THE IMPACT OF FINANCIAL STABILITY REPORT'S WARNINGS
ON THE LOAN TO VALUE RATIO*

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Abstract

This paper shows how Central Bank communications can play a role in macroprudential supervision. We document how specific warnings about real-estate markets, published in the Central Bank of Chile Financial Stability Report between June 2012 and September 2014, affected bank lending policies. We provide empirical evidence of a rebalance in the fraction of mortgage loans granted, with a reduction in those with high loan to value ratios, along with an increase among those with lower ratios.

1. Introduction

Since the onset of the Great Recession, there has been a heated debate on how to contain the risk of instability developing across financial markets and how to best achieve financial stability in the future. A central role in this discussion has been played by Central Banks, whom have increasingly used communications as an additional policy tool to restore stability. In particular, through the publication of Financial Stability Reports (FSR) and also in speeches and interviews, policymakers have made efforts to convey their view on the potential risks faced by the financial system.

Considering the relevance Central Banks have in the design and implementation of macroprudential policies, the relative novelty of these strategies in their toolbox, and the breadth of the definition of macroprudential policies. It is natural to ask, to what extent they have been successful in conveying their messages and attaining the intended effects.

The main aim of this paper is on measuring the effect some of these communicational tools, used by the Central Bank of Chile, have had on local financial markets. In particular, this paper focuses on the local housing market. By using a detailed administrative database of every housing transaction in the country, we study the extent to which warnings issued in the Central Bank Financial Stability Reports had an effect on house prices, lending standards, and volume of mortgage loans.

Since the onset of the subprime crisis, the real estate sector has received an increasing interest from academics and policy makers; at least three reasons justify this. First, the burst of the housing bubble in several economies, followed by the fact that highly levered households initiated a process of deleveraging that lead to deep macroeconomic adjustments. Second, housing is the main asset of the average household; therefore changes in property values affect their total wealth considerably. Third, a significant amount of home purchases are financed with mortgage loans, generating an exposure of banks to this sector. Since 2010, the Central Bank of Chile, through its Financial Stability Report (FSR), has documented sustained growth rate in house prices, higher than the one historically observed. The Central Bank, through the FSR, has analyzed the different constituent components of housing prices. Consequently, the monetary authority warned that recent developments in house price trends should not be extrapolated for monetary policy future decisions.

The paper starts by looking at the evolution of aggregate variables related to the real estate sector around the issuance time of the warnings. Housing debt decomposed by financing instrument, number of mortgage loans granted, average debt, house prices, and volume of sales are included in this analysis. In principle, the warnings did not seem to have an effect on these broad variables, supporting the view that their evolution had been consistent with macroeconomic fundamentals. However, when looking more closely at the distribution of loan to value ratios associated to granted loans, the messages conveyed through the FSR seem to have had an impact. Using a detailed database of mortgage loan transactions, this paper shows that FSR warnings had an effect on bank lending policies in the period between June 2012 and September 2014. In particular, following the FSR warnings, there was a noticeable reduction in the number of loans granted with high LTV ratios. Later, the analysis is formalized using probit and quantile regressions; these estimations confirm the previous findings. The warnings had a statistically significant effect reshaping the distribution of LTV ratios for

granted loans. In particular, there is evidence of a shift out of mortgages with high LTV values, and into lower ratios during the period. Furthermore, private banks and the state owned bank responded in different ways to these messages, most likely due to the different mandate under which the latter type of bank operates.

2. Chilean Real Estate Market

2.1 Housing finance

The housing market in Chile has been growing according to the development of the economy. Micco et al (2012) show that: (i) the fraction of overcrowded houses[1] dropped from 24% to 9% between 1990 and 2009, and (ii) the housing deficit[2] decreased from 540 thousand units to 410 thousand units. In addition, the Survey of Housing Finance conducted by the Central Bank of Chile indicates in its 2014 wave that homeownership rate was about 70%. According to Warnock (2014) this figure is at the top of Latin-American countries. A key element of this homeownership rate is access to housing finance. Several elements must be considered in order to understand the Chilean mortgage market. First, there is a unit of account indexed to inflation (UF)[3] in which banks and financial institutions can grant long-term (20-30 years) loans. Second, most of this market is dominated by banks, having a share of 88% of mortgage loans as of 2010 and a historical average of 90% since early 2000 (Graph 1). Given these facts, the following description will be focused on the banking sector. Among banks, a big player is BancoEstado (BE), a state-owned bank with a participation of 24% over total banking mortgage loans (Table 1).

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[1] According to the National Socioeconomic Characterization (CASEN) Survey, conducted in Chile and used by Micco et al. Overcrowded houses are defined as those where the ratio of residents over the number of bedrooms in a house exceeds 2.5.

[2] Micco et al. define housing deficit as the difference between total population and the stock of habitable permanent houses (excluding mobile units and those located in slums).

[3] Unidad de Fomento (UF) is a unit of account used in Chile. Its value in Chilean pesos is indexed to total inflation. It is widely used in determining the value of real estate, housing associated costs, and secured loans.

