EUROPEAN CENTRAL BANK

EUROSYSTEM

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Trade-offs in macroprudential policy

Session II: Macroprudential Policy Issues

Conference on Financial Stability

Banco de Portugal

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Disclaimer: The views and opinions expressed in this do not necessarily reflect those of the European Central Bank or its Governing Council. I am grateful to Stephan Fahr for helpful discussions in preparing this presentation.

Evaluating policy effectiveness requires clarity about objectives and awareness of trade-offs

1. **Operational objectives should be stated ex ante**
   $\Rightarrow$ What is the degree of resilience that policy actions aim for and against which types of risks? What is considered an excessive financial cycle amplitude?

2. **A necessary condition for effectiveness is that selected policy instruments have the capacity to achieve the stated objective**
   $\Rightarrow$ Transmission of policy instruments needs to be clarified

3. **Instruments should be assigned to objectives according to their relative effectiveness**
   $\Rightarrow$ Alternative policy instruments have comparative advantages in achieving objectives, requiring knowledge of trade-offs

Overview

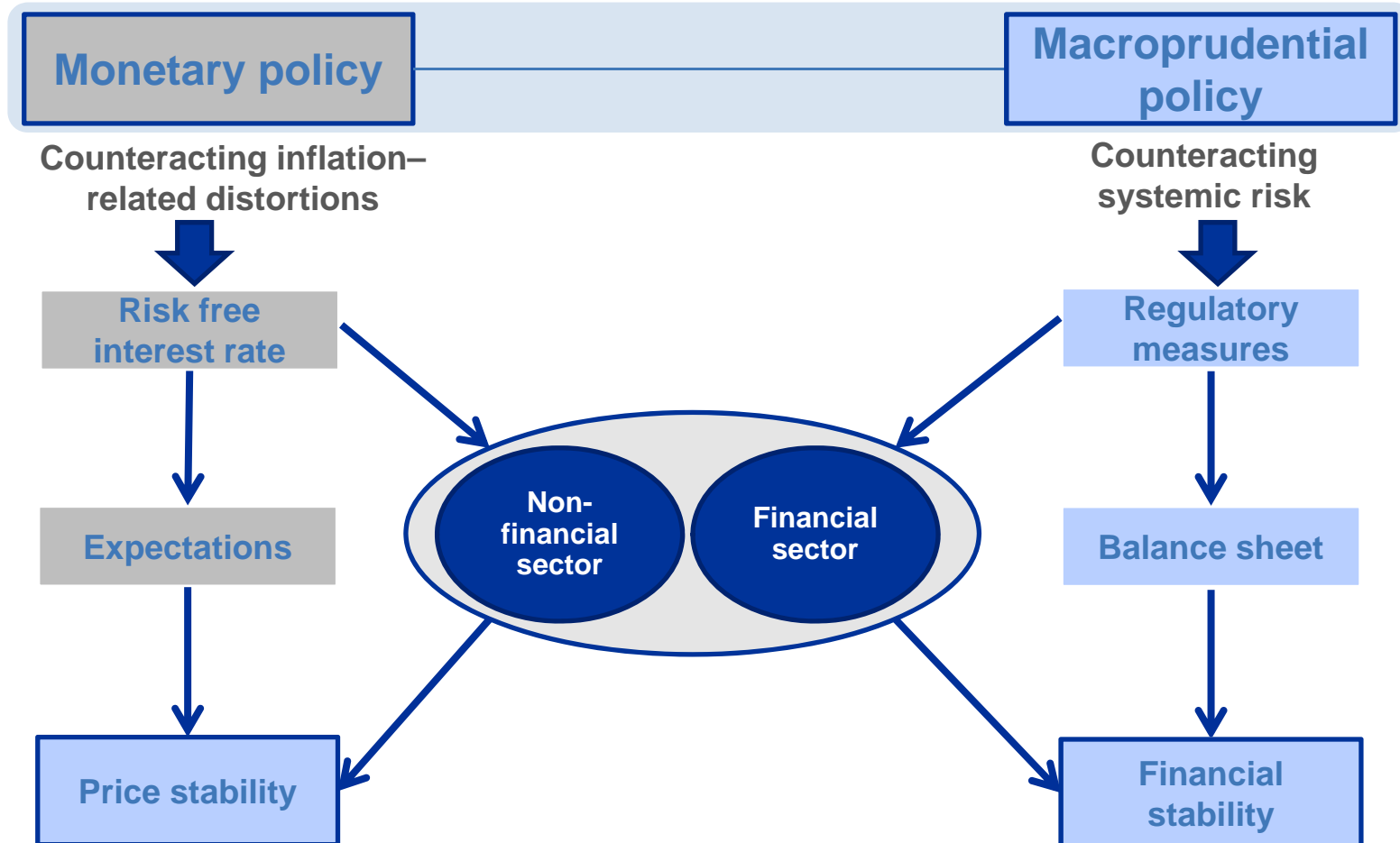**1** **Policy domain trade-off**: Macroprudential vs. monetary policy

