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# The monetary transmission mechanism in France:

# effects of the policy interest rate on bank interest

# rates and credit conditions

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# The monetary transmission mechanism in France: effects of the policy interest rate on bank interest rates and credit conditions[1]

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**Abstract**

This paper analyses the monetary transmission mechanism for France over the period 1999-2012 through two of its main channels: the interest rate channel and the bank lending channel. It also focuses on the impact of the recent financial crisis on the pass-through to interest rates and credit volumes. The effect of a change in the interest rates set by the European Central bank is positive and significant for money market rates, government debt rates and lending rates to non-financial corporations, implying that the interest rate channel is quite strong in France, especially in the short-term (the effect is weaker for rates with a maturity over 2 years); the pass-through to credit volumes seems to be non-significant.

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## 1. Introduction

The analysis of the adjustment of interbank and lending interest rates and credit volumes to changes in the European Central Bank (ECB) rate is a crucial element of the monetary policy transmission mechanism, especially in France where financing of the economic activity is primarily performed through the banking system (see part 10. of WP2). Indeed, commercial banks play an important role in this transmission of monetary policy, through their lending rates and deposit rates (interest rate channel) or through their loan supply (bank lending channel). The articulation of these two channels is meaningful for the central bank because the loan supply and hence the transmission of monetary policy to credit conditions hinge on the speed and size of the pass-through from policy-controlled interest rates to money market rates and bank interest rates. According to Bernanke and Blinder (1992), the pass-through from the central bank interest rate to commercial bank interest rates is expected to be positive, whereas the pass-through to lending and deposits volumes is expected to be negative because of the arbitrage with bonds. The results highlight a positive pass-through to lending and deposit rates while banking volumes do not react. The transmission of monetary policy therefore appears impaired.

Nonetheless, the worldwide financial crisis of September 2008 may have affected these channels, since the financial net worth of borrowers and lenders have sharply decreased. It is thus interesting to investigate whether this financial shock may have triggered a break in the monetary transmission mechanism in France.

This chapter is organized as follows: section 2 provides a review on the literature related to the interest rate and bank lending channels of the monetary transmission mechanism, especially articles that have included France in their analysis; data selection is presented in section 3. Section 4 provides the benchmark estimations and section 5 analyses the effect of the financial crisis on the pass-through to bank interest rates and credit volumes.

## 2. Literature review

Numerous studies have been conducted on the subject of the monetary transmission mechanism in order to identify quantitatively the several transmission channels of monetary policy. One of the pioneering studies of the monetary transmission mechanism is the article of Bernanke and Blinder (1992) which shows that the interest rate of the central bank (in their case, the Fed) is a good indicator of monetary policy because it records perfectly the variations of the Central Bank reserves. The transmission mechanism of monetary policy can thus be assessed through the impact of a change in this rate on retail rates (the interest rate channel) and on volumes of loans and bank deposits (the bank lending and money channels).

Regarding the interest rate channel, many econometric methods have been experimented and used in order to compute the pass-through between the central bank rate, money market rates and bank interest rates. First, Sander and Kleimeier (2004) use a VAR and a cointegration methodology that allow for asymmetric and threshold adjustment with a view to assessing the heterogeneity of the monetary transmission process in the euro zone; this article distinguishes the usual monetary policy approach, by which central bank sets the interest rate, from the balance-sheet approach, hence a cost-of-financing-fund approach. These approaches lead to opposite pass-through results. Burgstaller (2005) prefers VARs to VEC models with a view to computing as reliably as possible the Austrian pass-through. De Bondt (2002) bases its analysis of the retail bank interest rate pass-through on a marginal cost pricing model and finds that the interest pass-through is incomplete in the euro zone (50% at its highest within one month). Finally, Banerjee, Bystrov and Mizen (2010) care about forecasts of future interest rates in determining accurately short-and long-run pass-through.

Another branch of the literature on the interest rate channel focuses on the determinants of such a pass-through. Mojon (2000) uses an error-correction model to analyse differences in financial structure across euro area countries and their implications for the interest rate channel of the monetary transmission mechanism; money market integration, growth of debt securities market and competition among

banks seem to affect it. More recently, Gigineishvili (2011) examines the financial structure as a possible cause of heterogeneity that exists within the various monetary transmission mechanisms worldwide; per capita GDP, inflation or market volatility are found to be macroeconomic structural determinants whereas exchange rate flexibility, credit quality or overhead costs are found to be financial market structure variables that affect the interest rate pass-through. Wang and Lee (2009) also attest for the importance of market rates volatility in the transmission process from market rates to retail interest rates. Last, the recent financial crisis (2008-2010) may have affected the monetary transmission mechanism; Andries and Lecarpentier-Moyal (2012) focuses on the impact of the financial crisis on the transmission mechanism to non-financial corporations lending rates, while Blot and Labondance (2011) uses a SUR-ECM model to estimate the effect of the financial crisis on the global pass-through between market rates and bank interest rates.

The literature on the bank lending channel is less numerous than the one on the interest rate channel, notably because of a debate between Americans and Europeans upon its existence. Ashcraft (2003) minimizes this channel of the monetary transmission in the United States by showing that only the size of a bank explains its lending reaction. Indeed, the aggregate elasticity of output to bank lending is close to zero; affiliated banks are able to shield lending from a monetary contraction so the lending channel is not an important part of how monetary policy works. Nonetheless, Ehrmann, Gambarcota et al. (2001) show that Europe does have its bank lending channel of monetary transmission and that monetary policy does alter bank loan supply.

A large volume of research has been devoted to the monetary transmission mechanism through European bank lending and to the heterogeneity of interest-rates pass-through within the Eurozone. Most of them have included France in cross-country analyses in order to compare banks rates and banks volumes reactions to a change in monetary policy. Regarding the credit channel, Chatelain, Ehrmann et al. (2003) focus on the bank lending and the balance sheets channels by showing that less liquid banks may have a stronger loan supply response; De Bondt (1999) insists on the size of the banks (bank lending channel) and on the size of the

borrowers (balance sheets channel) through their impact on the monetary transmission mechanism; Favero, Giavazzi and Flabbi (1999) highlights some asymmetries within the European transmission mechanism regarding a squeeze in liquidity. Borio and Fritz (1995) study the interest rate channel through several econometrical methodologies (average cost of funding and marginal cost of funding); Andries (2012) studies the homogeneity of interest rates responses to a monetary policy impulse within European countries. Last, Cecchetti (1999) analyses the impact of the monetary transmission mechanism on inflation and output in France and other European countries.

## 3. Data

Our data set comprises variables at a monthly frequency from January 1999 to June 2012 for most of macroeconomic variables and interest rates, from January 2003 to June 2012 for bank rates (lending and deposit rates) and bank volumes (loan supply and deposits volumes). All data come from Banque de France and ECB Statistical Data Warehouse databases.

The endogenous variables needed for computing the interest rate channel include five sets of rates. The wholesale of rates used to indicate the money market rates include euro area overnight rates (EONIA) and EURIBOR rates from 1 to 12 month maturity. Lending rates are divided in three categories: government debt rates, lending rates for loans to non-financial corporations and lending rates for loans to households. Government debt rates include Treasury bills and OAT (public bonds) reference rates from 1 to 12 month, 2, 5 and 10 year maturity, all for the sample January 1999 to June 2012. Interest rates on loans to non-financial companies, over the period January 2003 – May 2012, include general rates on all forms of loans to non-financials, rates on revolving loans and overdrafts, convenience and extended credit card debt, rates on loans (other than revolving loans and overdrafts, convenience and extended credit card debt) of less than or equal to 1 million Euros (all maturities), on those of an amount greater than 1 million Euros (all maturities), on loans with an initial fixation period up to 1 year (all amounts) and on loans with an initial fixation period over 1 year (all amounts).

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Interest rates on loans to households, over the period January 2003 – May 2005 and as for non-financial corporations, include the rates on general loans to households, the rates on revolving loans and overdrafts, convenience and extended credit card debt, rates on loans for consumption, rates on loans for house purchase, rates on housing loans with an initial fixation period up to 1 year and rates on housing loans with an initial fixation period over 1 year. Last, deposit rates, over the period January 2003 – May 2012, are distinguished between five categories: the deposit rate for M3 (only for the sample January 2003 to May 2012), rates on overnight deposits, on deposits with an agreed maturity up to 2 years, on deposits with agreed maturity over 2 years and rates on deposits redeemable at notice remunerated at market rates (3 month maturity).

The endogenous variables needed for computing the bank lending channel include lending and deposits volumes. All these volumes will be taken in percent change of the stock (new issuance) in the econometric regressions. Loans volumes to non-financial corporations distinguish between all types of loans, available for the sample January 2003 – May 2012, and loans of an amount up to 1 million euros (all maturities) and those of an amount over 1 million euros, both available over the period January 2004 – May 2012. Loans volumes to households, as for loans to non-financial corporations, will be divided in three categories: total loans (for the sample January 2003 – May 2012), cash loans, and housing loans, both for the sample January 2004 – May 2012. Last, deposit volumes are available for the entire period January 1999 – May 2012 and distinguish between overnight deposits stocks, deposits with agreed maturity up to 2 years, deposits with agreed maturity over 2 years and deposits redeemable at notice remunerated at market rates (3 month maturity rate).

Controls will include macroeconomic and microeconomic variables, i.e. variables linked to the banking sector structure. Macroeconomic controls will be the inflation rate, gauged as the consumer price index in percent change, oil prices (Brent crude oil) and the exchange rate between Euros and US Dollars, EURUSD. They are all monthly available over the period 1999 (January) – 2012 (June). The growth rate of real GDP has been made monthly available using a linear interpolation on a quarterly basis, while the government debt ratio has been made monthly

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available using a linear interpolation on an annual basis; it is now available only for the sample January 1999 – December 2011. Last, the conditional volatility of money market rates has been computed using an ARCH method: we estimated GARCH (1,1) models (where for our purpose two lags proved to be sufficient to reduce remaining serial correlation) and extracted the estimates of the conditional volatility of money market interest rates (Euribor 12 month maturity).

Controls that are related to the French banking sector characteristics were taken on an annual basis and were made available on a monthly basis through the linear interpolation method. These controls include the number of MFIs[2]. Other controls relative to domestic banks characteristics have been taken from aggregated micro data issued from French MFIs balance sheets for the sample January 1999 – May 2012. Thus, several ratios have been computed on this basis: a capitalization ratio (capital and reserves over total assets), a liquidity ratio (total securities other than shares over total assets), a leverage ratio (total shares other than securities over total assets) and a size indicator (total assets). Last, the market capitalization of all French listed companies has been made monthly available using a linear interpolation on an annual basis; it is now available for the period January 1999 – December 2011. We introduce these controls because we believe that they impact on rates (respectively volumes) and may bias the estimated effect of ECB rate if omitted.

For instance, the first set of factors likely to influence the effect of monetary policy on the several set of endogenous variables relate to macroeconomic conditions. First, the inflation rate is usually positively correlated to the nominal interest rate, so a shift in inflation would yield to a shift in interest rate so as to keep constant the real interest rate. It would have a negative effect on loan supply, because of the depreciation of capital. Then, a decrease in the short-term real interest rate (market rates) implies that euro denominated asset will be less attractive than foreign assets, so the demand for Euros will decrease and the domestic currency will depreciate. This depreciation will have a negative effect on (euro-denominated) oil prices for the domestic country, so the response of the set of

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[2] MFIs (Monetary and Financial Institutions) include the central bank, credit institutions resident in France and other resident MFIs such as Money Market Funds.

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rates to oil prices is expected to be negative. An expansionary policy leads to more deposits at the bank, which makes more loans available, especially for firms which want to undertake investment projects, which lead to higher GDP; thus, a decrease in market rates and in bank interest rates lead to a higher GDP growth. A high government debt ratio may imply a high demand for bonds, which may decrease their prices and so may increase the long-term interest rates. Last, the conditional volatility of market rates is expected to hamper the monetary policy and the transmission mechanism.

The second set of factors likely to influence the effect of monetary policy on banks rates and stocks relate to structural characteristics peculiar to the banking sector and the ability of firms to find funds. Thus, a highly concentrated banking sector (assessed by a little number of MFIs) means a little competition within the sector and hence favours higher lending rates. A high market capitalization implies that firms can find easily other sources of funds than banks loans (market sources especially) to fund their investment projects; it tends to lower lending rates to non-financial corporations in order to make bank loans more attractive than equity. The same reasoning can be conducted for the capitalization ratio of French MFIs (and respectively their size): a monetary tightening will have less impact on their lending rates and loan supply if they can easily fund themselves on financial markets or make up for this monetary policy with their reserves, i.e. if they are big enough. Last, a high leverage ratio would imply a high dependence to interest rates and a high liquidity ratio a low dependence.

## 4. Benchmark estimations

Benchmark estimations are computed on the basis of the entire sample January 1999 – June 2012. We use Ordinary Least-Squares (OLS) estimations with Huber-White robust standard errors due to potential heteroscedasticity. One may argue that when the variance of residuals is assumed to be fixed, estimates of the parameters would be biased if the variance of residuals has evolved across time. We compute successively the effect of a monetary policy change on money market rates, lending rates (to government, non-financial corporations and households), deposit rates,

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lending volumes (to non-financial corporations and households) and deposit volumes.

## 4.1. Estimated Model

To obtain estimates of the transmission of the ECB rate to market rates, retail bank interest rates and loan supply, the following equation is estimated:

$$X_t = \alpha + \beta Y_t + \gamma X_{t-1} + \delta Z_t + \varepsilon_t$$

$X_t$ is the endogenous variable which is chosen successively among a set of endogenous variables (respectively the money market rates, government debt rates, lending to non-financial corporations rates, lending to households rates, deposits rates sets for the interest rate channel and the loans to non-financial corporations volumes, loans to households volumes and deposit volumes sets); $X_{t-1}$ is the first lag of the first difference of the chosen endogenous variable; $Y_t$ indicates the first difference of the monetary instrument and $Z_t$ is a set of controls that includes macroeconomic controls (inflation rate, growth rate of GDP, oil prices, government debt ratio, euro-dollar exchange rate, conditional volatility) and microeconomic French banking sector characteristics (number of MFIs, market capitalization of French listed companies, size of banking sector, capitalization, liquidity and leverage ratios); last, $\varepsilon_t$ is the error term and α the constant.

## 4.2 Interest rates (interest rate channel)

The interest rate channel is here analysed for interest rates over the sample 1999(1)-2012(6). Taking into account a marginal pricing model of pass-through, we can notice that the effect of the contemporary ECB rate on money market rates is quite low but highly significant and decreases with maturity (see Table 1). It reaches 0.45 in average for short maturities (one day to three months) and 0.28 for long maturities (six months to one year).

