THE REAL EFFECTS OF CONTAINMENT AND RESOLUTION POLICIES DURING SYSTEMIC BANKING CRISES:

A CROSS-COUNTRY STUDY

COLEGIO UNIVERSITARIO DE ESTUDIOS FINANCIEROS

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1. INTRODUCTION

The present Final Master's Project aims to analyse the effect of crisis intervention policies (containment and resolution) on economic growth. Specifically, we aim at demonstrating both qualitatively and quantitatively the need to apply different containment and resolution policies during systemic banking crises depending on specific characteristics at country-level. According to Claessens (2001), financial crises management is not homogenous across countries and, in particular, emerging countries are usually characterized by weaker institutions and suffer crisis periods that are often longer.

Hence, in this project we will pretend to give response to the following questions:

1. What is the impact of the crisis containment and resolution policies on economic growth?
2. Are the results homogenous across countries or do they vary depending on the characteristics of the legal and institutional environment?

Besides different studies have proved that developing countries have suffered a higher number of banking crises during the last decades, there is also evidence on the most negative consequences of financial distress episodes in developed countries (Laeven and Valencia, 2012). Consequently, if we may not expect to find the same results between both types of countries, why should we expect identical measures to be applied during a systemic banking crisis?

In order to achieve our objective, we will analyse whether and to what extent the degree of economic development affects the banking sector and, consequently, the effectivity of the intervention and resolution measures applied during a systemic banking crisis.

This Final Master's Project will follow the definition of systemic banking crises established by Caprio and Klingebel (2002), who defined the banking crises as "an episode during which the capital of the banking sector has been depleted due to loan losses, resulting in a negative net worth of the banking sector."

Therefore, in this project we will focus on the study of measures and variables that could affect the banking sector because of two main reasons. First, because the banking sector develops the basic function in the financial system, this is, to promote the relationship between the financial sector and the real economy by allowing the access to credit. Secondly, because developing countries tend to be more vulnerable to the factors that generally lead to banking turbulences and that amplify their impact.

Hence, the main purpose is to analyse that although intrinsically characteristics of an economy can affect the recovery of the internal

markets, they are not the explicative variables. Rather the speed of the recovery among countries differs due to the inadequacy of applying identical policies, measures, or regulations to economies with relevant differential aspects.

To prove this point, we will empirically examine how policy responses and intervention measures applied during periods of systemic banking crises occurred during the last decades affected the real economy differently across countries.

In the second section, we will review the previous and extensive financial and economic literature related to the effect of systemic banking crises on the real economy. Besides, we will refer to the most traditionally applied-intervention policies that will be analysed in this research.

In the third section, and after consolidating the academic justification of the project, we will present and justify the sample of countries and years that will be studied in the empirical analysis. The temporary space to be reviewed will be constrained to the requirements established by Laeven and Valencia (2010), who define the end of a crisis period as “the year before two conditions hold: real GDP growth and real credit growth are positive for at least two consecutive years”.

Furthermore, our empirical approach relies on two econometrical models. We differentiate between: (a) the basic model, that will allow us to study the effect of the containment and resolution policies, without differentiation across countries; and (b) the extended model, that will test the impact of the legal and institutional environment on the relationship between intervention policies and economic growth. Specifically, we will distinguish among countries in terms of two important features affecting the banking sector: the quality protection of creditor rights and the level of restrictions on non-traditional banking activities.

The fourth section will present the results obtained in the two models by focusing on the influence of the containment and resolution polices on economic growth through a general evidence and through a cross-country approach. In the fifth section, we will present a robustness analysis on our basic results in order to demonstrate the validity of the results of the project. Finally, last section concludes.

2. THEORETICAL BACKGROUND

2.1. Financial development and economic growth

Under normal financial circumstances, and according to Levine (1997) among many others, there is an evidence that the financial development has a positive correlation with the economic growth through the capital accumulation and the technological change channels. Besides, the positive connection between financial development and economic growth relies on the well-functioning of two mechanisms: lending channel which refers to the amount of money on circulation and the asset allocation channel which refers to how efficiently the money is allocated.

The financial system is the set of instruments, markets and institutions that allow channelling the amount of funding available from those agents with financial capacity to those agents with financial needing. Consequently, the primary function of financial systems is to facilitate the allocation of resources across time and space (Merton and Bodie, 2012). Those financial systems that are more effective in achieving this objective are the ones that positively influence the economic development the most. Besides, according to Bagehot (1873), “besides the direct effect of better savings mobilization on capital accumulation, better savings mobilization can improve resource allocation and boost technological innovation”.