2 **Operational objective trade-off**: Taming the cycle vs. ensuring resilience

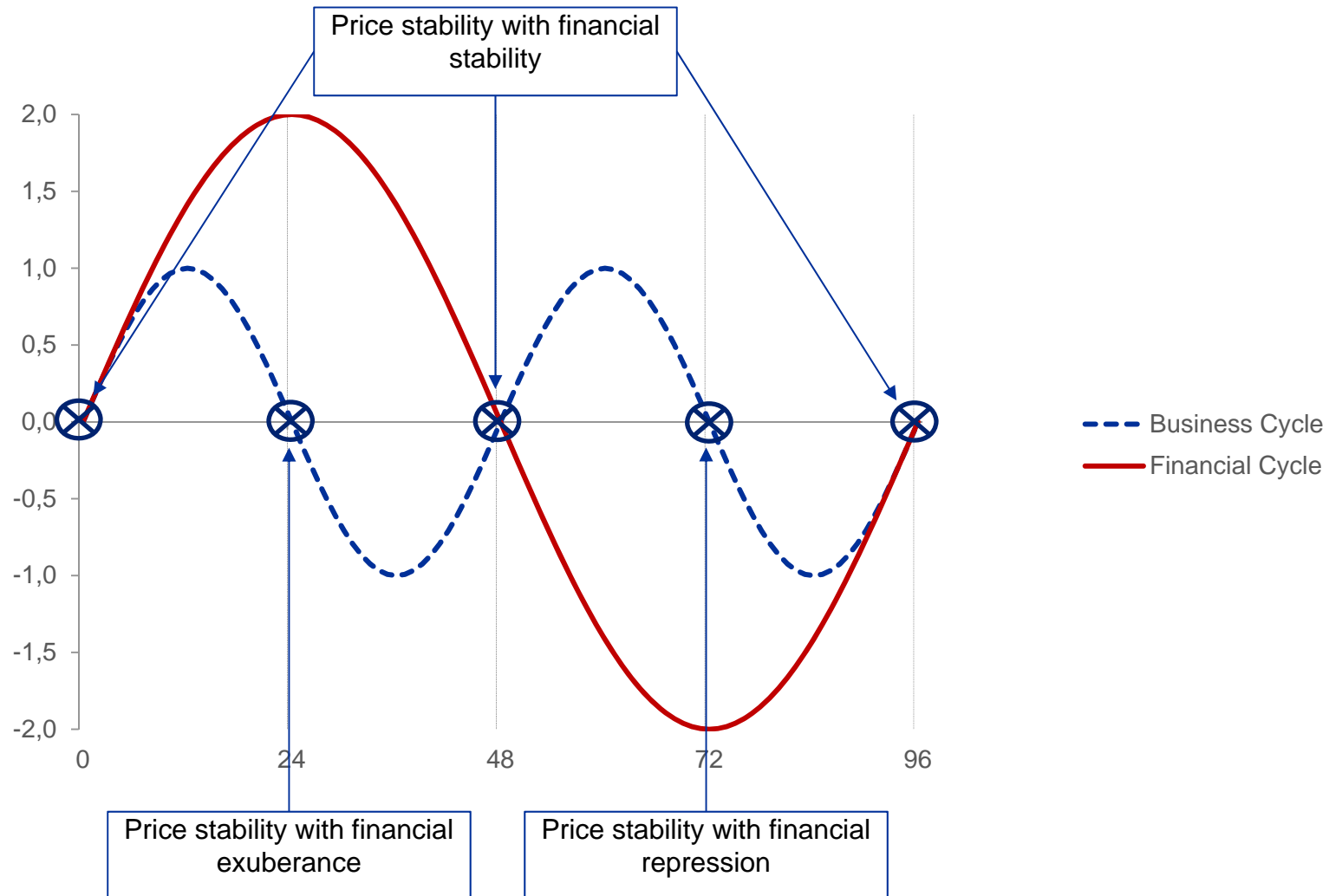**3** **Instrument trade-offs**: Borrower-based measures

Trade-off #1: Monetary vs. macroprudential policy trade-off

- Both policy domains have separate objectives and different instruments
- Policy transmissions not independent, each affecting the other's objective
- Effective assignment of instruments to objectives is necessary

Interaction of business and financial cycles

Price stability with financial stability

Price stability with financial exuberance

Price stability with financial repression

Business Cycle

Financial Cycle

Source: Fahr and Fell (2017), "Macroprudential policy – closing the financial stability gap", Journal of Financial Regulation and Compliance , Vol. 25(3), 2017.
Note: These stylised business and financial cycles are generated with sinusoid functions of the form: $y(t)=A\ sin(2\pi f t+\varphi)$ where A is the amplitude, f is the frequency and φ is the phase or position of the cycle at t=0. In the example shown here, the business cycle has a length of 4 years (48 months) and an amplitude of 1 while the financial cycle has double the period (96 months, 8 years) and double the amplitude of the business cycle.

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Assignment of monetary and macroprudential policy
(Fahr and Fell, 2017)

New-Keynesian model extended with crisis probability and lending spreads for financial intermediation

Macroprudential policy objective to minimize expected losses from crisis $p_t w_t$

Joint monetary and macroprudential policy objective function:

$$\max_{i_t, c_t, r_t} \left[E_0 \sum_{t=0}^{\infty} \beta^t \left(\underbrace{-\frac{1}{2} \pi(i_t, c_t, r_t)^2 - \frac{1}{2} \varkappa\, y(i_t, c_t, r_t)^2}_{\mathcal{L}:\ \textit{Monetary policy objective}} + \underbrace{\beta\, p(\overset{+}{y_t}, \overset{-}{c_t})\, w(\overset{+}{r_t})}_{\mathcal{M}:\ \textit{Macroprudential policy objective}} \right) \right]$$

i: interest rate	π : inflation	p : crisis probability
c: cyclical policies	y : output gap	w : loss during crisis
r: resilience policies		(counted negative)

New Keynesian economy with lending spreads

IS curve: $y_t = -\sigma_1(i_t - \pi_{t+1}^e) - \sigma_2(\rho_t - \pi_{t+1}^e) + y_{t+1}^e + \varepsilon_t$