Table 1 – Money market rates response to a change in the policy rate

| | X_1d | X_1d | X_1m | X_1m | X_3m | X_3m | X_6m | X_6m | X_9m | X_9m | X_12m | X_12m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | (X stands for D.mmr) | | | | | | | |
| D.bce | 0.433*** | 0.469*** | 0.516*** | 0.529*** | 0.369*** | 0.383*** | 0.288*** | 0.298*** | 0.260*** | 0.261*** | 0.252*** | 0.248*** |
| | [0.11] | [0.09] | [0.11] | [0.10] | [0.11] | [0.11] | [0.09] | [0.10] | [0.09] | [0.09] | [0.09] | [0.09] |
| LD.bce | | 0.375*** | | 0.366*** | | 0,164 | | 0,117 | | 0,082 | | 0,061 |
| | | [0.09] | | [0.12] | | [0.12] | | [0.11] | | [0.10] | | [0.10] |
| L2D.bce | | 0.210*** | | 0,128 | | 0,046 | | 0,023 | | -0,011 | | -0,042 |
| | | [0.06] | | [0.09] | | [0.08] | | [0.07] | | [0.08] | | [0.09] |
| LX_1d | 0,002 | -0.269** | | | | | | | | | | |
| | [0.12] | [0.12] | | | | | | | | | | |
| LX_1m | | | -0,02 | -0,249 | | | | | | | | |
| | | | [0.16] | [0.17] | | | | | | | | |
| LX_3m | | | | | 0,178 | 0,065 | | | | | | |
| | | | | | [0.14] | [0.18] | | | | | | |
| LX_6m | | | | | | | 0.355*** | 0.270* | | | | |
| | | | | | | | [0.10] | [0.14] | | | | |
| LX_9m | | | | | | | | | 0.376*** | 0.331*** | | |
| | | | | | | | | | [0.09] | [0.12] | | |
| LX_12m | | | | | | | | | | | 0.377*** | 0.355*** |
| | | | | | | | | | | | [0.08] | [0.10] |
| constant | -0,413 | -0,279 | -0,031 | 0,132 | -0,097 | 0,071 | -0,234 | -0,122 | -0,229 | -0,152 | -0,301 | -0,244 |
| | [0.58] | [0.51] | [0.67] | [0.59] | [0.51] | [0.49] | [0.54] | [0.52] | [0.56] | [0.55] | [0.59] | [0.58] |
| F-stat | - | 49,08 | - | 22,02 | - | 6,08 | - | 4,3 | - | 2,9 | - | 1,96 |
| p-value | - | 0 | - | 0 | - | 0,0149 | - | 0,0399 | - | 0,0911 | - | 0,1636 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 154 | 153 | 154 | 153 | 154 | 153 | 154 | 153 | 154 | 153 | 154 | 153 |
| r2 | 0,545 | 0,644 | 0,585 | 0,655 | 0,62 | 0,638 | 0,654 | 0,663 | 0,636 | 0,642 | 0,607 | 0,611 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. "D." and "L." stand for the difference and first lag operators. The following money market rates have been chosen: mmr_1d is the overnight Eonia rate; mmr_1m, mmr_3m, mmr_6m, mmr_9m and mmr_12m are respectively the 1 month, 3 months, 6 months, 9 months and 1 year Euribor rates for the sample 1999(1) - 2012(6).
F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero
Estimations are performed using OLS. *, ** and *** denote significance at the 10%, 5% and 1% levels. Robust standard errors are in brackets.
Estimates of controls have been removed for clarity; they are available from the author upon request

There is also a significant lagged effect of a change in the ECB rate on short money market rates (one day and one month), whereas only the contemporary effect is significant on longer horizons. We will thus remember that the effect of the ECB rate on money market rates is significant but that it is relatively small (a positive shock of 1% to the ECB rate leads to an increase of about 0.3% of the money market rates) and decreases with maturity.

Regarding the effect of the ECB rate on government debt rates (see Table 2), we can see that it is comparable with the pass-through to money market rates; the effect is slightly higher in the short term (approximately 0.4), decreases with maturity (up to one year) but it is, however, not significant in the long run (over two years). The fact that the ECB rate has no impact on the rate of long term debt is rather intuitive: the ratio of debt, government spending, tax revenues and debt sustainability are better trend data to shape these long-term debt rates. Nonetheless, the ECB rate retains some importance because government debt is a weighting average of short

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term and long term debt and because the pass-through to short-term debt rates is significant and quite high. As for money market rates, there exists a significant lagged effect in the very short run (one month).

## Table 2 – Government debt rates response to a change in policy rate

| | X_1m | X_1m | X_3m | X_3m | X_6m | X_6m | X_9m | X_9m | X_1y | X_1y | X_2y | X_2y | X_5y | X_5y | X_10y | X_10y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | (X stands for D.rrtb) | | | | | | | | | |
| D.bce | 0.472*** | 0.498*** | 0.461*** | 0.476*** | 0.394*** | 0.400*** | 0.326** | 0.324** | 0.297** | 0.296** | 0.200* | 0.203* | 0,106 | 0,117 | 0,057 | 0,075 |
| | [0.11] | [0.11] | [0.14] | [0.14] | [0.14] | [0.14] | [0.13] | [0.13] | [0.12] | [0.13] | [0.12] | [0.12] | [0.10] | [0.11] | [0.10] | [0.10] |
| LD.bce | | 0,077 | | 0,064 | | 0,022 | | -0,014 | | -0,033 | | -0,111 | | -0,17 | | -0.167* |
| | | [0.07] | | [0.08] | | [0.08] | | [0.09] | | [0.09] | | [0.11] | | [0.10] | | [0.09] |
| L2D.bce | | 0.151*** | | 0.138* | | 0,072 | | 0,015 | | 0,013 | | -0,052 | | -0,058 | | -0,02 |
| | | [0.05] | | [0.07] | | [0.07] | | [0.07] | | [0.08] | | [0.12] | | [0.11] | | [0.11] |
| LX_1m | 0,064 | -0,023 | | | | | | | | | | | | | | |
| | [0.13] | [0.15] | | | | | | | | | | | | | | |
| LX_3m | | | -0,025 | -0,073 | | | | | | | | | | | | |
| | | | [0.17] | [0.18] | | | | | | | | | | | | |
| LX_6m | | | | | 0,108 | 0,086 | | | | | | | | | | |
| | | | | | [0.14] | [0.15] | | | | | | | | | | |
| LX_9m | | | | | | | 0.234** | 0.234** | | | | | | | | |
| | | | | | | | [0.10] | [0.11] | | | | | | | | |
| LX_1y | | | | | | | | | 0.258*** | 0.265*** | | | | | | |
| | | | | | | | | | [0.09] | [0.10] | | | | | | |
| LX_2y | | | | | | | | | | | 0.209** | 0.220** | | | | |
| | | | | | | | | | | | [0.09] | [0.10] | | | | |
| LX_5y | | | | | | | | | | | | | 0.225*** | 0.231*** | | |
| | | | | | | | | | | | | | [0.08] | [0.09] | | |
| LX_10y | | | | | | | | | | | | | | | 0.176* | 0.181* |
| | | | | | | | | | | | | | | | [0.10] | [0.10] |
| constant | -0,523 | -0,543 | -0,693 | -0,729 | -0,765 | -0,743 | -0,993 | -0,944 | -0,967 | -0,935 | -0,695 | -0,631 | -0,616 | -0,565 | -0,017 | -0,024 |
| | [0.60] | [0.60] | [0.86] | [0.86] | [0.82] | [0.82] | [0.74] | [0.75] | [0.74] | [0.74] | [0.78] | [0.78] | [0.76] | [0.76] | [0.76] | [0.78] |
| F-stat | - | 19,26 | - | 12,61 | - | 6,67 | - | 3,32 | - | 2,31 | - | 0,03 | - | 0,36 | - | 0,48 |
| p-value | - | 0 | - | 0,0005 | - | 0,0109 | - | 0,0706 | - | 0,1305 | - | 0,8545 | - | 0,5474 | - | 0,4889 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 154 | 153 | 154 | 153 | 154 | 153 | 154 | 153 | 154 | 153 | 154 | 153 | 154 | 153 | 154 | 153 |
| r2 | 0,6 | 0,62 | 0,454 | 0,468 | 0,458 | 0,463 | 0,477 | 0,48 | 0,451 | 0,452 | 0,298 | 0,309 | 0,249 | 0,27 | 0,194 | 0,207 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. "D." and "L." stand for the difference and first lag operators. The following rates have been chosen: rrtb_1m, rrtb_3m, rrtb_6m,rrtb_9m, rrtb_1y, rrtb_2y, rrtb_5y and rrtb_10y are respectively the 1 month, 3 months, 6 months, 9 months, 1 year, 2 years, 5 years and 10 years Treasury bills and OAT reference rates for the sample 1999(1) -2012(6).

F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero

Estimations are performed using OLS. *, ** and *** denote significance at the 10%, 5% and 1% levels. Robust standard errors are in brackets.

Estimates of controls have been removed for clarity; they are available from the author upon request

# Table 3 – Lending rates to non-financial corporations' response to a change in policy rate

| | X_tt | X_tt | X_ccd | X_ccd | X_inf1y | X_inf1y | X_sup1y | X_sup1y | X_inf1m | X_inf1m | X_sup1m | X_sup1m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | (X stands for D.lrnfc) | | | | | | |
| D.bce | 0.200** | 0.242*** | 0.276** | 0.285*** | 0,267 | 0.307** | 0.195** | 0.242*** | 0.264** | 0.296*** | 0,231 | 0.273* |
| | [0.09] | [0.08] | [0.11] | [0.10] | [0.16] | [0.14] | [0.09] | [0.08] | [0.11] | [0.11] | [0.17] | [0.15] |
| LD.bce | | 0.286*** | | 0,021 | | 0.656*** | | 0.275*** | | 0.259** | | 0.569*** |
| | | [0.09] | | [0.14] | | [0.18] | | [0.10] | | [0.10] | | [0.20] |
| L2D.bce | | 0.179** | | 0,121 | | 0,14 | | 0.245** | | 0.260* | | 0,02 |
| | | [0.08] | | [0.10] | | [0.17] | | [0.09] | | [0.15] | | [0.19] |
| LX_tt | -0.226* | -0.316*** | | | | | | | | | | |
| | [0.12] | [0.12] | | | | | | | | | | |
| LX_ccd | | | -0.300** | -0.291** | | | | | | | | |
| | | | [0.13] | [0.13] | | | | | | | | |
| LX_inf1y | | | | | -0.197* | -0.296*** | | | | | | |
| | | | | | [0.11] | [0.11] | | | | | | |
| LX_sup1y | | | | | | | -0.310** | -0.355*** | | | | |
| | | | | | | | [0.12] | [0.12] | | | | |
| LX_inf1m | | | | | | | | | -0,028 | -0,107 | | |
| | | | | | | | | | [0.11] | [0.10] | | |
| LX_sup1m | | | | | | | | | | | -0.229** | -0.270** |
| | | | | | | | | | | | [0.11] | [0.11] |
| constant | 0,03 | 0,006 | 0,485 | 0,481 | -0,942 | -1,055 | 0,055 | 0,019 | -0,623 | -0,606 | -0,909 | -1,022 |
| | [0.63] | [0.59] | [0.65] | [0.65] | [0.79] | [0.79] | [0.88] | [0.85] | [0.75] | [0.72] | [0.94] | [0.94] |
| F-stat | - | 14,9 | - | 5,07 | - | 8,56 | - | 15,87 | - | 11,29 | - | 4,53 |
| p-value | - | 0,0002 | - | 0,0269 | - | 0,0044 | - | 0,0001 | - | 0,0012 | - | 0,0361 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 |
| r2 | 0,483 | 0,546 | 0,518 | 0,524 | 0,44 | 0,541 | 0,319 | 0,378 | 0,35 | 0,402 | 0,396 | 0,474 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. "D." and "L." stand for the difference and first lag operators. The following lending rates to domestic non-financial corporations have been chosen: lrnfc_tt stands for all types of loans, lrnfc_ccd stands for revolving loans and overdrafts, convenience and extended credit card debt, lrnfc_inf1Y for loans with a maturity up to 1 year, lrnfc_sup1y for loans with a maturity over 1 year, lrnfc_inf1m for loans up to € 1 million and lrnfc_sup1y for loans over € 1 million; all for the sample 2003(1) - 2012(6).

F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero

Estimations are performed using OLS. *, ** and *** denote significance at the 10%, 5% and 1% levels. Robust standard errors are in brackets.

Estimates of controls have been removed for clarity; they are available from the author upon request

The pass-through of ECB rate to lending rates towards non-financial corporations (see Table 3) is less substantial than the pass-through to money market and government debt rates (around 2.5) but it remains higher and significant for small loans (0.30). There is a first-lagged effect on large and short loans, a second lagged-effect on total, small and long-term loans, whereas the effect remains only contemporary for revolving loans and overdrafts.

The contemporary effect of the ECB rate on lending rates towards households is non-significant (see Table 4). Nonetheless, there exists a significant lagged pass-through to rates for housing loans, more particularly for long-term housing loans (over one year maturity).

### Table 4 – Lending rates to households' response to a change in policy rate

| | X_tt | X_tt | X_ccd | X_ccd | X_lfc | X_lfc | X_h | X_h | X_hinf1y | X_hinf1y | X_hsup1y | X_hsup1y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (X stands for D.lrhh) | | | | | | | | | | | |
| D.bce | 0,022 | 0,04 | 0,598 | 0,52 | -0,055 | -0,053 | -0,015 | 0,005 | -0,075 | -0,053 | -0,007 | 0,014 |
| | [0.05] | [0.05] | [0.39] | [0.36] | [0.10] | [0.10] | [0.05] | [0.05] | [0.09] | [0.09] | [0.05] | [0.05] |
| LD.bce | | 0,064 | | -0,72 | | 0,055 | | 0.146** | | 0.178** | | 0.149** |
| | | [0.07] | | [0.76] | | [0.12] | | [0.06] | | [0.07] | | [0.07] |
| L2D.bce | | 0,129 | | 0,613 | | -0,027 | | 0.113** | | 0,135 | | 0.128** |
| | | [0.08] | | [0.67] | | [0.12] | | [0.05] | | [0.09] | | [0.06] |
| LX_tt | 0,06 | 0,037 | | | | | | | | | | |
| | [0.12] | [0.12] | | | | | | | | | | |
| LX_ccd | | | -0.164*** | -0,104 | | | | | | | | |
| | | | [0.06] | [0.07] | | | | | | | | |
| LX_lfc | | | | | -0,171 | -0,165 | | | | | | |
| | | | | | [0.10] | [0.11] | | | | | | |
| LX_h | | | | | | | 0.298*** | 0.247** | | | | |
| | | | | | | | [0.10] | [0.10] | | | | |
| LX_hinf1y | | | | | | | | | 0,097 | 0,051 | | |
| | | | | | | | | | [0.10] | [0.09] | | |
| LX_hsup1y | | | | | | | | | | | 0,175 | 0,12 |
| | | | | | | | | | | | [0.11] | [0.11] |
| constant | 1.235** | 1.245** | 3,467 | 3,42 | 2.287** | 2.266** | 0,298 | 0,296 | -0,026 | -0,06 | 0,399 | 0,404 |
| | [0.52] | [0.52] | [2.62] | [2.60] | [1.10] | [1.12] | [0.41] | [0.39] | [0.44] | [0.43] | [0.43] | [0.41] |
| F-stat | - | 3,31 | - | 0,29 | - | 0,01 | - | 4,77 | - | 2,77 | - | 5,11 |
| p-value | - | 0,0724 | - | 0,5888 | - | 0,9145 | - | 0,0317 | - | 0,0999 | - | 0,0263 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 | 106 |
| r2 | 0,416 | 0,443 | 0,115 | 0,169 | 0,197 | 0,199 | 0,544 | 0,595 | 0,513 | 0,554 | 0,473 | 0,529 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. "D." and "L." stand for the difference and first lag operators. The following lending rates to domestic households have been chosen: lrhh_tt stands for all types of loans, lrhh_ccd stands for revolving loans and overdrafts, convenience and extended credit card debt, lrhh_lfc for loans for consumption excluding revolving loans and overdrafts, convenience and extended credit card debt, lrhh_h for housing loans, lrhh_hinf1Y for housing loans with a maturity up to 1 year and lrhh_hsup1y for housing loans with a maturity over 1 year; all for the sample 2003(1) - 2012(6).

F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero

Estimations are performed using OLS. *, ** and *** denote significance at the 10%, 5% and 1% levels. Robust standard errors are in brackets.

Estimates of controls have been removed for clarity; they are available from the author upon request

The contemporary pass-through to deposit rates (see Table 5) is not significant for overnight and redeemable deposits, though it remains significant but quite low for short term and long-term deposits (0.13 in average). There exists a highly significant lagged effect for money deposits (0.13 for the first lag of the ECB rate, 0.19 for the second) and redeemable deposits (0.47 for a second lag of the ECB rate).

