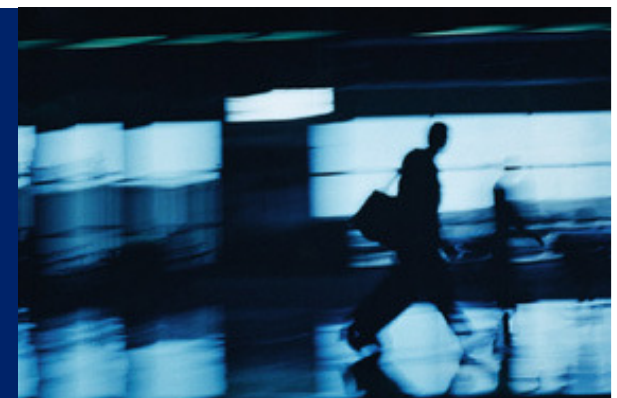


Macroeconomic Stress Testing

Matthias Föhl

Risk Management Breakfast

London, 25 September 2009



Agenda

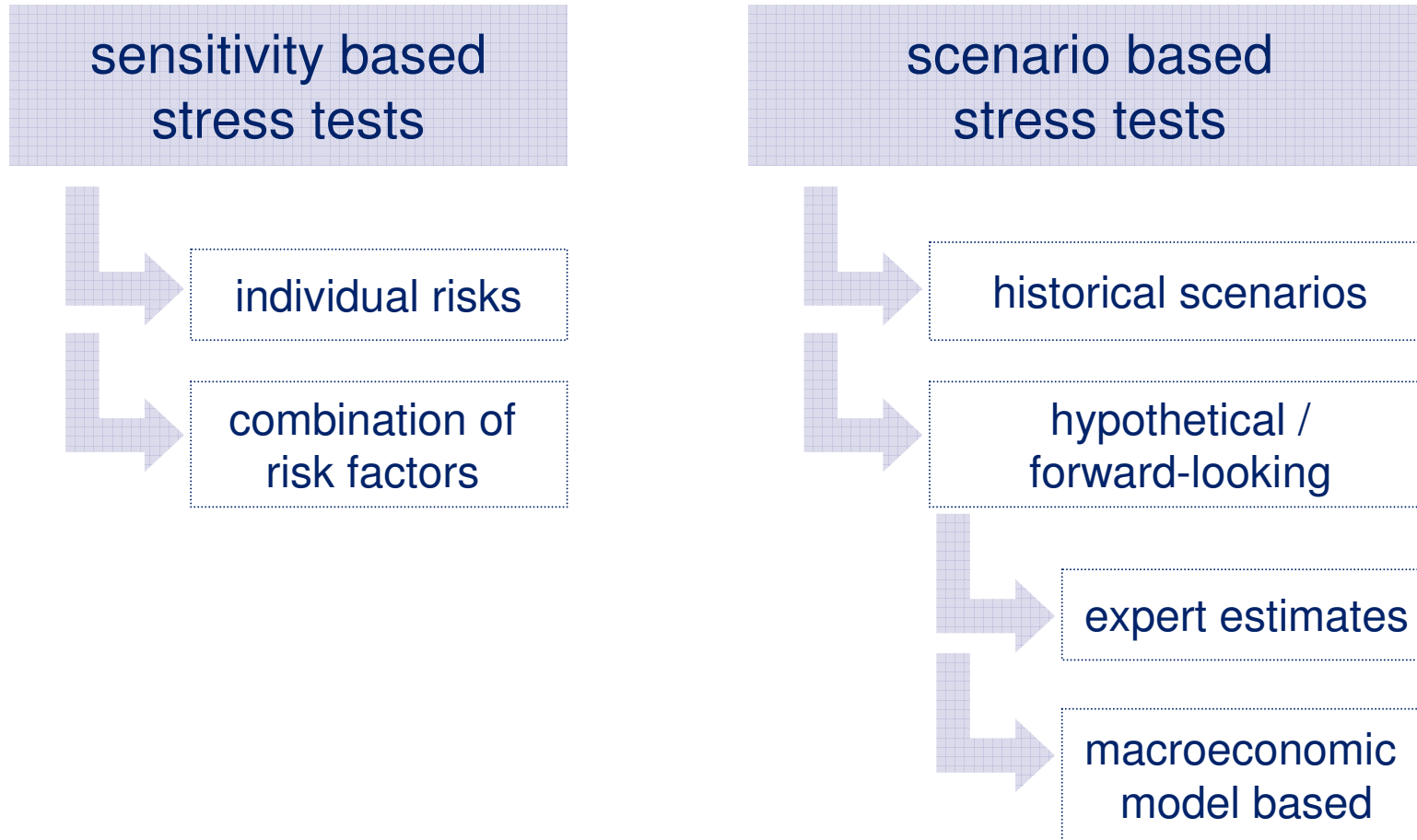
- Stress testing: Rationale and approaches
- Macroeconomic stress testing:
From economic factors to P&L and portfolio risk figures
- Risk reporting dimensions
- Further topics

