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Deposit insurance effects on risk-taking behavior in the Ecuadorian private banking industry

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This paper examines the effects of deposit insurance implementation on risk-taking behavior in the Ecuadorian private banking system. We use aggregated financial annual data of private banks financial statements from January 2007 to January 2015. Time series analysis employing system-wide financial ratios support our hypothesis that the levels of risk increased after deposit insurance was implemented in Ecuador on May 2009. Also, we observe that the increase of risk-taking behavior was mainly driven by large banks, which hold more than 60% of the banking system assets in total. This can easily have devastating effects on the insurance system and the whole economy if the moral hazard problem is left unattended.

1. Introduction

A Deposit Insurance System (DIS) is a set of policies and rules developed by economic authorities in order to protect banks depositors against possible losses caused by financial institutions failures. These measures are not meant to solve systemic banking crisis but to help stabilize the system in case of failure of a specific bank and to reestablish depositors' trust. It has been shown that deposit insurance can help reduce the probability of bank runs by creating a safety net that offers protection to banks' creditors (Diamond and Dybvig, 1983; Calomiris and Kahn, 1991; Eichengreen and Arteta, 2000; and Hoggarth et al., 2005). However, it is also widely accepted in the literature that DIS implementation increases the propensity by banks to take on excessive (and unnecessary) risk, also referred to as moral hazard (Merton, 1977, 1978; Kareken and Wallace, 1978; Keeton, 1984; Demirgüç-Kunt and Kane, 2002; Gropp and Vesala, 2004; Nier and Baumann, 2006). As explained by economist Paul

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Krugman, the term moral hazard refers to "any situation in which one person [or firm] makes the decision about how much risk to take, while someone else bears the cost if things go badly. Borrowed money is inherently likely to produce moral hazard" (Krugman 2009, pg. 63). The International Association of Deposit Insurers (IADI) describes moral hazard in the case of deposit insurance as "the incentive for increased risk taking by insured institutions that can result when depositors and other creditors are, or believe they are, protected from losses and thus do not monitor the institution's performance". This means that insured institutions have an incentive to use lower-cost insured deposits to undertake higher risk projects than would otherwise be optimal (IADI 2013).

In a system without deposit insurance, financial institutions are subject to market discipline (i.e., depositors and other creditors monitoring) that constrains risk-taking behavior. Depositors will demand higher expected returns if they perceive banks are taking on greater risk (e.g., holding riskier portfolio of assets or low capital ratios). Thus, the cost of borrowing will be higher and this will discourage further risk taking. With deposit insurance, the threat of deposits withdrawal or higher funding cost is virtually eliminated because the value of debt is guaranteed. Furthermore, insured depositors are insensitive to asset choice or capital levels because they now hold a risk-free asset. If we consider the fact that higher returns can be obtained by investing in riskier assets, it is easy to see how banks have incentives to take on higher level of risk in order to obtain higher returns while shifting risk to the deposit insurer. Inattention to the moral hazard problem by regulators can have negative consequences. Effective regulation needs to be design in order to prevent moral hazard, excessive risk taking can lead to increased losses to taxpayers and to a misallocation of economic resources.

Empirical evidence on the effects of deposit insurance on bank risk taking offers mixed results. Karels and McClatchey (1999) could not find evidence that deposit insurance implementation increased risk levels of the US credit unions on the 70's and 80's. Wheelock and Wilson (1994) and Alston et al. (1994) could not find a relationship between bank failures rates and deposit insurance in the US on the 20's. Conversely, Wheelock (1992) and Thies and Gerlowski (1989) found a positive and significant relationship. Studies by Kane (1989), McKenzie et al. (1992) and Cole (1993) suggest that moral hazard behavior was responsible for

a significant portion of the Savings & Loans losses of the 80's. Other studies proposed that the degree of risk taking of banks may be influenced by the amount of uninsured debt banks carry on their balance sheets (Dewatripont and Tirole, 1993a; and Calomiris, 1999).

This paper aims to contribute with the ongoing debate about the effects of introducing explicit deposit insurance on risk-taking behavior of banks. Existing empirical evidence on this topic tends to use U.S. or European data or uses samples that pool developing and developed countries information that usually are at different stages of financial sophistication[3]. There is limited evidence for developing countries, regarding the effects of DIS on risk taking behavior in an environment without a market system in which banks are publicly traded. Moreover, the studies that use data from emerging market economies perform their analysis at the cross-country level (Demirgüç-Kunt and Huizinga, 2004; Brown and Dinç, 2005; Apanard and Class, 2010). This paper tries to fill this void by testing the effects of DIS on moral hazard from a single emerging market economy perspective. Specifically, we want to empirically test our hypothesis that risk, measured through various financial indicators, increased in the Ecuadorian private banking system after deposit insurance was implemented in 2009.

We have two main reasons for using data on the Ecuadorian banking system to analyze whether deposit insurance implementation increases risk-taking behavior or not. First, Ecuador, a country with a turbulent economic and political history, offers a unique economic setting to examine DIS effects. With a dollarized economy[4], the Central Bank of Ecuador (BCE) cannot use orthodox monetary policy tools (e.g., currency devaluation or exchange rates adjustments) to stabilize the economy and has limited ability to act as the lender of last resort (i.e., to help banks in liquidity or solvency problems). In fact, the country's constitution[5] expressively prevents the government (central bank included) from bailing-out banks. For this reason, it is very important for Ecuador to have

[3] For example, Angkinand and Wilhborg 2010 analyzes specifically how government foreign ownership and shareholder rights affect the disciplinary effect of partial deposit insurance systems in a cross-section analysis of industrial and emerging market economies, as well as in emerging markets alone.

[4] The Ecuadorian economy was officially dollarized on March 13th, 2000 when President Gustavo Noboa signed the "dollarization law".

[5] The current constitution is the 20th to be in place in Ecuador. It was approved by a constitutional referendum on September 28th, 2008.

a strong financial system that can serve as an efficient tool to promote economic development and growth. A stable financial system has, as one of its pillars, a sound deposit insurance system that serves to promote confidence and trust among depositors. Our second reason to use Ecuador as the object of our analysis is related to deposit insurance. The country has a relatively young deposit insurance system that was full operational on May 2009[6]. Therefore, data on private banks financial statements is easily available, allowing us to compare risk levels between the pre and post deposit insurance periods.

