

Value and Capital Management

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Session 1: Intro and RAPMs

Contents

1. Introductions and organization
2. Motivation for Value Management
3. Better Information – Role of RAPMs

Agenda

	Session
08:30-09:00	Registration
09:00-10:30	Session 1: Introductions, Better Information
10:30-11:00	Coffee break
11:00-12:30	Session 2: Better Information (cont)
12:30-13:30	Lunch
13:30-15:00	Session 3: Better insights
15:00-15:30	Coffee break
15:30-17:30	Session 4: Better decisions
17:30	End of workshop

Introductions

Biography



2008 – current: Chief Risk Officer for Allianz Group
Chief Risk Officer Dresdner Bank

2005 – 2008: Chief Risk Officer for ING Insurance

2002 – 2005: Global Head, Finance & Risk Practice, Oliver Wyman

1998 – 2002: CFO & CRO for Swiss Re New Markets

1990 - 1998: Global Head, Risk Practice, McKinsey & Company

1989 PhD in Economics from Stanford University

1984 BSc in Business Administration from the
University of California at Berkeley

Author, *Value and Capital Management: A Handbook for the Finance and Risk Functions of Financial Institutions*

What I hope
to get from
the seminar:

- Give you my perspective on managing value in insurance and banking
- Engage you in a constructive debate, learn from our discussions

And what
about you?

- Who are you and what do you want to get from the seminar?

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Question: What measures are most used in strategic planning and performance measurement ?

1. Earnings and/or revenue growth
2. Return on economic capital
3. Return on book capital
4. Cost income ratios
5. Shareholder or intrinsic value?

The old paradigm: Focus on earnings and growth, less emphasis on capital, none on internal metrics...

Which three measures are most used for strategic planning and decision making?

1. Earnings and earnings growth

 2. Revenues and revenue growth

 3. Cost or cost/income ratios

 4. Return on book capital

 5. Return on economic capital or economic profit

 6. Market share

 7. Other

 8. Market or shareholder value, Embedded Value, Intrinsic Value
-

...based on the P/E multiple as a crude link to shareholder value.

Drive shareholder value by driving earnings growth

$$V = Ex \frac{P}{E} \quad \Leftrightarrow \quad \Delta V = \Delta Ex \frac{P}{E}$$

A simple experiment

- Marginal capital investment: €10
- Return: €0,10 or 1%
- Cost of Capital: 10%

- The alternative is to return capital to shareholders
- The investment increases earnings, but it destroys value

Unfortunately, P/E is „silent“ on risk, capital and the cost of capital

Looking forward, real challenges to earnings growth ...



Economic Environment

- Anemic growth
- Low rates
- Asset volatility

Regulatory Pressure

- Capital & leverage
- Conduct & consumer protection

Paradigm Shifts

- Technology
- New competitors
- Demographics

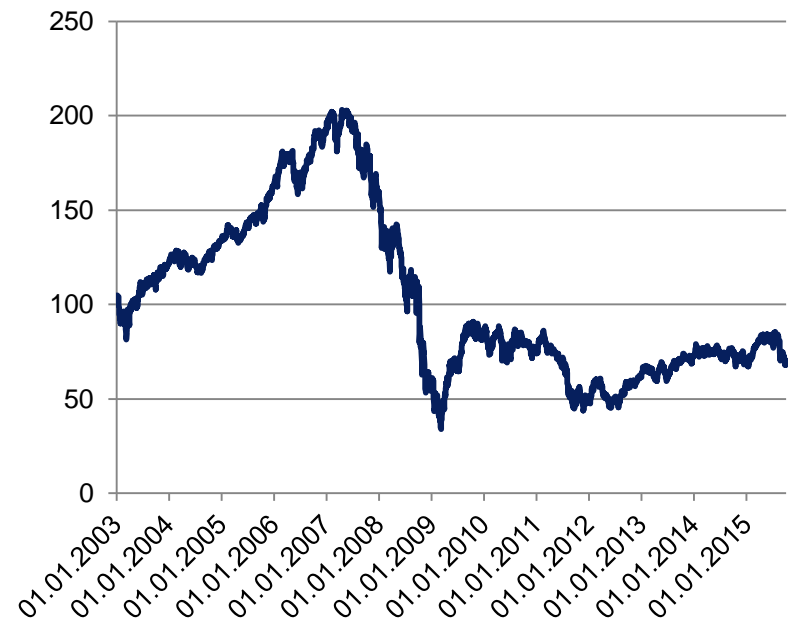
A turbulent ride for banks and insurers

Eurostoxx Insurance and Bank Index, 2003-2015

Euro Stoxx Insurance

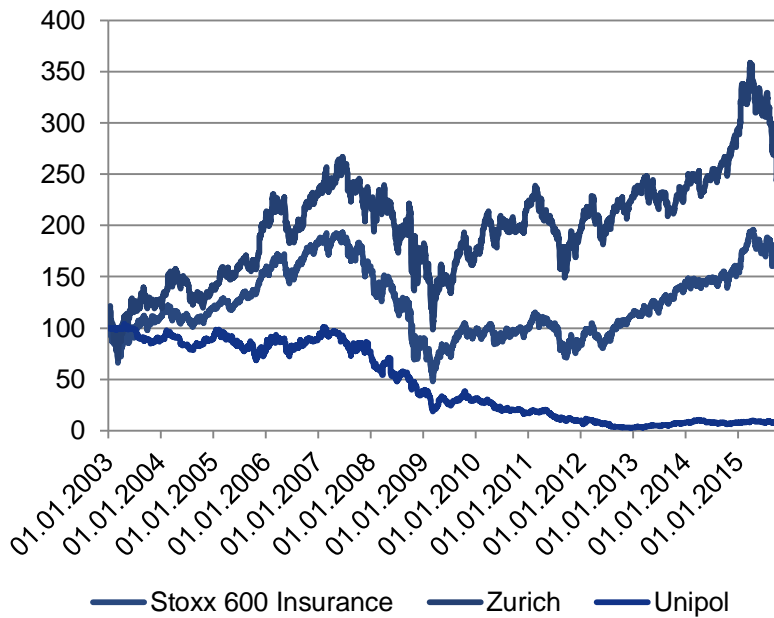


Euro Stoxx Banks

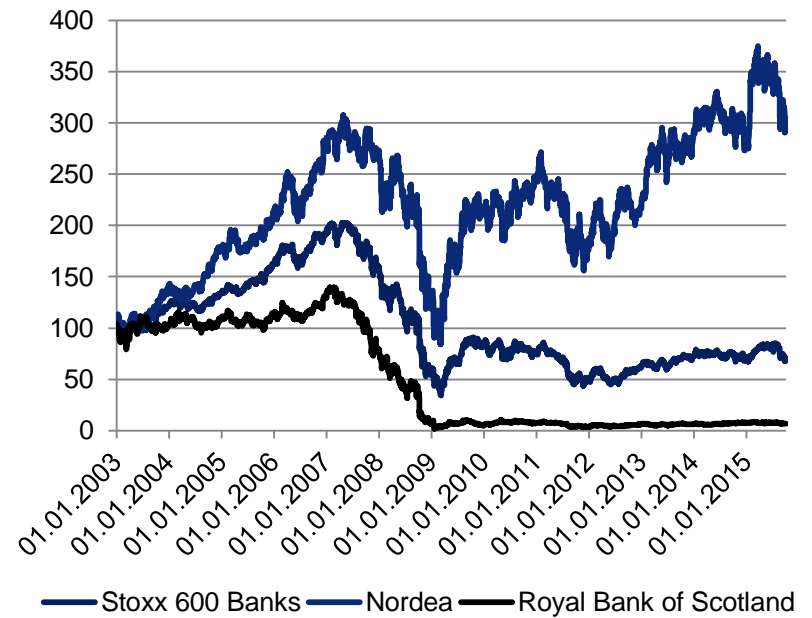


But some prosper more than others.

