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Taxonomy of Chilean financial fragility periods from 1975 to 2017*

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Abstract

The measurement of financial fragility is a key element but still an ongoing task for monetary, financial authorities and international financial institutions. This is specially relevant when applying financial policies that are contingent on the behavior of a particular economy or try to anticipate disruptive events. However, there are several dimensions that complicate the precise definition of financial fragility and the identification of these periods; some examples are: the distinction of causes, symptoms, effects and policy management measures. The current literature points out to a few key elements that have a broad impact on the financial system. In particular, it highlights the role of materialized credit risk, profits and credit activity of banks as signs of instability. In this paper, we combine these elements to identify and delimit historical financial fragility periods for the Chilean economy. In doing so, we build a novel monthly database that includes the 1980's local banking crisis period.

Resumen

La medición de la fragilidad financiera es un elemento clave, pero sigue siendo un desafío para las autoridades monetarias, financieras y las instituciones financieras internacionales. Esto es especialmente relevante cuando se aplican políticas financieras que dependen del comportamiento de una economía en particular o cuando se intenta anticipar eventos disruptivos.
Sin embargo, hay varias dimensiones que complican la definición precisa de fragilidad financiera y la identificación de estos períodos; algunos ejemplos son: la distinción de las causas, síntomas, efectos y medidas de gestión de crisis. La literatura actual señala algunos elementos clave que tienen un amplio impacto en el sistema financiero. En particular, se destaca el papel del riesgo de crédito materializado, la rentabilidad y la actividad crediticia de los bancos en la detección de inestabilidad financiera. En este documento, se combinan dichos elementos para identificar y delimitar los períodos históricos de fragilidad financiera para la economía chilena. En el proceso, se recopila información y se genera una base de datos que incluye el período de crisis bancaria local de los años ochenta.

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1 Introduction

Monetary policy development and implementation has been favored by a definition of price stability, measured through inflation. The use of a single indicator simplifies the decision making process for most monetary authorities and contributes to its accountability (Goodhart, 1989). However, the application of financial policies has been less precise and established since there is no full consensus about the object of analysis: the financial fragility (Goodhart, 1989, Borio & Drehmann 2009).

Financial fragility concept has been widely studied, especially after the recent global financial crisis. On the one hand, prudential monitoring has been incorporating a wide range of financial indicators that help in the aggregate judgement of the financial situation of an economy. That is how several Financial Stability Reports - of developed and developing countries financial authorities' (Lim et al., 2017) - have emerged and progressed in coverage and technical depth of the analysis of aggregate risks that potentially affect the system. Although the financial monitoring constitutes a valuable input to ensure the stability of the financial system, the implementation of macro-prudential policies has not been straightforward because of the lack of a unique indicator, as in the case of monetary policy, among other difficulties (Goodhart, 1989). In this context, it is often necessary to use several metrics to define historic periods of financial fragility to systematically analyze this financial phenomenon, and thus, collect lessons that allow a correct implementation of financial policies.

The design of policies that are focused on anticipate, prevent and mitigate the effects of financial fragility periods, requires a precise definition of its previous occurrences. For example, in the design of the Counter-Cyclical Capital Buffer, it is necessary to test the properties of several indicators in their ability to anticipate periods of financial fragility that are originated by an excessive credit growth (Borio, 2014). By assuming that there is an historical regularity, it is reasonable to undertake a retrospective analysis that attempts to measure the predictive power of early warning indicators on past fragility episodes, such as the AUROC [1]. However, although it is difficult to find clear evidence in the related literature (e.g. Detken et al (2014)), a delimitation of financial fragility periods has to be performed before the analysis of the early warning indicators.

There is no formal definition nor a consensus about financial fragility - or fi-

[1] Defined as the Area Under the Operator Characteristics Curve. For details, see Detken et al. (2014).

nancial stability - measures (Borio & Drehmann, 2009, Goodhart, 1989). Some metrics are based on historical events of excessive assets volatility (e.g. Merton, 1974), high probabilities of default and low profitability of banks (Goodhart et al., 2006), or - in the case of banking crises - bankruptcies of financial institutions and several dimensions of imbalances or risk (Leaven & Valencia, 2008). Although they may differ in their nature and methodology, all of these approaches aim to capture a systemic component of risks. That is, a period of fragility should be characterized by a small set of factors or variables that reflect the systemic vulnerability.

In particular, there is some evidence in the identification of fragility periods in the Chilean economy, but it is still necessary to work on the precision and historical depth of the delimitation of particular periods. The Chilean economy has experienced various episodes of financial turmoil, where the crisis of the 80's is clearly distinguished by its magnitude and the relevance of government interventions. In fact, it is considered as one of the episodes that had the largest fiscal impact above a wide set of economies (Laeven & Valencia, 2012).

Regarding the period nearby the so-called Asian Crisis (1998-1999) and the Global Financial Crisis (2008-2009), there are few studies that investigate some financial stylized facts in the Chilean economy. Since the 90's Chile has experienced a stable period with practically nonexistent disruptions. In this context, Ahumada & Budnevich (2002) investigate the properties of a set of financial variables as early warning indicators of financial fragility in Chile. In their estimations, they assume that past due loans and inter-bank spreads reflect financial fragility. On the other hand, De Gregorio (2009), points out that around to the Global Financial Crisis a liquidity shock of international financial markets affected the Chilean economy with some real consequences. Nonetheless, the effects of the shock were limited by the solid macroeconomic and financial environment, and the policy measures taken.

Despite the progress of the current literature, it is still necessary to provide a more complete and precise identification of financial fragility periods. First, we need a set of variables that allows us to identify contemporaneous financial fragility in a context where, as it has been emphasized, the definition of the concept is diffuse and encompasses many dimensions. Therefore, we have to present a specific financial fragility taxonomy. Second, we have to consider that more recent episodes had a considerably lower financial and macroeconomic impact. And finally, recognize that there is a lack of financial data in terms of homogeneity of definitions, time coverage and frequency. Thus, this paper addresses these issues and suggest precise dates for the beginning and end of financial fragility episodes in Chile, on a monthly basis, since 1975.

The remaining part of this paper is organized as follows. Section 2 provides a conceptual framework of financial fragility taxonomy. Section 3 presents the criteria in the elaboration of a financial database for the Chilean economy. Section 4 shows the empirical methodology, analysis and delimitation of financial fragility periods. Section 5 complements the statistical analysis with an historical context that illustrate the interaction of macro and financial elements in the fragility episodes. Finally, section 6 concludes.

2 Towards a financial fragility taxonomy

In order to perform the empirical analysis, we define the main dimensions of financial fragility that are in our focus. Thus, we develop a taxonomy that consists on discriminating among different dimensions and events around fragility periods. Consequently, we look for an operational definition of the concept that allows us to take the theory to the data.

Various authors have pointed out the necessity and difficulties to discern financial fragility periods owing to the fact that this concept overlaps with others, such as economic fragility, and economic and banking crisis (Allen & Gale, 2004; Goodhart et al., 2006; Claessens & Kose, 2013). Generally, by looking at financial and economic data for a broad set of economies, it can be argued that not all financial fragility periods are preceded or followed by an economic downturn. For example, the “dot com bubble burst" in 20002 was relatively well isolated from the real and financial sectors, especially because it was not financed with debt but equity (Brunnermeier & Schnabel, 2016).

