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Systemic Risks of the European Banking Sector and Effective Risk Controls for Europe

Duisburg 05/10/2012

UDE-CEDR Joint Conference 09. – 13. May 2012

Outline

- **Definition and measurement of systemic risk**
- **Systemic risks of the European Banking Sector**
  - in the aftermath of the bankruptcy of Lehman Brothers
  - the role of the European sovereign debt crisis
- **Effective risk controls for Europe**
  - the role of macroprudential instruments
  - the new regulation framework of Basel III
  - elements of an effective framework for financial stability
- **Conclusion**

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Systemic risk 1/3

Definition of systemic risk

There exist no general accepted definition of systemic risk between policymakers, regulators, academics and practioners. They know it when they see it. But such an approach is not useful for measurement and analysis, a pre-requisite for identifying threats to financial stability.

- *Group of Ten (2001)*
  systemic risk is a risk that an event will trigger a loss of economic value or confidence in, and attendant increases in uncertainty about, a substantial portion of the financial system that is serious enough to quite probably have significant adverse effects on real economy.
- *European Central Bank (2010)*
  systemic risk is a risk of financial instability so widespread that it impairs the functioning of a financial system to the point where economic growth and welfare suffer materially.
- *Billio, Gemansky, Lo and Pelizzon* (2010)
  system risk is any set of circumstances that threatens the stability of or public confidence in the financial system.

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Systemic risk 2/3

Definition of systemic risk

- Other authors and institutions have focused on more specific mechanism, including
  - imbalances (*Caballero* 2009),
  - correlated exposures (*Acharya, Pedersen, Philippon* and *Richardson* 2010),
  - information disruptions (*Mishkin* 2007),
  - feedback behavior (*Kapadia, Drehmann, Elliot*t and *Sterne* 2009),
  - asset bubbles (*Rosengren* 2010),
  - contagion (*Moussa* 2011).

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Systemic risk 3/3

Definition of systemic risk

- *Financial Stability Board (2009)*
  systemic risk is a risk of disruption to financial services that is
  - (i) caused by an impairment of all or parts of the financial system and
  - (ii) has the potential to have serious negative consequences for the real economy.

- Fundamental to the definition is the notion of **negative externalities** from a disruption or failure in a financial institution, market or instrument.

- All types of financial intermediaries, markets and infrastructure can potentially be systemically important to some degree.

Source: Financial Stability Board (2009: 2).

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Key criteria for identifying the systemic importance of markets and institutions

Three criteria are helpful in identifying

- **Size**
  the volume of financial services provided by the individual component of the financial system

- **Substitutability**
  the extent to which other components of the system can provide the same services in the event of a failure

- **Interconnectedness**
  linkages with other components of the system

Source: Financial Stability Board (2009: 2).

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Global systemically important financial institutions (G-SIFI)

Euro zone		Europe ex EMU		
Belgium	Dexia SA	Great Britain	Barclays HSBC Holdings PLC Lloyds Banking Group PLC Royal Bank of Scotland	8 G-SIFI banks
Germany	Deutsche Bank AG Commerzbank AG			
France	Banque Populaire CdE BNP Paribas SA Group Crédit Agrigole Société Générale	Sweden	Nordea AB	
		Switzerland	Credit Suisse AG UBS AG	
Italy	Unicredit Group SA	China	Bank of China	4 G-SIFI banks
Netherlands	ING Groep NV	Japan	Mitsubishi UFJ FG Mizuho FG Sumitomo Mitsui FG	
Spain	Banco Santander SA	USA	Bank of America Bank of New York Mellon Citigroup Goldman Sachs JP Morgan Chase Morgan Stanley Street State Wells Fargo	8 G-SIFI banks
	10 G-SIFI banks			

Remark: The list of G-SIFIs will be updated annually and published in November every year. Therefore, the list will not be fixed - there can be new entries and exits every year and the number of G-SIFIs may change. Future lists may also contain G-SIFIs that are not banking groups.

Source: Financial Stability Board (2011: 4).

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Top banks and banking groups in Europe

Banks ranked by total asset in trillion USD

Rank	Company	Country	in USD	in EUR	Balance sheet date	Core Tier 1 ratio
1	Deutsche Bank	Germany	**2.803**	2.164	31.12.2011	9,50 %
2	HSBC Holdings	Great Britain	**2.556**	1.973	31.12.2011	10,10 %
3	BNP Paribas	France	**2.545**	1.965	31.12.2011	9,60 %
4	Royal Bank of Scotland	Great Britain	**2.506**	1.872	30.09.2011	11,30 %
5	Barclays	Great Britain	**2.431**	1.877	31.12.2011	11,00 %
6	Crédit Agricole	France	**2.318**	1.731	31.12.2011	8,60 %
7	ING Group	Netherlands	**1.817**	1.282	30.09.2011	9,60 %
8	Santander Group	Spain	**1.622**	1.252	31.12.2011	10,74 %
9	Société Générale	France	**1.530**	1.181	31.12.2011	9,00 %
10	UBS	Switzerland	**1.510**	1.166	31.12.2011	14,10 %
11	Lloyds Banking Group	Great Britain	**1.509**	1.165	31.12.2011	10,80 %
12	Groupe BPCE	France	**1.474**	1.138	31.12.2011	9,10 %
13	UniCredit Group	Italy	**1.201**	0.927	31.12.2011	9,97 %
14	Credit Suisse Group	Switzerland	**1.115**	0.861	31.12.2011	10,70 %
15	Rabobank Group	Netherlands	**0.948**	0.732	31.12.2011	12,70 %
16	Commerzbank	Germany	**0.857**	0.662	31.12.2011	9,90 %
17	Intesa Sanpaolo	Italy	**0.828**	0.639	31.12.2011	10,10 %
18	BBVA	Spain	**0.775**	0.598	31.12.2011	9,20 %

Source:).

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Measuring systemic risks in the European banking sector

There are no general accepted indicators for measuring the current systemic risks

- In a new survey Bisias, Flood, Lo and Valavanis describe 31 quantitative measures of systemic risk in the economics and finance literature.
- They find six major categories:
  - Macroeconomic measures,
  - Granular foundations and network measures,
  - Forward-looking risk measurement,
  - Stress tests,
  - Cross-sectional measures
  - Measures of illiquidity and insolvency..
- I will use typical indicators in the next slides, which the **International Financial Institute** (IIF) use in the Bank Health Monitor (part of the monthly Capital Markets Monitor) for the European countries.

Source: Bisias, Flood, Lo and Valavanis (2012).

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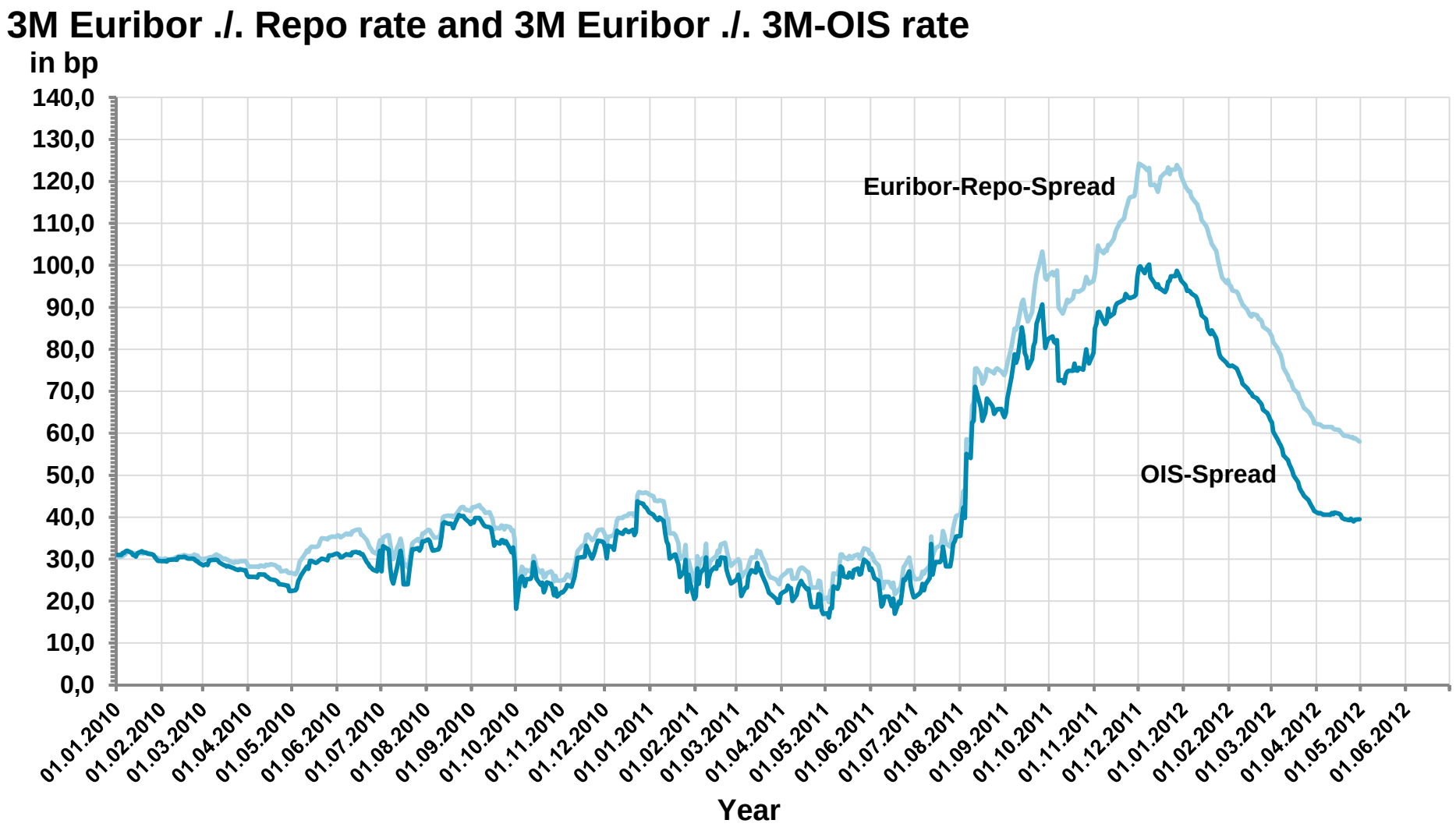
Euribor-Repo-Spread and Euribor-OIS-Spread for the Euro zone



Source: Thomson Reuters Datastream © 2012 and iefg © 2012.

