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## **Annuities: Lessons from Pension Reform in Latin America (IPT6)**

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# The Chilean Retirement Income Market

- Analysis of the Annuities Markets
- Developments regarding longevity risk management

# Retirement in Chile



DIRECTIONS IN DEVELOPMENT  
Finance

## Developing Annuities Markets

*The Experience of Chile*

Roberto Rocha and Craig Thorburn



- The Importance of Chile as a Case Study
- The Structure & Performance of the Chilean Annuities Market
- Main Issues in Product Regulation
- Main Issues in Provider Regulation
- Conclusions & Lessons

# Why Chile

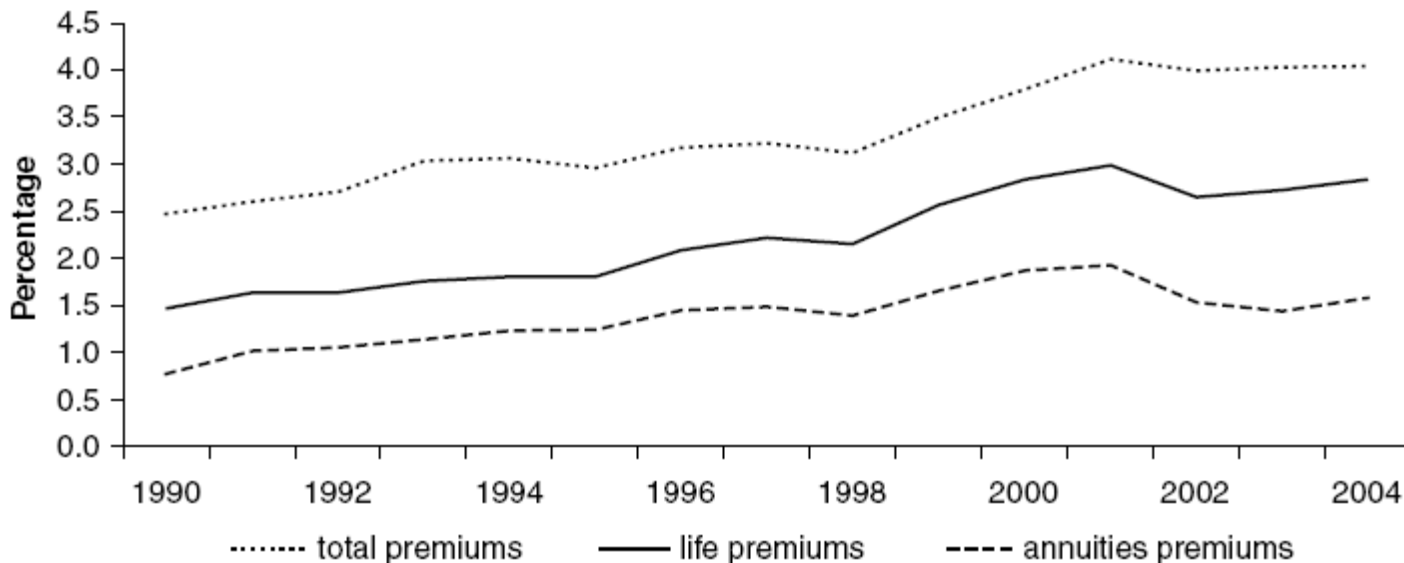
- Highly visible and often replicated and pioneering 1981 reform
- Prior to reform, Chile had
  - No material private pension sector
  - Insipient insurance sector
  - Little regulatory and supervisory capacity
  - Underdeveloped capital markets
- 20 years on
  - 320,000 annuities, 200,000 Programmed Withdrawals
  - 17 life insurance companies with assets around 20% of GDP
  - Pension funds with assets of 60% of GDP
- A market developed literally from scratch

# Structure of the study

- Examine and describe the market dynamics including the history that has brought the market to the current status including (all over time)
  - Demand for products and how (and why) it has changed
  - Performance of products
  - Performance of providers

# Life Insurance is an Annuity Business

**Figure 2.2. Insurance Premiums: Total, Life, Non-Life, and Annuities (in % of GDP), 1990–2003**



- Until recently, all annuities
  - Indexed to CPI (all contracts in Chile are in UF)
  - For males included a 60% reversion to the spouse
  - Have optional deferment and guarantee periods
  - Average retirement age around 50 with no occupational linkage