All in all, we can conclude in favour of the existence of an interest rate channel in France; the contemporary pass-through is high and significant for money market rates and government debt rates, even if this pass-through decreases with maturity. The pass-through seems to be lagged in the case of some deposit and lending rates to households or non-financial corporations.

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<div align="center">Table 5 – Deposit rates response to a change in policy rate</div>

| | X_m3 | X_m3 | X_od | X_od | X_inf2y | X_inf2y | X_sup2y | X_sup2y | X_rd | X_rd |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | (X stands for D.dr) | | | | | |
| D.bce | -0,026 | 0 | -0,015 | -0,012 | 0.136** | 0.136** | 0.131** | 0.137** | -0,113 | -0,08 |
| | [0.07] | [0.05] | [0.02] | [0.01] | [0.07] | [0.07] | [0.05] | [0.05] | [0.10] | [0.06] |
| LD.bce | | 0.137** | | -0,002 | | 0.107* | | -0,057 | | -0,062 |
| | | [0.05] | | [0.02] | | [0.05] | | [0.07] | | [0.08] |
| L2D.bce | | 0.193*** | | 0.033* | | 0,027 | | 0,089 | | 0.466*** |
| | | [0.06] | | [0.02] | | [0.06] | | [0.06] | | [0.10] |
| LX_m3 | -0.216** | -0.272*** | | | | | | | | |
| | [0.10] | [0.09] | | | | | | | | |
| LX_od | | | -0.327*** | -0.336*** | | | | | | |
| | | | [0.12] | [0.12] | | | | | | |
| LX_inf2y | | | | | -0.240** | -0.272** | | | | |
| | | | | | [0.11] | [0.11] | | | | |
| LX_sup2y | | | | | | | -0.600*** | -0.543*** | | |
| | | | | | | | [0.10] | [0.10] | | |
| LX_rd | | | | | | | | | -0,174 | -0,148 |
| | | | | | | | | | [0.15] | [0.12] |
| constant | 0,284 | 0,274 | -0,078 | -0,074 | 0,26 | 0,165 | 0,177 | 0,174 | -0,291 | -0,225 |
| | [0.23] | [0.21] | [0.09] | [0.09] | [0.48] | [0.48] | [0.48] | [0.47] | [0.50] | [0.47] |
| F-stat | - | 11,71 | - | 0,29 | - | 9,11 | - | 2,8 | - | 3,13 |
| p-value | - | 0,0009 | - | 0,593 | - | 0,0032 | - | 0,0976 | - | 0,0805 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 106 | 106 | 106 | 106 | 119 | 119 | 106 | 106 | 106 | 106 |
| r2 | 0,706 | 0,776 | 0,235 | 0,275 | 0,47 | 0,485 | 0,436 | 0,458 | 0,478 | 0,637 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. "D." and "L." stand for the difference and first lag operators. The following deposit rates for domestic households and non-financial corporations have been chosen: dr_m3 stands for broad money, dr_od stands for overnight deposits, dr_sup2y for deposits with agreed maturity over 2 years and dr_rd for redeemable deposits at notice remunerated at market rates; all for the sample 2003(1) - 2012(5); dr_inf2y stands for deposits with agreed maturity up to 2 years for the sample 2001(12) - 2012(5).

F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero

Estimations are performed using OLS. *, ** and *** denote significance at the 10%, 5% and 1% levels. Robust standard errors are in brackets.

Estimates of controls have been removed for clarity; they are available from the author upon request

## 4.3 Volumes (bank lending channel)

The same kind of empirical estimations of monetary policy transmission channels have also been performed with volumes, gauging the impact of policy rate on lending volumes for instance. The bank lending channel is here analysed for volumes over the sample 2003(1)-2012(6).The results of a first series of estimations are available in Table 6. They show that the pass-through to lending volumes to non-financial corporations and the pass-through to lending volumes to households are never significant (see Table 6 and 7); lending volumes seem to be independent from the ECB rate.

## Table 6 – Lending volumes to non-financial corporations response to a change in policy rate

| | X_tt_c | X_tt_c | X_inf1m_c | X_inf1m_c | X_sup1m_c | X_sup1m_c |
|---|---|---|---|---|---|---|
| (X stands for lnfcv) | | | | | | |
| D.bce | -0,226 | -0,257 | -1,472 | -1,855 | -6,653 | -6,511 |
| | [0.60] | [0.62] | [9.47] | [8.95] | [16.73] | [16.53] |
| LD.bce | | -0,904 | | 0,135 | | -6,412 |
| | | [0.57] | | [9.39] | | [17.56] |
| L2D.bce | | 0,721 | | -10,706 | | 17,566 |
| | | [0.57] | | [7.86] | | [18.41] |
| L.X_tt_c | -0,171 | -0,163 | | | | |
| | [0.11] | [0.10] | | | | |
| L.X_inf1m_c | | | -0,115 | -0,11 | | |
| | | | [0.17] | [0.17] | | |
| L.X_sup1m_c | | | | | -0.335*** | -0.330*** |
| | | | | | [0.11] | [0.11] |
| constant | 6,07 | 6,252 | 49,643 | 52,311 | -111,516 | -113,074 |
| | [4.33] | [4.36] | [59.25] | [59.84] | [102.90] | [105.84] |
| F-stat | - | 0,16 | - | 0,53 | - | 0,02 |
| p-value | - | 0,6862 | - | 0,4681 | - | 0,8866 |
| controls | yes | yes | yes | yes | yes | yes |
| Nb obs | 106 | 106 | 94 | 94 | 94 | 94 |
| r2 | 0,335 | 0,364 | 0,109 | 0,12 | 0,209 | 0,222 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. D. and "L." stand for the difference and first lag operators. The following lending volumes to non-financial corporations have been chosen: lnfcv_tt_c stands for the growth rate of all types of loans stocks for the sample 2003(1)-2012(5), lnfcv_inf1m_c for the growth rate of the monthly flows of new issuance of loans with an amount up to and including € 1 million and lnfcv_sup1m_c stands for the growth rate of the monthly flows of new issuance of loans with an amount over € 1 million, both for the sample 2004(1)-2012(5).

F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero

Estimations are performed using OLS. *, ** and *** denote significance at the 10%, 5% and 1% levels. Robust standard errors are in brackets.

Estimates of controls have been removed for clarity; they are available from the author upon request

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## Table 7 – Lending volumes to households to a change in policy rate

| | X_tt_c | X_tt_c | X_cl_c | X_cl_c | X_hl_c | X_hl_c |
|---|---|---|---|---|---|---|
| | (X stands for lhhv) | | | | | |
| D.bce | 0,273 | 0,284 | 6,76 | 7,157 | 8,14 | 8,248 |
| | [0.26] | [0.25] | [5.04] | [4.91] | [8.97] | [9.15] |
| LD.bce | | -0,071 | | 7,681 | | 8,172 |
| | | [0.30] | | [5.66] | | [10.42] |
| L2D.bce | | 0,312 | | 4,908 | | -1,077 |
| | | [0.32] | | [5.72] | | [9.66] |
| L.X_tt_c | -0,08 | -0,069 | | | | |
| | [0.11] | [0.11] | | | | |
| L.X_cl_c | | | -0.364*** | -0.380*** | | |
| | | | [0.11] | [0.11] | | |
| L.X_hl_c | | | | | -0.397** | -0.410** |
| | | | | | [0.15] | [0.16] |
| constant | -0,253 | -0,251 | 1,556 | -3,259 | -100,302 | -105,744 |
| | [2.46] | [2.47] | [48.77] | [48.76] | [87.88] | [91.64] |
| F-stat | - | 1 | - | 2,98 | - | 0,47 |
| p-value | - | 0,3211 | - | 0,0883 | - | 0,4936 |
| controls | yes | yes | yes | yes | yes | yes |
| Nb obs | 106 | 106 | 94 | 94 | 94 | 94 |
| r2 | 0,384 | 0,392 | 0,217 | 0,235 | 0,26 | 0,267 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. "D." and "L." stand for the difference and first lag operators. The following lending volumes to domestic households have been chosen: lhhv_tt_c stands for the growth rate of all types of loans stocks for the sample. 2003(1)-2012(5), lhhv_cl_c for the growth rate of the monthly flows of new issuance of cash loans and lhhv_hl_c stands for the growth rate of the monthly flows of new issuance of housing loans, both for the sample 2004(1)-2012(5)

F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero

Estimations are performed using OLS. *, ** and *** denote significance at the 10%, 5% and 1% levels. Robust standard errors are in brackets.

Estimates of controls have been removed for clarity; they are available from the author upon request

Last, the contemporary pass-through to deposit volumes is significant except for overnight deposits. There exists a strong and significant lagged effect of a change in the ECB rate on short-term deposits (7.38 for the first lagged ECB rate; 3.95 for the second lag). There seems to be a trade-off made by private agents between short-term and long-term deposits, since the effect is positive for short-term deposits but negative for long-term deposits. Last, there is a negative pass-through to redeemable deposits volumes which is both contemporary and lagged, as expected in the literature (see Bernanke and Blinder, 1992).

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### Table 8 – Deposit volumes response to a change in policy rate

| | X_od_c | X_od_c | X_inf2y_c | X_inf2y_c | X_sup2y_c | X_sup2y_c | X_rd_c | X_rd_c |
|---|---|---|---|---|---|---|---|---|
| (X stands for dv) | | | | | | | | |
| D.bce | -0,876 | -0,656 | 3.453** | 2,441 | -1.298* | -1,064 | -0.993** | -0.878** |
| | [1.34] | [1.41] | [1.71] | [1.54] | [0.75] | [0.73] | [0.40] | [0.40] |
| LD.bce | | -1,807 | | 7.379*** | | -1.821* | | -1.040** |
| | | [1.93] | | [2.01] | | [0.99] | | [0.42] |
| L2D.bce | | 0,469 | | 3.949** | | -0,376 | | -0,498 |
| | | [2.61] | | [1.86] | | [0.64] | | [0.50] |
| L.X_od_c | -0.357*** | -0.365*** | | | | | | |
| | [0.07] | [0.07] | | | | | | |
| L.X_inf2y_c | | | -0.141* | -0.232*** | | | | |
| | | | [0.08] | [0.08] | | | | |
| L.X_sup2y_c | | | | | 0,056 | 0,014 | | |
| | | | | | [0.13] | [0.14] | | |
| L.X_rd_c | | | | | | | 0.197** | 0,139 |
| | | | | | | | [0.09] | [0.09] |
| constant | -29.589** | -29.494** | 53.162*** | 57.905*** | -11,834 | -11,919 | -13.824*** | -14.097*** |
| | [11.64] | [12.03] | [18.37] | [18.13] | [7.42] | [7.74] | [3.03] | [3.08] |
| F-stat | - | 0,31 | - | 15,38 | - | 4,49 | - | 9,46 |
| p-value | - | 0,5807 | - | 0,0001 | - | 0,0359 | - | 0,0025 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 154 | 153 | 154 | 153 | 154 | 153 | 154 | 153 |
| r2 | 0,184 | 0,192 | 0,301 | 0,383 | 0,39 | 0,418 | 0,318 | 0,354 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. "D." and "L." stand for the difference and first lag operators. The following deposits volumes to domestic non-financial corporations and households have been chosen: dv_od_c stands for the growth rate of overnight deposits stocks, dv_inf2Y_c for the growth rate of the stocks of deposits with agreed maturity up to 2 years, dv_sup2Y_c for the growth rate of the stocks of deposits with agreed maturity over to 2 years and dv_rd_c for the growth rate of the stocks of redeemable deposits at notice at remunerated market rates, all for the sample 1999(1)-2012(5).

F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero

Estimations are performed using OLS. *, ** and *** denote significance at the 10%, 5% and 1% levels. Robust standard errors are in brackets

Estimates of controls have been removed for clarity; they are available from the author upon request

## 5. The impact of the financial crisis on the monetary transmission mechanism

The impact of the recent financial crisis (2008-2010) on the monetary pass-through can be assessed through a split-sample approach, by comparing the estimates of the pass-through before and after the crisis, and by rolling estimations which enables us to see its evolution through the entire period.

### 5.1 Split-sample approach

In this approach, the original sample has been split in two sub-samples (January 1999 – August 2008 and September 2008 – June 2012) in order to shed light on the impact of the financial crisis on the pass-through to bank interest rates and credit volumes.

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### 5.1.1 Interest rates

## Table 9 – Money market rates response to a change in policy rate

| | X_1d | X_1d | X_1m | X_1m | X_3m | X_3m | X_6m | X_6m | X_9m | X_9m | X_12m | X_12m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (X stands for D.mmr) - **Before the crisis** - Sample: 1999(1)-2008(8) | | | | | | | | | | | | |
| D.bce | 0.392*** | 0.477*** | 0.457*** | 0.520*** | 0.287*** | 0.280*** | 0.203** | 0.183** | 0.176** | 0.142* | 0.167* | 0,123 |
| | [0.10] | [0.08] | [0.07] | [0.07] | [0.07] | [0.07] | [0.08] | [0.08] | [0.08] | [0.08] | [0.09] | [0.09] |
| LD.bce | | 0.368*** | | 0.265** | | -0,005 | | -0,042 | | -0,076 | | -0,097 |
| | | [0.10] | | [0.11] | | [0.07] | | [0.07] | | [0.06] | | [0.07] |
| L2D.bce | | 0.186*** | | 0,077 | | -0,026 | | -0,048 | | -0,086 | | -0.127* |
| | | [0.06] | | [0.08] | | [0.08] | | [0.06] | | [0.07] | | [0.08] |
| LD.mmr_1d | -0.249* | -0.460*** | | | | | | | | | | |
| | [0.14] | [0.14] | | | | | | | | | | |
| LD.mmr_1m | | | -0,155 | -0.310* | | | | | | | | |
| | | | [0.14] | [0.16] | | | | | | | | |
| LD.mmr_3m | | | | | 0,171 | 0,179 | | | | | | |
| | | | | | [0.12] | [0.14] | | | | | | |
| LD.mmr_6m | | | | | | | 0.289** | 0.324** | | | | |
| | | | | | | | [0.12] | [0.14] | | | | |
| LD.mmr_9m | | | | | | | | | 0.284** | 0.336** | | |
| | | | | | | | | | [0.12] | [0.13] | | |
| LD.mmr_12m | | | | | | | | | | | 0.258** | 0.314** |
| | | | | | | | | | | | [0.12] | [0.12] |
| constant | -3.115*** | -2.098** | -2.728* | -2,038 | -1,376 | -1,362 | -1,77 | -1.933* | -1.913* | -2.249* | -2,032 | -2.548* |
| | [1.18] | [0.94] | [1.38] | [1.32] | [1.19] | [1.23] | [1.10] | [1.13] | [1.15] | [1.21] | [1.23] | [1.32] |
| F-stat | - | 29,68 | - | 26,74 | - | 2,81 | - | 0,45 | - | 0,02 | - | 0,45 |
| p-value | - | 0 | - | 0 | - | 0,0971 | - | 0,5061 | - | 0,8875 | - | 0,5057 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 114 | 113 | 114 | 113 | 114 | 113 | 114 | 113 | 114 | 113 | 114 | 113 |
| r2 | 0,473 | 0,578 | 0,523 | 0,571 | 0,464 | 0,466 | 0,525 | 0,528 | 0,5 | 0,51 | 0,466 | 0,483 |
| **After the crisis** - Sample: 2008(9)-2012(6) | | | | | | | | | | | | |
| | X_1d | X_1d | X_1m | X_1m | X_3m | X_3m | X_6m | X_6m | X_9m | X_9m | X_12m | X_12m |
| D.bce | 0,392 | 0,378 | 0.588* | 0.511* | 0.502* | 0.436* | 0.466* | 0.384* | 0.449* | 0.373** | 0.469** | 0.403** |
| | [0.25] | [0.26] | [0.31] | [0.27] | [0.26] | [0.22] | [0.25] | [0.19] | [0.24] | [0.17] | [0.22] | [0.16] |
| LD.bce | | 0.285* | | 0,509 | | 0,428 | | 0.483* | | 0.488* | | 0.477** |
| | | [0.16] | | [0.33] | | [0.27] | | [0.26] | | [0.25] | | [0.23] |
| L2D.bce | | 0,311 | | 0,021 | | 0,062 | | 0,122 | | 0,137 | | 0,16 |
| | | [0.22] | | [0.20] | | [0.18] | | [0.14] | | [0.14] | | [0.13] |
| LD.mmr_1d | -0,142 | -0,142 | | | | | | | | | | |
| | [0.23] | [0.24] | | | | | | | | | | |
| LD.mmr_1m | | | -0,444 | -0,417 | | | | | | | | |
| | | | [0.36] | [0.37] | | | | | | | | |
| LD.mmr_3m | | | | | -0,635 | -0,39 | | | | | | |
| | | | | | [0.56] | [0.50] | | | | | | |
| LD.mmr_6m | | | | | | | 0,26 | 0,57 | | | | |
| | | | | | | | [0.46] | [0.54] | | | | |
| LD.mmr_9m | | | | | | | | | 0,437 | 0,757 | | |
| | | | | | | | | | [0.47] | [0.53] | | |
| LD.mmr_12m | | | | | | | | | | | 0,585 | 0.836* |
| | | | | | | | | | | | [0.49] | [0.48] |
| constant | 6,034 | 4,485 | 2,986 | 0,705 | 6,002 | 3,312 | 5,276 | 1,667 | 5,985 | 1,939 | 6,127 | 2,248 |
| | [5.60] | [5.87] | [5.02] | [5.48] | [4.12] | [4.51] | [4.74] | [5.80] | [5.43] | [6.54] | [6.01] | [6.71] |
| F-stat | - | 7 | - | 3,5 | - | 3,83 | - | 4,9 | - | 5,21 | - | 6,47 |
| p-value | - | 0,0148 | - | 0,0747 | - | 0,0632 | - | 0,0376 | - | 0,0325 | - | 0,0185 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| r2 | 0,819 | 0,844 | 0,78 | 0,815 | 0,833 | 0,858 | 0,852 | 0,884 | 0,863 | 0,895 | 0,876 | 0,907 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. "D." and "L." stand for the difference and first lag operators. The following money market rates have been chosen: mmr_1d is the overnight Eonia rate; mmr_1m, mmr_3m, mmr_6m, mmr_9m and mmr_12m are respectively the 1 month, 3 months, 6 months, 9 months and 1 year Euribor rates.
F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero
Estimations are performed using OLS. *, ** and *** denote significance at the 10%, 5% and 1% levels. Robust standard errors are in brackets.
Estimates of controls have been removed for clarity; they are available from the author upon request