The basic function of the financial system may take place through two different, although not substitute, ways. First, the objective of the financial system may be achieved, through the capital markets, also named as direct channel. Second, through the banking institutions, this is, the intermediation channel. This project will focus on the intermediation channel because it allows the contribution of the financial sector to economic growth by the stimulation of savings, improvements on capital accumulation and on efficiency levels. Moreover, we will focus on banking crises episodes and on how their occurrence and resolution measures may finally affect the real economy.

Consequently, financial intermediation is one of the key factors explaining the nexus between financial development and economic growth during normal periods. As we will see in the following sections, during systemic banking crises there is a deterioration of the functioning of the banking sector and, thereby, the linkage between the financial system and the real economic performance becomes negative.

This correlation is clearly perceived by the positive and strong link between financial development and real GDP per capita during normal periods. This relation can be explained due to the functioning of the financial intermediation sector. In this sense, King and Levine (1993) stated that financial intermediation pushes capital accumulation and an

increase of productivity factors, leading to economic growth. Besides, financial intermediation promotes private investment and contributes to achieving higher economic growth rates by augmenting savings (Shaw, 1973).

Nevertheless, one of the most important aspect is that financial intermediation enhances liquidity and simultaneously decreases liquidity risk. Banks offer to savers liquid deposits but at the same time, banks undertake a mixture of low-return investments and high-return investments. Therefore, banks are offering insurance against liquidity risk to savers while simultaneously are easing long-term investments with a high return. Through this procedure, according to Bencivenga and Smith (1991), through the elimination of liquidity risk, "banks can increase investment in the high-return illiquid assets and accelerate growth".

2.2. Systemic banking crises: Implications for the real economy and the financial system.

Systemic banking crises hamper the intermediation role of the banking system due to two main reasons. First, financial intermediation increases the availability of external financing and fosters the access to funding. This is particularly relevant in the case of countries with less robust financial markets. Second, the banking sector is a key element to avoid credit constraints, and therefore to reduce the probability of economic downturns negatively affecting the real economy. Hence, the occurrence of financial distress episodes negatively affects these two basic functions of the financial intermediation process and, therefore, the negative effect is transmitted into the real side of the economy.

Besides, previous evidence has highlighted that systemic banking crises are usually associated with the decrease in real economic activity. These two main aspects tend to cope simultaneously with currency instability or sovereign debt crises in developing countries and tend to have similar results on the quantification of fiscal costs during systemic banking crises. One example is the fiscal costs of countries like Argentina and Japan during their systemic banking crises in 1980-1992 and 1992, respectively. Argentina's fiscal costs were 6% of its GDP, and Japan's fiscal costs represented 8.6% of its GDP. (Laeven and Valencia, 2018).

However, the most noteworthy are the implications that systemic banking crises do have on the real economy. Previous literature has established that, banking crises in general dampen real economic growth through two effects: Finance effect via a reduction in credit supply; and, asset allocation effect via a reduction in firms' intangible investment intensity.

A reduction in the credit supply provoked during banking crises implies that systemic banking crises episodes tend to affect more negatively and disproportionately to those economic agents whose dependence on external financing sources is higher (Kroszner et al., 2007). In a similar way, Caballero and Hammour (1994) showed that industrial sectors producers of perishable manufactured goods are the ones most disproportionately affected by a reduction in the credit supply.

As regards of the asset allocation channel, Fernández et al. (2013) argue that banking crises might affect growth negatively, not only because of the reduction in the amount of credit, but also by modifying the level of efficiency in the allocation of financial resources across investments (asset allocation effect). Besides, they suggested that, compared with the finance effect, the asset allocation effect is more significant on its negative influence on economic growth during crisis years.

Likewise, usually as a response to particular financial distress episodes, an increased number of restrictions on the banking system do have two fundamental financial consequences. Firstly, a decrease of capital rations and consequently a weakening of the market's discipline. Secondly, by controlling banking risk-taking behaviour, it has been proved that incentives of smaller depositors to withdraw the money are reduced (Cubillas et al., 2012). However, at the same time, it provokes interest rates becoming more sensitive to any operation or decision that could increase or decrease the banking risk in developed countries.

2.3. Crisis intervention policies

As regards of the implications of systemic banking crises on the financial sector and on the real economy, the Basel Committee on Banking Supervision (BCBS) enumerated some general recommendations to be applied during and after systemic banking crises[1]:

- Introduction of effective national resolution tools and frameworks.
- Mechanisms to facilitate their cross-border implementation.
- Firm specific contingency planning.
- Reduction of complexity and interconnectedness with group structures.
- Cross-border information sharing.
- Effective risk mitigation techniques.