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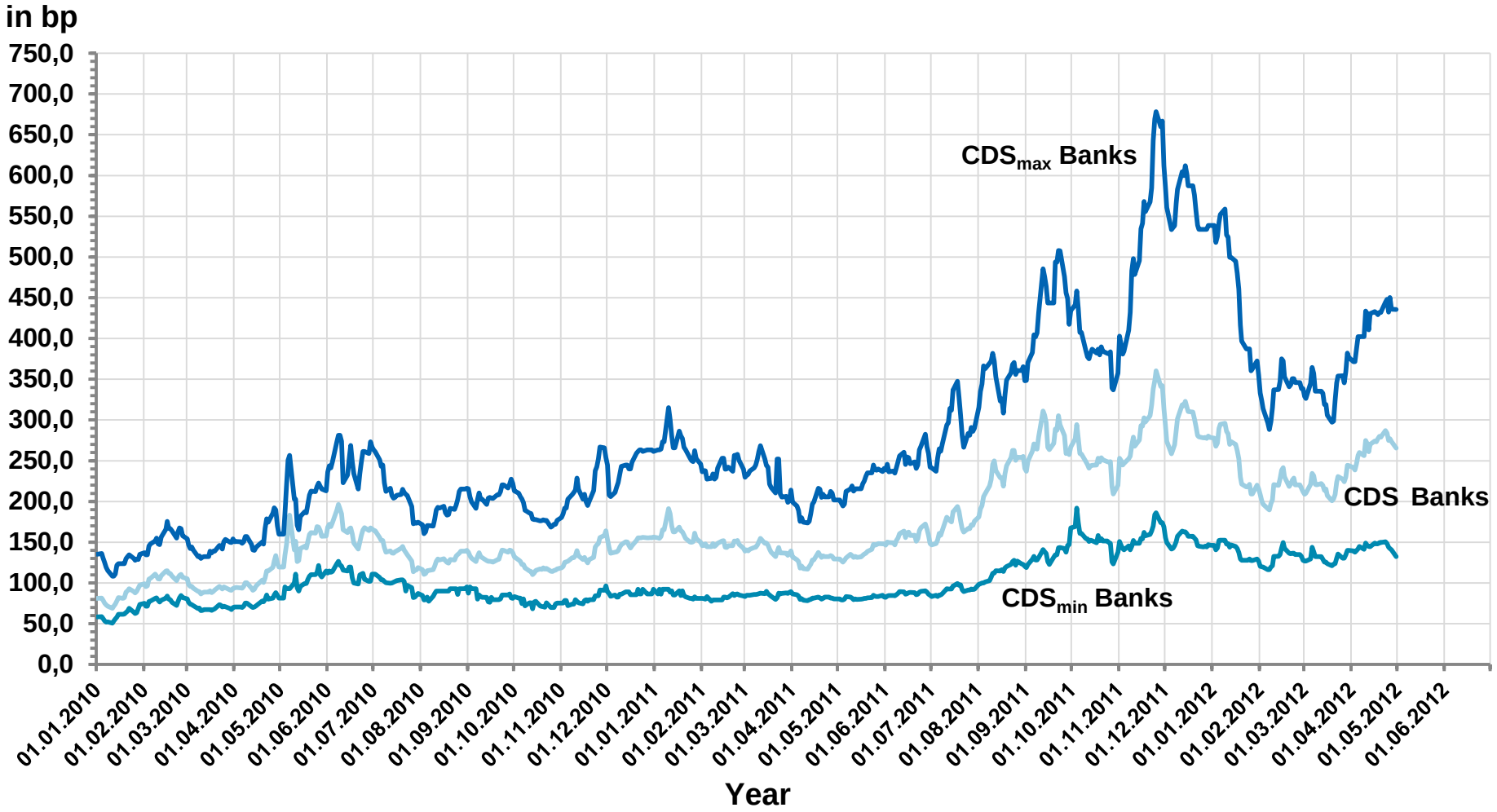
Average CDS spreads of major European banks and banking groups

5-years CDS spreads on the basis of same-weighted single CDS spreads (18 banks)



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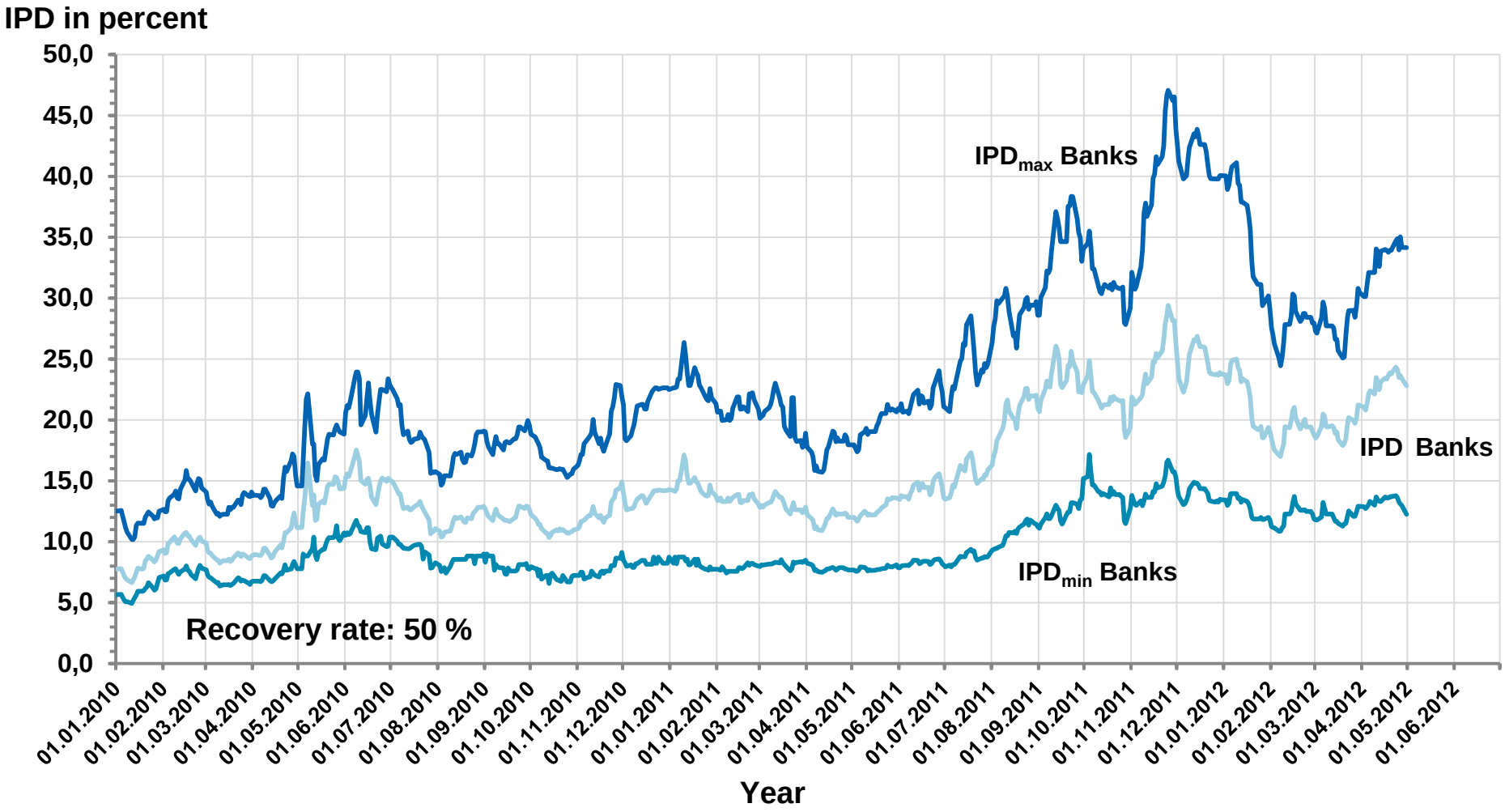
Average implied probability of default (IPD) of European banks and banking groups

IPDs on the basis of average CDS spreads (18 major European banks)



Source: Thomson Reuters Datastream © 2012 and iefg © 2012.

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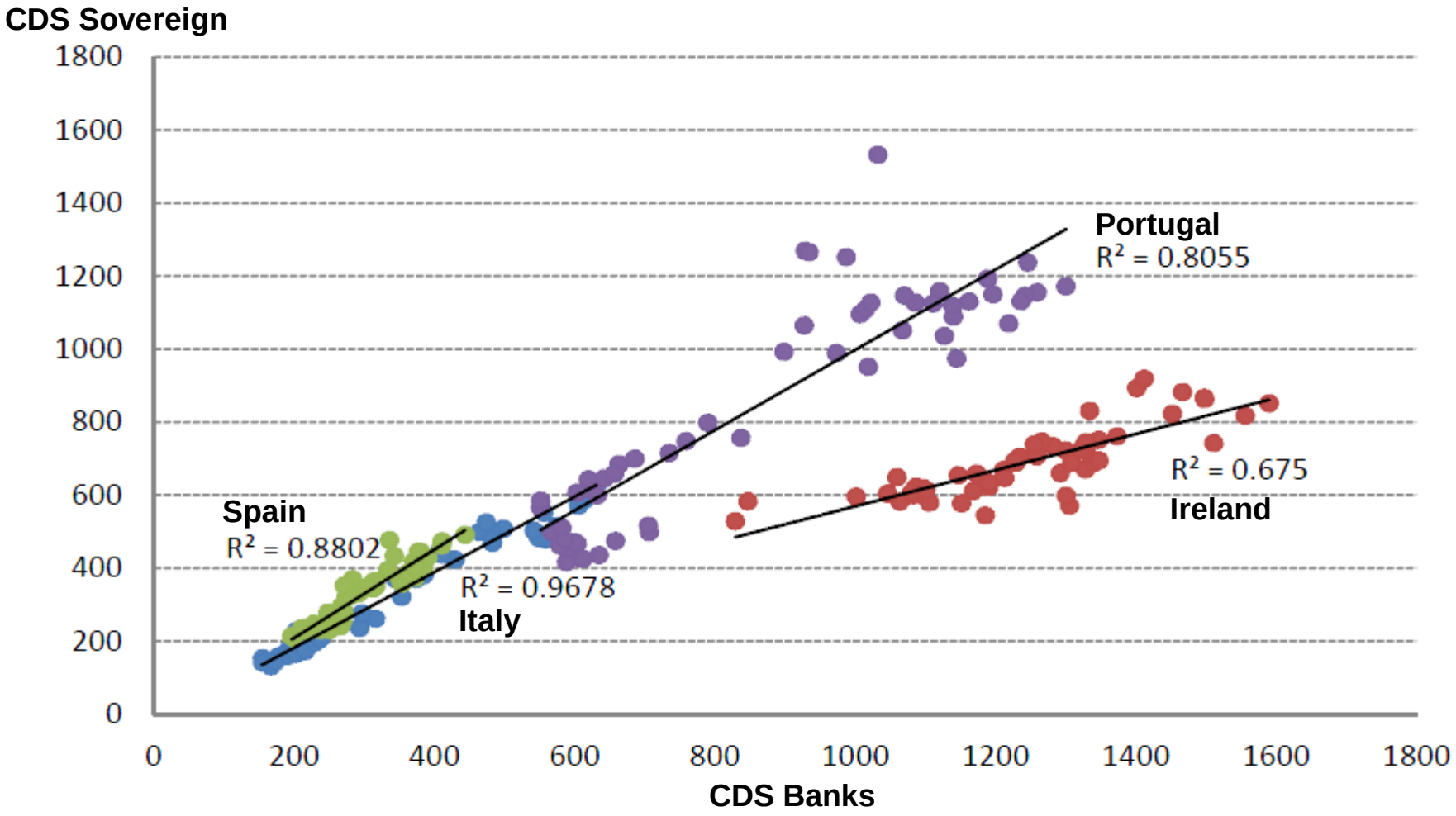
Interdependences between sovereign risk and banking risk

Correlation between sovereign and banking credit default swaps



Source: Angeloni and Wolff (2012: 1).

