

# RECENT DEVELOPMENTS IN THE RETAIL BANK INTEREST RATE PASS-THROUGH IN THE EURO AREA

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Recent developments in the retail bank interest rate pass-through in the euro area

*The adjustment of retail bank interest rates in response to changes in policy rates is a fundamental element of the monetary policy transmission mechanism. This is especially true for the euro area, given the relative importance of banks in collecting savings from and providing financing to the non-financial sectors of the economy. Therefore, the regular monitoring and assessment of the pass-through of changes in monetary policy rates to retail bank interest rates is essential. Against this background, this article discusses the determinants of banks' interest rate-setting behaviour, provides empirical evidence on the pass-through process in the euro area and evaluates the impact of the recent financial market tensions. In general terms, how rapidly and extensively changes in policy rates are passed on (via their effect on market interest rates) to retail bank interest rates hinges on a number of structural and cyclical factors. For this reason, retail bank interest rates are typically found to adjust to changes in policy and market rates with some lag.*

*Overall, in recent years the bank interest rate pass-through seems to have worked relatively well in the sense that the degree of inertia in retail bank interest rates to changes in monetary policy rates has not differed markedly from past patterns. Even during the current financial crisis, the bank interest rate pass-through has worked relatively well in terms of responding to developments in the euro interbank offered rate (EURIBOR) and longer-term market rates, although less well in terms of responding to developments in the euro overnight index average (EONIA – which in normal times is the closest market-based proxy for policy rates). At the same time, bank credit standards have been tightened significantly in recent quarters, countering, to some extent, the smooth pass-through to retail bank lending rates. As the economy gradually improves, banks' capital bases are reinforced and their risk-taking behaviour normalises, it will be essential for banks to increase their lending activity.*

## I INTRODUCTION

The transmission of policy rate changes to retail bank loan and deposit rates is a crucial part of the monetary policy transmission mechanism. This is especially true in the euro area which has a predominantly bank-based financial system.<sup>1</sup>

The financial crisis, which has had severe repercussions on financial markets and the banking sector, has raised questions about euro area banks' ability and willingness to pass on to their retail customers, in an effective manner, the changes in the monetary policy stance since October 2008. Since then the Governing Council of the ECB has, among other measures, lowered the main refinancing rate by 325 basis points, to stand at a level of 1% in July 2009.

Against this background, this article reviews the available evidence concerning the bank interest rate pass-through process in the euro area as a whole. Section 2 discusses banks' price-setting behaviour. Section 3 presents the stylised facts

regarding the pass-through to bank interest rates in the euro area based on new empirical evidence. In Section 4, the findings are put into the context of the financial crisis that erupted in mid-2007 and the extent to which recent policy rate reductions have been effectively passed on to retail customers is also examined.

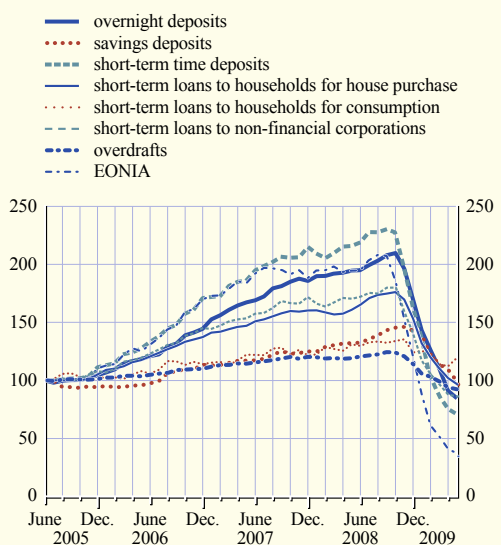
## 2 RETAIL BANKS' PRICE-SETTING BEHAVIOUR

Historically, retail bank interest rates have tended to move fairly closely in line with market interest rates with a similar maturity.

<sup>1</sup> See M. Ehrmann, L. Gambacorta, J. Martínez Pagés, P. Sevestre and A. Worms, "Financial systems and the role of banks in monetary policy transmission in the euro area", in I. Angeloni, A.K. Kashyap and B. Mojon (eds.), *Monetary Policy Transmission in the Euro Area*, Cambridge University Press, 2003, for an assessment of the various monetary policy transmission channels in the euro area during the early years of EMU. See also the article entitled "The external financing of households and non-financial corporations: a comparison of the euro area and the United States" in the April 2009 issue of the Monthly Bulletin.

**Chart 1 Monthly changes in short-term MFI interest rates and the EONIA**

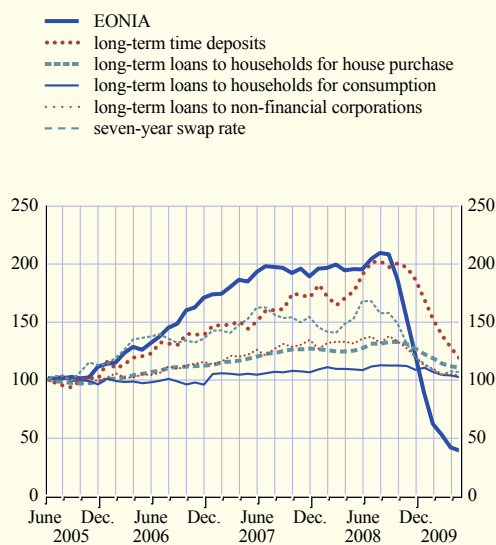
(monthly data; index: June 2005 = 100)



Sources: ECB and Reuters.

**Chart 2 Monthly changes in long-term MFI interest rates, the EONIA and the seven-year swap rate**

(monthly data; index: June 2005 = 100)



Sources: ECB and Reuters.

This is illustrated in Charts 1 and 2, which show the (indexed) monthly changes in selected retail bank lending and deposit rates against monthly changes in the EONIA and the seven-year swap rate over the past four and a half years. In response to the tightening of monetary policy that started in December 2005, market rates increased markedly until around mid-2008. Since October 2008, reflecting the sharp reversal in risks to price stability over the medium term in the context of the financial crisis and the economic downturn, key ECB interest rates have been sharply reduced. This has been mirrored by a sharp decline in market rates for products with various maturities. As observed, retail bank interest rates have broadly followed the movements in market rates in recent years, increasing until the fourth quarter of 2008 and, in most cases, declining sharply thereafter. However, it is also evident that, with few exceptions, retail bank lending and deposit rates tend to react rather sluggishly to changes in the corresponding market rates, in that they tend to only adjust with a lag and, even over long periods, may not adjust completely to movements in market rates. Hence, while monetary policy

strongly influences the financing conditions as set by banks, this influence operates with a certain lag.

