



BANK FOR INTERNATIONAL SETTLEMENTS

The divergence of bank lending rates from policy rates after the financial crisis: the role of bank funding costs

Anamaria Illes, **Marco Lombardi** and Paul Mizen

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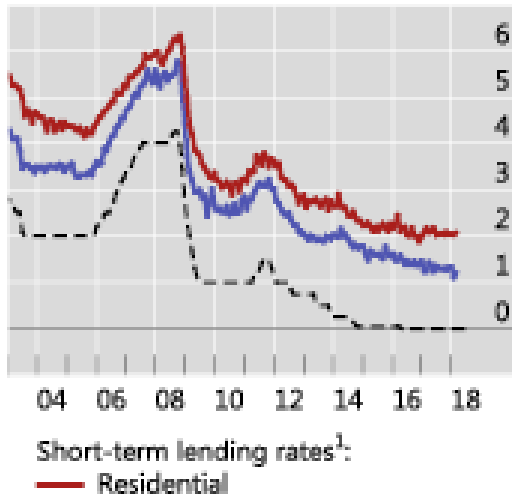


Motivation

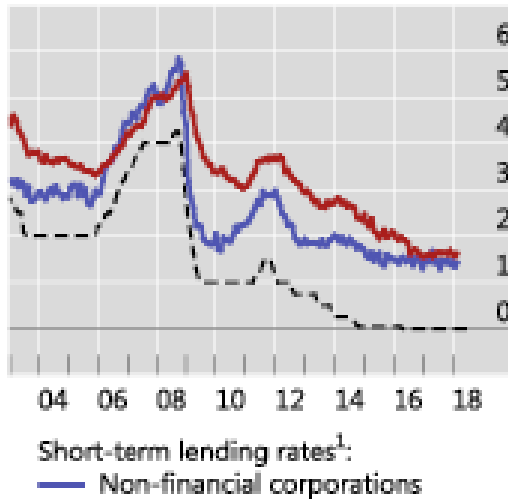
- Central banks in many countries cut policy rates to near zero levels after the Lehman collapse in September 2008
- Based on the pre-crisis relationship between bank lending rates and policy rates, it would have been reasonable to expect lending rates to have fallen by similar amounts
- However:
 - lending rates did not fall that much
 - margins over policy rates widened as policy rates fell
- In more technical terms: the cointegrating relationship between policy rates and lending rates broke down (Gambacorta, Illes and Lombardi 2015)

