"Risk Based Supervision of DC Pensions Systems: The Experiences of Australia and Mexico"

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Seminar Outline

- Risk-based supervision: broad and narrow definitions
- Outline of the broader World Bank project
- The Role of Australia and Mexico in the project
- The Australian system
- The Mexican system
- Comparisons and preliminary evaluation

Risk-Based Supervision: Two Alternative Definitions

- Broad definition: The whole risk management architecture, including risk-based regulations and risk-based supervision procedures

- Narrow definition: Only the supervisory part of the overall risk management architecture

The Basic Risk Management Architecture

- For the institution:
- Internal risk management:
  - Risk management strategy
  - Specific risk management functions in the organizational structure, reporting responsibilities

- For the supervisor:
- Internal organization of the agency
  - Specialist risk units or risk experts
- Regulatory standards and guidelines
- Internal risk scoring model

Market Discipline: The contributions of the actuary, auditor, fund members, market analysts, to sound risk management

Management of which risks?: Identification of main risks in pension systems

One Possible Taxonomy

- Financial or market risks (asset price volatility)
  - DB - insolvency/underfunding
  - DC - risk/return trade-off, cohort comparability, implicit target replacement ratios (pseudo liabilities)
- Credit risks
- Operational risks
- Liquidity risks
- Longevity risk
  - in DB systems

World Bank Project

- Provide case studies across a range of systems
  - All countries have large pension systems, but
  - Variety of DB and DC cases
- Identify common elements, country-specific arrangements, and possible lessons
- Provide guidance to supervisors about the changes needed to move towards RBS
- Elaborate supervision principles and standards which support the RBS approach

Where do Australia and Mexico fit in?

- Pure DB – Netherlands
- DC with minimum absolute return guarantee and risk/profit-sharing – Denmark, Switzerland
- DC with relative return guarantee (several LAC, CEE countries)
- DC with caps on absolute financial risk – Mexico
- DC without guarantees – Australia

Australia – system snapshot

- First Pillar with wide coverage providing benefit = 25% of average wage financed from general government revenue
- Mandatory Second Pillar introduced in 1993, now with 9 per cent of salary going into pension funds
- Total assets of just over 100 per cent of GNP
- Funds can be occupational or open, but mainly DC
- 307 trustee entities with around 1000 pension funds

Australia – system snapshot

- System based on fiduciary responsibilities of trustees
- Supervisory focus has always been towards allocating scarce resources most to those funds assessed as requiring attention
- Formal risk-based model introduced in October 2002
- APRA responsible for supervising banking, insurance and pensions

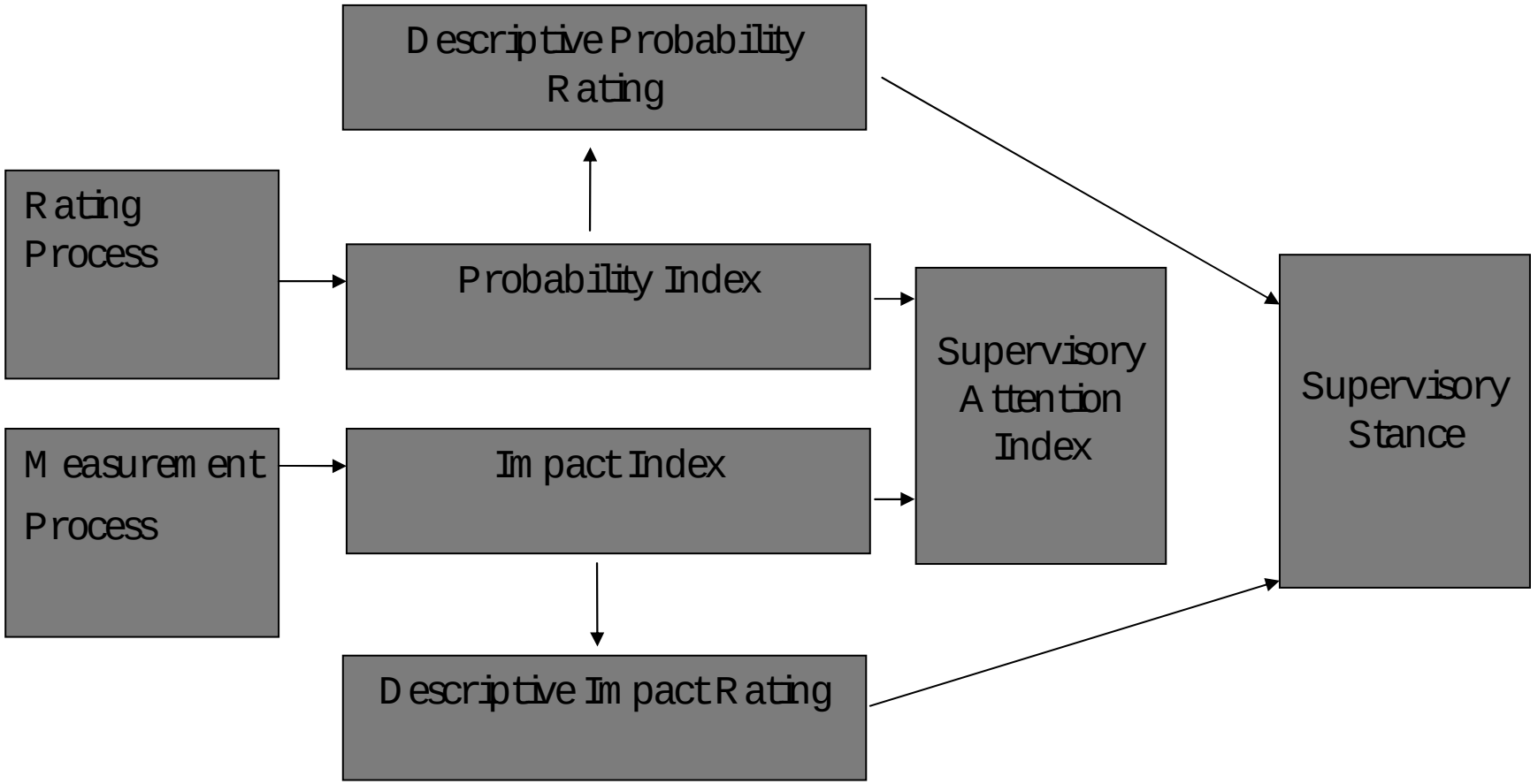
Australia: Evolution of risk-based supervision

- Drivers of the evolution in regulation have included:
  - change in the organization of regulatory agencies
  - struggle to resolve the mismatch between the large number of pension funds and the limited resources
  - a small number of failures among funds
  - regulatory concern about incomplete compliance with conduct rules and poor governance practices, particularly among small and medium-sized funds.

