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BANK'S PRICE SETTING AND LENDING MATURITY: EVIDENCE FROM AN INFLATION-TARGETING ECONOMY*

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Abstract

Acknowledging that pass-through of the policy interest rate may be different amongst the private banks, this paper presents evidence of monetary pass-through conditional on different banks characteristics. A simple theoretical model is used to argue that the inflation rate also has to be taken into account when analyzing monetary pass-through. The focus is on nominal and real interest rates for commercial and consumer loans with different payback horizons. Taking a closer look at the construction of the interest rate data available, it becomes clear that short-term consumption rates are quite rigid and, thus, by construction react less to changes in the policy rate. Evidence from panel estimations with Chilean data for the period 2008 to 2014 suggests that short-term commercial rates react quite fast to changes in the monetary policy rate, while those at long-term seem to react more to inflation. Particularly size and deposit strength affect banks when fixing nominal commercial rates, while the determination of rates of consumer loans is particularly influenced by bank size and capital strength. With respect to real interest rates, commercial loans are affected by deposit strength, non-interest income and external obligations, while mortgages are affected by liquidity strength and provisions. The evidence provided in the present study reveals that the degree to which different bank characteristics affect pass-through of changes in the monetary policy rate and inflation depends to a great extent on the horizons of the loans.

Resumen

Reconociendo que el traspaso de la Tasa de Política Monetaria (TPM) puede ser diferente entre los bancos privados, este trabajo presenta evidencia del traspaso de la TPM condicional a diferentes características de los bancos. Un simple modelo teórico es utilizado para argumentar que la inflación también debe ser considerada al analizar dicho traspaso. La atención se centra en las tasas de interés nominal y real de créditos comerciales y de consumo con distintos horizontes de pago. Al examinar con mayor detalle la construcción de las tasas de interés con la información disponible, se vuelve claro que las tasas de consumo de corto plazo son más rígidas, y por lo tanto reaccionan menos a los cambios en la TPM. Evidencia de estimaciones de panel con datos de Chile para el periodo 2008 al 2014 sugiere que la tasa comercial de corto plazo reacciona más rápido a cambios en la TPM, mientras que aquellas a largo plazo parecen reaccionar más a la inflación. Particularmente el tamaño y posición de depósitos afectan a los bancos al fijar la tasa comercial nominal, mientras que la determinación de las tasas de créditos de consumo se ve particularmente influenciada por el tamaño del banco y la posición de capital. Con respecto a las tasas reales, los créditos comerciales son

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afectados por la posición de depósitos, ingresos no financieros y obligaciones externas, mientras que las hipotecas son afectados por liquidez y provisiones por incobrabilidad. La evidencia expuesta en el presente estudio revela que el grado al que las características de los diferentes bancos afectan el traspaso de cambios en la TPM y la inflación depende del horizonte temporal de los préstamos.

1 Introduction

The transmission of monetary policy has been studied by several scholars and while empirical research has applied many different approaches to uncover secrets of this mechanism, several questions remain unanswered. The complex mechanism of monetary policy consists of different channels among the bank lending channel is an important one. Via this channel monetary policy affects banks' balance sheets on the asset as well as the liability side. Hence, according to this credit view of monetary transmission, the effectiveness of monetary policy actions depends to some extent on the state of bank's balances or, in other words, the banking sector may cause frictions in monetary policy transmission.

In the present paper we study effectiveness of the monetary policy in Chile taking into account the state of the banks' balances. We focus on pass-through of changes in the monetary policy rate to lending rates. As is well-known, part of the monetary transmission mechanism works from official rates, via money market rates to bank rates, which then affect the amount of loans to economic agents and thereby supply and demand in the economy. While there is naturally an inverse effect between quantities and prices, it is useful to study this preliminary interest rate step of the transmission mechanism to better understand changes in lending amounts and, hence, in aggregate supply and demand. In the present study we focus on lending rates separated between consumer and commercial loan as well as by lending horizons. We argue that, by construction of data, consumer rates are more rigid, i.e. they adjust less to policy changes than to deposit and commercial rates, particularly short-term ones. Our findings suggest that commercial rates have a relatively fast pass-through in the short term, while long-term rates seem to react more to inflation. Particularly size and deposit strength affect banks when setting nominal commercial rates, while determination of rates on consumer loans is particularly influenced by bank size and capital strength. With respect to real interest rates, commercial loans are affected by deposit strength, non-interest income and external obligations, while mortgages are affected by liquidity strength and provisions.

Concerning the effects of bank characteristics on pass-through, the monetary policy rate (MPR) pass-through to short-term nominal rates is mainly affected by provisions, and in the case of commercial loans, by capital and non-interest-income, while pass-through to long-term rates is mostly affected by size. For commercial loans, inflationary pass-through to long-to-medium-term rates is particularly influenced by deposit strength and non-interest-income, while long-term rate pass-through is mainly affected by bank size. Several bank characteristics seem to affect inflationary pass-through to consumer rates, but these results are affected by a great deal of heterogeneity in these rates. Finally, the way different bank characteristics affect long-term MPR pass-through to real rates is rather limited.

The literature using micro bank data started with studies focused on explaining changes in amounts. Kashyap and Stein (1995) utilize US. data to study how the bank lending channel is affected by the size of the bank, measured by its total assets, and supply evidence that lending of large banks is less sensitive to monetary policy shocks. In a later study, Kashyap and Stein (2000) also distinguish by liquidity of the banks' balance sheets and find that monetary policy has a larger impact on banks with less liquid balance sheets. Ehrmann et al. (2003) find similar results for banks in the euro area but their findings do not suggest that size matters for the banks' response to changes in the monetary policy rate. Along with (asset) size of the banks, Kishan and Opiela (2000) also differentiate between bank capital leverage ratios in the US. and find evidence supporting the hypothesis that it is difficult for undercapitalized banks to finance loans when monetary policy is contractionary. These results were confirmed with European data by Altunbas et al. (2002), who concluded that undercapitalized banks respond more strongly to policy changes, while Altunbas et al. (2004) found that monetary policy affects more the less capitalized banks.[1]

As loan demand may not be elastic, monetary policy changes may impact differently interest rates of banks with different size, liquidity position, capitalization, etc. With this in mind, researchers started to investigate impact on interest rates rather than on quantities, i.e. the so-called interest rate channel. Gambacorta (2008) uses a panel of Italian banks to investigate bank heterogeneity for deposit and lending rates. To investigate how monetary policy affects commercial interest rates, he controls for the macroeconomic environment (inflation and GDP growth) and bank-specific variables

[1] A number of researchers have adopted similar empirical approaches. These include several of the contributions to the Monetary Transmission Network, which were launched by the Eurosystem in 1999 (see Angeloni et al., 2003), Alfaro et al. (2004) for Chile, Gambacorta (2005) for Italy, Matousek and Sarantis (2009) for eight Central and Eastern European countries, Tabak et al. (2010) for Brazil, Bhaumik et al. (2011) for India, and Yalan (2011) for Peru. Gambacorta and Marqués-Ibáñez (2011) focus on functioning of the bank lending channel during times of financial crisis.

(size, liquidity, excess capital measured with respect to capital requirement, deposit strength and credit relationship). Furthermore, he includes variables to capture interest rate and credit risk, management efficiency, interest rate volatility and market structure. The results of this study suggest that heterogeneity in interest rate pass-through exists only in the short run and that the size of banks is not an important factor. With respect to lending rates he finds that they react less to policy changes in liquid and well-capitalized banks, while deposit rate pass-through depends on the liability structure of the banks.

Other studies which investigate how interest rate pass-through is heterogeneous across banks include De Graeve et al. (2007) with Belgium data, Wu et al. (2011) with data from 35 emerging economies from Europe, Latin America and Asia, and Horváth and Podpiera (2012) with Czech observations. In Belgium an important part of heterogeneity amongst banks when fixing their prices can be explained by the bank lending channel and banks' relative market power. In the long run pass-through seems to be complete and corporate loans are more competitive than consumer loans. Czech Republic evidence suggests that bank size does not matter for pass-through, but banks with greater credit risk are more affected by shocks to money market rates and more capitalized banks tend to have lower spreads. With a sample of 1273 banks, Wu et al. (2011) find that, independently of bank characteristics, foreign banks react less to monetary shocks than domestic ones in the sense that they adjust loan portfolios and interest rates to a lesser extent. Hence, the authors conclude that a bank lending channel does exist, but increased presence of foreign banks limits the strength of this channel.

This paper makes several contributions to the existing literature. Firstly, we sketch a theoretical model which argues that when evaluating monetary pass-through, not only the policy rate but also inflation should be taken into account. Secondly, while this has also been investigated by other scholars, we separate between loans to firms and consumers, which may reveal evidence of whether banks discriminate amongst agents. We do, however, also distinguish amongst lending horizons, which allows us to investigate to what extent this matters for pass-through and if different bank characteristics are important for different lending horizons. This separation between lending horizons turns out to be quite important for assessing the rigidities of interest rates and for monetary as well as inflationary pass-through.

The remaining of the paper is organized as follows. Section 2 presents the theoretical framework on which the empirical analysis is based and describes econometric models. The third section briefly describes the Chilean banking sector and presents data utilized in estimations. The fourth contains results of the empirical investigation, while the last one offers some concluding remarks.

2 Methodology

This section firstly outlines a theoretical model that argues that the inflation rate should also be taken into account when analyzing pass-through of the monetary policy rate to bank rates. Secondly, the empirical strategy is presented.

2.1 The Model

Our empirical exercise is guided by a simple theoretical model combining imperfect competition in the banking sector and term structure of interest rates.

Models of imperfect competition in the banking industry state that short-term lending rates across banks ($i_{k,t-1,t}$, where k is a specific bank, $t-1$ the time at which a loan is taken, and t the time at which the loan matures) are set as a constant mark-up (η) of the MPR (mpr),

$$i_{k,t-1,t} = \eta_k + mpr_{t-1,t}.^2 \tag{1}$$

Lending at different maturities imposes a non-arbitrage condition between short- and long-term lending. Non-arbitrage implies that lending at maturity s must equalize the expected return of rolling short-term lending during the maturity period plus a term premium (σ).

$$i_{k,t-1,t+s} = \frac{1}{s+1} E_{t-1} \left(i_{k,t-1,t} + ... + i_{k,t+s-1,t+s} \right) + \sigma_{t-1,t+s}. \tag{2}$$

[2] See Freixas and Rochet (1997).

Plugging equation 1 into equation 2 we obtain

$$i_{k,t-1,t+s} = \eta_k + \frac{1}{s+1} E_{t-1} \left(mpr_{t-1,t} + ... + mpr_{t+s-1,t+s} \right) + \sigma_{t-1,t+s}. \tag{3}$$

It is assumed that the monetary authority sets the MPR following an inflation-targeting rule of the form[3]

$$mpr_{t-1,t} = \rho \, mpr_{t-2,t-1} + (1-\rho) \, \kappa \, \pi_t, \tag{4}$$

where target inflation is normalized to zero. It is also assumed that banks form their inflation expectation from an AR(1) model, i.e.

$$\pi_t = \phi \pi_{t-1} + \epsilon_t^{\pi}.$$

Conditioning on the information available at time $t-1$, the expected MPR $s+1$ period ahead is

$$\mathrm{E}_{t-1} mpr_{t,t+s} = \rho^{s+1} mpr_{t-2,t-1} + (1-\rho) \, \kappa \phi \, \frac{\phi^{s+1} - \rho^{s+1}}{\phi - \rho} \pi_{t-1}. \tag{5}$$

Using equation 5, banks price loans according to the following rule:

$$i_{k,t-1,t+s} = \eta_k + \frac{1}{s+1} \left(\frac{\rho - \rho^{s+2}}{1-\rho} mpr_{t-2,t-1} + \frac{\phi \, (1-\rho) \, \kappa}{\phi - \rho} \left(\phi \frac{1-\phi^{s+1}}{1-\phi} - \rho \frac{1-\rho^{s+1}}{1-\rho} \right) \pi_{t-1} \right) + \sigma_{t-1,t+s}. \tag{6}$$

Two polar cases are interesting. If $\phi \to 1$, i.e. π tends to a random walk process, the following results hold

[3]The empirical application utilizes Chilean data where the anchor of the monetary policy is an inflation target.

$$\mathrm{E}_{t-1} mpr_{t,t+s} \to \rho^{s+1} mpr_{t-2,t-1} + \kappa \left(1 - \rho^{s+1}\right) \pi_{t-1}$$

$$i_{k,t-1,t+s} \to \eta_k + \frac{1}{s+1} \left(\frac{\rho - \rho^{s+2}}{1-\rho} mpr_{t-2,t-1} + \kappa \left(s + 1 - \rho \frac{1-\rho^{s+1}}{1-\rho} \right) \pi_{t-1} \right) + \sigma_{t-1,t+s}.$$

Conversely, if banks forecast inflation as not persistent at all ($\phi \to 0$), the opposite is true

$$\mathrm{E}_{t-1} mpr_{t,t+s} \to \rho^{s+1} mpr_{t-2,t-1}$$

$$i_{k,t-1,t+s} \to \eta_k + \frac{\rho - \rho^{s+2}}{(s+1)(1-\rho)} mpr_{t-2,t-1} + \sigma_{t-1,t+s}.$$

Wright (2011) and Bauer et al. (2014) show that the term premia might be accounted for by inflation uncertainty. This implies that a long-term relation between inflation and uncertainty, though consistent with banks using inflation to forecast changes in the MPR, is also consistent with banks pricing higher long- than short-term lending because of inflation uncertainty.

Summarizing, our simple model for term structure of bank-lending interest rates implies a maturity varying linear relation between bank lending interest rates, MPR, and inflation. Such relation depends on two structural parameters, namely degree of inflation persistence (ϕ) and MPR smoothing (ρ). Moreover, an alternative channel for inflation affecting banks' pricing is the term premium component. In the next session we set up the empirical model to assess the determinant of banks' price setting.

2.2 Empirical Strategy

We consider an econometric specification for bank-lending interest rates flexible enough to accommodate adjustments whenever banking rates differ from their long-term relation with respect to the MPR and inflation, and instantaneous and lagged adjustments whenever the MPR and inflation change

$$\Delta i_{kts} = \alpha_{ks} + \beta_{0s} i_{kt-1s} + \beta_{1s} mpr_{t-1} + \beta_{2s}\pi_{t-1} + \sum_{x=1}^{3} \beta_{2+xs}\Delta i_{kt-xs} + \sum_{x=0}^{1}\left(\beta_{6+xs}\Delta mpr_{t-x} + \beta_{8+xs}\Delta\pi_{t-x}\right) + \epsilon_{kts}. \tag{7}$$

The lag choice for Δi_k is the lowest lag value that assures well behaved residuals.[4]

The estimation method used for estimating equation 7 is Ordinary Least Squares (OLS). The preferred estimation method found in the literature, however, is the Arellano-Bond General Method of Moments (GMM) estimator. For the data we have, OLS does a better job. In panels, the GMM type of estimator is preferred whenever OLS induces Nickell bias, i.e. when the time dimension is small.[5] Our panel displays a large time series dimension, thus OLS estimates are unlikely to suffer Nickell bias. Leaving bias aside of the discussion and letting efficiency dominate the argument for picking an estimator, OLS is the preferred method.

Equation 7 implies the long-term relation

$$i_{kts} = -\frac{1}{\beta_{0s}}\left(\alpha_{ks} + \beta_{1s} mpr_{t-1} + \beta_{2s}\pi_{t-1}\right) + \epsilon^{LR}_{kts}. \tag{8}$$

To uncover heterogeneity in the way MPR and inflation affect banking rates, we interact them with a vector of demeaned (across the time series and cross-sectional dimensions) bank-specific characteristics ($(\mathbf{z}_{kt-1} - \bar{\mathbf{z}})$). Hence, the model is

[4] We rejected presence of serial correlation in the error term using the Cumby-Huizinga (1992) test.
[5] Regardless of the cross-sectional dimension.

$$
\begin{aligned}
\Delta i_{kts} = {} & \alpha_{ks} + (\beta_{0s} + \mathbf{\Gamma}_{1s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, i_{kt-1s} + (\beta_{1s} + \mathbf{\Gamma}_{2s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, mpr_{t-1} + \\
& + (\beta_{2s} + \mathbf{\Gamma}_{3s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \pi_{t-1} + \sum_{x=1}^{3} \beta_{2+xs} \Delta i_{kt-xs} + \\
& + \sum_{x=0}^{1} \big((\beta_{6+xs} + \mathbf{\Gamma}_{4+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \Delta mpr_{t-x} + (\beta_{8+xs} + \mathbf{\Gamma}_{6+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \Delta \pi_{t-x} \big) + \\
& + \mathbf{\Gamma}_{8s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}) + \epsilon_{kts}. \qquad (9)
\end{aligned}
$$

3 The Chilean Banking Sector and Data Description

As shown in Table 1, there are 25 banks operating in Chile, 14 foreign owned, ten national and one state-owned. About half of total loans are supplied by private local banks, real deposits are almost evenly distributed between the three types of banks, while nominal interest rate deposits are mainly made in private banks.

[Table 1]

The Chilean lending market contains four types of loans: consumer (CONS), commercial (COM), mortgage (MORT), and loans associated with foreign trade (FT). Table 2 reports the distribution of each of these loans by loan type and denomination: nominal / real interest rate in Chilean pesos (CLP) and loans denominated in US. dollars (USD). Consumer loans are issued almost only with nominal interest rates and in CLP, mortgage loans have real interest rates, while commercial loans are issued with nominal and real interest rates, in CLP as well as USD. With respect to consumer loans, the distributions are quite homogenous when separating banks by size and if they are local or foreign. Concerning commercial loans there are more heterogeneity, large banks (local and foreign owned) tend to have relatively larger part of loans with nominal rates. Real interest rate commercial loans are mostly for real-estate purchases such as office, but land purchased by natural persons also classify as commercial loans. Foreign trade loans are not considered in the present analysis as they are mainly USD denominated.

[Table 2]

This study is focused on bank lending with nominal and real interest rates offered in CLP, i.e. consumer and commercial loans with nominal rates and real interest rate commercial and mortgage loans. Data is supplied by the Central Bank of Chile and consists of observations from January 2008 to February 2014. Bank balance sheet data and interest rates are initially from 23 banks, but final samples contain less observations as not all banks have operations in all segments. Hence, for nominal commercial rates we have observations from 14 banks (93% of the operations) and seven for consumer rates (87%). As for to real interest rates, we have observations from ten banks for mortgages (97%) and eleven for real commercial loans (97%). Monthly interest rates are calculated with daily observations from each bank and nominal rates are separated according to their different time horizons for the loans in order to analyze differences in this dimension[6].

With respect to heterogeneity amongst banks, Figure 1 shows graphs to illustrate this for the four types of loans considered in the present study. Upper panels show dispersions amongst the individual banks' interest rates, while lower panels show reactions to changes in the MPR, the same months it was altered. Clearly there exists a great deal of heterogeneity amongst banks when fixing interest rates and in their immediate reactions to policy changes. This is particularly notable for consumer and real commercial loans, which implies that results obtained for these are affected by more uncertainty that those obtained for nominal commercial and real mortgage loans.