The remainder of the paper is organized as follows. Section 2 describes the link bwteen deposit insurance and moral hazard. In section 3 we provide some background of the Ecuadorian economic and political history. In Section 4 we describe the dataset we use and provide some summary statistics. Section 5 presents the methodology and empirical specification. Results are reported in section 6. Section 7 examines the robustness of our results and section 8 concludes.

2. Deposits insurance systems and moral hazard

The first deposit insurance system was established in the US as a response to the banking crisis of 1933. These were the times of the great depression when banking conditions deteriorated rapidly. Although it is not possible to point out any single factor that caused the crisis, we can say that the suddenness of deposits withdrawals played an important role by starting a panic of great proportions. There was a massive bank run affecting most of the states which quickly started declaring bank holidays. The panic reached its peak on March 1933 forcing President Roosevelt to proclaim a nationwide bank holiday on March 6[7]. Between 1932 and 1933, 5453 banks failed and the losses borne by depositors added up to USD $709 million (on average 16,4% of deposits in failed institutions)[8]. In the aftermath of the banking crisis, the Federal Deposit Corporation (FDIC) was created in order to provide deposit insurance guaranteeing the safety

[6] Actually, Ecuador had already created the Agencia de Seguro de Depositos (AGD) in 1998. However, the AGD was a complete failure partly due to mismanagement and corruption. Depositors perceived the AGD to serve only banks' interest and lost confidence on the agency from early on.

[7] Roosevelt was elected on November 1932 and his inauguration day was on March 4 1933. The bank holiday proclamation was one of the first official acts as the US president.

[8] Source: Federal Deposit Insurance Corporation (FDIC) www.fdic.gov

of depositors' accounts in member banks. The main purpose for its creation was to prevent bank runs from happening again. Since FDIC inception on January 1st, 1934, no depositor has lost any insured funds as a result of a bank failure[9]. Due to its success, many countries have followed the US example and have implemented deposit insurance systems to protect bank deposits. As of January 2014, 113 countries have instituted some form of explicit deposit insurance up from 12 in 1974 and another 40 are considering its implementation[10].

As mentioned above, deposit insurance is born from the necessity to prevent sudden bank runs that may contribute to the collapse of the whole banking system. In order to serve its primary objective, DIS needs to promote and maintain public confidence in a stable system. Thus, by protecting depositors from the risk of loss, DIS removes incentives for rapid deposits withdrawals in the case of a bank failure. Given its role of promoting financial stability and protecting savers from loss, DIS is considered a fundamental pillar of any financial system safety net. Still, deposit insurance also has its detractors. Much of the criticism focus on moral hazard issues that can be introduced after DIS is implemented. In systems without deposit insurance, depositors and creditors have strong incentives to monitor banks' behavior. If high levels of risk are perceived, depositors will demand higher returns, increasing funding cost and discouraging risky behavior. However, as explained in Weinstein 1992, with deposit insurance "[Banks] are sheltered from the rigors of the market [discipline] because risky activities are unlikely to cause depositors to depart undercapitalized [or risky] banks". Depositors have no incentive to punish risky behavior because the insurance scheme in place protects them from the risk of loss[11]. Because deposit insurance may separate risk from reward, that insurance can catalyze moral hazard (Weinstein 1992). Moreover, with deposit insurance, banks can shift risk towards the insurer. The direct cause of moral hazard lies in the incentives for an insured financial institution to operate in a risky fashion without real economic risk to its owner and/or managers.

The FDIC proposes three methods to contain the effects of moral hazard when DIS is implemented. First, regulators need to promote good

[9] Taken from the article: Who is the FDIC? Retrieved from https://www.fdic.gov/about/learn/symbol/index.html

[10] Source: International Association of Deposit Insurers (IADI) www.iadi.org

[11] In fact, no punishment from depositors is a signal of confidence in the system, the main objective of any DIS.

corporate governance and management of individual institutions. Second, market discipline may be exercised by uninsured depositors and other creditors. And third, regulatory discipline exercised by supervisors and deposit insurers. Literature in this topic also offers possible mechanisms to constrain moral hazard. Benston et al. (1986) also argue that uninsured depositors, other debtors, and equity holders can constrain risk-taking behavior through the threat of higher funding cost. Marcus (1984) points out that bank charter values may limit excessive risk-taking behavior. Saunders et al. (1990) shows that risk-averse managers may limit risky behavior. Cooper and Ross (2002) argue that introducing additional capital requirements can reduce the problems associated with deposit insurance.

3. Ecuador's economic and political historical background

Even though this is not a paper about the economic history of Ecuador, we think it is important to highlight the most relevant economic and, inevitably, political events that preceded the implementation of DIS in 2009. Taking into consideration this historical context will help us understand the importance of DIS and of its possible negative effects (i.e., increase in risk-taking behavior) in a country like Ecuador. In 1927, the "Law of Banks" was enacted in order to regulate the organization and functioning of financial institutions. More than six decades later, in 1994, this law was reformed by the "General Law of Institutions of the Financial System". This law enabled a liberalization and deregulation process in the banking system by eliminating certain controls and regulations imposed by the previous law (e.g., "off-shore" branches are legalized). Around the same time of the expedition of this law, Ecuador started to experience great political and economic instability. Between 1995 and 2000 there were four different presidents[12], Sixto Durán-Ballén (1992-1996), Abdalá Bucaram Ortiz (1996-1997), Fabián Alarcón Rivera (1997-1998) and Jamil Mahuad Witt (1998-2000). This political instability had consequences at the economic level. As we can see in Table 1 below, macroeconomic indicators worsened during this period and eventually resulted in the financial crisis of 1999.

[12] By the Ecuadorian constitution each presidential mandate should last four years.