[1] Basel Committee on Banking Supervision (2011), *Resolution policies and frameworks-progress so far*.

However, supervisory, regulatory, or institutional measures affect the discipline and development of the markets after a banking crisis, independently if it the crisis is systemic or not (Cubillas et al., 2012). We can distinguish two phases when dealing with the problems derived from a crisis episode. The first one based on the containment of liquidity pressures through liquidity support, guarantees, deposit freezes or bank holidays. The second one is, based on the mechanisms applied in order to restructure banks and to restore normality in terms of the behaviour of economic growth rates. Among the measures applied in this second phase, the most common are capital injection and asset purchases. (Laeven and Valencia, 2010).

Despite tools as bank holidays or deposit freezes are rarely used as containment policies, guarantees and emergency liquidity support are widely used. This is justified because addressing solvency problems with public money tends to be a more complex procedure due to the requirement in terms of specific legislation and political consensus. Consequently, liquidity support and guarantees are usually preferred. (Laeven and Valencia, 2010).

Liquidity support facilities provided by central banks pretend to assure liquidity to banks who are suffering liquidity mismatches on their balance sheets. However, liquidity support facilities also aim to avoiding "panics" regarding the financial health of banking institutions to spread in an unstable scenario. In other words, market participants need to perceive this instrument as the capability of the Central Bank to calm the situation on the financial markets. Consequently, preconditions of this type of financial support, such as collateral requirements, cannot be applied in order to fulfil its achievement. Because, "in an environment of large volatility in asset prices such as interest rates and exchange rates, it can be very difficult to differentiate mere illiquidity from solvency" (He, 2000). Likewise, liquidity support is usually coordinated with guarantee of deposits or blanket guarantees, especially when banking crisis are severe, as it was the case of the Nordic's countries crises in the 1990's.

Blanket guarantees reduce liquidity pressures generated on banks due to deposit withdrawals, because they reduce the public incentive to withdraw deposits (Laeven and Valencia, 2008). The inherent idea behind this mechanism is that if there is a reduction in depositors' trend of withdrawing their savings, then there should be a decrease of the bank's demand for liquidity support coming from the Central Bank.

In the particular cases of Finland and Japan, after the announcement of blanket guarantees, foreign liabilities decreased sharply, according to Laeven and Valencia (2008). The effect of blanket

guarantees is more relevant when there are significant pressures on the currency that drain foreign reserves.

However, the usefulness of other policies, such as asset purchases, should take into consideration their impact on the financial market. Their effectiveness would be reduced if they could be anticipated by the market, because "they may have been at least partly priced in already before the actual announcement" (Hesse et al., 2017).

The effect of these measures after a systemic banking crisis is partially recorded by the fiscal costs due to direct government intervention[2]. According to Amaglobeli et al. (2017), during the period between 1980 and 2011, the fiscal costs after systemic banking crises were around 6% GDP and only one third exceeded 10% GDP. Nevertheless, costs generated by induced future recessions and tighter financing conditions were not been directly measurable in this research.

According to the Law and Finance literature, it is a well-known fact that in emerging countries the institutional environment, in general, and regulation in particular, tends to be weaker than in developed countries (La Porta et al., 1998), as well as supervision is more limited and financial solvency data are scarce. Then, in this case, it is necessary intervention tools to be simple and, although having the same proposal than for developed countries, the approaches for the consecution should be different. However, and according to Claessens (2001), for both types of countries -developed and developing countries- is crucial to implement restructuration processes after a crisis episode according to the following aspects:

- Recognizing and allocating financial losses.
- Restructuring the financial claims of financial institutions and corporations.
- Restructuring the operations of financial institutions and corporations.

To summarize this section, a main idea should be highlighted. The objective of intervention or the adoption of policies is no other than to facilitate recovery, and then the negative effects on growth of a crisis may also be short lived. According to Claessens (2001) "Indeed, growth could actually increase if the policies enacted after the crisis improve the efficiency of the financial system. Of course, policy responses also can worsen the crisis and reduce the growth".

[2] There will be considered as direct fiscal costs the following politics or actions: Bank recapitalization, asset purchases, depositor pay-outs, call and guarantees, and banking assets value.