Additionally, not all financial fragility periods involve banks. However, when banks are affected, the impacts on the macro-economy are more sizeable (Reinhart & Rogoff, 2009). Furthermore, not all periods of fragility end up in crises. Thus, the analysis has to be especially cautious to distinguish the key elements of financial fragility. In that sense, our study is focused on the involvement of the banking system, but also considers the economic context distinguishing between i) causes, ii) characteristics or symptoms, and iii) effects and policy measures. Additionally, we describe historical circumstances and the changes in the regulatory framework. As previously noted, the definition of financial stability is still subject of debate in academic and macro financial policy forums (Borio & Drehmann, 2009). This discussion highlights the need and difficulty of identifying periods of financial fragility (Allen & Gale, 2004; Goodhart et al., 2006; Claessens & Kose, 2013), since there is a significant overlap with other concepts. However,

several advances have been made in the distinction of its fundamental elements. In this work, we rely on this progress to characterize the dimensions that reflect the strength or vulnerability of the banking sector. In other hand, we know that Minsky (1972) describes people that have misalignment in expectations through a form of myopia around good states of nature or booms. This generates excess risk taking and could propitiate financial fragility.

Favorable conditions for a financial fragility occurrence: causes and consequences

Although to define the causality between macroeconomic and financial fragility is a challenge, there are some economic and financial factors that may propitiate the occurrence of a financial fragility period or, in extreme cases, a crisis. Allen & Gale (2004) indicates that a financial system is unstable or fragile when there are conditions under which small shocks may cause major disruptions. In the economic literature there are different emphasis on the role of the financial sector.

For instance, Reinhart & Rogoff (2009) suggests that the traditional financial crisis concept refers to events that were not originated in the real sector. However, it is indirectly associated with financial or monetary systems imbalances that may cause considerable fluctuations in asset prices, that affect the financial institutions capacity to fulfill their obligations. On the other hand, macroeconomic factors such as policies or expectations that may affect the quality of bank assets, its funding costs, liquidity and credit dynamics, may induce financial fragility periods. Hausmann & Rojas-Suárez (1997) includes factors such as the excessive expansion of monetary aggregates, the effect of public expectations and, internal and external volatilities. Some external factors are the excessive capital inflows (Reinhart & Rogoff, 2009; Laeven & Valencia, 2008), current account and fiscal deficits (Laeven & Valencia, 2008), anomalous asset price fluctuations (Reinhart & Rogoff, 2009 and Claessens et al., 2013).

In reference to microeconomic causes, these are often related to i) weaknesses in banking regulation and supervision (Claessens et al., 2013 and Laeven & Valencia 2008), ii) disorganized financial liberalization schemes (Claessens et al., 2013, and Laeven & Valencia 2008), iii) inadequate accounting frameworks, (Laeven & Valencia, 2008), iv) excessive banking credit growth (Borio, 2014; Claessens et al., 2013; Reinhart & Rogoff, 2009; Laeven & Valencia, 2008 and Minsky, 1972), v) (excessively) flexible loan terms (Claessens et al., 2013) and vi) high leverage (Minsky (1972), among others.

Finally, regarding to the consequences of financial fragility, in extreme cases,

such as banking crises, the need for governmental intervention arises to reduce the negative effects (Claessens et al., 2013). Thus, as Leaven & Valencia (2008, 2012) propose, a banking crisis may cause an important detriment of government fiscal stance. Alternatively, Demirgüç-Kunt & Detragiache (1997) indicate that banking fragility periods are followed by bank nationalization. In a less extreme situation of financial fragility, De Gregorio (2009) suggests that the policy intervention involves liquidity easing to vulnerable sectors.

Banking crises and financial fragility identification

Banking crises are extreme events of financial fragility periods and have multiple causes and effects, and several dimensions. Nonetheless, we will focus on these types of events and also on milder financial fragility periods that are associated with the banking sector. The approach followed is based on the selection of banking (Shin, 2013) and coincident[2] (Logan, 2001) ratios. Although the elements of banking crises and financial fragility are present in the literature for a long time, they are often confused and mixed. For instance, Laeven & Valencia (2008, 2012) indicate that banking crisis periods can coincide with those of debt and currency. But, it has to be emphasized that there is no full overlap among these events. Moreover, when it comes to characterize banking crises periods, the authors include i) excessive losses because of rising non-performing loans and ii) significant fiscal costs of government intervention.

The selection of key variables

With the considerations of previous sections, we focus on variables that account for the symptoms rather than causes and consequences of disruptive events of financial fragility.

Table 1 is an extension of Amieva & Urriza (2000) which summarizes the set of relevant characteristics used in the literature. Among the symptoms that the banking sector experiences we highlight: (i) the increase in the delinquency rate (ii) insolvencies of banking institutions, (iii) liquidity constraints, (v) credit restrictions and (vi) balance-sheet effects. This evidence covers financial fragility periods as well as banking crises.

[2] An indicator that moves simultaneously with the financial environment and therefore reflects its current status.

Table 1: Financial fragility characteristics

Characteristic or Symptom	Research evidence	Rationale
High delinquency	Minsky (1972), Sundararajáan & Baliño 1991, Guttentag & Herring (1984), Manikow (1986), Veblen (1904), Mitchell (1941), Demirgüç-Kunt & Detragiache (1997).	When the financial system becomes unstable, macroeconomic (internal or external) or liquidity shocks have an impact in reducing the capacity of repayment of banks' debtors.
Credit restrictions	Stiglitz & Weiss (1981), Reinhart & Rogoff (2009), Laeven & Valencia (2008) and Minsky (1972).	Severe and persistent liquidity restrictions and excessive risk aversion of banks may lead to credit contractions that exacerbate the downturn.
Decrease in profitability	Goodhart et al. (2006), Albertazzi & Gambacorta (2009), Demirgüç-Kunt & Detragiache (1999).	Profitability contains several dimensions of banking activity. It mixes market competition, financial costs, operational costs, increasing in delinquencies materialized in loan loss provisions, etc. A high variation of this indicator may well account for a fragility period.
Liquidity constraints	Reinhart & Rogoff (2009), Schwartz (1985), Wolfson (1986) and Mirön (1986)	When solvency is a threat and repayment are being reduced, investors hold their resources to avoid further impacts. Thus, firms and banks face short term financing restrictions.
Insolvencies of banking institutions	Reinhart & Rogoff (2009) and Laeven & Valencia (2008).	When agents lower their repayments, in general, there are other simultaneous shocks that may reduce dramatically banks' net worth and solvency. An extreme case of this leads to insolvencies.
Balance sheet effects (price and quantity)	Bell & Pain (2000), Federal Reserve Bank of San Francisco (1985).	This is somewhat predetermined by a combination of the other characteristics. That is, the impact on bank's depositors and debtors and the market valuation of a bank is reflected in the banks' balance sheet. This condition also has a reinforcing effect on other dimensions of risk.

Source: Own elaboration based on listed references.

In our statistical analysis, we focus in the first three dimensions because of two main motivations. First, we try to avoid over-identification of financial fragility by including somewhat predetermined dimensions. For instance, we do not include bank balances-sheet effects, since they are captured by the other dimensions. Second, we do not consider variables that may signal to false positive cases of fragility - such as liquidity conditions -, mainly because not all restrictions obey or lead to fragility periods. Finally, we avoid to incorporate evidence that accounts for extreme cases of financial fragility only - such as banking crises. Thus, we avoid the inclusion of insolvency cases, because not all fragility periods lead to them.

3 Database compilation and description

At the date of this study, historical information of financial variables, for the period before 1989, was not available at a frequency higher than the annual rate,

which made it difficult to characterize the financial sector. For this reason, in this work, we compile a new database that allows us to estimate metrics of financial fragility and incorporate the dynamics of key variables suggested by the literature.

This section describes the criteria used to construct the database of financial banking variables. This is used afterwards in the the definition of financial fragility (i.e. past-due loans ratio, profitability and banking credit growth/contractions) and in the characterization or context of those periods (i.e. other macroeconomic and financial variables). The specific details on variables construction and sources is available in Appendix 2.