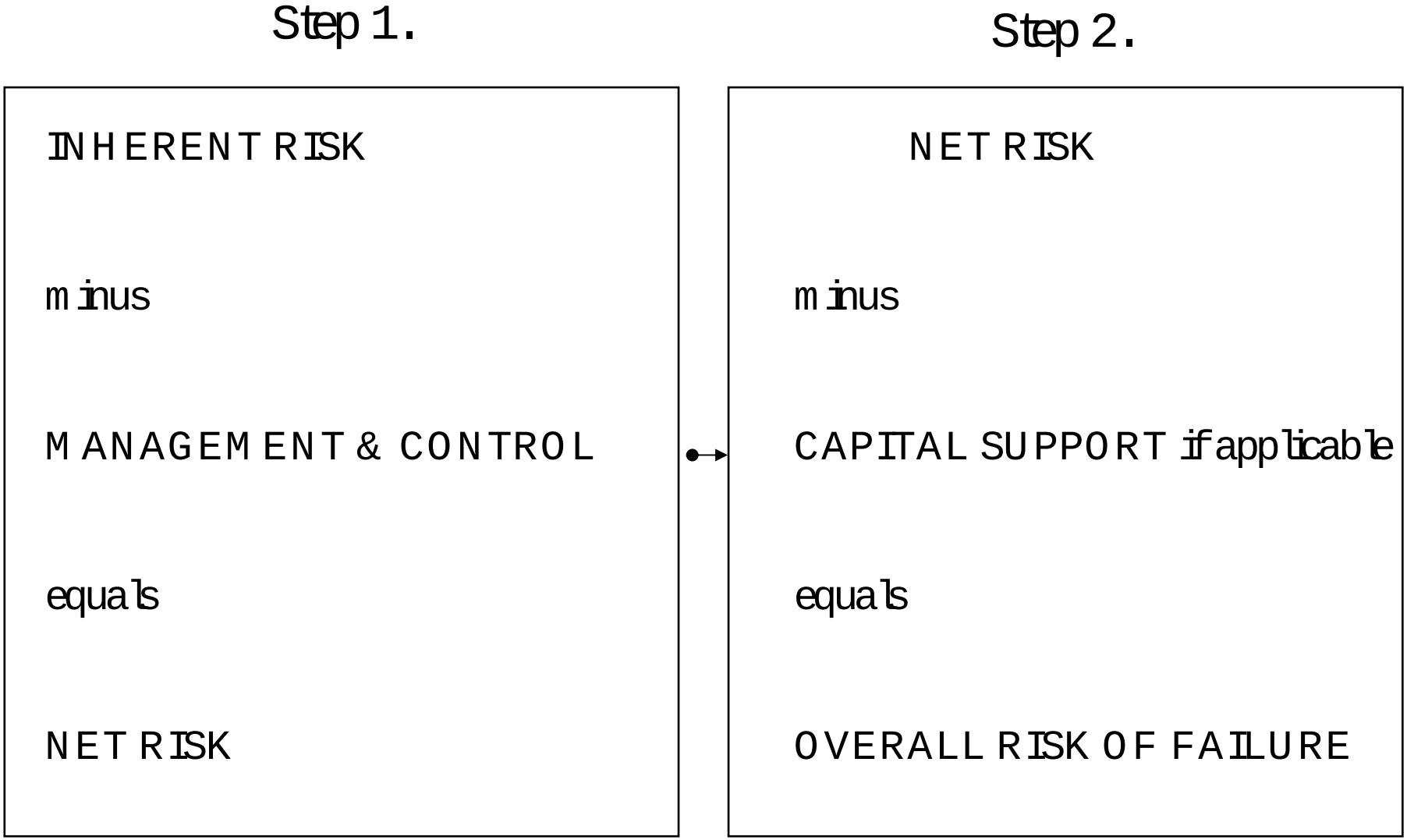
Australia: Main Elements of APRA's Risk Scoring Model

- A common methodology covering all types of regulated financial institutions (banks, insurers and pension funds)
- Addresses both the magnitude of the potential impact, as well as the probability of occurrence, of financial failure
- Employs a consistent, logical approach to selecting, rating, and weighting the factors which determine the overall probability of failure