3. METHODOLOGY.

3.1. Sample and database

In this section, we present the sample of countries and years that will be studied in the empirical analysis. In particular, we have collected data on six developed and developing countries, namely: Argentina, Cameroon, Chile, Finland, Indonesia, and Japan. We will examine the real effects of the different containment and resolutions policies that were applied after the episodes of banking crises that these countries suffered. Our sample period ranges from 1980 to 2003. Hence, a total 9 periods of crises were identified. In Annex 1 we show, the inception dates of the systemic banking crises periods in each country.

In particular, we will follow the criteria established by Laeven and Valencia (2018) to define the crises episodes. These authors have stated that a period of 24 months is required in order to foster the course and recovery from a systemic banking crisis in terms of the following key variables:

- Real Gross Domestic Product.
- Gross Domestic Product per capita.
- Sovereign debt.
- Credit supply.
- Blanket Depositor Supervision.
- Extensive Liquidity Provision.
- Government recapitalization.
- Nationalization.
- Fiscal costs.

As regards the sample selection criteria, there have been prioritized both geographical and temporary aspects. Thus, the cases are focused on the temporary period between 1980 and 2003, with the aim of not collapsing with the effects provoked by the 2007/2008 Global Financial Crisis.

Likewise, it is intended to analyse the implications of systemic banking crises' episodes in regions in which their economic and financial orientations, and social and cultural environments are different, but their evolution and reactions regarding systemic banking crises converge. This is why we have tried to search for a good representation of different economic and legal environments. The availability of diverse legal and institutional environments will allow us to examine further the differential impact of crisis reactions on real economy.

Finally, before proceeding to elaborate more on each significant case, it is necessary to stand out the process of classification between developed countries and developing countries, based on the criteria established by the World Bank and the International Monetary Fund. In

this project, a country would be considered as a developed one if it fulfils at least the requirements established by one of these institutions. If any of these requirements is not fulfilled, the country will be considered as a developing country.

In the case of the World Bank, the classification is based on the estimation of Gross National Income per capita converted to international dollars using purchasing power parity rates. According to this classification a developed country would be the one having a high income, which means $12,476 or more annually per person.

On the other side, International Monetary Fund's criteria is not as explicit as the World Bank's criteria. The International Monetary Fund uses a weighted average of data for individual countries regarding three issues:

- Per capita income level.
- Export diversification.
- Degree of integration into the global financial system.

Hence, the classification of the selected countries is the following:

Developed Countries:

- Chile (1981)
- Finland (1991-1994)
- Japan (1992)

Developing Countries:

- Argentina (1980-1992)
- Cameroon (1987-1995)
- Indonesia (1997-1998)

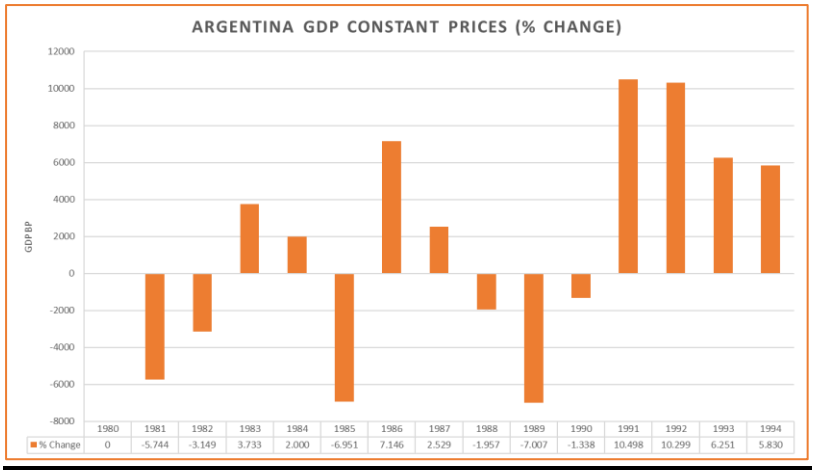
3.2. Countries and banking crisis episodes

In this section, we will describe more in depth the main characteristics of each of the countries composing our sample. To do so, we will describe the behaviour of the main macroeconomic indicators of each of these countries, focusing on the period around the episode of banking crisis and the years after it.