3.1 Banking data

From January 1970 to December 1988, the information of the printed bulletins of the Superintendency of Banks and Financial Institutions (SBIF) was used. Since January 1989, the information on the main financial statements of the banks (balance sheets and income statements) are digitized.

In general, the criterion for constructing the database of the banking system was to maintain current standards in order to make comparable different series of banks since 1970. Over the last decades, the accounting format of banks had significant changes. Two of the most important occurred in August 1985, with a locally originated modification introducing new balance-sheet and income statements models, and in January 2008, with the introduction of the International Financial Reporting Standards (IFRS).

Between 1975 and 1978, "Financial Companies" information was available. This group includes several financial firms - formal and informal - that were developed under the "free banking" framework. After three years, these were dissolved or absorbed by other financial institutions. These companies grew explosively due to the lack of an appropriate regulatory framework. Therefore, the information of this group was excluded in the elaboration of the series, because they distorted the dynamics of the financial system we want to capture.

The printed bulletins of the SBIF between 1970 and 1978 are available in the library of the Superintendency and only from 1979 are available in the library of the CBC. This information was homologated as is detailed in Appendix 2.

3.2 Macroeconomic data

The main source of information is the Statistical Database from the Central Bank of Chile (CBC). This dataset contains copper price series, unemployment rates, GDP, current account deficit and exchange rate. Additionally, from the Chilean Copper Commission (COCHILCO) we obtain monthly data of copper pound price (nominal and constant) from 1960.

The unemployment rate is available from 1970 and was extracted from the Central Bank of Chile (2001). These data are merged with quarterly data also published in the CBC statistical database named "Quarterly Unemployment Rate in Greater Santiago." The reason for extracting the unemployment rate from the Greater Santiago is due to its time coverage and the similarity with the unemployment data at national level published by the Instituto Nacional de Estadísticas (INE).

The current account deficit was obtained from the statistical database "Historical Information of Balance of payments of External Sector" of the Central Bank of Chile . Because the quarterly information is only available since 1996, it was considered an annual frequency to privilege the most historical information, dating from 1960.

For the exchange rate, we used the CBC statistical database named "Historical Information of Exchange Rates of Observed Dollar". In addition, the real exchange rate index was obtained from the same information source, but only from the first quarter of 1986.

Finally, the Consumer Price Index (CPI) was also obtained from the statistical database of the CBC "Historical Information of Annual Variation of Prices".

4 Empirical Analysis: methodology and results

As pointed out previously, in order to characterize the periods of fragility of the banking system, we focus on three dimensions 1) Activity, which is captured by the annual growth of total banking credits to the non-financial private sector. 2) Realized credit risk, which is manifested in the default of payments and it is measured by the past-due loan ratio (past-due loans over total loans). 3) Profitability, measured by the return on assets (ROA).

The relative value and changes of these indicators will define a critical date

around which a period of fragility occurs. Therefore, the points of lower growth, higher default and lower profitability mark the peak period of each cycle. We have to consider that the level and volatility of each variable has changed over time, so an absolute threshold cannot be defined to determine a particular period of interest. For instance, three clearly different periods can be observed, nearby the 80's, the 90's and after the mid 2000's (Figures 1, 2 and 3). In that sense, we take the information not only from the level but also from the major changes in a short period of time. For example, although in June 2000, one of the highest levels of overdue loans was recorded, it increased sharply until April 1999 before that peak.

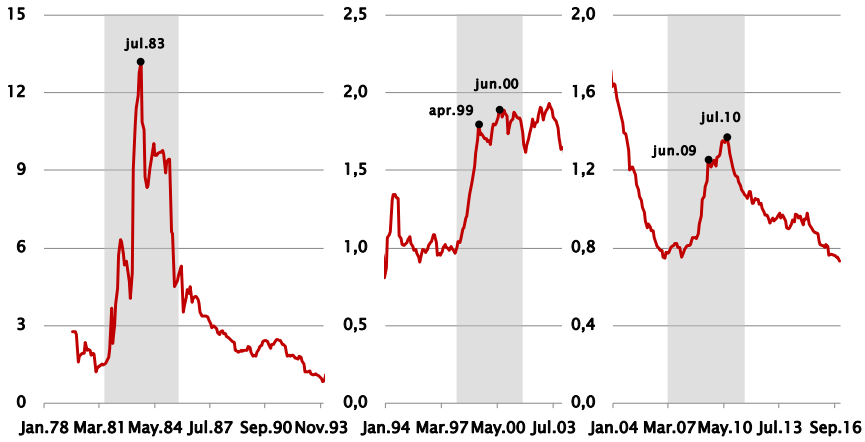
Figure 1: Banking Credit Growth

(percentage)

Source: Own elaboration based on data from the SBIF.

Figure 2: Past-due Index

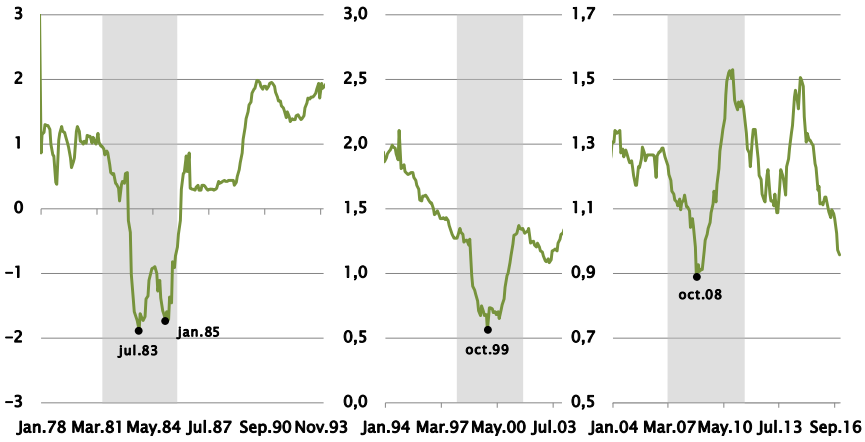
(percentage of total loans)



Source: Own elaboration based on data from the SBIF.

Figure 3: Return on Assets (ROA)

(percentage)



Source: Own elaboration based on data from the SBIF.

4.1 Empirical strategy

We can summarize the mechanism to define fragility periods into two steps. First, we propose a coincident indicator of financial fragility. Using this indicator we mark critical dates or candidates for fragility episodes at the lowest peak of a combination of financial variables. Second, by looking at the slope of the index, we delimit the beginning and the end of each period around the selected dates.

Financial Fragility metrics

Business cycles and financial stability metrics available in the literature attempt to summarize the behavior of a set of variables to identify periods where this set reports some relevant misalignment.

In order to forecast the GDP cycle, Stock & Watson (1999) reduced 215 variables into few indicators or factors using factor analysis. The factor analysis calculates linear combinations (factors) of a number of variables that maximizes the variance of the factor. In the same way, the Federal Reserve Bank of Chicago used 85 indicator to construct the Chicago Fed National Activity Index (CFNAI) based on this framework[3].

Alternatively, Eichengreen et al. (1996), for example, used models such as probit and logit to estimate the probability of the fragility periods based on a set of variables. However, it requires necessarily an ex-ante definition of the episodes. Since we do not have pre-defined periods, this method is unviable.

Another approach is to combine key variables using a transformation based on their observed cumulative distribution functions (CDF). Using this method, the variables are transformed to percentiles and then averaged. Additionally, an index of fragility can be calculated by counting the number of indicators above a threshold, such Edison (2003), Goldstein et.al (2000), and Kaminsky (1999).

Likewise, the variance-equal weights method use a simple average of the standardized variables assuming a normal distribution. The IMF constructs the Financial Stress Index (FSI) as the variance-weighted average of three subindices associated with the banking, securities, and foreign exchange markets, based on Illing and Liu (2006)[4]. Bordo et al. (2002) used a version of a standardized

[3]For further details, see Federal Reserve Bank of Chicago (2016).