The observed sluggishness of the response of retail bank interest rates may reflect a number of factors underlying banks' price-setting behaviour. From a theoretical viewpoint, the relationship between bank interest rates and corresponding market rates is typically considered in the economic literature using models of oligopolistic bank competition, where banks act as price-setters (under the assumption that banks have some market power<sup>2</sup>) in the retail loan and deposit markets, hence setting their interest rates while taking into account demand for loans and deposits. At the same time,

2 This may arise due to the "specialness" of banks in their function as "delegated monitors" and ultimately derives from the existence of asymmetric information between banks and their customers, which leads to problems of moral hazard and adverse selection (see, for example, D. Diamond and P. Dybvig, "Bank runs, deposit insurance, and liquidity", *Journal of Political Economy*, 91(3), 1983, pp. 401-419; and D. Diamond, "Financial intermediation and delegated monitoring", *Review of Economic Studies*, 51(3), 1984, pp. 393-414, for some early seminal contributions).

banks are usually assumed to be price takers in the interbank market and the capital markets where they seek additional funds (i.e. non-retail deposit funding) or place surplus liquidity.<sup>3</sup>

Given the market power of banks, market rates are normally expected to stand between bank lending rates and bank deposit rates (representing the funding costs of loans and the opportunity costs of deposits respectively). However, bank loans and deposits are not necessarily priced independently of each other, as banks may engage in cross-selling and cross-subsidising activities (e.g. by offering high deposit rates in order to obtain loan business).<sup>4</sup> In general, banks' interest rate-setting behaviour, as measured by the spread between retail bank rates and market rates, can be expected to depend on the degree of competition (or bank market power) and on factors related to the cost of intermediation, such as interest

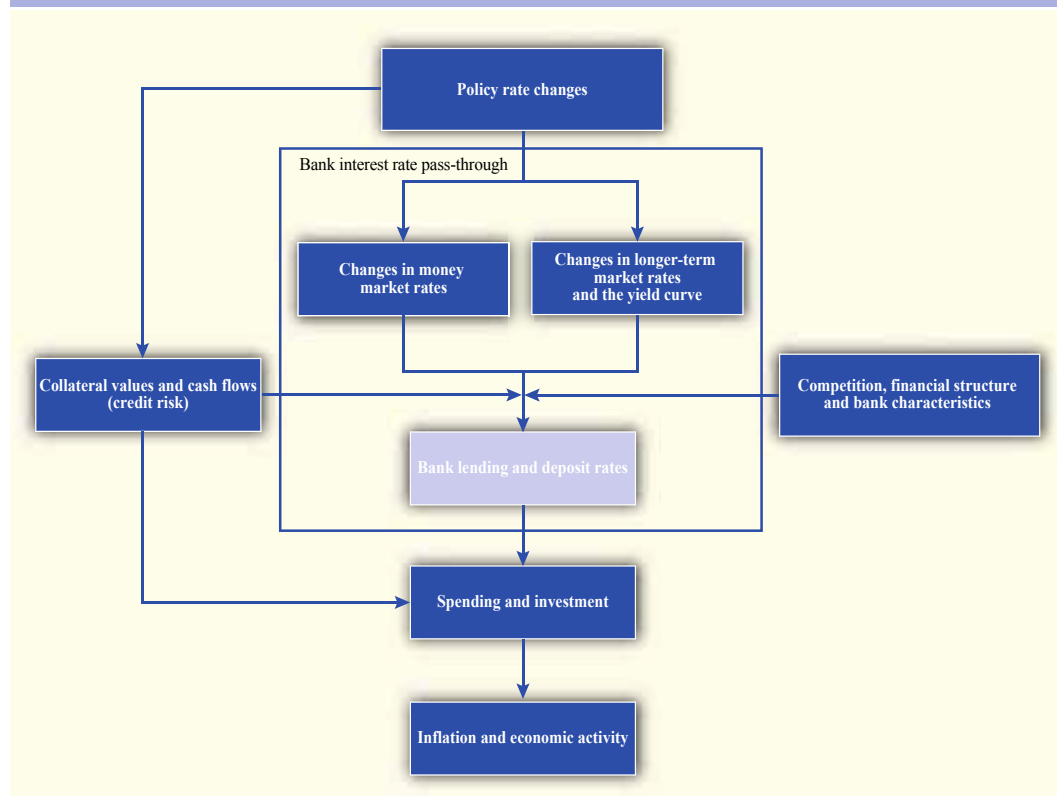
rate risk, credit risk, the banks' degree of risk aversion, unit operating costs, bank liquidity and product diversification.

Against this background, Chart 3 presents a stylised picture of the transmission of monetary policy rate changes to retail bank interest rates, via their impact on market rates, and highlights the various factors affecting bank spreads, both structural and related to the credit cycle. These factors influence banks' interest rate-setting behaviour and help to explain some of the apparent inertia in the reaction of bank interest rates to policy changes.

3 See X. Freixas and J.-C. Rochet, *Microeconomics of Banking*, The MIT Press, Cambridge (Massachusetts), second edition, 2008.

4 P.A. Chiappori, D. Perez-Castrillo and T. Verdier, "Spatial competition in the banking system, localization, cross-subsidies and the regulation of deposit rates", *European Economic Review*, 39(5), 1995, pp. 889-919.