[Figure 1]

Interest rates, which are weighted averages, are compiled according to International Finance Reporting Standards (IFRS) and are separated by time horizons. We make this distinction because, by construction, some interest rates react less to MPR changes, as discussed below, which is important to take into account when evaluating monetary pass-through. Figure 2 shows interest rates differentiated in the horizons considered. For consumption the first horizon is for less than three months due to the number of observations available for short-term loans. First of all, it is noteworthy that consumer rates are substantial higher than commercial rates, which most likely reflects higher negotiation power of firms with respect to natural persons. Differences between real

[6] To eliminate effects of outliers on estimation results, 5% of tail observations for each bank are trimmed away.

commercial and mortgage loans are smaller.

[Figure 2]

Table 3 shows the items included in nominal commercial and consumer loans with the distinctions applied in the empirical analysis. Loan amortization most likely react strongest to policy changes as these are loans demanded by customers, who can negotiate terms. On the other hand, interest rates on overdrafts are often fixed by contracts running for a least a year such that these rates react more rigidly to MPR changes. It is likely, however, that commercial rates are somewhat more flexible due to higher negotiation power of firms compared to consumers. The same goes for revolving credit-card debt and while purchases in fees are also fixed by contract, they are often zero due to bank promotions and agreements with retail stores. Table 3 reveals that on average commercial rates are more reactive to policy changes than consumer rates, particularly those on short-term loans.

[Table 3]

The econometric models estimated include eight bank characteristics that are often included in the literature, and definitions are supplied in Table 4. Capital requirement corresponds to those applying to Chilean banks. i.e., in accordance with the General Banking Law, banks must maintain a minimum ratio of Effective Equity to Consolidated Risk-Weighted Assets of 8%, net of required provisions and a minimum ratio of Basic Capital to Total Consolidated Assets of 3%, net of required provisions.[7] Because of the high correlation between the two measures, however, only the latter is included in estimations. The variable long-term loans is included to allow for a separation between banks which are focused on lending at different horizons. For example, banks related to the retail sector are often more intensive in short-term loans. As shown in the table, which is made with the banks used to model commercial interest rates, also with respect to bank characteristics there is a great deal of heterogeneity in the Chilean bank sector.

[Table 4]

Aside from the MPR and inflation rate, measured by the consumer price index, the empirical

[7]Because of the 2008 merger of Banco de Chile and Citibank Chile this institution is obligated to maintain an Effective Equity to Consolidated Risk-Weighted Assets ratio of no less than 10%.

analysis includes as control variable the Hodrick-Prescott(HP)-filtered IMACEC (Chilean indicator for monthly economic activity). To limit effects of the well-known end-point problems when applying HP filter, the filtered IMACEC-series contains data from January 1986 to September 2014. Inflation rates are included to investigate if some rates react to changes in this instead of or combined with changes in the MPR as discussed in section 2. To account for the unconventional monetary policy conducted during 2009-10 we also add the so-called term liquidity facility (FLAP for its Spanish abbreviation), which measures outstanding stock in millions of pesos. The log of this variable, which has observations from July 2009 to May 2010, is included in the econometric model as a kind of dummy variable.

4 Results of Empirical Analysis

4.1 Unconditional Response of Banking Rates

This section presents results of the empirical analysis. These are presented in different sub-sections in order to focus the presentation on how bank characteristics impact monetary pass-through. First, direct effects of MPR and inflation are presented followed by effects of each of the bank characteristics following the order presented in Table 4. As a starting point, however, Figure 3 shows some estimates of unconditional pass-through using model (7), which does not include bank characteristics. The figure also displays pass-through of inflationary shocks.

[Figure 3]

For short-term commercial rates unconditional pass-through is quite fast, but with longer horizons this is not the case. For consumer rates the picture is the opposite, i.e. less pass-through for short-term loans even though the initial effect is larger. Inflationary shocks seem to have larger impact on the rates of long-term loans. As mentioned earlier, because of large heterogeneity amongst nominal consumer rates, these estimations are affected by a great deal of uncertainty and should be interpreted in this context. Pass-through to real interest rates of both MPR and inflation changes seems to be limited.

4.2 Conditional Response of Banking Rates

We now turn to the direct impact of MPR and inflation followed by discussions on how different bank characteristics affect pass-through. The following results are obtained with model (9), where FLAP and state of business cycle are included as control variables. In general terms, particularly size and deposit strength affect banks when fixing nominal commercial interest rates, determination of rates of consumer loans are particularly influenced by bank size and capital strength, real commercial rates are affected by deposit strength, non-interest income and external obligations, while real mortgage rates are affected by liquidity strength and provisions. More details are reported below.

Table 5 presents coefficients for MPR and inflation(π).[8] The table also shows the number of observations and R^2 of each of the estimations.

[Table 5]

The MPR seems to affect directly changes of interest rates of consumer as well as commercial loans. MPR level has a positive effect on interest rate changes of short-to-medium-term commercial loans and commercial loans with real interest rate. Changes in the MPR affect short-to-medium-term commercial loans, and consumer loans with short- and mid-to-long-term horizons, and impact is positive as expected. The inflation rate seems to impact changes of interest rates on loans with long horizons.

Bank size

This part of the analysis seeks to answer the question: Does bank size matter when interest rates are fixed? Results presented in Table 6 will shed some light to the answer of this question. Changes of commercial short-to-medium-term rates are smaller or more negative in big banks, while they are bigger or less negative for short-term consumer loans, which may suggest that bigger banks prioritize lending to commercial customers. Looking at short- and medium-term commercial rates, the degree to which actual interest rate levels affect changes is positive for bank rates and negative

[8]The analysis is focused on different time horizons for nominal lending rates, but for completeness we also report results when total weighted average is utilized, as this is the rate often used in pass-through studies.

for the MPR such that big banks take more into account last month's interest and policy rates, but with opposite signs, i.e. last month's bank interest rate has a positive impact on changes, while last month's policy rate has a negative impact. For short-term consumer rates it is different, i.e. a high interest rate implies smaller or more negative changes, more so in big banks. Interactions of MPR and size seem to mainly affect in long-term commercial rates, while MPR changes interacted with size affect rates of short- and medium-term consumer rates. Interactions with the inflation rate, and changes in this, impact medium-term commercial rates and mid-to-long-term consumer rates. In conclusion, size does seem to have some impact on how banks set interest rates.

[Table 6]

Liquidity

As shown in Table 7, liquidity seems to generally have little impact on how banks change their interest rates. One-to-three-month commercial rates change more when the rate is high and less when the MPR is high, more so in well-liquid banks. Short- and long-term consumer rates react to MPR changes, more so in banks with more liquidity. Finally, mortgage rates seem to react to inflation, less so in more liquid banks.

[Table 7]

Excess capital

Evidence presented in Table 8 indicates that excess capital seems to matter somewhat for short-to-medium-term commercial rates and for consumer rates, but not when fixing real interest rates. Short-term commercial rates are changed more, or less negatively, in well capitalized banks and, those of loans with a horizon between one and three months are affected by the interaction of excess capital and MPR in the sense that well capitalized banks take more into account the MPR level and changes. Also for deciding on consumer rates interactions with the MPR are taken into account, MPR level for short-term loans and changes for loans with longer horizons. Finally, changes in the inflation rate seem to matter for banks when fixing rates of short-to-medium-term commercial rates, more so in well capitalized banks.

[Table 8]

Deposit ratio

As shown in Table 9, deposit strength seems to be a quite important parameter for banks when fixing rates of, particularly, commercial loans. In general, banks with strong deposit positions tend to raise interests less, or reduce them more, than banks with weaker positions. On the other hand, the higher the interest rate, strong positioned banks tend to change the rate more, but they change less if MPR is high. The same is true for real commercial loans. Nominal rates of short- and medium-term commercial loans as well as those of medium-term consumer loans react to the inflation rate, more so in banks with strong deposits positions, while MPR changes have higher effects on medium-term commercial loans in banks with a strong deposit position. No strong evidence suggests that mortgage rates are influenced by deposit positions of banks.

[Table 9]

Long-term loan ratio

Long-term loan ratio is important only for commercial rates, as shown in Table 10, where it has direct effect on short-to-medium-term and long-term rates, but with different impact such that banks with higher ratios change one-to-three months rates more, or less negatively and the opposite is the case for long-term rates. Only interaction with levels of included variables matters for fixing rates. Hence, the higher the interest level, the more do banks change rates, more so banks focused on long-term loans, while the opposite is true with respect to interaction with the MPR level. For medium-term loans interaction with inflation seems to matter, higher inflation, smaller changes in interest rate, which is most pronounced in banks with high ratios.

[Table 10]

Non-interest income

Non-interest income (nii) seems to have some influence in interest rates determination for commercial loans with relative short horizons, consumer loans with relatively long horizons, and commercial loans with real interest rates, as shown in Table 11, even though there is no strong evidence of direct effects in any of the cases. Interaction of nii with MPR affects short-term commercial rates, with a negative coefficient, i.e. MPR affects interest rate hikes less in banks with high nii. Changes in the MPR have same effect, but the sign is opposite for long-term consumer rates. Short-to-medium-term commercial and medium-term consumption rates are affected by interaction with inflation changes, such that they affect less fixing of interest rates in banks with high nii. Real commercial rates are impacted by interactions with MPR and inflation with opposite signs. Hence, MPR (inflation) affects interest rate fixing negatively (positively), more so in banks with high nii.

[Table 11]

Quality of portfolio

Quality of portfolio, or bad loan ratio, affects commercial loans of the three segments with shortest horizons and short- and mid-to-long-term consumer loans as shown in Table 12. Also fixing of mortgage rates is influenced directly by bad-loan-ratio such that banks with a high ratio change rates less in case of a positive change and more when the change is negative. Hence, it seems that banks with relatively bad portfolios are interested in incorporating more mortgage loans, supposedly to bring down the relative importance of provisions. The two shortest segments of commercial loans are impacted by interaction with MPR and inflation, but with opposite signs, i.e. short-term loan rate changes are affected positively by the MPR, more so in banks with relative bad portfolios, and negatively to the inflation rate. The reverse happens for short-to-medium-term rates. Interaction with MPR changes matter for medium-term commercial and consumer rates and to some extent for the short-term consumer rate. MPR changes have initially negative effect on interest rate determination, but this effect is practically reversed after one month.

[Table 12]

External obligations

As shown in Table 13, external obligations have some impact on interest rate determination, especially for loans with longer horizons. Rates of short- and long-term commercial loans, and loans with real interest rates, are affected negatively by external obligations such that the higher the degree of external obligations, the less do rates increase or they fall more in case of a negative adjustment. Rates of short-to-medium-term commercial loans are negatively affected by interaction of external obligations with the inflation rate, i.e. banks with more external obligations have lower pass-through of changes into the inflation rate. Medium-to-long-term commercial rates are influenced by interaction with MPR as well as inflation rate. MPR (inflation) has a negative (positive) impact on interest rate changes and the sizes of the coefficients are almost equal. MPR changes initially have a negative impact on interest changes, but this is more than compensated by a positive impact after a month. Inflation changes, on the other hand, have initially a positive impact. Long-term commercial loans are positively impacted by MPR changes, more so in banks with greater external obligations. Banks take into account MPR level when deciding on short- and long-term consumer rates and impact is negative; hence, banks with higher external obligations raise rates less or lower them more. Finally, real commercial rates are affected by interest rate level: the higher the level, the higher the changes, more so in banks with more external obligations.

[Table 13]

4.3 Conditional Impulse-Response Functions

To convey in a more transparent manner the quantitative implications of our results, we calculate impulse-response functions to MPR and inflation changes conditioning on banks' characteristics.

Conditional impulse-response functions were calculated as follows. In equation 9 all banks' characteristics were fixed to their mean value except one, i.e. $(\mathbf{z}_{kt-1} - \bar{\mathbf{z}})_{-k} = \mathbf{0}$ and $(\mathrm{z}_{\mathrm{i}\,t-1} - \bar{\mathrm{z}})_k$ free. The free characteristic we fix it at a specific value, e.g. quantile 25. Finally, we compute the impulse-response function for a 1% MPR and inflation change, respectively. We repeat the exercise for quantiles 50 and 75.

Results of the conditional pass-through exercises are presented in Figures 4-9. Figure 4 presents conditional pass-through of MPR change to commercial rates, Figure 5 of inflation rate change, Figure 6 (7) pass-through of MPR (inflation) change to consumer rates, while Figures 8 and 9 show conditional pass-through to real rates of an MPR change. The results of this exercise confirm that short-term commercial interest rates are affected by MPR pass-through, while long-term rates are more influenced by inflationary pass-through. Real commercial rates are affected by pass-through of MPR changes, while pass-through to mortgage rates seems to be limited. With respect to bank characteristics, the main results are the following. MPR pass-through to short-term commercial nominal rates is mainly affected by capital, non-interest-income and portfolio quality, while pass-through to long-term rates is mostly affected by size. Also with respect to nominal consumer rates, those of short-term seem to be principally affected by provisions and those of long-term by size. Inflationary pass-through to long-to-medium-term commercial rates is particularly influenced by deposit strength and non-interest-income, while long-term rate pass-through is especially affected by bank size. Several bank characteristics seem to affect inflationary pass-through to consumer rates, but it should be kept in mind that these results are affected by a great deal of uncertainty as there is a lot of heterogeneity in these rates. Finally, MPR pass-through to real commercial rates seems to be initially higher in banks with poor portfolio quality, while pass-through to mortgage rates seems to depend little of bank characteristics. In what follows, further details of results are supplied.

Effects of MPR Changes on Nominal Commercial Rates

In general terms, MPR pass-through tends to be larger for short-term rates than for those at longer terms. Size seems to matter somewhat for pass-through and, with the exception of the one-to-three month horizon, evidence suggests that smaller banks exhibit higher pass-through. Liquidity does not seem to be an important determinant for interest rate pass-through, though it may have some impact in the short run for loans with horizons of more than three months. Capital seems to matter for short- and long-term interest rates, such that pass-through is higher in well capitalized banks. Deposit strength matters mainly for very short-term rates in the sense that initially pass-through is lower in banks with little deposit strength, but it is higher in the long run. The long-term loan ratio matters for medium-to-long term rates, where banks with larger ratios experience higher pass-through. On the other hand, nii matters for short-term rates, higher nii implying higher pass-through. Quality of portfolio seems to be an important parameter, at least for the short-term pass-through, but reactions are very different for different horizons of loans. In the long-run, however, effects are different for short-term rates, where pass-through is lowest in banks with worst portfolio quality. Finally, external liabilities have little effect on MPR pass-through.

[Figure 4]

Effects of Inflation Changes on Nominal Commercial Rates

Inflation pass-through seems to be larger for long-term interest rates than for the short term. For the latter, marginal pass-through tends to be negative, i.e. negative effect on total pass-through. Marginal pass-through of inflation changes to short-term commercial rates seems to be affected mainly by portfolio quality such that it is higher in banks with more provisions. Pass-through to one-to-three month rates seems to be affected mainly by deposit strength, worse strength, higher (negative) pass-through, while the characteristics which have some impact on medium-term rates are deposit strength and long-term loan ratio. Strongest effects, however, are found in medium-to-long-term rates. For one-to-three year rates inflation pass-through is more pronounced in banks with low deposit strength and with high non-interest income. For long-term rates particularly size matters, smaller pass-through in big banks, but also deposit and long-term loan ratios seem to be important.

[Figure 5]

Effects of MPR Changes on Nominal Consumer Rates

While pass-through to rates of loans with horizons to three years initially is low it increases quickly to a higher rate. For loans with horizons longer than three years, the picture is the opposite such that the pass-through rate initially is high, but falls quickly and then rises to be stabilized at a higher level. Pass-through to short-term rates is higher in large banks, with few external liabilities and relatively good portfolio quality. For rates of loans with horizons between one and three months, pass-through seems to be largest in big banks with little liquidity and capital, high degree of external liabilities and relatively good quality of the lending portfolio. Pass-through to medium-to-long-term rates tends to depend positively on size, liquidity and excess capital, and negatively on deposit strength, bad loans, and non-interest income. Finally, pass-through to long-term rates is mainly affected by deposit strength, such that the stronger the position the lower the pass-through.

[Figure 6]

Effects of Inflation Changes on Nominal Consumer Rates

Several bank characteristics seem to affect pass-through of inflation changes on nominal consumer rates. It should be remembered, however, that results are affected by a great deal of uncertainty due to much heterogeneity amongst the rates set by each bank. Size and portfolio quality seem to be the most important factors across lending horizons (smaller bank, higher pass-through) while impact of bad loan ratio varies across horizons. Short-term rates are also affected by liquidity (better liquidity, more pass-through) and external liabilities (smaller, more negative, pass-through the higher the ratio).

[Figure 7]

Effects of MPR Changes on Real Interest Rates

MPR pass-through to real commercial rates seems to be higher in banks with poor portfolio quality, i.e. big bad loan ratios and in the smaller banks, though this last effect is not pronounced in the long run. Pass-through to mortgage rate seems to depend little of bank characteristics, but in the short run there may be lower pass-through in banks having least deposit strength and worst portfolio quality.

[Figure 8] [Figure 9]

5 Concluding Remarks

In this paper we aimed at understanding better the complex monetary transmission mechanism, by focusing on the part having to do with pass-through from changes in official interest rates to bank rates. A theoretical framework was presented to argue that also the inflation rate should be taken into account when analyzing pass-through as other scholars have argued that the term premium may be accounted for by inflation uncertainty. Analysis was made with Chilean micro data of interest rates and banks' balance sheets covering the period from 2008 to 2014. With these data we estimated econometric panel models explaining variations in interest rates for nominal and real commercial and consumer loans with different payback horizons. With a conditional impulse-response analysis we investigated what bank characteristics affect pass-through to rates of loans with different horizons.

A closer look at the decomposition of the average interest rates used in the analyses revealed that short-term consumer rates are quite rigid in the sense that they will move little with changes in the monetary policy rate. This, because a large percentage of the total rate is either predetermined by contracts or due to zero interest rate promotions.

The main results of the empirical analysis suggested that short-term commercial interest rates have a relatively fast pass-through, while those of long-term seem to react more to inflation. It turned out that particularly size and deposit strength affect banks when fixing nominal commercial rates, while determination of rates of consumer loans is mainly influenced by size of the bank and its capital strength. Turning to real interest rates, commercial rates are impacted by deposit strength, non-interest income and external obligations, while real mortgage rates are affected by liquidity strength and provisions.