[4]They calculate a Financial Stress Index for Canadian financial system and concludes that the standard-variable version has the lowest Types I and II errors compared with other measures commonly used in the literature.

distance from the median in order to avoid the skewness of the series and also separate the analysis in two different sub periods.

Typically, the objective of constructing a financial index is to foresee periods of distress. In this sense, the associated methodologies are adjusted in order to capture past crises. Therefore, its usefulness is related to its predictive power. Likewise, using these tools to define periods of financial fragility could have problems of endogeneity[5] and temporality[6]. In this context, instead of anticipating financial fragility periods this paper seeks to generate an index that determines periods of historical financial distress in order to characterize them.

Peaks of financial fragility

As previously explained, the first estimation step consists of summarizing the set of coincident financial indicators into one index. As we described in the previous sections, the financial variables has different levels between them and over time. A common technique to scale a variable is standardized it by subtracting its mean and divided it by its standard deviation. The standardized value can be interpreted as the deviation of the variable from its expected value (approximated by its mean). Since the characterization of fragility periods is an ex-post analysis, we observe the realization of the variable around a particular point in time. Thus, a value in the tail of the distribution is considered as critical.

An advantage of the standardization is that we are able to compare variables that were initially in different scales. Consequently, we can calculate linear combinations of each characteristic without being affected by the original units nor the changes in levels and volatilities over time.

With respect to the linear combinations, we have to define the weights of each dimension. One option is use weights obtained by the factor analysis approach. These weights are fixed in time and depends on the sample period. However, factor analysis is more useful when working with a high number of variables, which is not our case. On the other hand, the use of the historical distribution requires an enough large sample window to provide seemingly continuous distributions, and since we are using the values at the tails, the index is affected by extreme values. Therefore, we use the variance-equal weights method, which is simple and have a very straight forward interpretation. Additionally, as Bordo et al. (2002), we extend its calculation for a several time windows, although we use the normal

[5]The definition of crisis is based on the same metric which tries to predict it.

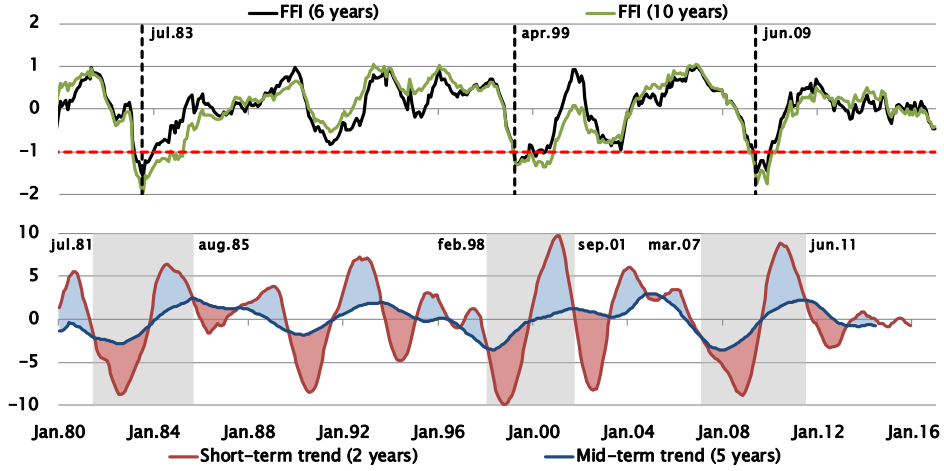
[6]We can only observe the state of nature after it was resolved. For example, the minimum value of a variable in a period.

distribution[7].

As we stated before, the (centered) rolling window frame allow us to avoid changes in the level and variance of each variable in order to compare them. Furthermore, our calculations are based on a data centered on the reference date, which is consistent with identifying ex-post the distressed periods. Typically, this kind of approaches are focused on finding early warning indicators that uses only information available until the date of reference (past data) or projections, but not actual future data. Considering the exposed differences (set of used variables and methodology), we denominate the summary of these three dimensions of the banking sector as the Financial Fragility Index (FFI). The FFI is an average of the standardized variables in a window (e.g. a window of 6 years considers 3 years before and 3 years after) around each point of time. The FFI calculated using windows of 6 and 10 years shows similar dynamics (Figure 4).

Figure 4: Financial Fragility Index (FFI)

(index)



(1) The calculations from 2012 are preliminary due to the use of centered windows.
(2) Trend estimated by OLS using data around the date of reference.
Source: Own elaboration based on data from the SBIF.

Using the FFI, we define the critical dates of each period when the index

[7]In a downturn period, financial indicators generally shows positive skewness (lower values), which gives a greater distance from the mean than the median. Thus, the use of the mean provides more evidence of a distress period.

reaches its lower value in the vicinity of dates with values below -1[8]. Both the window of 6 and 10 years coincide in the periods of critical values, but the first has a faster recovery. Thus, the months of July 1983, April 1999, and June 2009 characterized a fragility period and mark its deepest point.

Range definition of financial fragility episodes

Once fragility critical points are identified, we define the start and end dates of each of them. One option to declare the extension of the period is to use events around each date (see Table 7, 8, and 9 in the Appendix). However, theses events occur typically when the impact of the fragility is sizeable (e.g. changes in the market structure, bankruptcies) or as a measure to alleviate its effects (e.g. interventions of financial institutions, quantitative easing).

On the other hand, the starting and ending points can be determined as those dates when the short-term (slope) trend of the index crosses its mid-term trend. Previous to the critical date, when the short-term trend crosses from above the mid-term trend, it is considered that the dynamics of the indicator begin to decelerate at a rate significantly higher than its mid-term dynamics, which leads to its lower level later. Thus, this signal delimits the beginning of the period of fragility.

After the fragility period reaches its deepest point, starts a period of recovery. The credit activity, credit risk, and profitability stabilizes until the short-short term trend crosses the mid-term trend from below. In other words, these three dimensions begin to move away from their lower values with increasing speed in order to return to their "normal" levels. The signal afterwards delimits the end of the recovery and exit of the fragility period.

Figure 4 also presents the short (2 years) and mid-term (5 years) slope of the IFF[9]. According to this framework, we can define three the periods of financial fragility in the sample: i) the Chilean Financial Crisis, from July 1981 to August 1985; ii) the effect of the Asian Crisis, between February 1998 and September 2001; and iii) the effect of the Global Financial Crisis, from March 2007 to June 2011.

The year before the Chilean banking crisis, the credit showed an extremely high growth of 45% in average and low profitability (ROA of 1.06%). Although

[8]Cardarelli et al. (2009) defines episodes of financial stress when the index (e.g. Financial Stress Index) is more than one standard deviation above its trend.

[9]The slope is estimated by OLS using the FFI of 6 years. The calculations using the 10-year FFI do not have a significant difference, but the periods are slightly longer.

the sector was in a development process, the banks accumulated excessive credit risks due to the lack of experience in the sector. This was reflected in a past-due index before the crisis of 1.6% in average, similar to what we observed in the asian crisis and higher than global financial crisis. In July 1983, the past-due index reached 13.2%, its highest value in the last 40 years. In August 1985, the indicators tend to recover but to a lower level. Nonetheless, there was a contraction of banking credit between 1985 and 1987.