3.2.1. Developing countries

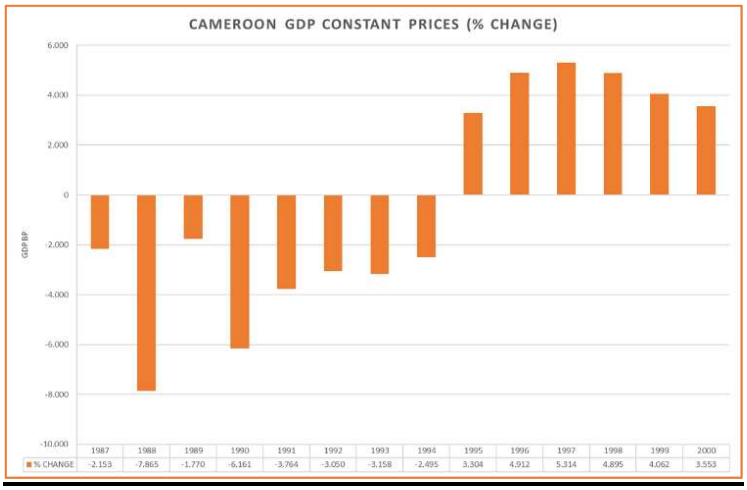
In the case of developing countries, there can be analysed three different tendencies before the beginning of each individual systemic banking crisis. There is no doubt that during the advancement of the systemic banking crisis the GDP would be decreasing continuously, after finally acquiring a positive tendency during the recovery period. However, it is relevant to highlight the differences among countries in terms of the evolution of the GDP before entering to the systemic banking crisis.

In the case of Argentina, in Graph 1 it can be appreciated increases and decreases on the GDP percentage rate between -5.74% and 2%. This wide range of variation could be partially explained by the uncertainty generated during those years due to negative outlook some Latin America countries were facing. There was a combination between the global economic downturn, external deficit, increase of debt and sharp cut of external private financing (Ugarteche, 2016).



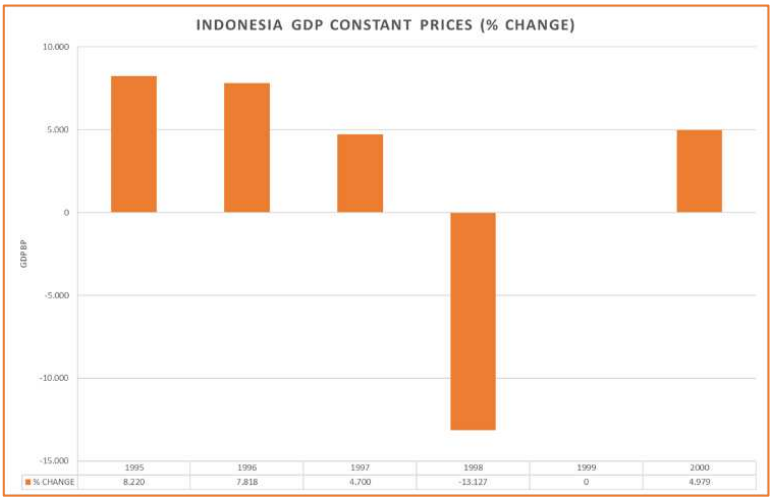
Graph 1: GDP in constant prices (% change) in Argentina.

Graph 2 shows the evolution of GDP in Cameroon. During the pre-crisis years, before 1987, it was considered as the “African miracle” due to its continuous and prolonged growth rates of GDP during several years. However, it was hardly hit years before the inception of the systemic banking crisis due to the fall of the export price index in CFA francs and the devaluation of this currency against the USD dollar (Nantang, 1991).



Graph 2: GDP in constant prices (% change) in Cameroon.

Indonesia's evolution has been rather positive based on its growth of GDP the years previous the beginning of the systemic banking crisis episode (Graph 3). However, the first fall of the GDP is more pronounced than in the case of Argentina and Cameroon. Specifically, the percentage rate change of GDP in 1997 was -13.127%



Graph 3: GDP in constant prices (% change) in Indonesia.

Consequently, the impact on the GDP per capita also differs among countries, although there is a common decrease pattern in all of them. As can be observed in Graphs 4, 5, and 6, however, the impressive decline took place in Indonesia in 1997 (from 6,601.49 USD to 5,669.45 USD per capita). While in the case of Argentina and Cameroon, the decrease of GDP per capita is produced in a slow and

continuous manner during several years but without such a high impact on the economy.

Graphs 4,5 and 6: GDP per capita in constant prices (Purchasing Power Parity; international dollars) in Argentina, Cameroon, and Indonesia.

On a different note, developing countries tend to be more dependent to the evolution to international trade due to the economic weight exportations do have on their economies. Consequently, their currencies tend to be more linked to international currencies like the USD dollar. This affects to a relevant aspect of the economy: the real effective exchange rate, which simultaneously affect to external debt and external loans and deposits.