PAIRS Ratings Framework



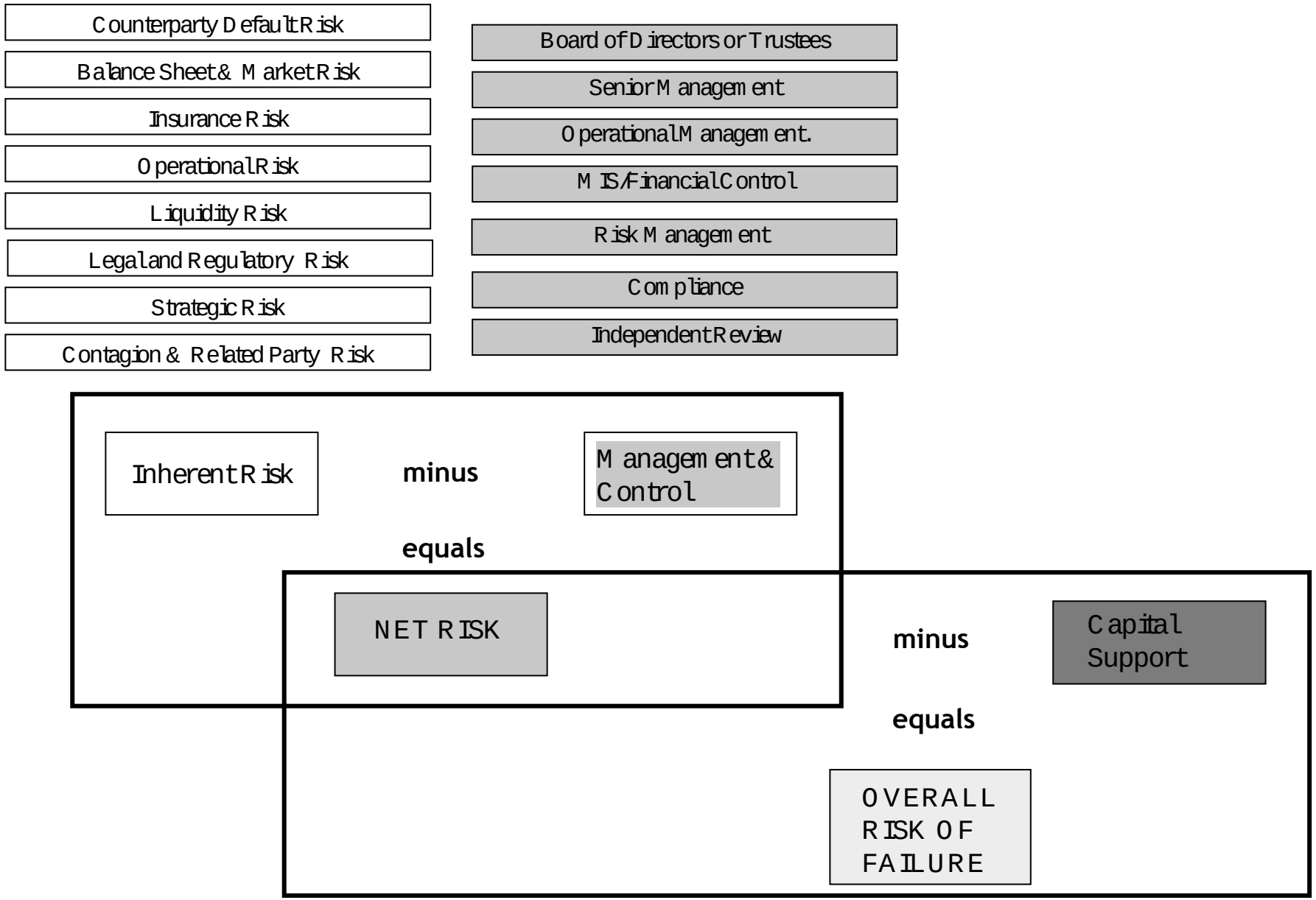
Conceptual Risk Assessment Model



Application of PAIRS to pension funds

- Adaptation of PAIRS to DC pension funds:
  - No solvency issues/specific promises to fund members in DC funds, therefore assessment of the net risk is limited to inherent risk and management and control.
- In the case of DB funds, capital support is relevant:
  - Involves an assessment of surplus or deficit position of the fund
  - It incorporates an assessment of support from the employer sponsor

Conceptual Risk Assessment Model



Quality Assessments

PARS Rating Score	PARS Inherent Risk Rating	PARS Management & Control Ratings	PARS Capital Support Ratings
0.25			
0.50	very Low	Strong	Strong
0.75			
1.00	Low	Sound	Sound
1.17			
1.33			
1.50	low Medium	Adequate	Adequate
1.67			
1.83			
2.00	high Medium	Vulnerable	Vulnerable
2.25			
2.50			
2.75			
3.00	High	Weak	Weak
3.33			
3.67			
4.00	Extreme	Extremely Weak	Extremely Weak

Significance weightings: inherent risk

Inherent risk	Significance (percent)	Quality	Quality index	Weighted risk
Counterparty default	10	1.0	1	0.1
Balance sheet/market	30	2.0	16	4.8
Insurance	5	0.5	1	0.05
Operational	20	2.5	39	7.8
Liquidity	5	2.0	16	0.8
Legal/regulatory	10	1.0	1	0.1
Strategic	20	1.5	5	1.0
Contagion/related party	0	0	0	0
Inherent risk total				1.96[1]

[1] Fourth root of the sum of the weighted risk.

Looking at financial market risk

- Assess the adequacy of the licensee's management of investments. Consider:
  - Investment strategy
  - Investment objectives
  - Asset allocation
  - Diversification
- Liquidity
  - Cash flows
  - Liquidity needs
  - Liquidity planning
- Selection of Investment Managers
- Performance Measurement, Monitoring and Benchmarks
- Valuation and Ownership
- Investments comply with strategy/limits in investment policy

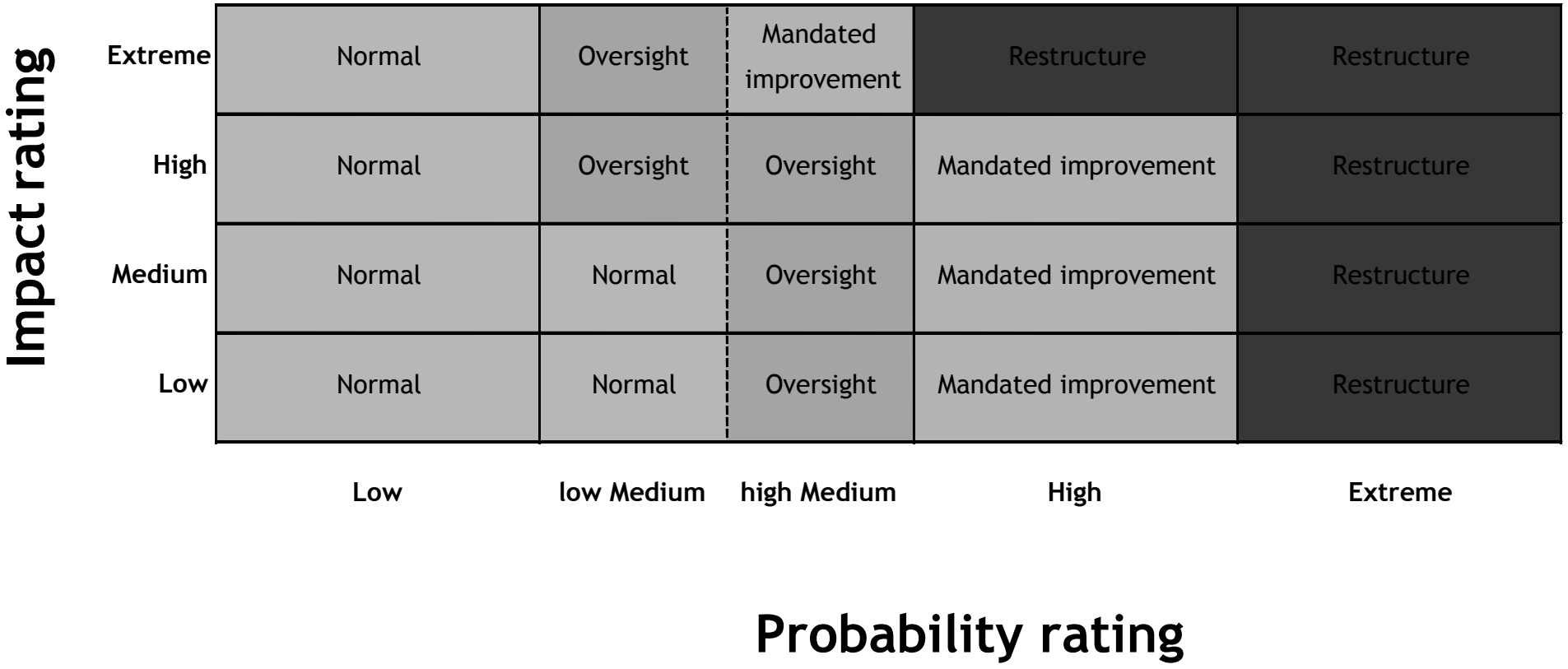
Significance weightings: management and control