Table 1: Macroeconomic indicators in Ecuador (1995 – 1999)

	1995	1996	1997	1998	1999
GDP growth	1,75	2,40	4,05	2,12	(6,30)
Inflation	22,80	25,50	30,70	43,40	60,70
International reserves (in millions USD)	1,557	1,831	2,093	1,698	1,276
Lending interest rate	59,92	45,96	39,02	60,53	74,97
Borrowing interest rate	47,72	33,68	31,53	49,45	47,71
Exchange rate*:					
Buy USD (in sucres)	2.563,94	3.198,51	3.997,70	6.573,98	11.767,80
Sell USD (in sucres)	2.566,00	3.191,34	3.998,96	6.582,08	11.838,76

*** Average rate for the period**
Source: Central Bank of Ecuador

In addition to this political environment, Ecuador was ending its international border warfare dispute against Peru, "the Cenepa War", in 1995. Oil prices felt down to USD 9,20 per barrel in 1998. The country's external debt increased because of a problematic fiscal deficit that was partly caused by the strong effects of the "Niño Weather Phenomenon" that stroke the Pacific in this same year. By the end of 1999, the Ecuadorian economy collapsed affecting the real and financial sectors. The "sucre" (the official currency at the time) lost almost 70% of its value in one year. There was a financial crisis during which the government declared a bank holiday and deposits were frozen. Some banks were bailed out and others were forced to merge; a total of 24 private banks failed and the government took over the ownership of 2 others. In January 9th 2000, in what is perhaps the most shocking economic event in the history of Ecuador, Jamil Mahuad, president at the time, announced the official dollarization of the economy by adopting the American dollar as the country's legal tender[13]. The decision was made as an extreme solution to control a massive devaluation of the Ecuadorian sucre which lost 17% of its value in the first week of January and the hyperinflation of around 100% by June 2000[14]. This situation had consequences at the social level as well. These measures did not have social support and people's street demonstrations against them ended with president Mahuad overthrown from power[15].

[13] The official exchange rate at which the economy was dollarized was $25.000 sucres per US dollar.
[14] Exchange rate and inflation information was taken from the Central Bank of Ecuador
[15] President Jamil Mahuad was overthrown from power on January 21st, 2000

It is evident that the collapse of the Ecuadorian economy by the end of year 1999 was caused by a combination of many unfortunate events. However, the root of the problems that caused many banks to fail during the crisis aroused from moral hazard issues that were common practice in the banking sector of the time. Since the deregulation of the banking industry that started in 1994, many important banks started concentrating their loans portfolios on a small number of borrowers, usually businesses owned by the own banks shareholders or by the shareholders' acquaintances. The loans concentration ratios, in terms of banks' technical capital[16], ranged from 35% in Banco La Previsora to 299% in Banco Litoral (Análisis Semanal, No. 6, 1999). This situation evidenced a clear example of bank mismanagement that benefited a small group of businesses and people that had personal connections with banks' managers and owners. At the same time, banks started facing liquidity problems caused in part by the slowdown of the economy. In order to alleviate this issue, the Central Bank of Ecuador started to offer emergency loans to banks in need of liquidity. Still, instead of using the extra funds to solve the issue, banks immediately transfer the money as loans to the same "connected" businesses and people, exacerbating the problem even further. The highly concentrated loans and the liquidity issues affected the solvency of many banks that ended up bankrupt and liquidated. When the biggest banks[17] started to have solvency issues, the government initiated a bail-out plan to avoid a systemic crisis. There was a generalized panic among depositors that lost confidence in banks and demanded their deposits back. In order to avoid a massive bank run, on March 1st 1999, Mahuad's government declared a bank holiday that froze deposits nationwide for a whole year.

After the bank holiday was declared, the government created the Agencia de Garantía de Depósitos (AGD), Ecuador's first attempt to protect its citizens bank deposits. The AGD was a public institution not only in charge of guarding deposits and building back depositors' trust but also of reestablishing the proper functioning of the banking system. Regarding this last point, the AGD had the authority to intervene in banks and to provide them with financial resources necessary to overcome their solvency problems. Up to a great extent, the AGD was playing the role of

[16] The maximum lawful limit for this type of loans was 20% (Central of Ecuador)
[17] Filanbanco and El Progreso were the two biggest banks (in terms of their assets) in Ecuador that had to be bailed out and eventually failed (Revista Gestion, No. 45, marzo 1998)

a central bank in terms of regulating the financial system as well as the role of a superintendence of banks in terms of supervising and controlling. However, the AGD was not successful in achieving its objectives. On the one hand, AGD's failure was partly caused by political maneuvering and corruption that prevented it from effectively performing its duties. On the hand, banks kept having liquidity and solvency issues due to deep structural problems of the financial system and a very slow economic recovery.

As mentioned above, Ecuador adopted the dollar as a policy alternative to bring economic and financial stability. The country started enjoying the expected benefits of dollarizing the economy soon after it was announced. For example, bank deposits that were frozen a year earlier were released in March 2000 and this did not translate into a bank run. By the first quarter of 2000 the economy started showing signs of recovery. Real GDP grew 5,1% in 2001, 3.4% in 2002, 2.7% in 2003, and bouncing back to 7% in 2004. By 2003 inflation rate dropped to single digits[18] to 7,9%, reflecting the stabilizing effect of dollarization. In 2004, as expected from a dollarized economy, inflation finally converged to US rates. In this year inflation for the year was only 2,7%.

Politically things did not change a lot. After Mahuad was deposed in early 2000, the political environment was still chaotic and fragile. There were three more presidents in a period of only six years (2000-2006). However, since January 2007, when President Rafael Correa was elected for his first mandate[19], Ecuador has lived a period of political stability. From the beginning, Correa's government started a great reform of the political and economic environment with new and unorthodox ideas. One of the changes more relevant to this paper is the creation of the so called "Financial Safety Net (FSN)" in late 2008. The FSN was created to contribute to the stability of the financial system, to stimulate depositors' confidence, to establish an efficient payment system, and to promote economic growth through domestic savings. Given the unfortunate economic history of the country, the FSN main objective is to reduce the probability of bank failures and prevent systemic contagion. The FSN was created based on four fundamental pillars for economic stability: (1)

[18] It was the first year since 1972 that Ecuador registered single digits inflation rates.
[19] Rafael Correa was officially declared president on December 4th, 2006 and was sworn into office on January 15th, 2007

prudential regulation and supervision, (2) lender of last resort, (3) banking resolution mechanism, and (4) deposit insurance.

Given the nature of this paper we will focus the last part of this section describing pillar number four from above. The Deposit Insurance Corporation (COSEDE) was created in 2008[20] and is in charge of managing the deposit insurance system of private banks. It insures all deposits in financial institutions that are subject to the control of the Superintendence of Banks up to USD $32.000. Since 2011, it also insures deposits in financial institutions that belong to the cooperative sector up to USD $11.000[21]. As of September of 2014, COSEDE is in charge of promoting two of the fundamental pillars of the FSN. Under the new monetary law enacted in 2014, COSEDE serves as the insurer of deposits in the private banking system, as the insurer of deposits in the cooperative and popular system, as the insurer of private insurance companies, and it also manages the "liquidity fund". This means that COSEDE not only manages the deposit insurance system but also serves as the lender of last resort in case of banks are in need of liquidity (these two functions correspond to pillars 2 and 4). The law that created COSEDE explicitly excludes from the insurance system deposits from people or businesses that have direct or indirect connection with bank managers and/or owners. It also excludes deposits in off-shore branches and commercial paper issued by financial institutions. These exclusions aim to prevent risk shifting towards the insurer through misappropriation of funds. We cannot forget that these three exclusions are related to the main reasons why many banks failed during the financial crisis of 1999. Finally, the deposit insurance scheme is financed with financial institutions premiums. Banks have to make two different kinds of payments every month: a fixed premium and a risk adjusted premium. These premiums are calculated as a percentage of the average of daily deposits registered by each bank. The fixed premium is set within the range of 0.3% to 0.65% annual rate. While the risk adjusted premium can go from 0% to 0.35% annual rate. In any case, payments of both premiums cannot add up to more than 0.65% of the average of daily deposits. COSEDE's board of directors is in charge to set the annual rates for both premiums within the ranges described above.