When pass-through is conditioned on different characteristics of the banks, it turns out that the loan horizon is important. MPR pass-through to short-term commercial nominal rates seems to be especially affected by capital, non-interest-income and portfolio quality. Pass-through to long-term commercial rates is mostly affected by size. Short-term nominal consumer rates are principally affected by provisions and those of long-term by size. Inflationary pass-through to long-to-medium-term commercial rates is particularly influenced by deposit strength and non-interest-income, while long-term rate pass-through is especially affected by bank size. Several bank characteristics seem to affect inflationary pass-through to consumer rates, but these results are affected by a great deal of uncertainty because of a lot of heterogeneity in these rates. Finally, MPR pass-through to real commercial rates seems to be initially higher in banks with poor portfolio quality, while pass-through to mortgage rates seems to depend little on bank characteristics.

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Table 1: Structure of the chilean financial system (2013)

Nominal interest rate	Number	% total loans	% total deposits
Foreign banks	14	44.64	49.95
Local private banks	10	50.69	43.10
State-owned bank	1	4.68	6.95

Real interest rate	Number	% total loans	% total deposits
Foreign banks	14	36.97	30.60
Local private banks	10	53.80	35.24
State-owned bank	1	9.23	34.16

Notes: Total loans include commercial and consumption loans.

Table 2: Structure of the chilean lending market (2013)

	Loan type				Denomination				
	CONS	COM	FT	MORT	CONS	COM	FT	MORT	
Nominal	99.1	78.7	11.2	0.0	19.0	78.2	2.8	0.0	100.0
Real	0.9	10.0	0.0	100.0	1.1	66.8	0.1	32.1	100.0
USD	0.1	11.3	88.8	0.0	0.0	34.1	65.9	0.0	100.0
	100.0	100.0	100.0	100.0					

Notes: CONS: consumption loans, COM: commercial loans, FT: foreign trade, MORT: mortgage loans. Nominal (Real): Loans in CLP with nominal (real) interest rate. USD: Loans in USD.
Source: Authors's calculations based on data from Central Bank of Chile.

Table 3: Contents of commercial and consumption interest rates (2013)

% Commercial rates

Chile	IFRS	Component	< 30 days	30-89 days	90 days-1 year	1-3 years	>3 years
1105	1302.1.01	Amortizing loans	68.1	53.1	40.5	38.2	59.8
1145	1302.3	Approved overdraft current account	9.4	4.8	55.3	60.2	32.1
1150	1302.9.02	Approved overdraft other accounts and credit cards	3.6	0.0	3.8	0.1	0.0
1155	1302.9.01	Non-approved overdraft current account	18.9	41.9	0.0	0.0	0.0
1160	1302.9.11	Credit card purchases paid in fees	0.0	0.1	0.3	0.1	0.1
1165	1302.9.12	Revolving credit card debt	0.0	0.1	0.0	1.4	8.0

% Consumption rates

Chile	IFRS	Component	< 30 days	30-89 days	90 days-1 year	1-3 years	>3 years
1205	1305.1	Amortizing loans	2.1	11.0	7.7	25.7	37.8
1210	1305.9.81	Credit payed in fees via paycheck	0.0	0.0	0.2	1.5	3.3
1220	1305.3	Approved overdraft current account	6.1	14.8	52.3	26.1	8.5
1225	1305.9.01	Approved overdraft other account and credit cards	21.9	0.1	5.1	1.8	0.0
1230	1305.9.01	Non-approved overdraft current account	69.8	20.3	0.0	0.0	0.0
1235	1305.4.01	Credit card purchases paid in fees	0.0	53.8	34.2	8.2	2.2
1240	1305.4.02	Revolving credit card debt	0.0	0.0	0.6	36.6	48.2

Notes: Chile: Classification in Chile. IRFS: International Financial Reporting Standards..
Source: Authors's calculations based on data from Central Bank of Chile.

Table 4: Descriptive statistics of bank characteristics (2013)

Characteristic	Description	Mean	Std. Error	Min	Max
Size	Total assets	14.720	1.992	10.174	17.071
Liquidity ratio	Cash and securities over total assets	0.101	0.116	0.027	0.460
Excess capital	Difference between regulatory capital and capital requirements	10.034	14.056	1.486	60.335
Deposit strength	Deposits over bonds plus deposits	0.869	0.091	0.701	1.000
Long term loans	One year or more commercial loans over total commercial loans	0.169	0.121	0.038	0.469
Capital	Capital over total assets	0.144	0.154	0.053	0.697
Non-interest income	Commissions and other operational incomes over total incomes	0.129	0.041	0.058	0.202
Bad loans	Provisions over loans	0.022	0.009	0.011	0.046
External obligations	Deposits abroad over total deposits	0.075	0.218	0.000	0.929

Notes: Calculated with observations from 14 banks.
Source: Authors's calculations based on data from Central Bank of Chile.

Table 5: Direct effects of MPR and inflation.

	Commercial rate						Consumption rate					Com. Real	Mortgage
	<30D	1 - 3M	3 - 12M	1-3Y	>3Y	Total	<3M	3 - 12M	1-3Y	>3Y	Total	Total	Total
MPR (-1)	0.357	0.789***	0.218	0.054	-0.198	0.584**	0.383	0.288	0.419	0.763	0.217	0.295**	0.024
	(0.424)	(0.150)	(0.271)	(0.157)	(0.193)	(0.233)	(0.447)	(0.536)	(0.335)	(0.631)	(0.342)	(0.129)	(0.026)
ΔMPR	-0.489	1.355**	0.949	-0.604	-0.793	0.947	-1.773	-1.918	-2.440	3.189**	-0.342	0.203	-0.076
	(1.750)	(0.452)	(0.861)	(0.637)	(0.642)	(1.015)	(1.414)	(2.594)	(1.521)	(1.389)	(1.047)	(0.515)	(0.121)
ΔMPR(-1)	0.906	-0.917**	-0.285	0.741	0.441	-0.501	4.175**	2.239	2.589**	-2.481*	-0.159	-0.637	-0.076
	(1.631)	(0.463)	(0.877)	(0.551)	(0.540)	(1.044)	(1.426)	(2.199)	(1.149)	(1.306)	(0.995)	(0.478)	(0.088)
π(-1)	-0.535*	-0.132	0.162	0.224	0.367**	-0.257	-0.106	-0.225	-0.730**	0.094	0.098	-0.100	0.002
	(0.320)	(0.095)	(0.160)	(0.148)	(0.167)	(0.191)	(0.455)	(0.546)	(0.351)	(0.505)	(0.275)	(0.073)	(0.015)
$\Delta\pi$	0.854	-0.361	0.019	0.195	0.465*	0.016	0.481	-0.931	-0.470	-0.218	0.548	-0.167	0.049*
	(0.670)	(0.294)	(0.320)	(0.262)	(0.266)	(0.384)	(0.580)	(0.941)	(0.632)	(1.066)	(0.529)	(0.172)	(0.029)
$\Delta\pi$(-1)	0.447	0.242	-0.121	-0.331	-0.316	0.011	-0.593	-0.844	0.446	0.657	0.304	-0.227	0.032
	(0.759)	(0.228)	(0.291)	(0.292)	(0.321)	(0.355)	(0.576)	(1.014)	(0.583)	(1.103)	(0.483)	(0.200)	(0.037)
Obs.	806	808	814	810	766	819	537	623	623	613	722	237	229
R^2	0.404	0.501	0.412	0.398	0.427	0.369	0.340	0.248	0.307	0.208	0.252	0.545	0.636

Notes: Numbers in parentheses are robust standard errors. * Significant at 10%, ** significant at 5%, *** significant at 1%. (-1) indicates the variable is lagged one period.

Table 6: Effects of bank size (Size).

	Commercial rate						Consumption rate					Com. Real	Mortgage
	<30D	1 - 3M	3 - 12M	1-3Y	>3Y	Total	<3M	3 - 12M	1-3Y	>3Y	Total	Total	Total
Size(-1)	-0.017	-0.017***	-0.007*	0.009	0.003	-0.004	0.076**	0.019	0.005	0.012	0.016	-0.010	0.000
	(0.012)	(0.004)	(0.004)	(0.009)	(0.011)	(0.006)	(0.037)	(0.024)	(0.022)	(0.016)	(0.010)	(0.011)	(0.006)
i(-1)*Size(-1)	0.001**	0.001***	0.001**	0.001	0.000	0.001**	-0.003**	-0.001	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.002)	(0.001)
MPR(-1)*Size(-1)	-0.002	-0.001*	-0.001*	-0.001	-0.004**	-0.001**	0.004	-0.005*	0.000	-0.002	-0.003**	0.001	0.000
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.000)
π(-1)*Size(-1)	0.000	0.000	0.000	0.000	0.002	0.000	0.002	0.005**	0.002	0.002	0.003**	0.000	0.000
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.003)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.000)
ΔMPR*Size(-1)	0.003	0.001	0.001	0.002	-0.007	0.000	-0.004	0.013	0.016**	-0.006	0.005	-0.001	-0.001
	(0.006)	(0.001)	(0.002)	(0.004)	(0.005)	(0.002)	(0.009)	(0.013)	(0.008)	(0.005)	(0.004)	(0.007)	(0.002)
$\Delta\pi$*Size(-1)	0.003	0.001	0.000	-0.001	0.004	0.000	-0.007	0.012**	0.009**	0.004	0.003	0.000	0.000
	(0.002)	(0.001)	(0.001)	(0.002)	(0.003)	(0.001)	(0.006)	(0.006)	(0.004)	(0.003)	(0.002)	(0.002)	(0.000)
ΔMPR(-1)*Size(-1)	-0.004	-0.002	-0.001	-0.005	0.005	-0.001	-0.017**	-0.012	-0.011*	0.003	-0.003	0.004	0.001
	(0.006)	(0.001)	(0.001)	(0.004)	(0.005)	(0.002)	(0.008)	(0.015)	(0.006)	(0.005)	(0.004)	(0.007)	(0.002)
$\Delta\pi$(-1)*Size(-1)	-0.002	-0.001	-0.002**	0.002	0.000	-0.001	0.009	-0.001	-0.003	-0.003	-0.003	0.000	0.000
	(0.002)	(0.001)	(0.001)	(0.002)	(0.003)	(0.001)	(0.006)	(0.005)	(0.004)	(0.003)	(0.002)	(0.002)	(0.001)
F(All)	**0.03**	**0.00**	**0.00**	0.17	**0.01**	**0.04**	**0.02**	**0.02**	**0.05**	0.52	**0.02**	0.97	0.34
F(MPR)	0.40	0.09	0.20	0.18	**0.04**	0.10	**0.02**	**0.03**	0.15	0.56	**0.01**	0.79	0.86
F(Inflation)	0.58	0.49	**0.02**	0.80	0.17	0.74	0.15	0.09	0.09	0.41	0.12	1.00	0.32

Notes: See table 5. F(All)/F(MPR)/F(π) is the p-value for the hypothesis that all the variables / the variables including MPR / π are jointly zero when applying an F-test.

Table 7: Effects of liquidity (Liq).

	Commercial rate						Consumption rate					Com. Real	Mortgage
	<30D	1 - 3M	3 - 12M	1-3Y	>3Y	Total	<3M	3 - 12M	1-3Y	>3Y	Total	Total	Total
Liq(-1)	0.017	0.010	0.090	-0.187	-0.191	0.016	-0.007	0.201	-0.034	-0.360*	-0.171	-0.285	0.133
	(0.153)	(0.057)	(0.070)	(0.136)	(0.169)	(0.071)	(0.295)	(0.277)	(0.225)	(0.186)	(0.121)	(0.222)	(0.113)
i(-1)*Liq(-1)	-0.009	0.018**	-0.011	0.000	0.016	-0.002	0.012	-0.001	0.001	0.006	0.003	0.074	-0.019
	(0.013)	(0.009)	(0.008)	(0.009)	(0.010)	(0.009)	(0.013)	(0.006)	(0.009)	(0.007)	(0.004)	(0.046)	(0.026)
MPR(-1)*Liq(-1)	0.027	-0.033**	-0.009	0.047	-0.023	-0.003	0.043	-0.091	-0.031	0.092**	0.061	-0.002	0.002
	(0.065)	(0.016)	(0.019)	(0.044)	(0.050)	(0.021)	(0.094)	(0.098)	(0.051)	(0.046)	(0.037)	(0.031)	(0.008)
π(-1)*Liq(-1)	-0.006	0.004	0.006	-0.055	-0.007	-0.006	-0.102	0.064	0.036	-0.054	-0.043	-0.027	-0.018**
	(0.053)	(0.013)	(0.016)	(0.042)	(0.043)	(0.018)	(0.089)	(0.085)	(0.041)	(0.041)	(0.033)	(0.019)	(0.006)
ΔMPR*Liq(-1)	0.152	-0.067	-0.029	0.255	-0.235	0.031	0.212	0.214	0.101	0.395**	0.226	-0.027	-0.061
	(0.268)	(0.069)	(0.087)	(0.189)	(0.270)	(0.086)	(0.318)	(0.331)	(0.191)	(0.145)	(0.145)	(0.173)	(0.065)
$\Delta\pi$*Liq(-1)	0.026	0.012	0.009	-0.061	-0.008	0.015	-0.094	0.182	0.132	0.075	0.133*	0.057	-0.003
	(0.106)	(0.033)	(0.042)	(0.096)	(0.096)	(0.042)	(0.210)	(0.189)	(0.115)	(0.103)	(0.075)	(0.071)	(0.016)
ΔMPR(-1)*Liq(-1)	-0.184	-0.034	-0.126	-0.140	-0.107	-0.074	0.582**	-0.437	0.115	-0.245**	-0.074	0.056	-0.020
	(0.218)	(0.063)	(0.094)	(0.192)	(0.230)	(0.077)	(0.294)	(0.366)	(0.206)	(0.122)	(0.122)	(0.192)	(0.063)
$\Delta\pi$(-1)*Liq(-1)	-0.066	-0.001	-0.012	0.015	-0.006	0.014	-0.371*	-0.240	-0.064	-0.069	-0.055	-0.044	0.004
	(0.113)	(0.030)	(0.035)	(0.078)	(0.091)	(0.038)	(0.200)	(0.227)	(0.111)	(0.095)	(0.071)	(0.062)	(0.014)
F(All)	0.98	0.09	0.21	0.76	0.24	0.60	0.05	0.72	0.80	0.12	0.13	0.10	0.00
F(MPR)	0.87	0.10	0.21	0.54	0.34	0.76	0.02	0.32	0.51	0.04	0.22	0.99	0.19
F(Inflation)	0.92	0.98	0.98	0.52	1.00	0.79	0.08	0.72	0.66	0.19	0.08	0.39	0.02

Notes: See table 5.

Table 8: Effects of excess capital (E_Cap).

	Commercial rate						Consumption rate					Com. Real	Mortgage
	<30D	1 - 3M	3 - 12M	1-3Y	>3Y	Total	<3M	3 - 12M	1-3Y	>3Y	Total	Total	Total
E_Cap(-1)	0.008**	0.001	0.002	-0.005*	0.005	0.001	0.012	0.009	0.000	0.002	0.005	-0.004	-0.002
	(0.003)	(0.001)	(0.001)	(0.003)	(0.004)	(0.001)	(0.014)	(0.008)	(0.006)	(0.008)	(0.004)	(0.005)	(0.003)
i(-1)*E_Cap(-1)	0.000**	0.000	0.000	0.000	0.000	0.000	-0.001	0.000	0.000	0.000	0.000	0.001	0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)
MPR(-1)*E_Cap(-1)	-0.001	0.001**	0.000	0.000	-0.001	0.000	0.003**	-0.001	0.001	0.001	0.000	0.000	0.000
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
π(-1)*E_Cap(-1)	-0.001	0.000*	0.000	-0.001	0.000	0.000	-0.001	0.000	0.000	0.000	0.000	0.000	0.000
	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.000)
ΔMPR*E_Cap(-1)	-0.004	0.002**	0.002*	0.003	-0.006	0.001	0.000	0.001	0.007**	0.003	0.004**	-0.004	-0.001
	(0.003)	(0.001)	(0.001)	(0.002)	(0.006)	(0.001)	(0.003)	(0.005)	(0.003)	(0.002)	(0.002)	(0.004)	(0.001)
$\Delta\pi$*E_Cap(-1)	0.002	-0.001	0.000	0.000	0.001	0.000	-0.005	0.001	0.000	0.000	0.001	0.000	0.000
	(0.001)	(0.001)	(0.000)	(0.001)	(0.002)	(0.000)	(0.003)	(0.002)	(0.001)	(0.002)	(0.001)	(0.001)	(0.000)
ΔMPR(-1)*E_Cap(-1)	0.004	-0.002**	-0.001	-0.003	0.002	0.000	-0.003	-0.001	-0.006**	-0.004**	-0.004**	0.004	-0.001
	(0.003)	(0.001)	(0.001)	(0.002)	(0.004)	(0.001)	(0.004)	(0.005)	(0.002)	(0.002)	(0.002)	(0.004)	(0.001)
$\Delta\pi$(-1)*E_Cap(-1)	0.001	0.001	0.000	0.000	-0.002	0.000	0.002	0.006**	0.000	0.001	0.000	-0.001	0.000*
	(0.002)	(0.000)	(0.000)	(0.001)	(0.002)	(0.000)	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.000)
F(All)	**0.00**	**0.04**	0.21	0.34	0.56	0.26	0.41	0.21	0.12	0.38	0.09	0.70	**0.03**
F(MPR)	0.62	**0.02**	0.29	0.50	0.42	0.75	0.10	0.82	**0.04**	0.23	0.05	0.58	0.21
F(Inflation)	0.26	0.13	0.68	0.52	0.69	0.64	0.44	0.05	0.95	0.97	0.65	0.84	0.20

Notes: See table 5.

Table 9: Effects of deposit strength (Dep).