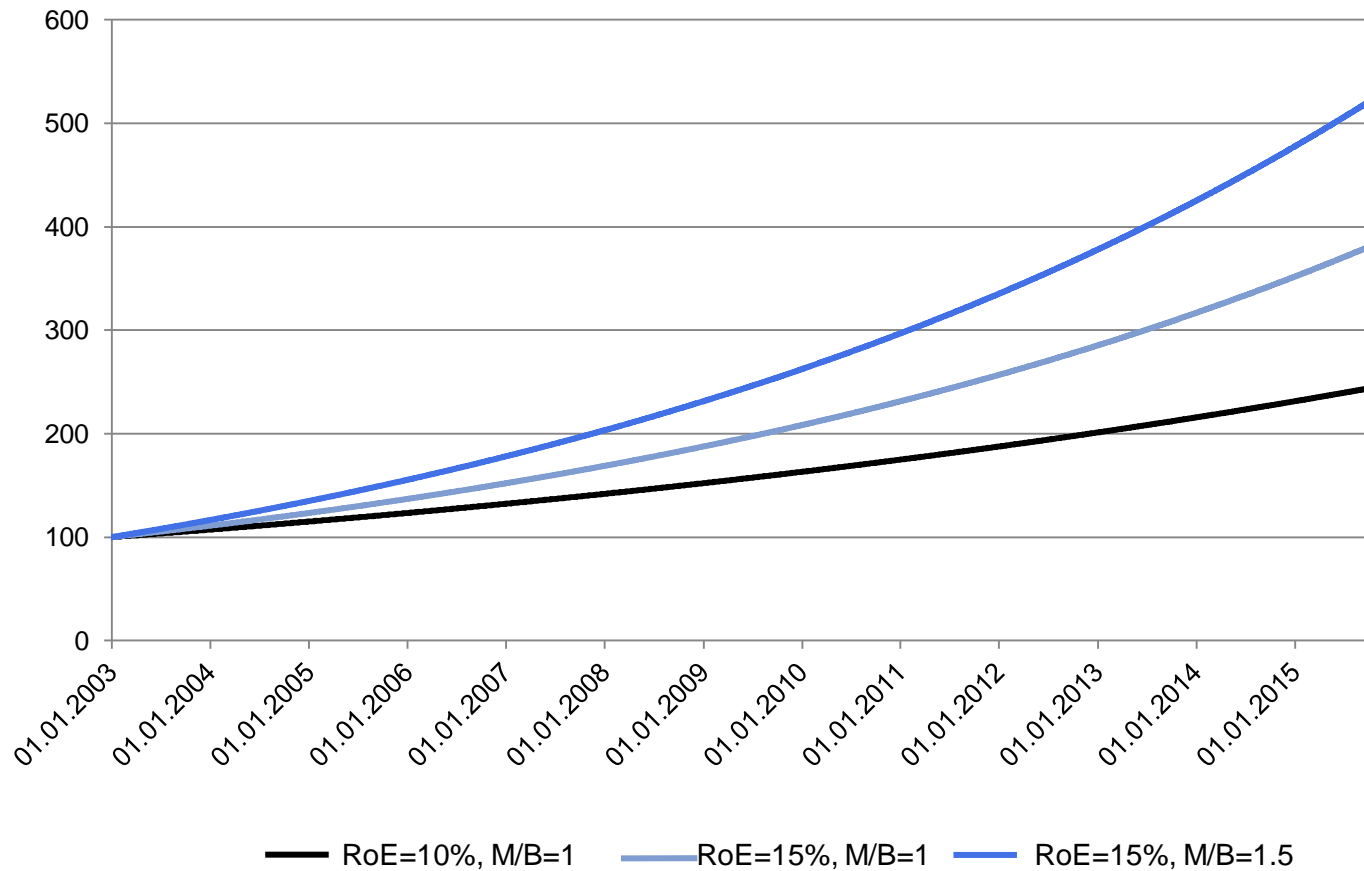
Euro Stoxx Insurance



Euro Stoxx Banks



Drivers of share value are trivial...

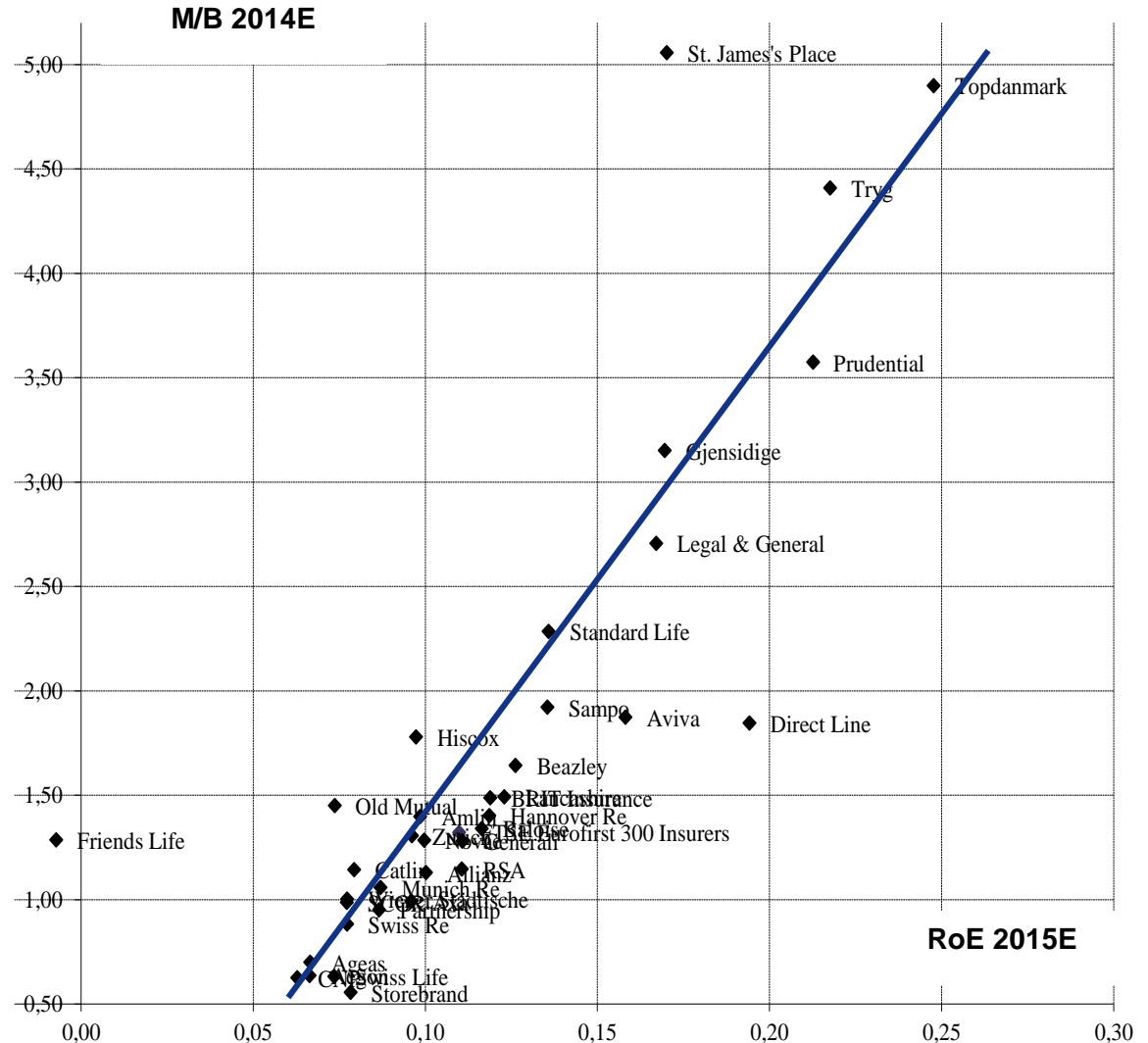


...but what drives M/B?

