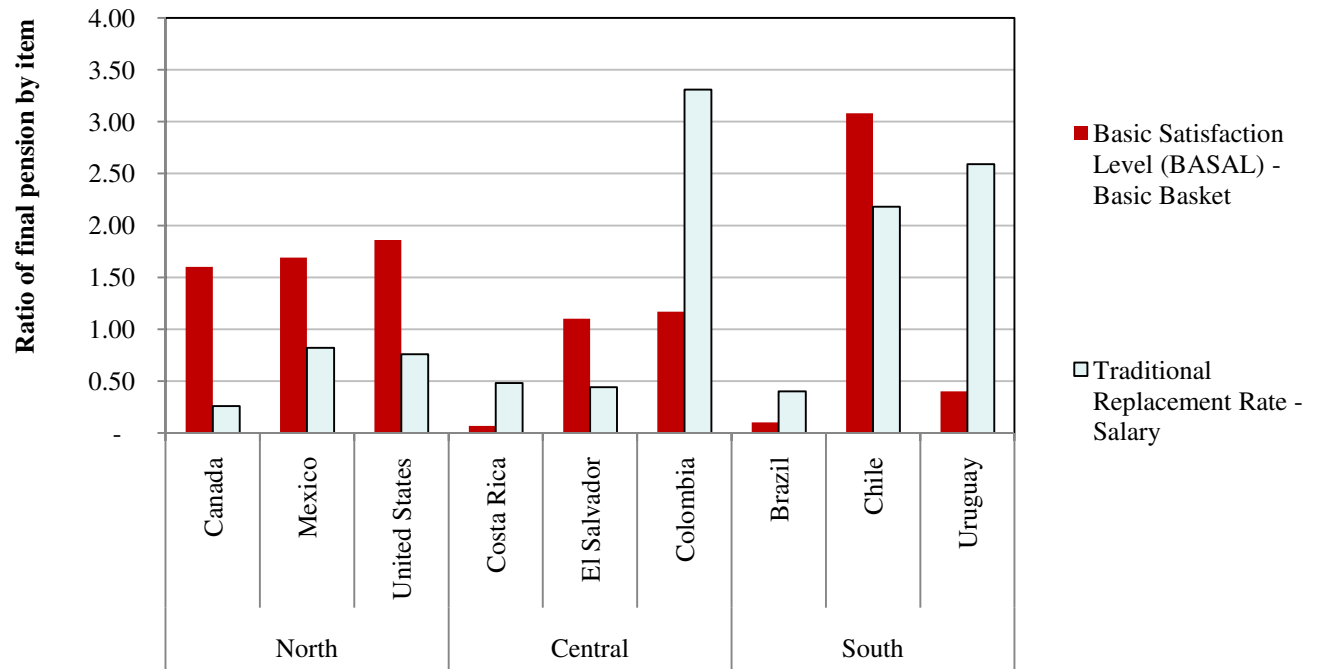
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Basal vs Traditional Replacement Rate (TRR)

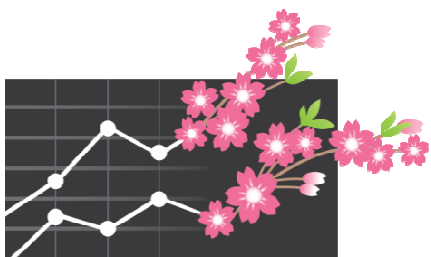
Note:

An age (25) worker with average earnings, was used to project its DC pension fund at retirement age, i.e. projected TRR and BASAL was calculated at (65)

Benchmark comparison for BASAL and Replacement Rate



Source: Gómez-Hernández, Ramírez de Jurado (2014).