Table 1: Total and mortgage loans by bank, as of December 2010

| BANK	TOTAL LOANS		MORTGAGE LOANS	
	US$ Millions	Percent	US$ Millions	Percent
Banco Bice	4,516	2.7%	473	1.2%
BBVA	12,277	7.4%	3,342	8.1%
Consorcio	257	0.2%	52	0.1%
De Chile	32,888	19.8%	6,144	15.0%
BCI	20,377	12.2%	4,030	9.8%
BancoEstado	23,647	14.2%	9,762	23.8%
Falabella	1,421	0.9%	482	1.2%
Internacional	1,381	0.8%	7	0.0%
Itaú (Chile)	5,895	3.5%	1,181	2.9%
Paris	383	0.2%	28	0.1%
Ripley	419	0.3%	119	0.3%
Santander - Chile	35,739	21.5%	9,796	23.9%
Security	4,621	2.8%	633	1.5%
Corpbanca	12,504	7.5%	2,144	5.2%
HSBC Bank (Chile)	686	0.4%	2	0.0%
Scotiabank Chile	8,195	4.9%	2,837	6.9%
Others	1,149	0.7%	1	0.0%
Total	**166,355**	**100%**	**41,032**	**100%**

Source: Central Bank of Chile.

Third, a number of mortgage-instruments are available for financing the purchase of a house: mortgage notes, endorsable mortgage loans, and non-endorsable mortgage loans. Mortgage notes can be used to finance a fraction of the value of the property, having a maximum allowed Loan to Value (LTV) of 75%; also there is a limit on Dividend to Income (DTI) of 25% for small and medium size loans. Endorsable mortgage loans have a maximum LTV of 80% and no-limit on DTI. Finally, non-endorsable mortgage loans have no-limit on LTV neither on DTI. During the early 2000s, most housing funding was granted through mortgage notes, but since 2004 there has been an increasing participation of non-endorsable mortgage loans. One reason behind this composition change is the combination of an increased credit demand and the relatively larger flexibility of non-endorsable mortgage loans, in terms of LTV and DTI limits, length of term, interest rates, and minimum down payment requirement. The shift also coincides with the introduction, in November 2002, of a transaction tax exemption to loan renegotiations[4] (Graph 1).

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[4] See Flores (2006).

In addition to the stock figures presented in Table 1, information on flows between June 2012 and September 2014 (period under study) shows that 8 banks are responsible for about 95% of the total transactions and 93% of the total amount lent (Graph 2). This distribution allows us to focus on 8 banks for our methodological framework, including the state-owned bank (BancoEstado, BE). It should be noted that the participation of BE in the total number of loans is about 33%, but weighted by amount is only 17%. That implies that BE tends to grant loans of relatively small size.

Graph 1: Banking housing debt by instrument (percent)
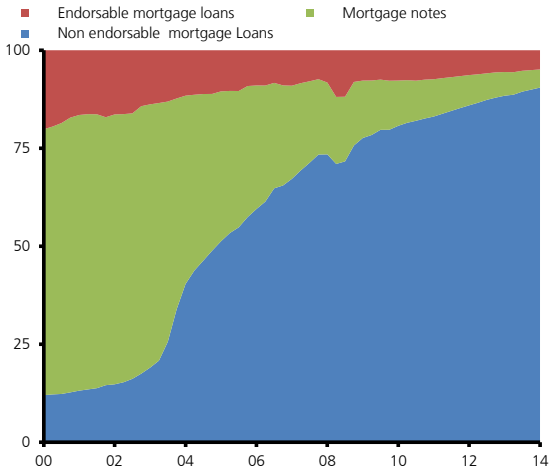
Source: Superintendent of Banks.

**Graph 2:** Number of loans by bank in sample[5] (cumulative percent)
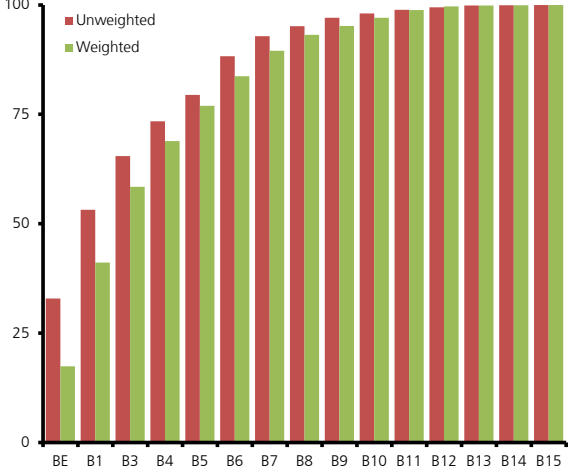
Source: Chilean Tax Authority.

Regarding mortgage loan dynamics, they have shown steady growth in the past five years, reaching annual variations above 10% in real terms since the second half of 2014. . This growth is mainly due to the increase in average debt, instead of number of debtors (Graph 3). Although this is consistent with the evolution of housing prices, discussed below, there is an increment in the number of mortgage loans by debtor. Indeed, in the last 5 years the fraction of debtors with more than one mortgage has increased from 20 to 25% of the total (Graph 4).