Short term lending and policy rates

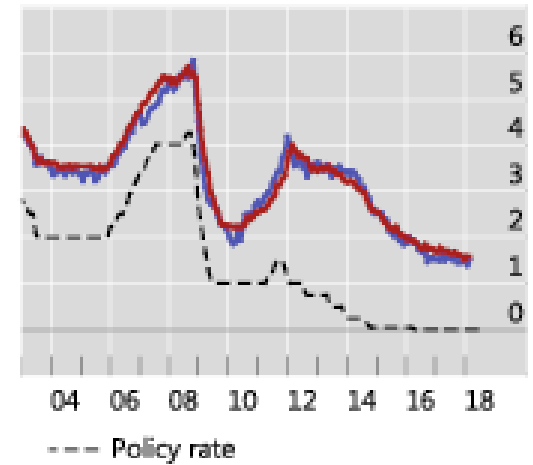
Germany



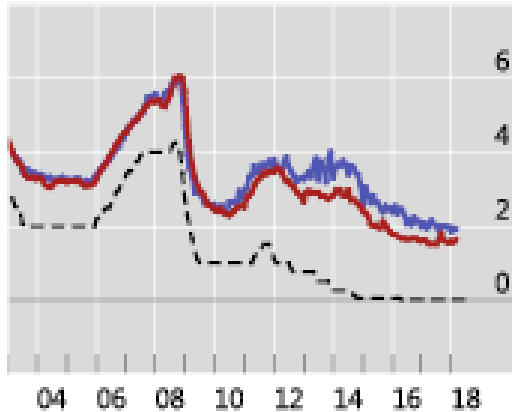
France



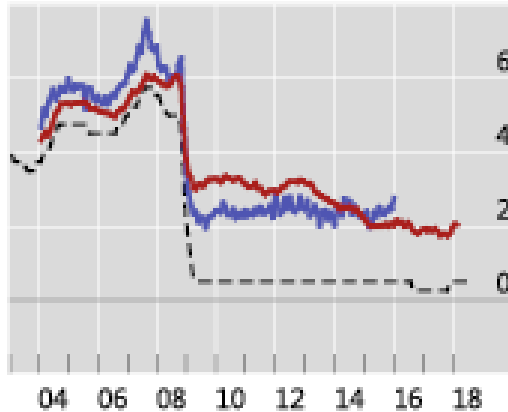
Italy



Spain

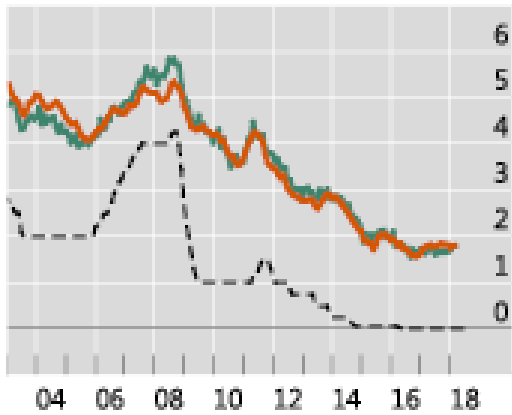


United Kingdom



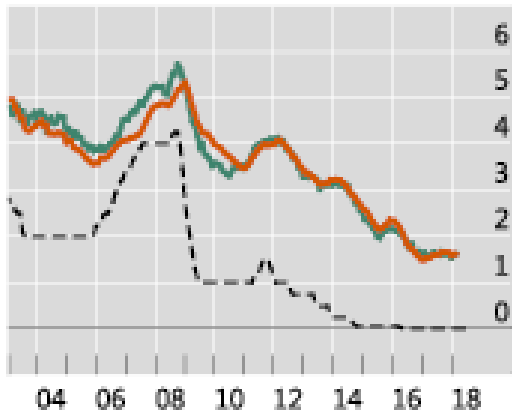
Long term lending and policy rates

Germany



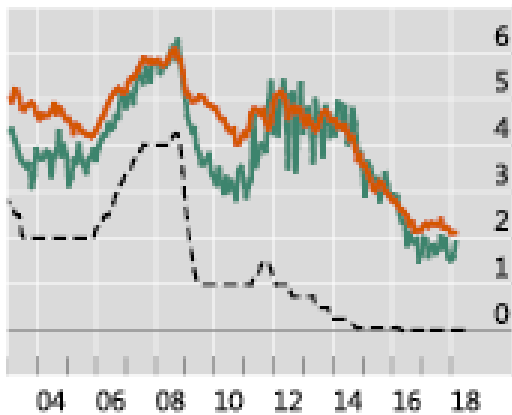
Long-term lending rates³:
— Residential

France

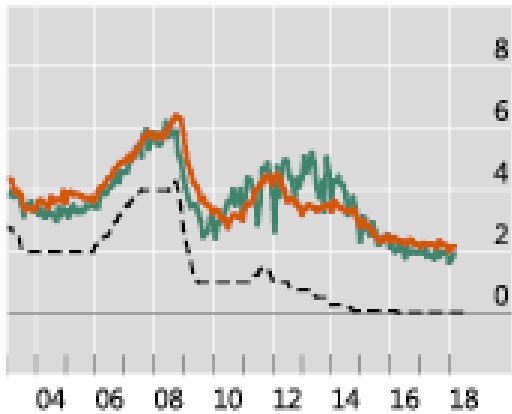


Long-term lending rates²:
— Non-financial corporation

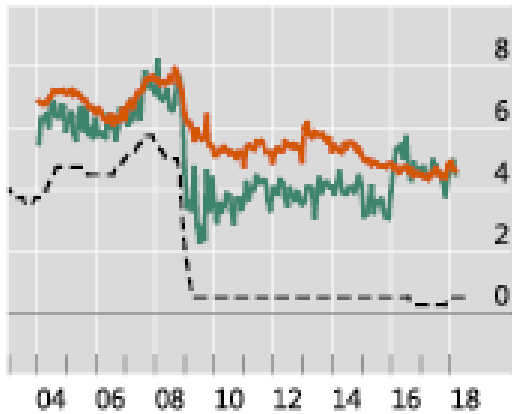
Italy



Spain



United Kingdom



Objective of the paper(s)

- Construct a measure of bank funding costs (WACL)
- Provide evidence that banks set lending rates according to the WACL rather than the policy rate
 - More technically: that the cointegrating relationship between the WACL and lending rates is stable
- Examine the impact of (unconventional) monetary policy on the components of the WACL and hence on lending rates