Phillips curve: $\pi_t = \kappa y_t + \sigma \pi_{t+1}^e + \nu_t$

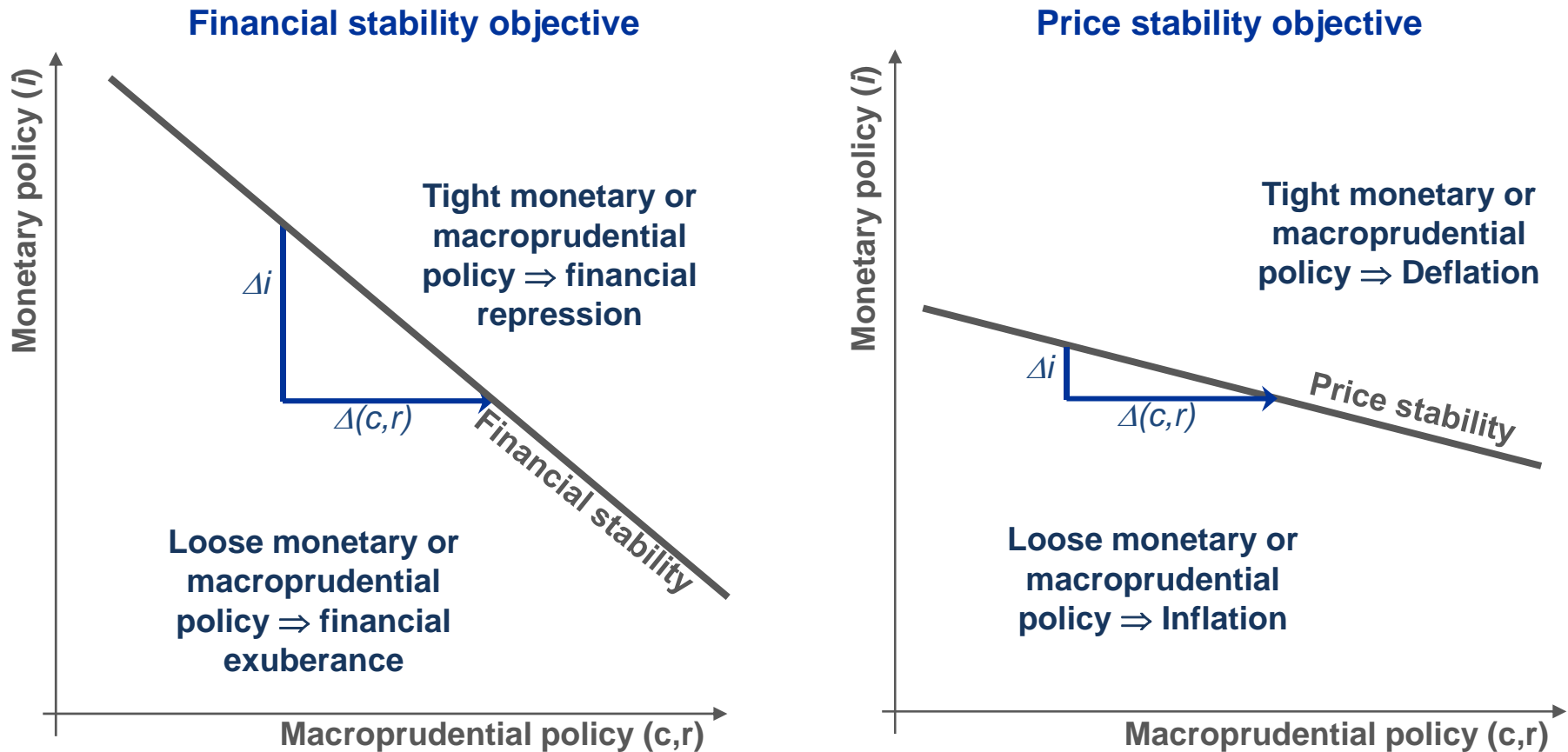Lending spreads: $\rho_t = i_t + \xi r_t + \lambda c_t$

Monetary vs. macroprudential policy trade-off

What is the relative effectiveness of achieving financial stability / price stability with monetary and macroprudential policy?

Relative slope: monetary policy more efficient instrument for price stability objective

Financial stability objective

Price stability objective

Source: Fahr and Fell (2017), "Macroprudential policy – closing the financial stability gap", Journal of Financial Regulation and Compliance, Vol. 25(4), pp.334-359.

Principle of effective market classification
(Mundell, 1962)

- **Monetary policy** relatively more effective for price stability; **macroprudential policy** relatively more effective for financial stability

- Inappropriate assignment of the policies would be destabilising (A ⇒ B')

- The policies need to take each other into account (A ⇒ B ⇒ C)

⇒ **Appropriate assignment of instruments to policy objectives mitigates spillovers and raises effectiveness**

Monetary policy – macroprudential policy assignment
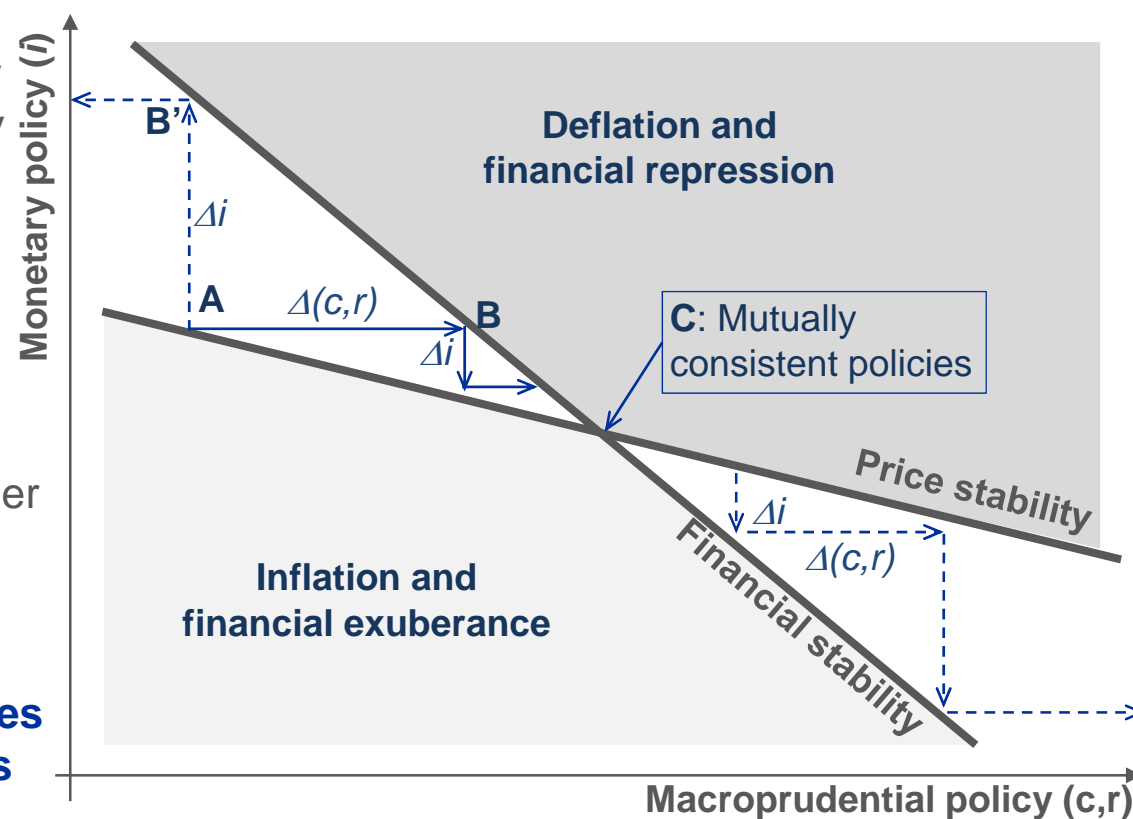
Source: Fahr and Fell (2017), "Macroprudential policy – closing the financial stability gap", Journal of Financial Regulation and Compliance, Vol. 25(4), pp.334-359.