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[5] Unweighted is the cumulative percentage of number of loans granted by each bank. Weighted is the cumulative percentage of the number of loans granted, weighted by the total sum of loan flows corresponding to each bank.
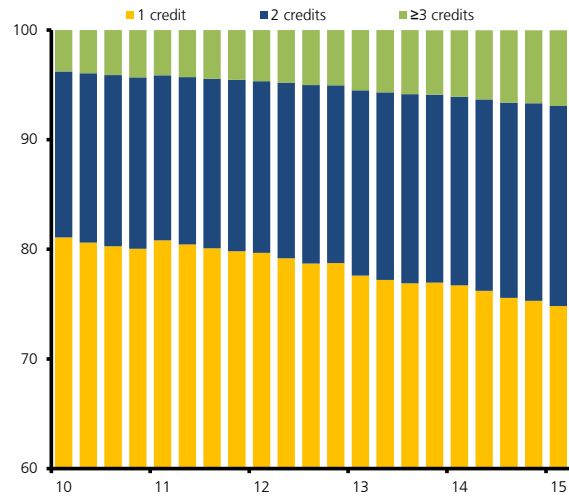
Graph 3: Mortgage loans

(real annual variation, percent)
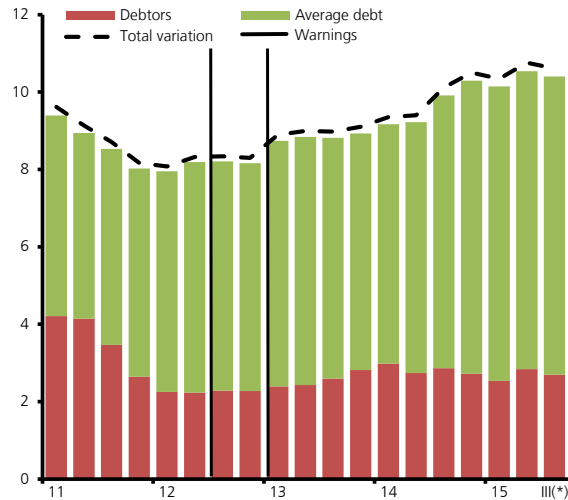
Graph 4: Mortgage loans by debtor

(percent)

Source: Central Bank of Chile.

Source: Superintendent of Banks.

2.2 Housing Price Index

The Chilean Tax Authority maintains a detailed administrative database of every housing transaction in the country. The database includes information related to the transaction, such as price, location of the house, etc. It also includes information about the characteristics of the house, such as: size (measured in squared meters), or type (apartment, town house). Finally, in this database there is information related to the conditions of the loan (if applies), such as: maturity and bank name. With this information it is straightforward to compute the loan to value ratio (LTV) per transaction.

Using the Chilean Tax database, the Central Bank of Chile calculates the housing price index (HPI) using a methodology known as stratified method or mix-adjustment[6]. This methodology measures the variations of prices of different types of houses by splitting the sample in groups by certain characteristics, such as, price, geographical location, size, etc. This methodology, therefore, controls for changes in the composition of the sold houses between periods not in groups. For each group average price is computed and we obtain an aggregate index by

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[6] For more details about methodology see Central Bank of Chile (2013).

weighting averages across groups. Further, the sample is divided into seven geographic zones: North, Center, South and the Metropolitan Area (M.A.) which is divided in M.A. East, M.A West, M.A Downtown and M.A South[7]. Also, each zone is divided between town-houses and apartments, getting a grand total of 14 groups. This allows us to construct the HPI by zone and type of house and aggregation is computed by weighting these by squared meters. In addition to this index, there is a private estimate generated by the Chilean Chamber of Construction (CChC). The latter is computed only for M.A. and it is based on new houses only. In addition, the index includes houses that are under still construction (promises), we use this additional source since the latter information is not available in our Chilean Tax database.

Both house price indexes show an upward trend since 2002. According to these sources aggregate prices have retained their growth rates, which is be consistent with growing national private income and low long-term interest rates (Graph 5). However, the national figure hides substantial heterogeneity across zones, which is probably influenced by differences in the behavior of demand and the relative supply in each of them (Graph 6). Del Negro and Otrok (2006) documented this heterogeneity in the U.S., their findings indicate that the factors driving house prices switch over time from local to national sources, the national variation does not seem to be linked to monetary policy changes. Allen et al. (2006) also explore this regional price heterogeneity using Canadian data, they find little evidence of long run correlation between different cities and also document a disconnect between house prices, interest rates and other macroeconomic variables. Local factors such as union wage levels, new housing prices and number of building permits issued seem to be more closely related to local house prices. Regarding our dataset, despite differences in methodologies of both indexes, they show similar trends. However, the one computed by CChC shows less fluctuation, most likely because it is based on a fitted model.