# Conditions for Retirement Benefits

- Age based normal retirement
  - (60F/65M at the time report prepared)
- Replacement rate based criteria for retiree
  - (was 50% now 70%)
- Minimum compared to the MPG level
  - (was 110% now 150%)
- No occupational link

**Table 2.5. Breakdown of the Stock of Pensioners, by Type of Retirement, 1990–2004**

Year	Total	Normal Old Age		Early Retirement		Disability + Survivors	
		Number	% of Total	Number	% of Total	Number	% of Total
1985	7,609	2,647	34.8%	-	0.0%	4,962	65.2%
1990	57,119	23,876	41.8%	5,790	10.1%	27,453	48.1%
1995	190,400	55,591	29.2%	69,537	36.5%	65,272	34.3%
2000	343,965	93,152	27.1%	132,221	38.4%	118,592	34.5%
2004	520,793	133,343	25.6%	220,929	42.4%	166,521	32.0%

Sources: SAFF.

**Table 2.6. Average Retirement Age, by Type of Retirement, 1988–2003**

	1988–1990	1991–1995	1996–2000	2001–2003
Old Age	65	65	65	64
Men	67	67	67	66
Women	63	62	62	62
Early Retirement	58	57	56	55
Men	58	57	56	56
Women	56	55	54	53

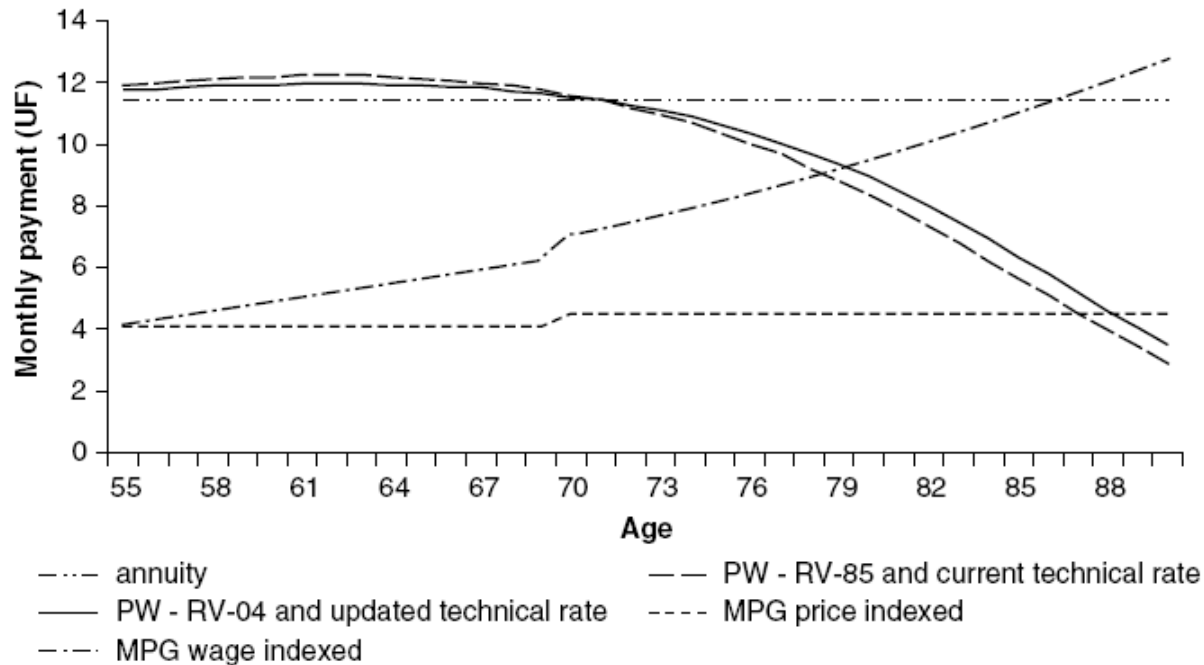
Source: SAFF.