Chart 3 Transmission of policy rate changes to retail bank interest rates



Nonetheless, the most direct determinants of retail bank lending and deposit rates for households and firms are policy (and hence market) rate changes. Indeed, market rates are important components of bank marginal costs and are directly affected by changes in monetary policy rates. As a result, in the literature on the interest rate channel for monetary policy transmission, particular focus has usually been put on how rapidly and extensively changes in policy rates are passed on, via changes in market rates, to retail bank loan and deposit rates – particularly given that retail bank interest rates are often priced against, and sometimes even indexed to, a market rate.<sup>5</sup>

The sluggishness observed in the response of bank interest rates is generally assumed to stem from the fact that banks may not find it profitable to adjust their retail interest rates frequently. For example, as a result of customer switching costs for many retail bank products, demand may be relatively inelastic to market rate changes, at least in the short run.<sup>6</sup> Furthermore, there may be nominal rigidities when banks set their interest rates (i.e. fixed adjustment costs of changing their retail rates). Such “menu costs” may, for example, become a deterrent when banks are uncertain about the permanence of market rate changes or if such changes are only minor.<sup>7</sup>

Likewise, the importance of relationship banking, which, in the predominantly bank-based euro area financial system, may be particularly pertinent, is likely to induce banks to smooth movements in retail interest rates over the cycle. This stems from the impetus to share the risk with bank retail customers in order to sustain a viable long-term bank/customer relationship, with the bank seeking to shield its customers from volatile market rate developments by keeping retail bank rates relatively stable over time.<sup>8</sup> Moreover, the market power of banks to set their retail rates, and hence the banks’ incentive to adjust them when market conditions change, also hinges on the bargaining position of borrowers. Thus, for example, corporate lending rates may be expected to adjust relatively quickly compared with rates on loans to households for consumer credit, simply because companies have better access to substitute sources

of non-bank financing (such as debt securities and equity issuance, trade credit, etc.) than the typical household. Hence, the pass-through to bank interest rates may differ considerably across different types of retail bank product, being quicker in those segments where banks face more competition from other banks and non-bank financing sources.

Heterogeneity across products in terms of pass-through can also be caused by cross-country differences in retail bank regulation and taxation, which may provide banks with different constraints and incentives when pricing their retail products.<sup>9</sup> More generally, a higher degree of competition from banks and non-banks,<sup>10</sup> as well as financial development and more efficient financial structures, for example triggered by financial innovations such as securitisation and derivatives,<sup>11</sup>

5 Other components influencing bank rates and margins are of a more structural nature (competition and efficiency) or less volatile, at least in the short run (credit risk and funding gaps). Hence, identifying the importance of such factors on a continuous basis when assessing the impact of monetary policy changes on bank interest rates offered to households and firms is less straightforward; see, for example, L.M. Ausubel, “The failure of competition in the credit card market”, *American Economic Review*, 81, March 1991, pp. 50-81.

6 See, for example, P.S. Calem, M.B. Gordy and L.J. Mester, “Switching costs and adverse selection in the market for credit cards: New evidence”, *Journal of Banking & Finance*, 30, 2006, pp. 1653-1685, who argue that information barriers between banks and their customers create non-negligible switching costs.

7 See, for example, T.H. Hannan and A.N. Berger, “The rigidity of prices: Evidence from the banking industry”, *American Economic Review*, 81, September 1991, pp. 938-945, as well as B. Hofmann and P. Mizen, “Interest rate pass-through and monetary transmission: Evidence from individual financial institutions’ retail rates”, *Economica*, 71, 2004, pp. 99-123.

8 See, for example, A.N. Berger and G.F. Udell, “Some evidence on the empirical significance of credit rationing”, *Journal of Political Economy*, 100, October 1992, pp. 1047-1077.

9 For a survey of the factors contributing to the cross-country dispersion of the level of MFI interest rates, see ECB, *Differences in MFI interest rates across euro area countries*, September 2006.

10 See, among others, H. Sander and S. Kleimeier, “Convergence in euro-zone retail banking? What interest rate pass-through tells us about monetary policy transmission, competition, and integration”, *Journal of International Money and Finance*, 23(3), 2004, pp. 461-492; and M. Van Leuvensteijn, C. Kok Sørensen, J.A. Bikker and A. Van Rixtel, “Impact of bank competition on the interest rate pass-through in the euro area”, ECB Working Paper No 885, 2008.

11 See, for example, A. Estrella, “Securitization and the efficacy of monetary policy”, *Economic Policy Review*, Vol. 8, No 1, Federal Reserve Bank of New York, May 2002, pp. 243-255; and R. Gropp, C. Kok Sørensen and J.-D. Lichtenberger, “The dynamics of bank spreads and financial structure”, ECB Working Paper No 714, 2007.

is expected to exert a positive impact on the speed and degree of the pass-through. Finally, to the extent that banks in a given situation do not want to fully satisfy demand (as, for example, in a situation of credit rationing), they may decide to hold retail rates relatively stable in order to avoid a “lemons problem” in the sense of attracting a large number of non-creditworthy borrowers.<sup>12</sup>

### 3 BANK INTEREST RATE PASS-THROUGH IN THE EURO AREA – EMPIRICAL EVIDENCE

This section presents recent empirical evidence on the bank interest rate pass-through for the euro area for a selection of representative loan and deposit categories.

Monetary policy typically has a significant and fairly immediate effect on market rates at various maturities. In particular, changes in policy rates in normal circumstances will spill over more or less one-to-one to unsecured short-term money market rates, such as the EONIA and, to a somewhat lesser extent, the term EURIBOR rates. Through its influence on expectations about future policy actions, changes in the monetary policy stance will often also have a strong impact on longer-term market rates, such as long-term government bond yields and swap rates, by moving the yield curve.<sup>13</sup> However, as mentioned in the previous section, the extent to which the policy-induced changes in market rates are eventually passed on to retail bank interest rates offered to borrowers and depositors hinges on a number of structural and cyclical factors.

There is a wealth of empirical literature on the retail bank interest rate pass-through process. Largely independently of the estimation method, sample period or geographical area involved, most empirical studies tend to confirm that retail bank interest rates respond sluggishly to changes in policy and market rates. Typically, banks are found to only pass a small part of the immediate change in market rates on to their retail rates and, even long after, bank retail rates are not always adjusted to the full extent.<sup>14</sup> At the same

time, how rapidly and extensively banks adjust their retail rates is typically found to differ substantially across different types of bank loan and deposit product, as well as across euro area countries.<sup>15</sup> This cross-country heterogeneity can, to some extent, be explained by differences in bank characteristics and financial structures. Moreover, a number of studies find evidence of some asymmetry in the pass-through over the interest rate cycle, with loan rates tending to be stickier when market rates decline, whereas deposit rates are typically found to react more sluggishly when market rates increase. This phenomenon, it is argued, depends on the degree of demand elasticity and bank competition.<sup>16</sup>

12 In the spirit of J.E. Stiglitz and A. Weiss, “Credit rationing in markets with imperfect information”, *American Economic Review*, 71, 1981, pp. 393-410. A number of US-based empirical studies found, however, only mixed support for this hypothesis; see, for example, S.R. King, “Monetary transmission: through bank loans or bank liabilities?”, *Journal of Money, Credit and Banking*, 18, 1986, pp. 290-303 and A.N. Berger and G.F. Udell (op. cit.).