	Commercial rate						Consumption rate					Com. Real	Mortgage
	<30D	1 - 3M	3 - 12M	1-3Y	>3Y	Total	<3M	3 - 12M	1-3Y	>3Y	Total	Total	Total
Dep(-1)	-0.228	-0.065**	-0.061*	-0.049	-0.184	-0.179**	-0.028	-0.486**	-0.094	0.196	0.264**	-0.272**	-0.020
	(0.151)	(0.030)	(0.036)	(0.105)	(0.167)	(0.066)	(0.243)	(0.190)	(0.109)	(0.135)	(0.120)	(0.090)	(0.077)
i(-1)*Dep(-1)	0.014**	0.020**	0.011***	0.010	0.014*	0.020***	-0.009	0.004	0.005	0.000	-0.004	0.074***	0.006
	(0.006)	(0.007)	(0.003)	(0.006)	(0.008)	(0.006)	(0.012)	(0.005)	(0.004)	(0.005)	(0.004)	(0.019)	(0.018)
MPR(-1)*Dep(-1)	0.023	-0.017**	-0.009	-0.040**	-0.001	-0.011	0.009	0.063*	0.033	-0.020	-0.021	-0.023*	-0.003
	(0.029)	(0.007)	(0.007)	(0.014)	(0.018)	(0.007)	(0.064)	(0.034)	(0.023)	(0.021)	(0.018)	(0.013)	(0.003)
π(-1)*Dep(-1)	-0.012	-0.006	-0.011	0.025*	0.007	-0.009	-0.023	0.016	-0.023	0.019	0.026	0.013	0.003
	(0.022)	(0.004)	(0.007)	(0.014)	(0.020)	(0.008)	(0.053)	(0.034)	(0.022)	(0.022)	(0.020)	(0.010)	(0.003)
ΔMPR*Dep(-1)	-0.036	0.000	-0.036	-0.060	-0.060	0.000	-0.153	-0.102	0.164	0.059	-0.144*	-0.078	-0.022
	(0.056)	(0.013)	(0.023)	(0.040)	(0.050)	(0.022)	(0.206)	(0.193)	(0.101)	(0.106)	(0.083)	(0.067)	(0.020)
$\Delta\pi$*Dep(-1)	0.096**	0.003	-0.005	0.045	0.071**	0.032**	0.032	0.138**	0.021	-0.003	0.032	0.043*	0.000
	(0.047)	(0.008)	(0.013)	(0.028)	(0.029)	(0.013)	(0.088)	(0.063)	(0.042)	(0.040)	(0.034)	(0.024)	(0.005)
ΔMPR(-1)*Dep(-1)	-0.127*	-0.005	0.052**	0.060	0.018	0.024	0.303	0.334	-0.007	0.007	0.159**	0.093	-0.024
	(0.072)	(0.016)	(0.020)	(0.047)	(0.049)	(0.031)	(0.186)	(0.208)	(0.094)	(0.097)	(0.072)	(0.069)	(0.017)
$\Delta\pi$(-1)*Dep(-1)	0.013	-0.001	-0.005	-0.015	0.031	-0.024*	-0.068	0.009	0.014	-0.016	-0.024	0.025	0.004
	(0.036)	(0.009)	(0.014)	(0.027)	(0.029)	(0.014)	(0.087)	(0.058)	(0.042)	(0.041)	(0.032)	(0.023)	(0.006)
F(All)	0.00	0.03	0.00	0.12	0.05	0.00	0.61	0.05	0.29	0.98	0.46	0.01	0.64
F(MPR)	0.00	0.06	0.07	0.04	0.58	0.24	0.32	0.09	0.15	0.62	0.12	0.19	0.22
F(Inflation)	0.21	0.48	0.37	0.19	0.02	0.00	0.76	0.16	0.56	0.83	0.53	0.17	0.57

Notes: See table 5.

Table 10: Effects of long term loans (LTerm).

	Commercial rate						Consumption rate					Com. Real	Mortgage
	<30D	1 - 3M	3 - 12M	1-3Y	>3Y	Total	<3M	3 - 12M	1-3Y	>3Y	Total	Total	Total
LTerm(-1)	0.041	0.022**	-0.004	0.027	-0.109**	-0.001	-0.074	0.011	0.011	-0.035	-0.053**	0.016	0.006
	(0.033)	(0.009)	(0.014)	(0.029)	(0.050)	(0.021)	(0.054)	(0.035)	(0.024)	(0.024)	(0.022)	(0.018)	(0.008)
i(-1)*LTerm(-1)	-0.003	0.003**	0.000	0.003*	0.007**	-0.001	0.002	-0.001	0.000	0.002	0.002	-0.002	-0.002
	(0.003)	(0.001)	(0.001)	(0.002)	(0.003)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.002)
MPR(-1)*LTerm(-1)	0.000	-0.010***	0.002	-0.019**	0.009	0.003	-0.003	0.010	-0.006	-0.005	-0.005	0.000	0.000
	(0.007)	(0.002)	(0.003)	(0.006)	(0.007)	(0.003)	(0.014)	(0.011)	(0.005)	(0.006)	(0.005)	(0.003)	(0.000)
π(-1)*LTerm(-1)	0.000	0.001	-0.005**	0.007	0.002	-0.001	0.002	-0.007	0.007	0.002	0.006	-0.001	0.000
	(0.005)	(0.002)	(0.002)	(0.005)	(0.006)	(0.002)	(0.012)	(0.010)	(0.005)	(0.005)	(0.004)	(0.002)	(0.000)
ΔMPR*LTerm(-1)	-0.014	0.002	-0.009	-0.020	0.002	-0.012	-0.026	0.040	-0.004	0.013	0.017	-0.005	0.002
	(0.039)	(0.010)	(0.012)	(0.029)	(0.049)	(0.016)	(0.047)	(0.043)	(0.029)	(0.024)	(0.024)	(0.020)	(0.005)
$\Delta\pi$*LTerm(-1)	0.006	-0.008*	-0.009	-0.019	0.002	0.000	-0.034	-0.008	-0.015	-0.009	-0.006	0.008	-0.002*
	(0.013)	(0.005)	(0.006)	(0.014)	(0.016)	(0.006)	(0.032)	(0.018)	(0.010)	(0.011)	(0.010)	(0.005)	(0.001)
ΔMPR(-1)*LTerm(-1)	-0.010	-0.013	-0.002	0.027	-0.009	-0.010	0.033	-0.030	0.001	-0.015	0.008	0.010	-0.004
	(0.039)	(0.010)	(0.012)	(0.031)	(0.039)	(0.021)	(0.045)	(0.051)	(0.024)	(0.024)	(0.021)	(0.019)	(0.005)
$\Delta\pi$(-1)*LTerm(-1)	-0.007	-0.008*	-0.005	0.009	-0.002	-0.010*	0.010	0.001	-0.011	-0.008	-0.011	0.003	0.000
	(0.014)	(0.004)	(0.006)	(0.013)	(0.017)	(0.006)	(0.032)	(0.022)	(0.011)	(0.010)	(0.009)	(0.005)	(0.001)
F(All)	0.97	**0.00**	**0.02**	**0.01**	0.34	**0.03**	0.82	0.90	0.31	0.59	0.29	0.72	0.66
F(MPR)	0.89	**0.00**	0.50	**0.03**	0.64	0.07	0.89	0.69	0.75	0.63	0.34	0.96	0.69
F(Inflation)	0.96	**0.05**	0.07	0.07	0.99	0.25	0.75	0.85	0.05	0.64	0.29	0.34	0.37

Notes: See table 5.

Table 11: Effects of non-interest income (NII).

	Commercial rate						Consumption rate					Com. Real	Mortgage
	<30D	1 - 3M	3 - 12M	1-3Y	>3Y	Total	<3M	3 - 12M	1-3Y	>3Y	Total	Total	Total
NII(-1)	0.130*	0.048*	0.035	0.011	0.041	-0.028	0.007	0.044	0.048	-0.001	0.060	0.058	0.045
	(0.072)	(0.025)	(0.029)	(0.075)	(0.098)	(0.031)	(0.112)	(0.074)	(0.064)	(0.075)	(0.070)	(0.103)	(0.045)
i(-1)*NII(-1)	-0.002	-0.007	-0.005	0.006	-0.006	0.005	0.004	-0.001	-0.003	0.002	-0.004	0.005	-0.007
	(0.006)	(0.006)	(0.004)	(0.005)	(0.006)	(0.004)	(0.005)	(0.002)	(0.004)	(0.003)	(0.003)	(0.022)	(0.011)
MPR(-1)*NII(-1)	-0.057**	0.008	0.009	0.020	0.029	-0.001	-0.007	0.022	0.024	0.011	0.028*	-0.033**	0.000
	(0.026)	(0.010)	(0.009)	(0.024)	(0.024)	(0.009)	(0.030)	(0.033)	(0.022)	(0.018)	(0.017)	(0.014)	(0.004)
π(-1)*NII(-1)	0.000	-0.014*	-0.011	-0.040*	0.005	-0.009	-0.013	-0.010	-0.034*	-0.010	-0.012	0.025**	-0.004
	(0.023)	(0.007)	(0.007)	(0.023)	(0.024)	(0.009)	(0.034)	(0.029)	(0.019)	(0.016)	(0.015)	(0.012)	(0.003)
ΔMPR*NII(-1)	-0.152***	-0.014	-0.010	0.039	0.058	0.007	0.067	0.033	0.000	0.053**	0.042	0.114	0.021
	(0.045)	(0.014)	(0.016)	(0.043)	(0.053)	(0.019)	(0.059)	(0.060)	(0.034)	(0.026)	(0.030)	(0.085)	(0.028)
$\Delta\pi$*NII(-1)	-0.040	-0.038**	-0.028**	-0.063	0.028	-0.037**	-0.031	-0.036	-0.080**	0.012	-0.004	0.012	0.006
	(0.040)	(0.017)	(0.014)	(0.039)	(0.055)	(0.016)	(0.064)	(0.058)	(0.035)	(0.031)	(0.028)	(0.031)	(0.007)
ΔMPR(-1)*NII(-1)	0.083*	0.000	0.011	-0.004	0.003	0.009	-0.076	0.007	0.011	-0.030	0.000	-0.016	-0.022
	(0.046)	(0.015)	(0.014)	(0.039)	(0.046)	(0.014)	(0.052)	(0.048)	(0.032)	(0.025)	(0.026)	(0.088)	(0.021)
$\Delta\pi$(-1)*NII(-1)	0.068*	0.016	-0.006	0.005	-0.079	0.004	0.028	0.062	0.039	0.002	0.010	-0.030	-0.002
	(0.036)	(0.013)	(0.013)	(0.036)	(0.054)	(0.014)	(0.058)	(0.043)	(0.030)	(0.028)	(0.024)	(0.022)	(0.006)
F(All)	**0.00**	0.07	**0.03**	**0.02**	0.35	0.06	0.11	0.53	0.12	0.27	0.20	0.19	0.31
F(MPR)	**0.01**	0.39	0.17	0.67	0.36	0.86	**0.04**	0.62	0.40	0.12	0.07	0.09	0.78
F(Inflation)	0.29	0.09	**0.04**	0.19	0.51	0.05	0.96	0.50	0.11	0.86	0.85	0.13	0.39

Notes: See table 5.

Table 12: Effects of bad loans (Bad).

	Commercial rate						Consumption rate					Com. Real	Mortgage
	<30D	1 - 3M	3 - 12M	1-3Y	>3Y	Total	<3M	3 - 12M	1-3Y	>3Y	Total	Total	Total
Bad(-1)	-1.133	0.560*	0.409	0.707	-1.970	-0.522	-0.870	-0.343	1.885*	1.152	0.590	2.093	-1.509**
	(1.051)	(0.315)	(0.360)	(1.020)	(1.509)	(0.501)	(2.297)	(2.010)	(1.045)	(1.235)	(0.854)	(1.436)	(0.765)
i(-1)*Bad(-1)	0.129*	-0.005	-0.002	-0.042	0.048	0.067	0.095	0.053	-0.032	-0.031	0.001	-0.321	0.334*
	(0.074)	(0.056)	(0.050)	(0.067)	(0.087)	(0.055)	(0.111)	(0.058)	(0.043)	(0.035)	(0.026)	(0.233)	(0.175)
MPR(-1)*Bad(-1)	0.430**	-0.206**	-0.013	-0.083	0.238	0.089	0.329	0.136	-0.067	-0.014	-0.106	-0.023	-0.052
	(0.195)	(0.081)	(0.076)	(0.178)	(0.191)	(0.073)	(0.538)	(0.411)	(0.221)	(0.233)	(0.160)	(0.169)	(0.039)
π(-1)*Bad(-1)	-0.363**	0.117**	-0.035	0.064	-0.134	-0.070	-0.704	-0.151	-0.214	0.177	0.082	0.010	0.030
	(0.171)	(0.053)	(0.056)	(0.163)	(0.153)	(0.067)	(0.490)	(0.381)	(0.200)	(0.204)	(0.147)	(0.126)	(0.031)
ΔMPR*Bad(-1)	1.228	-0.906**	-0.821**	-1.150	1.387	-0.358	-2.261	-2.576	-2.120**	-0.537	-1.592**	-0.135	0.434
	(1.357)	(0.297)	(0.415)	(1.044)	(1.357)	(0.378)	(1.560)	(2.064)	(1.054)	(0.763)	(0.769)	(1.056)	(0.275)
$\Delta\pi$*Bad(-1)	-0.060	0.026	0.023	0.328	0.182	0.100	0.745	-0.313	0.181	0.183	0.247	-0.108	0.029
	(0.470)	(0.146)	(0.161)	(0.414)	(0.431)	(0.196)	(0.858)	(0.728)	(0.382)	(0.359)	(0.306)	(0.321)	(0.060)
ΔMPR(-1)*Bad(-1)	-1.694	1.080***	0.923**	0.310	-0.460	0.371	3.864**	2.675	1.895**	1.039	0.649	-0.558	0.168
	(1.313)	(0.326)	(0.400)	(1.208)	(1.319)	(0.358)	(1.557)	(1.961)	(0.805)	(0.696)	(0.617)	(0.962)	(0.238)
$\Delta\pi$(-1)*Bad(-1)	-0.335	0.136	0.113	0.456	0.160	0.090	-0.190	-1.171	-0.341	0.354	0.014	0.273	-0.107
	(0.451)	(0.145)	(0.151)	(0.363)	(0.443)	(0.161)	(0.795)	(0.731)	(0.388)	(0.385)	(0.279)	(0.282)	(0.068)
F(All)	0.18	**0.01**	0.45	0.69	0.81	0.28	**0.04**	0.42	**0.04**	0.31	0.64	0.85	**0.00**
F(MPR)	0.08	**0.00**	0.14	0.43	0.43	0.36	**0.03**	0.46	0.10	0.44	0.18	0.84	**0.00**
F(Inflation)	0.17	0.10	0.79	0.34	0.66	0.53	0.11	0.22	0.39	0.53	0.84	0.79	0.29

Notes: See table 5.

Table 13: Effects of external obligations (Ext).

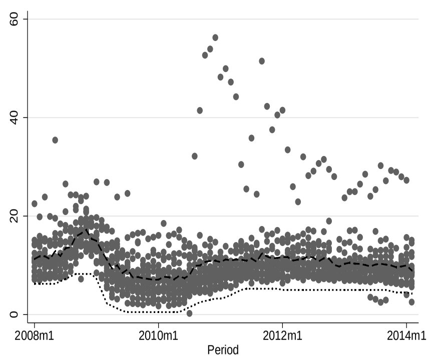
	Commercial rate						Consumption rate					Com. Real	Mortgage
	<30D	1 - 3M	3 - 12M	1-3Y	>3Y	Total	<3M	3 - 12M	1-3Y	>3Y	Total	Total	Total
Ext(-1)	-0.324**	0.085	-0.006	0.177	-0.776**	0.062	0.229	0.067	-0.350	0.948**	0.906***	-0.584**	0.092
	(0.152)	(0.062)	(0.076)	(0.186)	(0.323)	(0.082)	(0.891)	(0.305)	(0.314)	(0.399)	(0.272)	(0.189)	(0.226)
i(-1)*Ext(-1)	0.018	-0.033*	-0.001	0.001	0.025*	-0.035**	0.012	-0.006	0.016	-0.019*	-0.024**	0.106**	-0.028
	(0.020)	(0.020)	(0.015)	(0.012)	(0.013)	(0.015)	(0.036)	(0.011)	(0.014)	(0.011)	(0.008)	(0.037)	(0.056)
MPR(-1)*Ext(-1)	0.029	0.034	-0.009	-0.138**	0.092	0.056**	-0.382**	0.126	-0.032	-0.137**	-0.076*	-0.012	0.004
	(0.048)	(0.026)	(0.022)	(0.049)	(0.065)	(0.021)	(0.140)	(0.086)	(0.056)	(0.052)	(0.046)	(0.024)	(0.006)
π(-1)*Ext(-1)	-0.012	0.004	0.012	0.135**	0.085	-0.030*	0.271	-0.110	0.022	0.006	-0.017	0.038*	0.003
	(0.038)	(0.016)	(0.016)	(0.043)	(0.065)	(0.016)	(0.183)	(0.081)	(0.061)	(0.048)	(0.041)	(0.023)	(0.006)
ΔMPR*Ext(-1)	0.021	0.116*	-0.042	-0.452**	0.628**	0.002	-0.336	0.626*	0.050	-0.178	-0.229	-0.106	-0.036
	(0.165)	(0.065)	(0.082)	(0.156)	(0.240)	(0.092)	(0.345)	(0.367)	(0.189)	(0.333)	(0.159)	(0.153)	(0.060)
$\Delta\pi$*Ext(-1)	0.075	-0.027	0.004	0.217**	0.161	-0.010	0.211*	-0.240*	-0.089	-0.042	-0.120*	0.063	-0.002
	(0.064)	(0.036)	(0.027)	(0.092)	(0.143)	(0.029)	(0.118)	(0.141)	(0.099)	(0.086)	(0.072)	(0.053)	(0.010)
ΔMPR(-1)*Ext(-1)	-0.011	-0.138*	0.073	0.704***	-0.343	-0.108	-0.115	-0.657	0.043	-0.140	0.085	0.140	-0.038
	(0.172)	(0.080)	(0.084)	(0.175)	(0.251)	(0.105)	(0.362)	(0.430)	(0.208)	(0.283)	(0.155)	(0.172)	(0.046)
$\Delta\pi$(-1)*Ext(-1)	0.105	-0.054**	-0.036	-0.177*	-0.153	-0.032	0.086	0.161	-0.027	-0.106	0.021	-0.012	0.002
	(0.069)	(0.027)	(0.026)	(0.097)	(0.142)	(0.028)	(0.113)	(0.133)	(0.111)	(0.078)	(0.065)	(0.042)	(0.010)
F(All)	0.20	0.16	0.87	**0.00**	**0.04**	0.07	**0.00**	0.37	0.85	0.09	0.15	**0.04**	0.44
F(MPR)	0.94	0.30	0.81	**0.00**	**0.05**	**0.02**	**0.01**	0.21	0.82	0.05	0.21	0.82	0.32
F(Inflation)	0.06	0.05	0.42	**0.01**	0.47	0.11	0.18	0.21	0.62	0.47	0.40	0.29	0.91

Notes: See table 5.

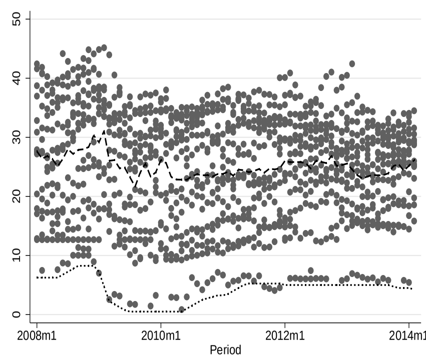
Figure 1: MPR and bank lending interest rates.

Panel A: interest rates (%).

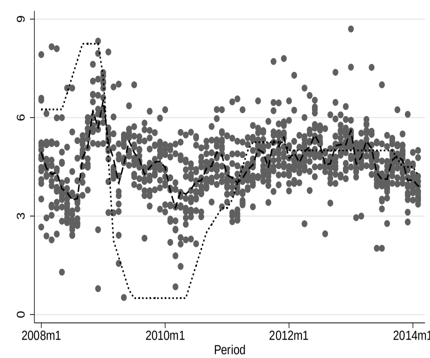
(a) Commercial.