Measuring bank funding costs

We construct a weighted average cost of liabilities for banks, which reflects the cost of funds that they actually face

$$WACL_{it} = \sum_{j=1}^J w_{ijt} r_{ijt}$$

A weighted average of the rates at which banks can obtain finance

- r_{ijt} are the rates on the different component liabilities
- w_{ijt} are the weights on those rates
 - based on the component share in total liabilities
- WACL measures the average cost of funding of a mix that keeps unaltered the structure of the balance sheet
- We construct a short-term and a long-term WACL

Component liabilities

The WACL is constructed using five types of liabilities:

1. retail deposits
 2. interbank market
 3. unsecured bonds
 4. covered bonds
 5. central bank operations
- Data source is MFIs aggregate balance sheet on a national basis (excluding the ESCB), obtained from the ECB and national central banks for Denmark and the United Kingdom

Weights

Our baseline approach is to use outstanding volumes to compute weights

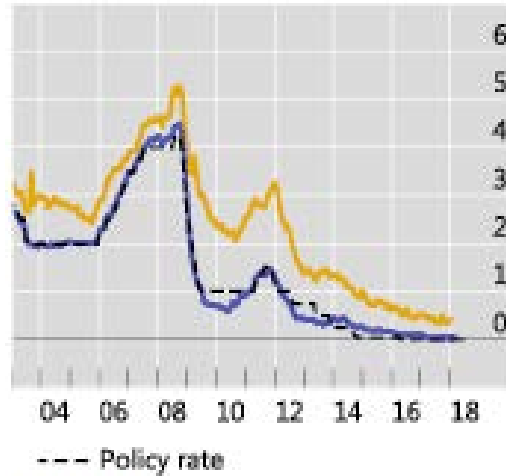
- This is “marginal” in the sense that it is the funding mix that ensures no change in the balance sheet structure
- For robustness, we also construct a **flow-based** WACL
 - Weights are based on flows data on new deposits and gross issuance
 - This WACL represents the effective cost of funding obtained at a given point in time
 - It is more volatile than the stock-based WACL

What about equity?

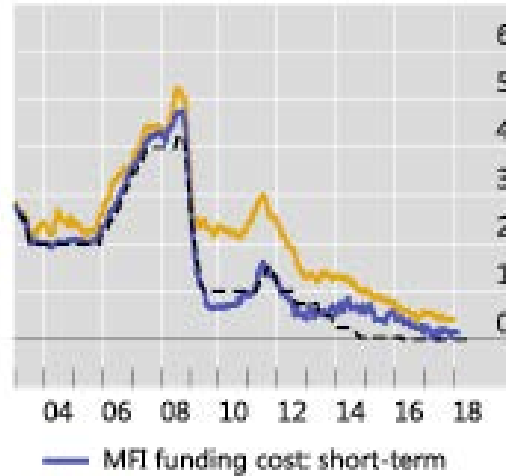
- **Equity issuance** is excluded from the WACL
 - It accounts for a small percentage of the outstanding balances
 - It is arguably not used by banks as a source of regular finance for bank lending, but rather as a structural adjustment (e.g. adjustment of capital ratios in response to regulatory requirements)
 - Adrian *et al.* (2013) show that, differently from other liabilities, equity remains 'sticky', i.e. it does not adjust when there is a change in assets