13 See also G.J. de Bondt, B. Mojon and N. Valla, “Term structure and the sluggishness of retail bank interest rates in euro area countries”, ECB Working Paper No 518, 2005.

14 See T.H. Hannan and A.N. Berger (op. cit.); A.N. Berger and G.F. Udell (op. cit.); C. Borio and W. Fritz, “The response of short-term bank lending rates to policy rates: A cross-country perspective”, BIS Working Paper No 27, 1995; and M. Berlin and L.J. Mester, “Deposits and relationship lending”, *Review of Financial Studies*, 12(3), 1999, pp. 579-607, for some early contributions at the individual country level. For more recent evidence covering euro area countries, see, for example, B. Mojon, “Financial structure and the interest rate channel of ECB monetary policy”, *Economie et Provision*, 147(1), 2001, pp. 89-115; G.J. de Bondt, “Interest rate pass-through: Empirical results for the euro area”, *German Economic Review*, 6(1), 2005, pp. 37-78; L. Gambacorta, “How do banks set interest rates?”, *European Economic Review*, 52(5), 2005, pp. 792-819; and Gropp et al. (op. cit.).

15 For some recent studies, see, for example, C. Kok Sørensen and T. Werner, “Bank interest rate pass-through in the euro area: A cross-country comparison”, ECB Working Paper No 580, 2006; and J. Nakajima and Y. Teranashi, “The evolution of loan rate stickiness across the euro area”, Bank of Japan IMES Discussion Paper No 09-E-010, 2009.

16 See, for example, T.H. Hannan and A.N. Berger (op. cit.); and L.J. Mester and A. Saunders, “When does the prime rate change?”, *Journal of Banking & Finance*, 19(5), 1995, pp. 743-764, for US-based evidence; and B. Mojon (op. cit.); and Gropp et al. (op. cit.) for evidence based on the euro area. Furthermore, H. Sander and S. Kleimeier, “Expected versus unexpected monetary policy impulses and interest rate pass-through in euro-zone retail banking markets”, *Journal of Banking & Finance*, 30, 2006, pp. 1839-1870, point to the importance of predictable monetary policy in smoothing the pass-through process.

In the light of these “stylised” facts, using an updated sample of euro area retail bank interest rates, Box 1 presents evidence on the pass-through process at the aggregate euro area level, which indeed points to a wide dispersion in the (estimated) “stickiness” of bank lending and deposit rates in the euro area across product type. Thus, whereas rates on loans to households for house purchase, rates on loans to non-financial corporations and, to a somewhat lesser extent, time deposit rates eventually fully adjust to the changes in market rates with a corresponding rate fixation period, the retail bank rate adjustment is largely incomplete as regards overnight and savings deposits and rates on loans to households for consumer credit.

As mentioned above, the product differences possibly reflect inter alia the market (and bargaining) power of banks vis-à-vis different categories of customer. This may arise in the context of competitive pressures from other banks, as well as from non-banks (e.g. capital markets, trade credit and other financial intermediaries). Likewise, the size and time-varying nature of the credit risk premium is likely to differ across loan products, which may, for example, help explain the generally weaker pass-through of (typically non-collateralised) consumer credit rates compared with (collateralised) mortgage rates.

#### Box 1

#### RESULTS OF THE PASS-THROUGH TO EURO AREA RETAIL BANK INTEREST RATES USING AN ERROR CORRECTION MODELLING APPROACH

According to the bank interest rate pass-through literature, the transmission of monetary policy rates, via changes in market rates, to bank interest rates can be modelled using an error correction modelling framework, where changes in a specific bank interest rate,  $\Delta BR_t$ , are regressed on simultaneous (and lagged) changes in a relevant market rate,  $\Delta MR_t$ , and (possibly) lagged changes in the bank interest rate itself with an error correction term reflecting the extent to which the bank rate had diverged from its long-run equilibrium relationship with the market rate in the previous period.<sup>1</sup> This is illustrated in the equation below:<sup>2</sup>

$$\Delta BR_t = \varphi + \gamma (BR_{t-1} - \beta MR_{t-1} - \kappa) + \alpha_1 \Delta MR_t + \alpha_2 \Delta MR_{t-1} + \eta \Delta BR_{t-1} + \varepsilon_t$$

The results of running this model for each of the 11 broad categories of retail lending and deposit rates offered by euro area MFIs for the period January 1997 to June 2007 (see the table) point to notable differences in terms of the pass-through of changes in market rates across the different types of product and are not affected by the financial crisis that erupted in August 2007.<sup>3</sup>

1 This specification hinges on whether bank and market rates are non-stationary (i.e. do not tend to return to their past values) and whether they are cointegrated (i.e. whether a stable long-run relationship between the variables can be estimated) – see S. Johansen and K. Juselius, “Maximum likelihood estimation and inference on cointegration – with applications to the demand for money”, *Oxford Bulletin of Economics and Statistics*, 52, 1990, pp. 169-210; and S. Johansen, “Estimation and hypothesis testing of cointegration vectors in Gaussian Vector Autoregressive Models”, *Econometrica*, 59, 1991, pp. 1551-1580. Standard unit root and cointegration tests confirmed that for the bank and market interest rates the conditions for using the error correction model were satisfied. Only in the case of short-term rates on loans for consumer credit could a cointegration relationship not be easily detected.

2  $\kappa$  can be interpreted as representing all other factors, apart from the market rate, that determine the level of the bank rate, such as bank market power and efficiency, credit and interest rate risk, cross-subsidisation effects, etc. Although this model specification may not entirely correct for potential “omitted variable” bias, residual tests do not point to significant misspecification problems. However, an alternative model specification could have directly incorporated factors, such as the level of banking competition, business cycle indicators, etc., as was the case in some of the studies mentioned in footnotes 10 and 11.