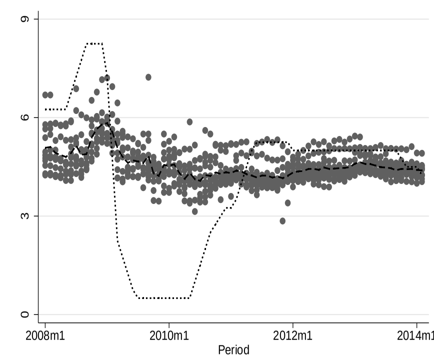
(b) Consumption.



(c) Real commercial.

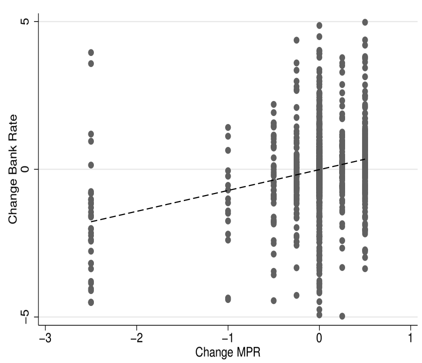


(d) Mortgage.

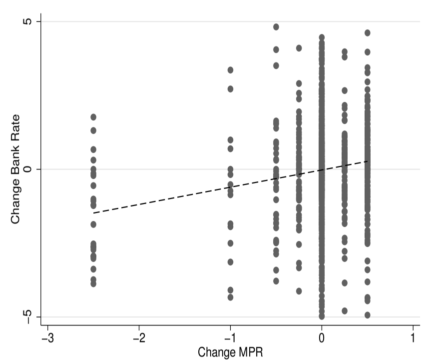


Panel B: interest rate changes (% -points).

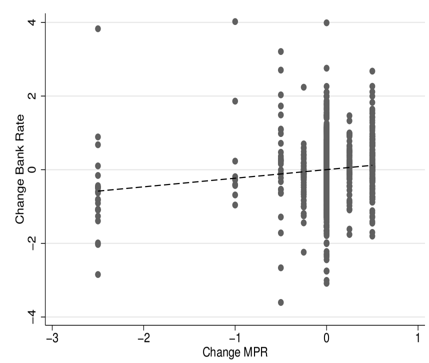
(e) Commercial.



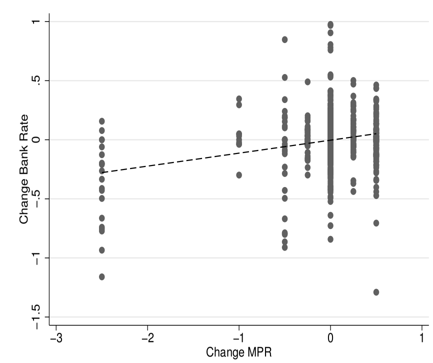
(f) Consumption.



(g) Real commercial.



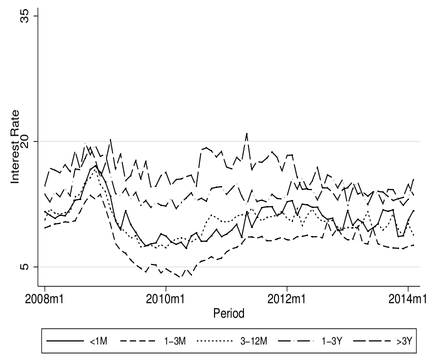
(h) Mortgage.



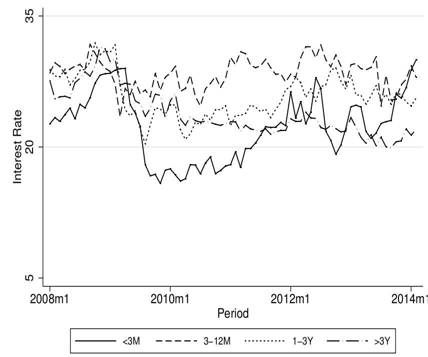
Notes: Panel A: Dotted (punctuated) lines: MPR (average). Panel B: Punctuated lines: Linear regression. Rates trimmed away are not shown in the graphs.
Source: Authors's calculations based on data from Central Bank of Chile.

Figure 2: Bank lending rates (%).

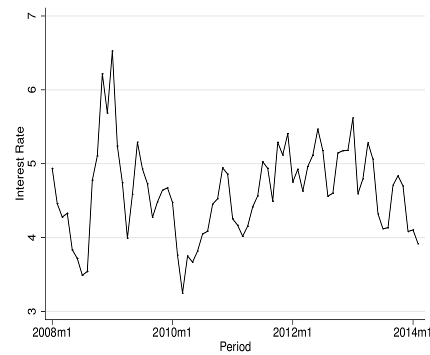
(a) Nominal commercial.



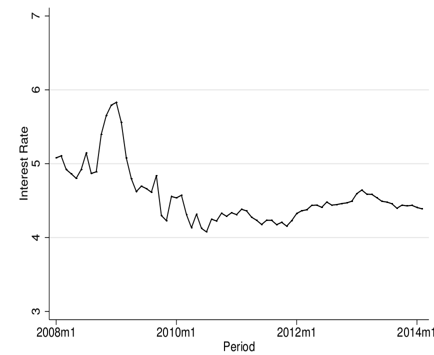
(b) Nominal consumption.



(c) Real commercial.



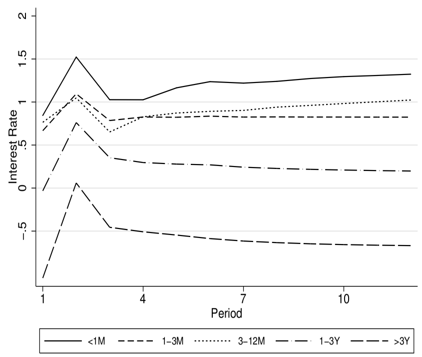
(d) Mortgage.



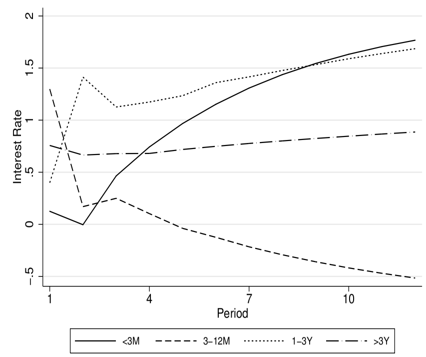
Notes: Interest rates are simple averages.
Source: Authors's calculations based on data from Central Bank of Chile.

Figure 3: Unconditional lending interest rate response to MPR and inflation change.

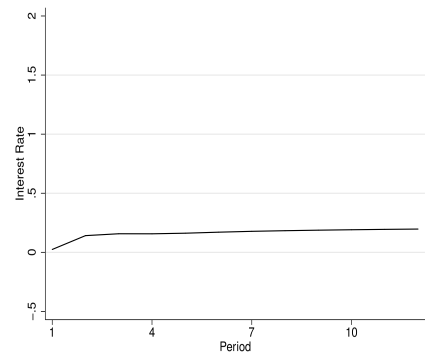
(a) Commercial - MPR.



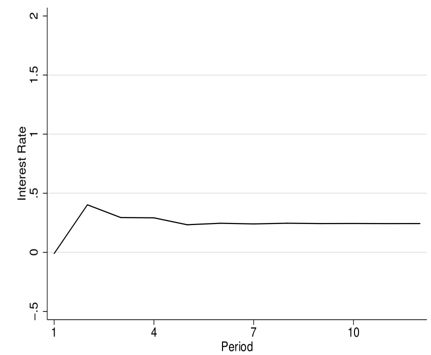
(b) Consumption - MPR.



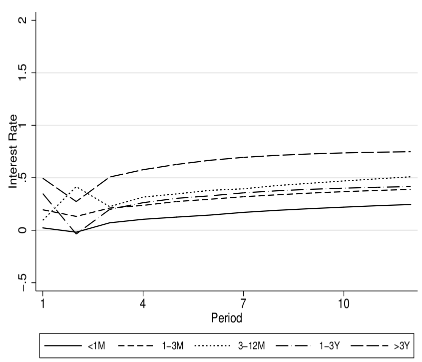
(c) Real commercial - MPR.



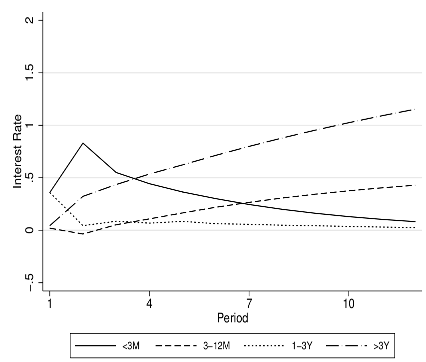
(d) Real mortgage - MPR.



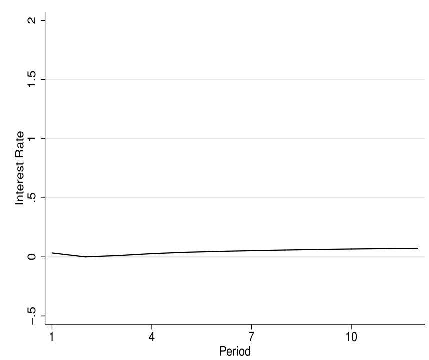
(e) Commercial - Inflation.



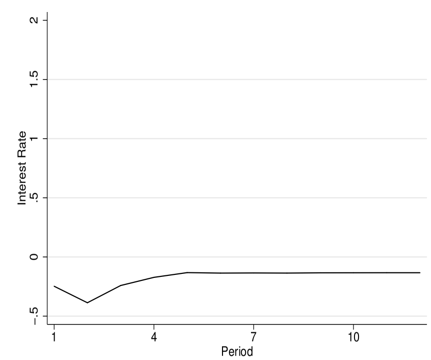
(f) Consumption - Inflation.



(g) Real commercial - Inflation.



(h) Real mortgage - Inflation.

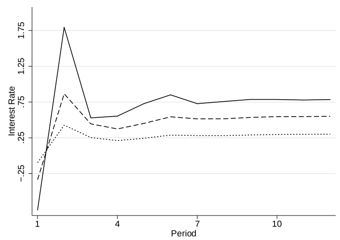


Notes: Impulse response functions computed from running panel regressions of form $\Delta i_{kst} = \alpha_s + \beta_{0s} i_{kst-1} + \beta_{1s} mpr_{t-1} + \beta_{2s}\pi_{t-1} + \sum_{x=0}^{1}\left(\beta_{6+xs}\Delta mpr_{t-s} + \beta_{9+xs}\Delta\pi_{t-s}\right) + \sum_{x=1}^{3}\beta_{2+xs}\Delta i_{kst-1-x} + \epsilon_{kst}$; where subindexes k, s, and t denote bank k, maturity s, and time, respectively, while variables i, mpr, π, and ϵ are lending interest rate, monetary policy rate, inflation, and a residual term, respectively. Figures 3a, 3b, 3c, and 3d show the response of nominal commercial, consumption, and real commercial and mortgage lending interest rates to a 1% monetary policy rate change, respectively. Figures 3e, 3f, 3g, and 3h show impulse response functions for the same variables to a 1% inflation change. Equation's coefficients are estimated through ordinary least square.
Source: Data on commercial lending interest rates, monetary policy rate, and inflation come from Banco Central de Chile.

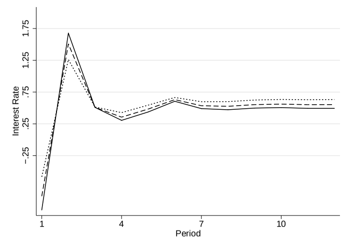
Figure 4: Conditional response commercial lending interest rate to MPR change.

Panel A: one month.

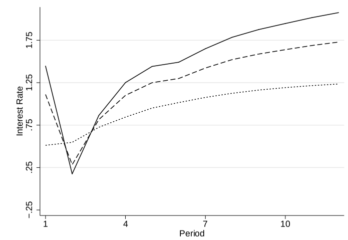
(a) Size.



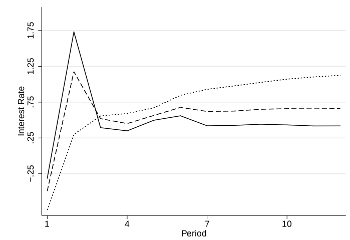
(b) Liquidity.



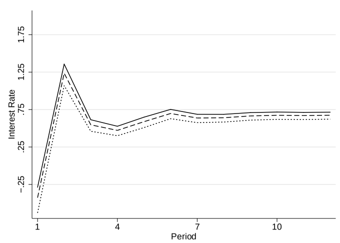
(c) Excess of capital.



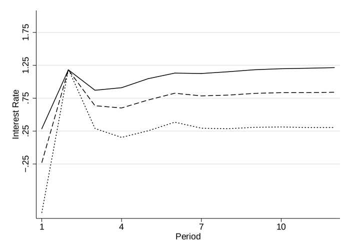
(d) Deposit strength.



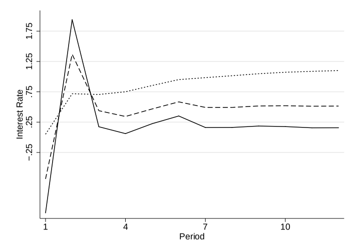
(e) Long term loans.



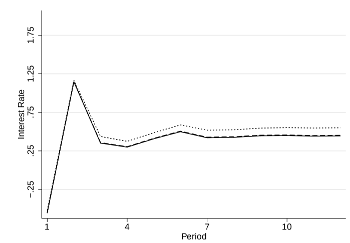
(f) Non-interest-income.



(g) Portfolio quality.

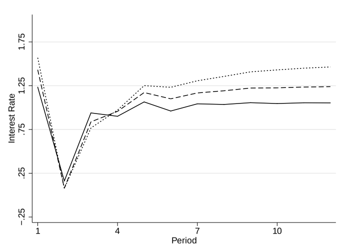


(h) External liabilities.

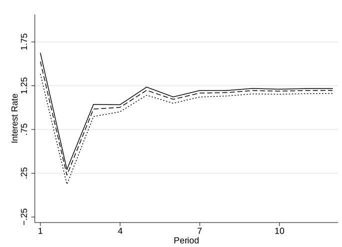


Panel B: one to three months.

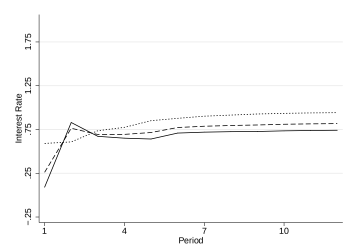
(i) Size.



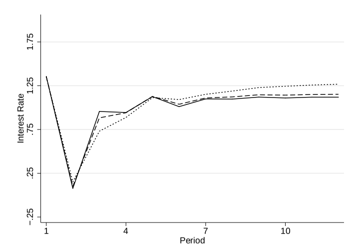
(j) Liquidity.



(k) Excess of capital.



(l) Deposit strength.

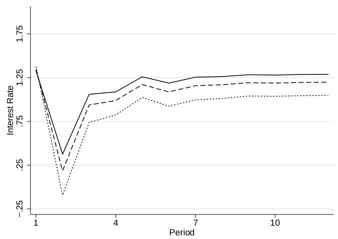


Notes: Continues on next page.

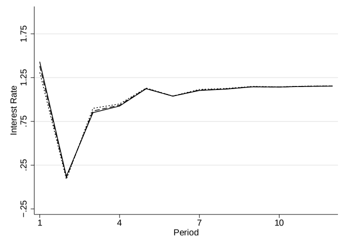
Conditional response commercial lending interest rate to MPR change (cont.).

Panel B: one to three months (cont).

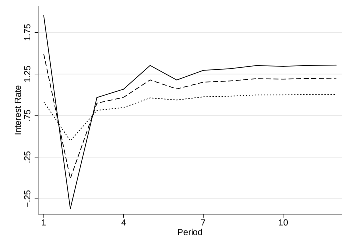
(a) Long term loans.



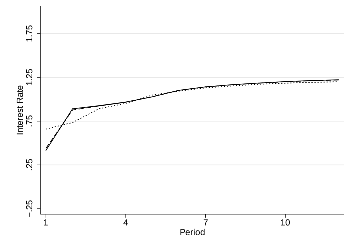
(b) Non-interest-income.



(c) Portfolio quality.

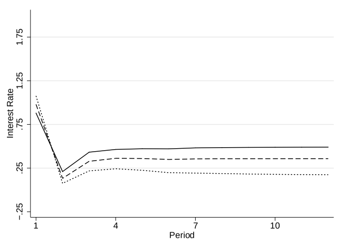


(d) External liabilities.

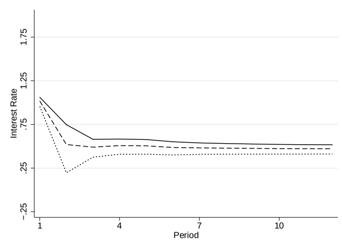


Panel C: three months to one year.

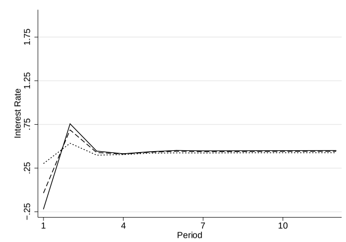
(e) Size.



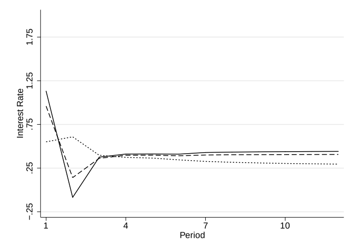
(f) Liquidity.



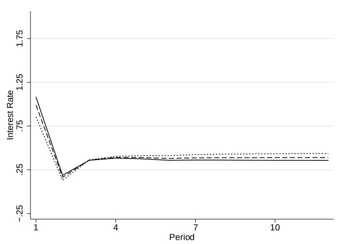
(g) Excess of capital.



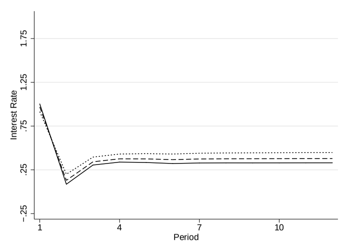
(h) Deposit strength.



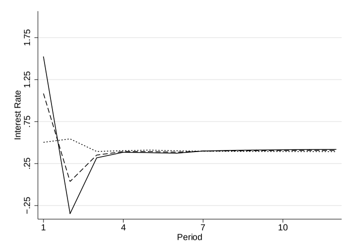
(i) Long term loans.



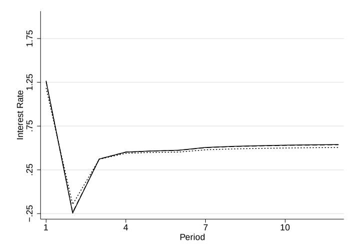
(j) Non-interest-income.