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[7] More details about the subdivision into zones see Central Bank of Chile (2013). A detailed map depicting the different zones is included for reference in Appendix 2.
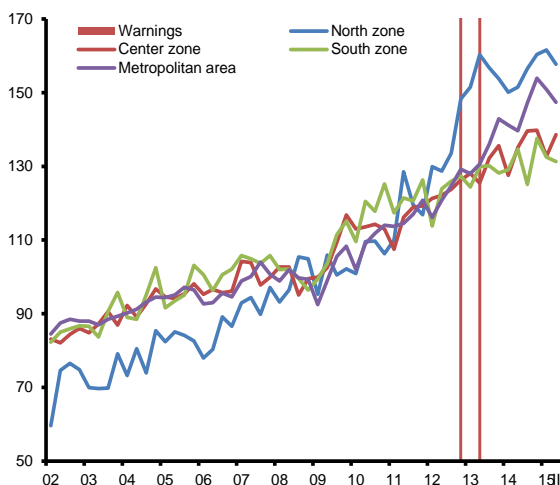
Graph 5: Comparison of HPIs[8]

(index 100 = 2008)
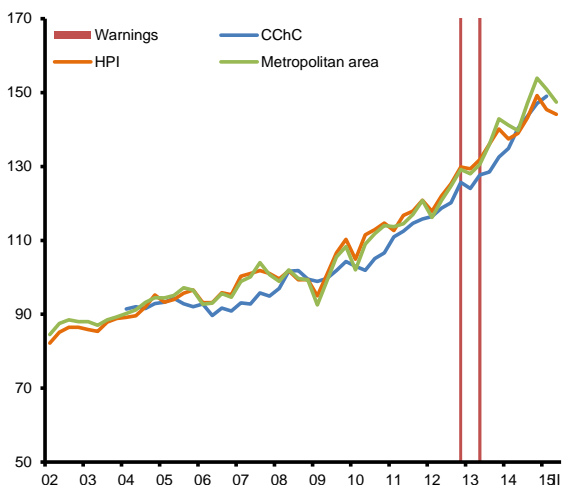
Sources: Central Bank of Chile and CChC.

Graph 6: House price index by zone

(index 100 = 2008)

Source: Central Bank of Chile.

2.3 Recent developments

The sale of housing units in Santiago shows a positive trend since the onset of the global crisis (Graph 7). This occurs in a context of growing prices, historically low interest rates, and recent changes in sales tax policy, which could partially explain the volume of units sold during last year.

During the first quarter of 2015, new home sales and construction in Santiago remained above their historical averages. Home sales continued to grow at a pace of around 10,000 units per quarter. The production of new homes, including gross commitments, grew strongly (22% in annual terms in the first quarter of 2015) possibly driven by higher sales expectations and/or the recent stabilization of costs, in particular those associated to labor. The slowdown in costs, together with increased volume of registered deeds, had a favorable impact on the profitability of the real estate business of the main companies in the sector. Finally, relative to disposable income, housing prices were stable in 2014 and in the lower range of indicators for a wide set of countries.

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[8] CChC uses a hedonic methodology to calculate the index, as opposed to the other indices where a stratified methodology is utilized.

Graph 7: Sales by type of property

(thousands of units)
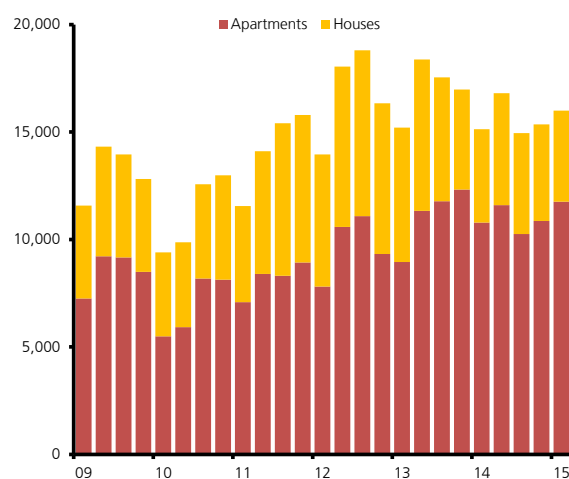
(*) Include promises.

Source: Chilean Chamber of Construction.

2.4 Warnings in the Financial Stability Report

Twice a year, the Central Bank of Chile publishes its Financial Stability Report (FSR). The objective of the FSR is to provide information to the general public, on a half-yearly basis, on recent macroeconomic and financial events that could affect the financial stability of the Chilean economy. In addition, the FSR presents policies and measures that support the normal operation of the internal and external payment system. In the first and second half of 2012 two warnings were published in the FSR, they were associated with the real estate market and its developments (Table 2). . Both referred to the existence of potential risks in the housing market, and the second one explicitly mentioned lending standards. It is hard to quantify the intensity of the messages just by reading the warnings. That is why we will take a quantitative approach in order to do this.

Table 2: FSR Warnings

| First Half 2012 (June 18, 2012)	Second Half 2012 (December 18, 2012)
"Aggregate housing prices move in tandem with the economy's level of interest rates and income. At some districts in the central and eastern area of the Santiago Metropolitan Region prices are outgrowing their historic trends, possibly due to constraints in the land available. It is important to keep in mind that the materialization of the risk scenario described in this Report could lead to a breakdown in current price trends. The potential implications of this are price adjustments influencing the profits of executed projects and, additionally, the collaterals backing mortgage loans".	"The Report highlights that aggregate housing prices indices have maintained their pace of expansion, in line with the dynamism of the economy, and that in many districts prices are rising above historic trends. These increases occur in a context of high growth in housing demand and a significant expansion of activity in this sector. [...] This, together with somewhat less stringent lending standards for mortgage credit. These developments could lead to financial vulnerabilities in the real estate and construction industry, or in those households searching for a home".