3 The data used in these regressions are based on the MFI interest rate statistics compiled by the ECB. Official statistics are available from January 2003, whereas, for the period prior to January 2003, the series have been “backcast” using consistent methods across the euro area countries. The “backdata” are not publicly available.



Bank interest rates are generally found to be relatively sticky. The immediate adjustment coefficient to changes in market rates ranges from around zero for consumer credit rates and savings deposit rates to 0.7 for short-term loans to non-financial corporations. Likewise, the speed of adjustment to the long-run equilibrium varies from 0.02 for rates on short-term loans for house purchase to close to 0.20 for rates on long-term loans for consumer credit and rates on non-financial corporate loans. In terms of the long-run adjustment of retail rates to changes in market rates, the results point to a less than complete pass-through for consumer credit rates, overnight deposit rates and savings deposit rates (ranging from around 0.1 to around 0.4); whereas time deposit rates, rates on loans to households for house purchase and non-financial corporate loan rates more or less fully adjust (ranging from around 0.8 to around 1.0).

#### MFI interest rate pass-through estimates based on an error correction model

(January 1997 – June 2007)

	Immediate pass-through ( $\alpha_1$ )	Final pass-through ( $\beta$ )	Speed of adjustment ( $\gamma$ )	R <sup>2</sup> (adjusted)	Corresponding market rate
Overnight deposits	0.14***	0.36***	-0.05**	0.45	EONIA
Savings deposits	0.06***	0.32***	-0.09***	0.30	three-month EURIBOR
Short-term time deposits	0.50***	0.83***	-0.12***	0.82	three-month EURIBOR
Long-term time deposits	0.15***	0.80***	-0.15***	0.45	three-year swap rate
Overdrafts	0.26***	0.72***	-0.06***	0.58	EONIA
Short-term loans for consumer credit	0.26***	0.11***	-0.09*	0.05	six-month EURIBOR
Long-term loans for consumer credit	-0.06	0.38***	-0.19***	0.21	seven-year swap rate
Short-term loans for house purchase	0.36***	1.05***	-0.02	0.63	three-month EURIBOR
Long-term loans for house purchase	0.17***	1.07***	-0.12***	0.77	seven-year swap rate
Short-term loans to non-financial corporations	0.72***	0.89***	-0.18***	0.76	three-month EURIBOR
Long-term loans to non-financial corporations	0.30***	1.03***	-0.17***	0.45	seven-year swap rate

Sources: ECB, Reuters and ECB calculations.

Notes: “\*”, “\*\*” and “\*\*\*” indicate significance at the 90%, 95% and 99% level respectively. The Schwarz information criterion has been used to select the optimal lag length of the explanatory variables. Corrected for White heteroscedasticity-consistent standard errors and covariance.

#### 4 THE IMPACT OF THE FINANCIAL CRISIS ON THE TRANSMISSION OF POLICY RATE CHANGES TO RETAIL BANK INTEREST RATES

The financial market turbulence that erupted in August 2007 was triggered by a deterioration in the value of US sub-prime mortgages, but soon spilled over into other financial market segments. The ensuing crisis, which intensified in the second half of 2008, led to massive write-downs and losses by euro area banks, which in turn put substantial pressure on banks' solvency ratios and gave rise to a general loss of confidence in the banking sector and among banks themselves. One of the consequences of these developments was disruption in the functioning of the euro

area money market, which was reflected in a pronounced and persistent widening of the spreads between EURIBOR and overnight interest swap (OIS) rates. As many bank loan and deposit rates are fixed against money market rates, the disruption of the normally close relationship between term unsecured market rates (EURIBOR) and overnight rates (which are close proxies for policy rates) potentially impaired the transmission of monetary policy rate changes to retail bank lending and deposit rates.<sup>17</sup> Moreover, as the severity of the financial crisis eventually contributed to a marked

<sup>17</sup> Likewise, banks largely obtain their funds in the interbank market and the market for short-term debt securities, hence much of their funding is likely priced against money market rates.

slowdown in euro area economic activity, it may have led many banks to increase their credit risk premia and tighten their standards for providing loans.<sup>18</sup> This, in turn, could have hampered the transmission to bank lending rates of cuts in monetary policy rates since October 2008.

#### CUMULATED CHANGES IN MFI INTEREST RATES SINCE MID-2007

In order to assess the impact of the financial crisis and the extent to which the easing of the ECB's monetary policy since the fourth quarter of 2008 has been passed on to MFI interest rates, an out-of-sample forecast of MFI loan and deposit rates based on market rate developments since mid-2007 is compared with the actual changes in MFI interest rates over the same period. The forecast values are based on the model specification described in Box 1. The cumulated changes in actual and forecast MFI interest rates are shown in the table. Notably, the actual changes in most MFI interest rates are considerably smaller than the substantial declines in comparable market rates over this period, thus reflecting the typical sluggish adjustment of retail bank interest rates to market rate developments. Nevertheless, the differences between actual MFI interest rates and the forecast rates based on developments

in comparable market rates, and taking into account the typical sluggish pass-through, are found to be relatively modest (in most cases).

Overall, this points to a fairly normal pass-through to retail bank interest rates since the start of the turmoil. However, some dispersion across bank products has been evident in terms of the response during the turmoil and, more recently, since the easing of monetary policy began. In particular, whereas most short-term MFI interest rates have declined markedly since June 2007, developments in longer-term MFI interest rates have been much more muted. Apart from the somewhat smaller decline in long-term market rates (especially in recent months), this could also reflect the fact that banks have tightened their credit standards for long-term loans more than for short-term loans.<sup>19</sup>

18 Indeed, the results of the Eurosystem bank lending survey point to a significant net tightening of credit standards by euro area banks since the third quarter of 2007, which, in particular, has been due to a sharp deterioration in banks' risk perceptions; see, for example, the box detailing the results of the July 2009 bank lending survey in this issue of the Monthly Bulletin.

19 This is consistent with evidence from the July 2009 bank lending survey, in which banks reported that the net tightening of credit standards since the third quarter of 2007 has partly been accommodated via more stringent requirements regarding the maturity of loans.