As a consequence of the interrelation between the local currencies and the USD dollar, since the beginning of the systemic banking crises the local currencies have been suffering a depreciation that most of the time acted like a trigger on the evolution and development of the banking crises. Besides, that decrease of the real effective exchange rate also has an incidence into the external debt and in the capacity to return external loans and deposits.

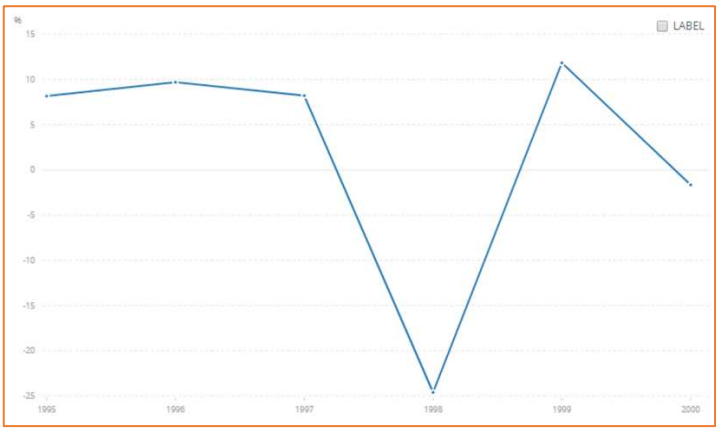
According to the World Bank, the debt service on external debt indicator shows the sum of principal repayments and interests that the country has actually paid in currency, goods, or services in long and short-term. It also included the repayments to the IMF. As expected, in the case, of Argentina, Cameroon and Indonesia the sum of repayments sharply decreases during the first years of the systemic banking crisis and that does not recover at the same speed during the recovery.

As can be seen in Graphs 7 and 8, in Argentina the sum of repayment on 1986 was 7.35 billion USD dollars while in 1989 (after the crisis period) was 4.38 billion USD dollars. In Cameroon, it went down from 674 million of USD dollars in 1988 to 405 million of USD dollars in 1989, in just one year.

Furthermore, the depreciation of the local currency also affected to the capacity to ask for loans and deposits in the foreign market. Consequently, banks did not have the same capacity of getting funding that in previous years and in some countries, like Indonesia or Cameroon. This situation provoked a potential liquidity risk situation for many banks. In fact, sixteen banks were closed by the Bank of Indonesia due to insolvency problems derived from liquidity difficulties.

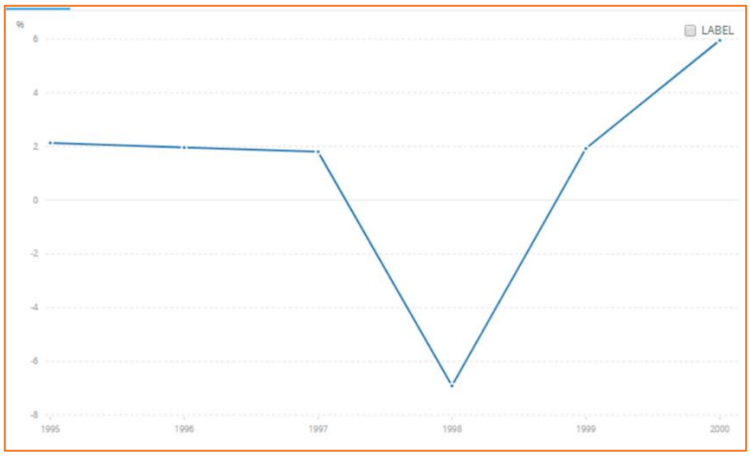
Graph 7 and 8: External loans and deposits of reporting banks vis-à-vis all sectors (% of domestic bank deposits) in Cameroon and Indonesia.

The situation also had an impact in terms of the real interest rate and the interest rate spread. In the case of the real interest rate, it can be highlighted two tendencies. First, a sharp decline of the interest rate when it was declared the aid of international organizations like the IMF or the World Bank or the local government implemented any substantial measure that can help to reduce banking risk. However, on the opposite side, when the banking risk increases, interest rates are very sensible to that movement and tends to increase. A clear example of this tendency can be found when the IMF decided to suspend its plan on Indonesia in 1999 because there was no intention to implement a banking sector reform and needed corporate restructuring.



Graph 9: Real interest rate (%) in Indonesia.

The same tendency can be perceived in terms of the interest rate spread in Graph 10. It is understood as the difference between the interest earned on loans and the interest paid on deposits during the same period. In this case, for Indonesia in 1998, the interest rate spread is -6.91%, which means that the interest paid on deposits was higher than the interest earned on loans.



