The monetary policy transmission mechanism in the euro area

ECB Central Banking Seminar
Frankfurt am Main, 11 July 2018
Monetary policy (MP) transmission

1. Official interest rates
   - Expectations
   - Money market interest rates
     - Money, credit
     - Asset prices
     - Bank rates
     - Exchange rate
       - Wage and price-setting
       - Supply and demand in goods and labour markets
         - Domestic prices
         - Import prices
   - Price developments
<table>
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<th>Transmission channels</th>
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<td>1. Interest rate channel</td>
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<td>2. Expectations channel</td>
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<td>3. Exchange rate channel</td>
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<td>4. Credit channel</td>
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<td>5. Risk-taking channel</td>
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Interest rate channel

- Change in official interest rates directly affects money market rates
- Subsequent effects on bank rates on loans and deposits
- More indirect effect on long-term market rates (expectations)

… affects returns on savings and costs of borrowing, and thus spending and investment decisions of firms and households, and in turn price level

- Change in discount factors may affect asset prices and thus also spending and investment via wealth effects
Expectations channel

Central bank can affect expectations of
- Future interest rates (thereby also long-term rates)
- Inflation

Prerequisites:
- Credibility
- Transparency (communication of objective and monetary policy strategy)

Importance:
- Economic decisions typically depend on longer-term expectations
- Anchored inflation expectations facilitate conduct of monetary policy (MP)
Transmission channel 3

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Exchange rate channel

Change in financing conditions and expectations affects exchange rates and asset prices

- **Exchange rate** movements affect
  - Domestic price of imported goods (final goods directly, or indirectly via input costs)
  - External demand

- **Asset price** movements affect
  - Domestic demand via wealth effects
Credit channel

- **Quantity** of new loans

- **Bank balance sheet channel:** Lower interest rates increase borrowers’ net worth (higher net present value, higher asset prices) and thus **collateral value**, leading to an increase in the ability to borrow

- **Bank lending channel:** Lower interest rates decrease the **riskiness of loans** (reduced likelihood of default of households and firms), leading to an increase in loan supply (keeping risk exposure constant)
Transmission channel 5

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Risk-taking channel

- **Riskiness** of new loans

- **Stretched collateral values:**
  Low interest rates boost asset and collateral values; if viewed as sustainable, this leads borrowers and banks to accept higher risk

- **Search for yields:**
  Low interest rates make riskier assets *relatively* more attractive, leading banks to soften credit standards; attempt to meet long-term return guarantees

- Analogous channels for nonbanks, e.g. “balance sheet channel”:
  Lower interest rate might decrease risk rating of assets; to keep a desired risk exposure, investors may add more risky assets
Monetary policy transmission

Official interest rates

- Expectations
- Money market interest rates

- Money, credit
  - Asset prices
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  - Exchange rate

  - Wage and price-setting
    - Supply and demand in goods and labour markets

    - Domestic prices
    - Import prices

  - Price developments

Shocks outside the control of the central bank

- Changes in risk premia
- Changes in bank capital
- Changes in the global economy
- Changes in fiscal policy
- Changes in commodity prices

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Monetary policy transmission under strain

Official interest rates

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Price developments

Shocks outside the control of the central bank

- Changes in risk premia
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- Changes in commodity prices
Impairments of the transmission mechanism during the crisis

- Impaired pass-through from official to money market rates and government bond yields (which determine pricing of other assets)
- Difficulties in bank access to funding and low liquidity in government bond markets (which serve as collateral)
- Cyclical downturn and drop in asset prices reducing net worth of lenders and their ability to borrow
- Drastic decline in risk appetite
- Cross-country heterogeneity (stressed vs non-stressed)
Tools of Unconventional Monetary Policy (UMP)

• **Zero interest rate** on main refinancing operations and negative rate on excess reserves
• **Targeted** longer-term **lending operations** (TLTROs)
• **Forward guidance** (state-contingent, time-contingent)
• **Asset purchase** programme of public and private securities (APP)
Transmission channels of UMP

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<td>Spread between capital market and borrowing conditions</td>
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<td>Financing conditions in open market</td>
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Spread between capital market and borrowing conditions

• Goal:
  – Patching MP transmission via banks: effective MP pass-through to households and firms
  – Compressing spread between financing conditions in capital market and borrowing conditions faced by individual borrowers in market for individual loans