First, we can see that the pass-through to money market rates (see Table 9) is positive and significant (0.44 in average) for short horizon rates before the crisis (up

to nine months) and that it decreases with horizon, consistently with earlier results. In contrast, the pass-through is significant only for horizons over 1 month after the crisis (0.41), certainly due to tensions on overnight interbank markets.

The contemporary effect of a policy rate change on government debt rates (see Table 10) is positive and highly significant before the crisis for short-term rates and decreases with maturity (0.28 on average for debt rates up to one-year maturity), while the pass-through is negative and lagged for maturities over 2 years, suggesting a trade-off. After the crisis, only a negative lagged pass-through is significant for long-term debt rates (10 year maturity).

Table 11 gathers the results of the estimated pass-through to lending rates to non-financial corporations in the split-sample approach. There exists a positive lagged significant pass-through for short term (less than 1 year) and small loans (less than 1 million) before the crisis, whereas the effect of a change in the ECB rate after the crisis is contemporary and affects significantly all types of loans aggregated (0.34), especially long-term loans (0.37).

Regarding the effect of a policy change on lending rates to households (Table 12), the pass-through before the crisis is only positive and significant through a lagged effect for housing loans, both short and long term ones. After the crisis, this significant effect of the ECB rate on housing short-term loans becomes negative (-0.38). This can be explained by the fact that banks might have regained their margins by de-correlating their housing loans rates with the ECB rate.

There exists a significant lagged positive pass-through to money, short-term and redeemable deposits rates (see Table 13) before the crisis, whereas this lagged effect does not exist anymore after the crisis. After the crisis, the effect of a shift in the ECB rate remains positive but becomes contemporary and significant only for long-term deposits rates (0.22 in average).

All in all, for all types of interest rates, the interest rate channel of the monetary transmission mechanism has been transferred from short-term rates to long-term rates after the crisis.

# Table 10 – Government debt rates response to a change in policy rate

| | X_1m | X_1m | X_3m | X_3m | X_6m | X_6m | X_9m | X_9m | X_1y | X_1y | X_2y | X_2y | X_5y | X_5y | X_10y | X_10y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (X stands for D.rrtb) - **Before the crisis** - Sample: 1999(1)-2008(8) | | | | | | | | | | | | | | | | |
| D.bce | 0.355*** | 0.391*** | 0.271*** | 0.279*** | 0.228*** | 0.199*** | 0.188** | 0.146* | 0.159* | 0,116 | 0,108 | 0,05 | 0,018 | -0,023 | 0,002 | -0,017 |
| | [0.06] | [0.07] | [0.08] | [0.09] | [0.08] | [0.08] | [0.08] | [0.08] | [0.09] | [0.09] | [0.11] | [0.11] | [0.12] | [0.13] | [0.13] | [0.13] |
| LD.bce | | 0,034 | | -0,014 | | -0,083 | | -0,102 | | -0,133* | | -0,234** | | -0,287** | | -0,223** |
| | | [0.06] | | [0.07] | | [0.06] | | [0.07] | | [0.07] | | [0.11] | | [0.11] | | [0.10] |
| L2D.bce | | 0.091* | | 0,052 | | -0,022 | | -0,093 | | -0,091 | | -0,176 | | -0,12 | | -0,02 |
| | | [0.05] | | [0.07] | | [0.07] | | [0.07] | | [0.07] | | [0.12] | | [0.12] | | [0.11] |
| LD.X_1m | 0,103 | 0,041 | | | | | | | | | | | | | | |
| | [0.08] | [0.14] | | | | | | | | | | | | | | |
| LD.X_3m | | | 0,135 | 0,136 | | | | | | | | | | | | |
| | | | [0.10] | [0.14] | | | | | | | | | | | | |
| LD.X_6m | | | | | 0.241** | 0.310** | | | | | | | | | | |
| | | | | | [0.10] | [0.13] | | | | | | | | | | |
| LD.X_9m | | | | | | | 0.256** | 0.324*** | | | | | | | | |
| | | | | | | | [0.11] | [0.12] | | | | | | | | |
| LD.X_1y | | | | | | | | | 0.257** | 0.321*** | | | | | | |
| | | | | | | | | | [0.12] | [0.12] | | | | | | |
| LD.X_2y | | | | | | | | | | | 0,195 | 0.239* | | | | |
| | | | | | | | | | | | [0.13] | [0.13] | | | | |
| LD.X_5y | | | | | | | | | | | | | 0,171 | 0.191* | | |
| | | | | | | | | | | | | | [0.11] | [0.10] | | |
| LD.X_10y | | | | | | | | | | | | | | | 0,091 | 0,103 |
| | | | | | | | | | | | | | | | [0.10] | [0.09] |
| constant | -1.716** | -1.513** | -1.729* | -1,711 | -1,615 | -1,801 | -2.032* | -2.435* | -1,869 | -2.455* | -1,534 | -2,629 | -0,74 | -1,925 | -0,56 | -1,488 |
| | [0.73] | [0.75] | [0.98] | [1.04] | [1.05] | [1.12] | [1.16] | [1.24] | [1.22] | [1.31] | [1.49] | [1.69] | [1.54] | [1.65] | [1.42] | [1.55] |
| F-stat | - | 12,08 | - | 3,74 | - | 0,43 | - | 0,12 | - | 0,56 | - | 2,38 | - | 3,64 | - | 1,29 |
| p-value | - | 0,0008 | - | 0,056 | - | 0,5113 | - | 0,7338 | - | 0,457 | - | 0,1258 | - | 0,0596 | - | 0,2589 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 114 | 113 | 114 | 113 | 114 | 113 | 114 | 113 | 114 | 113 | 114 | 113 | 114 | 113 | 114 | 113 |
| r2 | 0,639 | 0,647 | 0,546 | 0,551 | 0,528 | 0,534 | 0,484 | 0,498 | 0,437 | 0,454 | 0,309 | 0,35 | 0,308 | 0,357 | 0,301 | 0,33 |
| **After the crisis** - Sample: 2008(9)-2012(6) | | | | | | | | | | | | | | | | |
| | X_1m | X_1m | X_3m | X_3m | X_6m | X_6m | X_9m | X_9m | X_1y | X_1y | X_2y | X_2y | X_5y | X_5y | X_10y | X_10y |
| D.bce | 0.499* | 0.506* | 0,54 | 0,562 | 0,417 | 0,451 | 0.435* | 0.471* | 0,399 | 0,437 | 0,05 | 0,098 | 0,121 | 0,083 | -0,027 | -0,076 |
| | [0.25] | [0.25] | [0.37] | [0.37] | [0.32] | [0.34] | [0.25] | [0.26] | [0.24] | [0.26] | [0.26] | [0.26] | [0.21] | [0.23] | [0.24] | [0.19] |
| LD.bce | | -0,247 | | -0,443* | | -0,347 | | -0,261 | | -0,218 | | -0,378 | | -0,263 | | -0,563** |
| | | [0.16] | | [0.25] | | [0.24] | | [0.21] | | [0.21] | | [0.22] | | [0.29] | | [0.26] |
| L2D.bce | | 0,155 | | 0,173 | | 0,121 | | 0,13 | | 0,103 | | -0,059 | | -0,315 | | -0,677 |
| | | [0.23] | | [0.30] | | [0.26] | | [0.23] | | [0.22] | | [0.27] | | [0.40] | | [0.40] |
| LD.X_1m | -0.337* | -0,245 | | | | | | | | | | | | | | |
| | [0.19] | [0.17] | | | | | | | | | | | | | | |
| LD.X_3m | | | -0,407 | -0,3 | | | | | | | | | | | | |
| | | | [0.25] | [0.23] | | | | | | | | | | | | |
| LD.X_6m | | | | | -0,242 | -0,176 | | | | | | | | | | |
| | | | | | [0.22] | [0.21] | | | | | | | | | | |
| LD.X_9m | | | | | | | -0,138 | -0,082 | | | | | | | | |
| | | | | | | | [0.17] | [0.17] | | | | | | | | |
| LD.X_1y | | | | | | | | | -0,109 | -0,07 | | | | | | |
| | | | | | | | | | [0.15] | [0.16] | | | | | | |
| LD.X_2y | | | | | | | | | | | -0,179 | -0,208 | | | | |
| | | | | | | | | | | | [0.15] | [0.16] | | | | |
| LD.X_5y | | | | | | | | | | | | | -0,052 | -0,155 | | |
| | | | | | | | | | | | | | [0.19] | [0.25] | | |
| LD.X_10y | | | | | | | | | | | | | | | -0,016 | -0,262 |
| | | | | | | | | | | | | | | | [0.26] | [0.31] |
| constant | 11.970** | 12.587** | 17.228** | 18.808** | 20.469*** | 21.841*** | 19.614*** | 20.549*** | 21.477*** | 22.248*** | 23.091*** | 24.800*** | 12.343* | 14.271* | 0,481 | 2,692 |
| | [5.17] | [5.44] | [7.00] | [7.16] | [6.59] | [7.05] | [5.53] | [6.15] | [5.88] | [6.61] | [6.51] | [7.40] | [6.88] | [7.55] | [6.95] | [6.64] |
| F-stat | - | 0,82 | - | 0,2 | - | 0,14 | - | 0,5 | - | 0,5 | - | 0,45 | - | 0,5 | - | 3,98 |
| p-value | - | 0,3738 | - | 0,6625 | - | 0,7103 | - | 0,4863 | - | 0,4858 | - | 0,5092 | - | 0,4853 | - | 0,0587 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| r2 | 0,81 | 0,826 | 0,724 | 0,753 | 0,738 | 0,757 | 0,788 | 0,801 | 0,78 | 0,789 | 0,678 | 0,698 | 0,566 | 0,586 | 0,429 | 0,547 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. "D." and "L." stand for the difference and first lag operators. The following rates have been chosen: rrtb_1m, rrtb_3m, rrtb_6m, rrtb_9m, rrtb_1y, rrtb_2y, rrtb_5y and rrtb_10y are respectively the 1 month, 3 months, 6 months, 9 months, 1 year, 2 years, 5 years and 10 years Treasury bills and OAT reference rates

F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero

Estimations are performed using OLS. *, ** and *** denote significance at the 10% , 5% and 1% levels. Robust standard errors are in brackets.

Estimates of controls have been removed for clarity; they are available from the author upon request