Table 2: Financial fragility periods ratios (mean)

Chilean financial crisis (July 1981 - July 1983 - August 1985)				
	Before	Critical	Fragility	After
	Jul.80 - Jun.81	Jul.83	Jul.81 - Aug.85	Sep.85 - Aug.86
Credit Growth	45,19	-4,76	7,43	-4,46
Past-due Index	1,63	13,22	7,28	4,32
ROA	1,06	-1,89	-0,66	0,29

Asian crisis (February 1998 - April 1999 - September 2001)				
	Before	Critical	Fragility	After
	Feb.97 - Jan.98	Apr.99	Feb.98 - Sep.01	Oct.01 - Sep.02
Credit Growth	12,24	0,49	5,34	4,56
Past-due Index	0,99	1,80	1,64	1,75
ROA	1,36	0,71	0,97	1,27

Global financial crisis (March 2007 - June 2009 - June 2011)				
	Before	Critical	Fragility	After
	Mar.06 - Feb.07	Jun.09	Mar.07 - Jun.11	Jul.11 - Jun.12
Credit Growth	14,60	-1,69	7,38	11,38
Past-due Index	0,81	1,26	1,05	1,05
ROA	1,26	1,04	1,19	1,29

The Asian crisis followed the same dynamic as the previous crisis. In this case, there was a deceleration of the credit growth from 12.2% to -0.2% in June 1999, the past-due loans increased from 1% to 1.8% in April 1999 and continued increasing to 1.9% in June 2000. Although the returns on assets decreased to 0.6% in this time, it recovered nearly its previous level.

Regarding the period of the global financial crisis, the credit growth showed a more severe contraction but a faster recovery than the asian crisis. On the other hand, the past-due also increased, but its level and volatility were lower than the previous fragility periods. In the same way, the profitability dropped to 0.9% in

October 2008, but returned to an average of 1.3%. In terms of levels and changes on this core variables, the local banking crisis was more severe.

5 Historical context of Chilean financial fragility periods

In previous section, we identified three periods of financial fragility over the last 4 decades. This section describes the macroeconomic and financial contexts around these episodes, highlighting significant events that characterized financial vulnerability periods. Table 3 summarizes the main characteristics and causes of the delimited periods.

Table 3: Main characteristics and causes of financial fragility periods in Chile

Period	Characteristics	Causes
1982-1983 (external debt crisis)	Insolvency of many institutions Increased credit risk Balance Effects Statization of banks	Financial liberalization Faults in regulation Credit Boom Current account deficits
1997-1999 (Asian crisis)	Increased credit risk Reduction of profitability	Current account deficits Influence of capital
2007-2009 (global financial crisis)	Increased credit risk Liquidity Restrictions Credit Restriction	Current account deficits Influence of capital

5.1 Financial crisis 1982-1983

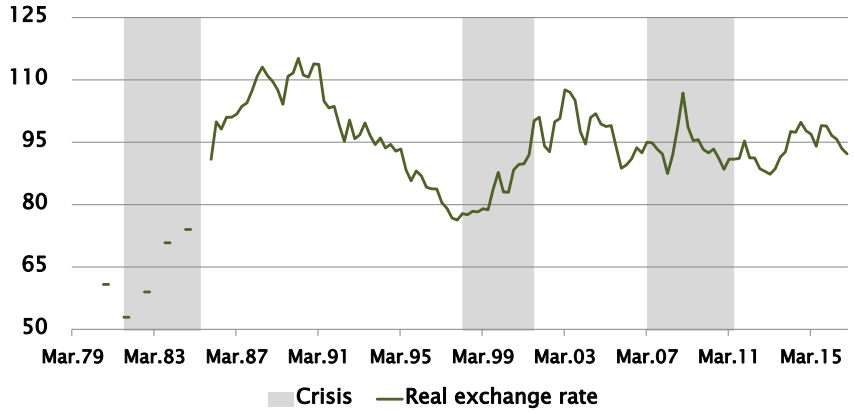
This is the only financial crisis period referred in the literature that is within our time span (i.e. 1970-). It is often characterized among the ones that had the biggest impact over a wide set of countries (Laeven & Valencia, 2008, 2012). This section analyzes the macroeconomic and financial conditions that originate and were associated with this crisis.

Macroeconomic conditions

Local inflation started to decline in mid 70s, arriving to one digit levels in 1982. In this context, between December 1980 and June 1982 the copper price fell more than 30% and the international price of oil rose more than 150% between mid-78 and 1981. Whereas real exchange rate evidenced a sharp appreciation (figure 5) which generated a current account deficit of 14.3% of GDP (Sundararaján

& Baliño, 1991; Caputo & Saravia, 2014).

Figure 5: Real Exchange Rate
(1986 = 100)

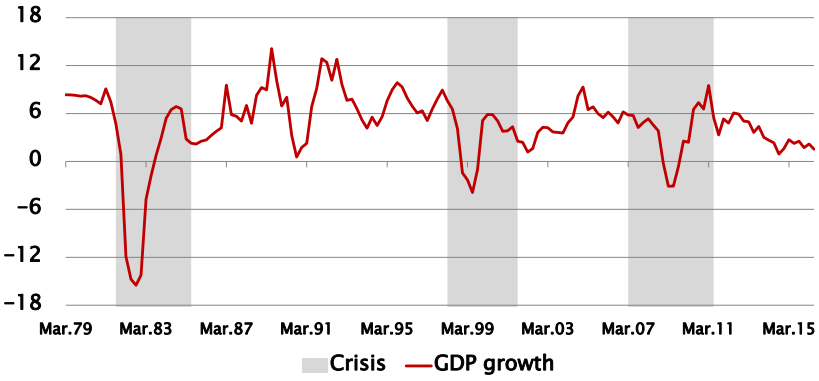


The gray areas represent periods of financial fragility.
Source: Own elaboration based on data from the CBC. Data before 1986 taken from Larrain & Vergara (2000) on annual basis.

As a consequence, terms of trade were deteriorated and forced a devaluation of the Chilean peso, changing the fixed exchange rate policy that was in force between 1979 and 1982. Furthermore, in 1982 the country suffered from an important external capital sudden stop that further increased external vulnerabilities (Agosin y Huaita, 2012). In particular, in 1982 net capital inflows were 64% lower than in the second half of the previous year.

Given the above, the Chilean macroeconomic environment showed deterioration signs, reflecting a slowdown in economic activity as measured by GDP, that declined from 9% in March 1981 to 0.9% in December of the same year (figure 6), and continued with a persistent contraction in the following years. Thus, in order to reactivate the economy - and restore trade competitiveness - the peso was devalued in 1982 to reduce the fall in the terms of trade. Along with this, a preferential exchange rate was established to mitigate the impact of devaluation on debtors in foreign currency.

Figure 6: GDP Growth
(percentage)



The gray areas represent periods of financial fragility.
Source: Own elaboration based on data from the CBC.

However, foreign credit contracted in 1982, mainly because the United States raised interest rates to soothe the rising levels of inflation. On the other hand, local inflation rose to more than 30% in 1983 (figure 7). Also, the unemployment rate reached 25% and GDP fell by 14% between 1982 and 1983 (figure 8).

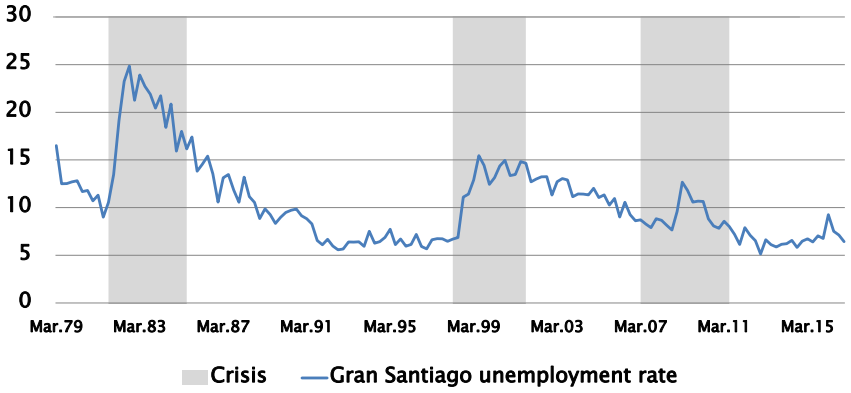
Finally - given the dollarization of firms and banking sector debt - the currency devaluation policy, in combination with a decrease in economic activity configured a scenario that led to a financial crisis that materialized in January 1983 with the intervention of two of the largest banks [10].