Source: Central Bank of Chile.

As we showed in the previous section, these warnings do not seem to have had an effect on aggregate house prices or the total volume of mortgage loans granted. The warning issued in June 2012 is marked in Graph 5 with a red bar; there is no noticeable effect on aggregate housing prices. The same lack of variation is observed when house prices are decomposed by zone (Graph 6). The second warning —also marked with a red bar— does not appear to have an impact on prices either. Graph 3 shows the growth rate of mortgages loans accelerating following the issuance of warnings. Thus, the aggregate figures suggest that warnings had no impact, and central bank communication through the FSR was ineffective as a macroprudential tool. There are two possible explanations for this, first warnings may not have power because market participants do not value the messages delivered in the FSR. This would imply a failure of warnings as a feasible macroprudential tool.

However, a second argument can be put forward on the basis that no impact on these aggregate variables can be explained by the fact that warnings did not point to a given imbalance on the market but a prospective vision of it. Thus, it is expected that warnings will affect the lending policies of banks, for example on Loan to Value ratio (LTV). Again an impact on average LTV will tell us about some generalized risk-taking behavior of banks; therefore warnings will point to a risk-type of imbalance.

By considering the information of the eight largest banks in this market, the distribution of LTV ratios for newly originated mortgages shows some variation around the two warning events. In particular, the high-end of the LTV distribution (90th percentile) fell after the first warning and then dropped again after the second warning (Graph 9). It is worth noting that the 75th percentile did not react to these warnings, being a compression of high LTV's. Prior to the first warning, about 10% of mortgage loans were granted with an LTV of 100%, after the warnings around 10% of loans were granted with an LTV of 90%. Concerned about a possible bias in our results due to the presence of the state owned bank BE, which could have followed the warnings more closely, we removed it from the sample. When re-estimating with this trimmed sample, the impact remains (Graph 10).

Graph 8: LTV full sample (*)
(percent)
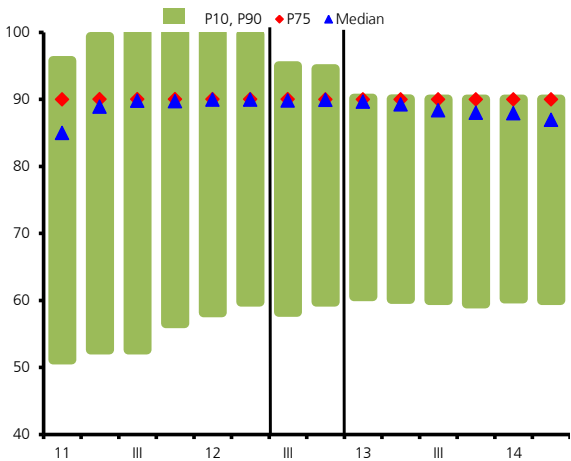
Graph 9: LTV without BE (*)
(percent)
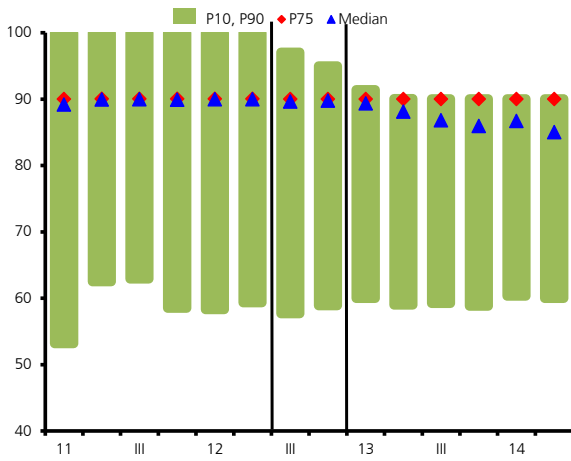
(*) Vertical lines indicate the warnings dates.

Source: Central Bank of Chile.

Before taking the econometric approach, let us assess the impact of warnings by computing LTV ratio brackets. From doing this, it becomes clear that banks tended to reallocate loans into brackets with lower LTVs. In particular, the impact of the first warning translated into a reduction in the high LTV bracket (above 90%) that was somehow compensated by an increase in the low LTV bracket (below 70%). One quarter after the first warning, the share of loans in the 81-90% bracket began to increase. A similar pattern is observed after the second warning (Graph 11). Results are robust to the exclusion of BE (Graph 12). In the next section we use quantile regressions to evaluate the statistical significance of the change in the 90th percentile we illustrated graphically. This exercise will also allow us to control for bank fixed-effects. A probit analysis will also be conducted in order to evaluate the statistical significance of these findings from a slightly different approach.