(k) Portfolio quality.



(l) External liabilities.

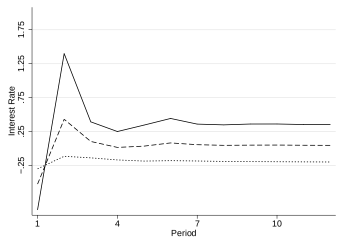


Notes: Continues on next page.

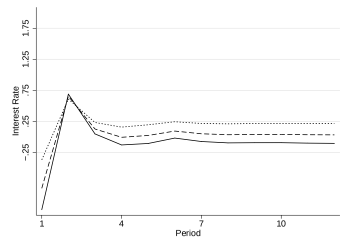
Conditional response commercial lending interest rate to MPR change (cont.).

Panel D: one to three years.

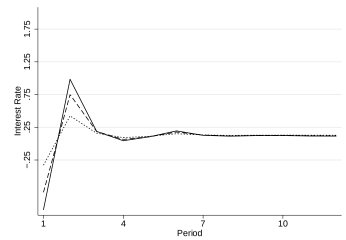
(a) Size.



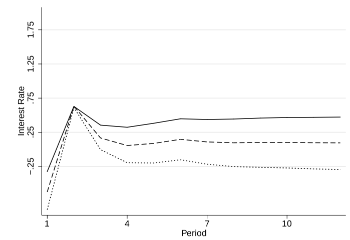
(b) Liquidity.



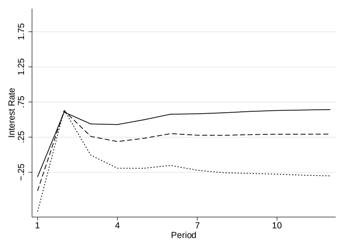
(c) Excess of capital.



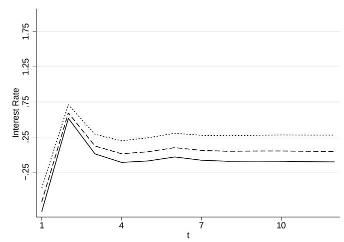
(d) Deposit strength.



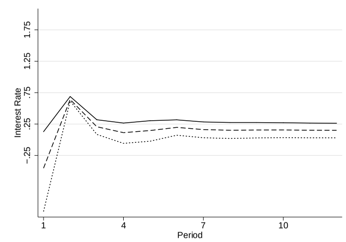
(e) Long term loans.



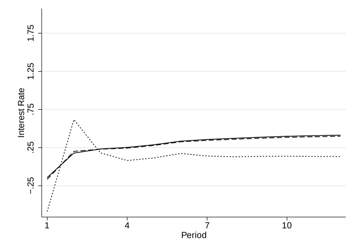
(f) Non-interest-income.



(g) Portfolio quality.

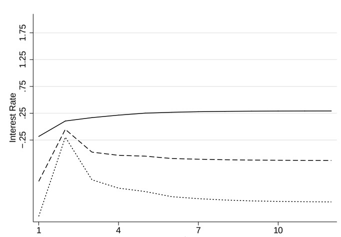


(h) External liabilities.

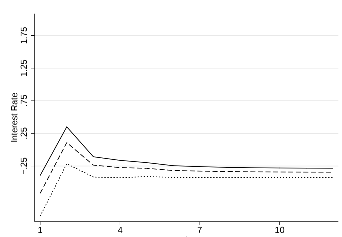


Panel E: more than three years.

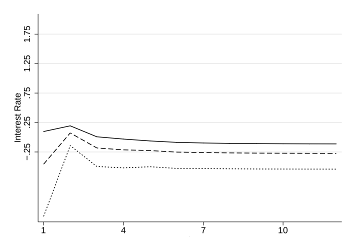
(i) Size.



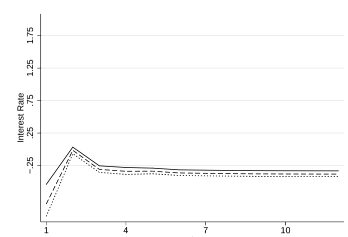
(j) Liquidity.



(k) Excess of capital.



(l) Deposit strength.

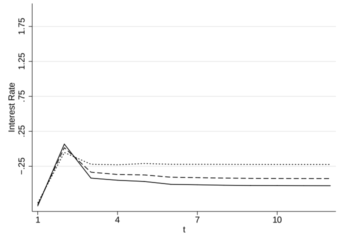


Notes: Continues on next page.

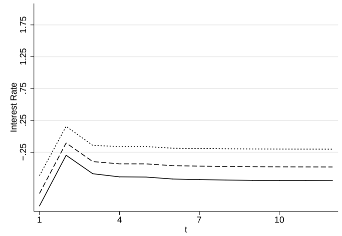
Conditional response commercial lending interest rate to MPR change (cont.).

Panel E: more than three years (cont.).

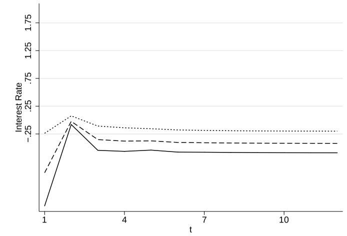
(a) Long term loans.



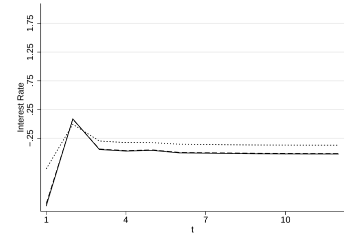
(b) Non-interest-income.



(c) Portfolio quality.



(d) External liabilities.

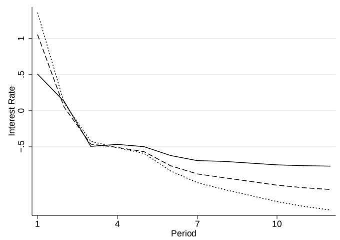


Notes: Impulse response functions computed from running panel regressions of form $\Delta i_{kst} = \alpha_{ks} + (\beta_{0s} + \mathbf{\Gamma}_{1s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, i_{kst-1} + (\beta_{1s} + \mathbf{\Gamma}_{2s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, mpr_{t-1} + + (\beta_{2s} + \mathbf{\Gamma}_{3s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \pi_{t-1} + \sum_{x=1}^{3} \beta_{2+xs} \Delta i_{kst-1-x} + + \sum_{x=0}^{1} \left((\beta_{6+xs} + \mathbf{\Gamma}_{4+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \Delta mpr_{t-x} + (\beta_{9+xs} + \mathbf{\Gamma}_{6+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \Delta \pi_{t-x} \right) + + \mathbf{\Gamma}_{4+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}) + \epsilon_{kst}$; where subindexes k, s, and t denote bank k, maturity s, and time, respectively, while variables i, mpr, π, and ϵ are lending interest rate, monetary policy rate, inflation, and a residual term, respectively, and vectors $\mathbf{z}$ and $\bar{\mathbf{z}}$ contain banks characteristics and their pooled mean, respectively. Impulse response function are calculated fixing all banks' characteristics to its mean value except one, i.e. $(\mathbf{z}_{kt-1} - \bar{\mathbf{z}})_{-k} = \mathbf{0}$ and $(\mathrm{z}_{\mathrm{i}\, t-1} - \bar{\mathrm{z}})_k$ free. Such free characteristic was fixed at specific values, quantile 25, 50, and 75. Finally, we compute the impulse response function for a 1% MPR change.
Dot, dash, and solid lines are 75%, 50%, and 25% of $(\mathrm{z}_{\mathrm{i}\, t-1} - \bar{\mathrm{z}})_k$, respectively.
Equation's coefficients are estimated through ordinary least square.
Source: Data on commercial lending interest rates, monetary policy rate, and inflation are from Banco Central de Chile.

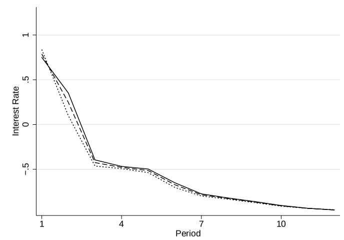
Figure 5: Conditional response commercial lending interest rate to inflation change.

Panel A: one month.

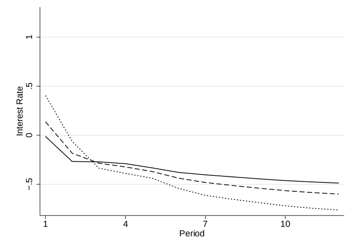
(a) Size.



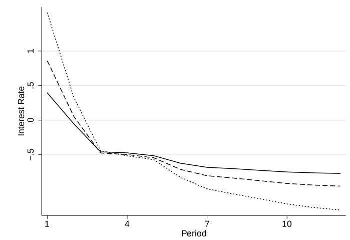
(b) Liquidity.



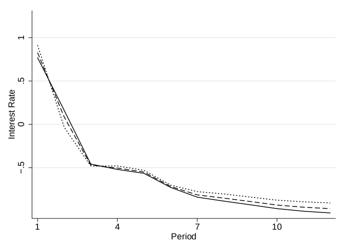
(c) Excess of capital.



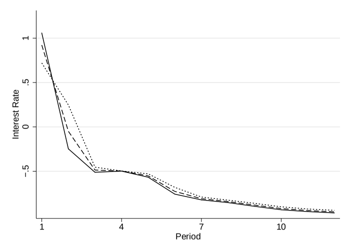
(d) Deposit strength.



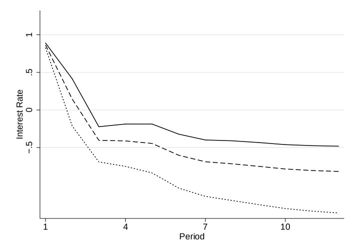
(e) Long term loans.



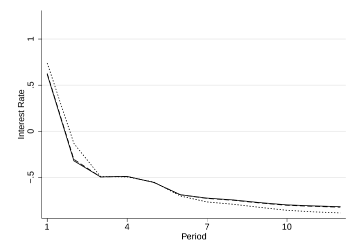
(f) Non-interest-income.



(g) Portfolio quality.

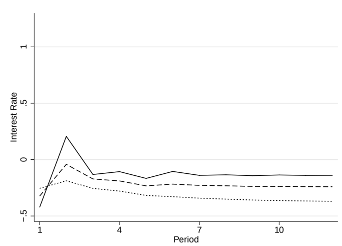


(h) External liabilities.

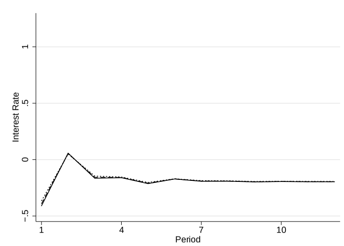


Panel B: one to three months.

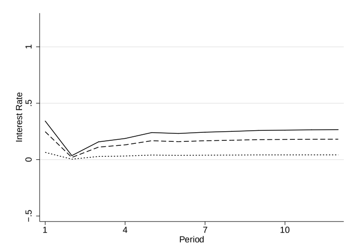
(i) Size.



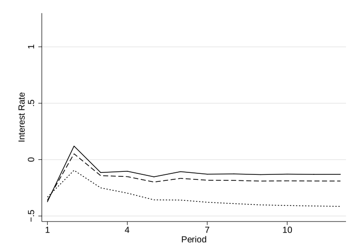
(j) Liquidity.



(k) Excess of capital.



(l) Deposit strength.

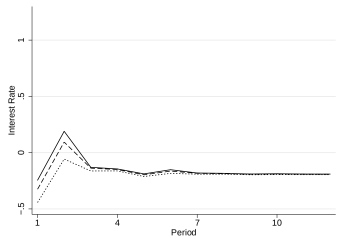


Notes: Continues on next page.

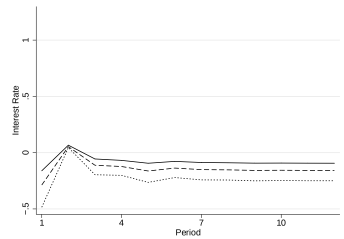
Conditional response commercial lending interest rate to inflation change (cont.).

Panel B: one to three months (cont.).

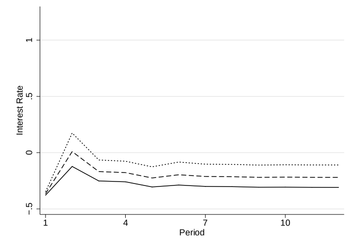
(a) Long term loans.



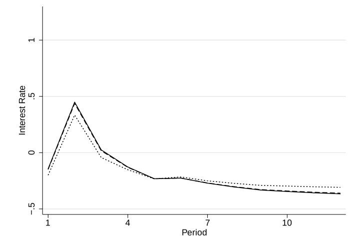
(b) Non-interest-income.



(c) Portfolio quality.

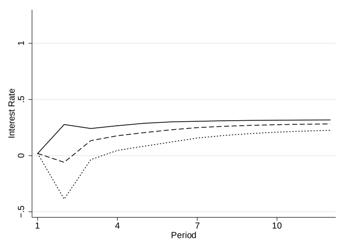


(d) External liabilities.

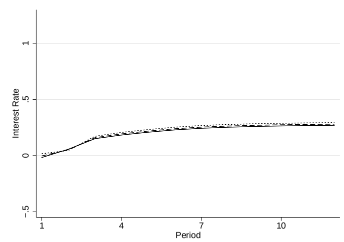


Panel C: three months to one year.

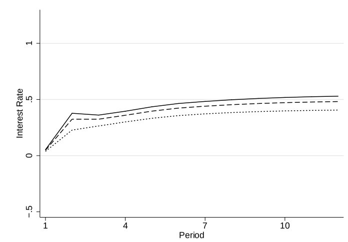
(e) Size.



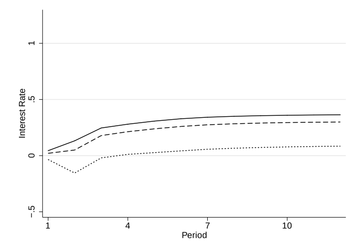
(f) Liquidity.



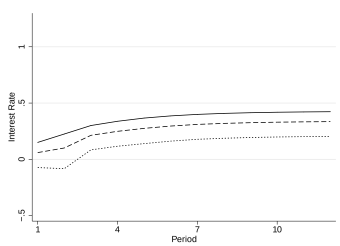
(g) Excess of capital.



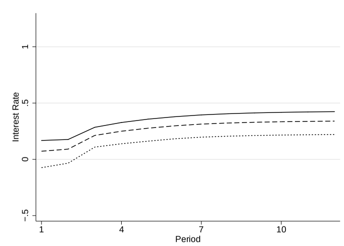
(h) Deposit strength.



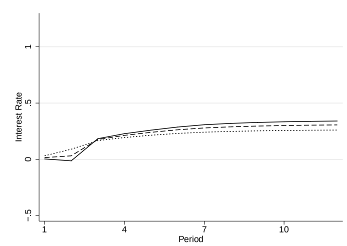
(i) Long term loans.



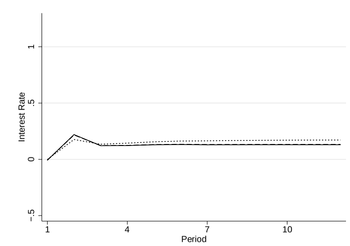
(j) Non-interest-income.



(k) Portfolio quality.



(l) External liabilities.

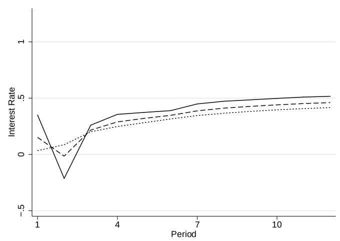


Notes: Continues on next page.

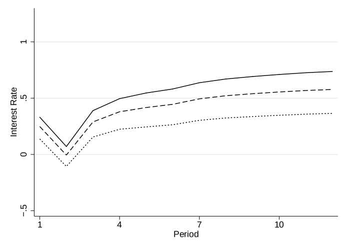
Conditional response commercial lending interest rate to inflation change (cont.).

Panel D: one to three years.

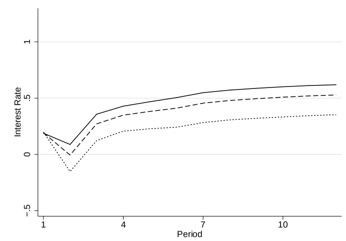
(a) Size.



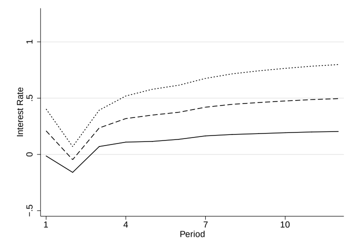
(b) Liquidity.



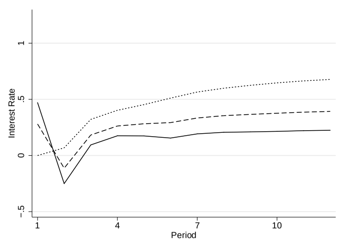
(c) Excess of capital.



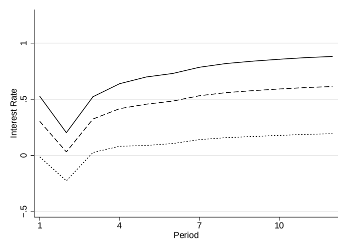
(d) Deposit strength.



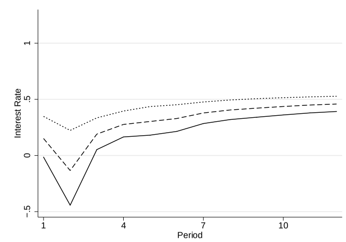
(e) Long term loans.



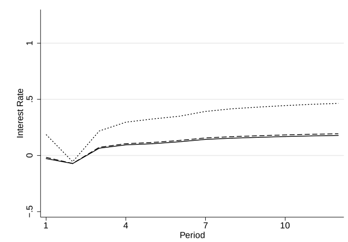
(f) Non-interest-income.



(g) Portfolio quality.

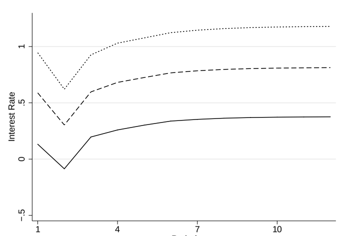


(h) External liabilities.

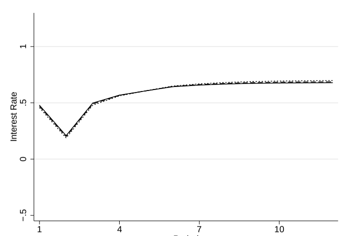


Panel E: more than three years.

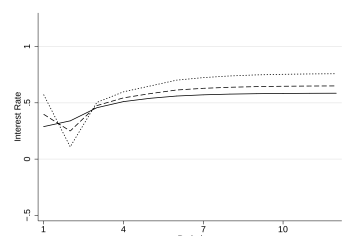
(i) Size.