Management and control	Significance (percent)	Quality	Quality index	Weighted control
Board of trustees	20	0.5	1	0.2
Senior management	20	1.5	5	1.0
Operational management	10	0.5	1	0.1
Management information/ financial control	15	2.5	39	5.85
Risk management	15	1.0	1	0.15
Compliance	10	1.5	5	0.5
Independent review	10	0.5	1	0.1
Management and control total				1.68

Non-Linear Relative Riskiness of Probability Ratings

PARS Overall Risk of Failure Score	PARS Probability Rating	PARS Probability Index	Indicative External Rating Equivalent
0.25		1	AAA
0.50	very Low	1	AA+
0.75		1	AA
1.00	Low	1	AA-
1.17		2	A+
1.33		3	A
1.50	low Medium	5	A-
1.67		8	BBB+
1.83		11	BBB
2.00	high Medium	16	BBB-
2.25		26	BB+
2.50		39	BB
2.75		57	BB-
3.00	High	81	B+
3.33		123	B
3.67		181	B-
4.00	Extreme	256	CCC

SOARS 'Supervisory Oversight and Response System'



Strengths and weaknesses of PAIRS

- Strengths:
  - Enforces analytical discipline
  - Facilitates communication
  - Reflects non-linear risk relativities
  - Supports scarce resource allocation
  - Links response to risk assessment
- Weaknesses:
  - Complexity
  - Subjectivity
  - Difficult in ensuring consistency
  - Difficulty in validation

Pension Funds: Asset Allocation

Asset class	2004	2000	1995
Cash and deposits	8.3	6.5	6.8
Loans and placements	3.6	4.9	4.4
Interest-bearing securities	16.0	18.5	25.3
Equities and units in trusts	48.5	43.1	38.5
Land and buildings	5.2	5.3	6.9
Other domestic assets	1.8	2.7	4.1
Total domestic	83.3	80.9	86.1
Assets overseas	16.7	19.1	13.9
Total	100.0	100.0	100.0

Source: APRA

A new classification of investments was introduced for 2005 and shows: Australian equities (33 percent), international equities (23 percent), Australian fixed interest (13 percent), international fixed interest (5 percent), listed and unlisted property (8 percent), cash (7 percent) and other (10 percent).

Recent Steps Taken to Strengthen the Risk-Based Policy Framework

- The main elements of the revised framework introduced over 2004-2006 were:
- licensing of all trustees and registration of all funds
- introduction of five new prudential measures, supported by guidance notes, dealing with:
  - fitness and propriety of trustees
  - risk management strategies and plans
  - outsourcing of trustee functions
  - the resources available to trustees
  - capital adequacy
- expanded reporting obligations for fund auditors

Mexico – system snapshot

- Individual capitalization accounts (second pillar) replaced PAYGO system in 1997
- Compulsory contribution for old age retirement of around 8.5% of the wage
- 18 Afores (pension fund managers)
- Specialized supervisory entity (CONSAR)
- Total assets of around 8 per cent of GNP

Mexico: First LAC country to move towards RBS

Main Elements of Mexican RBS System:

- Imposition of limits on absolute VaR to deal with financial risk
- Ongoing development of risk scoring model
- Prescriptive regulations of internal risk management structure