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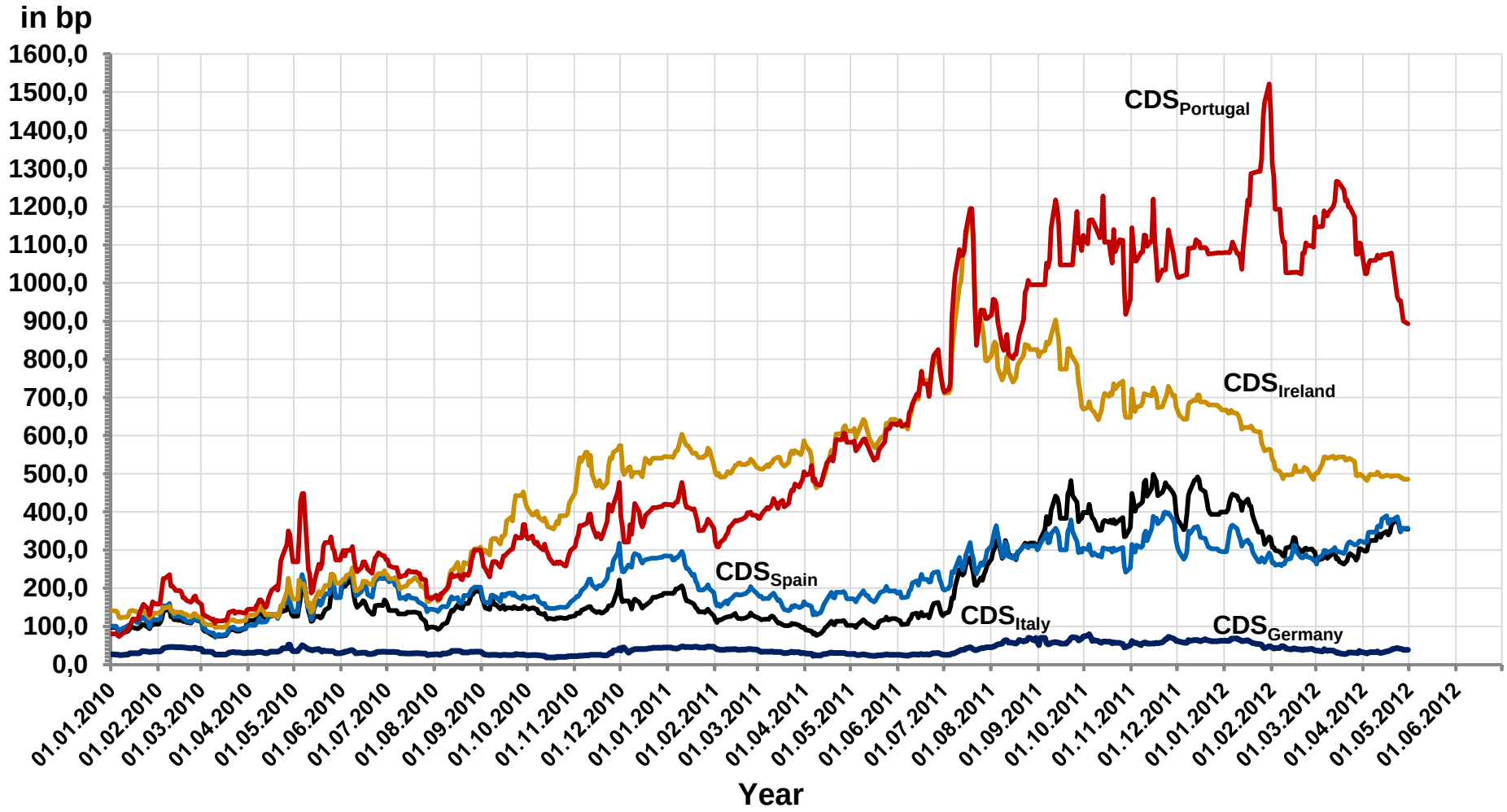
Selected Euro zone sovereign CDS spreads

5-year CDS spreads for Germany, Ireland, Italy, Spain and Portugal



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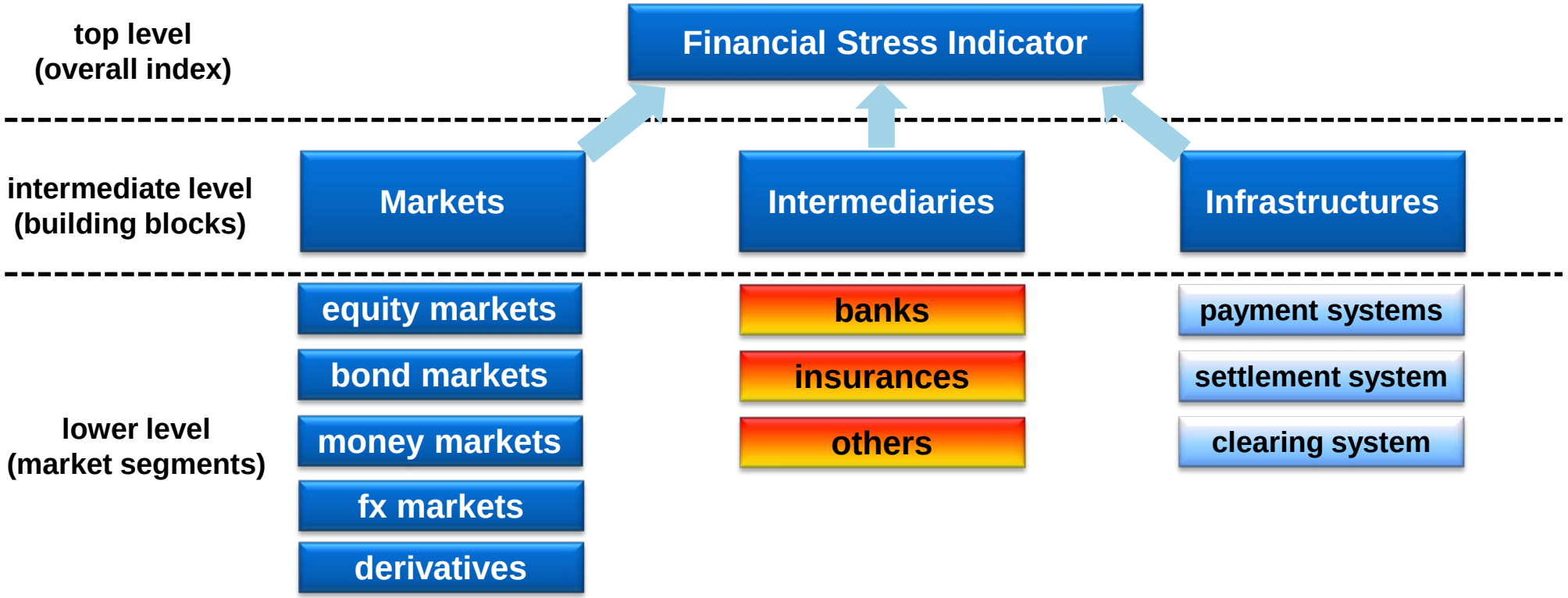
An overall indicator of systemic risk (stress) in the Euro zone

The need for a composite indicator of systemic risk

- Financial systems are complex interdependent networks of markets, intermediaries and infrastructures; all parts are able to cause and to amplify instability the system as a whole.



- Because of data limitations the stress indicator can be constructed normally only with market data and information about the financial intermediaries sector.

Source: Kremer (2011: 10) and own modifications.

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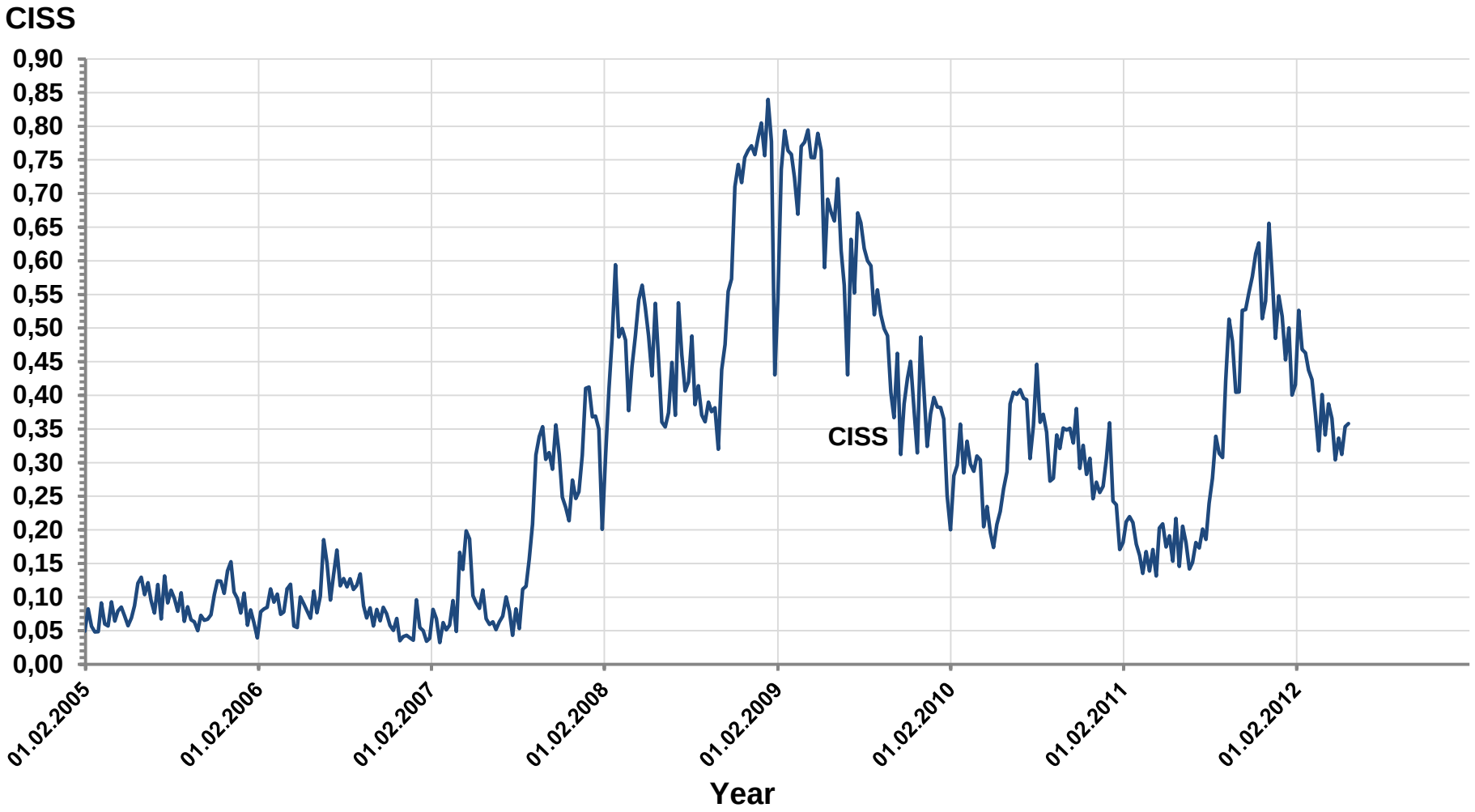
Systemic stress in the financial system of the Euro zone

ECB composite indicator of systemic stress (CISS) for the Euro zone



Source: European Central Bank © 2012 and iefg © 2012.

