Lessons from the failed World Bank Longevity Bond(s)

A panel discussion

Chair: Jonathan Callund

Panelists: Guy Coughlan, Patricio Espinoza, Amy Kessler & John Kiff

Objectives

- To assess after a period of 5 years the reasons for the failure in take-up of the longevity bond in Chile in 2009.
- Was the initiative mistake and, if so, why?
- What lessons have been learned?
- What key risks remain un-hedged?
- How can we improve on the design of the LB to make it more attractive to local annuity providers?
- Are alternative vehicles more appropriate?
- What are the next steps to putting in place a solution that works, i.e. to provide appropriate risk-hedging that is “attractive” to all parties?

Programme

- What happened with Chile's LB 2009?
- The Specialist Panelists
  - **Amy Kessler** – *SVP, Head Longevity Risk Insurance*, **Prudential USA**
  - **John Kiff** – *Senior Financial Sector Expert*, **International Monetary Fund** (IMF)
  - **Patricio Espinoza** - *Jefe Depto. de Regulación*, **Superintendenca de Valores y Seguros** (SVS)
  - **Guy Coughlan** - *Director*, **Pacific Global Advisors –** ex lider de JP Morgan del Bono Longevidad
  - **Ivan Zelenko** - Absent but top of mind – *Director of Market and Counterparty Risk*, **World Bank** – prime architect and leader of Chile LB projects.
- Panel discussion of key themes
- Questions from the floor

Jonathan Callund

Gerente General
Callund y Compañía Ltda.

Longevity Risk and the Stability of Retirement Systems: *The Chilean Longevity Bond Case*

IVAN ZELENKO

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Chile has experienced remarkably sustained economic development since the early 90s. The GDP growth rate has averaged 4.6% per annum over the period 1994–2012. Periods of strong and steady growth, such as 1994–1998 (6.7% annually) and 2000–2008 (4.3% per annum), and the period since 2010 (5.8% per annum), have been only temporarily interrupted by two major global crises: the Asian crisis in 1998, and the U.S. financial crisis in 2008.[1] GDP per capita is high (US$ 22,416 in 2012, according to the OECD), having more than doubled between 1992 and 2012, while climbing up every year by 8%, on average. Chile has also completed its demographic expansion. Population almost tripled between 1950 and 2014, reaching 17.6 million. Although demographic growth has stabilized and slowed in recent years. The Chilean population is expected to peak at 20 million in 2040. By then, a quarter of the population will be over 60 years old.[2] All this constitutes an outstanding record. Even accounting for the remarkable rise in prosperity in Brazil or Mexico, the strength of Chile's economic development has been unmatched on the South American continent since the 1990s. In 2006, Chile was the first Latin American country to join the Organisation for Economic Co-operation and Development (OECD).

LONGEVITY AS SYSTEMIC EXPOSURE

Prosperity and Longevity in Chile

Against this backdrop, continued progress in living conditions and health standards has lifted up average life expectancy. From a low of 55 years in 1950–1955, life expectancy (at birth) rose to 60 years in 1970 and passed 70 years in the 1980s. Interestingly, the increase in life expectancy continues at a sustained pace: from around 71 years during the period 1980–1985 to around 78.6 years during the period 2005–2010, according to the United Nations (UN), even if aggregate UN data tend to show an inflection point in the 80s. Chile is a regional champion in longevity. It has the highest life expectancy in South America and ranks 52nd worldwide. More interesting data regarding future longevity prospects can be found in Chile's relative position vis-à-vis advanced economies. The United States, Japan, and the European Union have life expectancies at birth of 80.4, 84.5, and 79.9 years, respectively (Japan is the champion among large industrialized nations and ranks in third position worldwide). Within Europe, Italians can expect, at birth, to live for 82 years; the Spaniards and the French for 81.5 years; the Germans, the Irish, and the Britons for 80.5 years

Building Blocks

A Mortality Table of all Annuitants administered by SVS

Established in the mid 80s, gathering annuitants mortality data of all life insurance companies

The mortality table updated in 2004 (RV 04) is based on data collected since 1995, with a methodology for calculating mortality rates.

The mortality table **would allow to compute pay offs based on the Cumulative Survival Rates (CSRs)** in a reliable and transparent manner

It would allow applying **actuarial methodologies to produce future estimated CSR values** and derive the value of the Longevity bond.