There is a theory...

...that generally works

$$\frac{M}{B} = 1 + \frac{(RoE - CoC)}{CoC - g}$$



Source: KBW Insurance Overview, 2014

What will be the most powerful source of shareprice appreciation in the sector in the coming 5 years?

1. Revenue growth
2. Efficiency gains
3. Improved risk / return underwriting
4. Capital and balance sheet management
5. Other?

Recognized by shareholders...

“...dividends have been the key attraction for investors in the European insurance sector. A focus on cash and dividends has driven the sector to an unprecedented fourth consecutive year of outperformance of the European equity market...”

Regulatory capital is the fuel for dividends ... (and) Given the importance of dividends we think it is crucial to understand how capital will be generated going forward.”

Morgan Stanley 2016

“(Investors need to understand)... how the capital is spent ... We are supportive of investment in new business ... (if it generates) IRRs above the company’s cost of capital and with reasonable payback periods . . . (but) business at or sub 9% IRRs which takes 9 years to break even ... is not a viable source of value for shareholders.”

Barclays 2011

“Earnings analysis is of limited use ... We prefer composites that i) generate strong cash flow after ‘maintenance capex’ ... , ii) have high growth capex that supports future earnings and iii) ... surplus cash generation, driving financial flexibility and the ability to redeploy capital for growth.”

Morgan Stanley 2012

...leading to a new paradigm where capital management **is** value management



Managing capital and value: 3 core skills from a Finance & Risk perspective

Better Information – What gets measured, gets managed

- How to value risk-based, capital intensive businesses?
- How to link management actions, risk adjusted performance measures (RAPMs) and other, Key Performance Indicators to value?

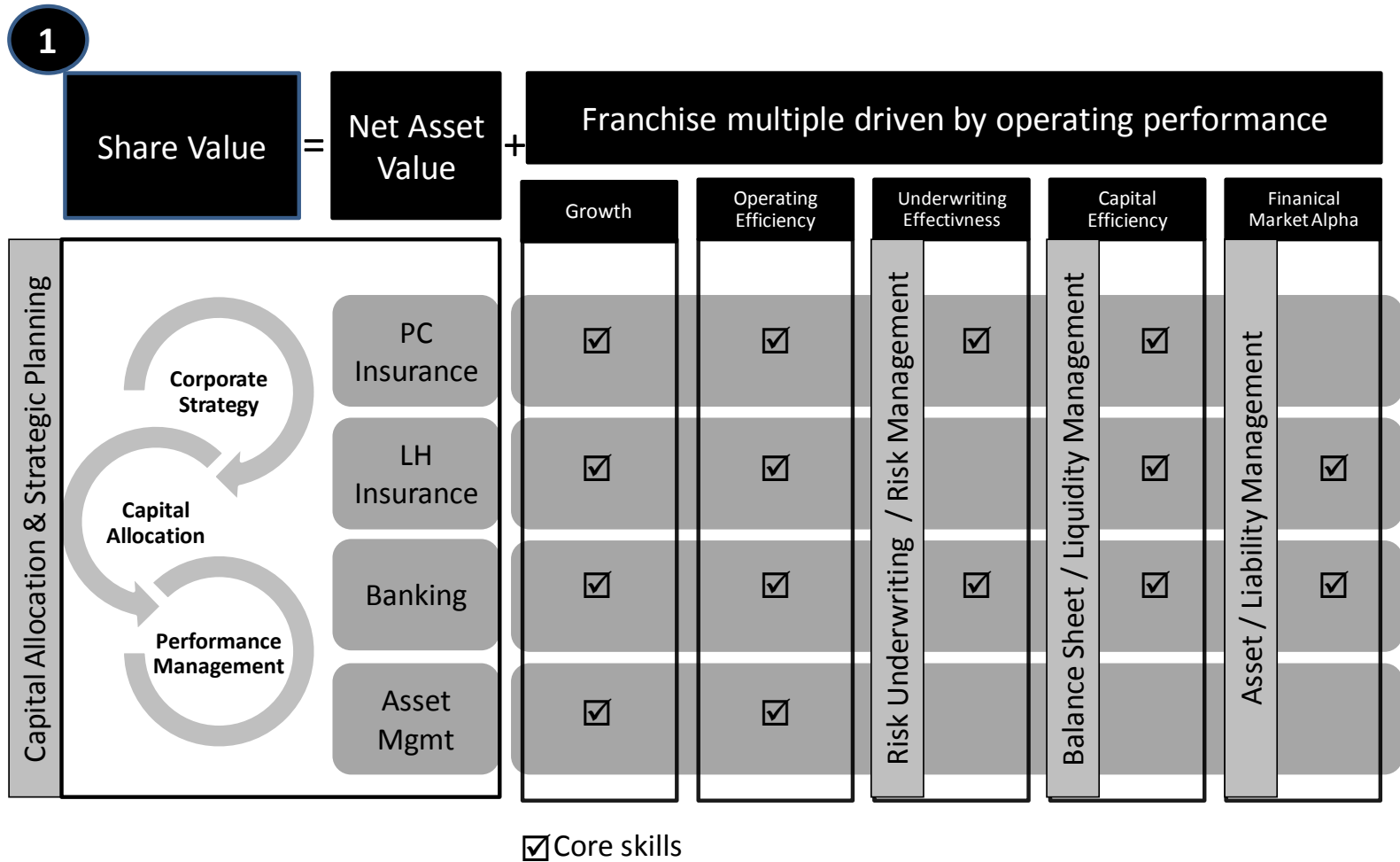
Better Insights – How to create value through operations

- What “rules of the game” (or generic strategies) create value in each business segment?
- What core skills are required in each segment?

Better Decisions – How Finance & Risk creates value

- Strategic planning and capital allocation
- Balance sheet, asset/liability and liquidity management
- Risk management and risk underwriting

1. Better information – What gets measured, gets managed. How to measure value in risk-based, capital-intensive businesses?