# Menu of Retirement Products

- Lump Sums
  - Severely restricted to very few cases
- Phased / Programmed Withdrawals
  - Provided by AFPs
  - Defined formula oriented against too rapid drawdowns
- Annuity
  - Provided by life insurers
  - Limited choice and flexibility in product design
- Temporary Withdrawals
  - PW available during an annuity deferment period

# Comparison of Illustrative Payment Paths

Figure 5.2. Payment Paths for a 55-Year-Old Pensioner

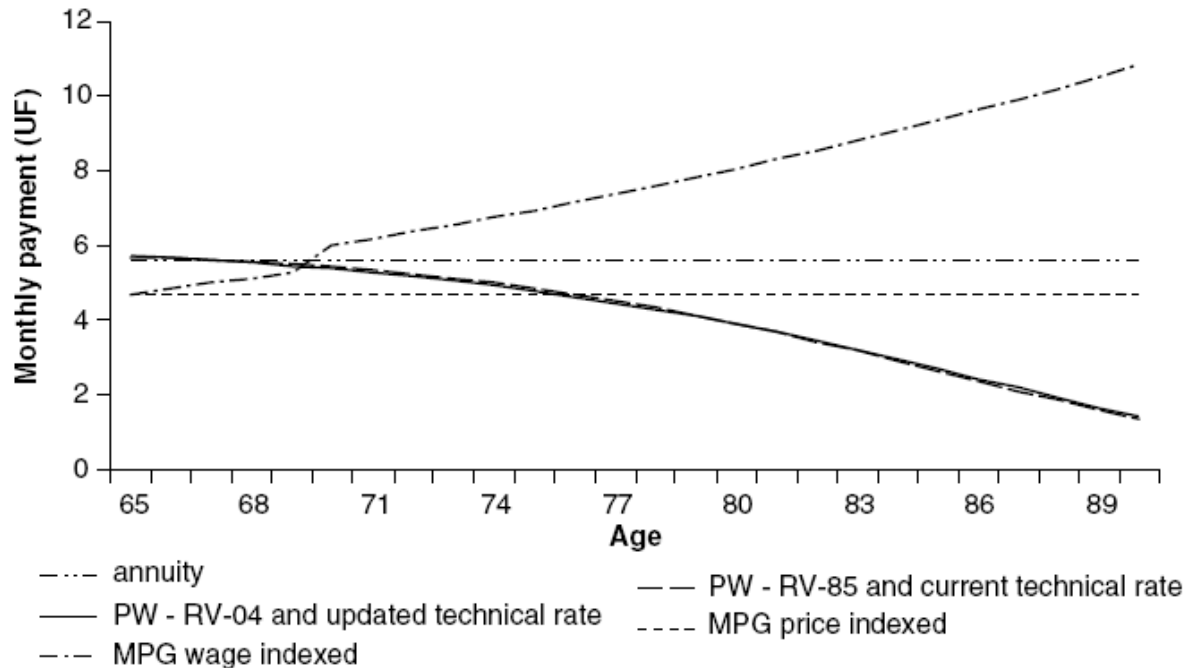


Source: Staff analysis.

- PWs can appear more attractive as the regulated formula uses a rate of return based on historic observations.
- Note MPG indexation and step shown.

# Comparison of Illustrative Payment Paths

Figure 5.4. Payment Paths for a Low Income 65-Year-Old Pensioner



Source: Staff analysis.

- PWs, with the MPG effects, preferable for lower balance retirees.
- Longevity insurance provided by annuity is less attractive, replaced by MPG

# Money's Worth Ratio Analysis

**Table A1.2. Summary Statistics of the Dataset**

	1999	2002	2003	2004	2005
<i>All Cases</i>					
Number	937	1,517	1,193	1,490	1,391
Average Age of Males	57.83	56.98	57.77	57.70	59.46
Average Age of Females	55.76	54.85	55.55	56.02	58.46
Average Purchase Price (UF)	1,971.66	1,859.65	2,116.94	2,098.79	2,454.9
Cases with deferment	21.2%	21.8%	25.7%	27.5%	30.1%
Of which:					
- 12 months	164	275	238	322	315
- 24 months	32	54	60	75	91
- 36 months	2	2	8	10	9
- 48 months	1	0	1	2	3
Number of cases with a guaranteed term	708 (75.6%)	1,191 (78.5%)	948 (79.5%)	1,153 (77.4%)	1,093 (78.6%)
Of which:					
- 5 years	11	19	17	18	23
- 10 years	422	701	511	636	559
- 15 years	244	387	335	380	353
- 20 years	18	64	63	93	124
- other	13	20	22	26	34

Source: SVS and staff analysis.