WACL funding costs and policy rates

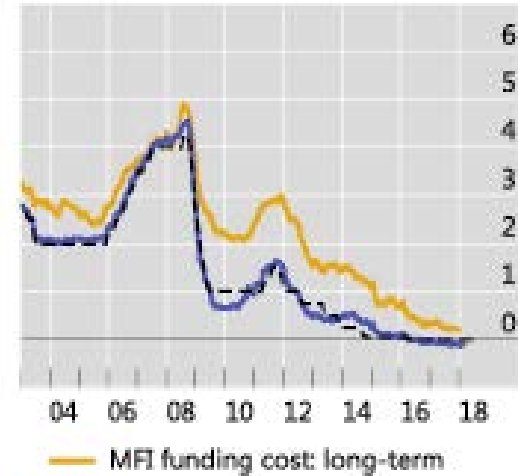
Austria



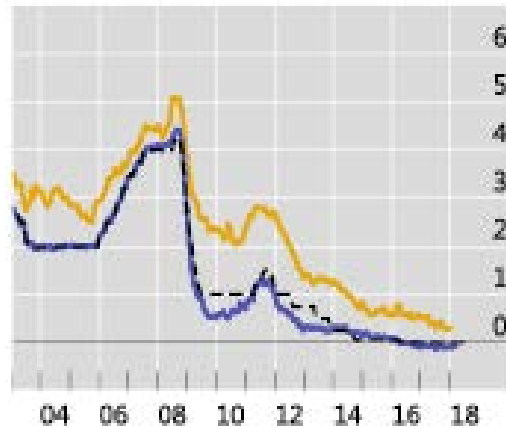
Finland



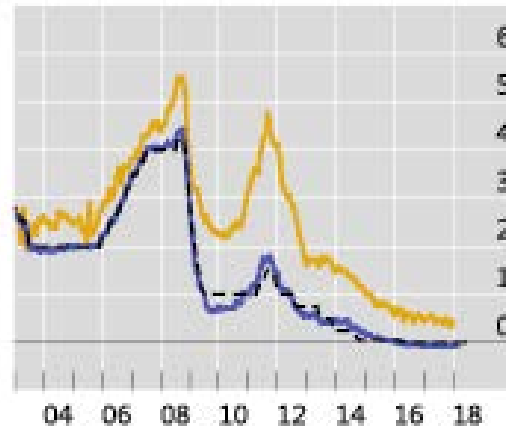
France



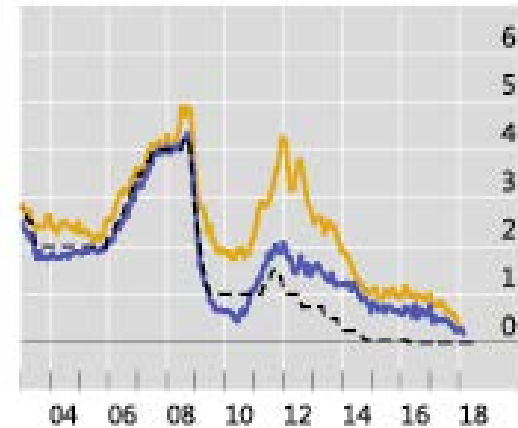
Germany



Ireland

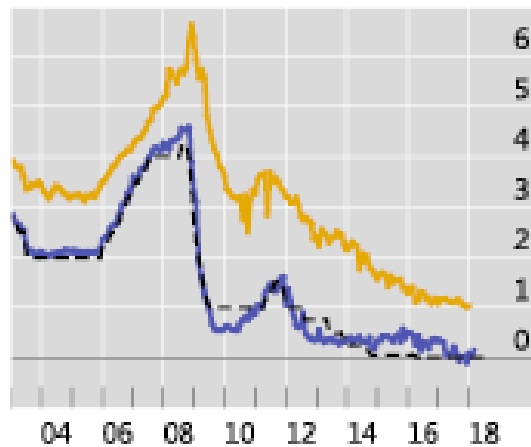


Italy

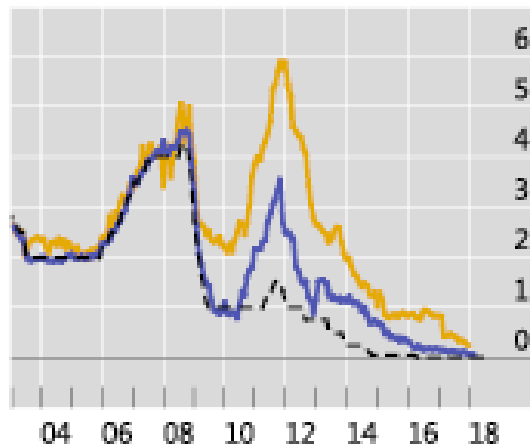


WACL funding costs and policy rates

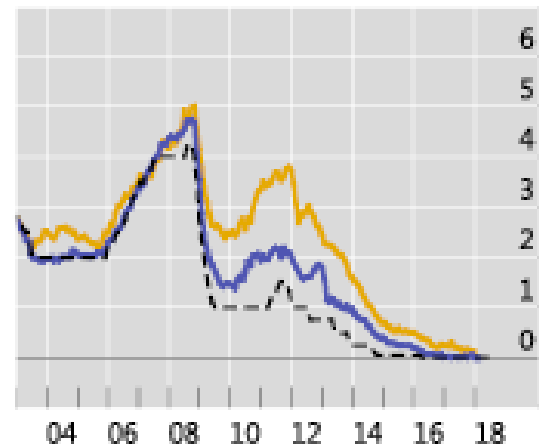
Netherlands



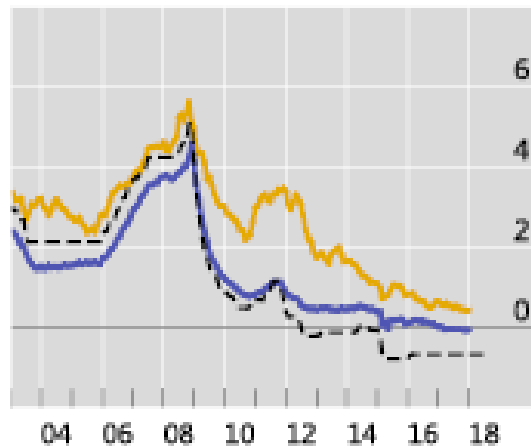
Portugal



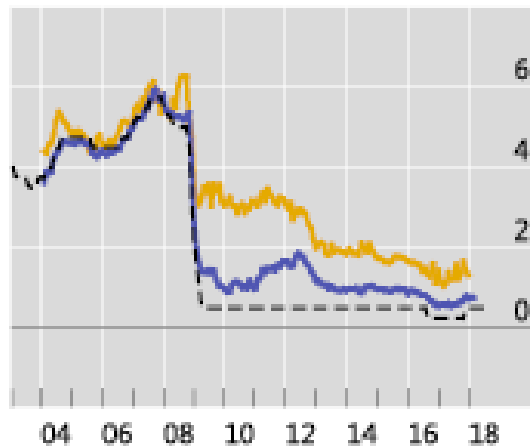
Spain



Denmark



United Kingdom



Estimation by pooled mean group (PMG) estimator

We take y_{it} (the lending rate), and x_{it} (the driver of the lending rate i.e. policy rate or the WACL). Assuming an ARDL model

$$y_{it} = \sum_{p=1}^P \chi_{ip} y_{it-p} + \sum_{q=0}^Q \delta_{iq} x_{it-q} + \mu_i + e_{it}$$

we rewrite as a stacked set of N individual equations relating y_{it} and x_{it} for countries $i = 1, 2, \dots, N$ over the time period $t=1, 2, \dots, T$ as

$$\Delta Y_i = \alpha_i Y_{i,-1} + \beta_i X_i + \sum_{p=1}^{P-1} \chi_{ip} \Delta Y_{i,-p} + \sum_{q=0}^{Q-1} \delta_{iq} \Delta X_{i,-q} + \mu_i \mathbf{1} + \varepsilon_i$$

where $Y_i = (y_{i1}, \dots, y_{iT})'$, $X_i = (x_{i1}, \dots, x_{iT})'$, $\mathbf{1} = (1, \dots, 1)'$, $e_i = (e_{i1}, \dots, e_{iT})'$ are all $T \times 1$ vectors of observations, ones and residual errors, and Δ is the first difference operator.

Estimation by pooled mean group (PMG) estimator

The model has the following cointegrating specification:

$$\Delta Y_i = \alpha_i (Y_{i,-1} - \theta_i X_i) + \sum_{p=1}^{P-1} \chi_{ip} \Delta Y_{i,-p} + \sum_{q=0}^{Q-1} \delta_{iq} \Delta X_{i,-q} + \mu_i \mathbf{1} + \varepsilon_i$$

The level relationship $\alpha_i (Y_{i,-1} - \theta_i X_i)$ provides information on the long-run comovements between lending rates and the driving variables (either policy rates or funding costs)

- $\beta_i = \alpha_i \theta_i$ coefficient is an estimate of the long-run pass-through coefficient
- α_i is the adjustment speed of rates to deviations from this long-run for the individual country i

Results – Main messages

- Data are non-stationary according to Im-Pesaran-Shin tests
- Cointegration relationships exist on the full sample between WACL(stock) and WACL(flow) and lending rates with a few exceptions
- NO cointegration exists between policy rates and lending rates on the full sample
- PMG estimates imply
 - 100bp \uparrow WACL(stocks) funding cost for banks \Rightarrow 85-89bp \uparrow in lending rates
 - long-term lending rates are consistently less responsive than short-term lending rates