Overview

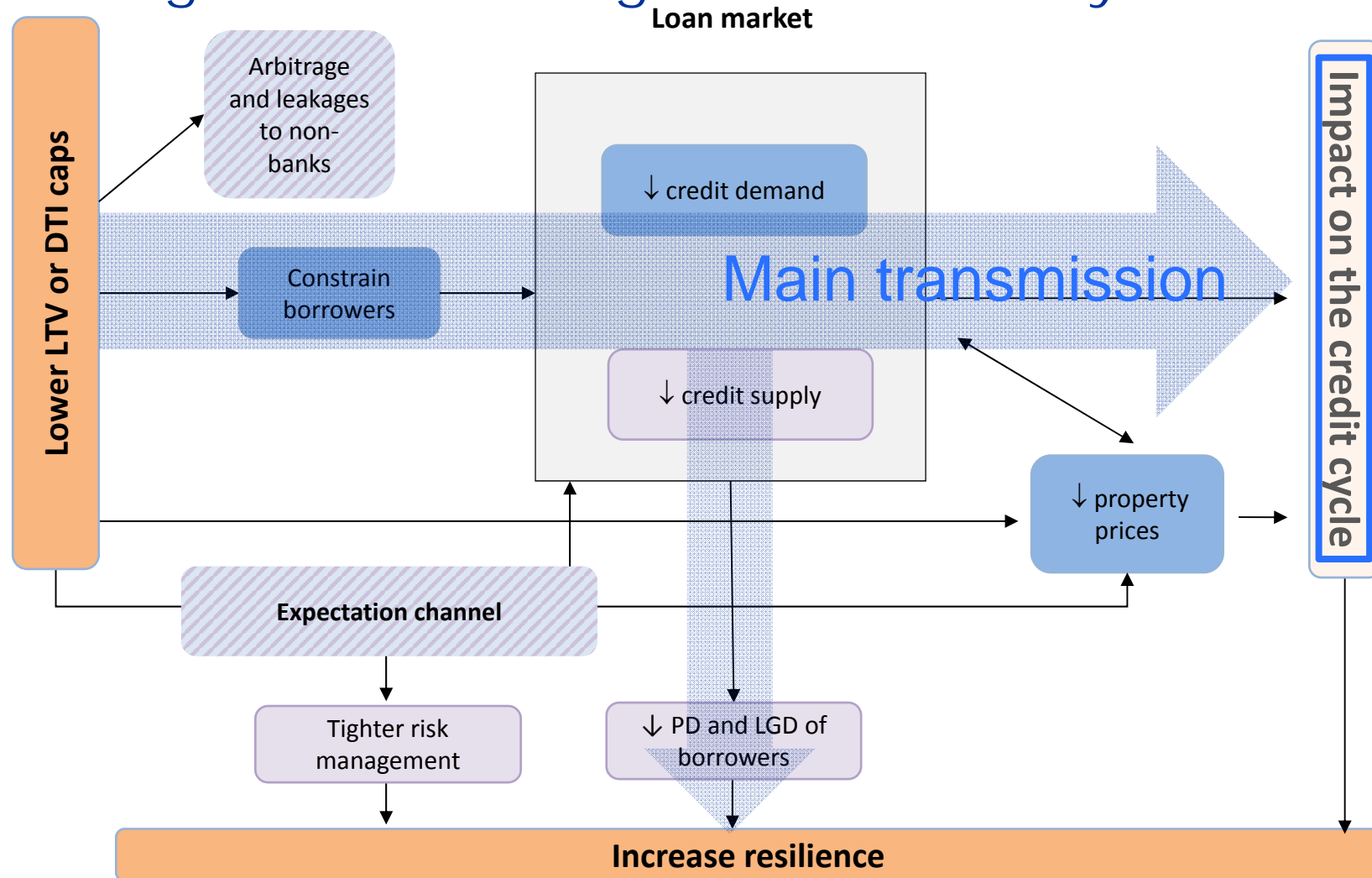**1** **Policy domain trade-off**: Macroprudential vs monetary policy

2 **Operational objective trade-off: Taming the cycle vs. ensuring resilience**

3 **Instrument trade-offs**: Borrower-based measures

Borrower-based instruments have a comparative advantage in influencing the financial cycle