# High Levels, Particularly for Indexed Annuities

**Table A1.4. Money's Worth Ratios in 1999, 2002, 2003, 2004, and 2005, Computed with the Risk-Free Rate and an Update Cohort Annuitant Table**

	<i>March 1999</i>	<i>March 2002</i>	<i>March 2003</i>	<i>March 2004</i>	<i>March 2005</i>
All cases	0.978	1.079	1.036	1.064	1.062
- maximum	1.148	1.222	1.181	1.276	1.223
- minimum	0.755	0.872	0.872	0.876	0.706
Male Single Life	0.987	1.086	1.044	1.061	1.054
Female Single Life	1.009	1.111	1.063	1.097	1.086
Joint Life	0.968	1.070	1.026	1.052	1.046
Male Single Life age 55	0.981	1.075	1.034	1.049	1.042
Male Single Life age 65	0.996	1.117	1.069	1.086	1.067
Female Single Life age 55	0.994	1.101	1.049	1.076	1.064
Female Single Life age 60	1.021	1.131	1.077	1.105	1.083
Joint Life – Male 65 and Female 60	0.998	1.083	1.050	1.078	1.069
Purchase Price up to UF 1,000	0.980	1.078	1.045	1.068	1.067
Purchase Price above UF 3,000	0.997	1.099	1.047	1.075	1.071
Without guaranteed term	0.990	1.092	1.045	1.071	1.073
With guaranteed term	0.974	1.076	1.033	1.062	1.059
Without deferment	0.979	1.079	1.035	1.063	1.061
With deferment	0.974	1.080	1.036	1.067	1.064

Source: Authors' calculations.

# Regression opens the window

- Value offering
- Pricing
- attitude to risk

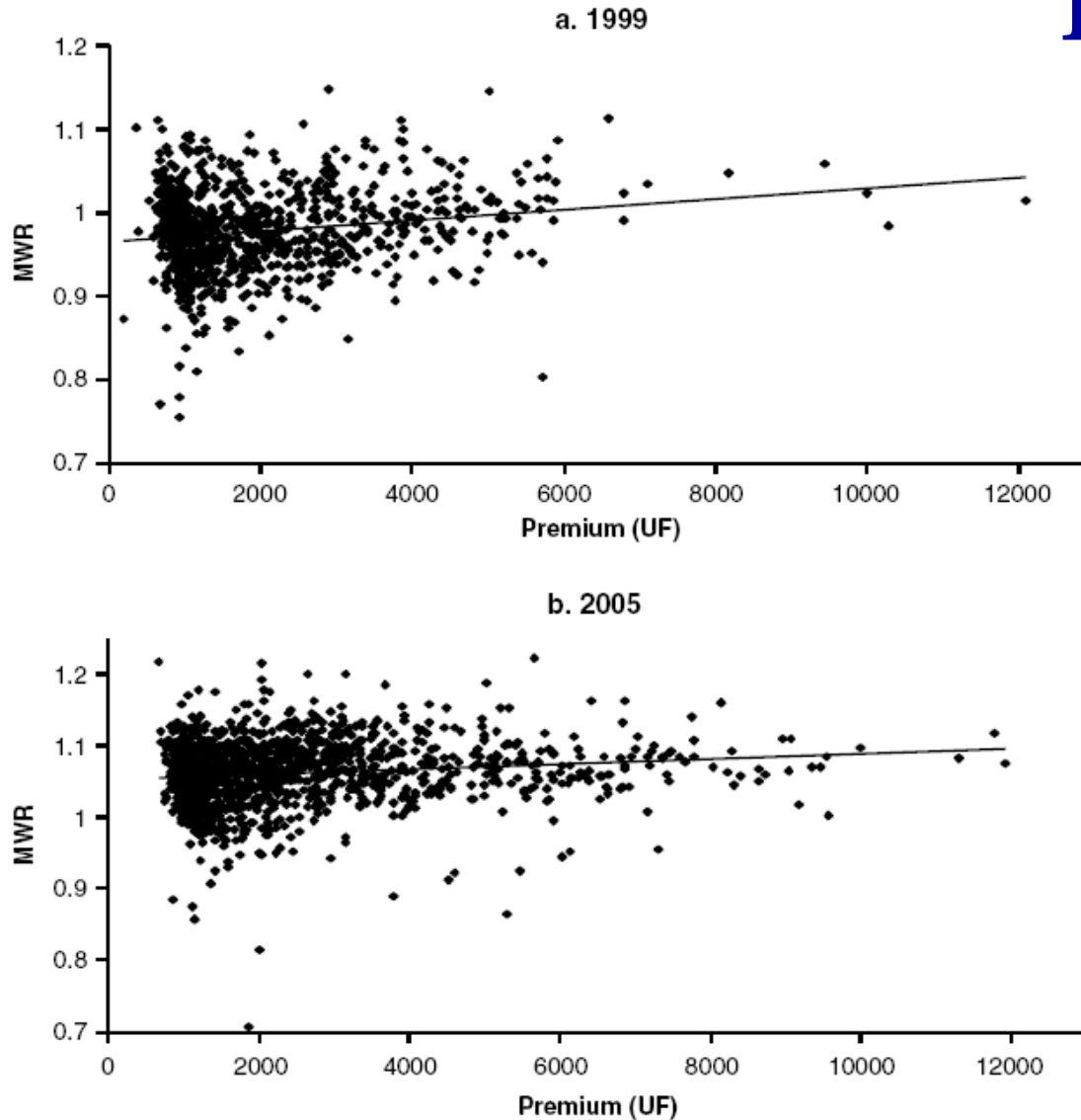
**Table A1.5. Main Determinants of MWRs, Pooled Data**