Graph 10: Distribution of LTV ratio, full sample

(percent)
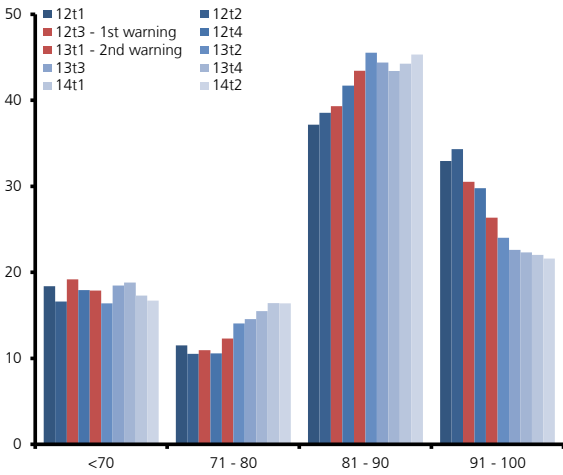
Graph 11: Distribution of LTV ratio without BE

(percent)
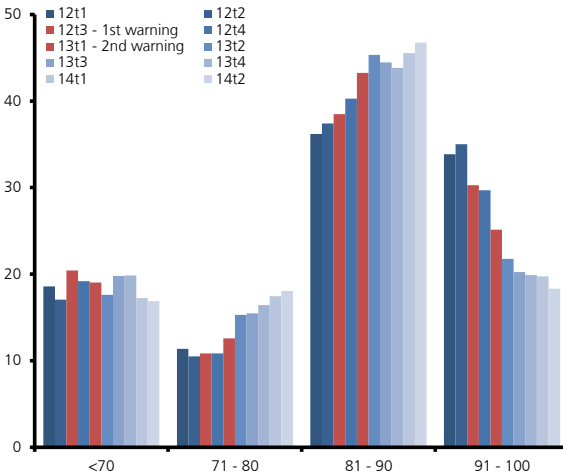
Source: Central Bank of Chile.

3. Empirical Results

As previously mentioned, a large fraction of loans (over 30% as of 2012Q1) were granted with a LTV ratio of 90% or higher. Furthermore, about 10% of these loans are associated with an

LTV ratio of 100%. The graphical evidence suggests that warnings in the FSR about real estate market vulnerabilities made by the Central Bank of Chile had an impact on the high end of the LTV distribution. To document whether these warnings had a significant impact, two different methodologies are used in this section. First, a binary probit model is estimated in order to quantify the effectivity public warnings about potential housing market vulnerabilities had in diminishing the probability that a high LTV ratio loan was granted. In this model a positive outcome is defined as the granting of a loan with an LTV ratio exceeding a given threshold. Second, as we showed in the previous section, the central moments of the LTV ratio distribution remained unchanged with the effects concentrated on its upper tail. Thus, a quantile regression is estimated in order to compute the impact of the public warnings on the median and several other percentiles of the LTV ratio distribution. Attending to the historical behavior of the state owned bank, a robustness exercise excluding BancoEstado is conducted for both probit and quantile estimations.

In all of the estimations below we use the Chilean Tax Authority data. The sample spans 2011Q1 through 2014Q2 with quarterly frequency.

3.1 Binary Modeling for high LTV

In this section we estimate a probit model. Our dependent variable is binary, it is equal to 1 when the LTV ratio associated to a transaction is higher than a given threshold, and 0 otherwise. We construct two dependent variables for two LTV thresholds, namely LTV90 and LTV80 for 90 and 80% thresholds, respectively.

As independent variables, we construct two dummy variables, one for each FSR warning. The first one was issued in 2012Q3, and the second in 2013Q1. Each of these is equal to 1 after the respective warning is issued, and 0 otherwise. In tables 3 and 4 results are presented for the sample containing all 8 banks, as well as the sample excluding BE. For the LTV90 estimation, in column 1 we can see the first warning reduced the probability of a loan being granted with an LTV higher than 90%. In columns 2 and 3 we report how the second warning also had a significant negative effect on the probability of occurrence. The sign for the first warning switches to positive, however the joint effect of both warnings remains negative and statistically significant. Furthermore, the estimation excluding BE shows a robust result, with

a larger magnitude for the total effect than the one obtained with the full sample. The fact this effect is larger without the state owned bank could be due to its mandate, and segment of the mortgage loan market where it operates. Next we show the estimation results for the 80% threshold in Table 4. For the model in column 1, with the first warning only, the effect is positive. This result is puzzling, but could be explained by a reallocation of loans, with banks granting more loans with lower LTV to compensate for the reduction in those with a higher ratio. This result follows the same pattern when we include both warnings in columns 2 and 3; there is a positive sign for the first warning and negative for the second, both statistically significant. When we estimate excluding BE, the impact of each warning over the probability of occurrence is individually negative and significant. Once again this could be due to the mandate that rules the state owned bank BE.

Table 3: Probit - (LTV90)

	Full Sample			Without BE		
	(1)	(2)	(3)	(4)	(5)	(6)
2012q3	-0.07***	0.04***	0.06***	-0.22***	-0.06***	-0.04***
2013q1		-0.16***	-0.16***		-0.21***	-0.22***
Constant	-0.25***	-0.25***	-0.04***	-0.19***	-0.19***	0.02***
Bank FE	-	-	Yes	-	-	Yes
N	198,299	198,299	198,299	157,985	157,985	157,985

* p<.1, ** p<0.05, *** p<.01

Source: Author's calculations.