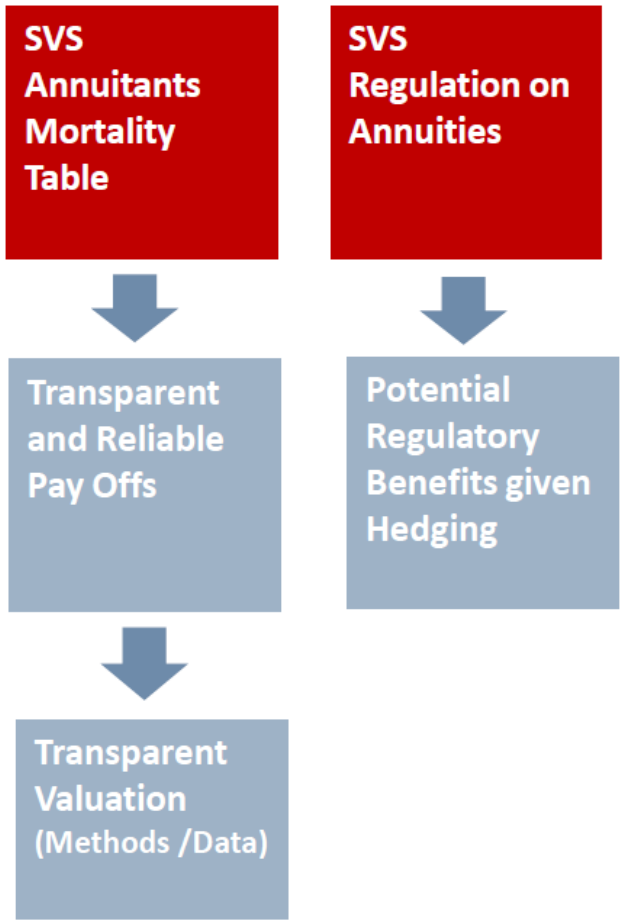
While estimates could differ according to expectations in a market context, the elements of the calculation would be transparent

A Regulation Reflecting longevity risk

Rule for calculating **Technical Reserves (CALCE rule) plus minimum regulatory capital for longevity risk** – 6% of Technical Reserves. SVS potentially ready to half the regulatory capital on hedged annuities

Cost Efficiency, Transparency and Capacity Building Objectives

Competitive selection of the reinsurer providing the longevity hedge
Optimal selection of the set of annuitants (Index) to hedge
Cost efficient structure
Publication of market / index values, of methodologies



Overview of Bond Structure

A Longevity Risk Hedging product for Chilean Life Insurers

A UF-denominated amortizing bond with a maturity of 25 years

- Issued by a collateralized SPV
- Sponsored by the **World Bank** - also a counterparty to the transaction
- Structured by **JPMorgan**
- Hedged through a Longevity swap with **Munich Re** intermediated by World Bank
- Partnership with **SVS**

A Longevity Hedge

- Provides a hedge of longevity risk associated with insurer's annuity portfolio
- Specifically hedges the longevity risk associated with the **sub-group of the annuitant population corresponding to female spouses, or "*beneficiarias*"**
- Involves a **"Longevity Index"** of beneficiarias that determines the bond cash flows. Cash flows increase if *beneficiarias* live longer than expected and decrease if they live shorter than expected