Dependent Variable: 100\*MWR; Least Squares with Robust Standard Errors  
Pooled Data for 1999, 2002, 2003, 2004, and 2005; Observations: 6526

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
C	62.39024	0.722912	86.30404	0.0000
AGE	0.410145	0.008974	45.70317	0.0000
LOG(PREMIUM)	1.618070	0.073313	22.07059	0.0000
GUARANTEE	-0.134448	0.008383	-16.03824	0.0000
DEFERMENT	0.016582	0.007399	2.241063	0.0251
Male	1.345882	0.206458	6.518928	0.0000
Female	4.023704	0.089566	44.92436	0.0000
2002	10.66352	0.149209	71.46677	0.0000
2003	5.699579	0.152080	37.47739	0.0000
2004	8.253581	0.150549	54.82318	0.0000
2005	6.507061	0.156551	41.56508	0.0000
R-squared	0.639507	Mean dependent var		104.9609
Adjusted R-squared	0.638954	S.D. dependent var		5.600486
S.E. of regression	3.365172	Akaike info criterion		5.266519
Sum squared resid	73778.36	Schwarz criterion		5.277954
Log likelihood	-17173.65	F-statistic		1155.747
Durbin-Watson stat	1.754037	Prob(F-statistic)		0.000000

Source: Authors' estimations on SVS data.