Managing capital and value: 3 core skills from a Finance & Risk perspective

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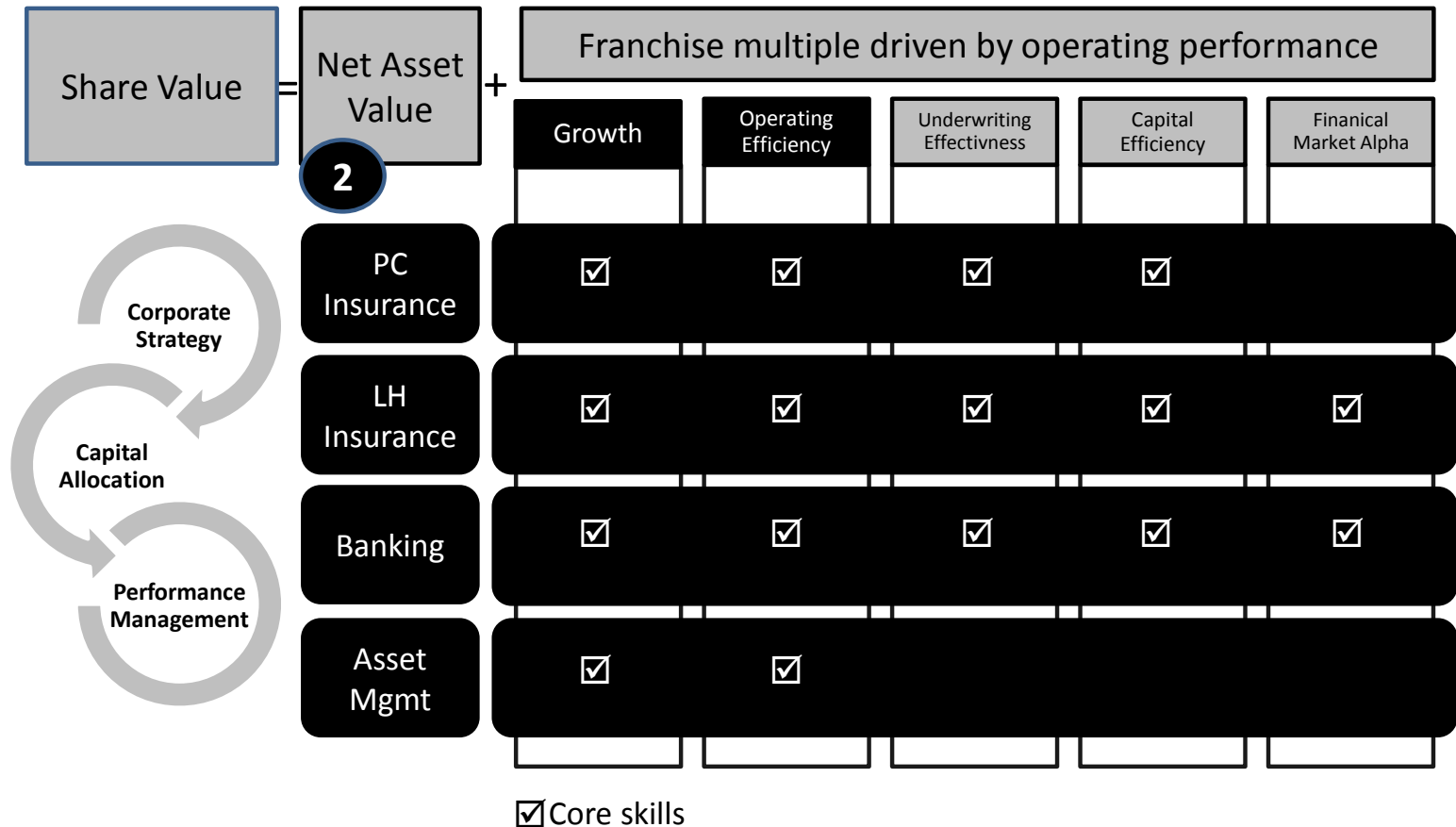
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Better Decisions – How Finance & Risk creates value

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2. Better Insights – What strategies, initiatives and KPIs by segment?



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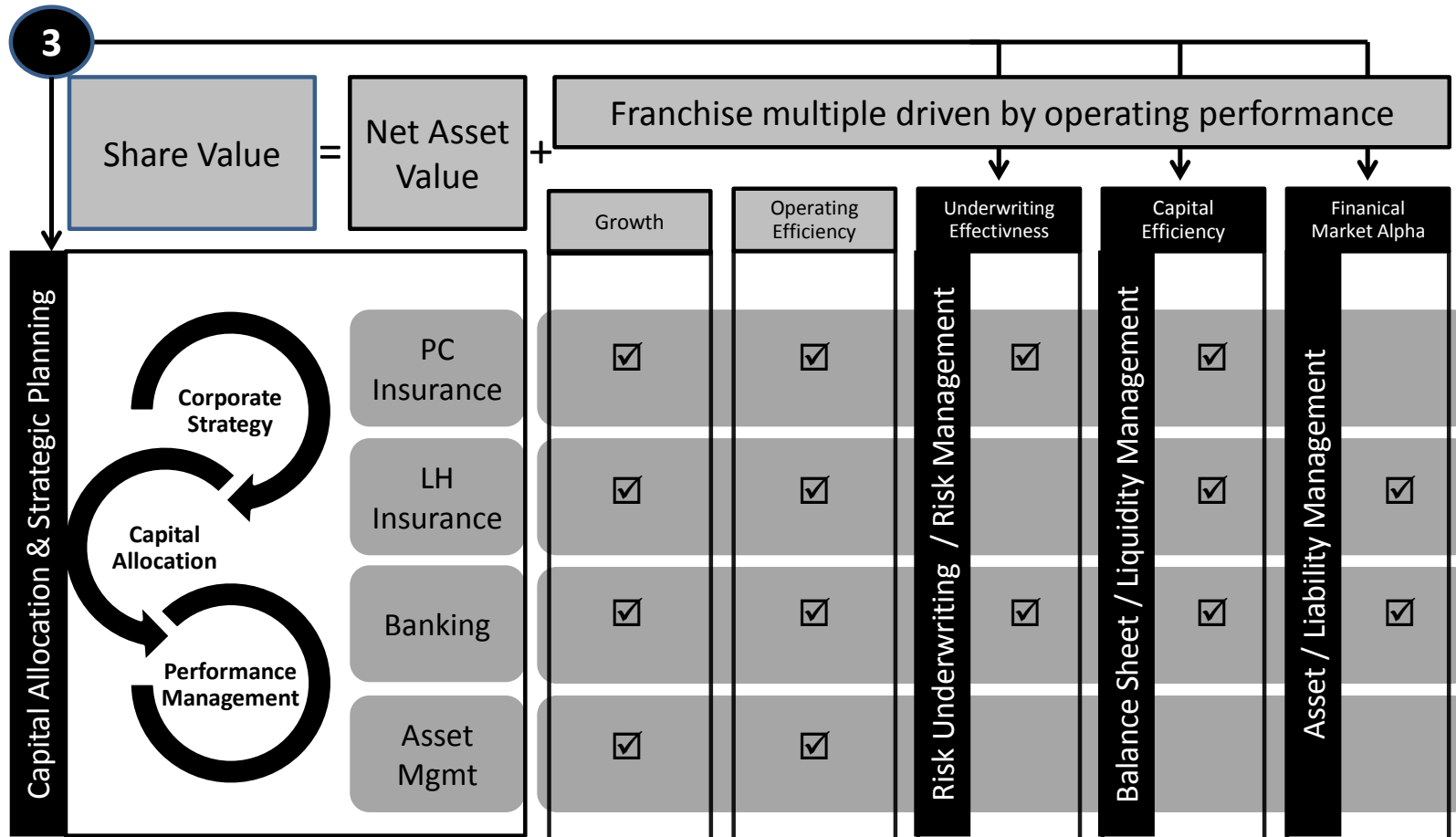
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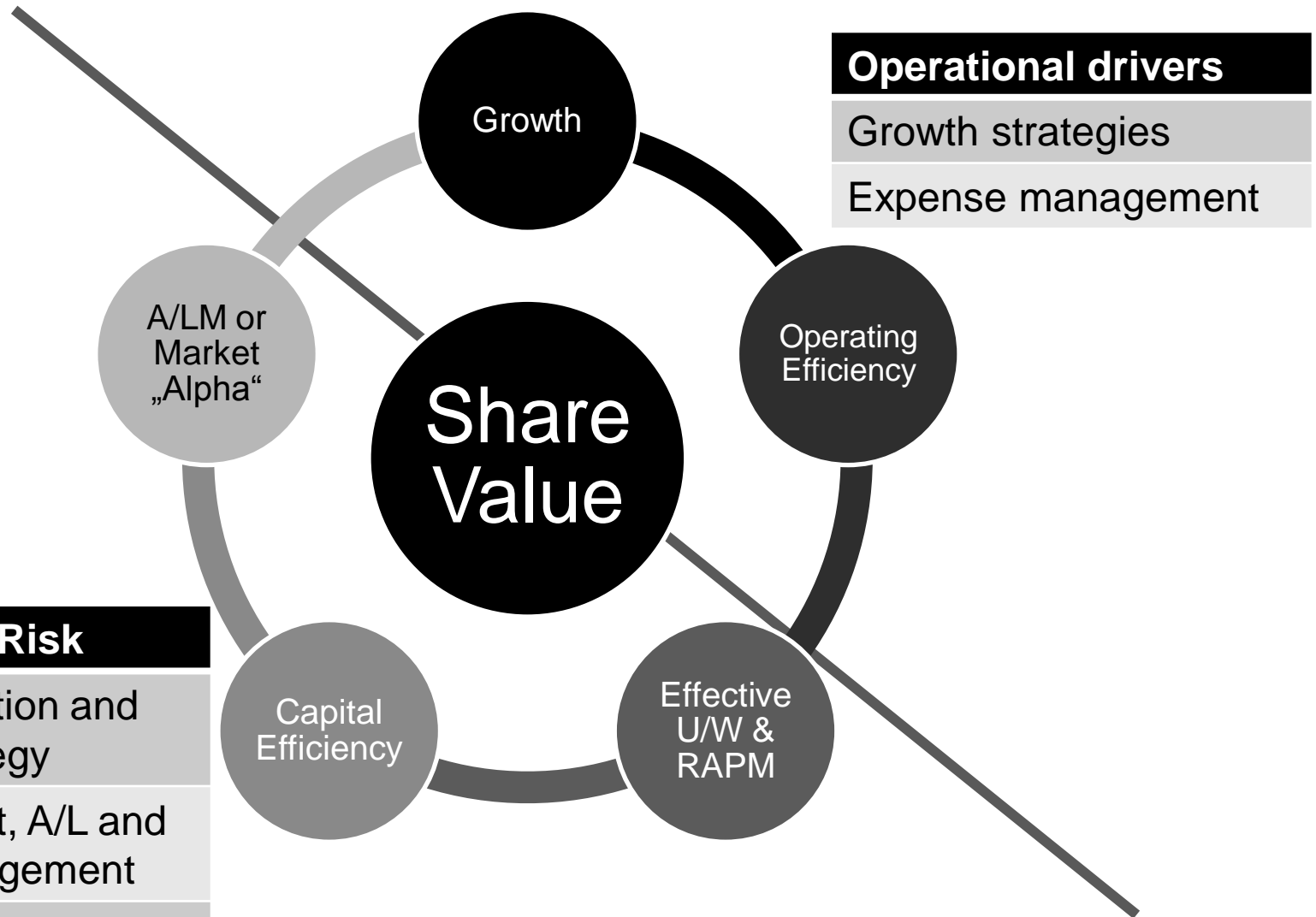
3. Better Decisions –