Stress testing: Rationale

Rationale for stress testing:

- Assessing the capital adequacy of a bank
- Disclosing risks not revealed by internal models
- Forward-looking risk estimation
- Revealing risk mitigation potentials
- Facilitating the development of countermeasure plans for potential stress scenarios

Stress testing: Approaches

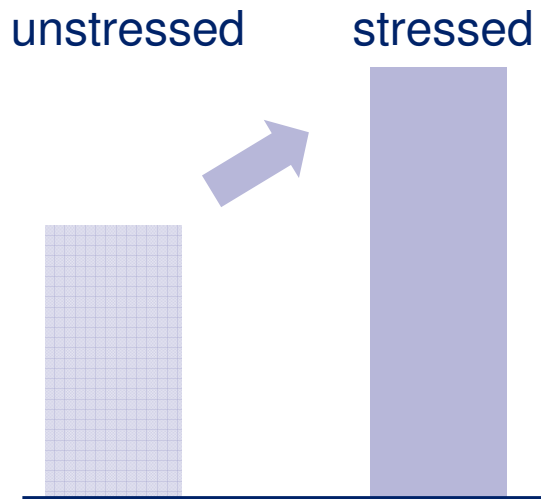


Stress testing: Single vs. multi period scenarios

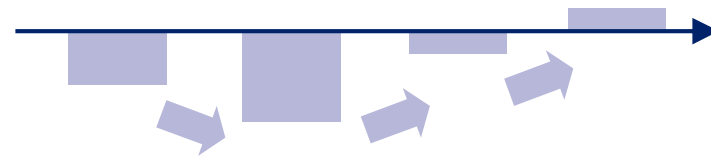
single period

multi period

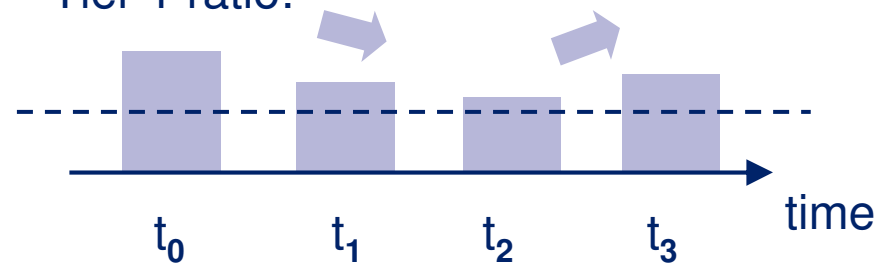
Capital requirements:



P&L



Tier 1 ratio:

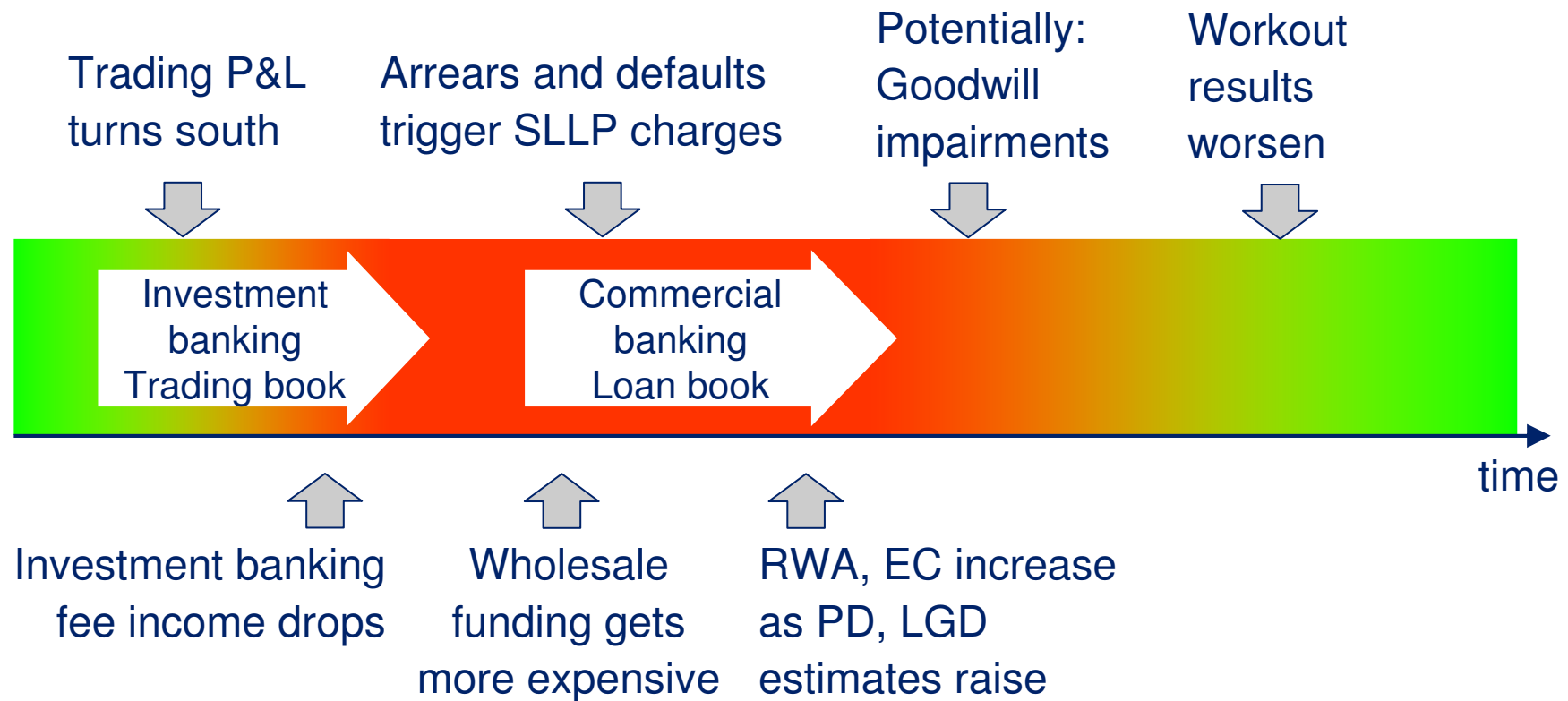


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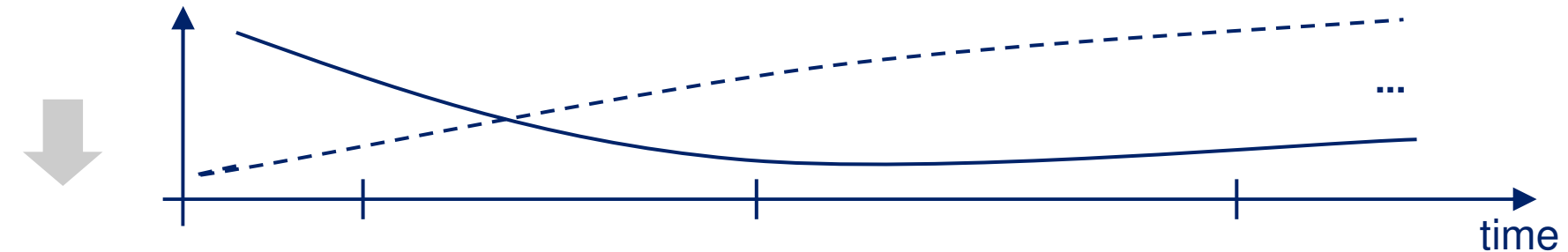
Banking in times of economic stress

P&L and capital ratios of banks during a down-turn:



Macroeconomic stress testing: Framework

1 Estimating development of economic factors over stress period:



2 Translate to risk parameters (PD, LGD, ...) by estimated relationships

3 Derive impact on Group P&L, OCI, Tier 1 ratio ... over stress period

➔ Main challenges:

- 1) Identification of relevant economic factors
- 2) Estimating relationship with portfolio risk parameters

Classifying macroeconomic factors

excerpt

Economic activity indicators:

Demand

- Real GDP
- Construction permits
- Private consumption
- Unemployment rate

Costs

- Inflation (CPI)
- Inflation (GDP deflator)
- Oil price
- Unit labour costs

Profitability

- (pre-tax) Corporate profits

Financing conditions

- Money supply (M3)
- Money market rates

Expectations

- Equity markets
- Implied volatilities
- Business climate surveys
- Purchasing managers index

Double-edged sword: Inflation

Impact of inflation on the loan book:



Reduction of real value of debt:

Higher inflation

=> Real value of debt decreases
(possible sell-off of assets)

=> lower default risk



Frictions in “cost-pushing”:

Higher inflation

=> Companies face higher
costs but have problems
to raise prices accordingly

=> higher default risk

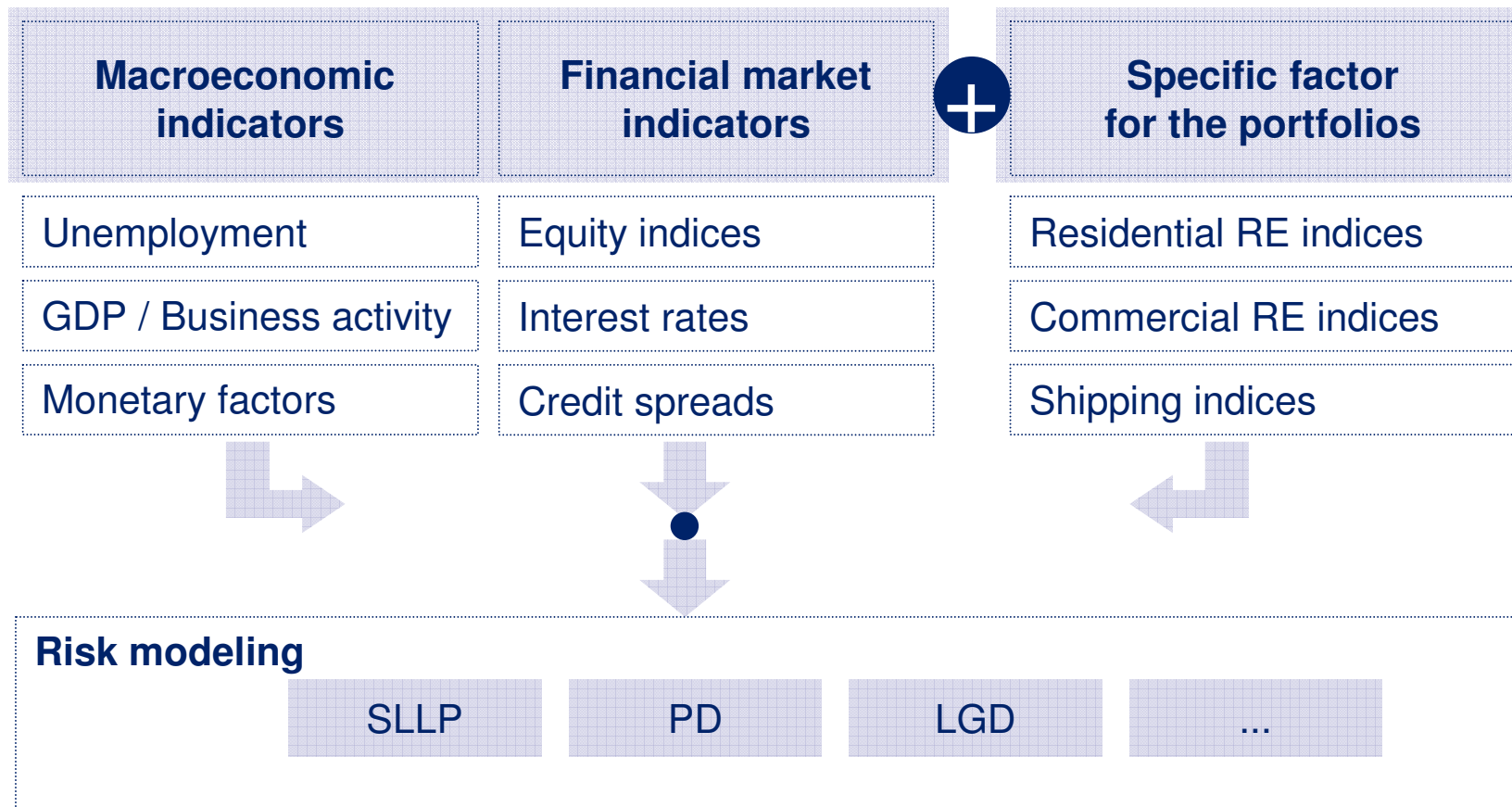
Inflation causes harm only if broadly out of line of expectations

Proposed approach:

no consideration in the economic recession scenarios,
but potentially separate high-inflation/deflation scenarios

Identification of relevant economic factors

Customised approach for each portfolio:



Getting the link: from economic factors to risk parameters

To estimate the relation between economic factors and risk parameters, several approaches are feasible:

- expert estimates
- benchmarking using historic stress periods
- time series analysis:

Various degrees of sophistication:

1

Individual regression of time series



2

SUR estimation of all equations simultaneously



3

Cointegration methods (VECM approach)