[20] Although created on December 2008, COSEDE began to operate on May 2009.

[21] Deposits in financial institutions that are under supervision of the Superintendence of the Cooperative and Popular Sector are also insured by COSEDE. Depending in the size of the financial institution on this sector, the maximum amount insured is either $1.000 or $11.000.

4. Data

This paper uses aggregated monthly financial statements data (i.e. balance sheet and income statement) from the Ecuadorian private banking system[22] from January 2007 to December 2014. The data was obtained from a number of different sources. The balance sheet and income statements are from the Superintendence of Banks. Macroeconomic data (e.g., GDP, inflation, Economic Activity Index) are either from the Central Banks of Ecuador or the World Bank database. As we aggregate financial statements information for the whole private banking system, we did not require banks to have observations for the entire sample period. This process yields a sample of 1507 variables[23] with 96 observations each. We further compute other variables needed to calculate the different financial ratios that are used as our proxies to measure risk. Adding these new variables and ratios, the final aggregated dataset contains 1699 variables with 96 monthly observations each. Macroeconomic variables collected are Nominal GDP, inflation, Economic Activity Index (EAI), and lending and borrowing rates. Table 2 presents some descriptive statistics for the main variables of this paper.

We can see that the average monthly amount of total assets in the private banking system was USD $21,4 billion which grew at a rate of 1,14 percent per month during the sample period. Average insured deposits amounted to USD $16,3 billion and represented on average 95,6 percent of all deposits in the system. Private banks obtained positive net gains during the period with an average of USD $161 million per month. We also grouped banks as BIG[24] and SMALL in terms of their size (i.e., total assets).

[22] For most of the sample period, from January 2007 to December 2014, there were 26 private banks operating in Ecuador. No monthly observations include aggregated financial statements information of less than 22 private banks at any point.
[23] Corresponding to every account of the balance sheet and income statements that banks required to report to the Superintendence of Private Banks.
[24] We follow the Superintendence of Private Banks classification of the big group that includes the four largest banks in terms of total assets. We classified all the other 22 banks in the SMALL group.

Table 2: Descriptive statistics for main variables in the dataset (2007 – 2014)

Variable	N	Mean	Min.	Max.	Std. Dev.
Capital adequacy ratio 1	96	0,043	0,024	0,061	0,010
Capital adequacy ratio 2	96	0,024	0,013	0,034	0,005
Capital adequacy ratio 3	96	0,011	0,007	0,012	0,001
Capital adequacy ratio 4	96	0,017	0,013	0,023	0,003
Loan delinquency ratio	96	0,031	0,023	0,037	0,003
Liquidty ratio 1	96	0,207	0,150	0,270	0,028
Liquidity ratio 2	96	0,289	0,226	0,362	0,027
Liquidity ratio 3	96	0,434	0,396	0,486	0,019
Financial risk	96	0,103	0,093	0,116	0,004
Operating risk	96	0,531	0,480	0,565	0,018
Leverage risk	96	8,758	7,657	9,735	0,406
Diversification	96	0,377	0,290	0,496	0,056
Percentage change in total assets (%)	96	1,144	-18,49	22,434	3,475
Percentage change in total liabilities (%)	96	1,168	-15,23	20,355	3,146
Insured Deposits ($1,000)	96	16.382.923,00	8.487.741,92	26.347.108,90	5.150.668,20
Insured Deposits/Deposits	96	0,956	0,944	0,974	0,005
Total assets ($1,000)	96	21.417.667,60	11.597.185,20	33.466.917,70	6.475.417,23
Deposits/Assets	96	0,762	0,724	0,787	0,015
Net Income ($1,000)	96	161.309,40	15.699,67	394.773,90	96.414,95
Economic Activity Index	96	403,03	307,03	530,03	78,05

Note: for variables definitions see Apendix 1

In appendix 1, we present summary statistics for each group in order to compare their differences; the main ones are described here. The BIG group includes the four biggest banks[25] in the system while the SMALL group includes the other twenty-two. Big banks hold 62,6 percent of all the assets in the private banking system. In terms of insured deposits the BIG group holds 62,4 percent of them. One can easily think of the devastating effects that a failure of one of these banks can have on the deposit insurance system. Also, these four banks can be considered as too-big-to-fail for the systemic effect that individually can cause in case of failure.

5. Empirical methodology

This paper uses time series methodology and tests in order to analyze the moral hazard effects of deposit insurance in the Ecuadorian private banking sector. As banks are not publicly traded, there is not market price information available and instead we use non-market measures of risk-taking behavior. We use some of the financial ratios proposed in Karels

[25] The four biggest banks are: Pichincha, Guayaquil, Produbanco, and Pacifico.

and McClatchey (1999) and three others[26], commonly used in the literature of this topic, as our measures of risk. Using balance sheet and income statement information, we construct these indicators and group them as follows[27]: (1) capital adequacy; (2) loan delinquency; (3) liquidity; (4) other financial indicators commonly used; and (5) indicators to be used in our robustness analysis. In table 3 below, we have a complete list of all the risk measures used in this paper.

Table 3: Risk measures and their expected effect

These financial indicators are used as dependent variables in our regression analysis. We use this ratios to to test our hypothesis that risk has increased in the Ecuadorian banking system after deposit insurance was implemented on 2009. The first column lists the different groups of indicators we use. Then, the second column presents the actual ratios and the financial accounts used to construct them. The last column shows the sign of the normalized time trend (t), independent variable, from the regression analysis that we expect to observe as evidence to support our hypothesis.