• Mechanism:
  – Target financial instruments with immediate influence on the setting of credit conditions by financial intermediaries
  – Affect portions of banks’ liability structures (central bank credit, wholesale funding) where connection with pricing of bank credit is closest
  – TLTROs and asset-backed securities (ABS) purchases, covered bonds purchases (under APP)
Market Expectations

- **Goal:**
  - Influence *market expectations* of future interest rates and inflation

- **Mechanism:**
  - Signaling the *future* course of monetary policy action
  - **Credibility** of promise on certain course of action for setting the future policy rates enhanced by asset purchases today
  - *Forward guidance* and APP influence expectations
  - State-contingent, time-contingent, open-ended forward guidance
Financing conditions in open market

- **Goal**: Direct pass-through to financing conditions in open market

- **Mechanism**: Pricing kernels
  - APP creates downward pressure on sovereign bond yield curves
  - Affects via yield curves the pricing kernels in each country – used to price the whole spectrum of local assets and credit

- **Mechanism**: Portfolio rebalancing
  - Purchases of sovereign bonds depress their term premium
  - Induces investors to move up the risk and maturity ladder, bidding up assets with higher risk-adjusted returns.
  - Incentive to reduce cash holdings due to negative rate policy
  - Rebalancing of bank balance sheets towards more asset holdings and lending
New times, new tools, new questions …

**Five research questions**

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Effects of conventional MP

- Direct (for given prices and wages):
  - impact on **returns on short-term assets** and payments of variable-rate debt
  - change in saving incentives (**intertemporal substitution**)
- Indirect (after adjustment in all prices and wages):
  - impact on wage **income**, dividends, employment, wealth

- Both direct and indirect effects are **heterogeneous across households**
- 24% of households in the euro area are **hand-to-mouth**
### Liquid and total wealth by hand-to-mouth status (euro area)

<table>
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<th>Net liquid assets</th>
<th>Net wealth</th>
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<tr>
<td>Poor-HtM</td>
<td>-0.4</td>
</tr>
<tr>
<td>Wealthy-HtM</td>
<td>38.2</td>
</tr>
<tr>
<td>Non-HtM</td>
<td>157.2</td>
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Source: HFCS 2nd wave. Countries: Euro Area countries.

Net liquid wealth = (deposits + stocks + bonds + mutual funds - credit card balances and overdraft debt)

(Ampudia, Georgarakos, Slacalek, Tristani, Vermeulen, Violante, 2018)
Household heterogeneity and the transmission of monetary policy

Estimated distributional impact on consumption of a temporary 100bp cut in standard policy interest rates (Germany, Spain)

\[ \Delta C = MPC \cdot \frac{\text{Net Interest Exposure}}{C} \cdot \Delta R - \sigma \cdot (1 - MPC) \cdot \Delta R + MPC \cdot \frac{Y}{C} \cdot \Delta Y \]

Source: HFCS 2nd wave. Countries: DE and ES.
Five research questions

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“Odyssean” FG

Commitment about future conduct of monetary policy

- Large effects on private sector expectations (but: “forward guidance puzzle”)
- Requires credibility
- State-contingent
- No sizable inflation overshoot

“Delphic” FG

Guidance about the likely future course of monetary policy

- Smaller effects; inflation undershoots target substantially and for extended period of time
- Can be counter-productive if taken as signal that economy is performing poorly (Campbell, Evans, Fisher and Justiniano BPEA 2012)
Examples of common types of forward guidance

- **Purely qualitative FG**
  E.g. ECB until Jan 2016: “we expect the key ECB interest rates to remain at present or lower levels for an extended period of time”

- **Time-contingent FG**
  E.g. Bank of Canada, April 2009 - April 2010: “conditional on the inflation outlook, commits to hold the current policy rate until the end of the second quarter of 2010”

- **State-contingent FG**
  E.g. FOMC Dec 2012: policy rates appropriate “at least as long as the unemployment rate remains above 6-1/2 percent, inflation between one and two years ahead is projected to be no more than a half percentage point above the Committee’s 2 percent longer-run goal, and longer-term inflation expectations continue to be well anchored”
Response of bond prices to macroeconomic news surprises