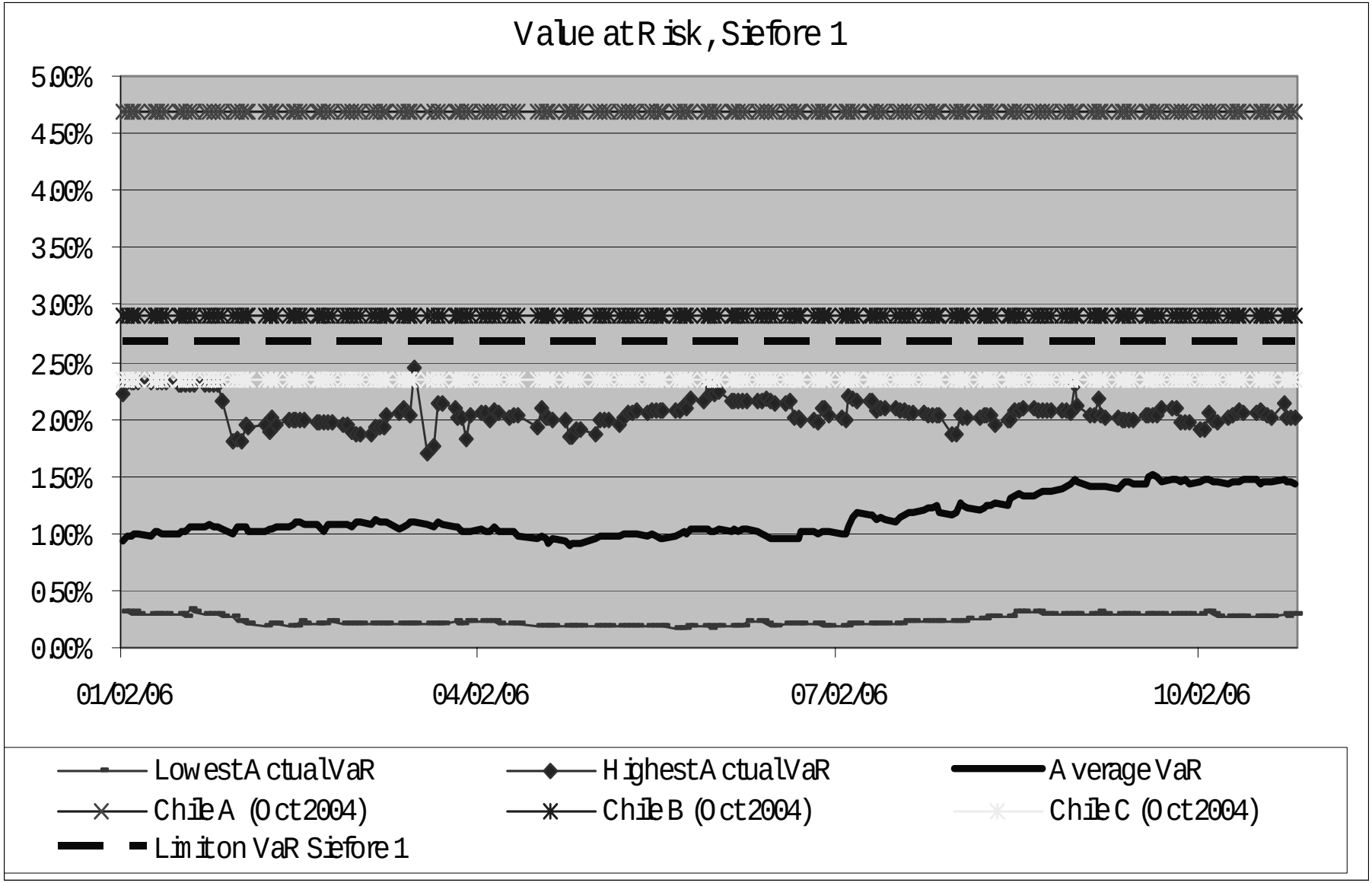
Use of VaR Limits – Basic Elements

- VaRs computed on a daily basis using 500 day moving sample. Price vector provided by private vendors
- Siefores 1 have a limit of 0.6 per cent and Siefores 2 a limit of 1.0 per cent; Confidence interval of 95 percent
- Daily limits imply a maximum monthly loss of 2.7% for Siefore 1 and 4.5% for Siefore 2
- Caps look flexible by comparison with actual VaRs in Chile
- However, interaction between VaRs and portfolio limits not clear
- Question of whether historical VaR computations provide relevant risk measures for pension funds

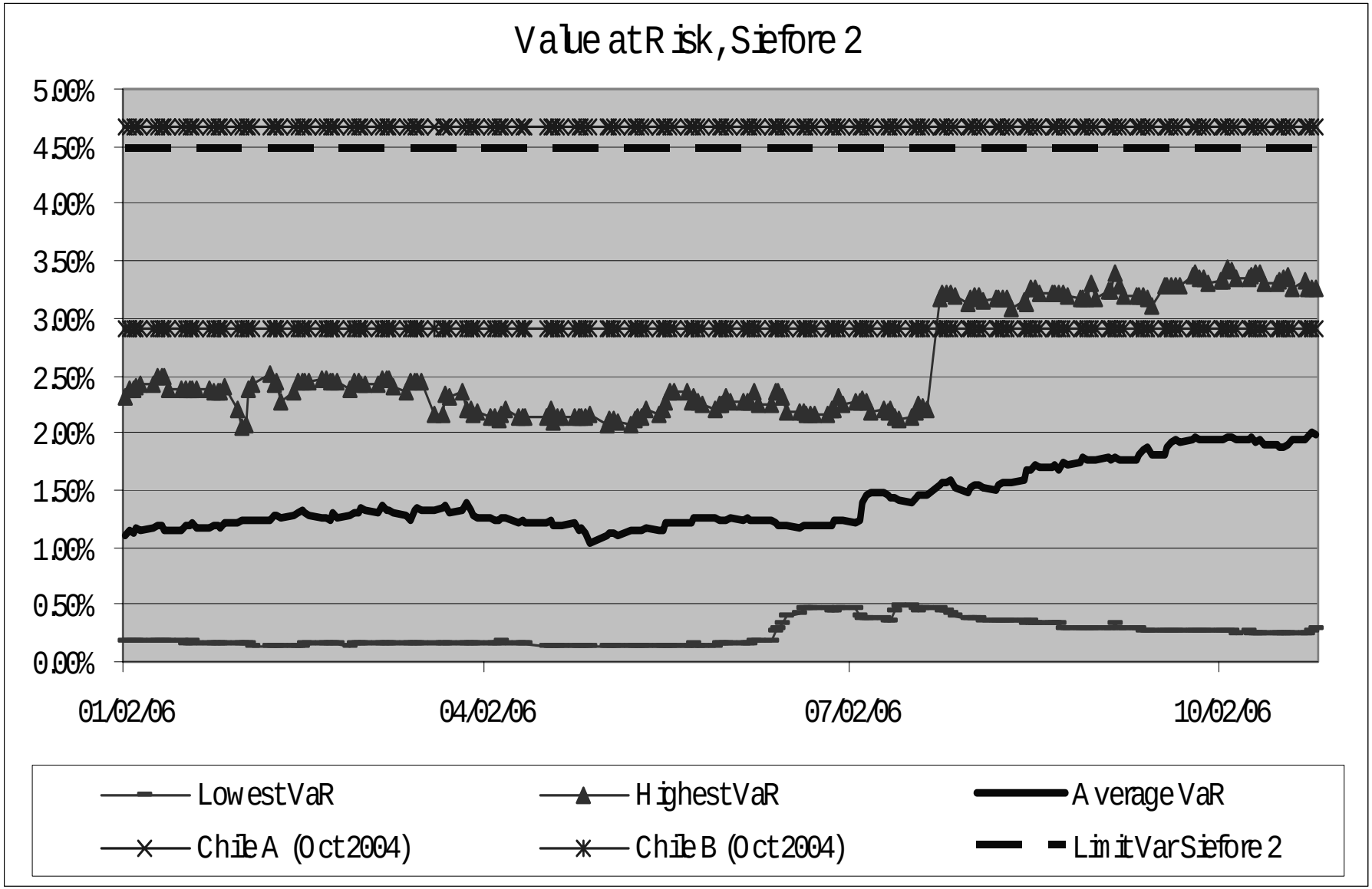
Benchmark: Actual Monthly VaRs in Chile

Fund	Aug-03	Oct-03	Dec-03	Feb-04	Apr-04
A	3.90%	4.03%	4.84%	4.42%	4.68%
B	2.15%	2.28%	2.91%	2.49%	2.91%
C	1.50%	1.35%	2.08%	1.93%	2.35%
D	1.02%	1.14%	1.35%	1.47%	1.13%
E	1.25%	1.07%	1.32%	1.36%	1.24%