Table 4: Probit – (LTV80)

	Full Sample			Without BE		
	(1)	(2)	(3)	(4)	(5)	(6)
2012q3	0.05***	0.09***	0.11***	-0.12***	-0.08***	-0.06***
2013q1		-0.05***	-0.06***		-0.05***	-0.07***
Constant	0.50***	0.50***	0.62***	0.62***	0.62***	0.69***
Banks FE	-	-	Yes	-	-	Yes
N	198,299	198,299	198,299	157,985	157,985	157,985

* p<.1, ** p<0.05, *** p<.01

Source: Author's calculations.

3.2 Quantile regression

The main objective of the analysis in this sub-section is to study how the FSR warnings affected the distribution of LTV ratios for newly originated mortgage loans, focusing on the upper tail of this distribution. In particular, we consider quantile regression analysis for the 90, 75 and 50th percentiles. We show additional results for the 85 and 80th percentiles in Appendix 2.

As dependent variable we use the LTV ratio of granted mortgage loans. Independent variables are the same we used when estimating the probit model, dummy variables for each of the two warnings issued by the Central Bank of Chile. As we showed in Graphs 9 and 10, the median and 75th percentile LTV ratios remain almost constant after both warnings. This is a desirable outcome since the warnings did not aim towards correcting a misalignment in the less risky brackets of LTV. Instead, the second warning explicitly mentioned the somewhat less stringent lending standards for mortgage credit, which in turn is associated with the upper tail of the LTV ratio distribution.

Our results in Table 5 suggest that the FSR warnings were relevant reducing the LTV of loans granted with ratios above 90% (graphically shown above in Graph 9). Column 2 shows how both warnings significantly reduced the 90th percentile of the LTV ratio distribution. The effect becomes relatively larger for the second warning when we add bank level fixed effects (column 3). Similar to the probit specification, the results are in general stronger when we exclude BE from the sample (columns 4 through 6), which historically has had a behavior different from that of private banks. Furthermore, the second warning has an even larger impact over the 90th LTV percentile, when compared to the first one. As mentioned above, we believe this different effect could be due to the explicit mention to less stringent lending standards included in the second warning. This element, combined with the different nature of the state owned bank, are plausible explanations to why the effects are larger when BE is excluded.

Table 5: Quantile Regression - (Q90)

	Full Sample			Without BE		
	(1)	(2)	(3)	(4)	(5)	(6)
2012q3	-9.871***	-4.950***	-0.625***	-9.483***	-3.886***	-1.077***
2013q1		-4.949***	-1.363***		-6.057***	-4.995***
Constant	99.95***	99.95***	100.00***	100.00***	100.00***	100.00***
Banks FE	-	-	Yes	-	-	Yes
N	198,299	198,299	198,299	157,985	157,985	157,985

* p<.1, ** p<0.05, *** p<.01

Source: Author's calculations.

Table 6: Quantile Regression - (Q75)

	Full Sample			Without BE		
	(1)	(2)	(3)	(4)	(5)	(6)
2012q3	-0.02***	-0.01***	-0.00	-0.04***	-0.020***	-0.01
2013q1		-0.02***	-0.01		-0.018***	-0.02
Constant	90.02***	90.02***	90.97***	90.04***	90.04***	90.97***
Banks FE	-	-	Yes	-	-	Yes
N	198,299	198,299	198,299	157,985	157,985	157,985

* p<.1, ** p<0.05, *** p<.01

Source: Author's calculations.

Table 7: Quantile Regression - (Q50)

	Full Sample			Without BE		
	(1)	(2)	(3)	(4)	(5)	(6)
2012q3	-0.27***	0.38***	0.02	-1.27***	-0.14	-0.01
2013q1		-1.00***	-0.13		-1.80***	-1.15***
Constant	89.54***	89.54***	89.99***	89.95***	89.95***	90.00***
Banks FE	-	-	Yes	-	-	Yes
N	198,299	198,299	198,299	157,985	157,985	157,985

* p<.1, ** p<0.05, *** p<.01

Source: Author's calculations.

Then, we estimate the model for the 75th percentile, looking for movements distinct to those in the 90th percentile in an a priori less risky bracket. As shown in Table 6, the magnitude of the effects is smaller than those previously obtained for the 90th percentile. When we add bank level fixed effects in column 3, the warning coefficients are no longer statistically significant. Also, we no longer observe an important difference in estimated coefficients after removing BE (columns 4 through 6).

Finally, results for the 50th percentile in Table 7 suggest that the first warning had a positive and statistically significant effect over the granting of mortgage loans, but still negative when aggregating the impact of both warnings (column 2). When we add bank fixed effects, the effects of both warnings are no longer significant (column 3). Once again this could be due to the warnings being aimed towards a riskier segment of credit. After excluding BE from the sample (columns 4 through 6), the effect of the first warning is not statistically significant. The second warning still has a negative and significant coefficient.