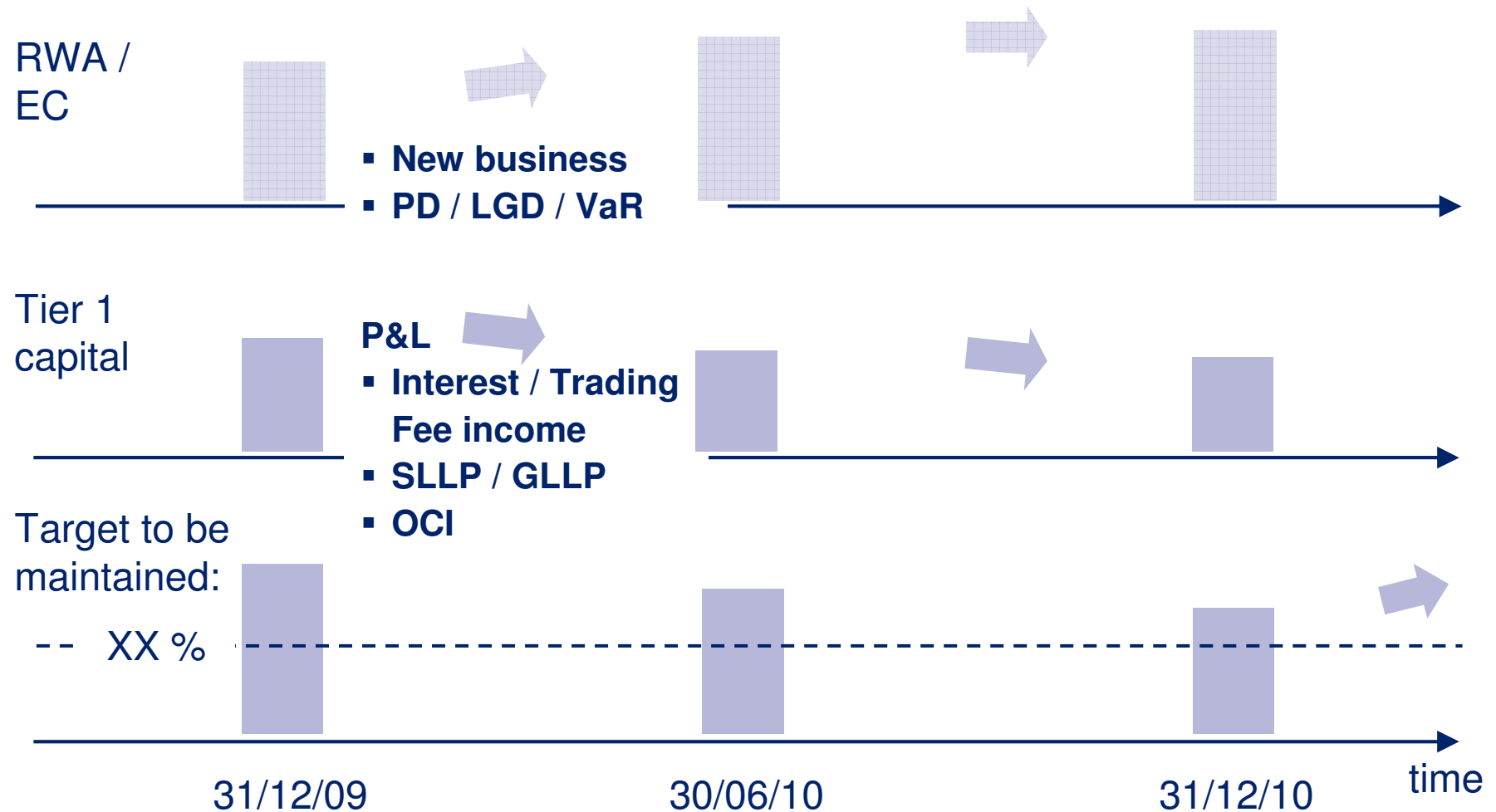
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Risk reporting dimensions to be considered

	P&L charges	OCI charges	To be covered by equity		
			regulatory	internal	
Fee-based business	Fee income				
Loan book (LaR)	Net interest income	FV disclosure only (IFRS 7)	RWA (PD, LGD)	Economic capital	
	SLLP				Run rate
					Intensive care
	GLLP (PD, LGD)				
Investment securities (AfS)	Impairment charges	FV changes (revaluation reserve)	RWA		
Trading book (HfT)	FV changes (incl. CDA, trading book defaults)		Market-risk position (VaR)		

Result: Development of risk figures over stress period



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Further topics

- Indirect risk arising from the risk positions of clients
 - Example: loans to hedge funds, cross currency loans ...
- Capital structure issues in times of stress
 - interest release on subordinated debt and hybrid bonds
 - OCI amortisation of LaR reclassified assets
- Business risk
- Liquidity risk

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