Siefore 1: Caps and Actual VaRs



Siefore 2: Caps and Actual VaRs



Daily VaRs with and without Derivatives

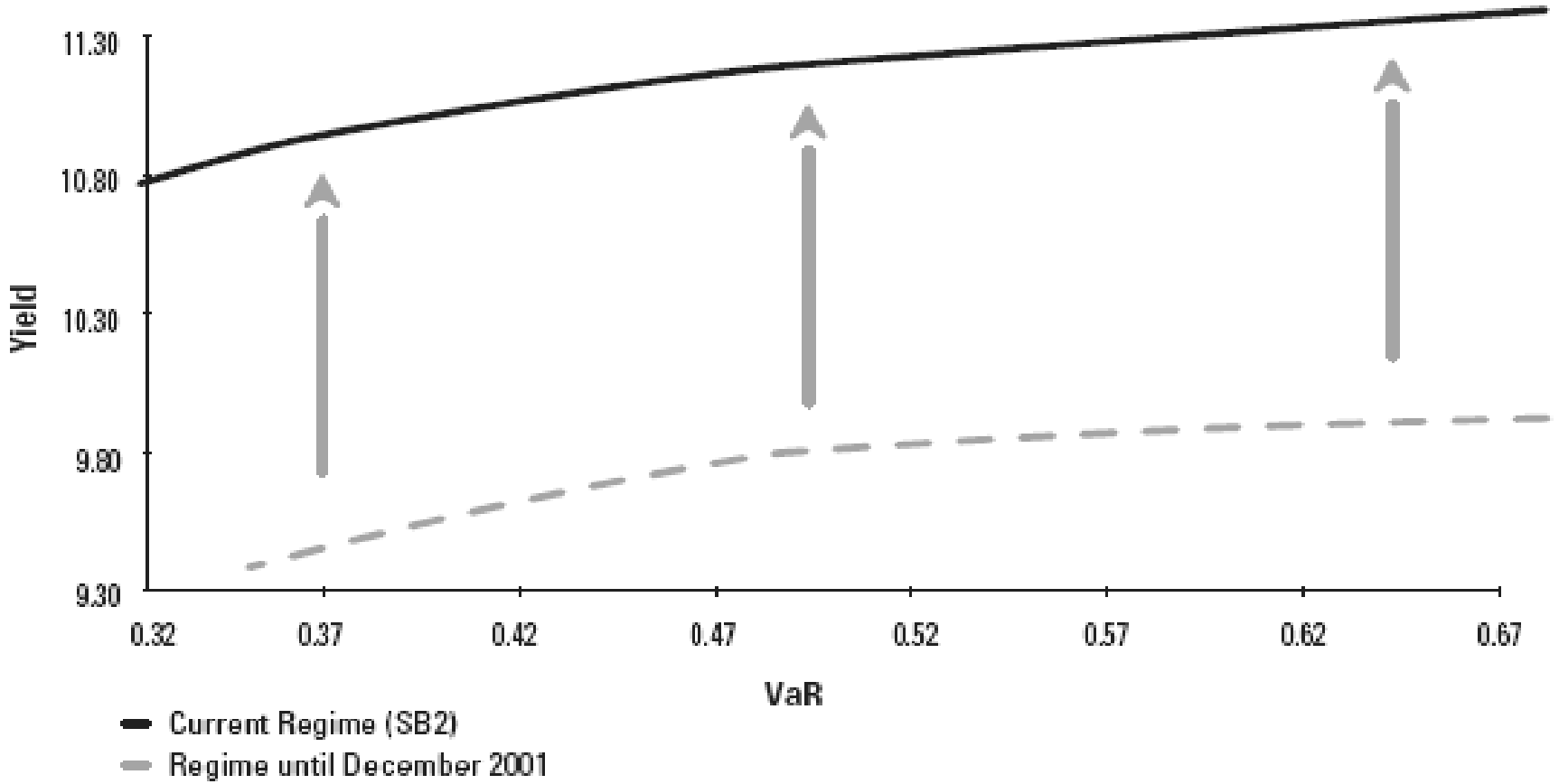
	Siefores Basicas 1			Siefores Basicas 2		
Date	VaR 95% w Derivatives (%)	VaR 95% w/o derivatives (%)	Diference (bp)	VaR 95% w Derivatives (%)	VaR 95% w/o derivatives (%)	Diference (bp)
27-Sep	0.270%	0.270%	0.00	0.450%	0.360%	9.00
28-Sep	0.280%	0.270%	1.00	0.380%	0.360%	2.00
29-Sep	0.260%	0.260%	0.00	0.380%	0.370%	1.00
02-Oct	0.270%	0.260%	1.00	0.380%	0.350%	3.00
03-Oct	0.270%	0.260%	1.00	0.380%	0.360%	2.00
04-Oct	0.270%	0.260%	1.00	0.390%	0.380%	1.00
05-Oct	0.260%	0.250%	1.00	0.400%	0.380%	2.00
06-Oct	0.260%	0.250%	1.00	0.390%	0.380%	1.00
09-Oct	0.280%	0.280%	0.00	0.400%	0.390%	1.00
10-Oct	0.280%	0.290%	-1.00	0.400%	0.390%	1.00