#### Cumulated changes in actual and forecast MFI interest rates for the period July 2007-May 2009

(basis points)

	Actual	Forecast	Difference
<b>Short-term rates:</b>			
Overnight deposits	-65	-64	-1
Savings deposits	-39	-23	-16
Short-term time deposits	-246	-251	5
Overdrafts	-143	-153	10
Short-term loans for consumer credit	-21	-74	53
Short-term loans for house purchase	-178	-178	0
Short-term loans to non-financial corporations	-229	-236	7
EONIA	-317		
Three-month EURIBOR	-287		
<b>Long-term rates:</b>			
Long-term time deposits	-72	-63	-9
Long-term loans for consumer credit	-15	-12	-3
Long-term loans for house purchase	-41	-50	9
Long-term loans to non-financial corporations	-91	-96	5
Three-year swap rate	-247		
Seven-year swap rate	-165		
Ten-year swap rate	-136		

Sources: ECB, Reuters and ECB calculations.

Note: Based on a one-step-ahead (static) forecast for the period July 2007-May 2009.



Furthermore, the cumulated changes in actual deposit rates between July 2007 and May 2009 generally resulted in somewhat lower deposit rates than forecast. This seems to suggest that banks have, overall, offered lower deposit rates to their retail customers during the turmoil than in the past, which could reflect the fact that euro area banks have tried to mitigate the losses incurred during this period somewhat by increasing their spreads on deposits and thereby enhancing their profitability. Efforts to increase profitability in order to alleviate the negative impact of the financial crisis may also have contributed to the positive difference observed between the cumulated changes in actual MFI lending rates and the forecast lending rates. At the same time, MFI lending rates have been forecast based on past pass-through behaviour (implicitly assuming a constant long-term credit risk premium). Therefore, they may somewhat underestimate the increase in banks' risk perceptions as regards the creditworthiness of their borrowers, which should give rise to tighter credit standards than in the past, inter alia via a widening of lending spreads.

### THE IMPACT OF THE FINANCIAL CRISIS ON SHORT-TERM MFI INTEREST RATES

Looking in more detail at the pattern of actual developments in MFI interest rates since the financial tensions emerged in mid-2007, and comparing them with what would have been expected based on past pass-through behavioural patterns and the actual market rate developments up to May 2009, an assessment of the impact of the financial market turmoil on euro area banks' pricing of retail products can be made. The most immediately notable impact of the turmoil on the bank interest rate pass-through has been observed in short-term bank rates. This is owing to the fact that in the period since mid-2007 the normally close relationship between overnight money market rates – over which monetary policy has some control – and term money market rates broke down. This disruption in the money market had implications for the pass-through of policy rate changes to short-term retail bank rates, since the latter are often priced against – and sometimes even indexed to –

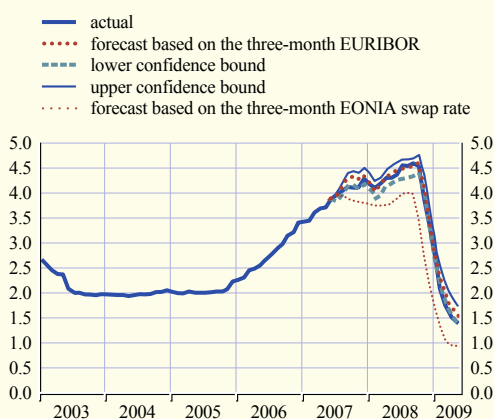
unsecured EURIBOR rates. After the outbreak of the financial market turbulence, banks continued to track EURIBOR rates closely when setting their short-term retail interest rates. However, given that, for an extended period, EURIBOR rates did not track developments in overnight (or policy) rates closely, the transmission of monetary policy rate changes to short-term retail bank rates seemed to be somewhat impaired.<sup>20</sup>

Turning first to developments in short-term time deposit rates, it is observed that, between June 2007 and May 2009, banks passed on changes in the three-month EURIBOR to a broadly similar degree as observed in the past (as indicated in Chart 4 by the almost identical developments in the actual rate on short-term time deposits and the forecast rate based on the three-month EURIBOR). In particular, the sharp decline in EURIBOR rates since October 2008, induced by the reduction in key ECB interest rates, was mirrored by a notable decrease in short-term deposit rates, which,

20 See also the box entitled “The implications of the money market tensions for the pass-through of MFI interest rates” in the December 2008 issue of the Monthly Bulletin.

Chart 4 Actual and forecast short-term time deposit rates

(percentages per annum; monthly data; January 2003 – May 2009)



Sources: ECB, Reuters and ECB calculations.  
Notes: N-step ahead (dynamic) forecast for the period July 2007–May 2009 based on actual market rate developments and the estimated coefficients of the model described in Box 1. The lower and upper confidence bounds refer to the forecast based on the three-month EURIBOR.

in very recent months, was even sharper than the forecast based on the three-month EURIBOR. At the same time, the actual level of short-term time deposit rates during this period was substantially higher (on average by about 56 basis points) than the forecast pattern of short-term time deposit rates based on developments in the three-month EONIA swap rate (as shown in Chart 4). This indicates that, during the turmoil, owing to the persistent wide spread between EURIBOR and OIS rates, retail deposit rates have exceeded the level normally implied by the monetary policy stance.<sup>21</sup>

Focusing instead on short-term lending rates, Chart 5 displays the actual and forecast (based on the EONIA) rates on overdrafts. While in the period June 2007-May 2009 overdraft rates tended to track the expected path (based on past experience) rather well, in the second half of 2008 they increased somewhat more than expected (and in the fourth quarter of 2008 they even rose slightly above the 95% confidence interval). This could reflect a heightened perception of risk on the part of banks during a period of extremely high uncertainty, which

may have triggered a tightening of credit standards on these typically non-collateralised loans and credit lines.<sup>22</sup> Such concerns, however, seemed to become less acute at the beginning of 2009, as overdraft rates fell substantially in parallel with the easing of the monetary policy stance.