An Attractive Investment

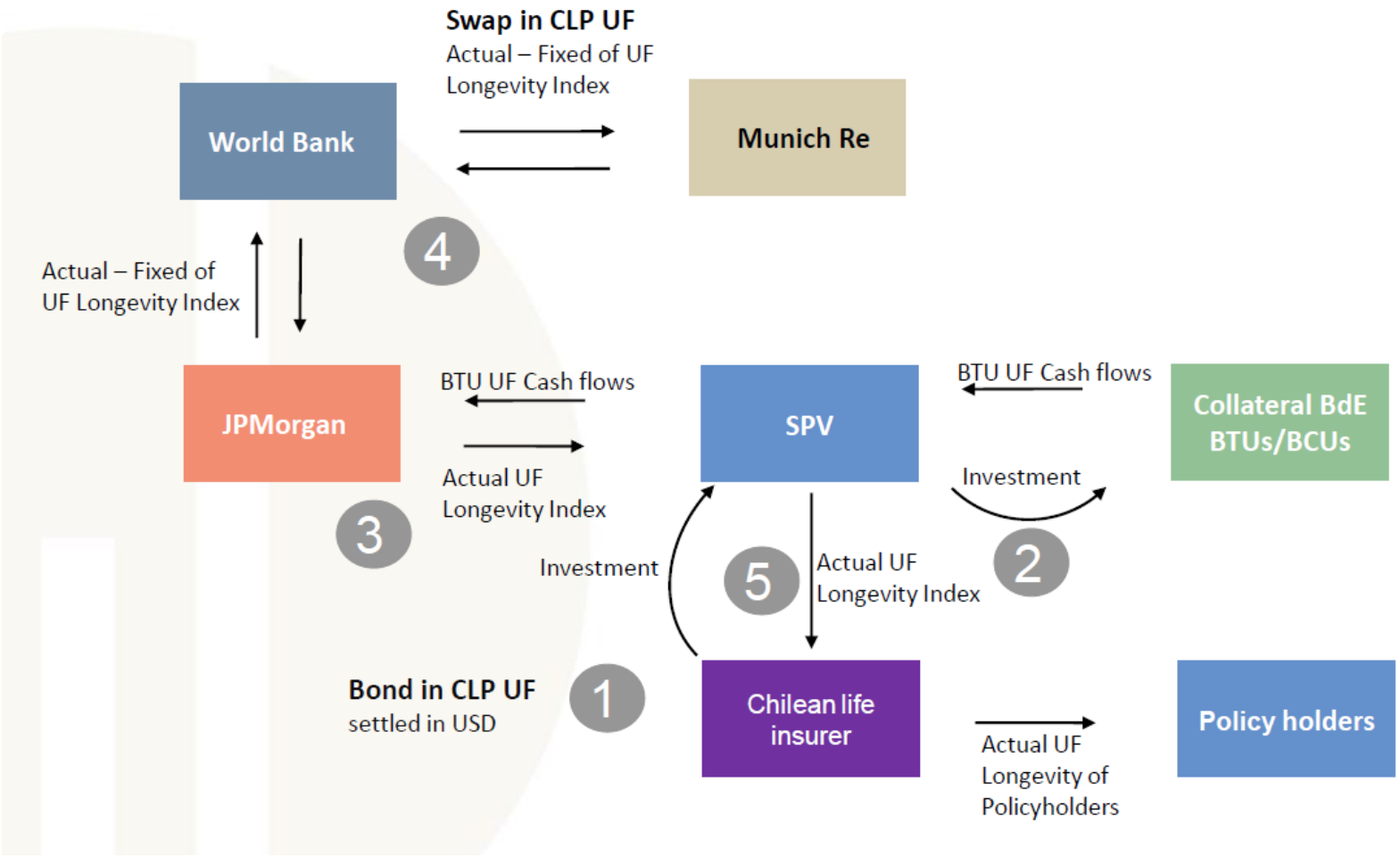
- Bond proceeds are invested in a **portfolio of government BTUs** (SPV collateral)
- Cash Flows match the longevity risk of the liability, with the security of Chilean government risk
- Structure provides a higher yield than BTUs which offsets cost of longevity hedge

A Source of Capital Relief

- Objective to provide **regulatory capital relief** as a benefit for longevity risk management

BTUs (*Bonos de la Tesorería*) are Chilean government issued UF-linked bonds

2009 WB/JP Morgan Bond



Chilean LB indicative terms

39-bp spread above Chilean government after longevity insurance cost

Yield enhancement comes from the credit spread in collateral and from regulatory capital reduction

Annual return (in UF)	
BTU 38s Yield (31% of Total Notional)	[3.09%]
BTU 28s Yield (39% of Total Notional)	[3.11%]
BCU 18s Yield (30% of Total Notional)	[3.13%]
Market Weighted BTU Portolio Yield	[3.11%]
Gross investment yield of annuity	[3.60%]
Cost of longevity hedge	[-0.40%]
All-in longevity bond yield	[3.20%]
Possible benefit from lower regulatory reserves	[0.30%]
All-in return for insurer	[3.50%]

39bps pickup over Bonos

Notes

- JPMorgan manages the cash flow mismatch between the BTU/BCU collateral portfolio and annuity cash flows
- Collateralized by bonds issued by a Chilean government owned bank: **Banco del Estado**
- Cost of longevity hedge based on indicative pricing from Munich Re
- Cost of capital benefit applicable to the portion of longevity risk that is hedged. Assumes 50% reduction in longevity capital requirement by the SVS (from 6% of technical reserves to 3%) and insurer cost of capital of 10%

Why the Chile LB Failed?