## Table 11 – Lending rates to non-financial corporations response to a change in policy rate

| (X stands for D.lrnfc) - **Before the crisis** - Sample: 2003(1)-2008(8) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | X_tt | X_tt | X_ccd | X_ccd | X_inf1y | X_inf1y | X_sup1y | X_sup1y | X_inf1m | X_inf1m | X_sup1m | X_sup1m |
| D.bce | 0.036 | 0.203 | 0.267* | 0.306* | 0.131 | 0.429 | 0.024 | 0.183 | 0.280* | 0.474** | 0.056 | 0.217 |
| | [0.12] | [0.16] | [0.13] | [0.16] | [0.26] | [0.29] | [0.16] | [0.20] | [0.14] | [0.20] | [0.22] | [0.25] |
| LD.bce | | 0.318* | | 0.070 | | 0.648** | | 0.287 | | 0.393* | | 0.346 |
| | | [0.17] | | [0.21] | | [0.26] | | [0.21] | | [0.21] | | [0.25] |
| L2D.bce | | 0.226 | | 0.086 | | 0.257 | | 0.303* | | 0.405 | | 0.046 |
| | | [0.15] | | [0.16] | | [0.22] | | [0.18] | | [0.30] | | [0.26] |
| LX_tt | -0.324** | -0.394** | | | | | | | | | | |
| | [0.15] | [0.16] | | | | | | | | | | |
| LX_ccd | | | -0.274** | -0.283** | | | | | | | | |
| | | | [0.13] | [0.13] | | | | | | | | |
| LX_inf1y | | | | | -0.201 | -0.275** | | | | | | |
| | | | | | [0.13] | [0.12] | | | | | | |
| LX_sup1y | | | | | | | -0.380** | -0.411** | | | | |
| | | | | | | | [0.17] | [0.17] | | | | |
| LX_inf1m | | | | | | | | | -0.120 | -0.207 | | |
| | | | | | | | | | [0.15] | [0.15] | | |
| LX_sup1m | | | | | | | | | | | -0.208* | -0.228** |
| | | | | | | | | | | | [0.11] | [0.11] |
| constant | -2.684 | -0.537 | -0.034 | 0.638 | -4.686 | -1.173 | -3.267 | -0.774 | -4.931 | -1.627 | -4.345 | -2.800 |
| | [2.72] | [2.93] | [2.58] | [2.87] | [3.88] | [4.42] | [3.56] | [4.08] | [3.43] | [3.51] | [4.05] | [4.62] |
| F-stat | - | 3.09 | - | 1.19 | - | 4.86 | - | 2.46 | - | 4.73 | - | 1.20 |
| p-value | - | 0.0851 | - | 0.2813 | - | 0.0324 | - | 0.1236 | - | 0.0346 | - | 0.2792 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 |
| r2 | 0.318 | 0.367 | 0.273 | 0.276 | 0.201 | 0.293 | 0.332 | 0.365 | 0.251 | 0.309 | 0.201 | 0.227 |
| **After the crisis** - Sample: 2008(9)-2012(6) | | | | | | | | | | | |
| | X_tt | X_tt | X_ccd | X_ccd | X_inf1y | X_inf1y | X_sup1y | X_sup1y | X_inf1m | X_inf1m | X_sup1m | X_sup1m |
| D.bce | 0.343** | 0.334** | 0.172 | 0.190 | 0.589 | 0.433 | 0.353** | 0.374*** | 0.256 | 0.238 | 0.557 | 0.404 |
| | [0.16] | [0.14] | [0.16] | [0.17] | [0.43] | [0.31] | [0.14] | [0.13] | [0.18] | [0.17] | [0.43] | [0.31] |
| LD.bce | | 0.043 | | -0.105 | | 0.654* | | -0.061 | | 0.094 | | 0.628* |
| | | [0.14] | | [0.20] | | [0.33] | | [0.11] | | [0.18] | | [0.32] |
| L2D.bce | | 0.025 | | -0.006 | | -0.034 | | 0.030 | | -0.056 | | -0.168 |
| | | [0.10] | | [0.14] | | [0.22] | | [0.08] | | [0.15] | | [0.21] |
| LX_tt | -0.135 | -0.158 | | | | | | | | | | |
| | [0.25] | [0.25] | | | | | | | | | | |
| LX_ccd | | | -0.607*** | -0.617*** | | | | | | | | |
| | | | [0.19] | [0.19] | | | | | | | | |
| LX_inf1y | | | | | -0.277 | -0.368 | | | | | | |
| | | | | | [0.29] | [0.27] | | | | | | |
| LX_sup1y | | | | | | | -0.188 | -0.158 | | | | |
| | | | | | | | [0.17] | [0.18] | | | | |
| LX_inf1m | | | | | | | | | 0.067 | 0.078 | | |
| | | | | | | | | | [0.17] | [0.20] | | |
| LX_sup1m | | | | | | | | | | | -0.355 | -0.420 |
| | | | | | | | | | | | [0.29] | [0.27] |
| constant | 2.679 | 2.446 | -8.794** | -8.356** | 4.584 | 1.719 | 6.031* | 6.277** | 4.350 | 4.071 | 3.584 | 1.003 |
| | [2.83] | [2.86] | [3.69] | [3.76] | [7.62] | [6.48] | [3.04] | [3.00] | [4.12] | [3.99] | [8.06] | [6.70] |
| F-stat | - | 2.10 | - | 0.06 | - | 3.17 | - | 2.08 | - | 0.72 | - | 2.37 |
| p-value | - | 0.1617 | - | 0.8153 | - | 0.0888 | - | 0.1637 | - | 0.4063 | - | 0.1381 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| r2 | 0.838 | 0.839 | 0.820 | 0.823 | 0.681 | 0.742 | 0.768 | 0.772 | 0.756 | 0.765 | 0.680 | 0.751 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. "D." and "L." stand for the difference and first lag operators. The following lending rates to domestic non-financial corporations have been chosen: lrnfc_tt stands for all types of loans, lrnfc_ccd stands for revolving loans and overdrafts, convenience and extended credit card debt, lrnfc_inf1Y for loans with a maturity up to 1 year, lrnfc_sup1y for loans with a maturity over 1 year, lrnfc_inf1m for loans up to € 1 million and lrnfc_sup1y for loans over € 1 million

F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero

Estimations are performed using OLS. *, ** and *** denote significance at the 10%, 5% and 1% levels. Robust standard errors are in brackets.

Estimates of controls have been removed for clarity; they are available from the author upon request

## Table 12 – Lending rates to households response to a change in policy rate

| | X_tt | X_tt | X_ccd | X_ccd | X_lfc | X_lfc | X_h | X_h | X_hinf1y | X_hinf1y | X_hsup1y | X_hsup1y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| (X stands for D.lrhh) - **Before the crisis** - Sample: 2003(1)-2008(8) | | | | | | | | | | | | |
| D.bce | -0.042 | -0.040 | -0.088 | -1.529 | -0.060 | 0.072 | -0.039 | 0.082 | 0.056 | 0.182** | -0.055 | 0.073 |
| | [0.11] | [0.14] | [1.06] | [1.08] | [0.18] | [0.25] | [0.08] | [0.08] | [0.07] | [0.07] | [0.08] | [0.09] |
| LD.bce | | -0.009 | | -2.981* | | 0.273 | | 0.238** | | 0.262*** | | 0.251** |
| | | [0.17] | | [1.60] | | [0.24] | | [0.09] | | [0.08] | | [0.10] |
| L2D.bce | | 0.101 | | -0.284 | | 0.128 | | 0.133 | | 0.137* | | 0.138 |
| | | [0.10] | | [0.79] | | [0.27] | | [0.08] | | [0.07] | | [0.09] |
| LX_tt | -0.033 | -0.029 | | | | | | | | | | |
| | [0.13] | [0.13] | | | | | | | | | | |
| LX_ccd | | | -0.171 | -0.139 | | | | | | | | |
| | | | [0.12] | [0.12] | | | | | | | | |
| LX_lfc | | | | | -0.213 | -0.200 | | | | | | |
| | | | | | [0.13] | [0.14] | | | | | | |
| LX_h | | | | | | | 0.023 | -0.058 | | | | |
| | | | | | | | [0.15] | [0.15] | | | | |
| LX_hinf1y | | | | | | | | | -0.101 | -0.223 | | |
| | | | | | | | | | [0.15] | [0.15] | | |
| LX_hsup1y | | | | | | | | | | | -0.073 | -0.136 |
| | | | | | | | | | | | [0.16] | [0.16] |
| constant | 0.871 | 1.309 | -1.869 | -15.787 | 4.400 | 6.100 | -1.962 | -0.591 | -4.429*** | -3.241*** | -1.876 | -0.368 |
| | [1.96] | [2.10] | [23.52] | [16.88] | [3.53] | [4.51] | [1.41] | [1.09] | [1.33] | [1.15] | [1.46] | [1.19] |
| F-stat | - | 0.03 | - | 3.65 | - | 0.58 | - | 4.43 | - | 11.36 | - | 4.10 |
| p-value | - | 0.8709 | - | 0.0621 | - | 0.4499 | - | 0.0406 | - | 0.0015 | - | 0.0485 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 |
| r2 | 0.387 | 0.400 | 0.210 | 0.400 | 0.296 | 0.313 | 0.482 | 0.549 | 0.563 | 0.626 | 0.439 | 0.507 |
| **After the crisis** - Sample: 2008(9)-2012(6) | | | | | | | | | | | | |
| | X_tt | X_tt | X_ccd | X_ccd | X_lfc | X_lfc | X_h | X_h | X_hinf1y | X_hinf1y | X_hsup1y | X_hsup1y |
| D.bce | -0.036 | -0.033 | 0.547* | 0.552* | -0.116 | -0.077 | -0.067 | -0.077 | -0.372*** | -0.379*** | -0.061 | -0.063 |
| | [0.07] | [0.07] | [0.29] | [0.27] | [0.15] | [0.15] | [0.07] | [0.06] | [0.12] | [0.12] | [0.06] | [0.06] |
| LD.bce | | -0.002 | | -0.157 | | -0.254 | | 0.024 | | 0.048 | | 0.019 |
| | | [0.09] | | [0.30] | | [0.16] | | [0.07] | | [0.14] | | [0.06] |
| L2D.bce | | 0.040 | | -0.190 | | -0.031 | | 0.126 | | 0.120 | | 0.159* |
| | | [0.10] | | [0.27] | | [0.17] | | [0.09] | | [0.16] | | [0.09] |
| LX_tt | -0.052 | -0.077 | | | | | | | | | | |
| | [0.25] | [0.26] | | | | | | | | | | |
| LX_ccd | | | -0.277 | -0.268 | | | | | | | | |
| | | | [0.18] | [0.24] | | | | | | | | |
| LX_lfc | | | | | -0.153 | -0.147 | | | | | | |
| | | | | | [0.22] | [0.21] | | | | | | |
| LX_h | | | | | | | 0.179 | 0.043 | | | | |
| | | | | | | | [0.21] | [0.22] | | | | |
| LX_hinf1y | | | | | | | | | -0.301 | -0.354 | | |
| | | | | | | | | | [0.18] | [0.21] | | |
| LX_hsup1y | | | | | | | | | | | 0.021 | -0.116 |
| | | | | | | | | | | | [0.21] | [0.22] |
| constant | 1.124 | 1.088 | -4.268 | -3.440 | 2.446 | 3.574 | 1.171 | 0.773 | 2.796 | 2.458 | 0.464 | 0.058 |
| | [1.78] | [1.95] | [8.09] | [8.50] | [4.05] | [3.88] | [1.41] | [1.63] | [2.92] | [3.23] | [1.50] | [1.66] |
| F-stat | - | 0.00 | - | 0.17 | - | 1.74 | - | 0.33 | - | 0.89 | - | 0.82 |
| p-value | - | 0.9769 | - | 0.6815 | - | 0.2009 | - | 0.5699 | - | 0.3548 | - | 0.3736 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| N | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| r2 | 0.706 | 0.709 | 0.537 | 0.545 | 0.326 | 0.382 | 0.834 | 0.854 | 0.806 | 0.813 | 0.804 | 0.840 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. "D." and "L." stand for the difference and first lag operators. The following lending rates to domestic households have been chosen: lrhh_tt stands for all types of loans, lrhh_ccd stands for revolving loans and overdrafts, convenience and extended credit card debt, lrhh_lfc for loans for consumption excluding revolving loans and overdrafts, convenience and extended credit card debt, lrhh_h for housing loans, lrhh_hinf1Y for housing loans with a maturity up to 1 year and lrhh_hsup1y for housing loans with a maturity over 1 year.

F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero

Estimations are performed using OLS. *, ** and *** denote significance at the 10%, 5% and 1% levels. Robust standard errors are in brackets.

Estimates of controls have been removed for clarity; they are available from the author upon request

# Table 13 – Deposit rates response to a change in policy rate

| | X_m3 | X_m3 | X_od | X_od | X_inf2y | X_inf2y | X_sup2y | X_sup2y | X_rd | X_rd |
|---|---|---|---|---|---|---|---|---|---|---|
| (X stands for D.dr) - **Before the crisis** - Sample: 2003(1)-2008(8) | | | | | | | | | | |
| D.bce | 0.044 | 0.156** | -0.015 | -0.027 | 0.169* | 0.240** | 0.086 | 0.078 | -0.047 | 0.011 |
| | [0.07] | [0.06] | [0.02] | [0.03] | [0.09] | [0.09] | [0.09] | [0.08] | [0.08] | [0.08] |
| LD.bce | | 0.233*** | | -0.031 | | 0.202*** | | -0.034 | | 0.076 |
| | | [0.08] | | [0.03] | | [0.06] | | [0.12] | | [0.08] |
| L2D.bce | | 0.244*** | | 0.048 | | 0.045 | | 0.086 | | 0.381*** |
| | | [0.09] | | [0.03] | | [0.08] | | [0.09] | | [0.09] |
| LD.dr_m3 | -0.040 | -0.203 | | | | | | | | |
| | [0.18] | [0.14] | | | | | | | | |
| LD.dr_od | | | -0.311** | -0.280** | | | | | | |
| | | | [0.14] | [0.14] | | | | | | |
| LD.dr_inf2y | | | | | -0.123 | -0.196 | | | | |
| | | | | | [0.16] | [0.15] | | | | |
| LD.dr_sup2y | | | | | | | -0.512*** | -0.483*** | | |
| | | | | | | | [0.13] | [0.13] | | |
| LD.dr_rd | | | | | | | | | -0.204 | -0.167 |
| | | | | | | | | | [0.14] | [0.13] |
| constant | 0.311 | 2.474** | -0.054 | 0.012 | -0.694 | -0.573 | -1.095 | -0.884 | -2.246 | -0.214 |
| | [1.30] | [1.15] | [0.45] | [0.45] | [1.24] | [1.22] | [1.29] | [1.66] | [1.77] | [1.34] |
| F-stat | - | 11.29 | - | 0.02 | - | 6.76 | - | 0.34 | - | 5.43 |
| p-value | - | 0.0015 | - | 0.8796 | - | 0.0117 | - | 0.5636 | - | 0.0240 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 66 | 66 | 66 | 66 | 79 | 79 | 66 | 66 | 66 | 66 |
| r2 | 0.530 | 0.672 | 0.226 | 0.330 | 0.350 | 0.400 | 0.359 | 0.375 | 0.409 | 0.566 |
| **After the crisis** - Sample: 2008(9)-2012(5) | | | | | | | | | | |
| | X_m3 | X_m3 | X_od | X_od | X_inf2y | X_inf2y | X_sup2y | X_sup2y | X_rd | X_rd |
| D.bce | -0.119 | -0.097 | -0.010 | -0.014 | -0.089 | -0.103 | 0.215*** | 0.235*** | -0.244 | -0.148 |
| | [0.09] | [0.08] | [0.02] | [0.02] | [0.10] | [0.10] | [0.07] | [0.07] | [0.17] | [0.12] |
| LD.bce | | 0.035 | | 0.031* | | 0.012 | | -0.107 | | -0.364** |
| | | [0.10] | | [0.02] | | [0.12] | | [0.06] | | [0.15] |
| L2D.bce | | 0.211** | | 0.019 | | -0.100 | | 0.020 | | 0.407* |
| | | [0.09] | | [0.02] | | [0.10] | | [0.11] | | [0.21] |
| LD.dr_m3 | -0.426** | -0.508** | | | | | | | | |
| | [0.20] | [0.19] | | | | | | | | |
| LD.dr_od | | | -0.487*** | -0.445** | | | | | | |
| | | | [0.14] | [0.17] | | | | | | |
| LD.dr_inf2y | | | | | -0.744*** | -0.783*** | | | | |
| | | | | | [0.20] | [0.21] | | | | |
| LD.dr_sup2y | | | | | | | -0.721*** | -0.647*** | | |
| | | | | | | | [0.10] | [0.14] | | |
| LD.dr_rd | | | | | | | | | -0.413 | -0.434** |
| | | | | | | | | | [0.27] | [0.21] |
| constant | 2.696 | 2.460 | -0.131 | -0.275 | -3.729 | -3.765 | 0.949 | 1.336 | -0.508 | 0.616 |
| | [1.86] | [1.60] | [0.33] | [0.33] | [3.14] | [3.33] | [1.53] | [1.72] | [5.01] | [3.45] |
| F-stat | - | 1.11 | - | 1.26 | - | 0.96 | - | 0.99 | - | 0.10 |
| p-value | - | 0.3037 | - | 0.2729 | - | 0.3374 | - | 0.3299 | - | 0.7521 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| r2 | 0.865 | 0.904 | 0.675 | 0.729 | 0.733 | 0.741 | 0.764 | 0.780 | 0.689 | 0.824 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. "D." and "L." stand for the difference and first lag operators. The following deposit rates for domestic households and non-financial corporations have been chosen: dr_m3 stands for broad money, dr_od stands for overnight deposits, dr_inf2y stands for deposits with agreed maturity up to 2 years, dr_sup2y for deposits with agreed maturity over 2 years and dr_rd for redeemable deposits at notice remunerated at market rates

F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero

Estimations are performed using OLS. *, ** and *** denote significance at the 10%, 5% and 1% levels. Robust standard errors are in brackets.

Estimates of controls have been removed for clarity; they are available from the author upon request

## 5.1.2. Volumes

The pass-through to lending volumes to non-financial corporations (see Table 14) is negative and lagged for all types of loans before the crisis and non-significant after the crisis.