Graph 10: Interest Rate Spread (%) in Indonesia.

Finally, the intervention of the IMF and the World Bank during the systemic banking crises occurred in these countries was based on two lines of actions. First, acting like a lender of last resort by promoting financing in order to enable the repayment of debts, including external debt and to require the compliance of structural adjustments, specially to commercial banks, in order to generate the needed resources to cancel debts.

However, in the case of Argentina the application of these measures did not reduce the relative weight of external debt because each adjustment generated a decrease on the GPD which implied a recessive vicious circle.

Moreover, the other line of action of the IMF tended to be anchored in a firm base monetary control (IMF, 2005). The main policies implemented were:

- Banking sector reform.
- Corporate restructuring.
- Effective bankruptcy system.
- Deregulation.
- Privatization.
- Improved governance.

With regard to these measures, the IMF usually considered them as a whole block that should be applied in coordination. When it is not, like in the case of Indonesia in 1999, the IMF can suspend its programme until further notice.

3.2.2. Developed countries

On a separate issue, towards complementing the description of significant developing countries' cases, the same process will be applied to significant developed countries' cases in this section.

According to what is shown in Graphs 10, 11, and 12, the evolution of the GDP does not differ during a systemic banking crisis between developed and developing countries as it can be observed that, both types of countries suffered from a fall of the GDP during the years of the crisis.

Graphs 11, 12 and 13: GDP in constant prices (% change) Chile, Finland and Japan.

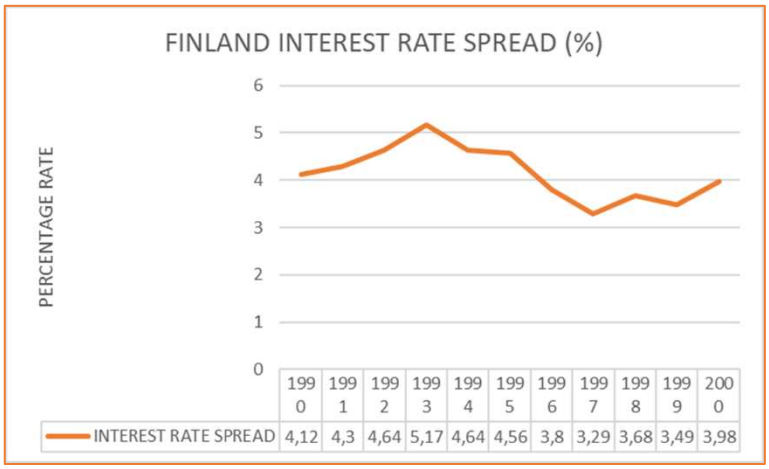
However, regarding the GDP per capita, there is not a common tendency of recovering of the GDP per capita between developed countries. While Chile did not recover the previous GDP per capita before the systemic banking crisis and, in fact, not even was increasing over time. Other countries like Finland did have a "V" recovery's shape after the systemic banking crisis, regaining the values previous to the crisis in just two year after its end. Other countries like Japan suffered of turbulences on the growth of the GDP per capita during the afterwards of the systemic banking crises, however it continued to growth slowly but steadily.

Graph 14, 15 and 16: GDP per capita in constant prices (Purchasing Power Parity; international dollars) in Chile, Finland, and Japan.

On a separate note, developed countries are not as dependent on the evolution on exchange rate although some of their economies can be dependent on the exportation sector like the Chilean's case, because they have strong currencies that do not have the same direct correlation with the USD dollar than local currencies of developing countries do. Consequently, the evolution of the exchange rate during a systemic banking crisis is more stable and their consequences on external debt and external loans and deposits is not as pronounced as in the case of developing countries.

Graph 17 and 18: Real effective exchange rate in Finland and Japan.

Likewise, real interest rate and interest rate spread did not suffer sharps falling and hugely recovery like in the developing countries. In fact, they suffered a graduated decrease and at the end of the systemic banking crisis, the growth is still slow.



Graph 19: Interest Rate Spread (%) in Finland.[3]

However, despite of the differences among countries previously remarked, the intervention policies applied in each country to solve systemic banking countries do not differ significantly. In countries like Finland, a Government Guarantee Fund was established in order to manage the banking crisis by implementing a strict requirement on banks, monitoring those banks receiving support and structural adjustment, and restructuring and merging some commercial banks (Honkapohka, 2009). As it can be perceived there are not significant differences with the measures implemented in Indonesia.