How to create value in Finance & Risk areas of responsibility?



☑ Core skills

Linked unambiguously to value drivers



Why shareholder value? Economic Darwinism

Changing competitive environment

- Intense competition and a continuous struggle to make “good” money
- Dynamic environment
 - Rapid mutations impacted by technological, regulatory and other disruptions create new competitors, distribution channels, etc.
 - Steady evolution breeds best practices in a virtuous circle
- Those with low multiples will be takeover candidates for those with higher multiples

Changing market for corporate control

- Less willingness among shareholders to tolerate weak performance
- Fundamental changes in capital markets and legal framework that facilitate takeovers, change of management
- In this environment, the average life span of managers tends to be short and getting shorter

The moral of the story?

- The fittest, most agile firms will survive...
- ...but unlike biological evolution, success is not genetically pre-ordained: firms have the capacity to evolve and adapt consciously
- This requires a constant and continually focus on value creation

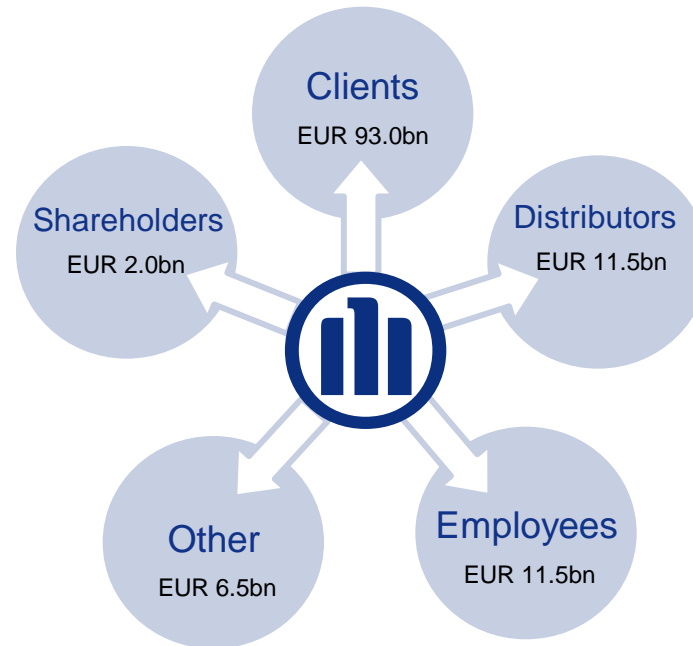
Enlightened self-interest: A Stakeholder perspective

Different stakeholders have different explicit and implicit claims

- Investors
- Employees
- Customers
- Suppliers
- Government
- Others

Example: Allianz public disclosures 2014

Benefits for our stakeholders



A successful firm can meet all of these needs; a firm which succumbs to economic Darwinism cannot

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 - b) Three generic RAPMs
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 - d) Illustration: The CAPM-RAPM
 - e) Impact of the cost of capital

What makes Financial Services unique?

1. We sell products whose ultimate profit contribution is uncertain

The uncertainty stems from risk underwriting decisions and future financial market developments. Estimating the value of new business at the point of sale requires an understanding how to measure and value risk.

2. Managing this risk is inherent in our value proposition

These risks are not only inherent in our products, but they also play a critical role in defining our strategies and how we create value for our shareholders and customers. Whereas industrial corporations typically try to avoid risks, banks and insurers create value out of taking and managing risks. Put simply, without risk, there is no value.

3. Our capital and funding structure is driven by risk and return considerations

- Our ability to bear risk depends on our capital position
- Liabilities represent not only financing, but also profit opportunities

Because of these unique characteristics, our capital and funding structure is not a theoretical exercise in indeterminacy as might be implied by the Modigliani-Miller theorem. Rather, it is much more directly determined by risk and operating profit considerations.

4. We are a heavily regulated industry, impacting our capital and leverage profile

Finally, banking and insurance are amongst the most regulated industries, enjoying a higher degree of supervision as well as constraints on capital and leverage than any other industry. Regulation not only affects our business models and capital structure but also our governance structure.

An intuitive introduction to RAPMs

Interesting observation:

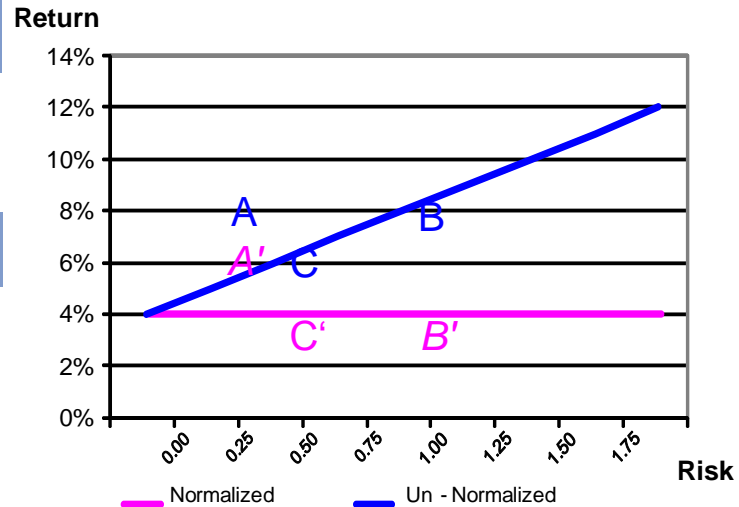
1. Not free to choose risk measure
2. Not free to choose confidence interval

RAPM Objectives

- ▶ Make risky returns directly comparable
- ▶ Measure value created

RAPM normalizing Risk / Return:

- ▶ Businesses A&B offer the same expected return but have different level of risk
- ▶ But how to compare, e.g. B&C?
 - Define a utility function?
 - Assume a relationship between risk and return given by market prices



Illustrative Market Risk / Return Equation:

$$\hat{R} = R_f + \text{"risk"} * R_p$$

\hat{R} ~ Expected return from the investment in the business activity

R_f ~ Risk free rate of return

R_p ~ Expected risk premium per unit of "risk"

Intuitive RAPM Formula:

$$RAPM = \frac{\text{Adjusted Returns}}{\text{Adjusted Capital}} = \frac{\hat{R} - R_f}{EC} = \frac{\hat{R} - R_f}{\alpha * \text{"risk"}} \geq R_f$$

EC ~ Required Economic Capital

where $EC = \alpha * \text{"risk"}$ and $\alpha = R_p / R_f$

Case example 1: Bankers Trust

Business issues:

- Pressure on the profitability of corporate banking due to commoditization of balance sheet lending and its subsequent disintermediation by the capital markets
- Identification of alternative sources of profit from trading and financial solutions
- How to achieve a transformation from a commercial lender to a trading powerhouse?
- How to measure the profitability of a customer across different products, especially corporate lending versus trading activities, given their very different risk profiles?

Business implications from introducing RAPM:

Changes to standard commercial banking practices included:

- A „zero-hold“ policy on most new loans
- An exceptionally creative approach to client risk management that depended heavily on their considerable expertise in the design of over-the-counter derivative products
- An aggressive trading culture overseen by Sanford (then Chairman)

Case example 2: Swiss Re

Business issues:

Adverse trends during the 1980's and 1990's:

- secular downward trend in risk premiums as the traditional covers became commoditized, overall growth stagnated and capital mobility into the reinsurance industry increased
- highly volatile, 'feast or famine' pricing cycles driven by ruthless competition
- general trend away from proportional or quota share treaties and towards potentially riskier products such as excess of loss or facultative covers
- search for growth into new and more complex markets, including structured financial reinsurance, weather and credit derivatives, etc.

Business implications from introducing RAPM:

- Beginning of the 1990's:
 - effort to calculate the risk adjusted capital required by the group
 - development of a Group Performance Measurement (GPM) system in an attempt to put the earnings of different lines of business on a comparable basis
- In 1998 and 1999: Swiss Re New Markets (SRNM) began to implement Raroc-based pricing across its entire business portfolio in order to achieve comparability of returns from different risks and different product structures
- By 2000, SRNM was pricing all of its transactions using a Raroc approach and reporting business unit performance on both an accounting and risk adjusted basis

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Three generic RAPMs – New Business RAPM (1/3)

New Business RAPM	
Primary Use	Risk adequate pricing of loans and insurance policies
Risks and returns covered	Only risks and returns from underwriting, e.g. predominantly credit and insurance risks, occasionally business and operational risk
Cost of Capital used	Market price of credit or insurance risk
Link to value	Direct link to value as the contribution of new loans and policies is recognized directly on a “mark-to-model” basis

$$\text{New Business RAPM} = \frac{E \left[\sum_{t=0}^T \left(\frac{CF_t + r_f C_t}{(1+r_f)^t} \right) \right]}{E \left[\sum_{t=0}^T \left(\frac{C_t}{(1+r_f)^t} \right) \right]} \geq CoC_{u/w}$$

$$EP = VNB = E^Q \left[\sum_{t=0}^T \left(\frac{CF_t + r_f C_t}{(1+r_f)^t} - \frac{CoC_{uw} C_t}{(1+r_f)^t} \right) \right] \geq 0$$

Three generic RAPMs – Investment RAPM or „alpha“ (2/3)

Investment RAPM	
Primary Use	Identify excess returns or “alpha” from trading and investment portfolios
Risks and returns covered	Traded financial market risks, e.g. open interest rate, FX, equity, etc. positions
Cost of Capital used	Market price of financial market risk based on the return for a risk-appropriate benchmark portfolio
Link to value	Direct link to value as portfolio returns are evaluated against a risk-appropriate benchmark which is achievable in the financial markets

$$\text{Investment RAPM} = \frac{\text{Expected Returns} - \text{Term funding} + \text{Capital benefit}}{\text{Allocated Economic Capital}} \geq \text{CoC}$$

Three generic RAPMs – New Business RAPM (3/3)

Business RAPM	
Primary Use	Measure risk adjusted return on allocated capital for an entire business
Risks and returns covered	All risks and returns managed by the business
Cost of Capital used	A single corporate weighted average cost of capital used across all activities
Link to value	Often no direct link to value, relying on capital allocation alone to make returns comparable

$$\text{Business RAPM} = \frac{\text{Adjusted Earnings} \approx \text{CoC}}{\text{Allocated Capital}}$$

New Business and Investment RAPMs can in principle directly link to sources of value creation

☑ Source of value creation

		Operational Levers for Creating Value				
		Growth	Operating Efficiency	Underwriting Effectiveness	Capital Efficiency	Financial Market Alpha
New Business RAPM – U/W risks	☑	☑	☑	☑	☑	
Investment RAPM – market risks					☑	☑
		Growth in premium, assets or loan volumes	Expense ratio or Cost Income Ratio	<ul style="list-style-type: none"> •Expected Loss Ratio •Economic Capital Intensity •Cost of under-writing capital 	Capital Efficiency Ratio	Cost of capital for risk-appropriate benchmark

Insurance New Business EP

Driver		Description
Growth	$P \times [1 -$	New Business Premium
Operating efficiency	$ER_{pv} -$	Expense ratio (All future expected allocated operating expenses, present value basis)
Underwriting effectiveness	$CR_{pv} -$	Claims ratio (ultimate claims / premium) (best estimate claims, present value basis)
	$rp_{u/w} \times ECI_{u/w} \times$	Cost of non-hedgable risk capital (present value basis) Where $rp_{u/w}$ is the risk premium above the risk free return for insurance risk ECI = Economic Capital Intensity ratio $= PVRC_{u/w} / P$ Where $PVRC_{u/w}$ is the present value of all future minimum capital requirements, e.g. $ECI = \left[\sum \min C_t / (1+r)^t \right] / P$
Capital efficiency	$CER]$	Capital Efficiency Ratio = Present value of actual capital divided by present value of minimum required capital $= PVAC_{u/w} / PVRC_{u/w}$ $= \left[\sum C_t / (1+r)^t \right] / \left[\sum \min C_t / (1+r)^t \right]$

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Significant tactical impact of RAPMs

1. Enforcing Pricing Discipline and Relationship Management

- ▶ Especially for risks which are not actively traded, e.g. middle market credit and insurance risk
- ▶ New Business RAPMs were developed for this application
- ▶ Early adopters (e.g. Bankers Trust) used RAPM approaches to 'price' illiquid credits as well as the profits from trading activities and evaluate overall client relationship profitability

2. Delegating Limits & Authorities

- ▶ Important role of Economic Capital (EC) and Value at Risk (VaR) models in the design and implementation of risk appetite and limits
- ▶ All banks currently use some form of EC or VaR metrics to set trading limits
- ▶ Most insurers use similar metrics to set limits on their general account asset portfolio and asset / liability mismatch position as well as for their dynamically hedged liabilities

3. Establishing Solvency Standards & Capital Attribution

- ▶ Most banks and insurers now use internal EC models to determine both their target solvency levels as well as for attributing capital to their business units
- ▶ Benefits of the internal models: recognition of the specific risk situation of the company, business line or product

Limited strategic impact of RAPMs

RAPM Doesn't drive strategy

Which three measures are most used for strategic planning and decision making?