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How can financial stability be maintained?

Framework for maintaining financial stability

In order to avoid systemic risks and to maintain financial stability, public authorities should have a structure in place enabling them to

- **identify potential vulnerabilities at an early stage**
  The authorities need to monitor and analyse all potential sources of risk and vulnerabilities, which requires systematic monitoring of individual parts of the financial system,

- **take precautionary measures, which make it less likely that costly financial disturbances occur,**

- **undertake actions to reduce the costs of disturbances and restore financial stability after a period of distress.**

Source: Borio (2003).

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The objectives of macroprudential policy

Macro- versus microprudential perspectives

	Macroprudential	Microprudential
Proximate objective	limit financial system-wide distress	limit distress of individual institutions
Ultimate objective	avoid macroeconomic costs linked to financial instability	consumer (investor / depositor) protection
Characterisation of risk	„endogenous“ (dependent on collective behavior)	„exogenous“ (independent of individual agents‘ behavior)
Correlations and common exposures across institutions	Important	Irrelevant
Calibration of prudential controls	in terms of system-wide risk; top-down	in terms of risks of individual institutions; bottom-up

Source: Borio (2003).

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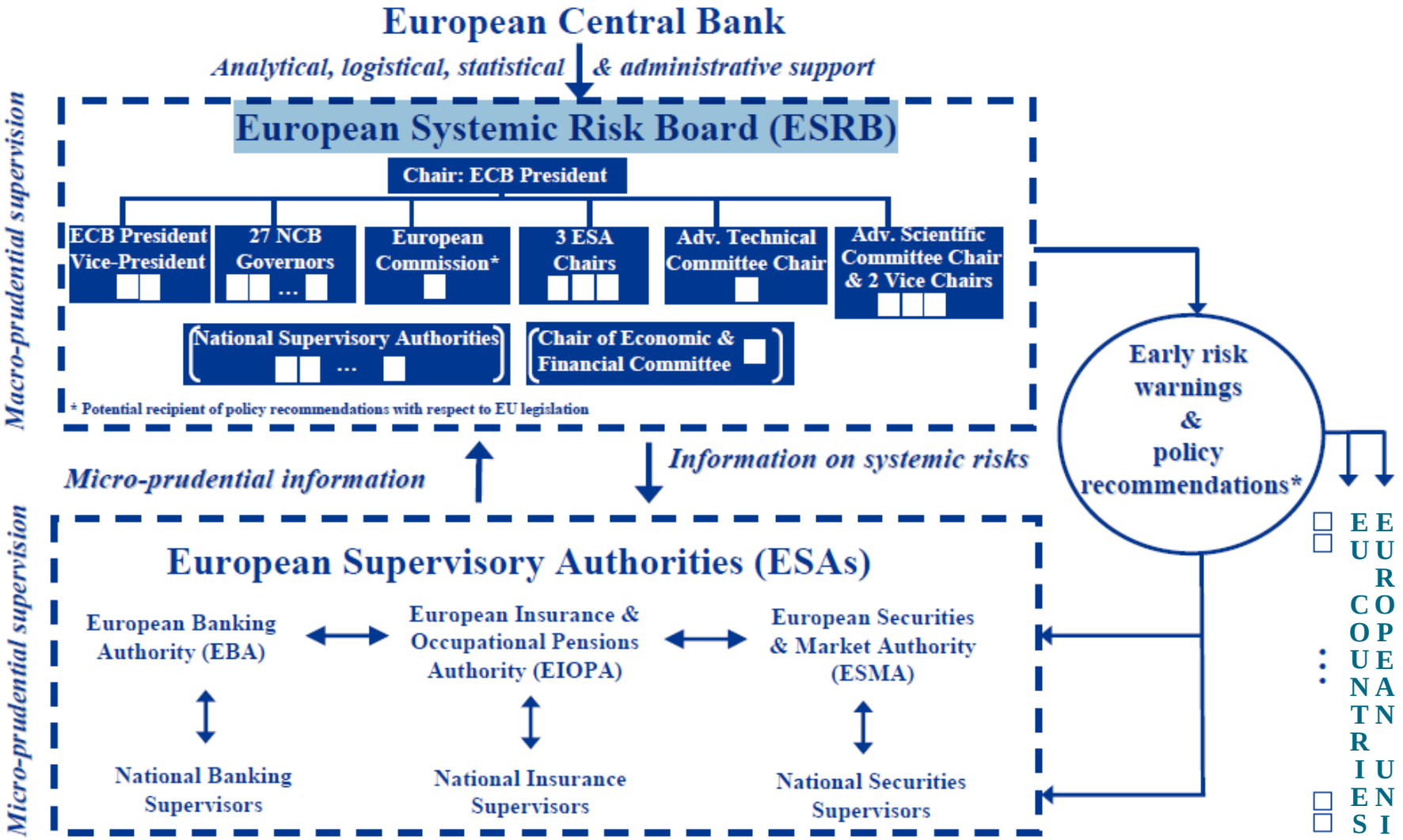
The new organisational structure to avoid systemic risks and to maintain financial stability in the European Union



Source: European Council (2010) and Hartmann (2011).

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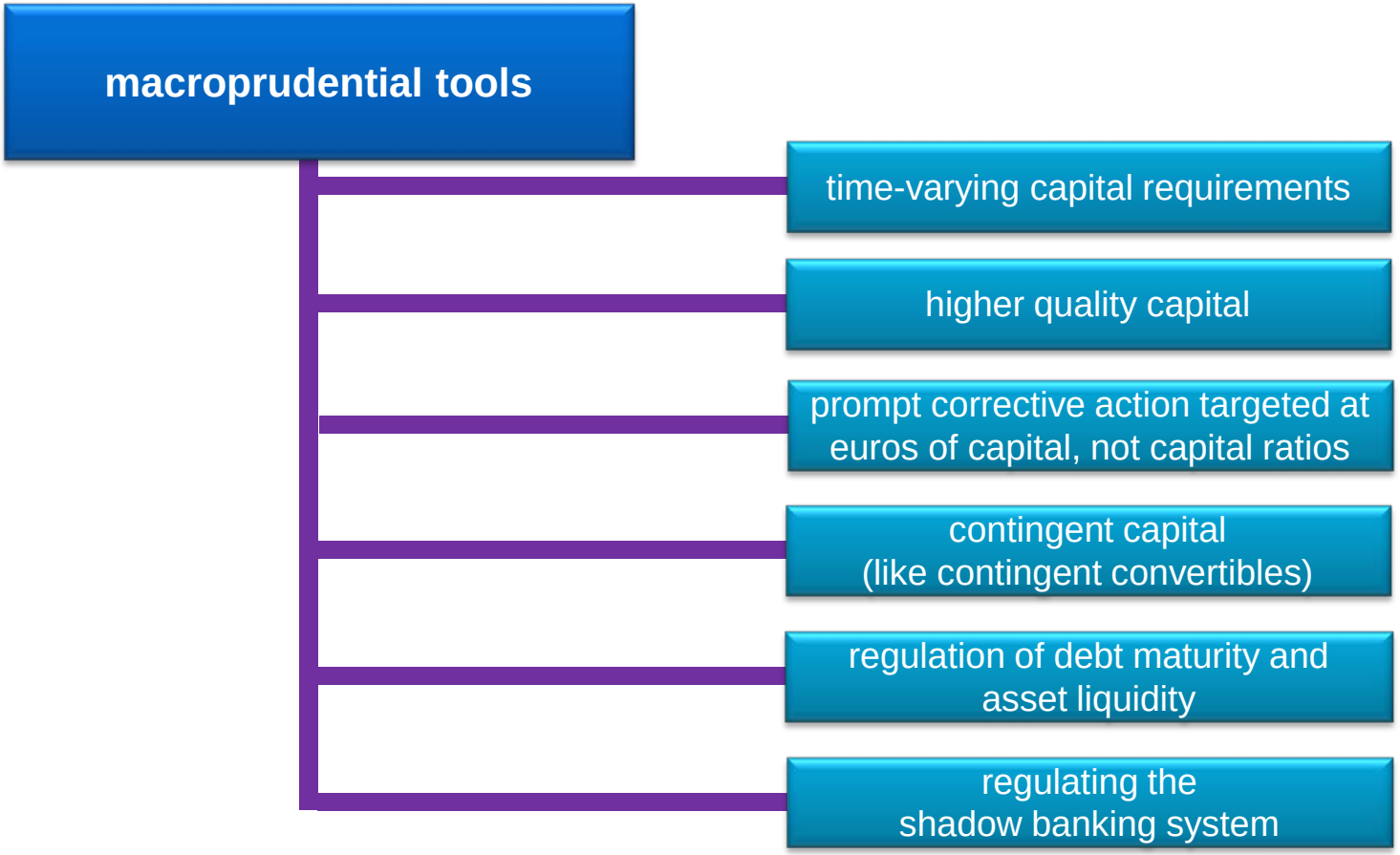
Instruments of macroprudential regulation – The proposals of Hansen, Kashyap and Stein

The macroprudential toolbox



Source: Hanson / Kashyap / Stein (2010).