Group:	**Financial indicator:**	**Expected signed of normalized time trend***
Capital adequacy	CA1: total capital over total loans CA2: total capital over total assets	negative
Loan delinquency	LD1: loans delinquent 2 months or more/ total loans	positive
Liquidity	LR1: cash & due from banks / total assets LR2: 1-(total loans / deposits) LR3: 1-(total loans / total assets)	negative
Other commonly used	Financial risk (FR): equity over assets Operating risk (OR): net loans over assets Leverage risk (LevR): liabilities over equity	negative positive positive
Robustness indicators	CA3: legal reserves over total assets CA4: total reserves to total assets DM: diversification measure	no effect negative negative

* the normalized time trend takes the value of 0 for observations before May 2009. It equals 1 for May 2009 and increases by one thereafter.

These indicators are used as dependent variables in our regression analysis. The second column (Table 3) presents the actual ratios and the financial accounts used to construct them. The last column shows the

[26] These are: financial risk, operating risk, and leverage risk
[27] We follow Karels and McClatchey (1999) classification of these indicators.

expected sign of the normalized time trend (independent variable) used in our regression analysis. We are interested in the sign of this coefficient because it will provide us with evidence to support our main hypothesis. More details on this trend and its interpretation will be given as we further describe our methodology.

Risk can be measure through capital adequacy ratios because of how total capital is composed. In this paper we calculate total capital as:

$$total\ capital\ =\ reserves\ +\ retained\ earnings$$

The reserves account reflects capital determined by regulation while retained earnings are the funds retained from each period's net income. This last component of capital is complete under managerial control. Without deposit insurance, banks' mangers would have used retained earnings as an extra safety. Conversely, insurance would have replaced this safety, thus changes in retained earnings are expected to reflect effects on risk behavior[28].

Loans delinquency is directly related to asset risk. This paper uses the proportion of delinquent loans[29] in the loans portfolio as another measure of risk. With deposit insurance, depositors perceive the system as more stable and trust more of their money to banks. Then, with higher deposits intake, banks can issue more loans, increasing the probability of a higher proportion of problematic loans in the portfolio, thus increasing asset risk. Banks with lower liquidity face higher risk in the case depositors demand their money back suddenly. As deposit insurance eliminates the probability of these sudden withdrawals, banks are able to hold more long-term assets that pay higher returns by decreasing liquidity. But, keeping low liquidity ratios for long times may increase the risk of insolvency.

Chernykh and Cole (2011) examines the benefits and cost of deposit insurance in the Russian banking system. The authors use as measures of risk the financial risk ratio and the operating risk ratio. The former is measured by the ratio of bank equity to assets ratio and the latter is

[28] There was no regulatory changes on the minimum amount of legal reserves that a bank must hold in Ecuador.
[29] Loans on default of interest and capital payments for two months or more.

measured by the ratio of bank loans to assets. These two indicators are also use in our analysis. Following Gropp and Vesala (2004), we also use the leverage risk as another risk measure. Leverage risk is defined as the ratio of equity to assets. The rationale for the use of this ratio is given by the authors in their paper, "It measures the degree of gearing of the bank; the more highly geared a bank is, the riskier it, as its cushion against an unexpected deterioration in the quality of its assets is smaller than in a less leveraged bank".

Finally, we need a model to test our hypothesis that risk has increased in the Ecuadorian banking system after deposit insurance was implemented on 2009. This model would need to capture changes in the trend of the dependent variable (i.e. financial indicators described above) during the post-insurance period. If deposit insurance influenced the behavior of risk ratios, their value would have changed from the pre-insurance level to a post-insurance level. Thus, we use the following reduced form model to test our hypothesis:

$$risk_t = \beta_0 + \beta_1 trend + \beta_2 X_t + \beta_3 X_{t-1} + \beta_4 Z + \varepsilon_t$$

where $risk_t$ is the financial indicator used to measure risk in each period t. *trend* is a normalized time trend that takes the value of 0 for observation before May 2009, equals 1 for May 2009, and increases by one unit thereafter. A significant *trend* coefficient suggests that the risk ratio value changed after deposit insurance was implemented. The expected sign of this coefficient is listed in table 3 for each of the financial indicators used. The variable $X_t = (assets_t - assets_{t-1})/assets_{t-1}$ in the capital and liquidity regressions or $X_t = (liabilities_t - liabilities_{t-1})/liabilities_{t-1}$ in the delinquency regressions. The percent change in assets or loans (X_t), and its lag value (X_{t-1}), are used in order to control for changes in economic conditions and cyclical fluctuations. Month dummies are also included in the model in order to control for the seasonality of deposits and other macroeconomic changes (these dummies are included in matrix Z).

6. Results[30]

Monthly aggregated financial statements data is employed to calculate industry financial indicators for the period 2007 – 2014. All regressions are corrected for first-order autocorrelation and also report robust standard errors. Estimation results for the capital adequacy ratios and the loan delinquency ratio are presented in Table 4. Results for liquidity ratios are in Table 5 and Table 6 shows results for the last three financial indicators used.

Table 4: Capital adequacy ratios and loan delinquency ratio regression results

This table presents regression results for the capital adequacy ratios and the loan delinquency ratio (our proxies to measure risk). For each indicator, results in column (1) were estimated using OLS while column (2) results were corrected for first-order autocorrelation. In both cases, monthly dummies were also included in the regressions; however this results are not reported due to space. All regressions report heteroskedasticity corrected standard errors. Sample period Jan. 2007 to Dec. 2014

	CA1: Total Capital to Total Loans		**CA2: Total Capital to Total Assets**		**LD1: Loans Delinquent 2+ months/Total Loans**	
Variables	(1)	(2)	(1)	(2)	(1)	(2)
trend	-0.000198***	-0.000193***	-8.97e-05***	-8.75e-05***	-3.35e-05***	-1.85e-05
	(1.63e-05)	(3.01e-05)	(8.48e-06)	(1.61e-05)	(1.11e-05)	(4.50e-05)
pctTA	0.000285*	0.000123	9.01e-05	2.53e-05	-0.000265**	-6.09e-06
	(0.000167)	(0.000133)	(7.92e-05)	(6.85e-05)	(0.000133)	(7.53e-05)
L.pctTA	0.000244	3.39e-05	7.71e-05	-1.14e-05	-0.000203	7.22e-05*
	(0.000236)	(9.44e-05)	(0.000115)	(4.66e-05)	(0.000210)	(3.91e-05)
Constant	0.0358***	0.0366***	0.0193***	0.0197***	0.0309***	0.0310***
	(0.00191)	(0.00211)	(0.000877)	(0.00105)	(0.00112)	(0.00214)
Observations	94	94	94	94	94	94
R-squared	0.893	0.878	0.888	0.883	0.337	0.768