1. Earnings and earnings growth
2. Revenues and revenue growth
3. Cost or cost/income ratios
4. Return on book capital
5. Return on economic capital or economic profit
6. Market share
7. Other
8. Market or shareholder value, Embedded Value, Intrinsic Value

RAPM not Linked to Shareholder Value

How satisfied are you with the following aspects of your current performance measurement framework?

Accurately reflects shareholder perspectives	90%
Accepted within the organization	83%
Level of detail / granularity	67%
Transparency with respect to value drivers	58%
Accurate reflection of the business economics	58%
Link between internal metrics (e.g. RAPM) and shareholder value	27%

External Stakeholders Don't Understand Internal Metrics

Do you feel that external stakeholders understand your business?

	Rating agencies	Equity analysts	Regulators
Key business drivers	85%	82%	52%
Financial statements	95%	76%	71%
Economic performance & Capital Framework	33%	24%	33%

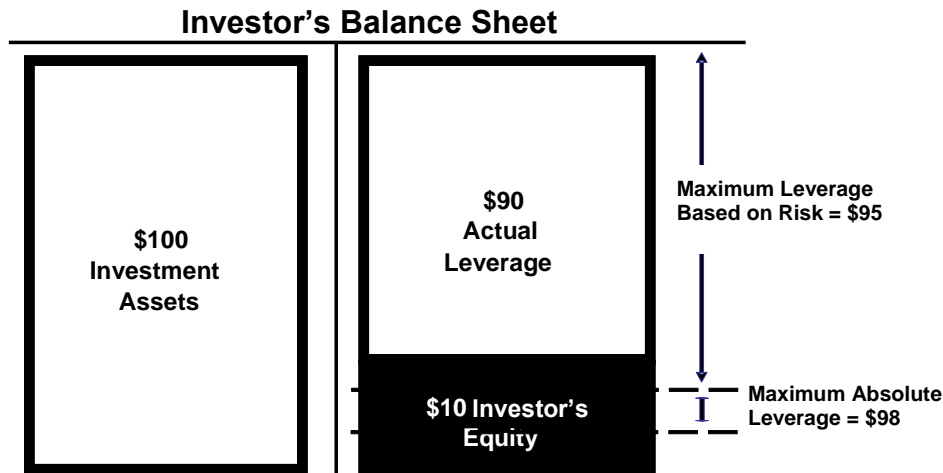
Internal Metrics Not Used for External Communication

What are the most important financial information that you communicate externally?

Earnings and earnings growth	83%
Return on equity	58%
Line of business information	58%
Capital or solvency ratio	58%
Exposure or risk information	42%
Revenue and revenue growth	42%
Earnings guidance	33%
Cost/income ratio	33%
Return on risk capital	17%

The issues with Business RAPM

- You have €10 to invest in a levered portfolio of assets.
- Maximum €95 leverage due to risk-based margin requirements
- Maximum €98 leverage due to nominal leverage constraint
- You choose a lower amount of leverage (€90) in practice.



- What is the capital that you have invested in the business? What about the (risk-based) leverage constraint? Does this reflect your invested capital?
- What return do you expect on the portfolio? Would it differ depending on the assets? How would you measure the “excess” returns you receive?

A summary of the conceptual issues

- 1. Capital allocation:** Business RAPMs take a “debt holders” perspective, using the minimum capital required to ensure that the firm’s obligations can be met at some level of confidence.
 - The capital attributed to business should reflect the amount of shareholder *value* invested in the business
 - Regulatory- or risk-based capital are *constraints* to be managed, not shareholder capital
- 2. Cost of Capital:** Most RAPMs use a common cost of capital or hurdle rate assuming that risk capital is sufficient to “normalize” returns across different business activities.
 - The use of a single cost of capital across all businesses is inappropriate and misleading even if capital is allocated based on the risk of the business.

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CAPM-RAPM: Definitions

Risk, return and excess returns in the CAPM World

$$R_i = R_f + \beta_i(R_m - R_f) = R_f + \beta_i R_p$$

where
$$\beta_i = \frac{\sigma_{i,m}}{\sigma_m^2} = \frac{\sigma_i \rho_{i,m}}{\sigma_m}$$

R_i ~ expected return on security "i"

R_f ~ risk free rate of return

R_m ~ expected return on the market portfolio

R_p ~ market risk premium

$\sigma_{i,m}$ ~ covariance between security "i" and the market portfolio

σ_i, σ_m ~ standard deviation of returns for security "i" and the market portfolio

Shareholders' perspective: Add leverage and the potential for excess returns to CAPM World

$$\hat{R}_i = [\alpha + R_f + \beta_i * R_p] - dR_f$$

$$\hat{R}_i = \alpha + R_f + \beta_i R_p - \left(\frac{d}{d+e}\right)R_f = \alpha + \left(1 - \frac{d}{d+e}\right)R_f + \beta_i R_p$$

$$\hat{R}_i = \alpha + \gamma R_f + \beta_i R_p$$

\hat{R}_i ~ expected return from the levered portfolio "i" for one unit of investment

α ~ expected excess returns

$\gamma = \frac{e}{e+d}$ ~ percentage of equity financing of the total portfolio

The Debtholders' Perspective: Economic Capital in the CAPM World

$$EC_i = \eta(e+d)\sigma_i$$

or $EC_i = \eta\sigma_i$ if $(e+d)=1$

η ~ constant set by management in a manner consistent with management's rating aspiration or risk appetite

Appropriate Cost of Capital

Standard CAPM-RAPM

$$E[RAPM] = \left[\frac{\hat{R}_i - \gamma R_f}{EC_i} \right] = \left[\frac{\alpha + \gamma R_f + \beta_i * R_p - \gamma R_f}{EC_i} \right] = \left[\frac{\alpha + \beta_i R_p}{EC_i} \right]$$

Assumption: $e > EC$

Subtract risk free return on capital invested to isolate contribution of risk

The right CoC should isolate excess returns when calculating Economic Profit where

$$EP_i = EC_i [RAPM_i - CoC_i]$$

$$CoC_i = \left[\frac{\beta_i R_p}{\eta \sigma_i} \right] = \left[\frac{\rho_{i,m} R_p}{\eta \sigma_m} \right] = \left[\frac{\beta_i R_p}{EC_i} \right]$$

Depends on the systematic of the portfolio (idiosyncratic risk nets out in EP)

► $EP_i = (e + d)\alpha$

Observation 1:

Excess returns to shareholders do not depend on risk based capital but rather on the actual capital invested in the business (unless risk-based capital is a binding constraint).

Observation 2:

The appropriate RAPM hurdle rate or cost of capital will generally depend on the business' risk profile, in spite of the fact that we have used economic capital or risk-based capital to normalize returns.

Observation 3:

If the business generates excess returns, then marginally more leverage increases economic profit, all else being equal.

Solvency or leverage constraints

Table 1: Economic capital and leverage constraints

Constraints	Traditional Form	Expressed in terms of constraint on debt	Comments
Risk-based Capital Constraint	$e \geq EC_i$ $e \geq (e + d)\eta\sigma_i$	$d \leq e \left(\frac{1 - \eta\sigma_i}{\eta\sigma_i} \right)$	Limits the amount of risk which can be assumed per unit of equity, or equivalently the leverage which can be used to fund risky assets.
Financial Leverage Constraint	$\frac{d}{d + e} \leq x$	$d \leq e \frac{x}{1 - x}$	Limits the absolute amount of leverage that can be assumed, regardless of the riskiness of the portfolio.

- Risk-based solvency and leverage restrictions on debt (assumes one will be binding based on observation 3 earlier):

$$d(e, \sigma_i) \leq e \times \min \left[\left(\frac{x}{1-x} \right), \left(\frac{1-\eta\sigma_i}{\eta\sigma_i} \right) \right] \quad \text{with} \quad \frac{\partial d}{\partial e} > 0 \quad \text{and} \quad \frac{\partial d}{\partial \sigma_i} \leq 0$$

- Maximum CAPM-Economic Profit under leverage constraints:

$$EP_i = EC_i [RAPM_i - CoC_i] = (e + d(e, \sigma_i))\alpha = e \left(1 + \min \left[\left(\frac{x}{1-x} \right), \left(\frac{1-\eta\sigma_i}{\eta\sigma_i} \right) \right] \right) \alpha$$

Observation 4:

Risk-based capital and leverage constraints only matter if they are binding constraints: if the business is generating excess returns, a binding constraint represents a constraint on shareholder value.