- ***Horal hazard***
  - Mix of:
    - complex and competitive sales process.
    - Remoteness and perceived low likelihood of risk.
    - Government guarantee in Law N° 3.500 (Nov-80)
      - 100% minimum pension
      - 70% of difference!
  - "Keep dancing!"
    - Akin to US banks in mortgage crisis prior to 2008.
      - Disinterest in facing costs – today
      - Neglect for lon-tail remote risks
      - Font-end, short-term profit taking

Lessons Learned

- Longevity is systemic risk, an externality like:
  - Climate change.
  - Systemic risks in financial markets.
- It's not only about aging itself, but also about reasons why people are living longer.
- Degree and impact of uncertainty remains an unknown.
  - ***Remote*** – emerges over a long period of time.
  - ***Vast***– affects whole populations/systems and in a material way.
  - ***Silent*** –community as a whole is largely unaware.
- As such, longevity is not assimilated into the market economy and therefore not priced for, despite clear social costs:
  - Focus on mortality tables but there are no incentives to consider uncertainty in pricing models.
  - Longevity is not front and center in the debate!

Lessons Learned

- Need for **risk-based capital approach** as seen under Basel III for banks and Solvency II for insurers.
  - SVS is introducing risk-based capital rules
- Institutional **monitoring of systemic risk**
  - *Comité de Estabilidad Financiera*
    - SVS, Banco Central, SP & SBIF
- Need for longevity risk to be front and centre.

Preliminary Conclusions

- Chile's LBs of '07 and '09 were stepping stones in education and furtherance of awareness:
  - Government – new regulations
  - Insurers – preparing to bite the bullet
- We're now in a better place, but there's a lot of work still to be done!

Next Steps

- "Governments should never buy insurance" [Arrow & Lind]
  - Can spread the risk across the national population
  - But we'd agree AFP retiree longevity risk is not a risk that Chile can handle alone.
  - Pricing is essential to avoid intergenerational transfers.
  - Need to access non-correlated parts of international financial markets
- Peak risks – Chile's longevity risk is akin to Florida hurricane risk
- Given longevity is a non-diversifiable risk it naturally leads to risk sharing.
- Need for efficiently designed hedging vehicles, but there's no one model:
  - Bonds – already tried and failed
  - Swaps - emerging
  - Reinsurance – consolidating in U & EU pension markets

Panelists

Patricio Espinoza

Jefe Depto. de Regulación, **Superintendenca de Valores y Seguros** (SVS)

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Guy Coughlan

Director
Pacific Global Advisors

ex leader in JP Morgan del Bono
Longevidad

Panel Discussion

Patricio Espinoza

- Today, how do insurer capital requirements in Chile recognize longevity risk?
- Tell us a little about the new approach to assessing risk capital and reserving.
  - How much is it in line with the presentation we heard from Brent Walder yesterday, in terms of providing incentives for appropriate reserving?
- Will the regulator be able to grant sufficient capital relief to make holding a LB worthwhile?

Amy Kessler

- Earlier today you talked about UK annuity writers using longevity *reinsurance* to manage the risk, but how do they know they are getting the right price?
- How competitive is the reinsurance market?
- Is there any divergence of the perception of the risks between the global reinsurers and local annuity writers in the UK?
- Might the reinsurers be charging too much?

John Kiff

- Is there an effective inter-generational shifting of the load of getting longevity pricing wrong?
- What might the consequences be if we wait to tackle this challenge?
- Is Chile unique in facing this problem?
  - How pervasive is this issue globally?

Guy Coughlan

- As we've seen over the last two days with the papers and comments, many of the capital markets solutions for longevity use population indices. Is basis risk between the population index and the insurer's annuities important and can it be overcome?
- You were here in 08/09 working actively on the LB project – what really happened at the time.
- Any further comments on the process as outlined?
- Why hasn't there been a successful bond to-date?
  - Why are they all more like swaps?

Q & A