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

As we can see in Table 4, capital adequacy ratios were affected by the implementation of deposit insurance. Coefficients for the normalized time trend are negative and significant at the 1 percent level. This suggests that discretionary capital (retained earnings) decreased during in the period with deposit insurance. On the other hand, the proportion of delinquent loans in the loans portfolio was not affected by deposit insurance. In fact, the negative coefficient for the time trend in these regressions suggests that loans delinquency ratios have decreased overall

[30] Results are obtained running OLS estimations and Pries-Winsten estimation to correct for autocorrelation of first-order (see Prais and Winsten 1954). Heteroscedasticity corrected standard errors are also reported for all regressions.

in the banking industry. However, this result is not statistically significant after controlling for autocorrelation at any of the standard confidence levels. A reason to explain the lack of effect of deposit insurance over delinquency on loan is that Ecuador has lived relatively good and economic times during this period[31]. Thus, the possible negative effects of deposit insurance over this indicator were offset by people's stable income stream that was used to repay their debts on time. In terms of liquidity risk, Table 5 shows mixed results. In general, system-wide liquidity measures were not affected by deposit insurance implementation. Two of the three indicators used to measure liquidity risk are

Table 5: Liquidity ratios regression results

This table presents regression results for the capital adequacy ratios and the loan delinquency ratio (our proxies to measure risk). For each indicator, results in column (1) were estimated using OLS while column (2) results were corrected for first-order autocorrelation. In both cases, monthly dummies were also included in the regressions; however this results are not reported due to space. All regressions report heteroskedasticity corrected standard errors. Sample period Jan. 2007 to Dec. 2014

	LR1: Cash & Due from Banks / Total Assets		**LR2: 1-(Total Loans / Shares & Deposits)**		**LR3: 1-(Total Loans / Total Assets)**	
Variables	(1)	(2)	(1)	(2)	(1)	(2)
trend	-0.000843***	-0.000746***	-4.35e-05	0.000179	-0.000310***	-0.000219
	(8.32e-05)	(0.000277)	(0.000107)	(0.000515)	(6.83e-05)	(0.000279)
pctTA	0.00123**	0.00102***	0.00191	0.000819***	0.00161*	0.000712***
	(0.000602)	(0.000365)	(0.00120)	(0.000301)	(0.000837)	(0.000210)
L.pctTA	0.00115**	0.000745**	0.00190**	0.000583*	0.00142**	0.000400*
	(0.000481)	(0.000308)	(0.000803)	(0.000350)	(0.000608)	(0.000234)
Constant	0.229***	0.223***	0.290***	0.277***	0.443***	0.437***
	(0.00525)	(0.0144)	(0.0100)	(0.0285)	(0.00779)	(0.0152)
Observations	94	94	94	94	94	94
R-squared	0.642	0.612	0.130	0.444	0.329	0.818

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

negative but only one of them is significant (at the 1% level). The other one is insignificant and even positive. Table 5 does not provide any conclusive results.

As shown in Table 6, banks have increased their leverage in response to the implementation of deposit insurance. The trend coefficient is positive, as expected, and significant at the 1% level. Results in this table also provide further evidence that capital adequacy indicators have been

[31] The effects of the world economic crisis of 2007-2008 did not severely impact the Ecuadorian economy.

negatively impacted by deposit insurance. Financial risk as measured by the ratio of equity over assets has decreased during the post-insurance period. We also observe that operating risk increased for the post-DIS period suggesting that the proportion of loans in the assets portfolio increased after deposit insurance. As explained above, this can translate into a problem of higher defaults on loans payments. However, the trend coefficient in this case is not significant.

Table 6: Alternative ratios to measure risk regression results

This table presents regression results for the capital adequacy ratios and the loan delinquency ratio (our proxies to measure risk). For each indicator, results in column (1) were estimated using OLS while column (2) results were corrected for first-order autocorrelation. In both cases, monthly dummies were also included in the regressions; however this results are not reported due to space. All regressions report heteroskedasticity corrected standard errors. Sample period Jan. 2007 to Dec. 2014

	Financial risk: equity over assets		**Operating risk: net loans over assets**		**Leverage risk: liabilities over equity**	
Variables	(1)	(2)	(1)	(2)	(1)	(2)
trend	-0.000143***	-0.000150***	0.000235***	0.000149	0.0136***	0.0148***
	(1.12e-05)	(3.16e-05)	(6.67e-05)	(0.000266)	(0.00104)	(0.00311)
pctTA	-0.000170	-0.000175***	-0.00141	-0.000555***	0.0144	0.0146***
	(0.000184)	(4.99e-05)	(0.000908)	(0.000188)	(0.0155)	(0.00406)
L.pctTA	-0.000131	-8.63e-05**	-0.00128**	-0.000335	0.0116	0.00769**
	(0.000203)	(4.06e-05)	(0.000562)	(0.000214)	(0.0178)	(0.00329)
Constant	0.107***	0.107***	0.525***	0.530***	8.345***	8.353***
	(0.00105)	(0.00166)	(0.00796)	(0.0144)	(0.0997)	(0.152)
Observations	94	94	94	94	94	94
R-squared	0.681	0.934	0.265	0.899	0.692	0.910

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The time series results suggest that capital adequacy ratios and leverage ratios in the Ecuadorian private banking system have decreased after deposit insurance was implemented in 2009. In terms of liquidity and loans delinquency, we observed the expected signs for the coefficients (negative for liquidity and positive for delinquency) but these results are not conclusive as they are not statistically significant. Overall, the time series evidence suggests that the adoption of deposit insurance in Ecuador has led to an increase in risk-taking behavior as proxied by various financial indicators.

7. Robustness

For our robustness analysis we have taken two approaches. First, we use alternative financial indicators that ex-ante should not have been affected

by deposit insurance implementation. CA3 is the ratio of legal reserves to assets. The legal reserves account is out of control of banks' managers. CA4 is the ratio of total reserves to assets. Although it includes a discretionary component, Ecuadorian banks total reserves are mainly composed of legal reserves. We also include the proportion of non-interest income in total income to measure banks' willingness and ability to diversify into non-lending, non-traditional activities, and to some extent will also proxy for the banks' "innovation ability" as in Gropp and Vesala 2004. It is expected that as a bank diversifies its operations, its risk levels decrease. Thus, we expect to observe a negative and significant coefficient as support for our hypothesis. Table 7 shows the estimation results for the first approach of our robustness analysis. We can see how deposit insurance had no effect on the time trend of the alternative capital adequacy ratios, as expected[32]. From the diversification aspect, we find that the private banking industry in Ecuador has decreased its diversification activities, increasing its loans portfolios and thus increasing risk-taking behavior.

