

# Gestão Integrada do Balanço: Uma Visão Atual

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**Cláudio Paiva**

**2º Congresso Internacional de  
Gestão de Riscos**

**FEBRABAN**

São Paulo, 22 de outubro de 2012

# Agenda

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- A evolução de ALM: evidências recentes
  - Os efeitos da Crise que se iniciou em 2007
  - Requerimentos do negócio e demandas regulatórias
  - Integração entre Riscos e Finanças
  - Perspectiva do Regulador
  - Perspectiva dos Bancos
- Gestão Integrada do Balanço
  - Balanço X Capital X Liquidez
  - Visão prospectiva
- Implementando Gestão Integrada do Balanço
  - Consistência dos dados e das premissas
  - Integrando cenários econômicos X opcionalidades do balanço X estratégias da IF

# A crise de 2007...

**UNITED STATES BANKRUPTCY COURT  
SOUTHERN DISTRICT OF NEW YORK**

**REPORT OF  
ANTON R. VALUKAS, EXAMINER**

**LEHMAN BROTHERS**

FWC070111.EDM



**WACHOVIA**

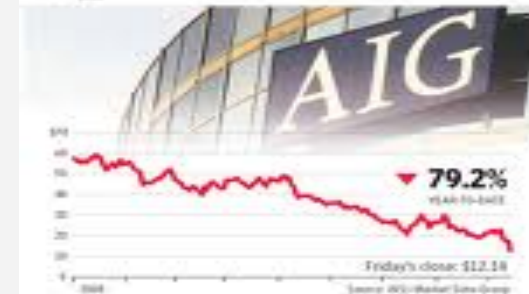
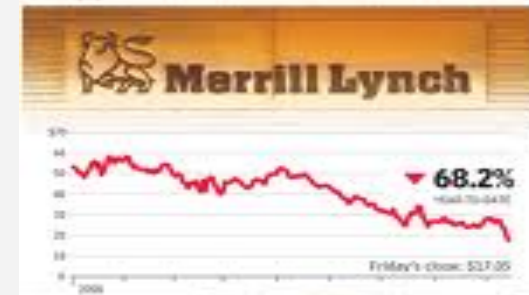
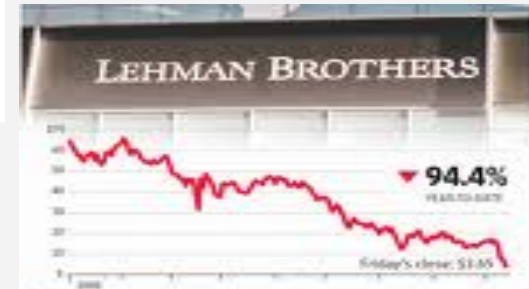


**Merrill Lynch**



**WaMu**

**BEAR  
STEARNS**



**The failure of the Royal Bank of Scotland**

Financial Services Authority Board Report



**FSA**<sup>®</sup>

Financial Services Authority

# The Turner Review

A regulatory response to the  
global banking crisis

March 2009

# Turner Review – 2009

## comissionado em outubro 2008

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- O que podemos aprender com a crise de 2007/2008?
  - Modelos matemáticos sofisticados falharam?
  - Produtos complexos como crédito estruturado
    - Preços baseados em modelos sofisticados
    - Ausência de dados históricos para ratings
  - Riscos espalhados no balanço de forma complexa e pouco transparente
  - Hipóteses de liquidez se alteraram dramaticamente devido à falta de mercado de certos produtos
  - Atenção como produtos/ operações são classificadas (disponíveis para negociação, etc.)
  - Nem todos os riscos podem ser geridos ao nível da IF
- Silos!!

# A review of corporate governance in UK banks and other financial industry entities

Final recommendations

26 November 2009

## Walker Review – 2009

comissionado em fevereiro 2009



# TOWARD EFFECTIVE GOVERNANCE *of* FINANCIAL INSTITUTIONS

The report is wide-ranging in its coverage of the composition and functioning of FI boards and the roles of regulators, supervisors, and shareholders.

30

Group of Thirty

G30  
2012



# Pesquisa conduzida pela PwC “antiga” mas ainda atual

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- **Balance sheet management benchmark survey**
  - Status of balance sheet management practices among international banks
    - © 2009 PricewaterhouseCoopers LLP (1º semestre 2009)
  - This study covers the four main areas of balance sheet management, namely interest rate risk management, liquidity risk management, capital management and management of discretionary investment portfolios.
- **Conclusões da Pesquisa:**
  - ⇒ The scope of balance sheet management has expanded to embrace capital management as well as a more ‘holistic’ view of the balance sheet, **although this remains a work in progress.**



# *Key Findings*

## “Balance sheet management benchmark survey”

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**Overall governance:** There is still a trend for banks to measure, manage and monitor the different risks separately, but an encouraging trend is the establishment of either capital management committees, or a broader mandate for the existing Asset-Liability Committee (ALCO) to focus on capital.

**ALM unit roles and responsibilities:** The responsibility for the ALM unit is almost evenly divided between the Treasury and Chief Financial Officer (CFO) functions (see Figure 3.1). Only 51% of ALM units look at capital management (see Figure 3.2), but in certain cases capital management lies with other departments, such as the Chief Risk Officer (CRO).

# *Key Findings*

## Balance sheet management benchmark survey

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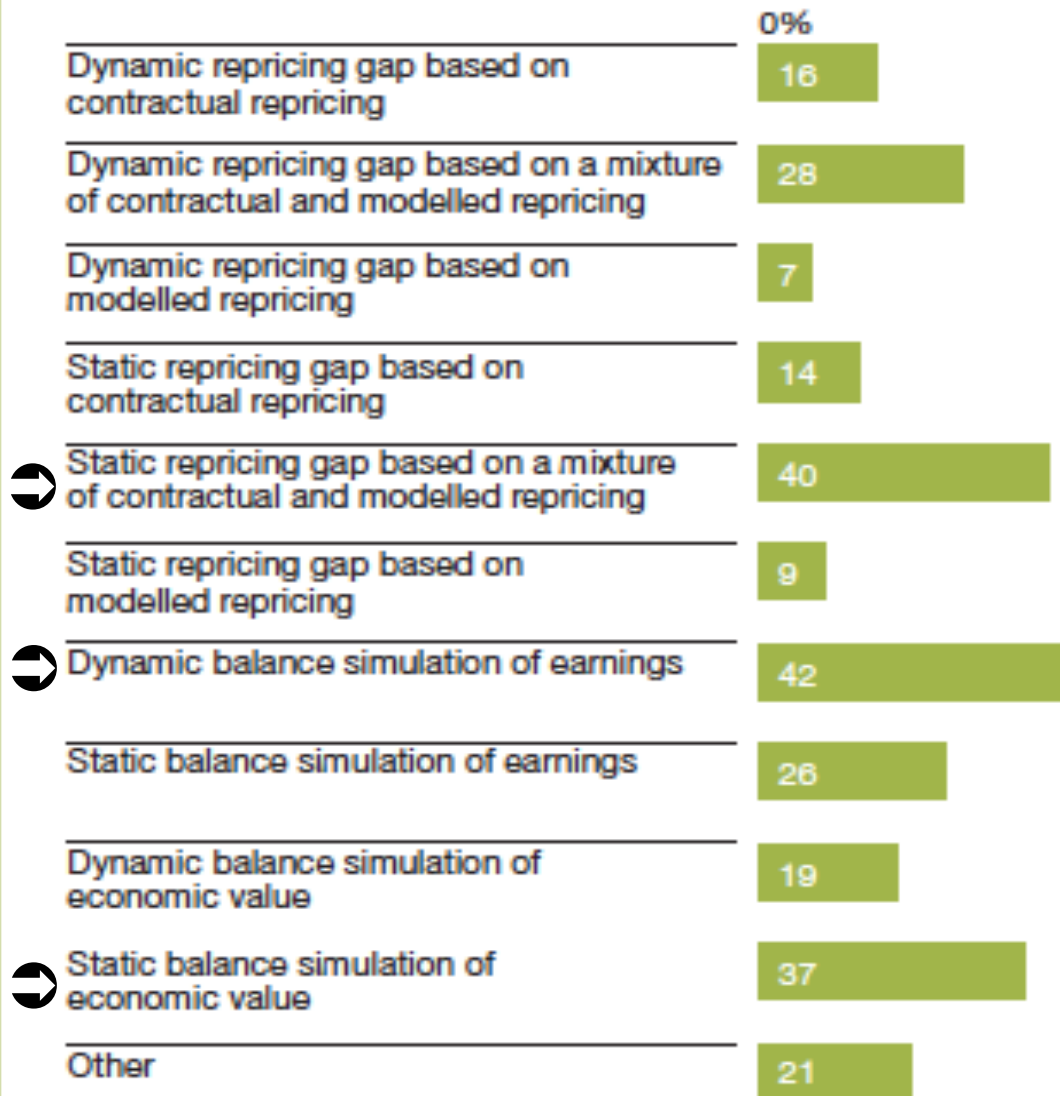
**Interest rate risk:** Governance remains an area of potential weakness for interest rate risk management, with the ALM unit responsible for both management and measurement in around half of respondents (emerging best practice is for measurement to be done by an independent unit, such as Finance). However,