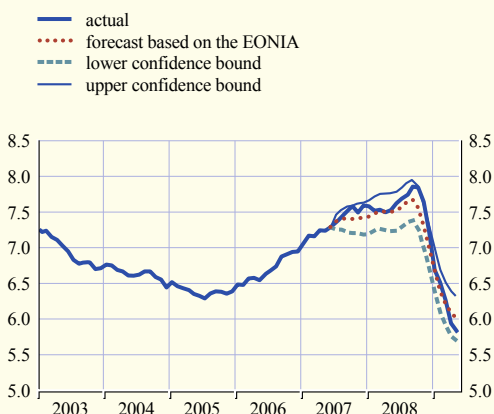
Developments in short-term rates on loans to non-financial corporations and on loans to households for house purchase are broadly similar (see Charts 6 and 7 respectively). Whereas the rates on both types of loan tended to develop broadly in line with the forecast based on past experience and recent developments in the three-month EURIBOR, there was a marked difference in the actual level of these rates compared with the level predicted based on developments in the overnight swap rate (on average 40-50 basis points between June 2007 and May 2009). Hence, in the market for short-term loans, the monetary policy

21 A similar pattern is found for other types of retail deposit rates, such as overnight rates and savings deposit rates.

22 This corresponds with the record level of net tightening of credit standards in the fourth quarter of 2008, as reported by euro area banks in the January 2009 bank lending survey.

**Chart 5 Actual and forecast rates on overdrafts**

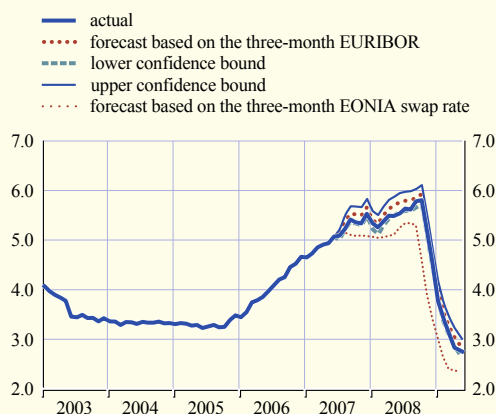
(percentages per annum; monthly data; January 2003 – May 2009)



Sources: ECB, Reuters and ECB calculations.  
 Notes: N-step ahead (dynamic) forecast for the period July 2007-May 2009 based on actual market rate developments and the estimated coefficients of the model described in Box 1. The "overdraft rate" is the weighted average of rates on overdrafts to households and non-financial corporations, using new business volumes as weights.

**Chart 6 Actual and forecast short-term rates on loans to non-financial corporations**

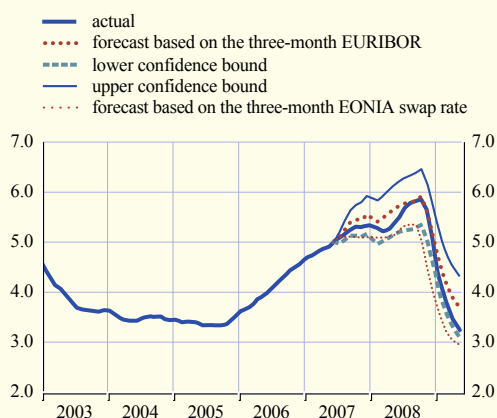
(percentages per annum; monthly data; January 2003 – May 2009)



Sources: ECB, Reuters and ECB calculations.  
 Notes: N-step ahead (dynamic) forecast for the period July 2007-May 2009 based on actual market rate developments and the estimated coefficients of the model described in Box 1. The lower and upper confidence bounds refer to the forecast based on the three-month EURIBOR.

**Chart 7 Actual and forecast short-term rates on loans to households for house purchase**

(percentages per annum; monthly data; January 2003 – May 2009)



Sources: ECB, Reuters and ECB calculations.

Notes: N-step ahead (dynamic) forecast for the period July 2007–May 2009 based on actual market rate developments and the estimated coefficients of the model described in Box 1. The lower and upper confidence bounds refer to the forecast based on the three-month EURIBOR.

transmission mechanism was likewise somewhat impaired, especially in the period from mid-2007 to late 2008. Nonetheless, short-term lending rates to both households and non-financial corporations have been lowered

dramatically since November 2008, reflecting the reductions in key ECB interest rates – along with other measures taken by the ECB to foster a gradual normalisation of money market conditions.<sup>23</sup> In May 2009 they stood substantially lower (at 180-230 basis points) than the level immediately before the turmoil erupted. However, the possibility that part of the reduction in short-term lending rates in recent months has been driven by a lack of demand for loans on the part of firms and households in the context of a weakening economy cannot be ruled out.<sup>24</sup>

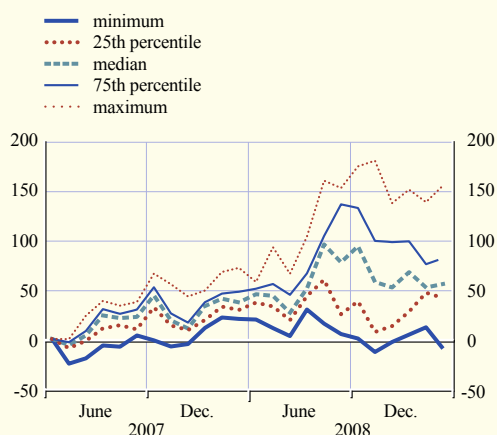
The divergence between the EURIBOR and OIS rates during the financial crisis affected the extent to which banks passed on changes in policy rates in almost all euro area countries. This is illustrated in Charts 8 and 9 which show the cross-country dispersion of differences

23 Such as the decision of 18 December 2008 to restore the corridor of standing facility rates and the launch of various supplementary longer-term refinancing operations with full allotment and, following the Governing Council's decision of 7 May 2009, with maturities of up to one year.

24 This is, for example, reflected in the strongly negative net loan demand reported in the July 2009 bank lending survey.

**Chart 8 Cross-country dispersion of differences between actual short-term rates on large loans to non-financial corporations and forecast rates based on the three-month EONIA swap rate**

(basis points; monthly data; June 2007 – April 2009)

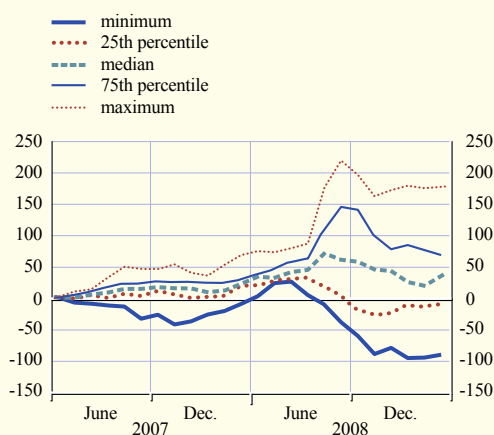


Sources: ECB, Reuters and ECB calculations.