Event Study

News Release

bond price

time relative to announcement release

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Response of bond yields varies by type of forward guidance

\[ \Delta R_t^{c,i} = \alpha^{c,i} + \alpha_{SG} S_G^c + \alpha_{OG} O_G^c + \alpha_{LTG} LTG_t^c + \alpha_{STG} STG_t^c + \beta s_t^{c,i} + \beta_{SG} S_G^c s_t^{c,i} + \beta_{OG} O_G^c s_t^{c,i} + \beta_{LTG} LTG_t^c s_t^{c,i} + \beta_{STG} STG_t^c s_t^{c,i} + \varepsilon_t^{c,i} \]

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<th>(surprise impact)</th>
<th>Overall</th>
<th>APP in place</th>
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<tr>
<td>Time-contingent FG, &lt;1.5years</td>
<td>1.25***</td>
<td>0.25</td>
</tr>
<tr>
<td>Open-ended FG</td>
<td>0.44**</td>
<td>0.51*</td>
</tr>
<tr>
<td>No FG</td>
<td>0.41**</td>
<td>0.41**</td>
</tr>
<tr>
<td>State-contingent FG</td>
<td>0.22*</td>
<td>0.22*</td>
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<tr>
<td>Time-contingent FG, ≥1.5years</td>
<td>0.08</td>
<td>0.05</td>
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Bond yields respond to macroeconomic surprises …

– **less** under **state-contingent** FG and **long-horizon** FG.
– unchanged under open-ended FG.
– **more** under **short-horizon** FG in absence of APP.
Effect of various types of forward guidance and APP

- **Short-horizon** and **open-ended** FG seem to have little (or perverse) effects
- **Long-horizon** FG seems more effective
- All types of FG strengthened in the presence of an APP

- **State-contingent** FG
  - Preserves market responsiveness, lowers disagreement
  - Consistent with central bank’s own uncertainty and provides more flexibility
  - Caveats: time inconsistency, credibility requirement, trade-off between simplicity and accuracy/robustness of state contingency

(Coenen, Ehrmann, Gaballo, Hoffmann, Nakov, Nardelli, Persson, Strasser, 2017)
### Five research questions

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“Whatever it takes” altered risk-taking of euro area banks

(Alcaraz, Claessens, Cuadra, Marques-Ibanez, Sapriza, 2018)

• **Event-study** approach:
  – Treatment: Draghi’s “whatever it takes” (26 July 2012)
  – Event window: March 2012-October 2012

• Data for **Mexico: mix of domestic and foreign banks**
  – Euro area banks vs. non-euro foreign & domestic banks
  – Separation of supply shocks from demand shocks using loans to multi-bank firms

• Findings:
  – “Whatever it takes” radically **altered risk-taking of euro banks**
  – **Less aggressive lending of euro area banks** in Mexico
    (higher interest rates, slower growth of loans to firms)
  – Cross-border **spillovers of MP** due to global risk taking
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existing price-setting models at odds with empirical distribution of price changes

Menu cost model

- **Too few** small price changes, perfect price-setting
- Prices **far** from optimal level get reoptimized

Calvo pricing

- **Too many** small price changes, random timing of price-setting
- Random sample of all prices get reoptimized, including many already **close** to optimal level

➢ Under menu cost average size of price changes is larger than under Calvo,
➢ and more flexible aggregate price level and smaller real effects of MP
How does wage-and price setting respond to MP?

Response to Money Supply Shock

(Nakov, Costain, Petit, 2018)

- Assumption: precise decisions are costly, thus price reset not precise
- Decision cost parameter reflects price changes in micro data
- In DSGE model this gives intermediate response for both wages and prices as in data. Spans the range of MP transmission between the two extremes menu cost and Calvo.
- Real effects of nominal shocks 3x larger than under menu cost and 1/2 of the size under Calvo – and this with a micro-founded approach
- Rationale for strong expansion in consumption with delayed response of inflation currently observed in the euro area
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Monetary policy transmission evolves with the structure of financial intermediation ...

- Historically, credit intermediation has been largely bank-based in the euro area (LTRO, TLTRO targeted at banks)
- Recently, structural shift away from bank lending to credit intermediation through financial markets

- Likely tradeoff
  - Faster MP transmission: Non-banks may respond more quickly to changes in market prices, larger funding share in capital market than banks
  - Financial stability risks: Non-banks might engage in more maturity transformation than banks (in low interest rate environment)