There has been further progress towards development of economic value measurement (as recommended by the BCBS), and 80% of respondents now assign capital to Interest Rate Risk in the Banking Book (IRRBB) under Basel II Pillar 2 (in Australia it is part of Pillar 1). However, these capital measures are still quite crude, with many banks using either the standard 200 bp shock or Net Interest Income (NII) simulation.

## IRRBB

- Risco de reapreçamento de ativos, passivos e posições fora do balanço
- Risco de base
- Risco de curva de taxas de juros
- Opcionalidades referentes a taxas de juros embutidas nos produtos bancários

Figure 5.10: Primary measurement tool for IRRBB



# *Key Findings*

## Balance sheet management benchmark survey

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**Capital management:** This includes capital planning, stress testing, capital allocation and economic capital calculation, and tends to sit broadly in the CFO function, although economic capital and stress testing at a number of banks resides within the CRO's area. With capital planning sitting in Finance, having capital stress tests conducted in Risk can give rise to issues around the consistency and coordination of linkages.

# *Key Findings*

## Balance sheet management benchmark survey

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**Systems:** Banks still tend to operate with a patchwork of legacy systems set up to manage different aspects of the balance sheet (liquidity risk, interest rate risk, etc.), but significant changes are planned. With different systems, any kind of integrated balance sheet management simulation and stress testing is virtually impossible. We anticipate that, over the coming years, banks will upgrade to a more integrated approach, allowing planning and stress scenarios to be carried out across all aspects of the balance sheet. We expect that these integrated systems will cover:

- IRRBB and funds transfer pricing;
- Liquidity risk;
- Capital planning and stress testing; and
- Credit portfolio management.



# “Transforming the CFO role in financial institutions”

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A report from the Economist Intelligence Unit in collaboration with CFO Research Services

2011

**Aligning risk and finance: The benefits and the barriers**

# “Transforming the CFO role in financial institutions”

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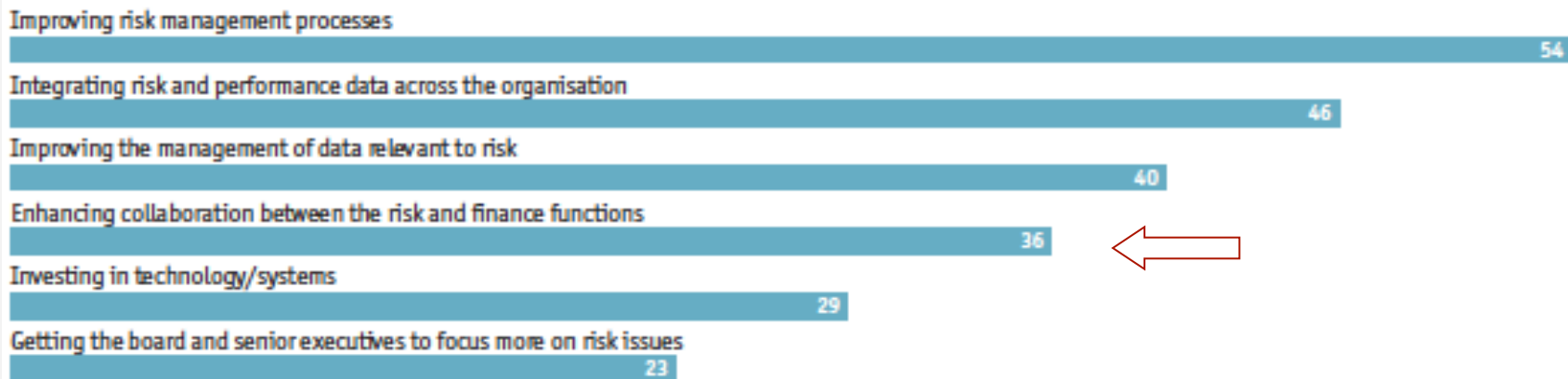
- Tighter alignment is part of the emerging competitive landscape
  - A central element of the integration of risk considerations into the management and operation of financial institutions is the improvement of alignment between the risk and finance functions. The push in this direction predates the 2008-09 global financial crisis.
  - Alignment, of course, does not mean merger.
- Structured co-operation can enhance collaboration between finance and risk
  - Better alignment between the risk and finance functions, then, is both necessary and profitable. Improved data are an important part of the picture, and financial institutions are working towards this aim.



# “Transforming the CFO role in financial institutions”

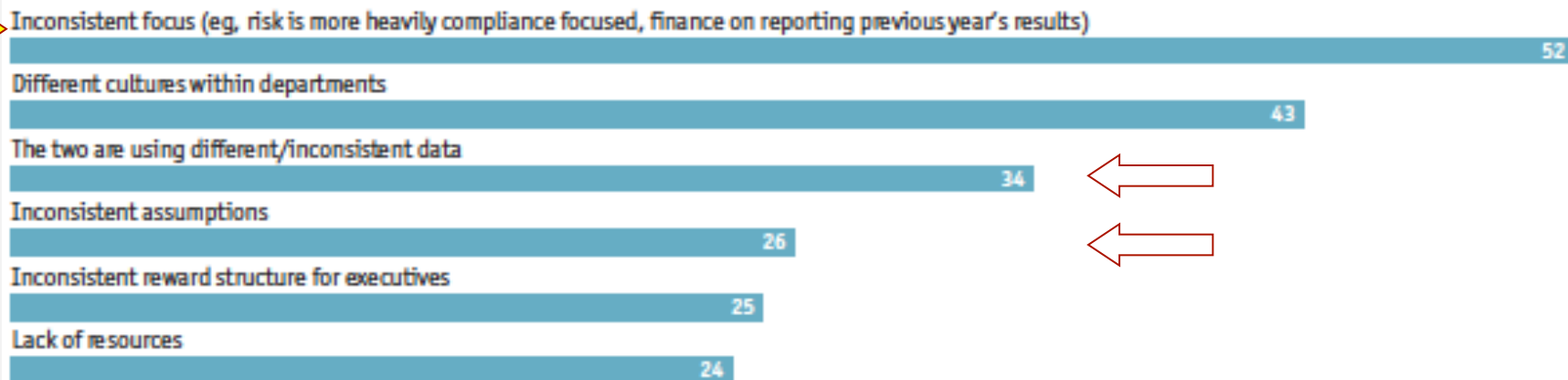
## Which of the following represent the highest risk-related priorities within the finance organisation?

(% respondents)



## What are the major barriers to better aligning the finance and risk functions at your company?

(% respondents)



# Managing risk and capital

By Mike Baxter, Thomas Olsen and Mark Judah

**Banks' future hangs in  
the balance sheet**

BAIN & COMPANY

“A comprehensive analysis by Bain & Company of approximately 200 banks around the world reveal how banks are modifying a broad range of practices they relied on before the crisis in order to better compete in the new environment”.