Note: N-step ahead (dynamic) forecast for the period July 2007–April 2009 based on actual market rate developments and the estimated coefficients of a country-specific error correction model.

**Chart 9 Cross-country dispersion of differences between actual short-term rates on loans to households for house purchase and forecast rates based on the three-month EONIA swap rate**

(basis points; monthly data; June 2007 – April 2009)



Sources: ECB, Reuters and ECB calculations.

Note: N-step ahead (dynamic) forecast for the period July 2007–April 2009 based on actual market rate developments and the estimated coefficients of a country-specific error correction model.

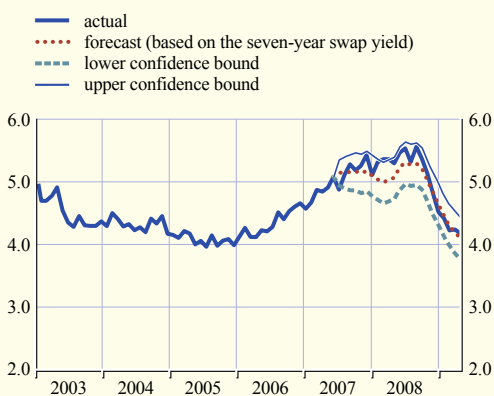
between actual rates on short-term loans to non-financial corporations and households for house purchase respectively and forecast rates based on the three-month EONIA swap rate. Nonetheless, throughout the period a wide dispersion was observed across banks in different countries in terms of the impact of the money market malfunctioning on the pass-through process. In addition, whereas the median difference between the level of actual short-term lending rates and the OIS-based forecast has declined somewhat since autumn 2008, the cross-country dispersion has widened notably. This dispersion could reflect the fact that banks in some euro area countries are more prone to pricing their loan rates against EURIBOR rates. It may also reflect the fact that the bank balance sheet position and the credit risk outlook in these countries are somewhat less benign and hence force banks to operate with higher spreads vis-à-vis market rates. It is likewise possible that competitive forces in some countries have induced banks to start indexing their rates against the EONIA rather than the EURIBOR and hence to re-establish the close link between monetary policy rates and short-term retail interest rates.

## THE IMPACT OF THE FINANCIAL CRISIS ON LONG-TERM MFI INTEREST RATES

Finally, turning to the pass-through evidence regarding longer-term loan rates since the start of the financial crisis in mid-2007, Charts 10 and 11 show the actual long-term rates on loans to non-financial corporations and households for house purchase respectively, against forecast rates based on the error correction model described in Box 1 and the seven-year swap rate. Overall, based on market rate developments between June 2007 and May 2009, changes in monetary policy rates were passed on to long-term rates on both types of loan in a manner which was broadly consistent with past behaviour. In the second half of 2007 and most of 2008 the (rather volatile) long-term non-financial corporate loan rate hovered somewhat above the level predicted by the pass-through model, which may reflect banks' practice of setting relatively high interest rates in the context of continued high loan demand during this period of high uncertainty. Furthermore, like short-term MFI interest rates, long-term lending rates have also declined markedly in recent months and, despite the problems facing banks in terms of their profitability and balance

**Chart 10 Actual and forecast long-term rates on loans to non-financial corporations**

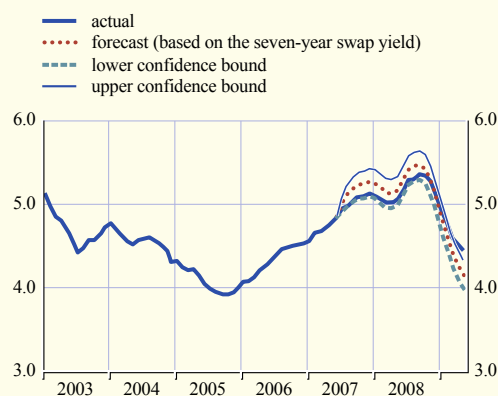
(percentages per annum; monthly data; January 2003 – May 2009)



Sources: ECB, Reuters and ECB calculations.  
Note: N-step ahead (dynamic) forecast for the period July 2007–May 2009 based on actual market rate developments and the estimated coefficients of the model described in Box 1.

**Chart 11 Actual and forecast long-term rates on loans to households for house purchase**

(percentages per annum; monthly data; January 2003 – May 2009)



Sources: ECB, Reuters and ECB calculations.  
Note: N-step ahead (dynamic) forecast for the period July 2007–May 2009 based on actual market rate developments and the estimated coefficients of the model described in Box 1.

sheet position, euro area banks appear to have passed on the policy rate reductions to a broadly similar extent as in the past, although in very recent months the actual rates on loans for house purchase have been somewhat higher than the forecast based on the seven-year swap rate.

All in all, the pass-through to long-term lending rates does not seem to have been notably more sluggish than in the past. This development should, however, also be seen in the context of weaker loan demand on the part of firms and households, as reported in the latest rounds of the bank lending survey, which may have put downward pressure on bank lending rates. Owing to the many countervailing factors currently affecting bank lending rates in the context of continued high uncertainty, close monitoring of developments in the coming months will be essential.

## 5 CONCLUSION

As the euro area has a bank-based financial system, the extent to which monetary policy rates are transmitted to the interest rates offered to euro area banks' retail customers is a crucial aspect of the monetary policy transmission process. This article has discussed the main factors affecting the bank interest rate pass-through. It has also examined the available empirical evidence for the euro area and considered the functioning of the pass-through process during the recent period of financial market tensions. Overall, notwithstanding some underlying disparities across euro area countries, in recent years the bank interest rate pass-through seems to have worked satisfactorily in the sense that the co-movement between retail bank interest rates and market rates has not seemed to differ markedly from past patterns. Even during the current financial crisis, the bank interest rate pass-through has worked relatively well in terms of responding to developments in EURIBOR rates and longer-term market rates, although less well in terms of responding to developments in the EONIA in the context of continued stress in the interbank money market

over this period. At the same time, bank credit standards have been tightened significantly in recent quarters, countering, to some extent, the smooth pass-through to retail bank lending rates. As the economy gradually improves, banks' capital bases are reinforced and their risk-taking behaviour normalises, it will be essential for banks to increase their lending activity.