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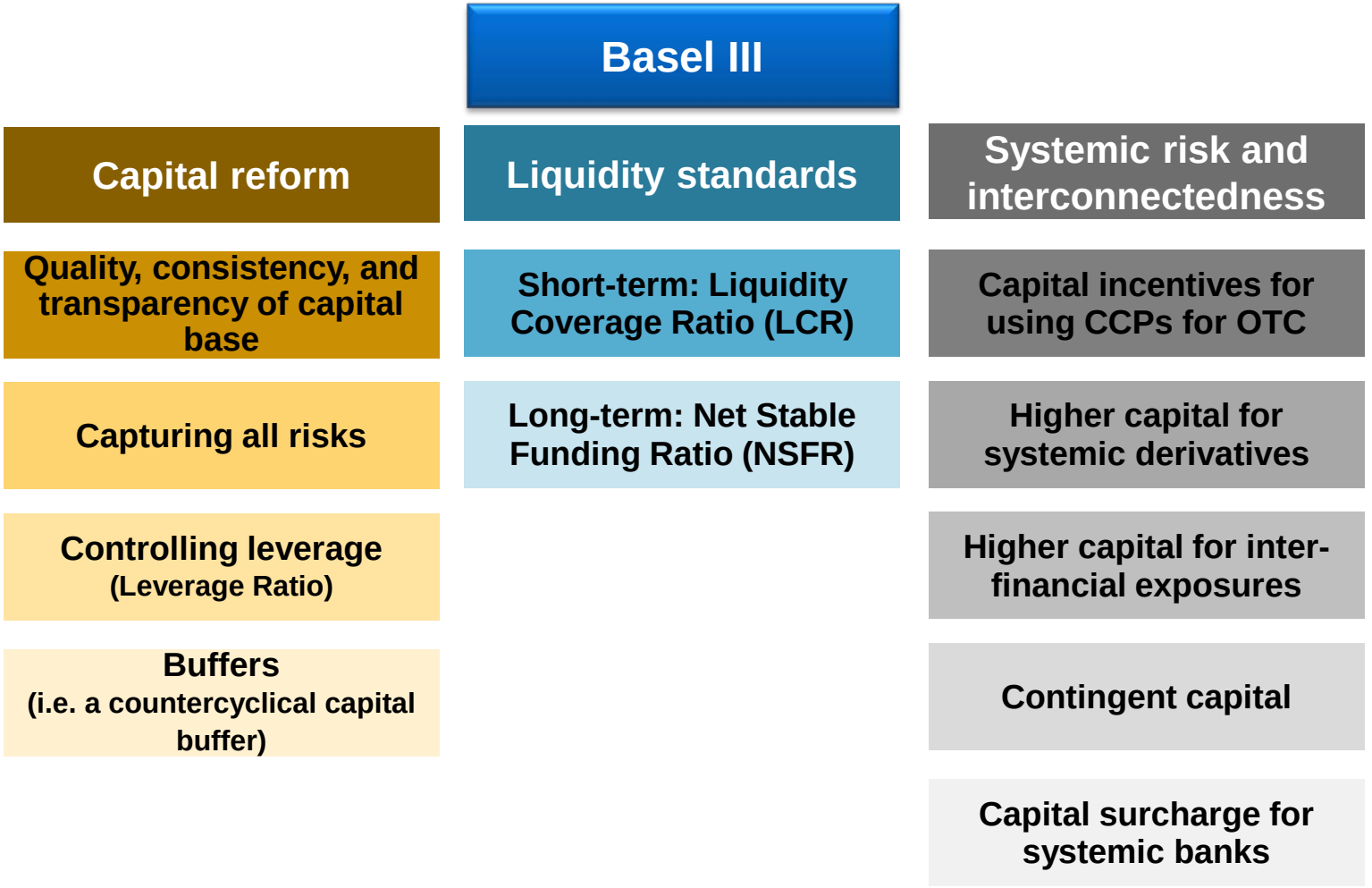
The Basel III proposals

Breakdown of the Basel III proposals



Source: KPMG (2011) and own modifications.

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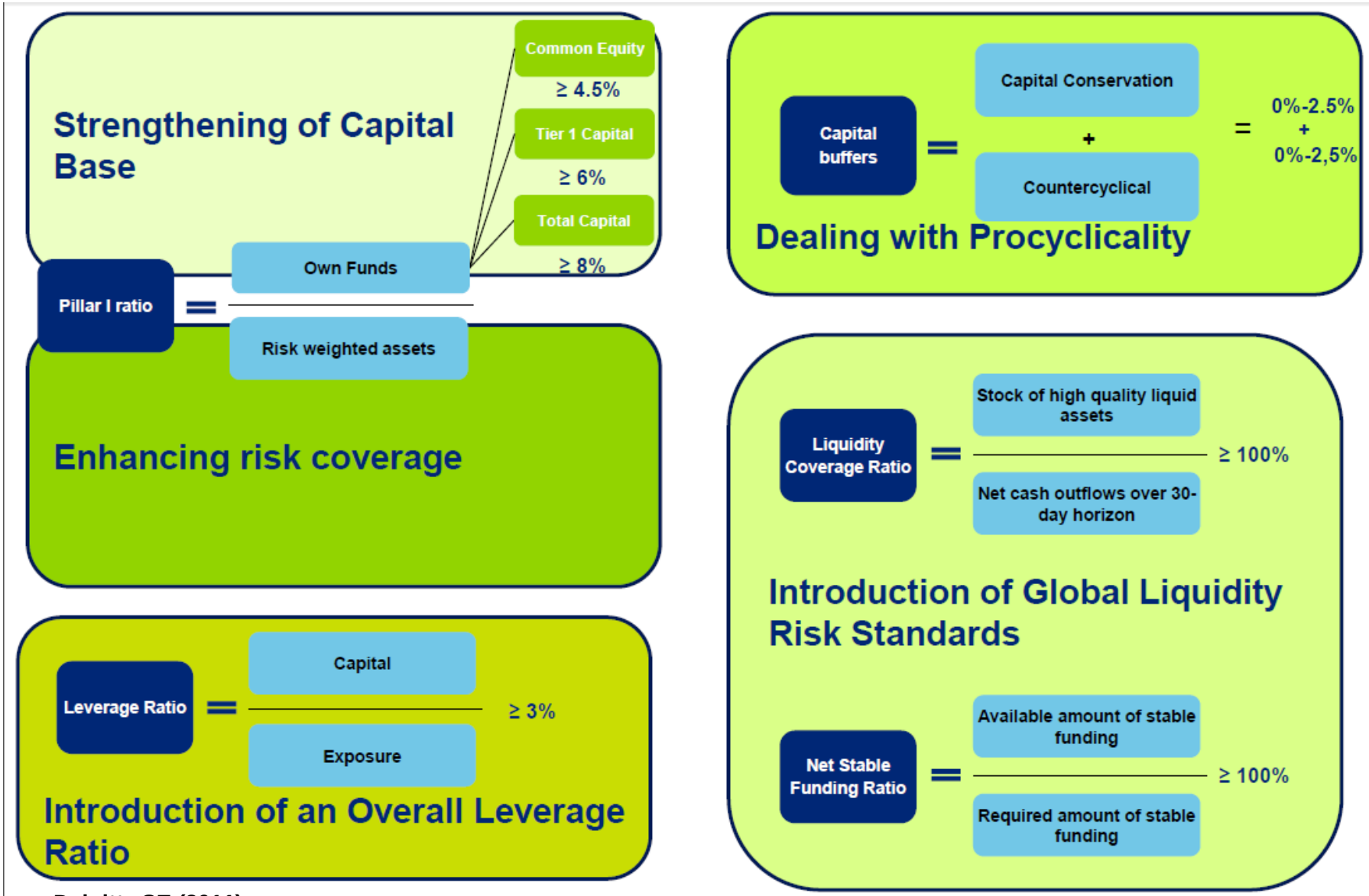
The Basel III – Overview of the metrics



Source: Deloitte SE (2011).

Some remarks concerning an optimum regulation

Only few but good rules, which fulfil the following conditions

- Allocation and sanction functions of the financial markets must remain effective.
- Functioning competitive structures may not be affected.
- Implementing costs by the introduction of new rules have to be limited.
- New rules and modificated rules must be communicated clearly.
- The use of the rules may deliver no range for interpretation.
- Running supervision costs must be limited.
- High transparency and current supply of all relevant data for the control, whether and to what extent the rules were kept.
- Not negotiable sanction measures and adaptation processes must be communicated a priori.

Source: Michler and Thieme (2010).

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Some remarks concerning an optimum regulation

Further conditions

- For the avoidance of regulation arbitrage and distortions of competition a **level playing field** may be necessary for all financial institutions (banks, insurance and so on)
- Institutionally, financially and personnel independent regulators are necessary.
- For the avoidance of trade-offs it is necessary to separate the regulation institutions (objective: **stability of the financial system**) on the one side and the central banks (objective: **price level stability**) on the other side.
- **If one checks the European regulatory measures in detail, one will find a row of technical mistakes (i.e. the effectiveness of the leverage ratio or the positions in the liquidity ratios)**
- **However, in comparison to the Dodd Frank Act these mistakes are less serious. The Dodd Frank Act in the USA has no general concept, no level playing field, a broad range of interpretation, different objectives and a huge number of different regulators.**

Source: Michler and Thieme (2010).

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Conclusions

- 60 percent of the global systemically important financial institutions (G-SIFI) have their headquarters in Western Europe (EMU: 10; other European countries: 8)
- Beside these banks there is great number of domestic systemically important financial institutions (D-SIFI) in every countries (i.e. BBVA in Spain or Alpha Bank in Greece)
- There is no general accepted definition of systemic risks or financial (market) stability.
- Up to now there is no general accepted indicator for measuring the current systemic risks in the financial markets or better to forecast the development of financial stress in the future.
- The current systemic risks of European banks are strong correlated with the actual European sovereign debt crisis; the risks will not decrease in view of the latest political developments in Greece and other countries of the Euro area.
- If the new fiscal pact – signed on Friday 2 March in Brussels by 25 of the 27 countries in the European Union – is weakened, the risks of European banks will further rise.

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Conclusions

- The European Union has reacted to the financial crisis (starting in 2007 / 2008) with the establishment of the “European Systemic Risk Board (ESRB)” as an new institution to identify systemic risks. The main objective is the prevention or mitigation of systemic risks to financial stability in the Union that arise from developments within the financial system.

  But they main problem – to find good indicators for systemic risks or financial instability – remains.

- A quick conversion of the Basel III Accord in the European bank right will strengthen the meaning of the macroprudential instruments.

- Basel III shows in detail a huge number of technical mistakes. That's why we will experience during the coming years a number of modifications (Basel IV and so on).

- However, in comparison to Dodd Frank Act in the USA the set of rules shows clearly less construction mistakes.

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Thank you for your attention !