# "Banks' future hangs in the balance sheet"

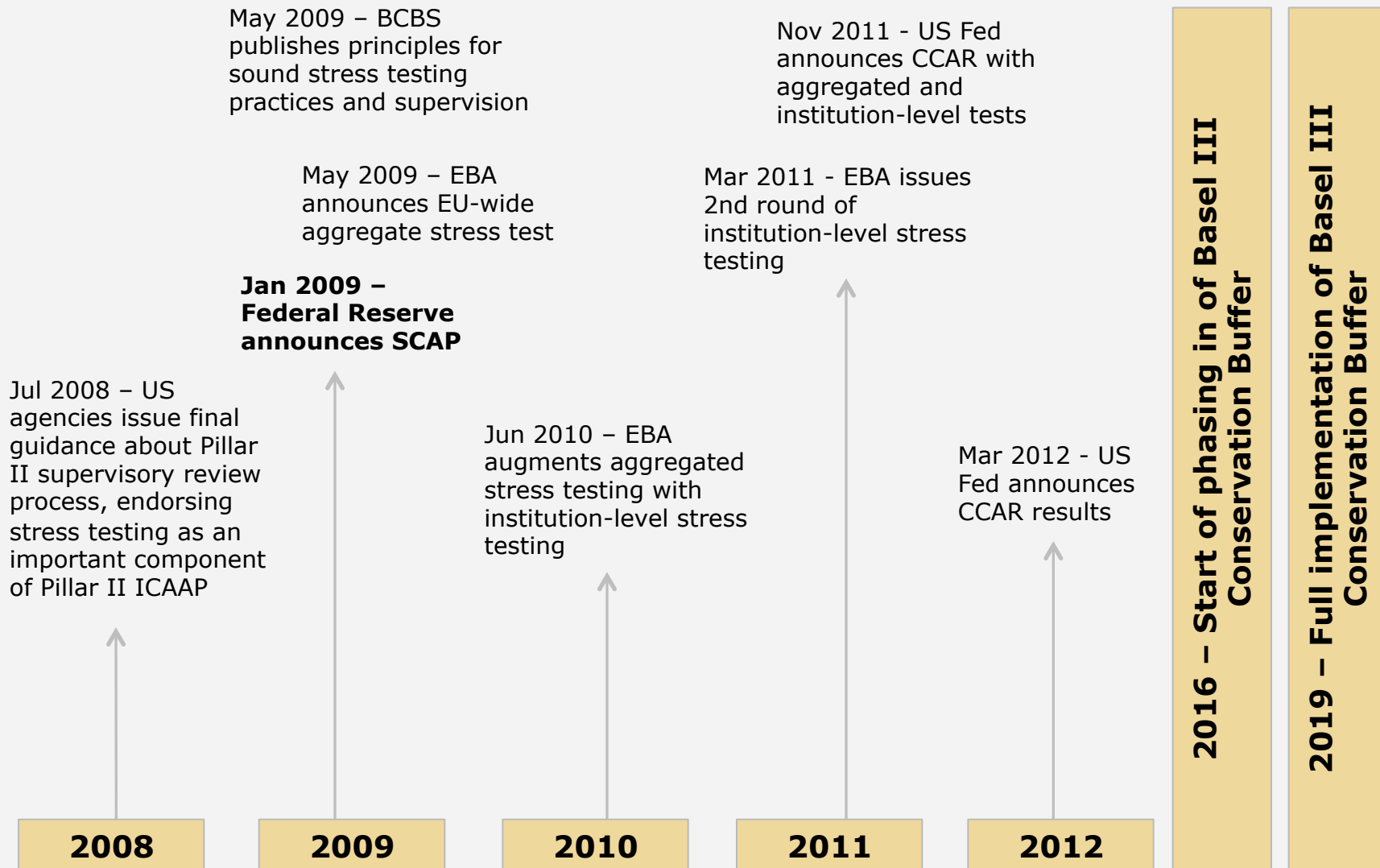
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- Leading banks now recognize that the ability to fully account for risk, capital and liquidity in line decisions will be a source of competitive advantage.
- *Meeting the new standards will put a big dent in banks' return on equity and make it much harder for them to exceed their cost of capital. As banks begin to come to grips with these new realities, it is clear that many have been using an incomplete map to guide their business. The pursuit of revenue and earnings growth with insufficient attention to the balance sheet ran them into a ditch.*

**O QUE DIZEM OS  
REGULADORES?**

# Testes de stress regulatórios

**2004 – BCBS publishes Basel II rules requiring stress testing, under Pillar I and as a component of Pillar II ICAAP**



# Testes de Stress

## SCAP, CCAR, EBA

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| Pre-SCAP   | Post-SCAP  |
|--|--|
| <ul style="list-style-type: none"> <li>• Mostly single shock</li> </ul>                  | <ul style="list-style-type: none"> <li>• Broad macro scenario and market stress</li> </ul>       |
| <ul style="list-style-type: none"> <li>• Product or business unit level</li> </ul>       | <ul style="list-style-type: none"> <li>• Comprehensive, firm-wide</li> </ul>                     |
| <ul style="list-style-type: none"> <li>• Static</li> </ul>                               | <ul style="list-style-type: none"> <li>• Dynamic and path dependent</li> </ul>                   |
| <ul style="list-style-type: none"> <li>• Not usually tied to capital adequacy</li> </ul> | <ul style="list-style-type: none"> <li>• Explicit post-stress common equity threshold</li> </ul> |
| <ul style="list-style-type: none"> <li>• Losses only</li> </ul>                          | <ul style="list-style-type: none"> <li>• Losses, revenues and costs</li> </ul>                   |

**Table 2: Features of stress testing, pre- and post-SCAP**

“Stress Testing Banks”  
 Til Schuermann, 2012

# Testes de Stress

## SCAP, CCAR, EBA

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- Exemplo: *Supervisory Capital Assistance Program (SCAP)*
  - Construção de um modelo de gestão integrada de riscos para efetuar testes de stress em vários componentes simultaneamente:
    - Receitas
    - Perdas
    - Requerimentos de capital
    - Novos cenários de volumes e demais opcionalidades
    - Restrições de liquidez
  - **Objetivo: prover suporte consistente do plano de negócios do banco.**
- Validação dos inputs é parte crítica do processo!



# CCAR

## Comprehensive Capital Analysis and Review

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- *Attempt to evaluate capital planning process of 30 largest BHCs, to assess their ability to continue operations through economic and financial market stress*
  - Focus not on ability to raise capital but ability to manage capital
  - In addition to stress testing, evaluated quality of each BHC's capital planning process
- Stress test component involved 4 scenarios and 25 variables
  - Assessed ability to sustain Tier 1 Common ratio > 5%, Tier 1 ratio > 6%, and Tier I Leverage Ratio > 3 or 4%, through 9 quarters in all scenarios
  - Not a one-off event. Designed to reveal and resolve deficiencies in capital planning process on an ongoing basis