Loan market

Lower LTV or DTI caps

Arbitrage and leakages to non-banks

Constrain borrowers

↓ credit demand

Main transmission

↓ credit supply

↓ property prices

Impact on the credit cycle

Expectation channel
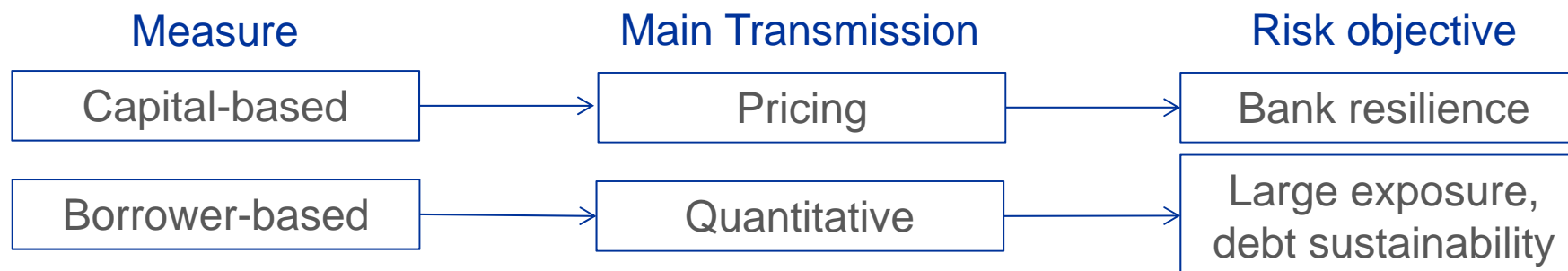
Tighter risk management

↓ PD and LGD of borrowers

Increase resilience

Source: CGFS Report "Operationalizing the Selection and Application of Macro-Prudential Instruments", Dec. 2012

Capital-based instruments have a comparative advantage in enhancing resilience
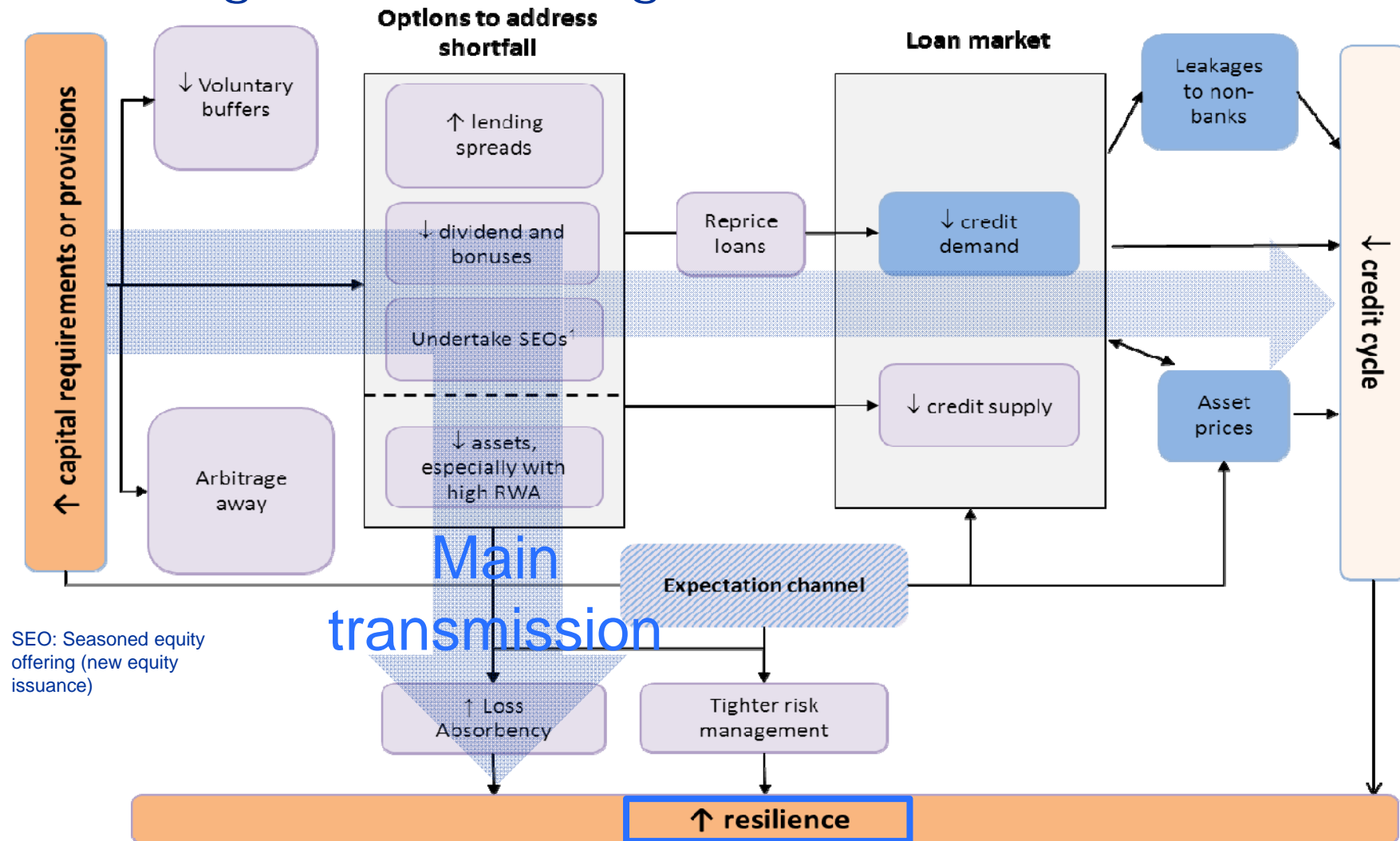
SEO: Seasoned equity offering (new equity issuance)

Source: CGFS Report "Operationalizing the Selection and Application of Macro-Prudential Instruments", Dec. 2012

Relative effectiveness: borrower- vs capital-based instruments

- **Transmission of macroprudential policy on lending**

Measure	Main Transmission	Risk objective
Capital-based	Pricing	Bank resilience
Borrower-based	Quantitative	Large exposure, debt sustainability

- Bank-based measures mainly enhance bank resilience
  - **CCyB:** limited impact on real estate / other asset trade-off (Basten & Koch (2015))
  - **Risk-weight add-ons:** limited lending impact Ferrari, Pirovano, Kaltwasser (2016),
  - **LTV-sensitive requirements:** affects high risk/ low risk trade-off
  - **Risk-weight floors:** potentially incentivize high-risk lending

- Borrower-based measures are more effective for credit flows
  - LTV, LTI and DSTI measures limit credit flows (Kuttner & Shim 2013),
  - But effects on real estate prices limited:
    - Kelly et al. 2015 (Ireland: €1 of additional credit raises house prices by 22 cents)
    - Evidence from HK, SG, Korea: LTV caps have a limited impact property prices but can effectively restrain credit

Intermediate objectives for macroprudential policy

## How to allocate macroprudential instruments to intermediate objectives?

Example: borrower-based instruments are effective in limiting lending, capital-based ones raise resilience.