[10]See Table 7 in the Appendix.

Figure 7: Inflation
(percentage)

The gray areas represent periods of financial fragility.
Source: Own elaboration based on data from the CBC.

Figure 8: Unemployment Rate
(percentage)



The gray areas represent periods of financial fragility.
Source: Own elaboration based on data from the CBC.

Financial Environment

Since 1974, Chilean banking transited towards greater private sector participation. It is also called a period of "financial liberalization" that sought to pro-

mote investment, savings and efficiency in financial intermediation. At that time, quantitative controls and direct allocations of credit were eliminated, there was a reduction in reserve rates and restrictions, the latter with the aim of allowing private banks to borrow in other countries. In addition, the market was opened to financial companies and foreign banks so that there would be greater competition.

As a result of the financial liberalization, bank credit grew strongly during this period in the second half of that decade. Credit operations of banks were extended, changing from specialized to a multi-bank business type. On the other hand, it started a process of privatization of banking entities, which were in the hands of CORFO. In addition, as of 1976, deposit reserve rates were reduced, which stabilized in 1980 at 10% for demand deposits and 4% for term deposits, which contributed to further increase the capacity to grant loans. Finally, this financial liberalization process was translated into a significant increase in the number of banks, from 26 to 45 between 1978 and 1981 (of which 18 were foreign), and a significant increase in obligations with foreign banks.

Regarding the external situation, some developed countries increased interest rates in order to control the higher levels of inflation derived from the rise in the price of oil. This increase affected the payment capacity of companies and banks that had borrowed abroad, which, added to the deterioration of the terms of trade, were important factors that triggered the economic crisis of the early eighties. Furthermore, this process was exacerbated because of the increased exposure of credit to non-tradable sectors (Brock, 1989). Additionally, the financial liberalization process was developed under a regulatory and supervisory framework that was not properly adapted to this growth of the banking system. For example, an important part of bank loans was used to finance companies related to the bank's controlling group (Held & Jimenez, 1999).

As already noted, the policies taken to manage the crisis are mainly summarized in three: (i) assistance plans for local debtors, (ii) programs to strengthen the banks solvency and (iii) policies to strengthen banking supervision (promoting a new General Banking Act).

Consequently, there was a fall in the past-due portfolio since 1985, an increase in the profitability indicators since 1986 and a decrease in the leverage level in the same year. It should be noted that the SBIF allowed the banks to build up the shortfall in provisions for credit risk in the loan portfolio until the end of 1986. Government policies allowed to stabilize the economy, and in 1984 GDP reversed the decline of previous years. This, along with the plans taken to regularize the banking system, permitted the industry to improve its financial situation. In

this way, since 1985, there was a fall in the past-due portfolio, an increase in the profitability indicators since 1986 and a decrease in the level of leverage in same year. The SBIF helped the banks to build up the shortfall in provisions for credit risk in the loan portfolio until the end of 1986. In order to strength the position of the financial system, in November 1986 the General Law on Banks was modified, which improved the weaker aspects of previous legislation (Held & Jimenez, 1999).

5.2 Asian Crisis 1997-1999

Unlike the local banking crisis, this period was largely attributable to external factors that reversed the period of high economic expansion that the country lived in the period 1984-1997 with an average GDP growth of 7.1% per annum, the highest from the country's independency (De Gregorio, 2005).

Macroeconomic conditions

The main effects of the Asian crisis were reflected in the unfavorable results of foreign trade, due to Chile's high dependence on international markets and the relatively low diversification of its export goods and destinations. Indeed, the deterioration of the terms of trade (4.8% for 1998) are mainly explained by the fall in exports. As a consequence of the above, in the last quarter of 1997 the current account deficit was around 4,000 billion, equivalent to 5% of GDP (figure 6). Also, this economic crisis had an impact on local economic activity, which registered a fall of 0.9% of GDP and an increase in unemployment that exceeded 10% in 1999 (figure 8), and was exacerbated - in a context of exchange rate band policy - by a monetary adjustment that almost doubled the real annual interest rate from 8.5% to 14%.

Financial environment

The Asian crisis impact on the banking system was limited in terms of insolvencies. This was largely due to policies that were implemented before, such as the General Banking Act (or "Ley General de Bancos" in Spanish) and modifications made in 1986 and 1997 (the Basel framework was included in 1997). These changes made it possible to reduce the impact of the deterioration of the capacity of companies and households in the past-due portfolio indicators, in spite of the drop in economic activity and the increase in unemployment already indicated. During the 90's changes provisions regulation were combined with an explosive increase in consumer credit, given flexible lending policies. This situation ended in higher levels of write-offs (reached 1.3% in 1999, from 0.9% in 1997) and past-due loans (reached 1.8% in 1999, from 1.0% in 1997). However, profitability indicators

were the most affected ones. In fact, in 1999 ROA and ROE reached the lowest levels in 30 years (0.7 and 9.4%, respectively), caused mainly by the increase in the cost of loan loss provisions, because of increased credit risk.

Although important, as compared to the previous crisis, this episode had a moderate impact on the growth rate of banking credit. Indeed, commercial lending registered almost zero growth in mid-1999, while consumer lending showed an attenuated fall. Housing loans grew sharply in the 1990s as a result of the massive development of non-endorsable mortgage loans, low interest rates and the sharp increase in mortgages loan-to-value to finance properties of up to 100%.

On the other hand, the leverage remained stable in this period. Given the implementation of the capital adequacy ratio (CAR) - under Basel I criteria that was present in the General Banking Act - banks increased their capital by more than 7% in 1999. Hence, the CAR rose from 11.04% in December 1998 to 13.50% in December 1999.

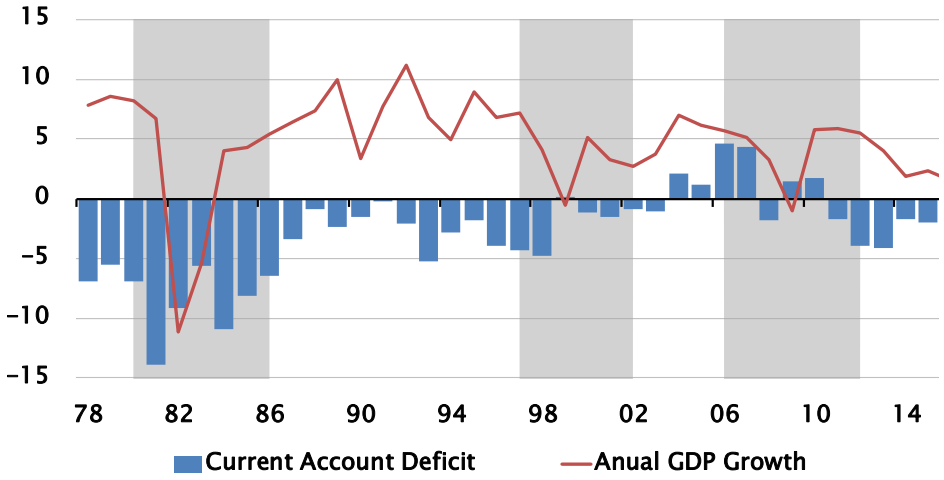
5.3 Global Financial Crisis (2007-2009)

As in the Asian crisis fragility period, the Global Financial Crisis episode was originated, to a large extent, by external factors that affected the external financial position. These factors are related to a sharp reduction in global liquidity and the investors flight to quality that prevailed between 2007 and 2008, and was translated in local credit restrictions (Claessens et al., 2010).