# CCAR

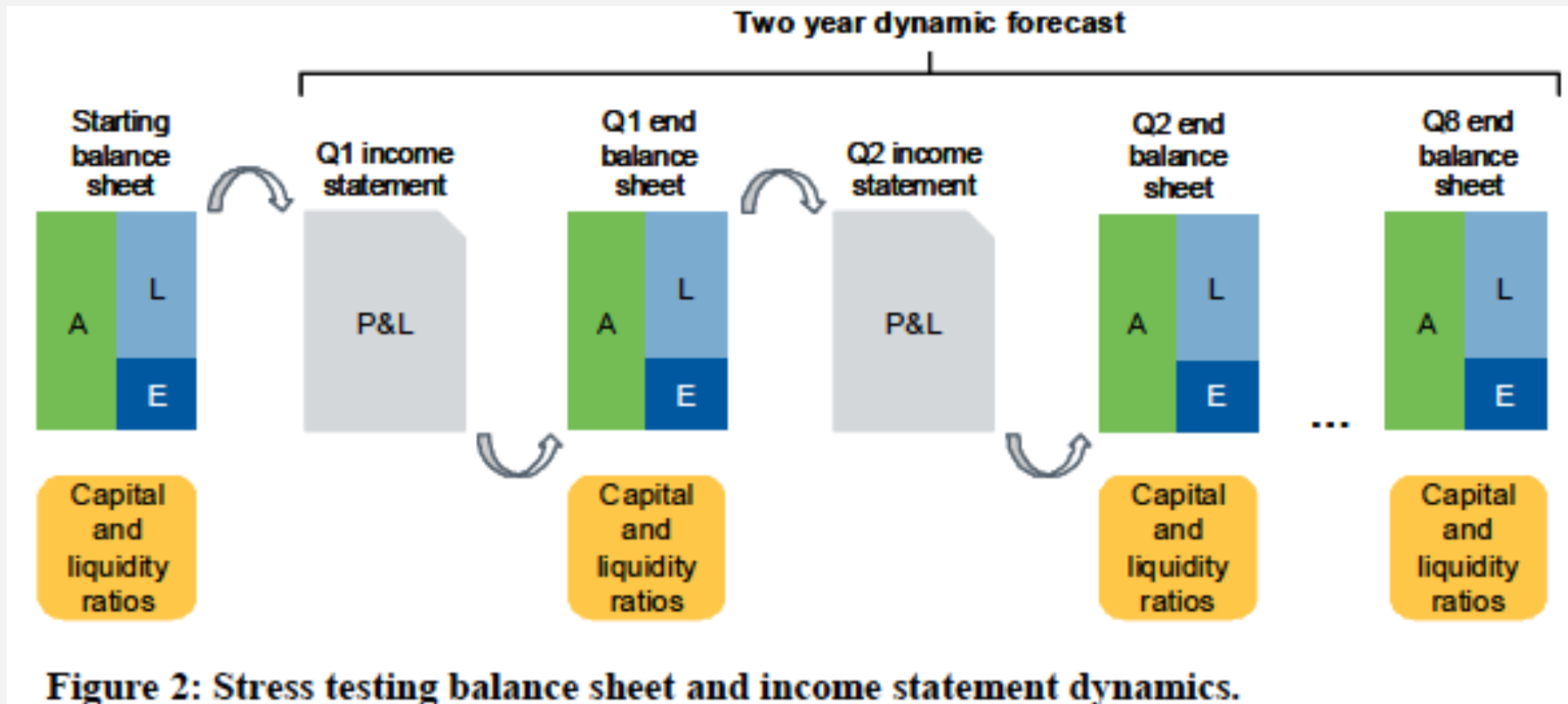
## Comprehensive Capital Analysis and Review

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- More than simply a stress tests. Fed also evaluates BHC's
  - Capital policy
  - Comprehensive capital plan
  - Reasonableness of assumptions and analysis underlying the capital plan
- At least four scenarios
  - BHC Baseline
  - Supervisory Baseline
  - At least one BHC Stress
  - Supervisory Stress
- BHCs submit annual capital plans to the Federal Reserve:
  - Description of BHC's process for assessing capital adequacy
  - Planned capital actions (dividends, share repurchases, issuance)
  - BHC's capital policy governing capital distribution and issuance
  - Projections of sources and uses of capital over 9-quarter forward horizon under expected and stressed economic conditions

# Testes de Stress

## SCAP, CCAR, EBA



## Compilation of documents that form the global regulatory framework for capital and liquidity

| Date         | Documents   |
|--------------|---|
| 11 June 2012 | Report to G20 Leaders on Basel III implementation   |
| 21 Dec 2011  | Application of own credit risk adjustments to derivatives - consultative document   |
| 20 Dec 2011  | Core principles for effective banking supervision - consultative document   |
| 19 Dec 2011  | Definition of capital disclosure requirements - consultative document   |
| 25 Oct 2011  | Treatment of trade finance under the Basel capital framework  |
| 01 Jun 2011  | Basel III: A global regulatory framework for more resilient banks and banking systems - revised version June 2011             |
| 20 Dec 2010  | Capitalisation of bank exposures to central counterparties - consultative document  |
| 16 Dec 2010  | Basel III: International framework for liquidity risk measurement, standards and monitoring                                   |
| 13 Jul 2009  | Revisions to the Basel II market risk framework - final version   |
| 30 Jun 2006  | Basel II: International Convergence of Capital Measurement and Capital Standards: A Revised Framework - Comprehensive Version |

ICAAP

Basel 2.5

IRRBB

Basel III





# **BANCO CENTRAL DO BRASIL**

## **RESOLUÇÃO Nº 3.988, DE 30 DE JUNHO DE 2011.**

Art. 2º Para os efeitos desta Resolução, define-se o gerenciamento de capital como o processo contínuo de:

I - monitoramento e controle do capital mantido pela instituição;

II - avaliação da necessidade de capital para fazer face aos riscos a que a instituição está sujeita; e

III - planejamento de metas e de necessidade de capital, considerando os objetivos estratégicos da instituição.

Parágrafo único. No gerenciamento de capital a instituição deve adotar uma postura prospectiva, antecipando a necessidade de capital decorrente de possíveis mudanças nas condições de mercado.

# FSA Guidance (jan 2011) asset & liability management

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Financial Services Authority

**Finalised guidance**

**ASSET AND LIABILITY MANAGEMENT**

January 2011



# Dear CEO – ALM

## FSA 2011

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Dear CEO

I am writing to set out the ‘good practices’ we have observed during our asset and liability management (ALM) examinations over the last year<sup>1</sup>. I also want to take this opportunity to expand on these observed practices and set out some suggestions that may make your ALM functions more effective. Smaller firms should consider the content of this letter proportionately and in the context of their own business model.

*Our views are based on a number of in-depth reviews of treasury functions and associated risks as part of introducing the new liquidity regime, as well as our ongoing supervisory assessments and reviews. This work covered a wide range of firms – including both large and small banks and building societies, overseas banks operating in the UK, and some larger investment firms. As part of this work, we have attended as an observer a number of senior ALM committees, as described more fully in this letter, and received senior ALM committee minutes and papers from a wide range of firms.*



# Dear CEO – ALM

## FSA 2011

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- Four key themes emerged from our work in this area:
  1. The role of the senior ALM committee.
  2. The composition and authority of the senior ALM committee.
  3. The forward-looking nature of, and decisions made by, the senior ALM committee.
  4. The degree of challenge observed at the senior ALM committee.

# Dear CEO - ALM

## FSA 2011

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### 1. The role of the senior ALM committee

ALM is a key management function that spans the **entire legal entity and group**, as appropriate. The exact scope of ALM can vary – for example, oversight for non-traded market (interest) risk in the banking book might be the responsibility of a separate market risk committee, sitting alongside the senior ALM committee. We also appreciate that the senior ALM committee **may additionally be responsible for monitoring capital and risk-weighted assets**. But this letter deliberately does not comment on the ALM function in relation to capital, risk-weighted assets, traded market risk or credit risk.

### 3. The forward-looking nature of, and decisions made by, the senior ALM committee

Our reviews highlight that the senior ALM committee is often **unduly preoccupied with monitoring and commenting on the past rather than on proactive management of the future**. We accept that the senior ALM committee needs to undertake a degree of monitoring to ensure the risk appetite set by the governing body is complied with and provide risk updates to EXCO and the wider governing body. However, good senior ALM committees (appear to) **focus more on the affects of the future plans, strategy at the entity** and, where appropriate, group level on assets and liabilities.

# Dear CEO - ALM

## FSA 2011

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### Qual o objetivo do ALCO?

The ALM committee focuses on the **entire balance sheet**. Its core purpose, from our experience, is:

- **to ensure that individual business lines are aligned in terms of the firm's overall objectives and proactively controlled, with regard to the prudential risks under the ALM's control (liquidity, and funding risk and interest-rate risk in the banking book);**
- to ensure that all ALM risks remain within the risk appetite set by the governing body; and
- to evaluate and assess the impact of other **potential driver of earnings volatility**, such as competitive pressures or non-interest rate related changes to market conditions.

In many firms, the ALM function is responsible for designing and implementing an appropriate funds transfer pricing mechanism. Effective senior ALM committees regularly review this mechanism to ensure all business areas are aligned with and incentivised according to the firm's strategic objectives and risk appetite.

# BIS – BCBS 222

## *consultative document – junho 2012*

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- Principles for effective risk data aggregation and risk reporting
  - 1. One of the most significant lessons learned from the global financial crisis that began in 2007 was that banks' information technology (IT) and data architectures were inadequate to support the broad management of financial risks. Many banks lacked the ability to aggregate risk exposures and concentrations quickly and accurately at the bank group level, across business lines and between legal entities. ...  
...
  - 4. Many in the banking industry recognise the benefits of improving their risk data aggregation capabilities and are working towards this goal. ...  
Supervisors observe that making improvements in risk data aggregation capabilities and risk reporting practices remains a challenge for banks, and supervisors would like to see more progress, ...