Final remarks

The structure and behavior of the mortgage market are crucial elements to consider when analyzing the home purchasing decision. In recent years, house prices have grown significantly relative to their historical pattern. In this context, the Central Bank of Chile in its Financial Stability Report highlighted potential vulnerabilities in certain housing markets. From an aggregate perspective, in the context of the real estate market, these warnings do not seem to have had an effect over the volume of sales or credit. However, at the micro level, empirical evidence suggests that loans granted with high LTV ratios were significantly reduced following the issuance of these reports. We conclude that the issued warnings had a significant effect on bank lending policies. This finding is in line with the Central Bank pointing out to the existence of prospective risks, associated to less stringent lending standards in the real estate market. As opposed to a broad misalignment in any housing market aggregate, such as house prices or average LTV ratios of granted loans.

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Appendix 1

Chilean geographic zones
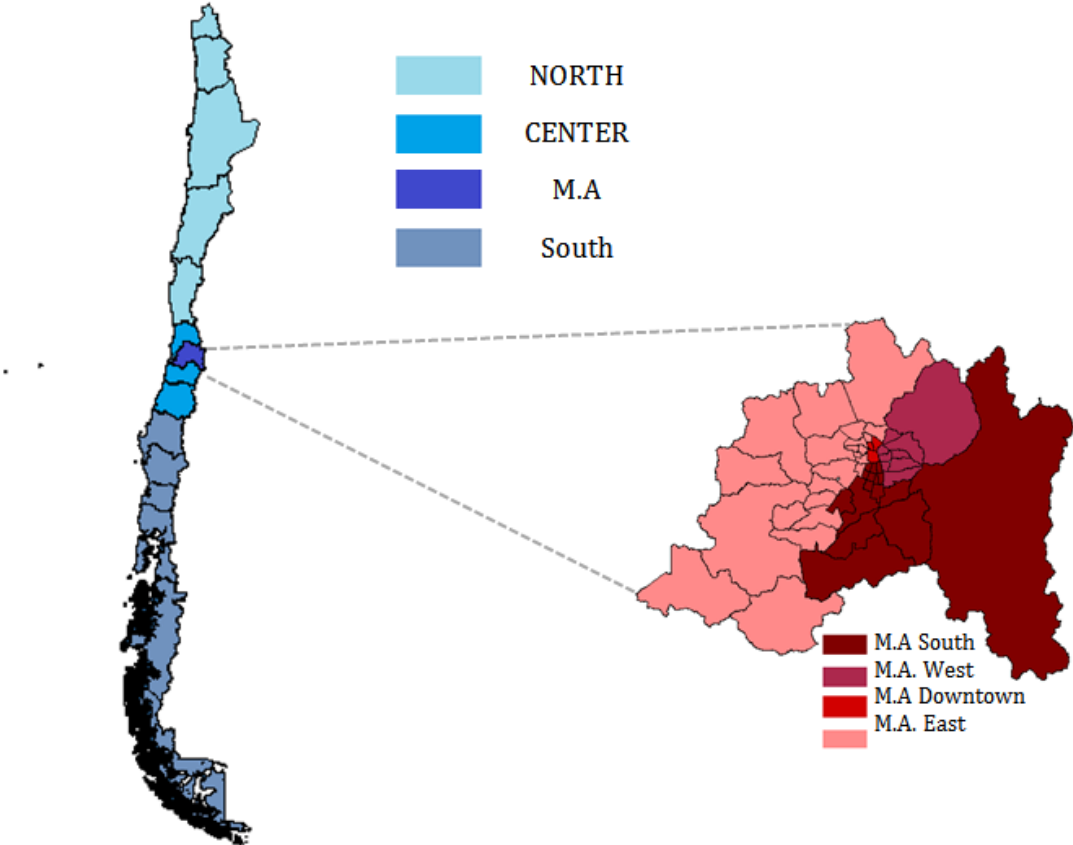
Source: Author´s elaboration based on Chilean Tax Authority data.

Appendix 2

Table A1: Quantile Regression - (Q85)

	Full Sample			Without BE		
	(1)	(2)	(3)	(4)	(5)	(6)
2012q3	-2.94***	-2.76***	-0.045	-5.07***	-3.16***	-2.23***
2013q1		-0.18	-0.035		-1.92***	-0.42***
Constant	92.97***	92.97***	100.00***	95.10***	95.10***	100.00***
Banks FE	-	-	Yes	-	-	Yes
N	198,299	198,299	198,299	157,985	157,985	157,985

* p<.1, ** p<0.05, *** p<.01

Source: Author's calculations.

Table A2: Quantile Regression - (Q80)

	Full Sample			Without BE		
	(1)	(2)	(3)	(4)	(5)	(6)
2012q3	-0.05***	-0.02***	-0.01	-0.83***	-0.79***	-0.10
2013q1		-0.03***	-0.02		-0.04	-0.03
Constant	90.06***	90.06***	95.09***	90.84***	90.84***	95.16***
Banks FE	-	-	Yes	-	-	Yes
N	198,299	198,299	198,299	157,985	157,985	157,985

* p<.1, ** p<0.05, *** p<.01

Source: Author's calculations.