Table 7: Robustness analysis regression results

This table presents regression results for the financial indicators used to check the robustness of our specification. For each indicator, results in column (1) were estimated using OLS while column (2) results were corrected for first-order autocorrelation. In both cases, monthly dummies were also included in the regressions; however this results are not reported due to space. All regressions report heteroskedasticity corrected standard errors. Sample period Jan. 2007 to Dec. 2014

	CA3: Legal Reserves to Total Assets		**CA4: Total Reserves to Total Assets**		**Diversification: non-interest income over**	
Variables	(1)	(2)	(1)	(2)	(1)	(2)
trend	2.94e-05***	2.87e-05	-1.76e-05***	-1.68e-05	-0.00206***	-0.00216***
	(4.35e-06)	(1.97e-05)	(6.02e-06)	(1.19e-05)	(9.96e-05)	(0.000491)
pctTA	-2.81e-05	-3.84e-05***	-2.49e-05	-7.67e-05**	0.000449	0.000121
	(4.36e-05)	(1.11e-05)	(6.16e-05)	(2.95e-05)	(0.00102)	(0.000166)
L.pctTA	-1.44e-05	-2.72e-05**	-3.25e-06	-5.43e-05	0.000278	-2.02e-05
	(4.03e-05)	(1.23e-05)	(4.75e-05)	(4.02e-05)	(0.00111)	(0.000133)
Constant	0.0100***	0.00937***	0.0168***	0.0169***	0.413***	0.428***
	(0.000374)	(0.00127)	(0.000770)	(0.000943)	(0.00954)	(0.0268)
Observations	94	94	94	94	94	94
R-squared	0.386	0.572	0.747	0.724	0.857	0.868

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

[32] Both coefficients are statistically insignificant at all conventional levels.

In our second approach, we run the time series analysis for BIG and SMALL banks separated. We group banks into two groups in terms of their total assets. This is based on the notion that big banks, which constitute a large share of the banking system[33], do not adjust their risk taking with deposit insurance. Even more, we propose that big banks increase their risk-taking behavior reflecting the "too-big-to-fail" issue. Table 8 shows the estimation results for regressions including only big banks data. Conversely, Table 9 shows results for small banks only. For the Big group we observe that for all but two financial indicators, the coefficient of the time trend has the expected sign and is also significant at least at the 5% level. On the other hand, the SMALL group regressions show mixed results. For the most part, small banks have either decreased or have had no impact on their risk level during the post-insurance period. We interpret this finding as evidence that "too big to fail" has become an even more relevant issue after the adoption of deposit insurance and further that the limit of the safety net to depositors is only credible for smaller banks.

[33] As mentioned in section 4, the BIG group is composed by the four largest banks in Ecuador that hold 62.7% of the system assets.

Table 8

Regression results for financial indocators using BIG banks aggregated data only

This table presents regression results for the varios financial indicators used as proxies to measure risk in this paper. Description of each indicator is the same as in the tables used above (see appendix 1 for further detail). Data used in this table comes from the aggregated financial statements of BIG banks only for the period 2007 -2014. For each indicator, results were were corrected for first-order autocorrelation. Monthly dummies were also included in the regressions; however this results are not reported due to space. All regressions report heteroskedasticity corrected standard errors.

Variables	CA1	CA2	LD1	LR1	LR2	LR3	Finc. Risk	Oper. Risk	Lev. Risk	Diverisifcation
trend	-0.000340***	-0.000161***	6.53e-05	-0.000949***	-0.000300	-0.000578**	-0.000168***	0.000498**	0.0163***	-0.00216***
	(4.92e-05)	(2.11e-05)	(4.28e-05)	(0.000347)	(0.000473)	(0.000231)	(3.51e-05)	(0.000215)	(0.00354)	(0.000223)
pctTA	-1.69e-05	-4.34e-05	-7.09e-05	0.000762**	0.000588**	0.000717***	-0.000206***	-0.000470***	0.0158***	0.000218
	(0.000120)	(6.39e-05)	(5.63e-05)	(0.000377)	(0.000237)	(0.000186)	(5.73e-05)	(0.000154)	(0.00439)	(0.000189)
L.pctTA	-5.77e-05	-4.57e-05	8.68e-07	0.000596*	0.000422	0.000394*	-9.02e-05**	-0.000283	0.00737**	1.58e-05
	(0.000104)	(5.05e-05)	(3.30e-05)	(0.000321)	(0.000302)	(0.000209)	(4.33e-05)	(0.000185)	(0.00326)	(0.000147)
Constant	0.0462***	0.0247***	0.0256***	0.220***	0.302***	0.458***	0.109***	0.503***	8.162***	0.458***
	(0.00339)	(0.00150)	(0.00187)	(0.0184)	(0.0255)	(0.0126)	(0.00181)	(0.0116)	(0.162)	(0.0115)
Observations	94	94	94	94	94	94	94	94	94	94
R-squared	0.814	0.836	0.653	0.505	0.487	0.836	0.920	0.888	0.886	0.884

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 9

Regression results for financial indocators using SMALL banks aggregated data only

This table presents regression results for the varios financial indicators used as proxies to measure risk in this paper. Description of each indicator is the same as in the tables used above (see appendix 1 for further detail). Data used in this table comes from the aggregated financial statements of SMALL banks only for the period 2007 -2014. For each indicator, results were were corrected for first-order autocorrelation. Monthly dummies were also included in the regressions; however this results are not reported due to space. All regressions report heteroskedasticity corrected standard errors.