### Table 14 – Lending volumes to non-financial corporations' response to a change in policy rate

| (X stands for lnfcv) - **Before the crisis** - Sample: 2003(1)-2008(8) | | | | | | |
|---|---|---|---|---|---|---|
| | X_tt_c | X_tt_c | X_inf1m_c | X_inf1m_c | X_sup1m_c | X_sup1m_c |
| D.bce | -0,091 | -1,245 | 9,671 | 14,379 | -20,92 | -45,422 |
| | [1.07] | [1.18] | [15.99] | [19.27] | [43.12] | [47.11] |
| LD.bce | | -2.366** | | 12,538 | | -54.006* |
| | | [0.99] | | [21.93] | | [29.56] |
| L2D.bce | | -1,067 | | 11,253 | | 12,455 |
| | | [1.12] | | [20.40] | | [44.98] |
| L.X_tt_c | -0,17 | -0,17 | | | | |
| | [0.16] | [0.15] | | | | |
| L.X_inf1m_c | | | -0,119 | -0,121 | | |
| | | | [0.21] | [0.21] | | |
| L.X_sup1m_c | | | | | -0.361** | -0.363** |
| | | | | | [0.16] | [0.17] |
| constant | -30.317* | -44.807** | 970,357 | 1103,357 | -589,033 | -687,688 |
| | [16.88] | [20.84] | [827.12] | [882.27] | [2397.25] | [2103.46] |
| F-stat | - | 2,99 | - | 0,65 | - | 2,11 |
| p-value | - | 0,0903 | - | 0,4254 | - | 0,1553 |
| controls | yes | yes | yes | yes | yes | yes |
| Nb obs | 66 | 66 | 54 | 54 | 54 | 54 |
| r2 | 0,365 | 0,412 | 0,191 | 0,197 | 0,345 | 0,394 |
| **After the crisis** - Sample: 2008(9)-2012(5) | | | | | | |
| | X_tt_c | X_tt_c | X_inf1m_c | X_inf1m_c | X_sup1m_c | X_sup1m_c |
| D.bce | -0,583 | -0,374 | -8,487 | -10,747 | 5,259 | 5,473 |
| | [0.93] | [0.98] | [10.00] | [9.75] | [19.17] | [19.43] |
| LD.bce | | -0,942 | | 10,267 | | 3,479 |
| | | [1.05] | | [9.29] | | [19.06] |
| L2D.bce | | 0,467 | | -7,091 | | 17,165 |
| | | [0.95] | | [10.55] | | [19.18] |
| L.X_tt_c | -0,273 | -0,282 | | | | |
| | [0.20] | [0.23] | | | | |
| L.X_inf1m_c | | | -0.463* | -0.410* | | |
| | | | [0.23] | [0.23] | | |
| L.X_sup1m_c | | | | | -0.585*** | -0.566*** |
| | | | | | [0.14] | [0.15] |
| constant | -5,537 | -1,894 | 225,59 | 184,247 | -667,721 | -690,228 |
| | [23.99] | [23.33] | [259.86] | [272.00] | [411.28] | [406.76] |
| F-stat | - | 0,18 | - | 0,23 | - | 0,6 |
| p-value | - | 0,6789 | - | 0,6374 | - | 0,4454 |
| controls | yes | yes | yes | yes | yes | yes |
| Nb obs | 40 | 40 | 40 | 40 | 40 | 40 |
| r2 | 0,473 | 0,504 | 0,391 | 0,437 | 0,596 | 0,611 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. D. and "L." stand for the difference and first lag operators. The following lending volumes to non-financial corporations have been chosen: lnfcv_tt_c stands for the growth rate of all types of loans stocks for the sample, lnfcv_inf1m_c for the growth rate of the monthly flows of new issuance of loans with an amount up to and including € 1 million and lnfcv_sup1m_c stands for the growth rate of the monthly flows of new issuance of loans with an amount over € 1 million.

F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero

Estimations are performed using OLS. *, ** and *** denote significance at the 10%, 5% and 1% levels. Robust standard errors are in brackets.

Estimates of controls have been removed for clarity; they are available from the author upon request

The effects of the ECB rate on the lending volumes to households (Table 15) are quite difficult to interpret. For the first sub-sample, the pass-through is negative and lagged for all types of loans, as expected. However, housing loans volumes react strongly and positively to the ECB rate (22.2). The housing bubble of the 2000s may explain this counter-intuitive correlation. After the crisis, the pass-through to consumption loans is lagged and positive and this could be due to the credit crunch of the 2007-2008 years.

### Table 15 – Lending volumes to households response to a change in policy rate

| | X_tt_c | X_tt_c | X_cl_c | X_cl_c | X_hl_c | X_hl_c |
|---|---|---|---|---|---|---|
| (X stands for lhhv) - **Before the crisis** - Sample: 2003(1)-2008(8) | | | | | | |
| D.bce | -0,019 | -0,68 | 11,239 | 6,608 | 20.377** | 22.238** |
| | [0.47] | [0.59] | [8.24] | [9.23] | [8.13] | [8.81] |
| LD.bce | | -1.236** | | -10,472 | | 3,977 |
| | | [0.50] | | [10.25] | | [11.99] |
| L2D.bce | | 0,035 | | 2,58 | | -8,715 |
| | | [0.57] | | [12.51] | | [13.07] |
| L.lhhv_tt_c | -0,057 | 0,054 | | | | |
| | [0.14] | [0.14] | | | | |
| L.lhhv_cl_c | | | -0.485*** | -0.466*** | | |
| | | | [0.15] | [0.15] | | |
| L.lhhv_hl_c | | | | | -0.505*** | -0.533*** |
| | | | | | [0.12] | [0.14] |
| constant | -7,745 | -13,841 | -149,744 | -161,56 | 243,992 | 196,059 |
| | [8.15] | [9.88] | [380.77] | [434.29] | [616.82] | [569.66] |
| F-stat | - | 1,82 | - | 0 | - | 0,59 |
| p-value | - | 0,1837 | - | 0,958 | - | 0,4478 |
| controls | yes | yes | yes | yes | yes | yes |
| Nb obs | 66 | 66 | 54 | 54 | 54 | 54 |
| r2 | 0,258 | 0,365 | 0,415 | 0,435 | 0,563 | 0,574 |
| **After the crisis** - Sample: 2008(9)-2012(5) | | | | | | |
| | X_tt_c | X_tt_c | X_cl_c | X_cl_c | X_hl_c | X_hl_c |
| D.bce | -0,15 | -0,218 | 12,124 | 8,46 | 1,367 | 2,575 |
| | [0.47] | [0.42] | [11.28] | [10.35] | [14.83] | [14.42] |
| LD.bce | | 0,562 | | 20.207** | | 1,486 |
| | | [0.47] | | [9.56] | | [13.54] |
| L2D.bce | | 0,222 | | 3,999 | | 17,519 |
| | | [0.46] | | [12.56] | | [13.20] |
| L.lhhv_tt_c | -0.333* | -0.334* | | | | |
| | [0.19] | [0.18] | | | | |
| L.lhhv_cl_c | | | -0,223 | -0,262 | | |
| | | | [0.23] | [0.24] | | |
| L.lhhv_hl_c | | | | | -0.550** | -0.585** |
| | | | | | [0.22] | [0.23] |
| constant | -8,905 | -11,599 | -7,529 | -106,517 | -379,959 | -421,07 |
| | [13.94] | [14.38] | [282.88] | [281.70] | [483.84] | [498.73] |
| F-stat | - | 0,52 | - | 3,01 | - | 0,84 |
| p-value | - | 0,4801 | - | 0,0967 | - | 0,3694 |
| controls | yes | yes | yes | yes | yes | yes |
| Nb obs | 40 | 40 | 40 | 40 | 40 | 40 |
| r2 | 0,54 | 0,562 | 0,214 | 0,31 | 0,554 | 0,571 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. "D." and "L." stand for the difference and first lag operators. The following lending volumes to domestic households have been chosen: lhhv_tt_c stands for the growth rate of all types of loans stocks, lhhv_cl_c for the growth rate of the monthly flows of new issuance of cash loans and lhhv_hl_c stands for the growth rate of the monthly flows of new issuance of housing loans

F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero

Estimations are performed using OLS. *, ** and *** denote significance at the 10%, 5% and 1% levels. Robust standard errors are in brackets.

Estimates of controls have been removed for clarity; they are available from the author upon request

Last, there exists a lagged positive pass-through to short-run deposit volumes (see Table 16) before the crisis that is no more significant after it.

### Table 16 – Deposit volumes response to a change in policy rate

| (X stands for dv) - **Before the crisis** - Sample: 1999(1)-2008(8) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | X_od_c | X_od_c | X_inf2y_c | X_inf2y_c | X_sup2y_c | X_sup2y_c | X_rd_c | X_rd_c |
| D.bce | -1,126 | -1,648 | 1,776 | 2,529 | -0,734 | -0,84 | -0,616 | -0,733 |
| | [1.57] | [1.51] | [1.86] | [1.88] | [0.66] | [0.68] | [0.45] | [0.47] |
| LD.bce | | -2,841 | | 4.728** | | -0,829 | | -0,769 |
| | | [2.29] | | [1.85] | | [0.62] | | [0.56] |
| L2D.bce | | -2,028 | | 3,036 | | -0,378 | | -0,416 |
| | | [3.15] | | [2.54] | | [0.79] | | [0.69] |
| L.dv_od_c | -0.341*** | -0.355*** | | | | | | |
| | [0.08] | [0.08] | | | | | | |
| L.dv_inf2y_c | | | -0.210** | -0.249** | | | | |
| | | | [0.10] | [0.10] | | | | |
| L.dv_sup2y_c | | | | | 0,089 | 0,057 | | |
| | | | | | [0.08] | [0.09] | | |
| L.dv_rd_c | | | | | | | 0.187* | 0,164 |
| | | | | | | | [0.11] | [0.11] |
| constant | -43,715 | -58.985* | 9,996 | 34,555 | -10,798 | -14,416 | -7,1 | -10,797 |
| | [32.19] | [34.87] | [25.96] | [29.65] | [8.42] | [9.34] | [7.56] | [8.68] |
| F-stat | - | 1,65 | - | 5,06 | - | 2,07 | - | 2,61 |
| p-value | - | 0,2017 | - | 0,0268 | - | 0,1532 | - | 0,1093 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 114 | 113 | 114 | 113 | 114 | 113 | 114 | 113 |
| r2 | 0,201 | 0,225 | 0,367 | 0,398 | 0,282 | 0,301 | 0,245 | 0,262 |
| **After the crisis** - Sample: 2008(9)-2012(5) | | | | | | | | |
| | X_od_c | X_od_c | X_inf2y_c | X_inf2y_c | X_sup2y_c | X_sup2y_c | X_rd_c | X_rd_c |
| D.bce | -1,008 | 0,303 | 1,941 | 1,404 | -3,974 | -2,087 | -1,622 | -1,441 |
| | [4.68] | [4.01] | [7.62] | [8.06] | [4.07] | [4.59] | [1.09] | [1.07] |
| LD.bce | | -4,342 | | 6,138 | | -5.278* | | -0,993 |
| | | [3.70] | | [4.53] | | [2.78] | | [0.98] |
| L2D.bce | | 6.037* | | -0,727 | | -1,737 | | 0,302 |
| | | [3.33] | | [5.69] | | [3.48] | | [1.35] |
| L.dv_od_c | -0.431** | -0.407* | | | | | | |
| | [0.20] | [0.22] | | | | | | |
| L.dv_inf2y_c | | | -0,393 | -0,36 | | | | |
| | | | [0.24] | [0.26] | | | | |
| L.dv_sup2y_c | | | | | -0,161 | -0,292 | | |
| | | | | | [0.22] | [0.28] | | |
| L.dv_rd_c | | | | | | | -0,063 | -0,055 |
| | | | | | | | [0.18] | [0.19] |
| constant | -77,745 | -61,154 | 131,931 | 104,333 | 138.708* | 182.721* | -46.288* | -42,177 |
| | [127.44] | [111.96] | [148.59] | [150.88] | [73.32] | [88.79] | [26.10] | [25.06] |
| F-stat | - | 0,1 | - | 0,38 | - | 2,81 | - | 1,05 |
| p-value | - | 0,7554 | - | 0,5447 | - | 0,1081 | - | 0,3156 |
| controls | yes | yes | yes | yes | yes | yes | yes | yes |
| Nb obs | 40 | 40 | 40 | 40 | 40 | 40 | 40 | 40 |
| r2 | 0,347 | 0,427 | 0,578 | 0,598 | 0,599 | 0,636 | 0,691 | 0,704 |

Sources: Authors' computations on the basis of Banque de France and ECB databases. "D." and "L." stand for the difference and first lag operators. The following deposits volumes to domestic non-financial corporations and households have been chosen: dv_od_c stands for the growth rate of overnight deposits stocks, dv_inf2Y_c for the growth rate of the stocks of deposits with agreed maturity up to 2 years, dv_sup2Y_c for the growth rate of the stocks of deposits with agreed maturity over to 2 years and dv_rd_c for the growth rate of the stocks of redeemable deposits at notice at remunerated market rates.

F-stat tests the null hypothesis that the sum of coefficients associated to D.bce is equal to zero

Estimations are performed using OLS. *, ** and *** denote significance at the 10%, 5% and 1% levels. Robust standard errors are in brackets.

Estimates of controls have been removed for clarity; they are available from the author upon request

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All in all, we cannot conclude that the crisis has had a clear-cut effect on the bank lending channel; the pass-through to bank volumes remains almost no-significant.
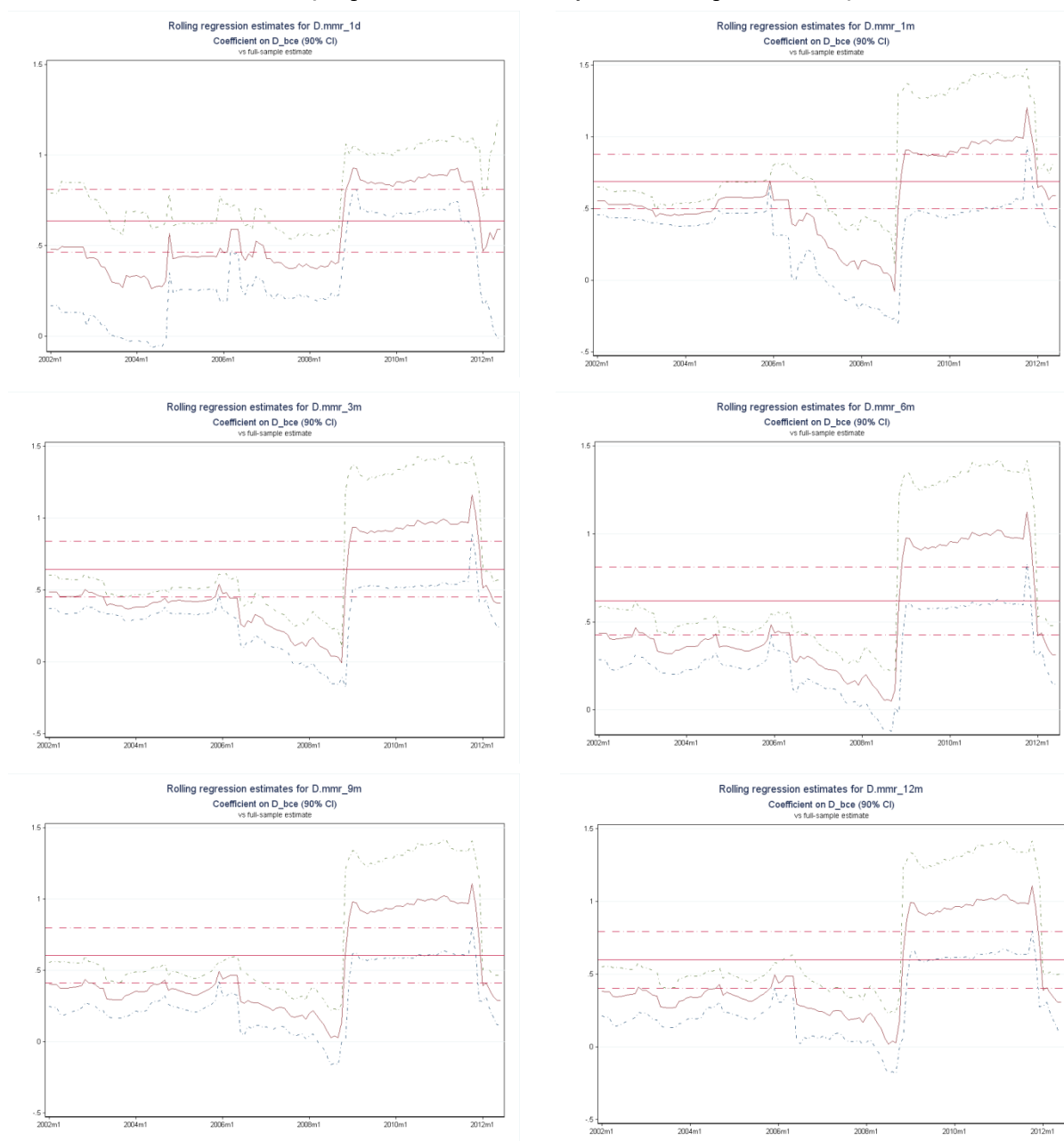
## 5.2 Rolling estimations

We made some OLS estimations on a series of windows of 3 years observations, performing which is commonly called rolling regressions, in order to compute the effect of the recent financial crisis on the pass-through to bank interest rates and volumes. These are made on a reduced form of the previous model, without lags on the endogenous variables, lags on the policy rate and controls.