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Differentiated Cost of Capital: Empirical Evidence

Phrasing the Questions:

1. *Is there empirical evidence that shareholders require different hurdle rates for different businesses, even if each business is capitalized to a common rating standard?*

 - ▶ We call this the 'Differentiated Cost of Capital Effect'. This effect has strong implications for valuing the performance of different business lines that reside under a common corporate umbrella.
2. *Is there empirical evidence that, all else being equal, shareholders require a premium from firms that have higher leverage, and therefore a higher probability of default?*

 - ▶ We call this the 'Leverage or Default Effect'. This effect has implications for capital adequacy decisions and rationalizing shareholder- and debtholder-perspectives of capital attribution.
3. *Is there empirical evidence that, all else being equal, shareholders place a premium on firms that have less idiosyncratic risk and can therefore afford greater leverage?*

 - ▶ We call this the 'Idiosyncratic Risk Cost'. This effect, weakly supported by the data, has potentially strong implications on corporate portfolio diversification decisions.

Differentiated Cost of Capital: Empirical Evidence

(A) Differentiated Cost of Capital**			(B) Leverage Effect**				
	AA to A+ firms	Beta range	Rating	AA+	AA	AA-	A+
Insurance	AEG, CGNU, AXA, AS	0.81-1.29 (1.03)	Universal Banks	DB – 0.94	DRB – 1.01 NBA – 0.92 COM – 0.72	BHV – 0.93 SG – 1.23 BBVA – 1.22 BSCH – 1.25 FB – 1.19	BNP – 1.56 JPM – 1.95 RBS – 1.70 BA – 1.76
				Avg.	0.94	0.88	1.16
Investment Banking	ML, MS, GS, LB	2.34-3.78 (2.90)					

(A) The Differentiated Cost of Capital Effect:

- Empirical evidence shows that investment banks have levered betas which are almost three times as high as insurers, implying a cost of capital 9-15% higher.

(B) The Default Effect:

- The average levered beta increases as the probability of default increases
- A firm with higher leverage should have a higher cost of levered capital to reflect the benefits of leverage

The Idiosyncratic Risk Effect:

- All else being equal, shareholders require a premium from firms that have more idiosyncratic risk
- Diversification is an important criterion when evaluating an insurance company's ability to leverage

* Average domestic betas and blended public rating (Moody's, Standard & Poor's) when available, 1990-2001

** MR = Munich Re, SR = Swiss Re, AL = Allianz, PRU = Prudential UK, AEG = Aegon, ML = Merrill Lynch, AS = Allstate, MS = Morgan Stanley, GS = Goldman Sachs, LB = Lehman Brothers, DB = Deutsche Bank, DRB = Dresdner, NBA = National Bank of Australia, COM = Commonwealth Bank of Australia, BHV = Bayerische Hypo-Vereinsbank, BSCH = Banco Santander Central Hispanoamerica, FB = FleetBoston, BNP = Banque National de Paris, JPM = J. P. Morgan, RBS = Royal Bank of Scotland, BA = Bank of America

Common Cost of Capital can lead to bad decisions

Impact for AA-US/UK representative firms:

Representative firm	Share	Levered Beta	Cost of Capital	P/E Multiple
Regional bank				
Retail banking	60%	1.05	9.3%	24.60
Commercial banking	40%	1.58	12.2%	14.62
Average	100%	1.26	10.4%	19.32
Multiline insurance				
Life insurance	40%	0.90	8.4%	30.56
P&C insurance	40%	0.99	9.0%	26.44
Asset management	20%	1.55	12.0%	14.99
Average	100%	1.07	9.4%	24.06
Investment bank				
Asset management	20%	1.55	12.0%	14.99
Equity investment banking	40%	3.90	25.0%	5.26
Fixed income investment banking	40%	1.77	13.3%	12.72
Average	100%	2.58	17.7%	8.27
Universal bank				
Retail banking	40%	1.05	9.3%	24.60
Commercial banking	30%	1.58	12.2%	14.62
Asset management	10%	1.55	12.0%	14.99
Equity investment banking	5%	3.90	25.0%	5.26
Fixed income investment banking	15%	1.77	13.3%	12.72
Average	100%	1.51	11.8%	15.44
Diversified financial services firm				
Retail banking	25%	1.05	9.3%	24.60
Commercial banking	20%	1.58	12.2%	14.62
Asset management	15%	1.55	12.0%	14.99
Life insurance	15%	0.90	8.4%	30.56
P&C insurance	5%	0.99	9.0%	26.44
Equity investment banking	10%	3.90	25.0%	5.26
Fixed income investment banking	10%	1.77	13.3%	12.72
Average	100%	1.56	12.1%	14.81

* risk free = 3.5%, risk premium = 5.5%, growth = 5%

$$P/E = d/(CoC - g)$$

Default and idiosyncratic risk

Default / Leverage Effects

Business	European						US/UK					
	Beta			P/E Multiple			Beta			P/E Multiple		
	AAA	AA-	A	AAA	AA-	A	A	AA-	A	AAA	AA-	A
Retail	1.03	1.11	1.31	25.1	22.7	18.4	1.01	1.09	1.29	25.8	23.3	18.8
Commercial	1.20	1.30	1.52	20.5	18.7	15.2	1.53	1.64	1.94	15.2	13.9	11.5
Asset Mgmt	1.19	1.29	1.51	20.7	18.8	15.4	1.49	1.61	1.90	15.6	14.3	11.8
Life insurance	0.98	1.05	1.24	27.2	24.5	19.8	0.87	0.94	1.10	32.1	28.8	23.1
P&C insurance	1.01	1.09	1.29	25.8	23.3	18.9	0.96	1.04	1.22	27.7	25.0	20.2
Equity I-banking	1.68	1.81	2.13	13.6	12.4	10.3	3.77	4.07	4.78	5.5	5.0	4.2
Fixed income I-banking	1.26	1.35	1.59	19.4	17.7	14.5	1.71	1.85	2.17	13.2	12.1	10.0

* risk free = 3.5%, risk premium = 5.5%, growth = 4%

- ▶ **Leverage effect:** the difference in P/E multiples between AAA- and A- European commercial banking operations is 5.3 points
- ▶ **Country of domicile effect:** the difference between a European and US/UK AA- rated commercial bank is 4.8 points

Impact of Idiosyncratic Risk

Representative firm	Avg Idiosyncratic risk			Avg R-squared - 1.65 sd			P/E Diff
	Levered	Cost of	P/E Multiple	Levered	Cost of	P/E	
	Beta	Capital		Beta	Capital	Multiple	
Regional bank	1.26	10.4%	19.32	1.24	10.3%	19.73	2.1%
Multiline insurance	1.07	9.4%	24.06	1.05	9.3%	24.51	1.9%
Investment bank	2.58	17.7%	8.27	2.49	17.2%	8.59	3.8%
Universal bank	1.51	11.8%	15.44	1.48	11.6%	15.81	2.4%
Diversified financial services firm	1.56	12.1%	14.81	1.53	11.9%	15.17	2.5%

* risk free = 3.5%, risk premium = 5.5%, growth = 5%

- ▶ **P/E Diff:** the benefit in terms of the cost of capital from reducing idiosyncratic risk from the average level to 1.65 standard deviations below the average brings roughly a 2-4% relative increase in the P/E multiple, with higher systematic risk firms benefiting more