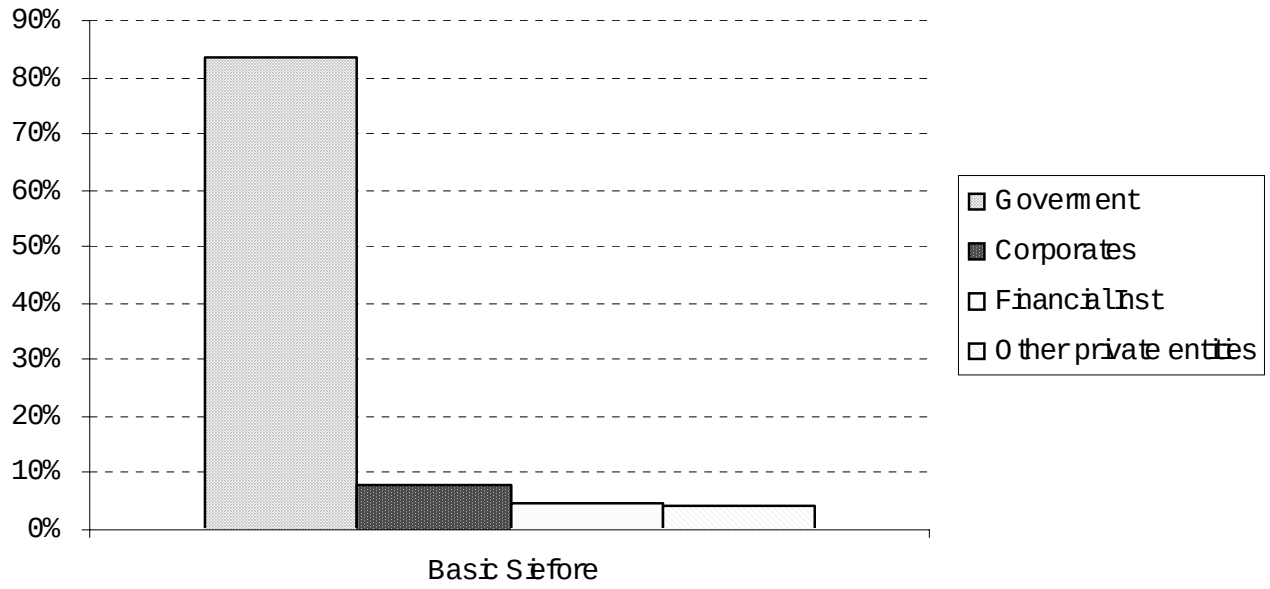
Mexico – Interactions between the VaR Approach and the Investment Regime

- Changes to the investment regime aimed at higher returns and better pensions.
  - Increase investment opportunities per issuer and currency
  - Regulate credit risk by credit quality and not by type of issuer
  - Allow the use of "plain vanilla" derivatives – one of the first LAC countries to do so
- Prerequisites
  - improved skills and experience of the fund managers
  - an adequate risk management infrastructure
  - development of local financial markets.

Expected Impact of Mexican System

Figure 8.8. Impact of Reforms between December 2001 and April 2004: Shift in the Efficient Frontier

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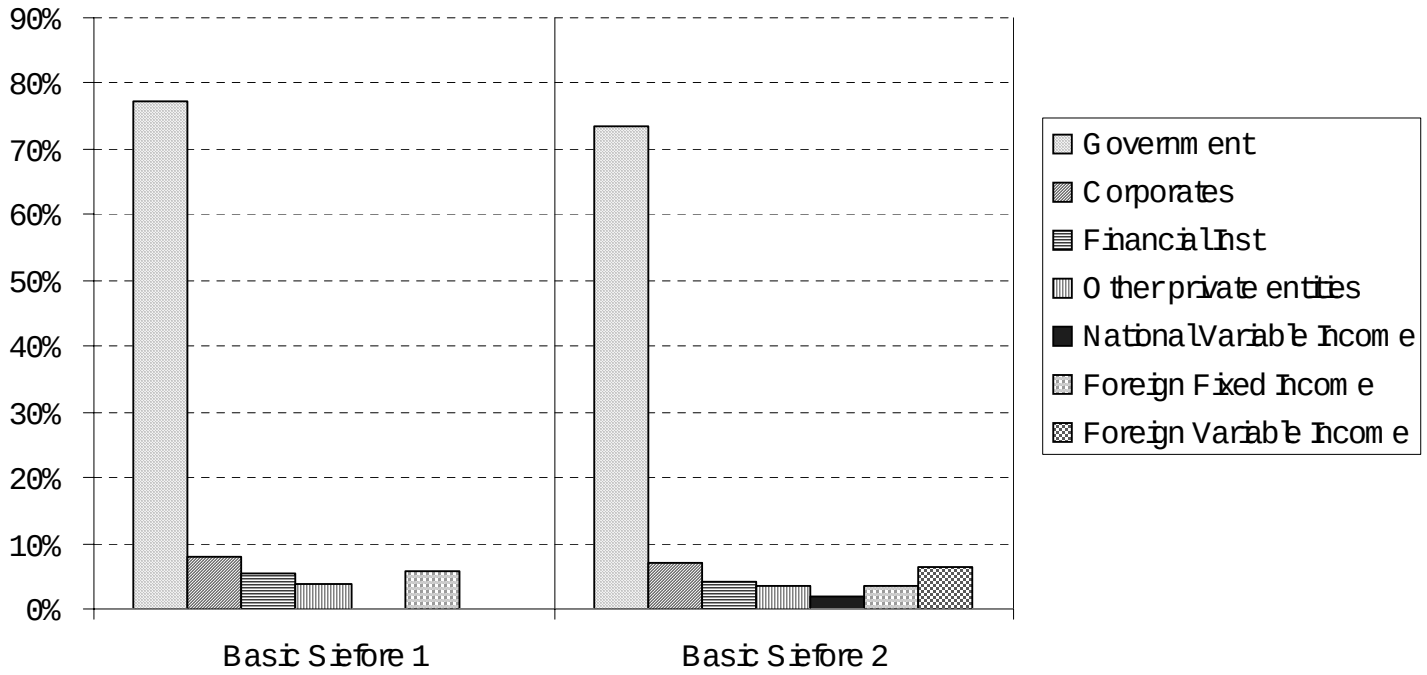
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Mexico – Ongoing Efforts to Develop Risk Scoring Model

- Three modules:
  - Operations
  - Internal controls
  - Financial performance

Mexico – risk scoring model

- Operations module:
  - Registration
  - Transfer
  - Revenues
  - Withdrawals
  - Attention to the worker
  - Promotion
  - Information technology
  - Funds investment

Mexico – risk scoring model

- Internal control module:
  - Planning
  - Implementation and processes monitoring
  - Management of information
- Financial performance module:
  - Returns
  - Solvency
  - Afores liquidity

Mexico – risk scoring model

- Early stages of implementation
- Intended to capture quality of internal risk management and control
- Links with VaR (difference between actual VaR and Cap) still not clear

Mexico:
Internal Risk Management Structure

All Afores must have:

- Operational Risk Committee
- Financial Risk Committee
- Independent risk units headed by a chief risk officer who reports to the Board
- Independent compliance officer whose role soon to be defined by regulation
- Prescriptive regulation that standardizes risk management function across pension funds

Preliminary Evaluation - Mexico

- Expected efficiency gains in investment
- However, no apparent reduction in compliance burden – in fact greater reporting requirements.
- Development of risk scoring model, but not clear that it is being used to determine intensity of supervision
- There has been a move towards riskier investments recently
- Prescriptive/directive approach to build-up of internal risk management

What Lessons and Observations Can be Derived From the Initial Case Studies on Risk Based Supervision?