Variables	CA1	CA2	CA3	CA4	LD1	LR1	LR2	LR3	fincrisk	operatrisk	leverisk	diversif
trend	5.44e-05*	2.42e-05	2.87e-05	6.69e-05***	-0.000123***	-0.000383**	0.000911*	0.000325	-0.000124***	-0.000362	0.0126***	-0.00233**
	(2.93e-05)	(2.54e-05)	(1.97e-05)	(1.33e-05)	(4.00e-05)	(0.000161)	(0.000541)	(0.000339)	(3.34e-05)	(0.000332)	(0.00328)	(0.00101)
pctTA	0.000206*	8.79e-05	-3.84e-05***	-1.97e-05	0.000142	0.00181***	0.00182***	0.00103***	-0.000199***	-0.00101***	0.0201***	-0.000562*
	(0.000119)	(7.03e-05)	(1.11e-05)	(6.13e-05)	(0.000129)	(0.000333)	(0.000446)	(0.000334)	(4.75e-05)	(0.000306)	(0.00476)	(0.000316)
L.pctTA	0.000171	7.51e-05	-2.72e-05**	3.86e-05	0.000206**	0.00105***	0.00122***	0.000677**	-0.000131***	-0.000665**	0.0131***	-0.000331*
	(0.000112)	(6.62e-05)	(1.23e-05)	(4.29e-05)	(8.54e-05)	(0.000299)	(0.000395)	(0.000289)	(4.40e-05)	(0.000268)	(0.00420)	(0.000190)
Constant	0.0201***	0.0120***	0.00937***	0.00980***	0.0368***	0.226***	0.240***	0.405***	0.104***	0.572***	8.649***	0.386***
	(0.00167)	(0.00134)	(0.00127)	(0.000558)	(0.00208)	(0.00810)	(0.0312)	(0.0190)	(0.00160)	(0.0186)	(0.154)	(0.0630)
Observations	94	94	94	94	94	94	94	94	94	94	94	94
R-squared	0.902	0.896	0.572	0.723	0.801	0.699	0.406	0.733	0.926	0.885	0.903	0.738

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

8. Conclusions

This paper analyzed the effects of the implementation of deposit insurance in the private banking system of Ecuador. Using time series analysis, we find evidence to support our hypothesis that the adoption of explicit deposit insurance may significantly increase risk-taking behavior of banks. We observed that this increase in risk has mainly been driven by larger banks behavior. Small banks risk levels have either decreased or remained unchanged during the post-insurance periods. Our finding suggest that from a single emerging market economy perspective, the implementation of deposit insurance create incentives for banks to increase their risk-taking behavior, as other papers have shown. Previous papers that concluded that deposit insurance does not increase moral hazard have largely used data from developed economies (i.e., US and EU) or have use panel datasets with countries at different stages of financial sophistication. A reason for the difference in results may be that developed economies have stronger institutions and well developed financial markets through which market discipline is better exercised. Deposit insurance main objectives are to promote a stable banking system and to protect depositors from the risk of loss. Although the Ecuadorian banking system has been stable during our sample period, regulator should pay more attention to the moral hazard issue. Only four banks hold more than 60% of the assets in the banking system. Failure of one of these banks will have devastating effects not only in the deposit insurance system but also in whole economy.

Our estimation results are in the most part conclusive and support our hypothesis that deposit insurance increases moral hazard. However, we have performed our analysis using aggregated financial data. Future research on this topic can perhaps pool data on individual banks to test for deposit insurance effects on moral hazard. Deposit insurance also promotes depositors trust in the banking system as reflected by an increase in deposits. This is another area that has not been tested in the Ecuadorian case. Finally, the use of different methodology as well as the use of alternative measures of risk can strengthen the result on this paper.

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Appendix 1

Table A2: Descriptive Statistics for both BIG and SMALL banks in the sample (2007 – 2014)

Variable	N	Mean	Min.	Max.	Std. Dev.
BIG					
Capital adequacy ratio 1	96	0,049	0,025	0,078	0,013
Capital adequacy ratio 2	96	0,027	0,014	0,041	0,007
Capital adequacy ratio 3	96	0,012	0,007	0,015	0,002
Capital adequacy ratio 4	96	0,020	0,014	0,029	0,004
Loan delinquency ratio	96	0,029	0,021	0,036	0,003
Liquidty ratio 1	96	0,201	0,133	0,280	0,035
Liquidity ratio 2	96	0,300	0,248	0,370	0,030
Liquidity ratio 3	96	0,445	0,391	0,495	0,024
Financial risk	96	0,104	0,093	0,121	0,005
Operating risk	96	0,514	0,467	0,565	0,021
Leverage risk	96	8,589	7,272	9,772	0,426
Diversification	96	0,409	0,317	0,501	0,055
Percentage change in total assets (%)	96	1,266	-22,77	29,992	4,321
Percentage change in total liabilities (%)	96	1,350	-18,57	26,335	3,892
Insured Deposits ($1,000)	96	10.226.667,00	5.139.409,00	17.300.000,00	3.373.382,00
Insured Deposits/Deposits	96	0,960	0,945	0,973	0,005
Total assets ($1,000)	96	13.391.848,00	7.027.539,00	22.100.000,00	4.297.802,00
Deposits/Assets	96	0,761	0,722	0,785	0,014
Net Income ($1,000)	96	105.354,50	10.152,64	273.040,60	64.492,25
Economic Activity Index	96	403,03	307,03	530,03	78,05
SMALL					
Capital adequacy ratio 1	96	0,034	0,014	0,045	0,008
Capital adequacy ratio 2	96	0,020	0,008	0,027	0,005
Capital adequacy ratio 3	96	0,008	0,006	0,010	0,001
Capital adequacy ratio 4	96	0,013	0,009	0,020	0,003
Loan delinquency ratio	96	0,034	0,023	0,044	0,005
Liquidty ratio 1	96	0,217	0,183	0,257	0,019
Liquidity ratio 2	96	0,272	0,188	0,350	0,034
Liquidity ratio 3	96	0,417	0,369	0,475	0,021
Financial risk	96	0,100	0,092	0,108	0,004
Operating risk	96	0,559	0,502	0,606	0,021
Leverage risk	96	9,047	8,246	9,922	0,405
Diversification	96	0,323	0,239	0,489	0,066
Percentage change in total assets (%)	96	0,961	-11,79	12,062	2,669
Percentage change in total liabilities (%)	96	0,891	-10,30	12,355	2,422
Insured Deposits ($1,000)	96	6.156.256,00	3.320.820,00	9.313.793,00	1.785.578,00
Insured Deposits/Deposits	96	0,951	0,929	0,976	0,009
Total assets ($1,000)	96	8.025.819,00	4.544.426,00	11.800.000,00	2.189.093,00
Deposits/Assets	96	0,763	0,722	0,798	0,018
Net Income ($1,000)	96	55.954,87	5.547,03	126.113,70	32.982,75
Economic Activity Index	96	403,03	307,03	530,03	78,05

Note: the BIG group is composed by the 4 biggest banks in terms of total assets. The SMALL group is composed by the other 22 banks.