# BIS – BCBS 222

## *consultative document – junho 2012*

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- 8. The adoption of these principles will enable fundamental improvements to the management of banks. These principles are expected to support a bank's efforts to:
  - Enhance the infrastructure for reporting key information, particularly that used by the board and senior management to identify, monitor and manage risks;
  - Improve the decision-making process throughout the banking organisation;
  - Enhance the management of information across legal entities, while facilitating a comprehensive assessment of risk exposures at the global consolidated level;
  - Reduce the probability and severity of losses resulting from risk management weaknesses;
  - Improve the speed at which information is available and hence decisions can be made; and
  - Improve the organisation's quality of strategic planning and the ability to manage the risk of new products and services.



BANK FOR INTERNATIONAL SETTLEMENTS

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# **Shareholder value and stability in banking: Is there a conflict?**

**Speech by Jaime Caruana**

General Manager, Bank for International Settlements

Morgan Stanley European Financials Conference

London, 27 March 2012

- Rentabilidade & adição de valor!

O QUE OS BANCOS ACHAM  
DE TUDO ISSO?



Inside Business

February 28, 2011

## Brighter future for bank stocks as believers join the fold

By Patrick Jenkins

*Why would you ever invest in a bank?*

It's a natural enough question. Between January 2008 and December 2010 banks globally **lost 41% of their stock market value**, much worse than the broader market (minus 29%). And the reams of rules and regulations introduced after the financial crisis threaten to **drag down future profitability**.





September 30, 2012

## Wall Street: Leaner and meaner

By Tom Braithwaite

*Banks confront a post-crisis world of tougher regulations and lower profits*

When [Goldman Sachs](#) went public in 1999, it was able to boast an **ROE** of more than 40%, although it was never again to reach such levels. Last year it racked up its worst ever ratio: 3.6%.

If the institutions adjust to the new financial landscape, the employees who remain are going to have to adjust, too. Their bosses insist that bonuses will have to fall if banks are to **deliver a decent return for investors.**

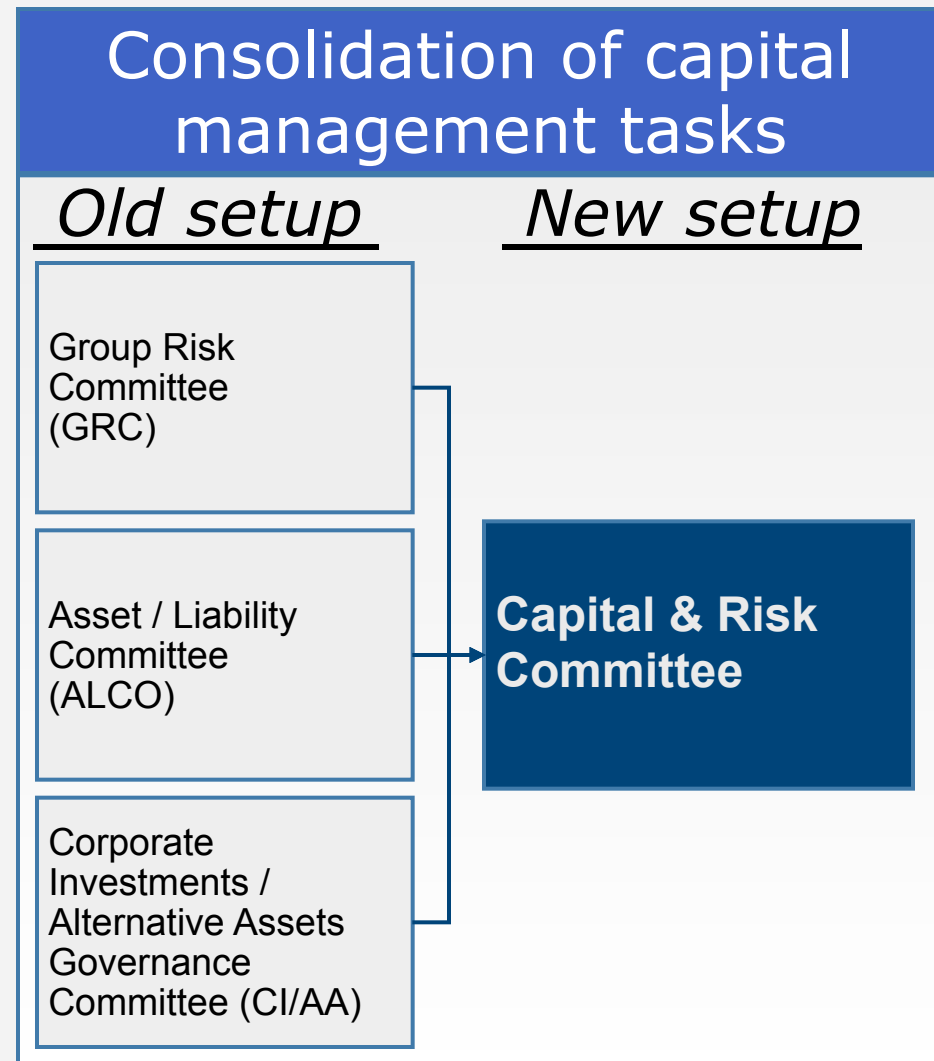
**Some bankers are finding it hard to adapt to the new Wall Street.**

# Deutsche Bank

## 2007/2008

### Newly formed Capital & Risk Committee (CaR)

- Composition: CRO (Chair), CFO, MRM, CRM, TCM plus Executive Level Business Heads
- Key advantages
  - Explicit management responsibility for all capital drivers
  - **Integrated planning and monitoring of business and risk profiles to maximize capital performance**
  - Ongoing capital consumption control



# Deutsche Bank

## Annual report 2011

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- Deutsche Bank like all other financial institutions will continue to be impacted both by the changing competitive landscape and a stricter regulatory environment and it continues to operate in an environment that exposes it to significant litigation risks.
- Risk management, capital adequacy and balance sheet efficiency will remain increasingly important as competitive differentiators. Deutsche Bank Management has improved our capital, liquidity and refinancing structures, which are crucial for future success.

# ING

Barclays Global Financials Conference, 11/09/2012

## Basel 3 is a catalyst to manage Bank Balance Sheet more efficiently

**Balance Sheet stable at EUR 900 bln**

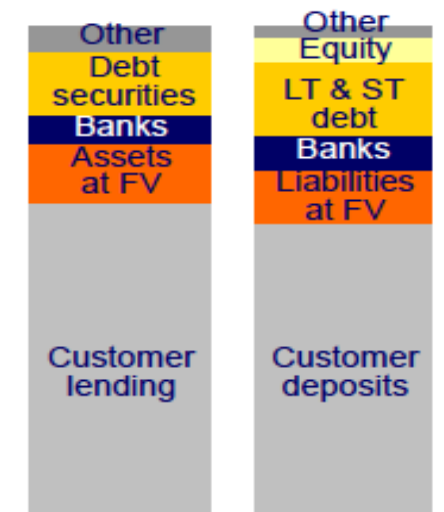
Evolve investment portfolio into liquidity portfolio and continue to de-risk

Reduce non-strategic trading assets and redesign products to mitigate CVA impact

Grow customer lending and selectively shift towards higher margin areas; re-price to reflect increasing cost of capital

### Ambition 2015

~ EUR 900 bln



Strong capital generation to grow into Basel III requirements

Extend long-term debt profile and reduce reliance on short-term professional funding

Continue to build on strong deposit gathering ability as primary source of funding

Assets      Liabilities

|          |         |
|----------|---------|
| CT1      | ≥10%    |
| RoE*     | 10-13%  |
| LCR      | >> 100% |
| NSFR     | > 100%  |
| LtD      | < 1.1   |
| Leverage | <25     |

# Key priorities for balance sheet optimisation

**Continue strong deposit growth**

**Reduce short-term funding**

**Replace low-yielding assets with customer lending**

**Transform investment book into liquidity portfolio**

**Balance sheet integration**

## **Re-pricing mostly in business lending**

- Pricing discipline (centralised pricing model) for new production and existing portfolio
- Review of non-core (low returning) client relations

## **Selective shift to higher-yielding assets**

- Balance sheet optimisation will allow us to continue to support our customers and grow our loan portfolio without growing the balance sheet

## **Balance sheet integration**

- Align capital, assets and liabilities



# Nedbank

## annual report 2011

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NEDBANK  
GROUP

### BALANCE SHEET MANAGEMENT:

Over the past five years or so, and after the global financial crisis, the landscape of banking has changed fundamentally, together with very significant regulatory developments (eg Basel II and now Basel III).