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Annex

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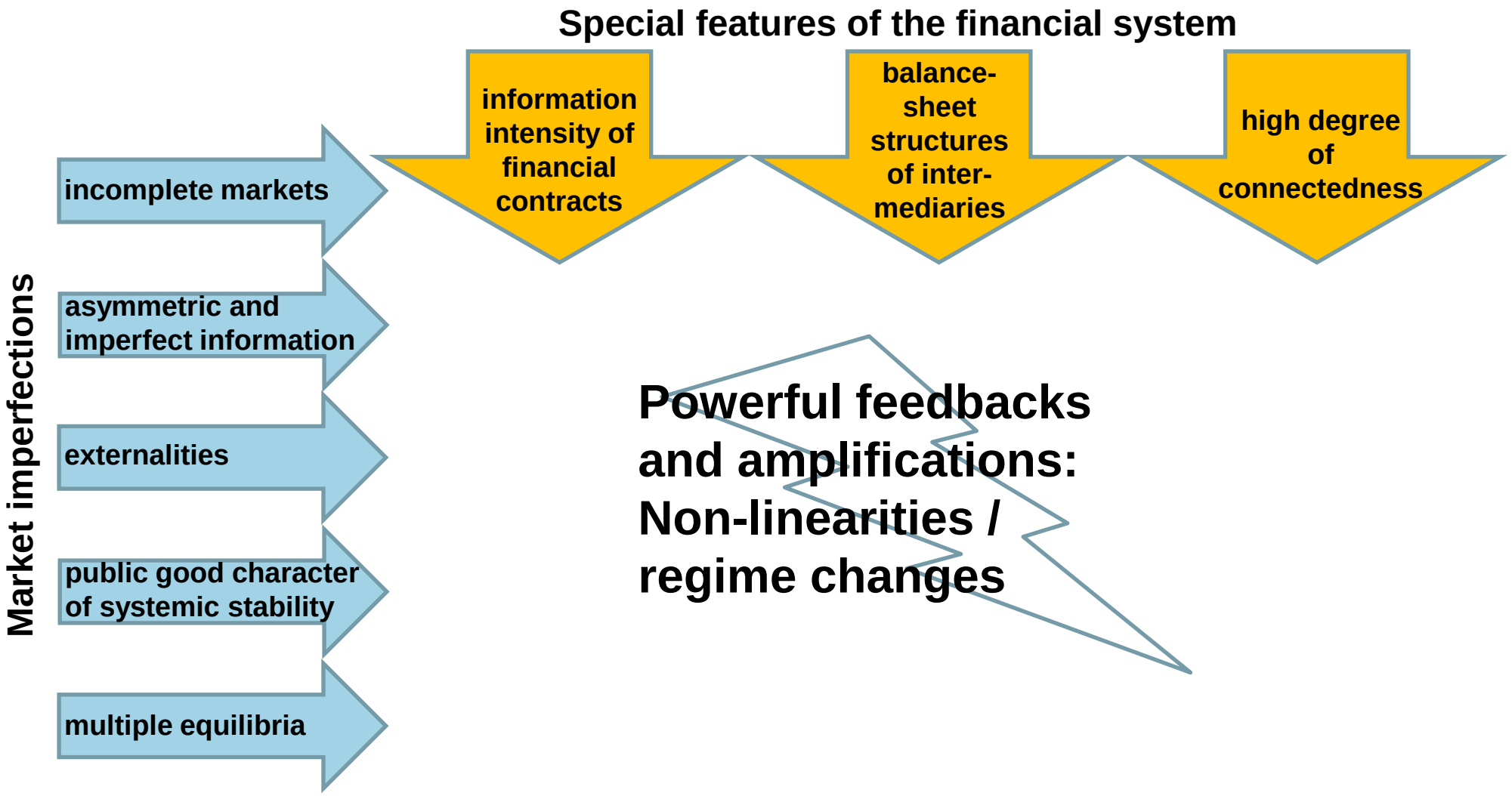
Ultimate source of systemic risk



Source: de Bandt and Hartmann (2000) and Hartmann (2011).

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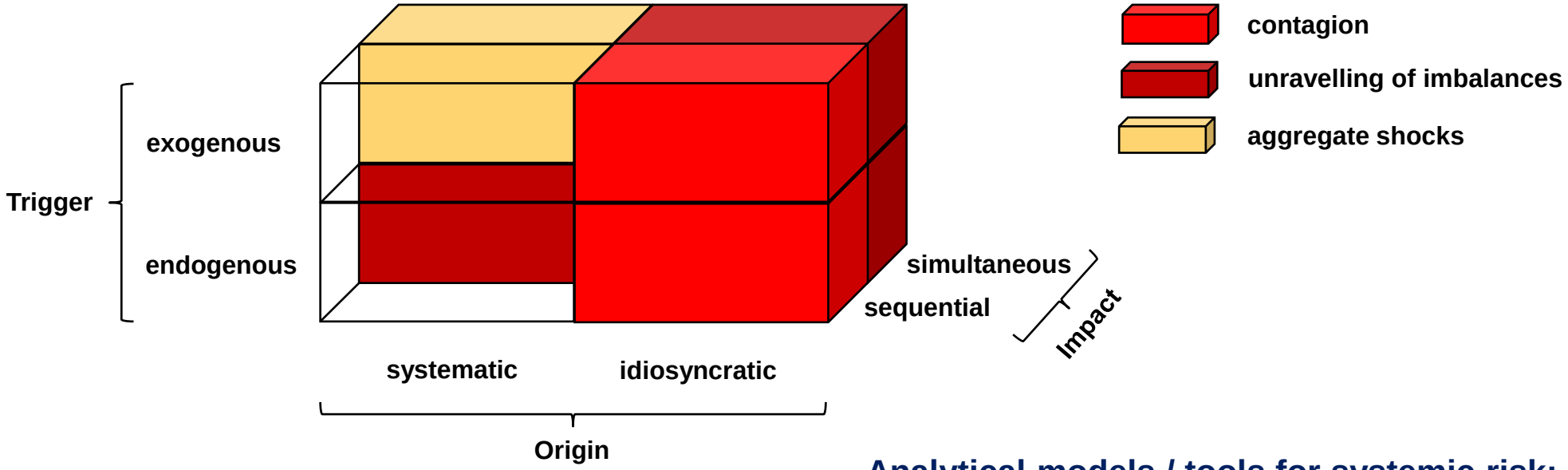
Forms of systemic risk and analytical approaches

The systemic risk cube



Analytical models / tools for systemic risk:

- systemic risk I: Contagion — Contagion and spillover models
- systemic risk II: endogenous build-up and unravelling of widespread imbalances — Early warning indicators and models
- systemic risk III: aggregate shocks — Macro stress testing models

Source: de Bandt, Hartmann and Peydró (2009), ECB (2010) and Hartmann (2011).

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Key criteria for identifying the systemic importance of markets and institutions

Criteria for institutions and markets

- **Criteria for institutions**
  - The **size** of exposures, volumes of transactions or assets managed are indicative of the extent to which clients and counterparties could be disrupted.
  - **Clusters** of institutions can be individually small but collectively significant because they fall into distress at the same time.
  - Some institutions, for example those providing key services such as clearing and settlement, **lack immediate substitutes** for this role.
  - **Interconnectedness** captures situations when distress in one institution raises the likelihood of distress in others.
- **Criteria for markets**
  - The systemic importance of a market derives to an extent from that of the institutions that participate in it.
  - However, the size of a market is a determinant of potential economic costs in case of malfunction.
  - If the function of a stressed market cannot be replicated by other mechanisms, the economic impact can be significant.
  - Interconnectedness refers to markets' interdependence on each other as well as on institutions.

Source: Financial Stability Board (2009: 3).

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Market-implied default probabilities (IPD) based on CDS spreads

A rule of thumb

- As a rule of thumb, the implied probability of default can be approximated by:

$$IPD \approx 1 - \frac{1}{\left\{1 + \frac{CDS_{market}}{\left[1 - \frac{rr}{100}\right]}\right\}^{t}}$$

- where **rr** is the recovery rate, **t** the maturity and $\mathbf{CDS_{market}}$ the observed CDS spread level.

Source: J.P. Morgan (1999) and Deutsche Bank Research (2009: 7).

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Objectives of macroprudential policy

Macro- versus microprudential perspectives

	Macroprudential	Microprudential
Proximate objective	limit financial system-wide distress	limit distress of individual institutions
Ultimate objective	avoid macroeconomic costs linked to financial instability	consumer (investor / depositor) protection
Characterisation of risk	„endogenous“ (dependent on collective behavior)	„exogenous“ (independent of individual agents‘ behavior)
Correlations and common exposures across institutions	Important	Irrelevant
Calibration of prudential controls	in terms of system-wide risk; top-down	in terms of risks of individual institutions; bottom-up

Source: Borio (2003).

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Macroprudential tools

Alternative sets of tools to foster financial stability

Tool set	Goal	Instruments
Prudential policy: Microprudential	limit distress of individual institutions	e.g. quality/quantity of capital, leverage ratio
Prudential policy: Macroprudential	limit financial system-wide distress	e.g. countercyclical capital charges
Monetary policy	price stability	policy rate, standard repos
	liquidity management	collateral policies; interest on reserves; policy corridors
	lean against financial imbalances	policy rate; reserve requirements; mop-up of liquidity; FX reserve buffers
Fiscal policy	manage aggregate demand	taxes; automatic stabilizers; discre-tionary countercyclical measures
	build fiscal buffers in good times	e.g. measures to reduce debt levels; taxes/levies on the financial system
Capital controls	limit system-wide currcency mismatches	e.g. limits on open foreign exchange positions; constraints on the type of foreign currency assets
Infrastructure policy	strengthen the resilience of the infra-structure of the financial system	e.g. move derivative trading on exchanges

Source: Hannoun (2003); Galati and Moessner (2011: 8).

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Macroprudential tools

Macroprudential instruments 1/3

1. Risk measurement methodologies	Examples
By banks	Risk measures calibrated through the cycle or to the cyclical trough
By supervisors	Cyclical conditionality in supervisory ratings of firms; Develop measures of systemic vulnerability (e.g. commonality of exposures and risk profiles, intensity of inter-firm linkages) as basis for calibration of prudential tools; Communication of official assessments of systemic vulnerability and outcomes of macro stress tests;
2. Financial Reporting	
Accounting standards	Use of less procyclical accounting standards; dynamic provisions
Prudential filters	Adjust accounting figures as a basis for calibration of prudential tools; Prudential provisions as add-on to capital; smoothing via moving averages of such measures; time-varying target for provisions or for maximum provision rate
Disclosures	Disclosures of various types of risk (e.g. credit, liquidity), and of uncertainty about risk estimates and valuations in financial reports or disclosures

Source: BIS (2008).