Macroeconomic Environment

The current account suffered a reversal of more than 6 points of GDP in 2008 compared to the previous year, reaching a deficit of 2.4% of GDP (figure 9).

Figure 9: GDP Growth and Current Account Deficit.
(percentage)



The gray areas represent periods of financial fragility.
Source: Own elaboration based on data from the CBC.

The copper price that represented 50% of exports in those years fell to $1.4 per pound during the crisis. It was equivalent to a decline of more than 50% in 2008. The local loans interest rate in dollars increased more than 300 bp in October 2008. Moreover, there was a drop in the demand for Chilean exports (goods and services exports fell more than 6% in 2009). Also, between 2008 and 2009 the national unemployment rate increased from 7.8% to over 10% (figure 9) and the domestic demand fell 8% in the first half of that year as compared to the same period in 2008. Additionally, the GDP turned from an annual growth slightly above 5% in 2008 to a contraction of 3% in the second half of 2009.

Financial Environment

The volatility that characterized this period generated a greater preference for liquidity, which triggered an increase in interest rates in the local financial market (Financial Stability Report, First Half 2009). The spread between the local loan interest rate in the foreign currency and the LIBOR rate increased around 100bp, between May and September 2008, a situation that also had an impact on the rates of loans and funding in pesos (Financial Stability Report, Second Half 2008).

Since the last quarter of 2008, the banking credit growth decelerated (particularly for consumer and commercial portfolios). On the other hand, the credit

risk increased. Thus, both the past-due loans ratio and loan loss provisions increased by approximately 50bp between 2008 and 2009. Accordingly, the baking system tighten its credit standards and the credit demand decreased, particularly for consumer loans (BCCh ECB report, 2008).

Profitability was less affected than in the Asian crisis, and reached its lowest level in early 2009 (12% ROE) but recovered the average of the last 5 years at the beginning of 2010 because of both the more expansive monetary policy and long-term liquidity facilities (FLAP). The latter helped to reduce the bank's cost of funds and increase the profit from treasury operations.

The banks solvency increased in the period. Between October 2008 and December 2009, both the leverage and the capital adequacy ratio increased by more than 50 and 250 basis points, respectively. Mainly, due to risk-weighted assets reduction (9% in the same period).

6 Final remarks

In this paper we have shown that the Chilean financial fragility periods can be identified by using a small set of variables that describe the banking sector performance and risks. In this respect, this is the first paper in attempting to characterizing the Chilean financial cycle. To accomplish that, we do a review of the literature and select a group of ratios following a precise rationale. Accordingly, we build a database that extends those financial variables back to the 70's, and process this information, developing a composite index that delimits financial fragility periods.

Also, we illustrate the financial cycle and fragility periods by introducing a series of indicators of macroeconomic performance, and external/internal financial position. By assuming that historic patterns will repeat in the future in a similar fashion, this analysis enables us to extract policy lessons from past macroeconomic and financial regulatory frameworks.

We propose the use of the analysis and conclusions of this work for financial policy design and implementation, especially, for the banking sector. In particular, in Chilean case, our results allow policy makers to test anticipative properties of early warning indicators that are introduced by the contemporaneous macroprudential framework, such as the CCyB.

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7 Appendix

7.1 Data construction criteria

For the stock of provisions, it was estimated for 1980, 81 and 82, the constitution (expense in the year) that was added to the initial balance. This criterion was adopted once the notes to the Balance Sheets of the banks for 1979 were revised, in which it was observed that more than 90% of the movement of the stock corresponded to higher expenses by the constitution and to a lesser extent, by the application of write-off.

The criterion for obtaining the data that did not appear in the series of stock of provisions on loans was the interpolation, the average of the previous year or, in its absence, the last available flow was maintained. These criteria were used for the quarters of December 1978; December 1979; December 1980; December 1981.

Table 4: Balance Sheet series of the banking system (1)(2)(3)(4)

Series (5)	**Period**	**Description**
Loans (6)	Jan.1970-Sep.1978	Loans +Effective +Contingents
	Oct.1978-Dec.2007	Loans +Effective +Letters of credit +Past-due +Contingents
	Jan.2008-	+Effective loans (includes interbank loans) Contingent loans: +Guarantees and endorsements +Foreing letters of credit +Documentary letters of credit +Waranty papers +Interbank guarantee letters

(continued)

Series (5)	Period	Description
Assets	Jan.1970-sep.1978	+Available funds +Loans +Investments +Other assets
	Oct.1978-Dec.2007	+Current assets +Fixed assets +Other assets +Control and adjustment accounts (assets) -Control and adjustment accounts (liabilities) -Float (instruments of other banks)
	Jan.2008-	+Assets -Operations with settlement in progress +Guarantees and endorsements +Foreing letters of credit +Documentary letters of credit +Waranty papers +Interbank guarantee letters
Profits (7)	Jan.1970-sep.1978	+Income: Interests, discounts, commissions and others -Expenses: Interests, discounts, commissions, salaries and others
	Oct.1978-Oct.1982	+Income: Operational, monetary correction and others -Expenses: Operational, fixed, monetary correction and others
	Nov.1982-	+Net profit

(1) The information since January 2008 uses unconsolidated data to make the series comparable to the period 1970-2017.
(2) The unavailable data (i.e. profits of June and September 1972) were obtained by its ratio over loans interpolated or extrapolated linearly.
(3) Between 1975 and 1978, information on the "Financial Firms" is not included. This group was composed of non-bank financial firms (formal and informal) that were formed under the so-called "free banking experiment", which after 2 or 3 years were dissolved or absorbed by other financial entities.
(4) The source of information is the Financial Information Bulletin of the Superintendency of Banks and Financial Institutions (SBIF).
(5) The series are expressed in millions of CLP and considers the total of currencies (domestic and foreign) at the currect exchange rate. Until September of 1975, the "escudos" currency were transformed to pesos (CLP), according to the rate 1 peso ($) = 1 000 escudos (E).
(6) The real annual growth of loans considered the CPI as a deflator until September 1979 and the "Unidades de Fomento" (UF, inflation indexed currency) since October of the same year.
(7) The ROA considers the annualized profit based on the sum of the last 12 monthly results.

Table 5: Risk variables of the banking system (1)(2)(3)(4)

Series (5)	Period	Description
Loan Loss Reserves	Jan.1970-Sep.1978	+Loan Loss Reserves
	Oct.1978-Feb.1982	N.A.
	Mar.1982-Jan.1983	+(Loan Loss Reserves/Loans) x Loans
	Mar.1983-Jun.1985	+95% x (Total stock of provisions/(Loans + Investments)) x (Loans + Investments)
	Jul.1985-	+Loan Loss Reserves
Loan Loss Provisions (6)	Sep.1979-Jun.1982	+Global, individual and other provisions
	Sep.1982-Mar.1983	+70% x (Provision expenses and write-offs)
	Jun.1983-Dec.1983	+Global loan provisions
	Feb.1984-Jun.1985	+95% x Global provisions expenses for loans and financial investments
	Jul.1985-	+ Loan loss provisions
Write-offs (6)	Sep.1989-Mar.1981	+Loans and financial investments write-offs (quarterly)
	Jun.1981-Mar.1983	N.A.
	Jun.1983-Dec.1983	+Loans write-offs (quarterly)
	Feb.1984-	+Loans write-offs (monthly)
Past-due Loans	Aug.1979-	+Past-due Loans

(1) The information since January 2008 uses unconsolidated data to make the series comparable to the period 1970-2017.
(2) The unavailable data were obtained by its ratio over loans interpolated or extrapolated linearly.
(3) Between 1975 and 1978, information on the "Financial Firms" is not included. This group was composed of non-bank financial firms (formal and informal) that were formed under the so-called "free banking experiment", which after 2 or 3 years were dissolved or absorbed by other financial entities.
(4) The source of information is the Financial Information Bulletin of the Superintendency of Banks and Financial Institutions (SBIF).
(5) The series are expressed in millions of CLP and considers the total of currencies (domestic and foreign) at the currect exchange rate. Until September of 1975, the "escudos" currency were transformed to pesos (CLP), according to the rate 1 peso ($) = 1 000 escudos (E).
(6) Loan loss provisions and write-offs consider the annualized profit based on the sum of the last 12 monthly results.