Accordingly, Nedbank Group has embedded worldclass balance sheet management (BSM) across the following five core functions:

- Risk management.
- Funding and liquidity management.
- Capital management.
- Margin management.
- Strategic portfolio management (eg portfolio tilt).

# Nedbank

## gestão por valor

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- The strategic impact of Basel III internationally is very significant, changing business models and potentially reducing return on equity (ROE) extensively.
- Maximising economic profit (EP) form part of the four key strategic focus areas of Nedbank Group, a carefully structured, integral and holistic component of the group's 'manage for value' emphasis, involving strategic portfolio management and client value management.

# Nedbank

## objetivos buscados

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- Target an optimal balance sheet and income statement shape and mix.
- Maximise Economic Profit and ROE via optimising EP-rich activities.
- Optimise the strategic impact of Basel III.
- Reduce TTC earnings volatility.
- Optimise the risk profile versus return of the group, aligned with the approved risk appetite.
- Embed a culture of client value management in all businesses.



**O QUE É GESTÃO INTEGRADA  
DO BALANÇO?**

# Situação atual

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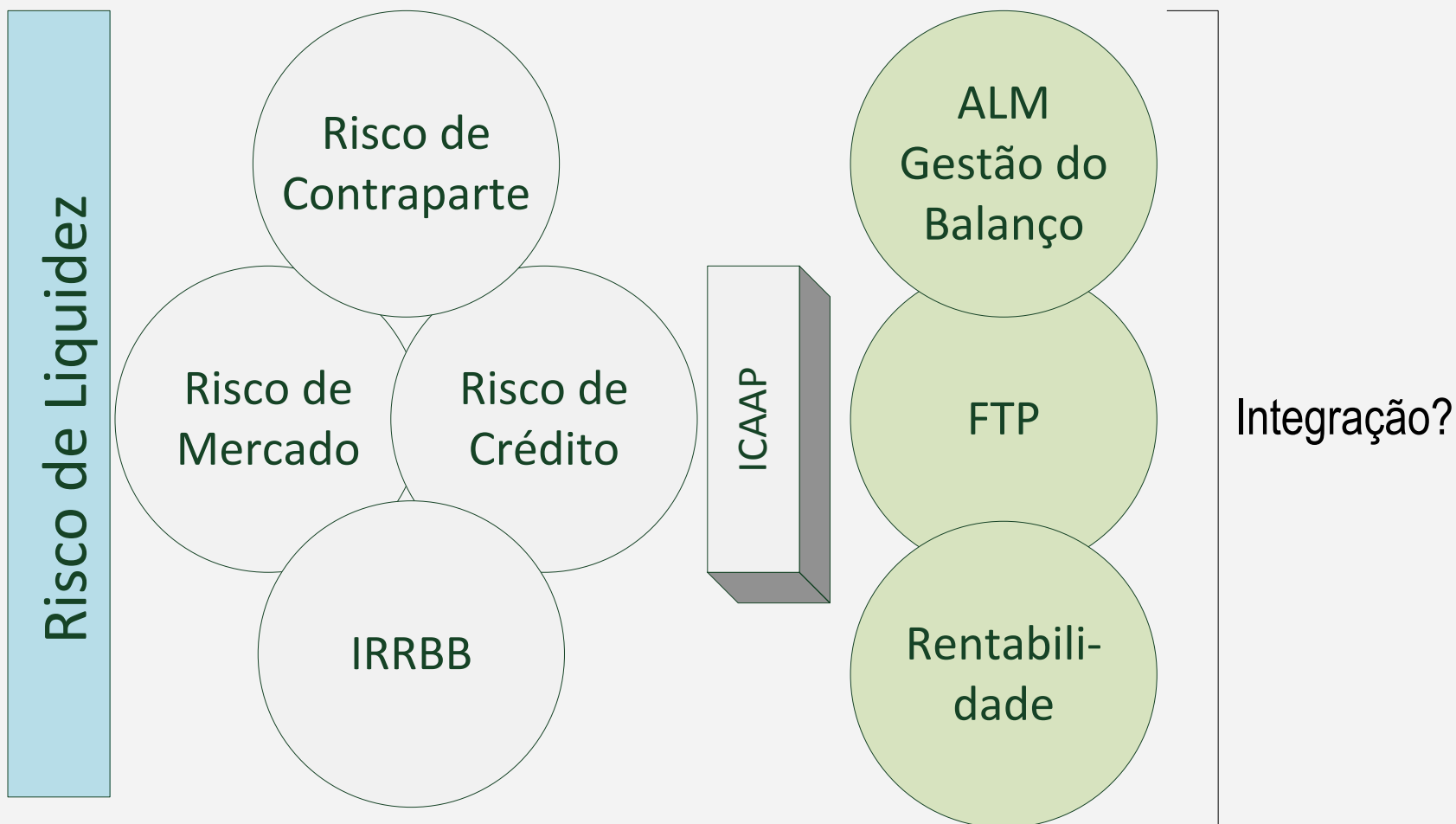
1. Ambiente de negócios mais desafiador
  1. Mercados voláteis
  2. Spreads cada vez mais comprimidos
2. Maior complexidade do balanço
3. Aumento do custo regulatório
  1. Custos diretos (pessoal e sistemas)
  2. Capital (mais e melhor)
4. Maior foco no balanço atual
  1. E o futuro?

# Situação atual

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5. Processo de gestão fragmentado/ insuficiente
  1. Foco restrito e/ou pouco integrado
  2. Área de Risco como Compliance
    - Gerar relatórios regulatórios
  3. Finanças como análise das demonstrações financeiras do ano anterior
6. Ambiente interno
  1. Silos
    - Tipos de riscos
    - Finanças/ risco
    - Áreas de negócio
  2. Múltiplos processos correlatos
  3. Processos fragmentados

# Processo fragmentado



# Gestão Integrada do Balanço

## definição!

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**Gestão Integrada do Balanço** – É um conjunto de processos e medidas visando prover uma visão simultânea e consistente do perfil de risco e de rentabilidade/valor adicionado, incluindo restrições de capital, a que a instituição está submetida visando subsidiar decisões estratégicas e o planejamento de capital da IF, observando tanto a posição atual bem como fornecendo uma visão prospectiva dinâmica.