### 5.2.1 Interest rates

Table 17 gathers the results of the rolling estimations of the pass-through to money market rates. We can first see that the rolling estimates are relevant because the full sample pass-through is not representative of the real evolution of the pass-through over the period; it stands around 0.6 for the full sample whereas it reaches 0.8 on average after the crisis and 0.5 before. The difference in the pass-through before and after Lehman Brothers' bankruptcy is significant; moreover, the pass-through for market rates with a maturity higher than 1 day was decreasing from 2006 to 2008 and the crisis has largely increased it.

Regarding the pass-through to government debt rates (Table 18), the rolling estimation is relevant for short-term rates: the full-sample estimates are not representative of the evolution of the pass-through over the period. It is nonetheless not the case for long-term debt rates (over 5 year maturity), where the evolution of the pass-through stands in the 95% confidence interval of the full-sample estimate.

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## Table 17 – Time-varying estimates of the pass-through to money market rates

## Table 18– Time-varying estimates of the pass-through to government debt rates

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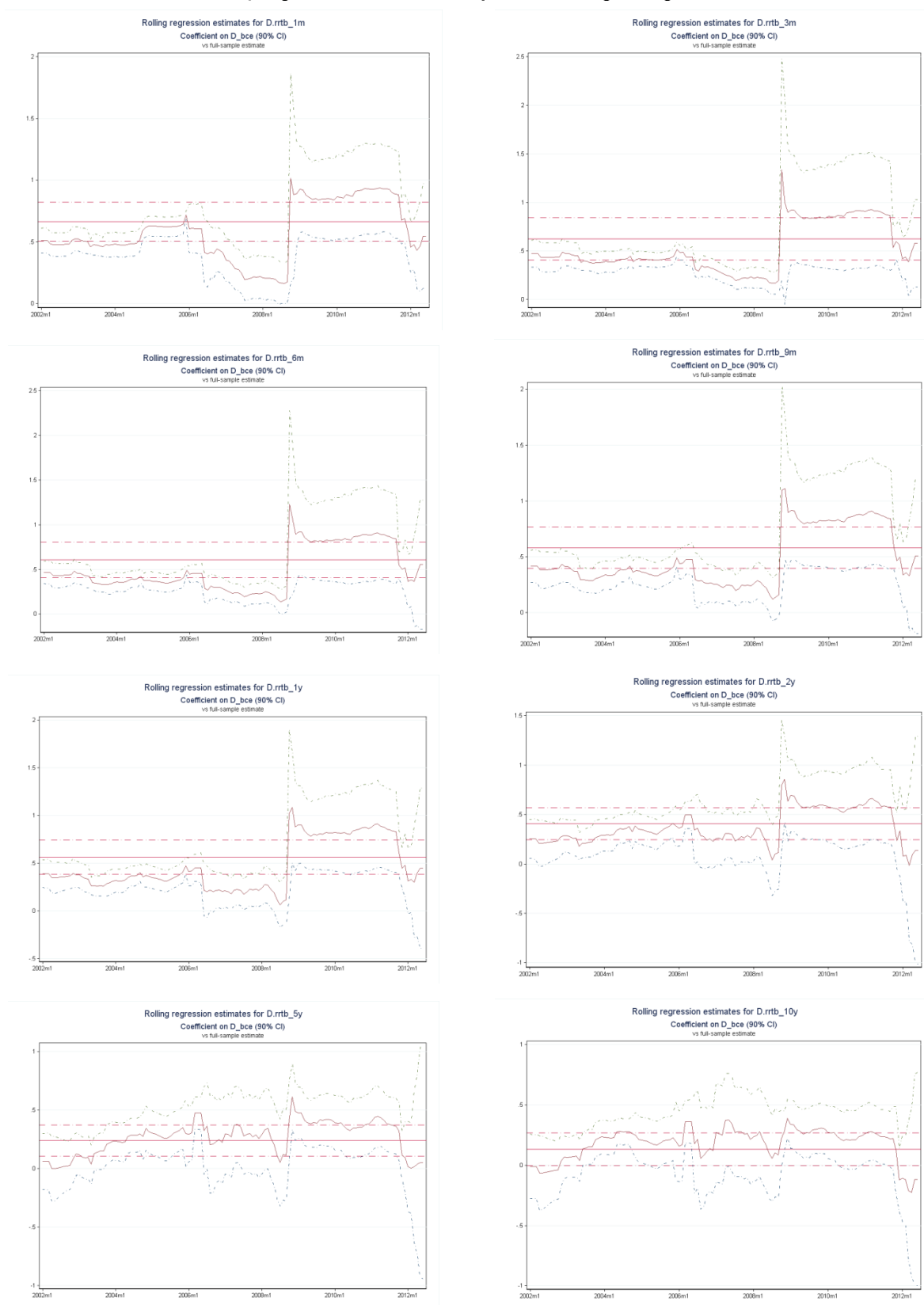
For government debt rates from 1-month to two-year maturity, where time-varying regressions are relevant, the pass-through is around 0.4 before the crisis and overpasses 1 after it; this difference is significant. For short-term debt rates (1 or 3-month maturity), the pass-through had been decreasing before the crisis.

**Table 19 – Time-varying estimates of the pass-through to lending rates to non-financial corporations**
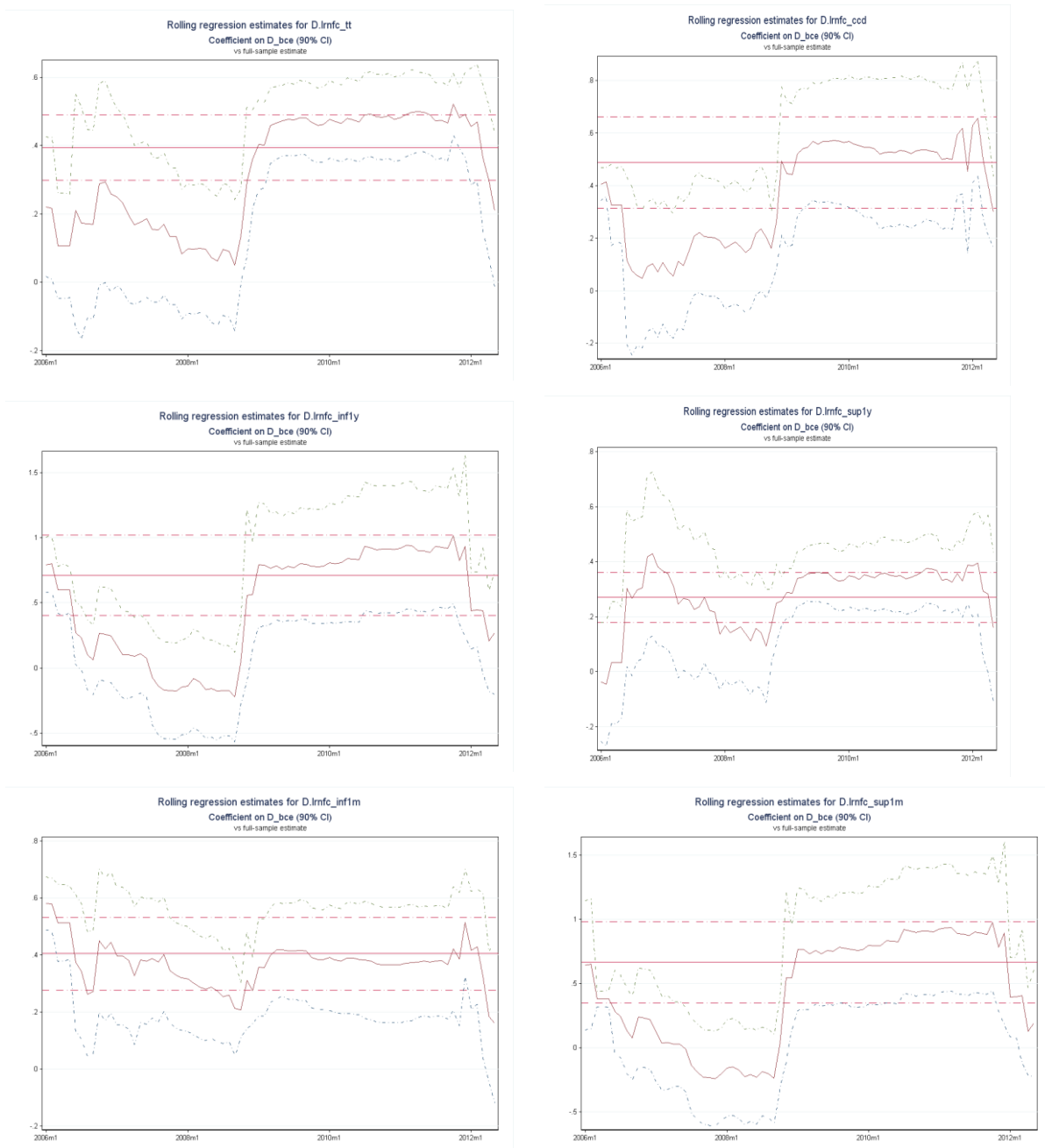
For lending rates to non-financial corporations rolling estimations (see Table 19), there has been a significant change in the pass-through on both sides of the crisis only for loans of all types and short loans of big amounts. For other loans, the full sample is quite well representative of the pass-through evolution over the period and the crisis has not produced a significant change.

Table 20 – Time-varying estimates of the pass-through to lending rates to households

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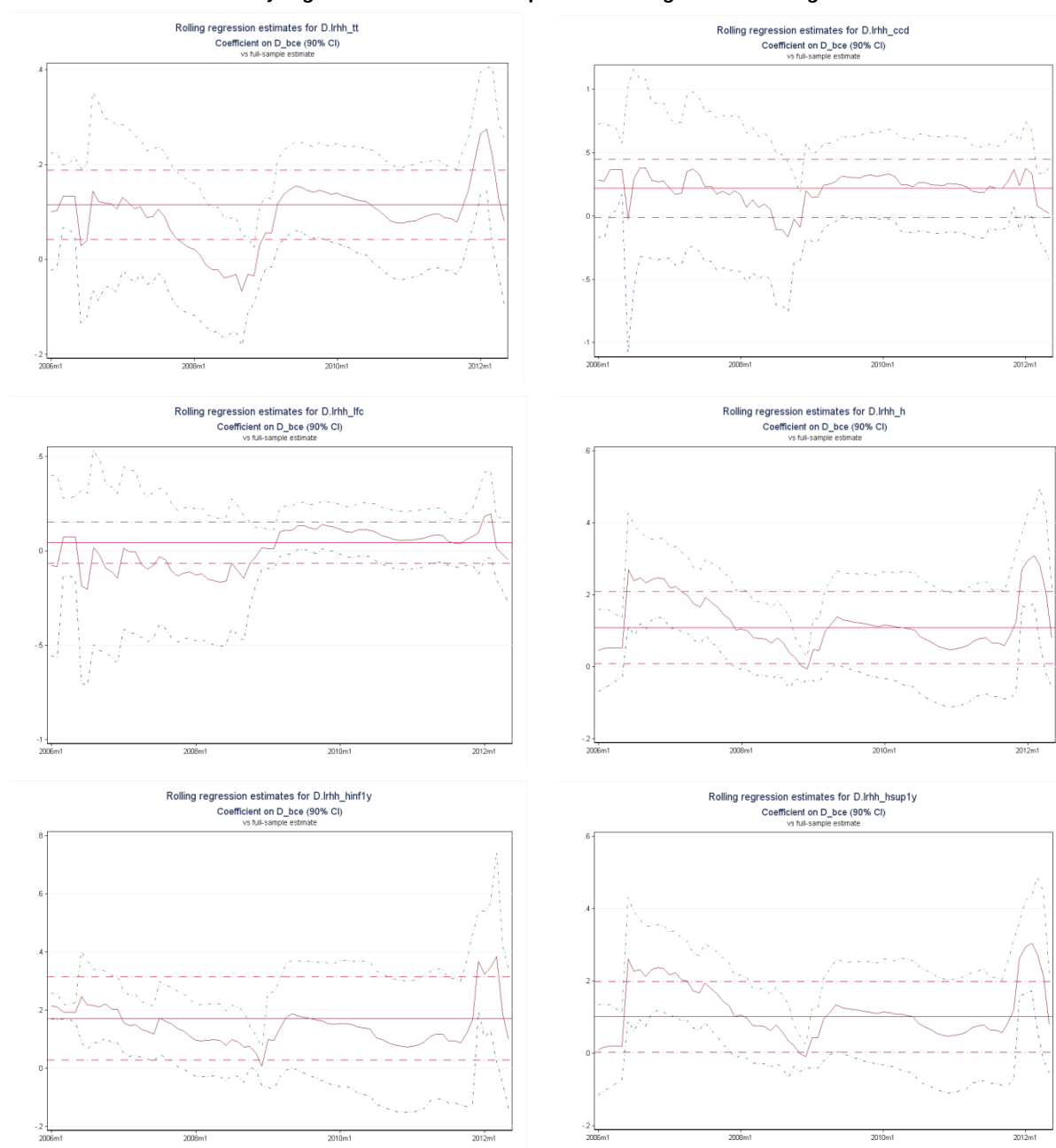
The crisis has not brought a significant change on the pass-through to lending rates to households (see Table 20), which value stands around its full-sample estimation without significant increase or decrease on both sides of the crisis.

Last, rolling estimations for the pass-through to deposit rates (Table 21) does not prove a significant change after the crisis, except for short deposits (its pass-through is about 0.15 before the crisis and about 0.3 after the summer 2008, with a peak around 0.5 in 2012).