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- Some attributes of BASAL comparability:
 - ✓ **Standard.** Projected macroeconomic parameters in the BASAL like the basic basket and inflation (CPI), are typically provided by the central banks
 - ✓ **Flexible.** The adaptive cumulative model is sensitive to typical DC schemes' parametrization, e.g. uses the investment returns, portfolio distribution, salaries, contributions and commissions' policies
 - ✓ **Econometric.** Enables users to project and benchmark the pension entitlement and reflects the projected purchasing power of a basic basket of goods at retirement



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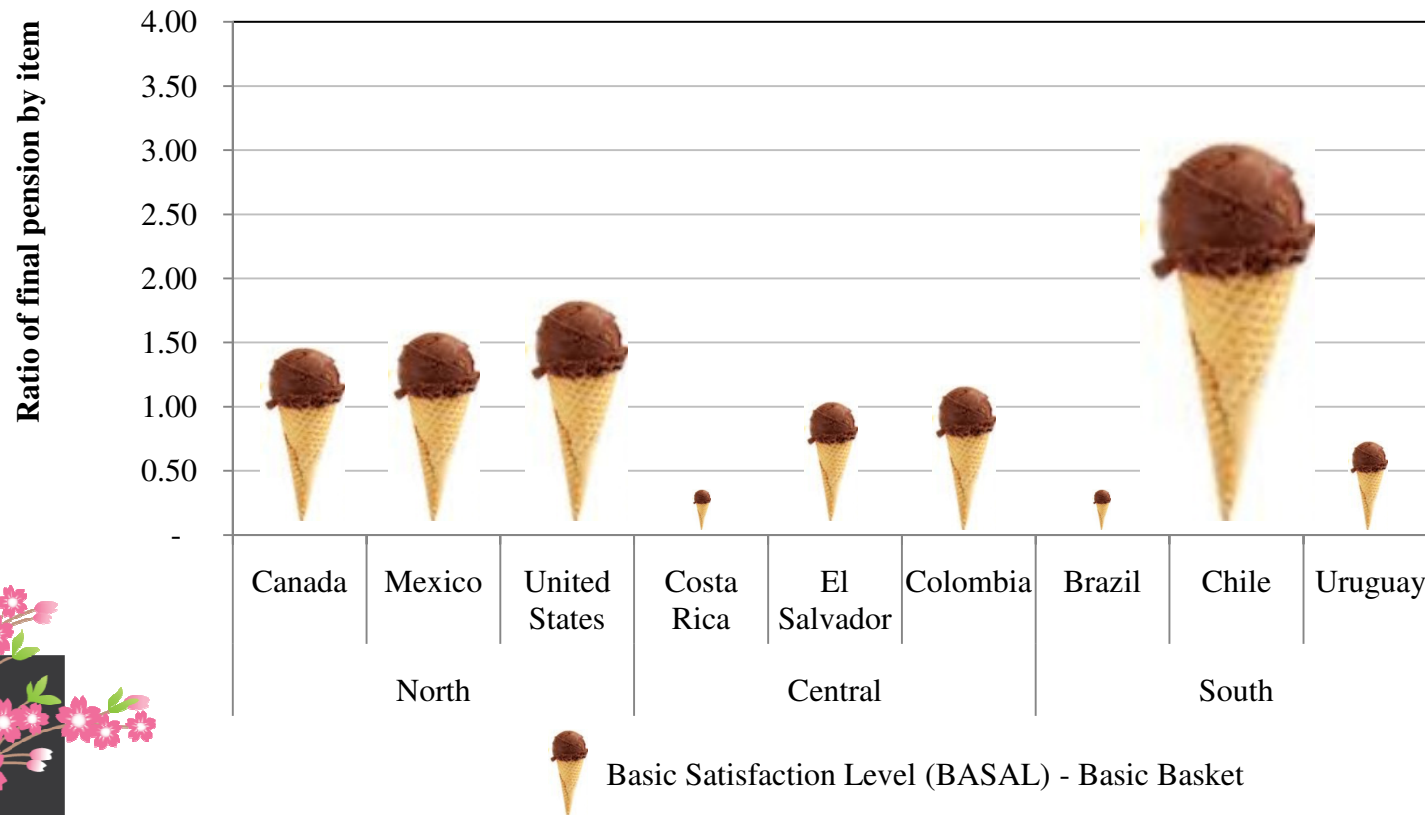
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- BASAL in *ice cream* terms



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Thank you



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