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Macroprudential tools

Macroprudential instruments 2/3

3. Regulatory capital	Examples
Pillar 1	Systemic capital surcharge; Reduce sensitivity of regulatory capital requirements to current point in the cycle and with respect to movements in measured risk; Introduce cycle-dependent multiplier to the point-in-time capital figure; Increased regulatory capital requirements for particular exposure types (higher risk weights than on the basis of Basel II, for macroprudential reasons)
Pillar 2	Link of supervisory review to state of the cycle
4. Funding liqudity	Cyclically-dependent funding liquidity requirements; Concentration limits; FX lending restrictions; FX reserve requirements; currency mismatch limits; open FX position limits
5. Collateral arrangements	Time-varying Loan-to-value (LTV) ratios; Conservative maximum loan-to-value ratios and valuation methodologies for collateral; Limit extension of credit based on increases in asset values; Through-the-cycle margining
6. Risk concentration limits	Quantitative limits to growth of individual types of exposures; (Time-varying) interest rate surcharges to particular types of loans.

Source: BIS (2008).

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Macroprudential tools

Macroprudential instruments 3/3

7. Compensation schemes	Guidelines linking performance-related pay to ex ante longer-horizon measures of risk; back-loading of pay-offs; Use of supervisory review process for enforcement
8. Profit distribution restrictions	Limit dividend payments in good times to help build up capital buffers in bad times
9. Insurance mechanisms	Contingent capital infusions; Pre-funded systemic risk insurance schemes financed by levy related to bank asset growth beyond certain allowance; Pre-funded deposit insurance with premia sensitive to macro (systemic risk) in addition to micro (institution specific) parameters
10. Managing failure and resolution	Exit management policy conditional on systemic strength; Trigger points for supervisory intervention stricter in booms than in periods of systemic distress

Source: BIS (2008).

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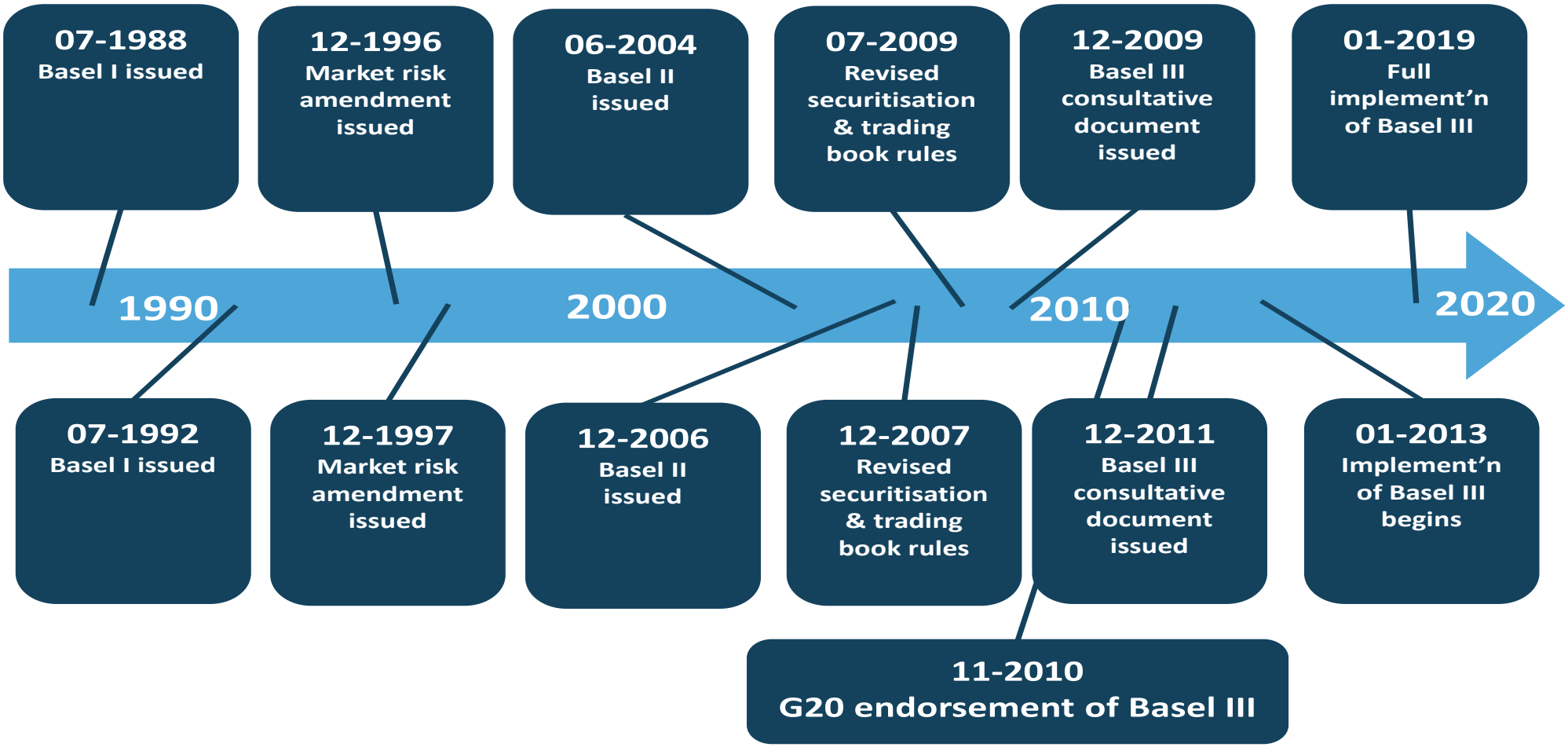
Thirty years of the Basel process

Time line of Basel process



Source: BIS (2010).

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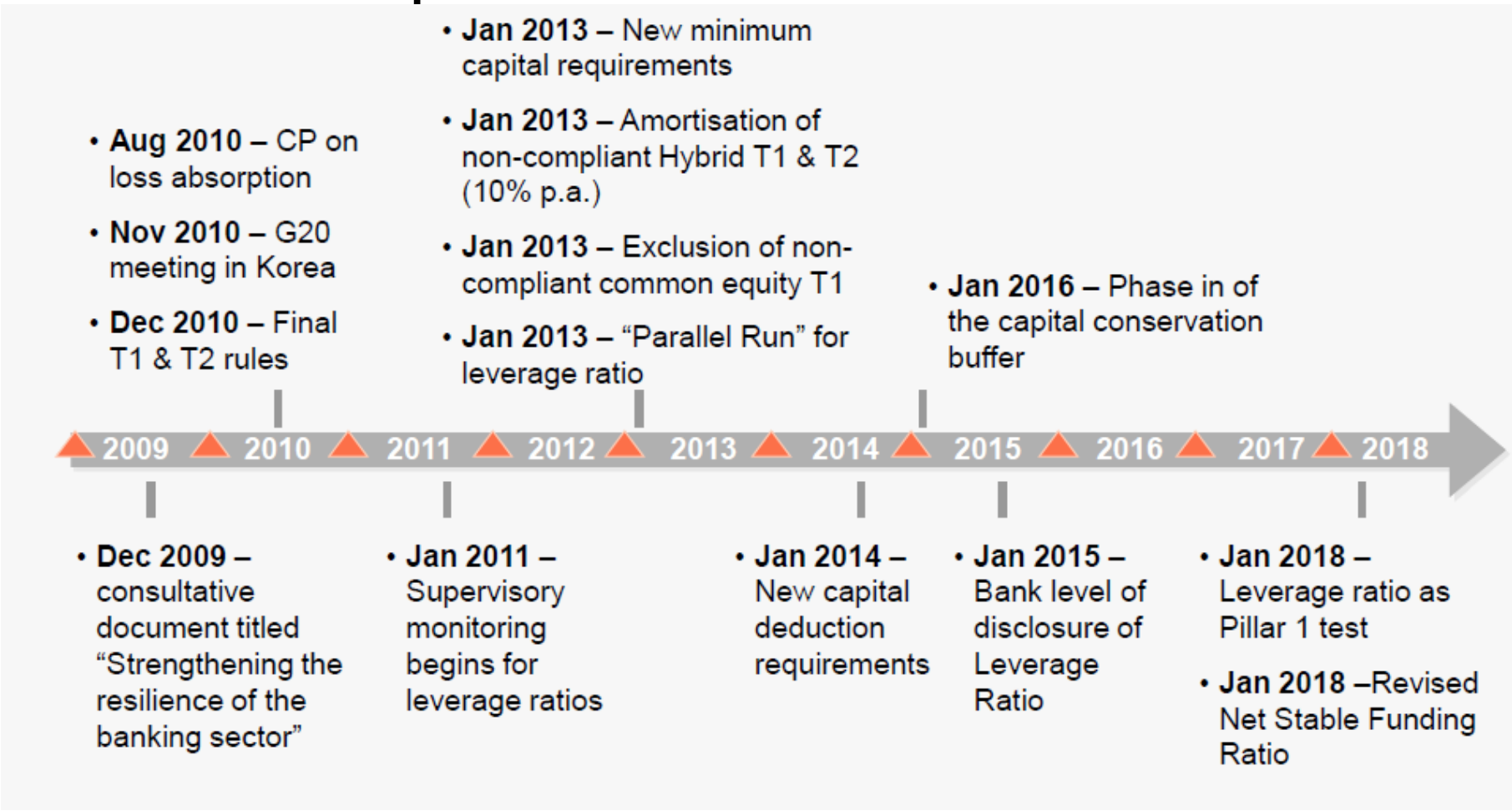
Thirty years of the Basel process

Time line of Basel process



Source: HSBC (2010).