Figure A1.1. MWRs and Premiums in 1999 and 2005



# Dispersion?

- questions regarding price discovery
- SCOMP will be interesting

# Investments in search of yield

**Table 4.9. Portfolio of Life Insurance Companies (in % of Total), 1991–2004**

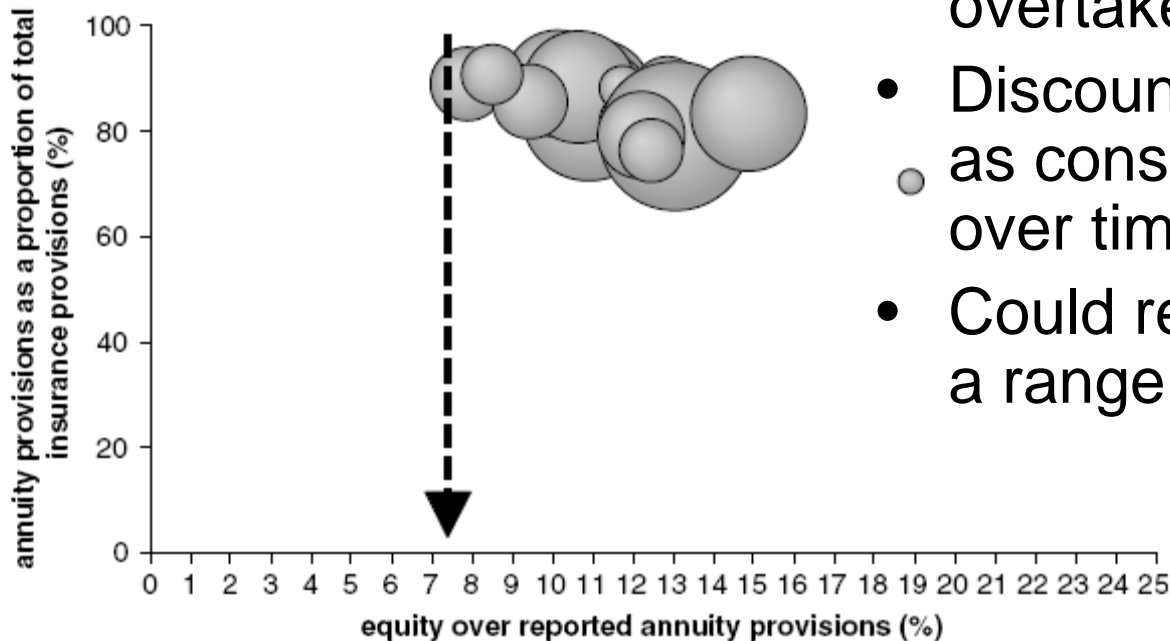
	1991	1995	2000	2001	2002	2003	2004
<b>Government Sector</b>	<b>38.3</b>	<b>40.3</b>	<b>28.7</b>	<b>21.9</b>	<b>18.9</b>	<b>17.6</b>	<b>17.1</b>
<b>Financial Sector</b>	<b>23.0</b>	<b>28.4</b>	<b>45.1</b>	<b>42.2</b>	<b>41.3</b>	<b>37.6</b>	<b>32.9</b>
Mortgage Bonds	13.9	18.6	24.2	22.0	20.6	18.8	14.7
Mortgage-Backed Securities	3.0	6.0	10.1	9.9	10.6	10.1	9.2
Time Deposits	4.0	1.9	1.6	1.6	1.9	1.2	1.8
Bonds of Financial Institutions	2.1	1.9	9.2	8.6	8.3	7.5	7.2
<b>Company Sector</b>	<b>29.0</b>	<b>22.1</b>	<b>15.3</b>	<b>24.5</b>	<b>28.0</b>	<b>33.4</b>	<b>37.8</b>
Shares	8.9	10.2	3.4	3.1	2.7	2.9	3.4
Bonds	20.1	10.7	10.7	20.3	24.4	29.3	33.3
Investment Fund Shares	0.0	1.1	1.1	1.0	1.0	1.1	1.1
<b>Real Estate</b>	<b>7.8</b>	<b>7.7</b>	<b>7.4</b>	<b>7.3</b>	<b>7.3</b>	<b>7.3</b>	<b>7.4</b>
<b>Foreign Sector</b>	<b>0.0</b>	<b>0.1</b>	<b>2.0</b>	<b>2.4</b>	<b>2.3</b>	<b>1.9</b>	<b>2.6</b>
<b>Others</b>	<b>2.0</b>	<b>1.4</b>	<b>1.6</b>	<b>1.7</b>	<b>2.2</b>	<b>2.2</b>	<b>2.2</b>
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
Fixed Income/Total Assets	81.3	79.4	84.4	84.4	84.6	84.5	83.3
Total Assets (US\$ million)	2339.1	6661.4	11934.1	12095.6	12392.8	14215.6	18874.3
Assets/GDP	6.1%	9.2%	15.9%	17.7%	18.4%	19.7%	19.0%

Source: SVS.

# Solvency

- Existing technical provisions were conservative when rule first established but mortality assumption had been overtaken by improvement
- Discount rate was no longer as conservative as rates fell over time.
- Could revalue portfolios on a range of assumptions

Figure 6.3. Annuity Company Capacity to Absorb Increases (Detail)



# A postscript on longevity risk

- Longevity insurance and reinsurance options limited
- Challenges of rate of return
- Challenges of index construction
  - But can develop local index with high quality hedge given 20 year data set.

**End**

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