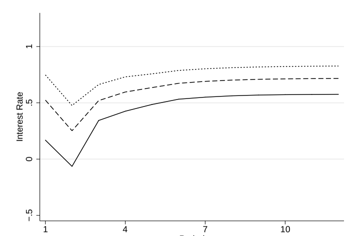
(j) Liquidity.



(k) Excess of capital.



(l) Deposit strength.

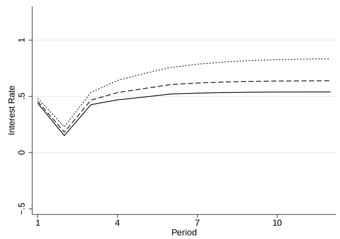


Notes: Continues on next page.

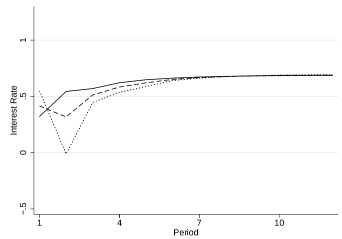
Conditional response commercial lending interest rate to inflation change (cont.).

Panel E: more than three years (cont.).

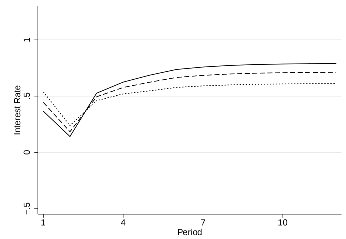
(a) Long term loans.



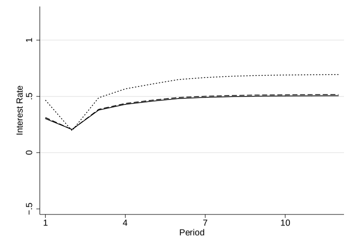
(b) Non-Interest-Income.



(c) Portfolio quality.



(d) External liabilities.

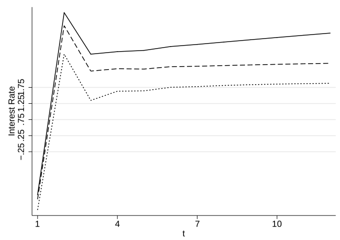


Notes: Impulse response functions computed from running panel regressions of form $\Delta i_{kst} = \alpha_{ks} + (\beta_{0s} + \mathbf{\Gamma}_{1s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, i_{kst-1} + (\beta_{1s} + \mathbf{\Gamma}_{2s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, mpr_{t-1} + + (\beta_{2s} + \mathbf{\Gamma}_{3s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \pi_{t-1} + \sum_{x=1}^{3} \beta_{2+xs} \Delta i_{kst-1-x} + + \sum_{x=0}^{1} \left((\beta_{6+xs} + \mathbf{\Gamma}_{4+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \Delta mpr_{t-x} + (\beta_{9+xs} + \mathbf{\Gamma}_{6+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \Delta \pi_{t-x} \right) + + \mathbf{\Gamma}_{4+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}) + \epsilon_{kst}$; where subindexes k, s, and t denote bank k, maturity s, and time, respectively, while variables i, mpr, π, and ϵ are lending interest rate, monetary policy rate, inflation, and a residual term, respectively, and vectors $\mathbf{z}$ and $\bar{\mathbf{z}}$ contain banks characteristics and their pooled mean, respectively. Impulse response function are calculated fixing all banks' characteristics to its mean value except one, i.e. $(\mathbf{z}_{kt-1} - \bar{\mathbf{z}})_{-k} = \mathbf{0}$ and $(\mathrm{z}_{\mathrm{i}\ t-1} - \bar{\mathrm{z}})_k$ free. Such free characteristic was fixed at specific values, quantile 25, 50, and 75. Finally, we compute the impulse response function for a 1% inflation change.
Dot, dash, and solid lines are 75%, 50%, and 25% of $(\mathrm{z}_{\mathrm{i}\ t-1} - \bar{\mathrm{z}})_k$, respectively.
Equation's coefficients are estimated through ordinary least square.
Source: Data on lending interest rates, monetary policy rate, and inflation are from Banco Central de Chile.

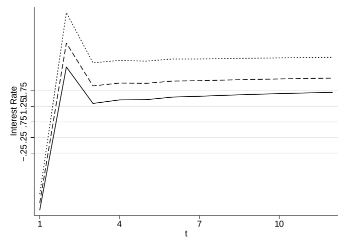
Figure 6: Conditional response consumption lending interest rate to an MPR change.

Panel A: three months.

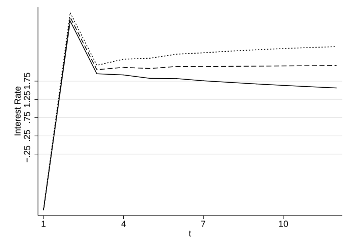
(a) Size.



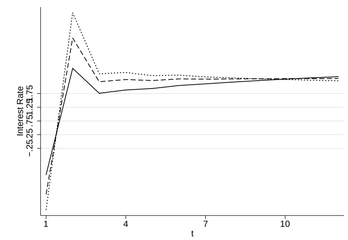
(b) Liquidity.



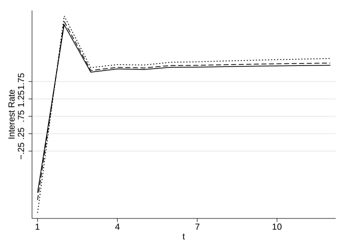
(c) Excess of capital.



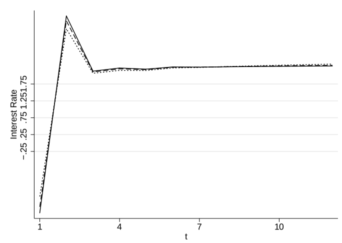
(d) Deposit strength.



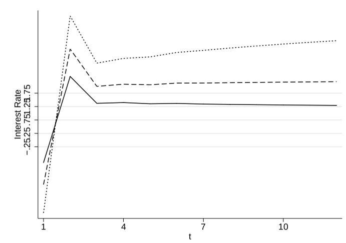
(e) Long term loans.



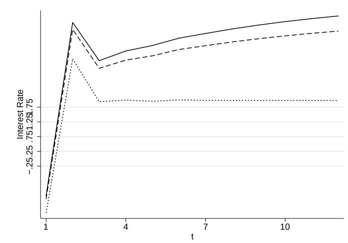
(f) Non-interest-income.



(g) Portfolio quality.

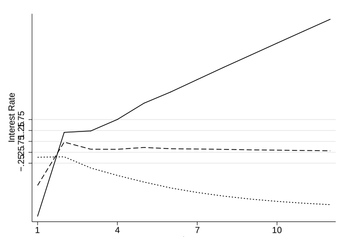


(h) External liabilities.

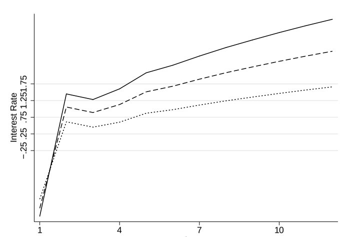


Panel B: three months to one year.

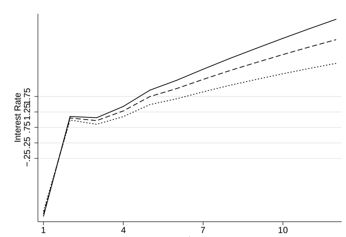
(i) Size.



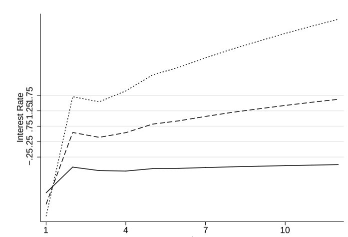
(j) Liquidity.



(k) Excess of capital.



(l) Deposit strength.

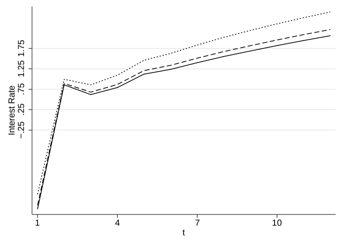


Notes: Continues on next page.

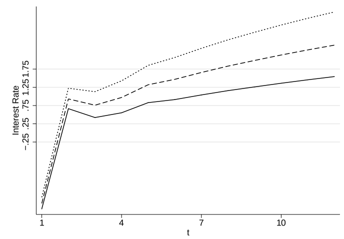
Conditional response consumption lending interest rate to an MPR change (cont.).

Panel B: three months to one year (cont.).

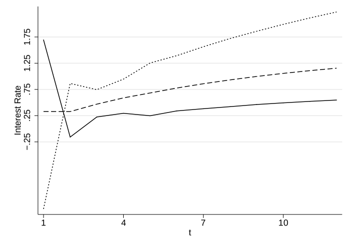
(a) Long term loans.



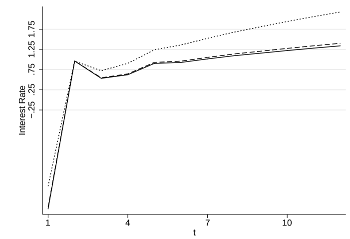
(b) Non-interest-income.



(c) Portfolio quality.

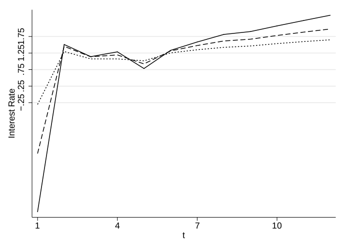


(d) External liabilities.

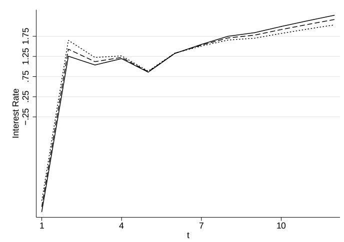


Panel C: one to three years.

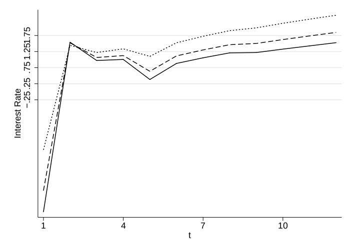
(e) Size.



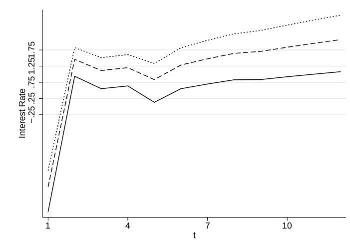
(f) Liquidity.



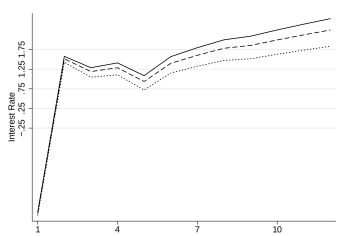
(g) Excess of capital.



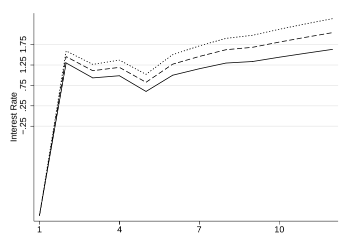
(h) Deposit strength.



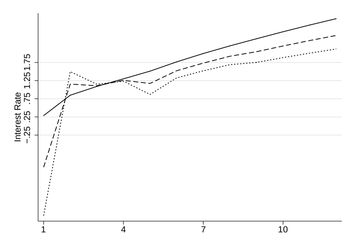
(i) Long term loans.



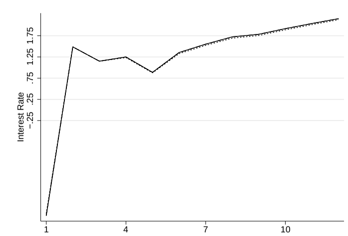
(j) Non-interest-income.



(k) Portfolio quality.



(l) External liabilities.

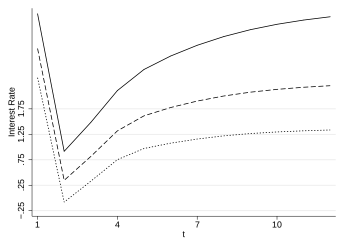


Notes: Continues on next page.

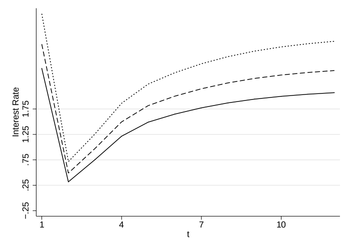
Conditional response consumption lending interest rate to an MPR change (cont.).

Panel D: more than three years.

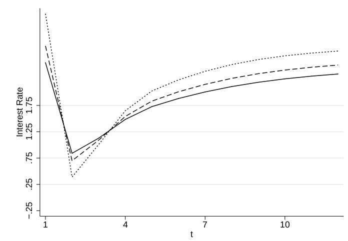
(a) Size.



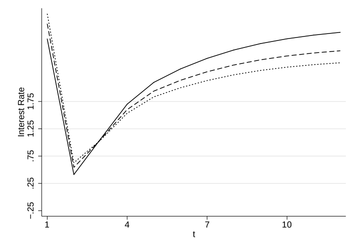
(b) Liquidity.



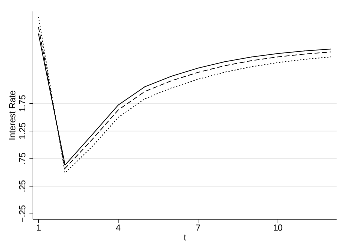
(c) Excess of capital.



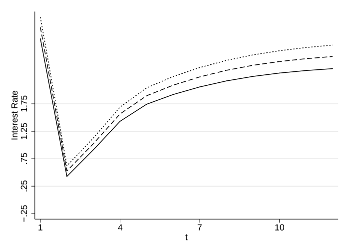
(d) Deposit strength.



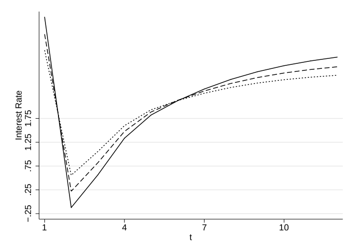
(e) Long term loans.



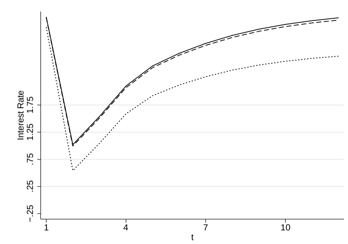
(f) Non-interest-income.



(g) Portfolio quality.



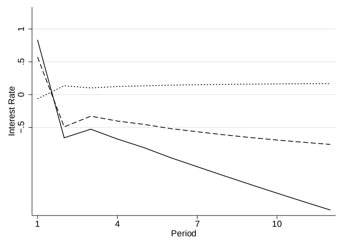
(h) External liabilities.



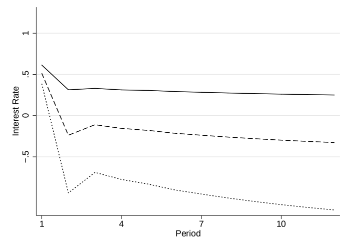
Notes: Impulse response functions computed from running panel regressions of form $\Delta i_{kst} = \alpha_{ks} + (\beta_{0s} + \mathbf{\Gamma}_{1s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, i_{kst-1} + (\beta_{1s} + \mathbf{\Gamma}_{2s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, mpr_{t-1} + + (\beta_{2s} + \mathbf{\Gamma}_{3s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \pi_{t-1} + \sum_{x=1}^{3} \beta_{2+xs} \Delta i_{kst-1-x} + + \sum_{x=0}^{1} \left((\beta_{6+xs} + \mathbf{\Gamma}_{4+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \Delta mpr_{t-x} + (\beta_{9+xs} + \mathbf{\Gamma}_{6+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \Delta \pi_{t-x} \right) + + \mathbf{\Gamma}_{4+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}) + \epsilon_{kst}$; where subindexes k, s, and t denote bank k, maturity s, and time, respectively, while variables i, mpr, π, and ϵ are lending interest rate, monetary policy rate, inflation, and a residual term, respectively, and vectors $\mathbf{z}$ and $\bar{\mathbf{z}}$ contain banks characteristics and their pooled mean, respectively. Impulse response function are calculated fixing all banks' characteristics to its mean value except one, i.e. $(\mathbf{z}_{kt-1} - \bar{\mathbf{z}})_{-k} = \mathbf{0}$ and $(\mathrm{z}_{\mathrm{i}\ t-1} - \bar{\mathrm{z}})_k$ free. Such free characteristic was fixed at specific values, quantile 25, 50, and 75. Finally, we compute the impulse response function for a 1% inflation change.
Dot, dash, and solid lines are 75%, 50%, and 25% of $(\mathrm{z}_{\mathrm{i}\ t-1} - \bar{\mathrm{z}})_k$, respectively.
Equation's coefficients are estimated through ordinary least square.
Source: Data on consumption lending interest rates, monetary policy rate, and inflation are from Banco Central de Chile.

Figure 7: Conditional response consumption lending interest rate to inflation change.

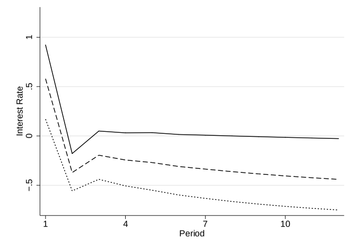
Panel A: three months.



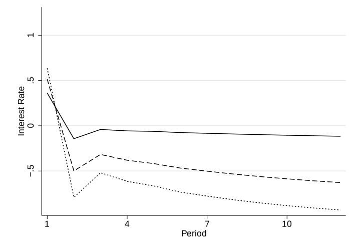
(a) Size.



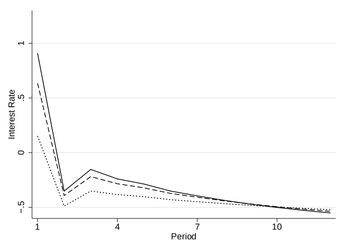
(b) Liquidity.



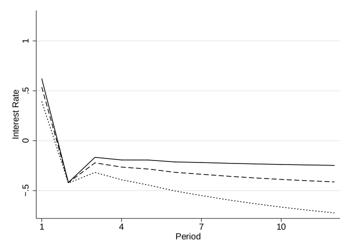
(c) Excess of capital.



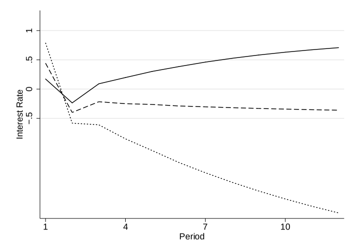
(d) Deposit strength.



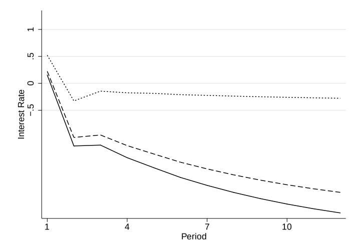
(e) Long term loans.



(f) Non-interest-income.

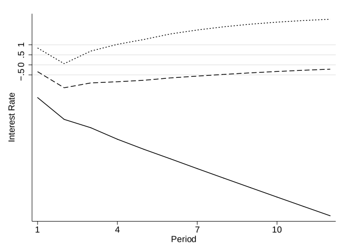


(g) Portfolio quality.