⇒ Appropriate assignment of instruments within macroprudential policy space

General assignment:

1. **Formulate and quantify clear intermediate objectives**

2. **Assess ability of instruments to achieve objectives, including its undesired effects**

3. **Assign most effective instrument to intermediate objective (pecking order)**

**Policy trade-offs within macroprudential policy space**

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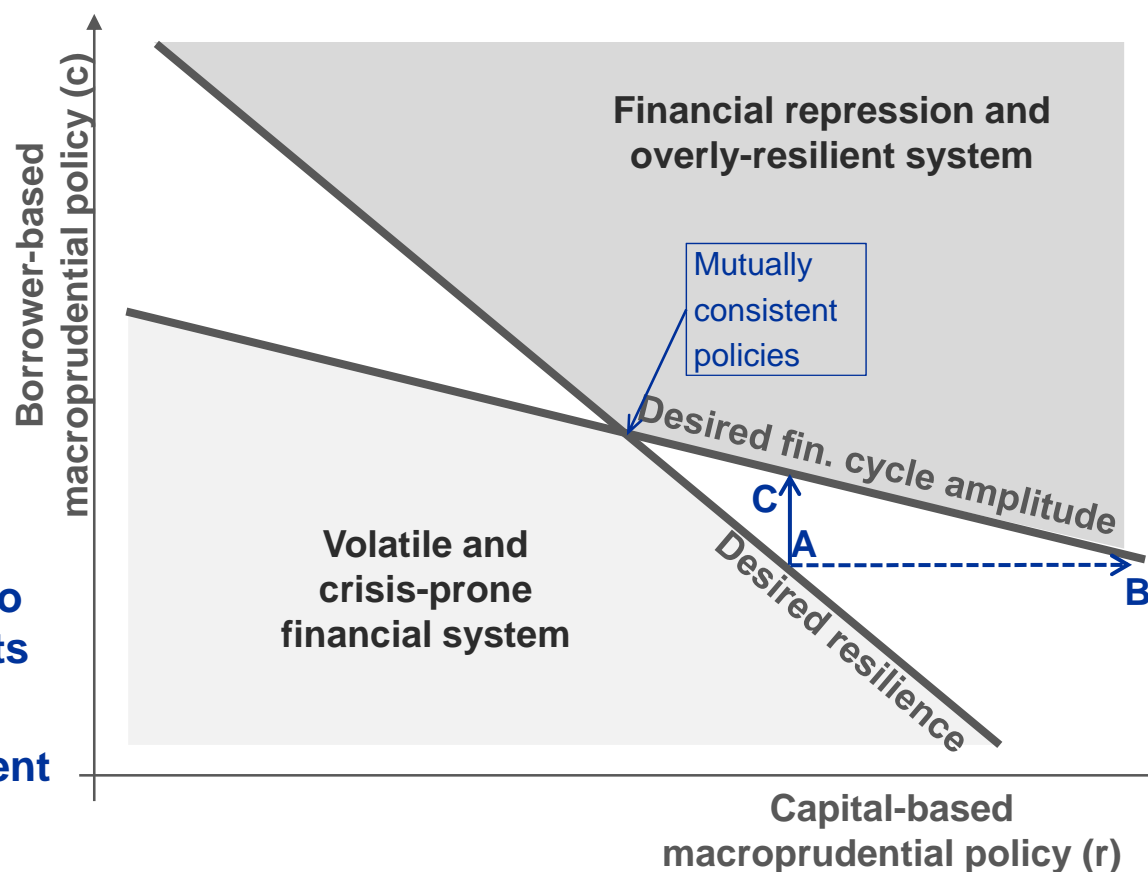
Mutually consistent mix of monetary and macroprudential policies

- **Effective Assignment:**
  Borrower-based instruments for taming the cycle; capital-based instruments for resilience and monetary policy aimed at price stability

- **Interaction:**
  Tighter monetary policy shifts mutually consistent macroprudential policy mix inward (i.e. macroprudential policy can be looser when mon. pol. is tighter).

Three dimensions of policy trade-offs
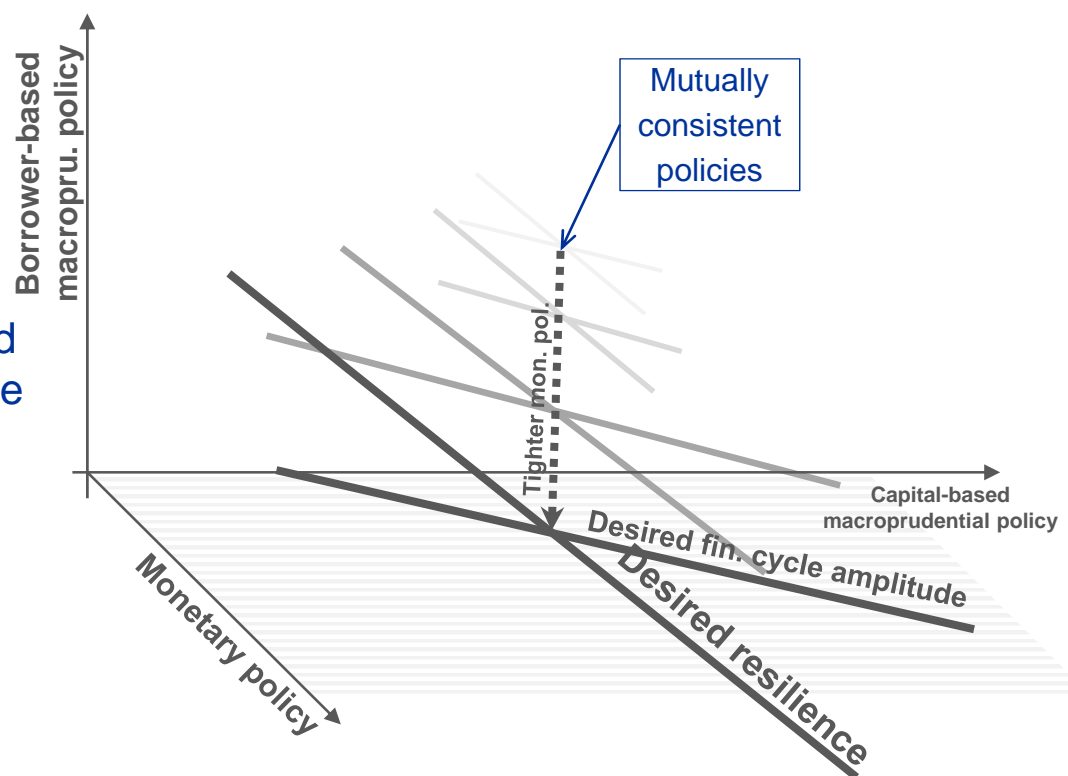
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Overview