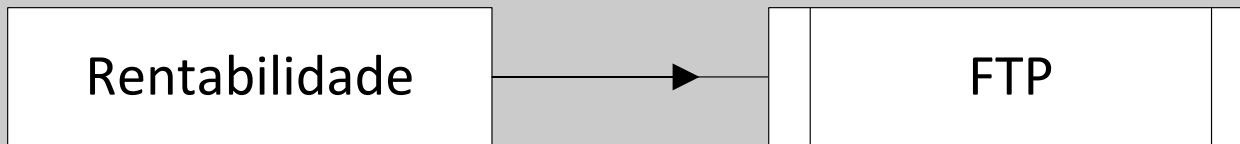
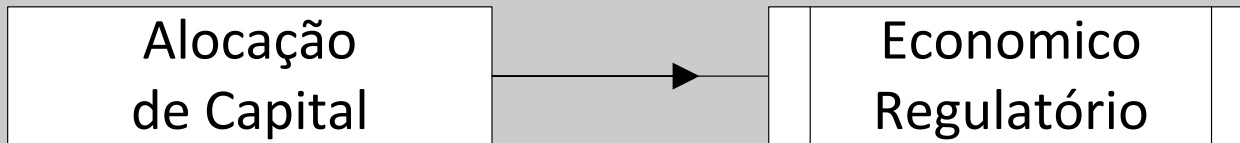
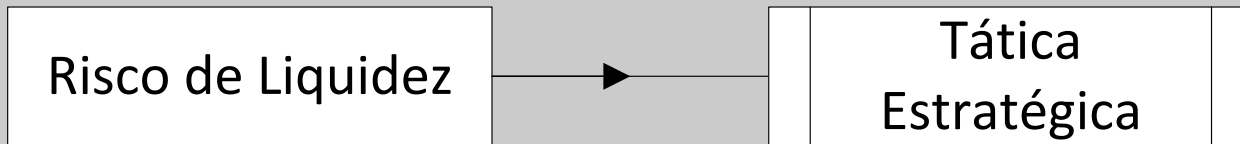
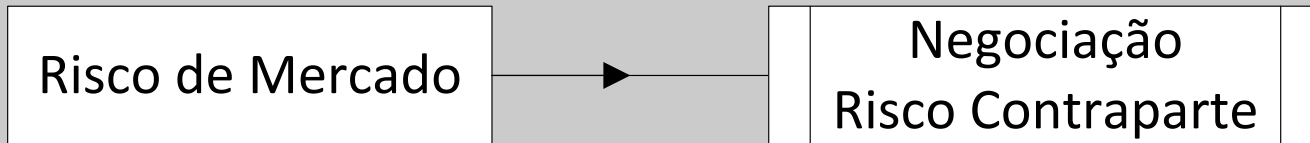
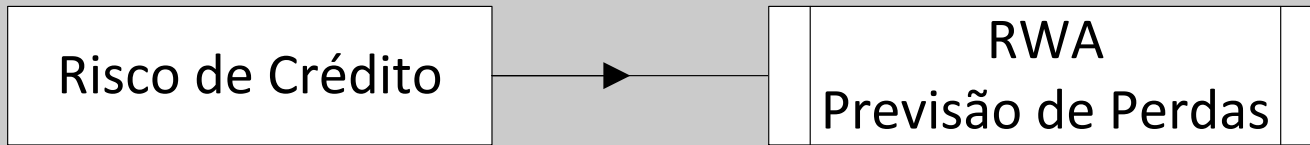
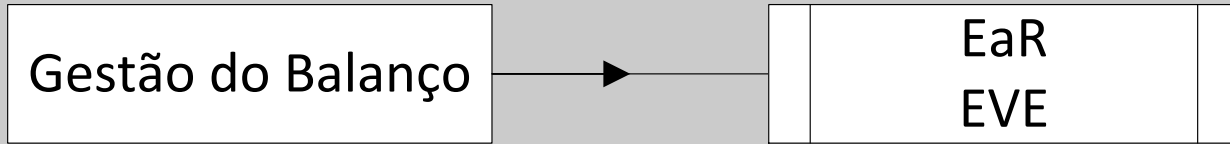
Concerne prioritariamente o processo de tomada de decisões estratégicas em toda a Instituição

- Alocação de recursos dentro da IF
- Foco no comportamento futuro
- **Rentabilidade sustentável (no tempo)**

# Ingredientes

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- Integração dos diferentes aspectos da gestão do balanço visando obter uma abordagem integrada, colaborativa e consistente:
  - ALM
    - IRRBB, EaR(resultados), EVE (valor econômico)
    - NII – net interest simulation
  - Risco de crédito/ mercado
    - Econômico e regulatório
  - Risco de liquidez
    - LCR, NSFR
  - Planejamento de capital
    - RWA (risk-weighted assets)
    - Alocação de capital econômico e regulatório
  - Testes de stress macroeconômico
  - Rentabilidade
    - FTP
      - Taxas de juros
      - Preço de transferência de liquidez
    - RAROC



# Benefícios

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- Propiciar uma visão integrada e global de riscos da instituição
- Identificar riscos e antecipar o comportamento atual e futuro do Balanço com maior antecedência e precisão, incorporando cenários de mercado, de comportamento e de estratégias corporativas
- Aumentar a competitividade dos produtos e apoiar o seu desenvolvimento
- Promover alocação efetiva e eficiente de capital e seu planejamento futuro
- Reduzir a volatilidade dos resultados
- Estabelecimento de apetite de risco da IF

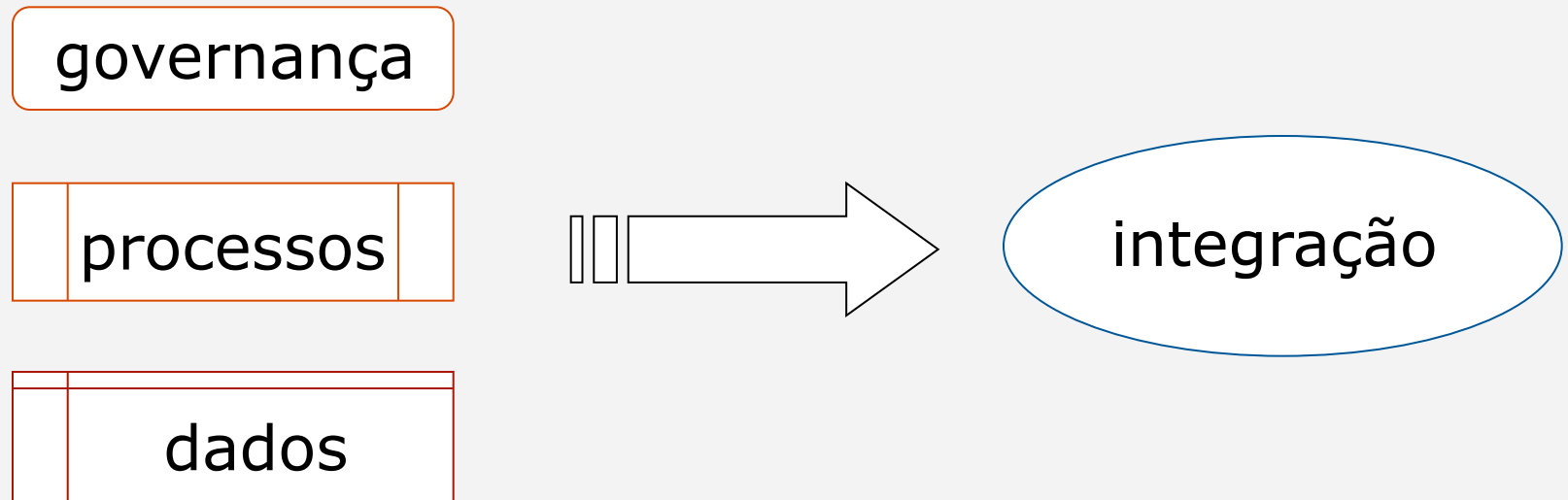


# Novas necessidades

## novas soluções

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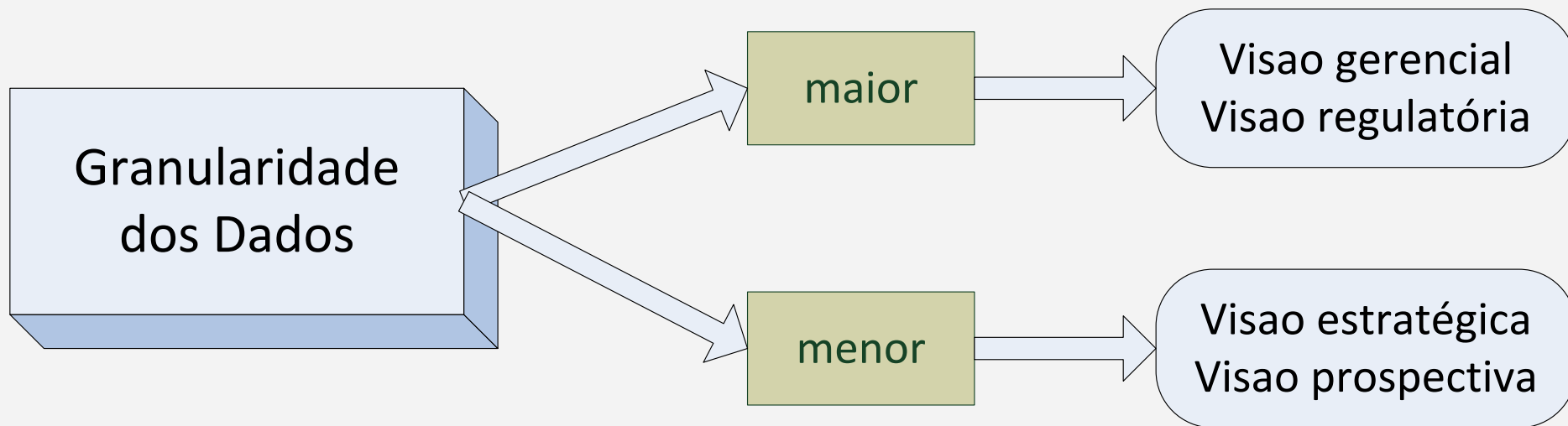
- Necessidade de aprimoramentos na gestão de riscos e do balanço abrange três frentes