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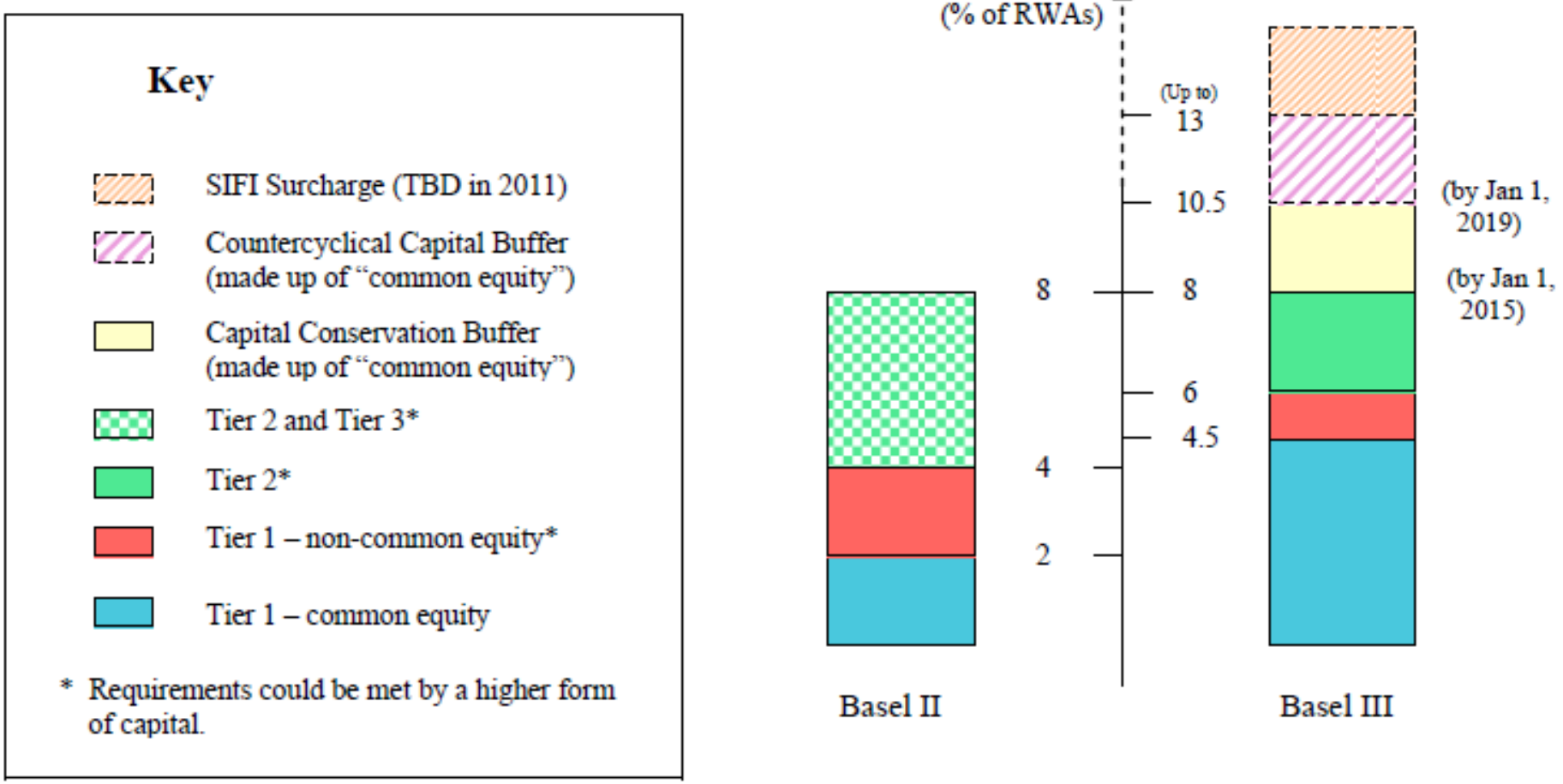
Key elements of the Basel III framework

The capitel ratios



Source: Shearman and Sterling LLP (2011).

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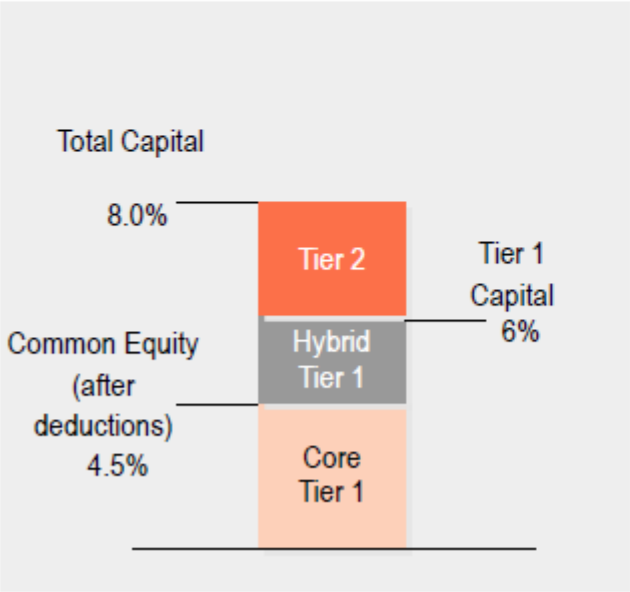
Key elements of the Basel III framework

The capitel ratios

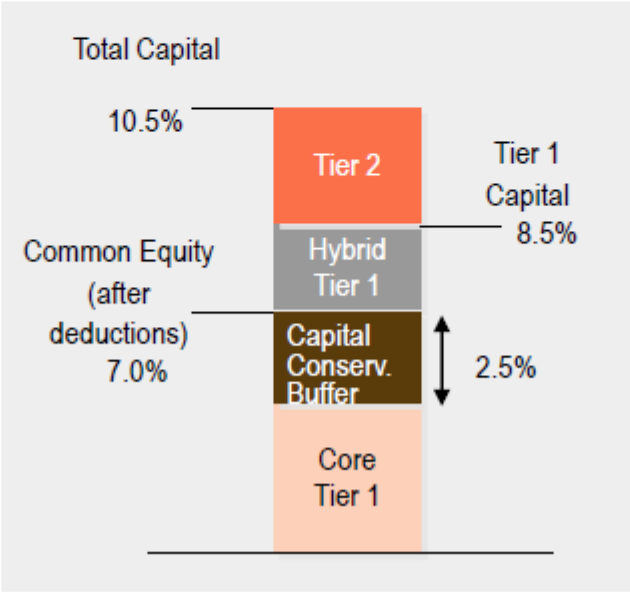
Minimum Capital Requirement

- Minimum common equity ratio increases from 2% to 4.5%



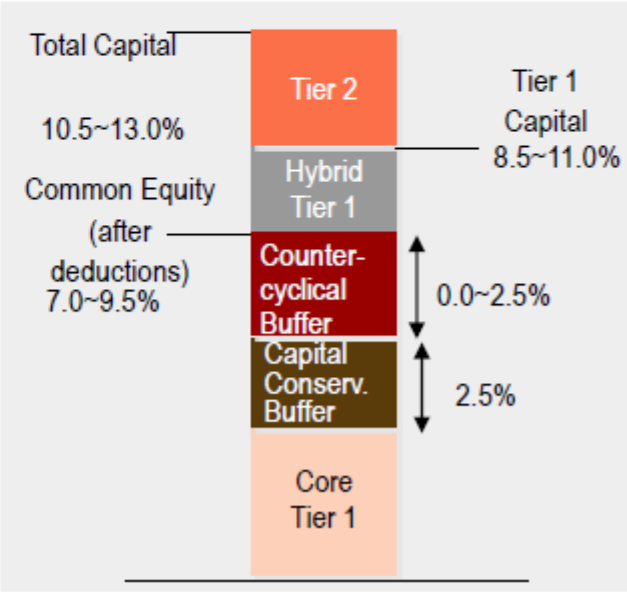
Capital Conservation Buffer

- Capital conservation buffer of 2.5% must be met with common equity (after regulatory adjustment)



Countercyclical Buffer

- A countercyclical buffer (0.0%~2.5%) of common equity or other loss absorbing capital will be introduced



Source: HSPC (2011).

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The Basel III reform of bank capital regulation

Strengthened capital framework: from Basel II to Basel III

In percentage of risk-weighted assets	Capital requirements							Additional macroprudential overlay	
	Common equity			Tier 1 capital		Total capital		Counter-cyclical buffer	Additional loss-absorbing capacity for SIFIs*
	Minimum	Conservation buffer	Required	Minimum	Required	Minimum	Required	Range	
Basel II	**2**			4		**8**			
Memo:	*Equivalent to around 1% for an average international bank under the new definition*			*Equivalent to around 2% for an average international bank under the new definition*					
Basel III New definition and calibration	**4.5**	2.5	**7.0**	6	8.5	**8**	**10.5**	0–2.5	Capital surcharge for SIFIs?

* Modalities to be defined.

Quelle: BIS (2010).

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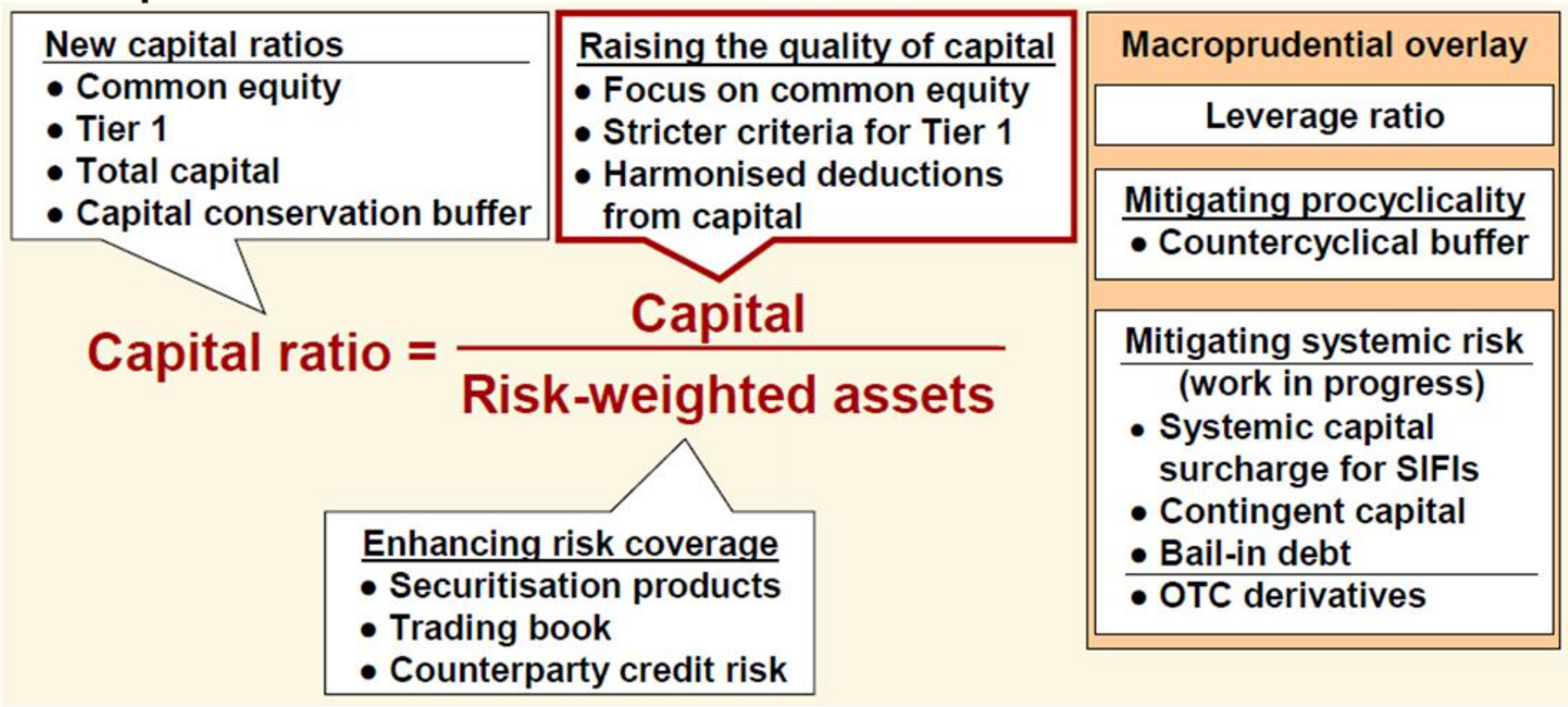
The Basel III reform of bank capital regulation

The capital ratio



Quelle: BIS (2010).