1	**Policy domain trade-off**: Macroprudential vs monetary policy

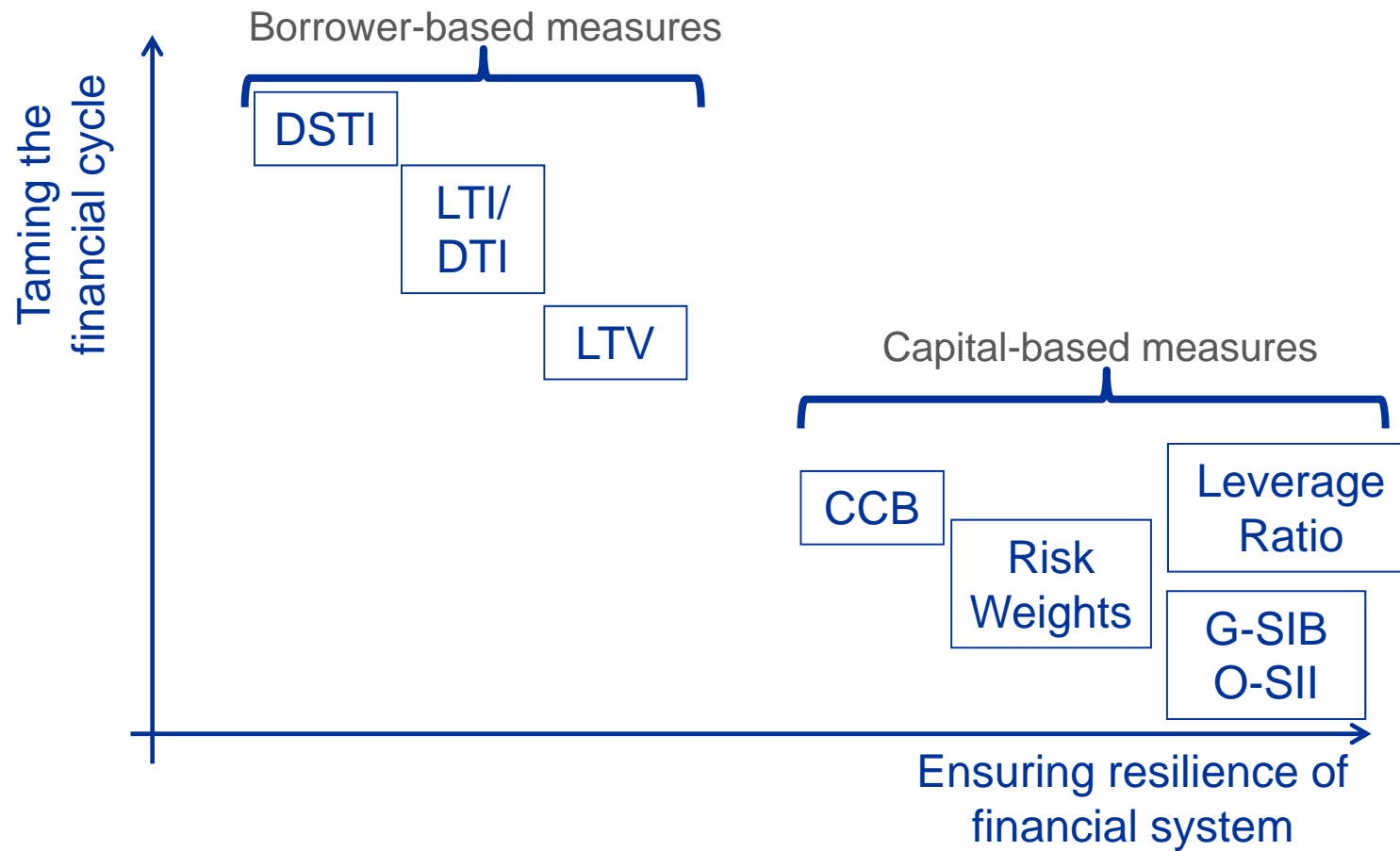|	
2	**Operational objective trade-off**: Taming the cycle vs. ensuring resilience

3	**Instrument trade-offs: Borrower-based measures**

Commonly observed practices

- **Combine LTV with LTI/DSTI limits: CY, EE, IE, LT, SK**
  ⇒ LTV alone can be circumvented in numerous ways: combine asset- and income-based measures to reduce probability of default (PD) and loss given default (LGD)

- **DSTI with maturity limit (amortisation requirements): EE, LT, NL, SK**
  ⇒ avoid circumvention of income constraint through loan maturity extension

- **DSTI limits with interest rate stress (LT, SK)**
  ⇒ ensure affordability over the business cycle

Relative strength of instruments

Interdependence among borrower-based measures

- In a standard (fixed-repayment) mortgage, the **DSTI** ratio, **LTI** ratio, initial **amortisation** and **maturity** are <u>inter</u>dependent at given **interest rate**.