# Implementação

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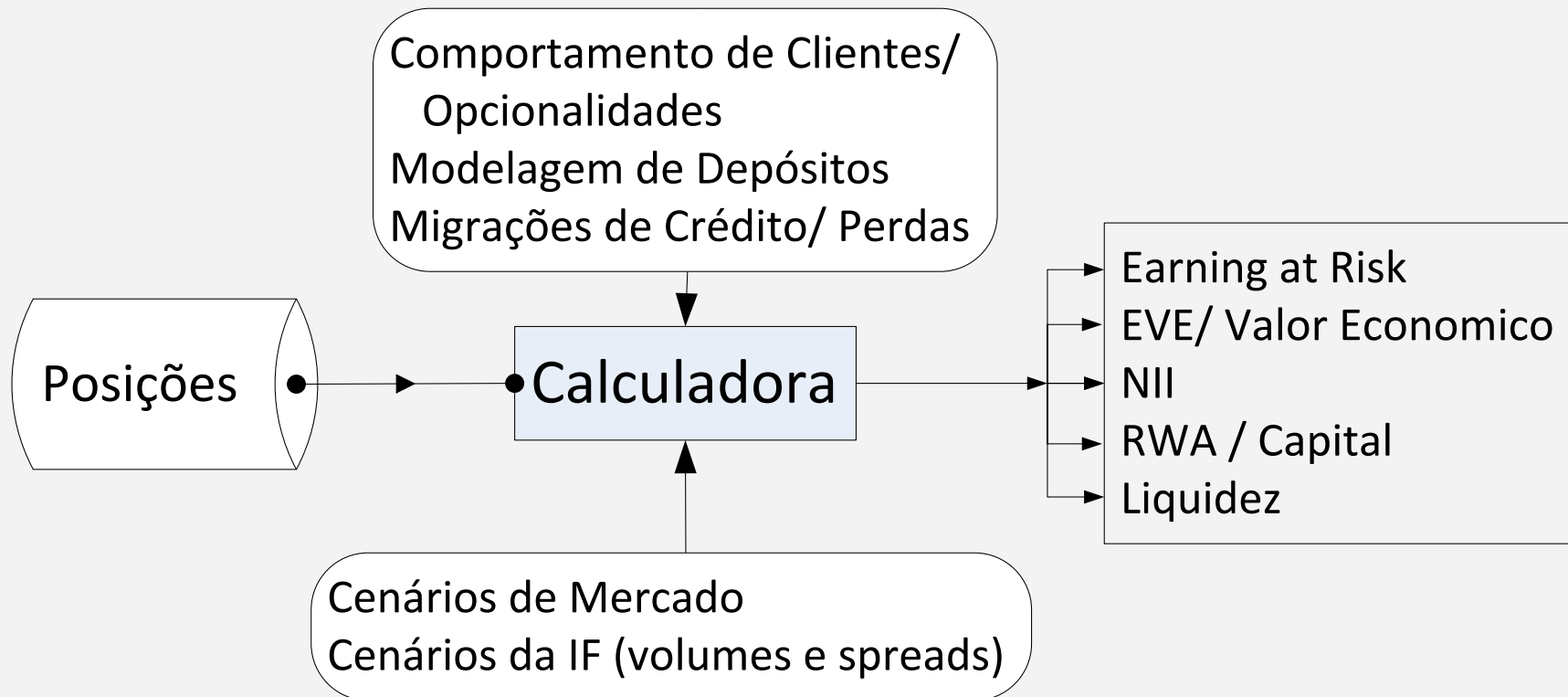
- **Disciplina de dados**
  - Trabalho cooperativo das diversas áreas
  - Repositório com uma visão única de dados e com premissas consistentes
  - **Disciplina!**
- **Granularidade dos dados**



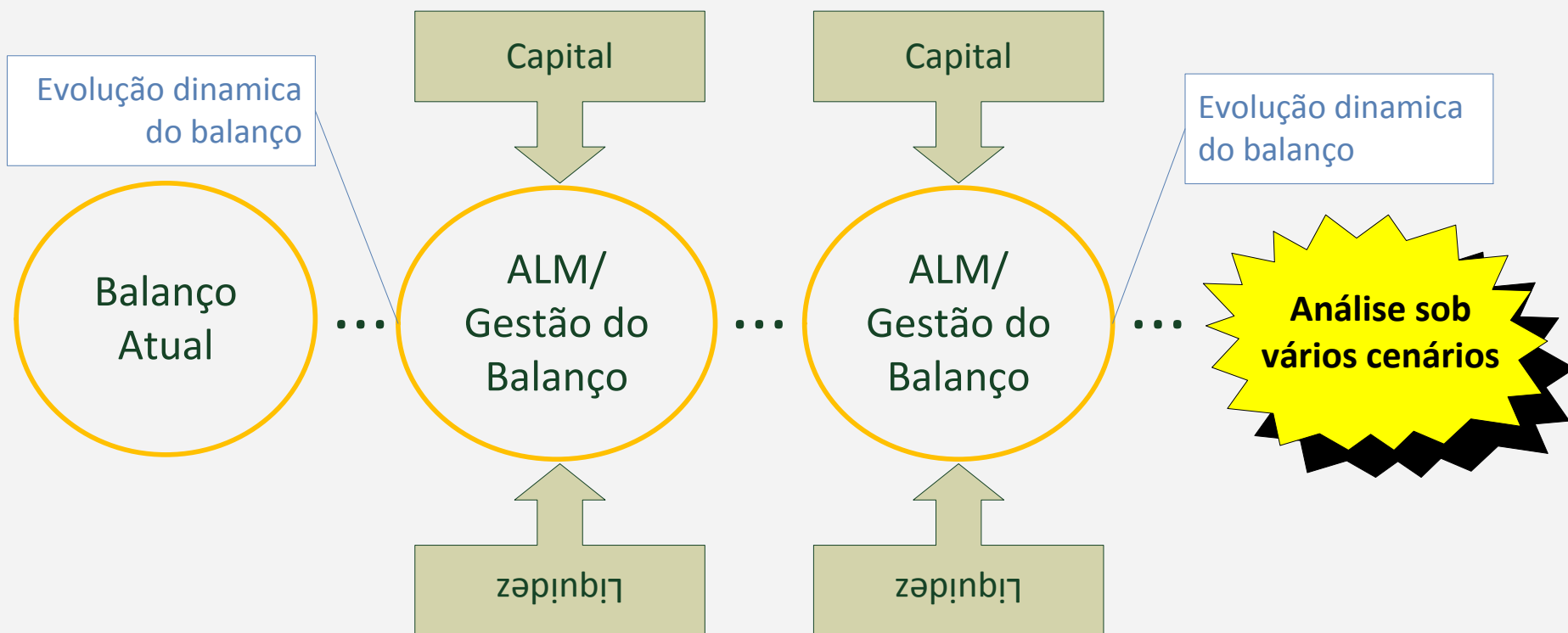
# Implementação

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Conjunto abrangente de medidas & análises



# Implementação visão prospectiva



Cláudio Paiva

Sócio-Diretor

Analitix Soluções em Finanças

Av. Pedroso de Moraes, 38

São Paulo, SP

Tel 11 3814 4491

[claudio.paiva@analitix.com.br](mailto:claudio.paiva@analitix.com.br)