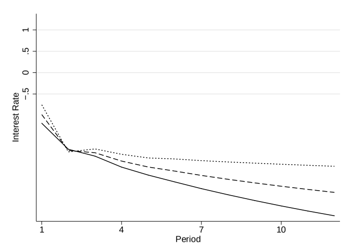


(h) External liabilities.

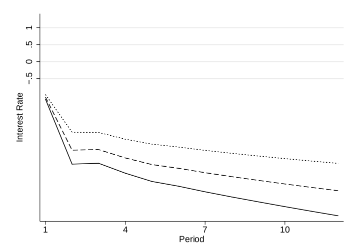
Panel B: three months to one year.



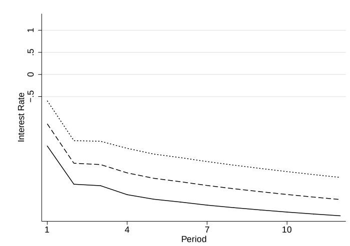
(i) Size.



(j) Liquidity.



(k) Excess of capital.



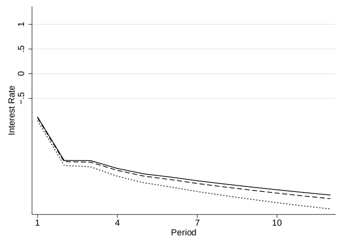
(l) Deposit strength.

Notes: Continues on next page.

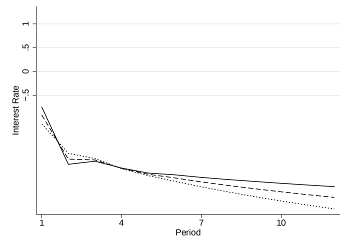
Conditional response consumption lending interest rate to inflation change (cont.).

Panel B: three months to one year (cont.).

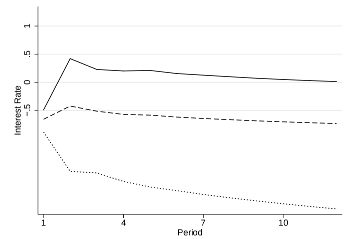
(a) Long term loans.



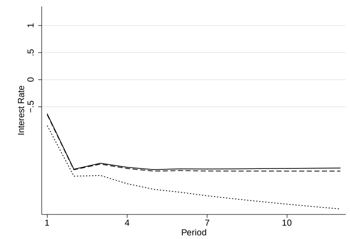
(b) Non-interest-income.



(c) Portfolio quality.

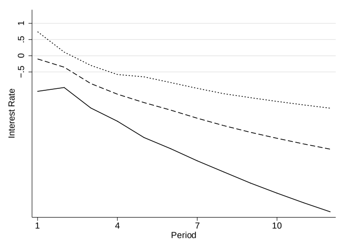


(d) External liabilities.

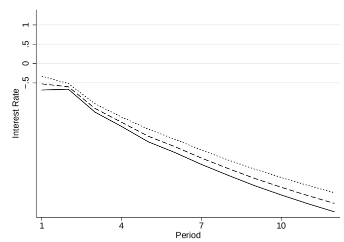


Panel C: one to three years.

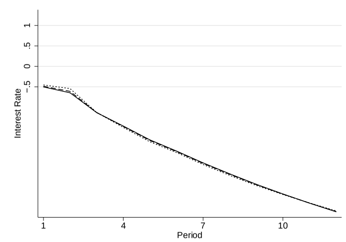
(e) Size.



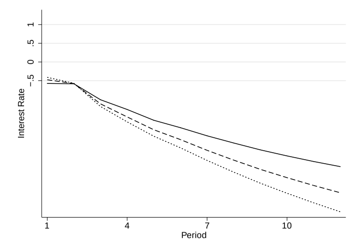
(f) Liquidity.



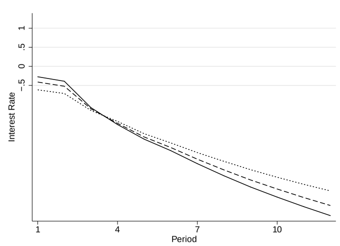
(g) Excess of capital.



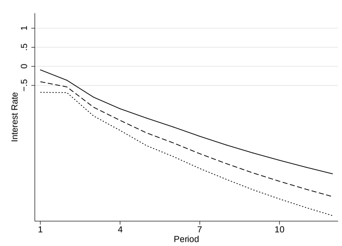
(h) Deposit strength.



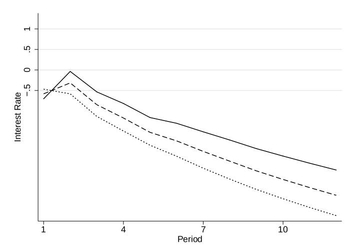
(i) Long term loans.



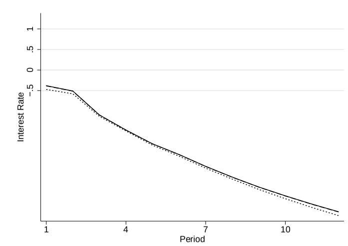
(j) Non-interest-income.



(k) Portfolio quality.



(l) External liabilities.

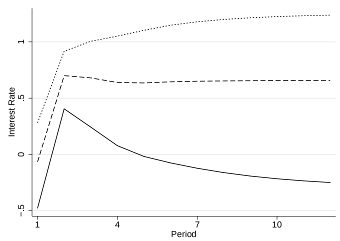


Notes: Continues on next page.

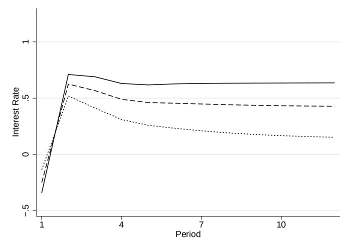
Conditional response consumption lending interest rate to inflation change (cont.).

Panel D: more than three years.

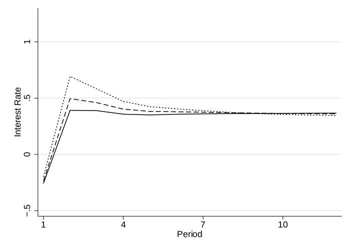
(a) Size.



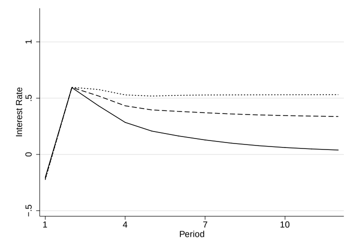
(b) Liquidity.



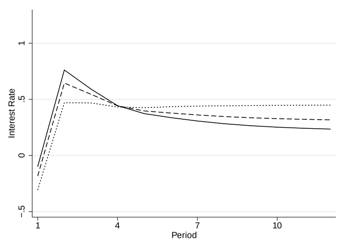
(c) Excess of capital.



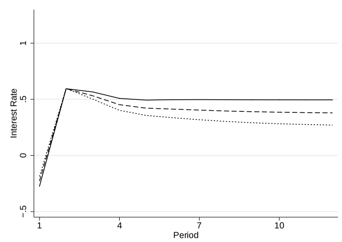
(d) Deposit strength.



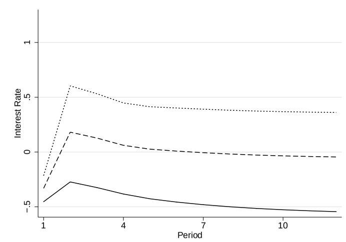
(e) Long term loans.



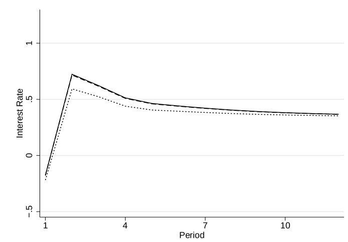
(f) Non-interest-income.



(g) Portfolio quality.



(h) External liabilities.



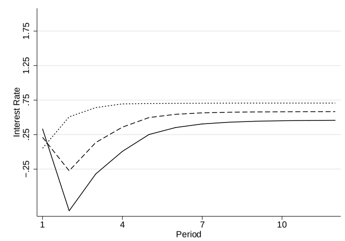
Notes: Impulse response functions computed from running panel regressions of form $\Delta i_{kst} = \alpha_{ks} + (\beta_{0s} + \mathbf{\Gamma}_{1s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, i_{kst-1} + (\beta_{1s} + \mathbf{\Gamma}_{2s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, mpr_{t-1} + {} + (\beta_{2s} + \mathbf{\Gamma}_{3s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \pi_{t-1} + \sum_{x=1}^{3} \beta_{2+xs} \Delta i_{kst-1-x} + {} + \sum_{x=0}^{1} \left((\beta_{6+xs} + \mathbf{\Gamma}_{4+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \Delta mpr_{t-x} + (\beta_{9+xs} + \mathbf{\Gamma}_{6+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \Delta\pi_{t-x} \right) + {} + \mathbf{\Gamma}_{4+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}) + \epsilon_{kst}$; where subindexes k, s, and t denote bank k, maturity s, and time, respectively, while variables i, mpr, π, and ϵ are lending interest rate, monetary policy rate, inflation, and a residual term, respectively, and vectors $\mathbf{z}$ and $\bar{\mathbf{z}}$ contain banks characteristics and their pooled mean, respectively. Impulse response function are calculated fixing all banks' characteristics to its mean value except one, i.e. $(\mathbf{z}_{kt-1} - \bar{\mathbf{z}})_{-k} = \mathbf{0}$ and $(\mathrm{z}_{\mathrm{i}\ t-1} - \bar{\mathrm{z}})_k$ free. Such free characteristic was fixed at specific values, quantile 25, 50, and 75. Finally, we compute the impulse response function for a 1% MPR change.

Dot, dash, and solid lines are 75%, 50%, and 25% of $(\mathrm{z}_{\mathrm{i}\ t-1} - \bar{\mathrm{z}})_k$, respectively.

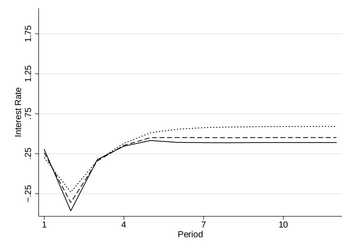
Equation's coefficients are estimated through ordinary least square.

Source: Data on consumption lending interest rates, monetary policy rate, and inflation are from Banco Central de Chile.

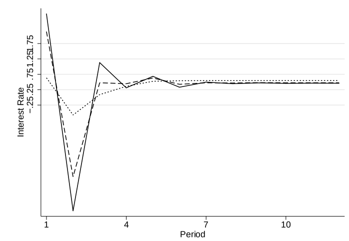
Figure 8: Conditional response real commercial lending interest rate to MPR change.



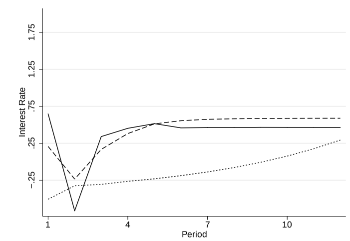
(a) Size.



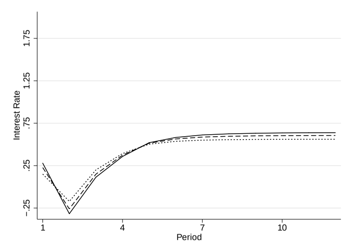
(b) Liquidity.



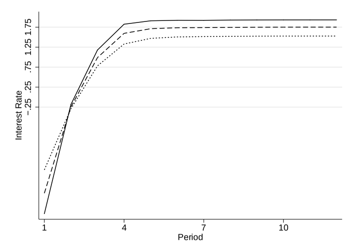
(c) Excess of capital.



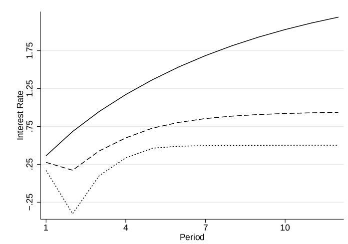
(d) Deposit strength.



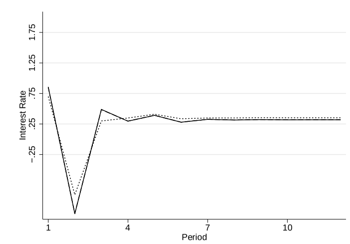
(e) Long term loans.



(f) Non-interest-income.



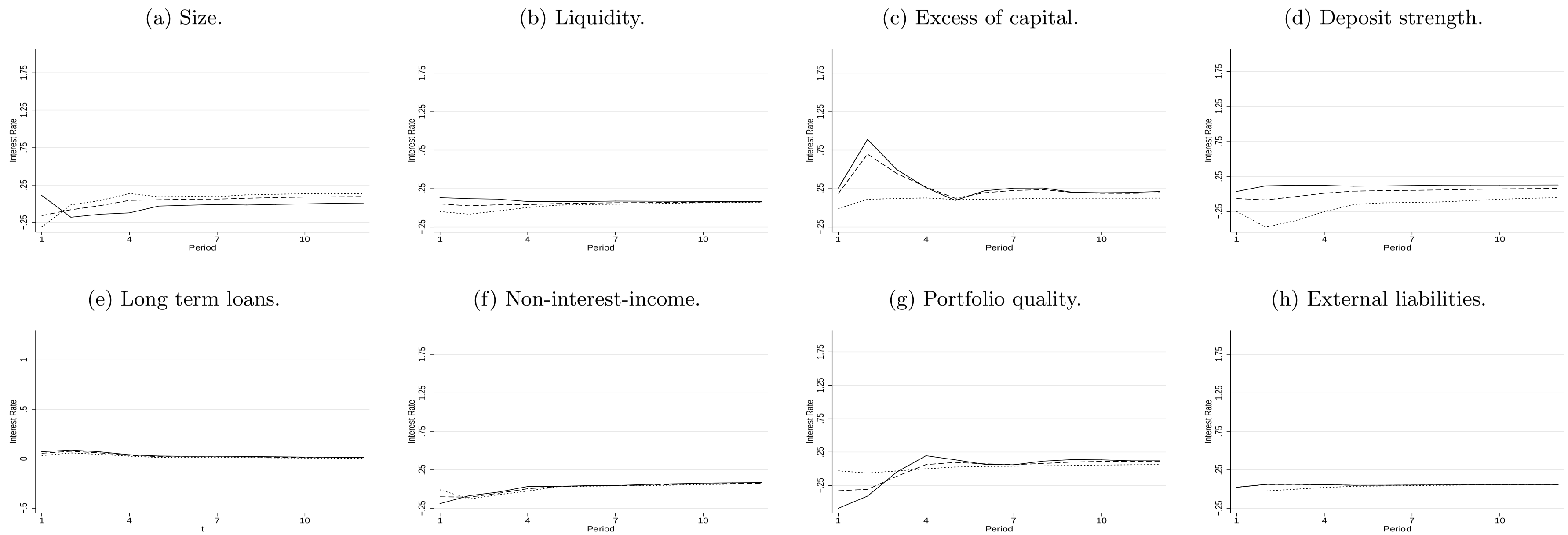
(g) Portfolio quality.



(h) External liabilities.

Notes: Impulse response functions computed from running panel regressions of form $\Delta i_{kst} = \alpha_{ks} + (\beta_{0s} + \mathbf{\Gamma}_{1s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, i_{kst-1} + (\beta_{1s} + \mathbf{\Gamma}_{2s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, mpr_{t-1} + + (\beta_{2s} + \mathbf{\Gamma}_{3s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \pi_{t-1} + \sum_{x=1}^{3} \beta_{2+xs} \Delta i_{kst-1-x} + + \sum_{x=0}^{1} \left((\beta_{6+xs} + \mathbf{\Gamma}_{4+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \Delta mpr_{t-x} + (\beta_{9+xs} + \mathbf{\Gamma}_{6+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \Delta \pi_{t-x} \right) + + \mathbf{\Gamma}_{4+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}) + \epsilon_{kst}$; where subindexes k, s, and t denote bank k, maturity s, and time, respectively, while variables i, mpr, π, and ϵ are lending interest rate, monetary policy rate, inflation, and a residual term, respectively, and vectors $\mathbf{z}$ and $\bar{\mathbf{z}}$ contain banks characteristics and their pooled mean, respectively. Impulse response function are calculated fixing all banks' characteristics to its mean value except one, i.e. $(\mathbf{z}_{kt-1} - \bar{\mathbf{z}})_{-k} = \mathbf{0}$ and $(\mathrm{z}_{\mathrm{i}\,t-1} - \bar{\mathrm{z}})_k$ free. Such free characteristic was fixed at specific values, quantile 25, 50, and 75. Finally, we compute the impulse response function for a 1% inflation change.
Dot, dash, and solid lines are 75%, 50%, and 25% of $(\mathrm{z}_{\mathrm{i}\,t-1} - \bar{\mathrm{z}})_k$, respectively.
Equation's coefficients are estimated through ordinary least square.
Source: Data on real commercial lending interest rates, monetary policy rate, and inflation are from Banco Central de Chile.

Figure 9: Conditional response mortgage interest rate to MPR Change.



Notes: Impulse response functions computed from running panel regressions of form $\Delta i_{kst} = \alpha_{ks} + (\beta_{0s} + \mathbf{\Gamma}_{1s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, i_{kst-1} + (\beta_{1s} + \mathbf{\Gamma}_{2s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, mpr_{t-1} + + (\beta_{2s} + \mathbf{\Gamma}_{3s} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \pi_{t-1} + \sum_{x=1}^{3} \beta_{2+xs} \Delta i_{kst-1-x} + + \sum_{x=0}^{1} \left((\beta_{6+xs} + \mathbf{\Gamma}_{4+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \Delta mpr_{t-x} + (\beta_{9+xs} + \mathbf{\Gamma}_{6+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}))\, \Delta \pi_{t-x} \right) + + \mathbf{\Gamma}_{4+xs} \times (\mathbf{z}_{kt-1} - \bar{\mathbf{z}}) + \epsilon_{kst}$; where subindexes k, s, and t denote bank k, maturity s, and time, respectively, while variables i, mpr, π, and ϵ are lending interest rate, monetary policy rate, inflation, and a residual term, respectively, and vectors $\mathbf{z}$ and $\bar{\mathbf{z}}$ contain banks characteristics and their pooled mean, respectively. Impulse response function are calculated fixing all banks' characteristics to its mean value except one, i.e. $(\mathbf{z}_{kt-1} - \bar{\mathbf{z}})_{-k} = \mathbf{0}$ and $(\mathrm{z}_{\mathrm{i}\ t-1} - \bar{\mathrm{z}})_k$ free. Such free characteristic was fixed at specific values, quantile 25, 50, and 75. Finally, we compute the impulse response function for a 1% MPR change.
Dot, dash, and solid lines are 75%, 50%, and 25% of $(\mathrm{z}_{\mathrm{i}\ t-1} - \bar{\mathrm{z}})_k$, respectively.
Equation's coefficients are estimated through ordinary least square.
Source: Data on Mortgage interest rates, monetary policy rate, and inflation are from Banco Central de Chile.

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