Influences on the Movement To Risk Based Supervision

- Capacity to move this capital and resulting competition makes country conditions and efficiency of markets key national competitive issues
- Private funds play increasing role in retirement income to limit fiscal exposure and enhance stability
- Pension funds become major source of capital for which national markets compete
- Effective supervision can improve market efficiency through liquidity, corporate governance, transparency thus enhancing national competitiveness
- Effort to improve the efficiency of private funds by limiting opportunity costs and regulatory burden

The Fundamental Challenge: Balancing Efficiency and Security

- There have been two basic supervision paradigms:
  - Transactional: Focus on agency risks and procedural standards, trust based using prudent person principles
  - Structural: Commercial entities, quantitative limits, directed to systemic and portfolio risks – Use of Portfolio Limits as Proxy
- Each establishes a level of security (risks) as the objective without defining acceptable cost and efficiency parameters
- Both can impose potentially high opportunity costs and regulatory burdens
  - Transactional approaches limit investment opportunities based on relationships- consider primarily legal and procedural issues
  - Quantitative approaches presume historic relationship between categories of investments and risk

Australia and Mexico: Similarities

- Both countries concerned with the build up of better risk management in pension funds

- Both countries have some form of risk scoring model.
  - Australian model very sophisticated and used to drive supervision of individual entities
  - Mexico moving in that direction

Australia and Mexico: Differences

- Important difference in addressing financial risk:
  - Mexico: VaR caps + portfolio limits
  - Australia: more subtle, imbedded in risk assessment
- Important differences in approach for achieving improvements in internal risk management:
  - Australia: less prescriptive, more reliance on trustees, allowing differences in internal structures
  - Mexico: more directive, aiming at more standardized internal structures

Effectiveness of RBS in DC Pension Systems

- Preliminary assessments: RBS systems are very young
- RBS can allow relaxation of quantitative controls in exchange for demonstrated risk management capacity
- Encourages greater risk awareness in entities and supervisor
- Provides analytical consistency and discipline in identifying and measuring risks if model is well designed and checks and balances are in place
- Enables better allocation of supervisory resources
- Can lead to efficiency gains and better pensions through:
  - Improved risk-return trade-off
  - Reduction of the regulatory burden and operating costs

Mexico and Australia Represent Convergence of Two Models Toward a New Paradigm

- Movement toward risk management and outcome orientation rather than a focus on structure and compliance - Target becomes the "efficient frontier"
- Incorporates assessments of risk management capacity
- Whole portfolio approach to risk management rather than evaluation of individual instruments
- Movement from normative models to reliance on market pricing and dynamics
- Evaluation of risks through scoring systems that combine quantitative and qualitative standards to establish "supervisory ladders" and "traffic light" approaches
- Selective interventions based on evaluation of the quality of the management of funds and changes in risks rather than routine inspections

Different Approaches Reflective of Starting Points and Conditions

- Common law versus Code legal Foundations
- Number of Funds to Supervise
- Extent of capital market depth and development
- Single Purpose and Integrated Supervisors
- Development and Complexity of Private Pension System
- Political and public risk tolerance
- Capacity to rely on third party warrantee and transparency

Key Issues and Limitations: Risk Scoring and Weighting

- Based on Subjective Judgments of Risk and Mitigation
  - Consistency may be difficult to maintain and defend
  - Open to fragmentation and challenges – Aggregation of rating makes individual elements open to dispute
  - Potentially exposed to political influence and corruption
- Looks to Infrastructure of Risk Management – Limited Standards for Evaluation of Quality – Not Outcome/Results Oriented in Current Development
- Lack of Transparency Makes Linkages to Potential Incentive Effects Difficult
- Implicitly Accepts Losses At Undefined Level Or To Smaller Funds
- Requires Long Start Up Period and Constant Updating of Standards to Addresses Market Development and Innovation

Key Issues and Limitations: Use of Quantitative Measures (Var)

- Addresses Pension Funds as Financial Intermediaries – There Is No Explicit Treatment of Retirement Income Adequacy
  - Start with a presumption of risk tolerance and accept returns and variance as derivative of this
  - Represents the reverse of typical portfolio process which sets return target and acceptable variation and optimizes risks taken to achieve this
- To Be Administrable Using a Single Point on Efficient Frontier as Target – Optimal Only for "Average" Member
  - Can only accommodate variation in risk return preferences in a simplified manner (e.g for predetermined portfolio type)
- Interaction of Various Elements of Regulatory Framework Are Not Considered
- Arbitrary Selection of Parameters – Requires calibration Within Overall Policy Framework

Broader Policy Issues

- Potentially Pro-Cyclical Outcomes and Market Distortions
  - When underlying markets become more volatile funds will be induced to sell risky asset classes – thereby accentuating volatility
- Not Feasible to Implement With Time Horizons Relevant to Pension Funds
  - Feasible time periods reduce returns – preclude time diversification gains
- Must Either Limit its Asset Classes to Observable Returns or Accept Limitations of Off Market Pricing
- Relies on Historical Relationships of Asset Classes and Risk Management Methods That May Not Hold in the Future
  - Potentially Significant Policy Errors in Developing Markets
  - Limits Access to new Products

Some More Practical Questions

- All RBS methods implicitly accept some level of losses – Will need to be effectively aligned with structure and financing of guarantees
- Although they are directed toward reducing compliance burdens and improving efficiency so far there is no accepted way to measure these trade-offs and gains
- The degree of political fortitude in maintaining this approach in a financial crisis remains untested

Some Other Challenges

- Accommodating diversity and individual choice
  - Multiple portfolios are required to address increasingly varying needs – Complicates standards required
  - Creates need for education and advice – raises significant problems of conflicts of interest for financial services industry
- Enhancing corporate governance
  - Pension funds will become major owner of equities and often only large shareholders
  - Regulatory standards and oversight by supervisor will have significant effect on market transparency and efficiency
- Development of centers of high level financial and technical expertise within supervisory authority and effective deployment of this across operating units – Capacity to pay competitive wages
- Introducing relevant outcome measures and performance standards for supervisors
- Managing change in "culture" and "mentality" of supervisors