- Higher amortisation rates, higher DSTI/LTI ratios and lower interest rates **imply shorter maturity loans** (lower right corner)
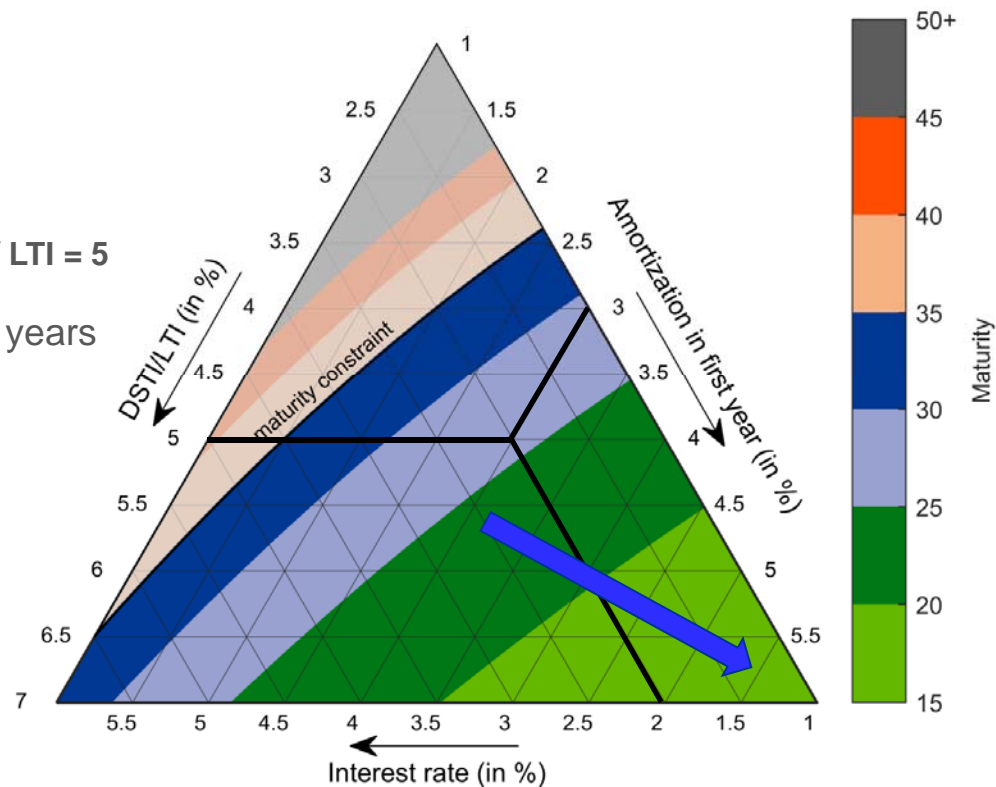
Benchmark loan :

Initial amortisation = 3%

Interest rate = 2%

DSTI ratio = 25%

LTI ratio = 5

$\left.\begin{array}{l}\text{DSTI ratio = 25\%}\\\text{LTI ratio = 5}\end{array}\right\}$ **DSTI / LTI = 5**

Implied max maturity = 26 years
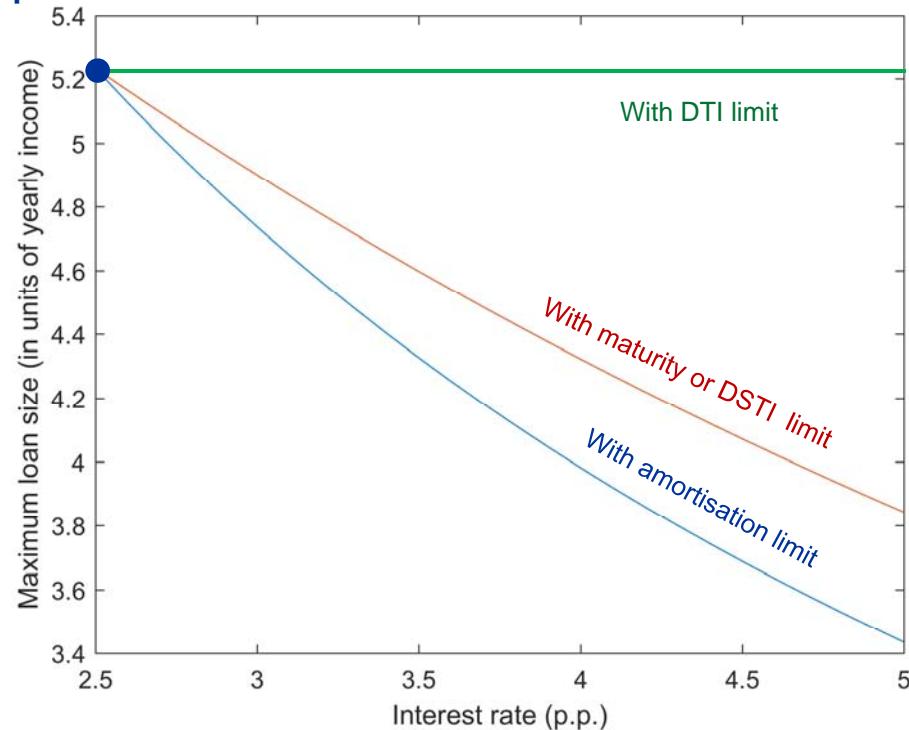
Tightness of borrower-based measures varies with interest rates

With increasing interest rates, amortization limits appear relatively tighter compared to maturity or DSTI limits because higher interest rates are partially offset by lower initial amortization rates

Dependence of borrower-based measures on interest rate levels

Note: The loan follows a constant annuity formula, with initial conditions of : 30 years maturity, 2.5% interest rate, 2.3% amortisation in the first year and a DTI ratio of 5.2 resulting in a DSTI ratio of 25%. Maturity and DSTI limits have the same ceteris paribus effects on amortisation, an interest rate increase has thus identical implications.

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Concluding remarks

– **Policy instruments should be paired with objectives according to their effectiveness (principle of effective market classification)**

– **Capital-based and borrower-based macroprudential policies are not independent, implying important trade-offs**

– **Combinations of measures can exploit complementarities and avoid leakage, thereby enhancing effectiveness**

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