Table 6: Macroeconomic variables

Series	Period	Source/Description
Copper price	1970-	COCHILCO database. Monthly copper price in USD cents by pound of copper from the London Metal Exchange.
Unemployment rate	1970-	Central Bank of Chile, "Indicadores Sociales y Económicos de Chile: 1960 – 2000". Universidad de Chile, Statistical database of "Fuerza de Trabajo, Empleo y Desocupación; Empleo en el Gran Santiago" Quarterly unemployment rate.
Inflation	1970-	Central Bank of Chile database. Annual change of the Consumer Price Index (CPI).
Exchange rate (CLP/USD)	1970-	Central Bank of Chile database. Exchange Rates\ Historica Information\ Observed USD
Current account deficit	1970-	Central Bank of Chile database. External Sector\ Historical Information\ Balance of payments
GDP	1970-1985	Central Bank of Chile database. Quarterly data interpolated from annual GDP growth, "Indicadores Sociales y Económicos de Chile: 1960-2000".
	1986-	Central Bank of Chile database. National Accounts\ Historical Information\ GDP at constant prices

7.2 Timeline around fragility periods

Table 7: Chilean financial crisis (July 1981 - July 1983 - August 1985)

Date	Event	Type
Apr.80	Exit of Banco Consititución (Banco A. Edwards)	M
Apr.80	Entry of American Express International Banking	S
May.80	Exit of Financiera Melón	E
Jul.80	Exit of Financiera Tasco	E
Oct.80	Exit of Banco Curicó (Banco Nacional)	M
Dec.80	Entry of Chicago Continental Bank	S
Mar.81	Entry of Bank of Tokyo	S
Apr.81	Entry of Banco Empresarial de Fomento	S
Apr.81	Exit of Agrobanco de Chile (Banco del Pacífico)	M
Jul.81	Exit of Banco Israelita (Banco Internacional)	M
Aug.81	Exit of Banco Regional de Linares (Banco Linares)	M
Sep.81	Entry of Centrobanco	S
Oct.81	Exit of Financiera de Papeles y Cartones	E
Nov.81	Intervention of Banco Español-Chile	I
Nov.81	Intervention of Sociedad Financiera del Sur	I
Nov.81	Intervention of Banco de Talca	I
Nov.81	Intervention of Financiera de Capitales	I
Nov.81	Intervention of Financiera Cash	I
Nov.81	Intervention of Compañía General Financiera Sociedad Anónima	I
Nov.81	Intervention of Banco Linares	I
Nov.81	Intervention of Banco de Fomento de Valparaíso	I
Apr.82	Liquidation of Banco de Fomento de Valparaíso	E
Apr.82	Liquidation of Compañía General Financiera Sociedad Anónima	E
Apr.82	Liquidation of Financiera de Capitales	E
Apr.82	Liquidation of Financiera del Sur	E
Apr.82	Liquidation of Banco de Talca (Centrobanco)	M
Apr.82	Liquidation of Banco Linares	E
Apr.82	Liquidation of Financiera Cash	E
Apr.82	Intervention of Banco de Fomento del Bío-Bío	I
Apr.82	Intervention of Banco Austral	I
May.82	Entry of The Hongkong and Shanghai Banking Corporation	S
May.82	Exit of Financiera de Los Andes (Banco A. Edwards)	M
Jun.82	Intervention of Banco Empresarial de Fomento	I
Jul.82	Liquidation of Adelantos y Créditos Sociedad Anónima Financiera	E
Jan.83	Intervention of Banco Hipotecario de Fomento Nacional.	I
Jan.83	Intervention of Banco Colocadora Nacional de Valores	I
Jan.83	Intervention of Banco Concepción	I
Jan.83	Liquidation of Financiera Ciga	E
Jan.83	Intervention of Banco de Santiago	I
Jan.83	Intervention of Banco Internacional	I
Jan.83	Intervention of Banco Nacional	I
Jan.83	Liquidation of Banco Unido de Fomento	E
Jan.83	Intervention of Banco de Chile	I
Jan.83	Liquidation of Banco Hipotecario de Chile	E
Feb.83	Exit of Financiera Latinoamericana de Desarrollo (Banco Desarrollo)	M
Feb.83	Exit of Financiera de Interés Social (Banco Desarrollo)	M
Feb.83	Exit of Banco Empresarial de Fomento (Banco Desarrollo)	M
Jan.85	Intervention of Financiera Mediterráneo	I
Feb.85	Intervention of Financiera Davens	I
Mar.85	Exit of Financiera Corfinsa (Banco Sud Americano)	M
May.85	Exit of Banco Colocadora Nacional de Valores (Banco Santiago)	M
Jun.85	Liquidation of Financiera Davens	E
Jun.85	Liquidation of Financiera Mediterráneo	E
Jul.85	Intervention of Financiera Davens	E
Oct.85	Exit of Morgan Finansa (Banco de Chile)	M
Nov.85	Entry of Morgan Bank	S

[1] S = Entry, E = Exit, M = Merge and Adquisitions, I = Intervention.

Table 8: Asian crisis (February 1998 - April 1999 - September 2001)

Date	Event	Type
Sep.94	Exit of Chicago Continental Bank	E
Dec.94	Exit of Financiera Fusa (Santander)	M
Dec.94	Exit of Chemical Bank (BCI)	M
Feb.95	Exit of Banesto Chile Bank (BHIF)	M
Jun.96	Exit of Banco Osorno y la Union (Santander)	M
Dec.96	Exit of Banco O'Higgins (Banco Santiago)	M
Aug.98	Exit of Banco ING (Falabella)	M
Oct.98	Exit of BHIF (BBVA)	M
Feb.99	Exit of Financiera Atlas (Citibank)	M
Jun.99	Exit of Banco Santiago (Santander)	M
Jun.99	Exit of Financiera Condell (Corpbanca)	M
Dec.99	Exit of Banco Real (ABN Amro)	M
Jan.00	Cambio Banco Sudamericano (Scotianbank)	M
Jun.00	Exit of Banco Exterior (BBVA)	M
Dec.00	Entry of de Deutsche Bank	S
May.01	Exit of Banco do Estado do Sao Paulo	E
Nov.01	Exit of Bank of America	E
Dec.01	Exit of Banco A. Edwards (Banco de Chile)	M

[1] S = Entry, E = Exit, M = Merge and Adquisitions, I = Intervention.

Table 9: Global financial crisis (March 2007 - June 2009 - June 2011)

Date	Event	Type
Feb.07	Exit of Bankboston (Banco Itaú)	M
Jun.07	Exit of HNS Banco (Rabobank)	M
Dec.07	Exit of de Citibank (Banco de Chile)	M
May.08	Exit of ABN Amro (Royal Bank of Scotland)	M
Jan.09	Entry of de DnB NOR Bank	S
Nov.09	Exit of Desarrollo (Scotiabank)	M
Dec.09	Exit of de Banco Monex (Consorcio)	M
Dec.10	Exit of RBS	E
Dec.12	Exit of DnB NOR Bank	E

[1] S = Entry, E = Exit, M = Merge and Adquisitions, I = Intervention.

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