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## Table 21 – Time-varying estimates of the pass-through to deposit rates
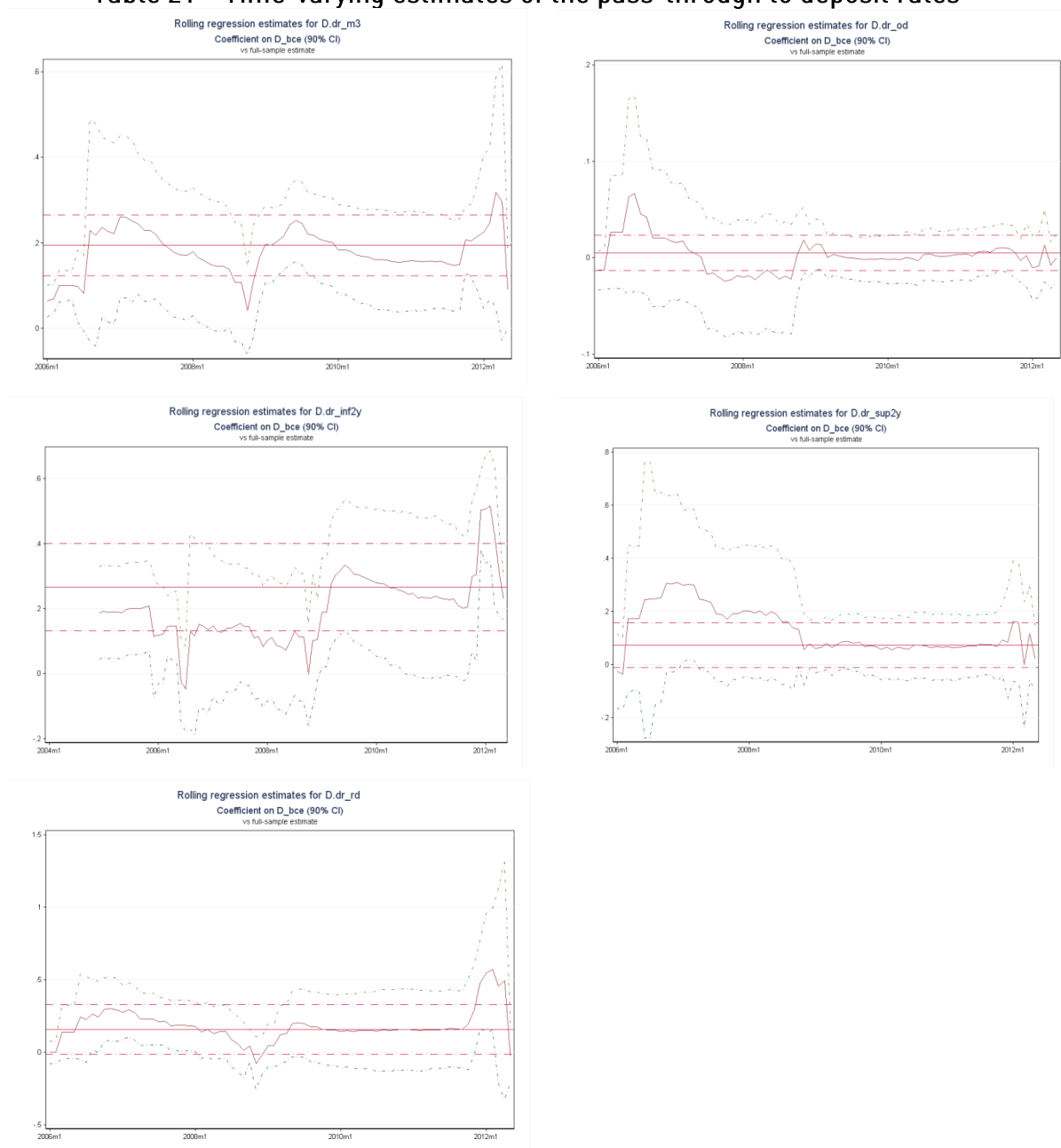


Thus, the interest rate channel has been affected by the crisis only through the pass-through to money market rates and government debt rates; the full sample is quite representative of its evolution for lending rates to households and deposit rates, whose pass-through has not been modified by the 2008 events.
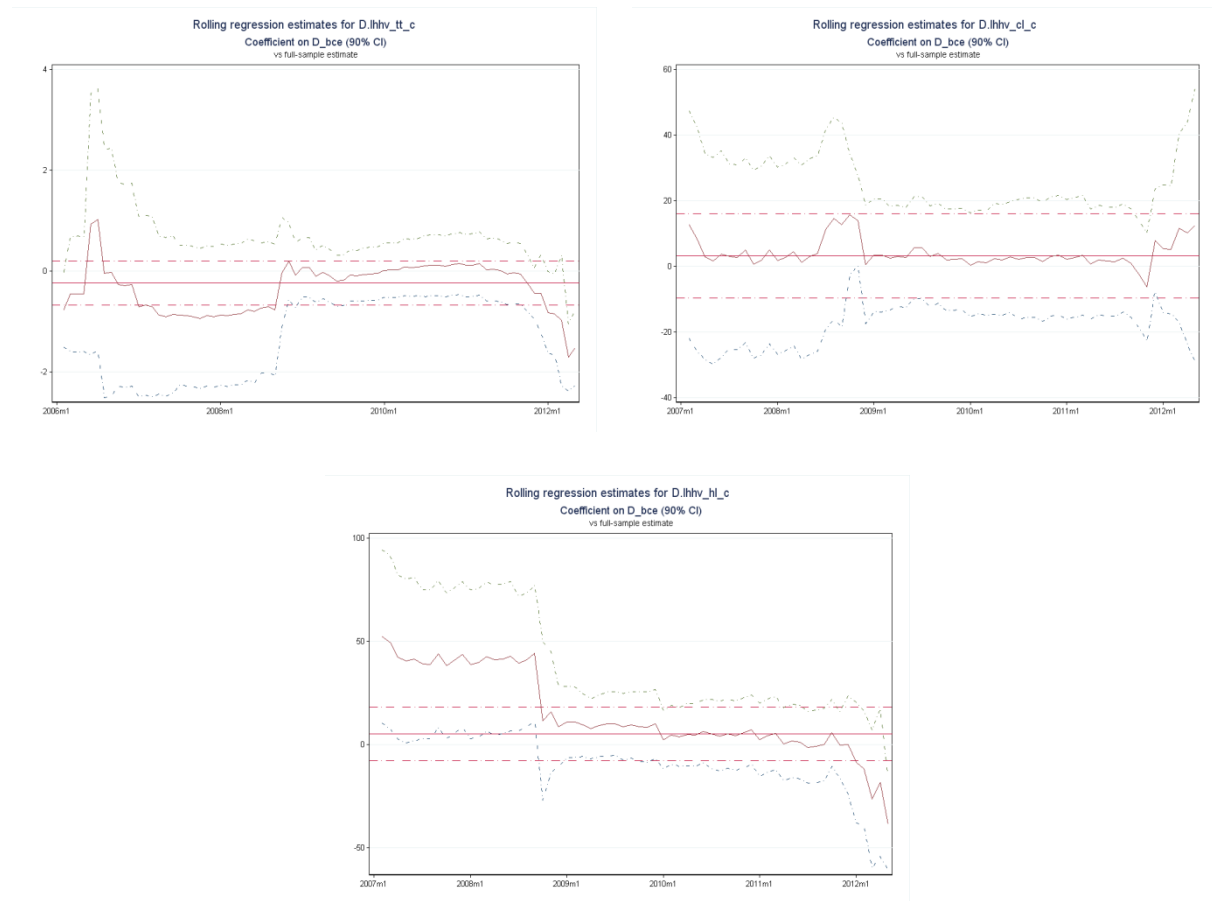
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### 5.2.2 Volumes

As we can see through the tables 22 to 24, the bank lending channel has not been affected by the crisis; the changes are not significant and the full-sample estimates remain representative of the evolution of the effect of a change in the policy rate on credit conditions.
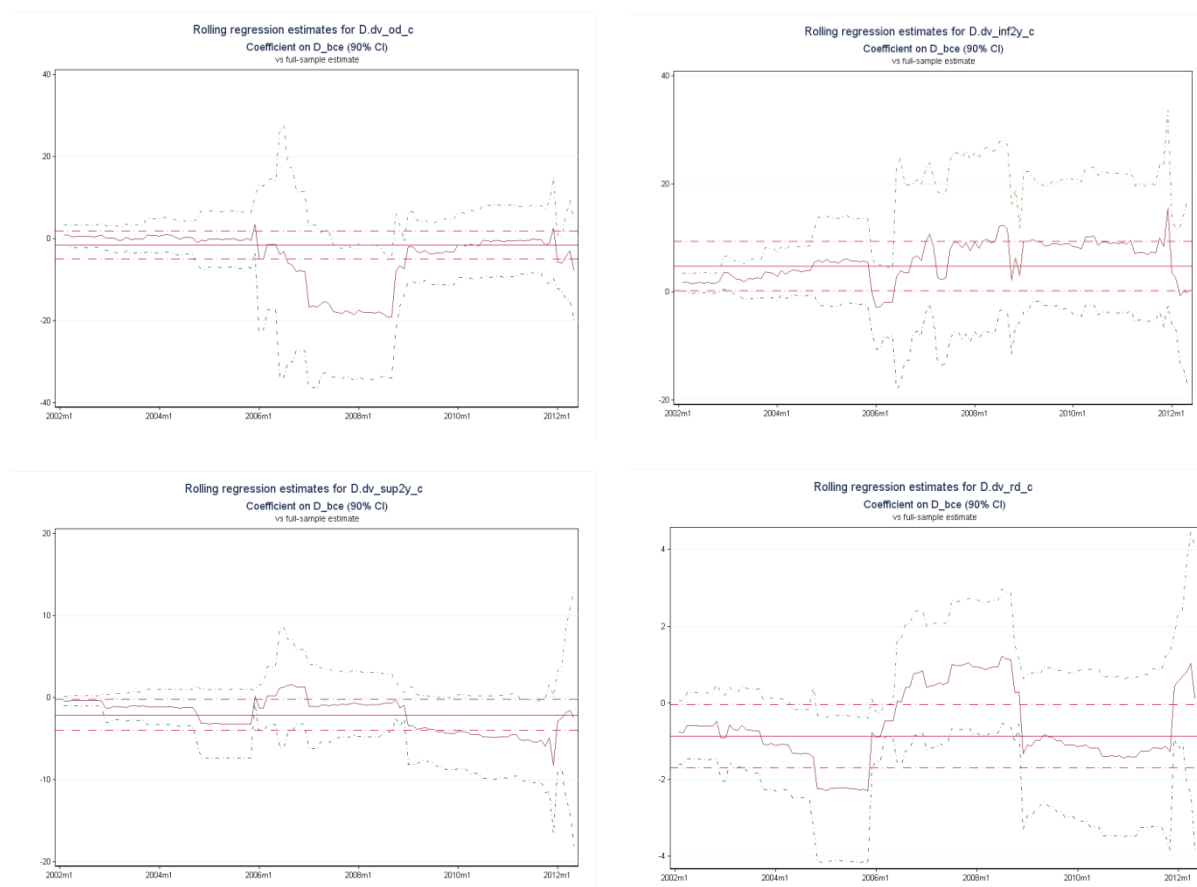
**Table 22 – Time-varying estimates of the pass-through to lending volumes to non-financial corporations**

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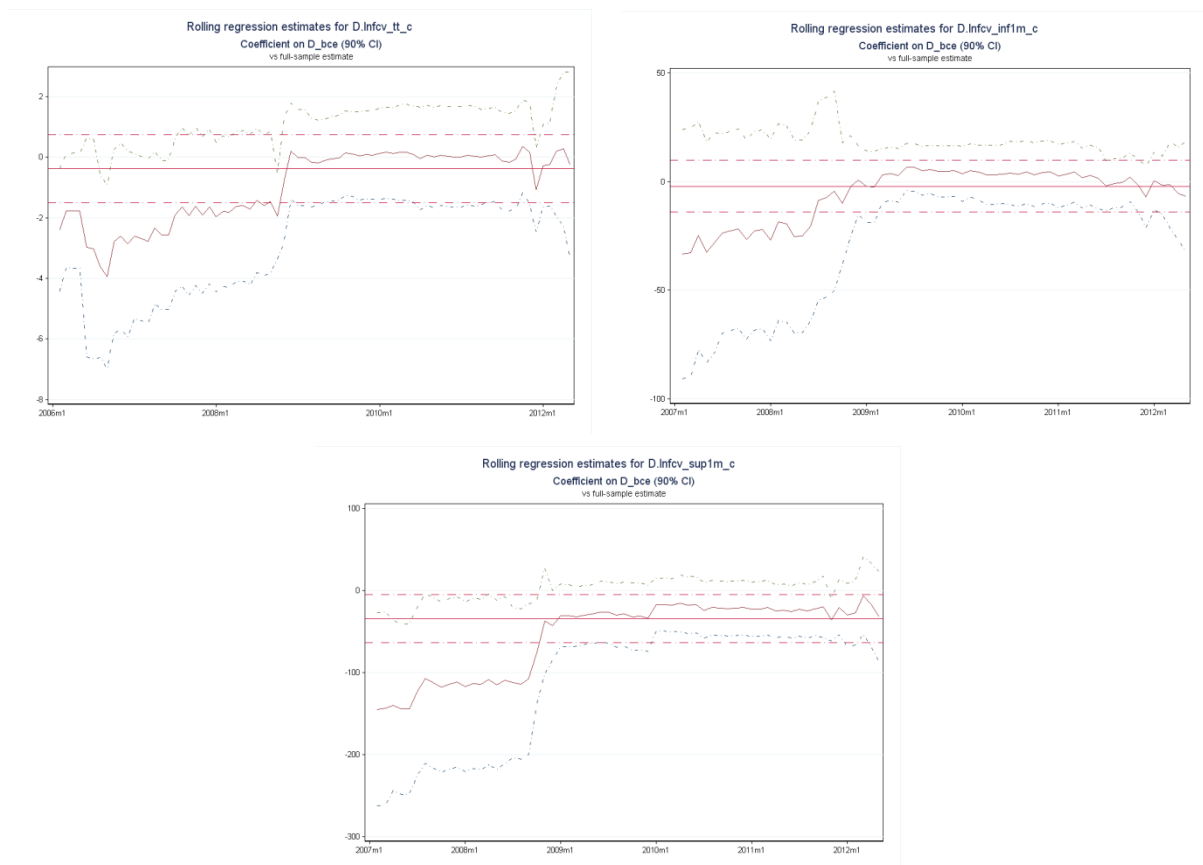
## Table 23 – Time-varying estimates of the pass-through to lending volumes to households

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**Table 24 – Time-varying estimates of the pass-through to deposit volumes**



## 6. Conclusion

This chapter focuses on two aspects of the monetary transmission mechanism in France which may contribute to asymmetries relative to other European countries. The first is the interest rate channel which corresponds to the pass-through from the ECB rate to bank interest rates (respectively money market rates, government debt rates, lending rates to non-financial corporations or households and deposit rates); the analysis of the French pass-through has shown that it was quite high and significant for money market rates, government debt rates and lending rates to non-financial corporations and that it has almost doubled since the crisis. The effect of a shift in the ECB rate could be either immediate or delayed, depending on the interest rates. The second is the bank lending channel, which appears to be far less important than the interest rate channel but still significant for loan supply to

households. This supply has experienced a drop since the crisis. As for interest rates, the effect of a shift in the ECB rate could be either immediate or delayed.

All in all, if the interest rate channel is effective, the bank lending channel seems not to be: the banks have indeed lowered their rates in the aftermath of a drop in the ECB rate but they have not increased their loan supply until mid-2012. This conclusion supports the hypothesis that banks have reconstituted their capital ratio and reduced access to credit. The fact that there exists a significant pass-through only to interest rates (and not to volumes) may also explain the recent ECB policy of quantitative easing. This non-conventional monetary policy instrument, which consists in the ECB balance sheet expansion through the acquisition of assets (debt securities, bonds or riskier assets like agency debt, asset-backed securities or mortgage-backed securities) in order to increase the banking sector's reserves and thus the impact of the monetary policy on real economy in a low interest rate environment, has been indeed used recently by the central bank in order to try to escape a European liquidity trap and to counter speculation in bond markets that finance sovereign debts.

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