Cointegration tests

Cointegration test allowing for cross sectional dependence	Persyn & Westerlund (2008) Test	Short rate to NFCs	Long rate to NFCs	Short mortgage rate	Long mortgage rate
Policy Rate					
Policy rate (full sample)	G_r	-3.030***	-0.985	0.182	-1.072
Policy rate (full sample)	P_r	-0.604	-2.212*	0.156	-2.815***
Policy rate (Pre-GFC sample)	G_r	-5.801***	-3.375***	-3.462***	-0.430
Policy rate (Pre-GFC sample)	P_r	-4.612***	-5.241***	-3.810***	-4.283***
Weighted Average Cost of Liabilities (WACL)					
WACL (stock, unadjusted)	G_r	-3.023***	-2.331**	-2.186**	-3.081***
WACL (stock, unadjusted)	P_r	-1.338*	-4.366***	-2.387***	-2.106**
WACL (stock, adjusted)	G_r	-3.023***	-2.925***	-2.186**	-3.553***
WACL (stock, adjusted)	P_r	-1.338*	-2.876***	-2.387***	-2.392***
WACL (flow, adjusted)	G_r	-0.431	-1.272	-2.164**	-2.611***
WACL (flow, adjusted)	P_r	0.842	-2.868***	-1.964**	-2.558***



Cointegration tests with structural break

Cointegration test allowing for structural breaks and cross sectional dependence	Banerjee & Carrion-i-Sylvestre (2013) Test	Short rate to NFCs	Long rate to NFCs	Short mortgage rate	Long mortgage rate
Policy Rate					
Policy rate (full sample, intercept break)	Z_a	-1.429	-1.311	-2.882***	-0.193
Policy rate (full sample, intercept and cointegrating vector break)	Z_{ac}	-0.592	-0.468	0.448	1.834
Weighted Average Cost of Liabilities (WACL)					
WACL (stock, adjusted, full sample, intercept break)	Z_a	-2.203**	-2.355***	-1.824*	-1.763*
WACL (stock, adjusted full sample, intercept and cointegrating vector break)	Z_{ac}	-3.321***	-1.208	-0.954	-0.526



Results – Main messages (continued)

- Taking all 11 countries, EA and EA(core), PMG estimates imply
 - short-term lending rates and WACL(stocks) relationships are fairly similar across the three groups of countries
 - greater differences exist between the 11 countries and the EA and EA(core).
- Adjustment coefficients are all negative and significant



PMG estimates of pass through

	WACL (stock, adjusted)			
	Short rate to NFCs	Long rate to NFCs	Short mortgage rate	Long mortgage rate
Countries: Euro Area, UK and Denmark				
Cointegrating relation				
Pass through estimate	0.890*** 0.012	0.879*** 0.037	0.856*** 0.016	0.886*** 0.047
Countries: Euro Area				
Cointegrating relation				
Pass through estimate	0.877*** 0.013	0.733*** 0.038	0.864*** 0.016	0.907*** 0.061
Countries: Euro Area Core				
Cointegrating relation				
Pass through estimate	0.876*** 0.014	0.749*** 0.041	0.859*** 0.017	0.953*** 0.071



Results – contrast with policy rates

- Pass-through estimates with policy rates: 100bp \uparrow in policy rates \Rightarrow 52-96bp \uparrow in lending rates. The range of values is wider. In many cases the pass through estimate is lower.
- Cointegration breaks down even when we allow for a structural break.
- A Hausman test rejects the null of equality of coefficients across countries (rejecting the PMG restriction).



PMG estimates – policy rates

	Short rate to NFCs	Long rate to NFCs	Short mortgage rate	Long mortgage rate
Countries: Euro Area, UK and Denmark				
Cointegrating relation				
Pass through estimate	0.938 ^{***}	0.615 ^{***}	0.523 ^{***}	0.738 ^{***}
	0.015	0.032	0.014	0.031
Countries: Euro Area				
Cointegrating relation				
Pass through estimate	0.937 ^{***}	0.633 ^{***}	0.943 ^{***}	0.699 ^{***}
	0.015	0.051	0.023	0.049
Countries: Euro Area Core				
Cointegrating relation				
Pass through estimate	0.939 ^{***}	0.661 ^{***}	0.958 ^{***}	0.720 ^{***}
	0.016	0.054	0.024	0.054



Conclusions

- Funding costs became disconnected from policy rates in the post crisis period
- The LR relationship between lending rates and funding costs is stable through the whole sample
- Policy rates display a structural break and the relationship with lending rates is not stable
- Pass-through does decline by about 100bp after the GFC, but this is mostly on long rates not short rates





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Thank you!