As in some developing countries, some measures did not solve the problems. In the case of Japan, for instance, despite large and repeated stimulus, packages based on credit guarantees and increases of credit lines, Japan's growth remained stagnant amidst deflationary pressures and public deficits. Indeed, an important decrease of private investment was produced despite the continuous increases in government expenditures (Brückner et al., 2011).

3.3. Dependent and explanatory variable

3.3.1. Dependent variable

Once we have reviewed the behaviour of each country in terms of the basic macroeconomic variables and around the crisis inception

[3] Interest Rate Spread for the developed countries has been only available for the case of Finland.

dates, we now proceed with a detail explanation on the econometrical tools that will allow us to give response to our basic research questions.

The econometric model will allow us to explain the evolution of our sample of developed and developing countries -Chile, Finland, Japan, Argentina, Cameroon, and Indonesia- during a specific period among 1980 and 2003, during which systemic banking crises have occurred. In order to study the influence of the containment and resolution tools applied during banking crisis episodes on the country's economy's recovery, it has been established a set of explicative variables (see below) to enlighten the dependent variable of the model: the growth rate of per capital Gross Domestic Product in real USD$. This variable has been collected from the International Financial Statistics (IMF databases).

According to Laeven and Valencia (2018), the duration of a recovery period is defined by analysing quarterly years since the first fall of real per capita income until the quarter on which the country reaches the real per capita income previous to the banking crisis. However, due to the time period to be analysed is referred to four decades ago, international databases, as the ones of the International Monetary Fund or the World Bank, do not provide real per capita income growth information in quarterly bases for the entire sample of countries. Nevertheless, as there is availability of annual data for all the set of variables in each country, the dependent variable will be presented and studied annually. Following Laeven and Valencia (2018), we identify the crisis periods by a dummy variable that takes the value 1 during the crisis years and 0 for the rest of the periods.

3.3.2. Explanatory variables

Our explanatory variables can be divided into three different categories:

A. Variables referred to the crisis containment policies.

For the definition and computation of the following variables, Laeven and Valencia's (2018) database has been used as reference.

- Liquidity Support, according to Laeven and Valencia (2018), measures "claims of the monetary authorities on the banking sector, expressed as a percentage of the total deposits, and foreign liabilities of the banking system". It will take the value of 1 if a banking sector in a specific year received liquidity support and 0 if when, during the year referred, there has not been a systemic banking crisis and/or no liquidity support has been implemented.

- Increase in Public Debt, which is measured as the amount of public debt expressed as a percentage of GDP. It will take the value of 0 when, during the year referred, there has not been a systemic banking crisis and/or no public debt issuance has been implemented.
- Bank holidays: it is defined as a dummy variable that indicates whether the government introduced restrictions on deposit withdrawals or a bank holiday.

B. Variables referring to the crisis resolution and intervention policies.

Laeven and Valencia (2018)'s database is the main source of data for the definition and computation of these variables[4]. In particular, the variables considered are:

- Assets purchases: it is defined as a dummy variable that takes the value 1 if the central bank, the treasury, or the government entity (such as an asset management company) has purchased assets from financial institutions, and 0 otherwise. It is defined as on the basis of significant asset purchases as those exceeding 5 percent of GDP.
- Bank recapitalization: it is measured as the share of GDP that represent bank recapitalization aid. It takes value of 0 if it is a non-crisis year or if no recapitalization strategies have been applied.

C. Control variables:

This set of variables allows us to control for additional factors potentially affecting economic growth. In particular, we account for the severity of the crisis in each country, measured through the amount of output losses; the quality of the institutional environment, proxied by the index of creditor rights protection; and the extent to which non-traditional banking activities are allowed in each country[5].

- Output loss: it includes the cumulative sum of the differences between actual and trend real Gross Domestic Product (GDP) over the period. Output loss is calculated as a percentage of

[4] For this category, it is relevant to highlight that according to Laeven and Valencia's (2018) database, there is not a recording for Cameroon's resolution and intervention policies.

[5] Although, our empirical analysis has been developed presenting these three control variables, alternative control variables have been also considered. In particular, we have also defined alternative specification of our empirical model using rule of law, political stability, control of corruption, regulatory quality, voice, and accountability, and, government effectiveness as other control variables.

GDP and it will take the value of 0, when during the year referred, there has not been a systemic banking crisis.

- Protection of creditor rights, it is measured by the index developed by the World Bank (Doing Business Dataset). This index ranges from, 0 (low protection) to 11 (strong protection) and it refers to the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders both outside and in bankruptcy.
- Restrictions on bank activities: proxied through an index that measures the legal restrictions on non-traditional bank activities such as securities, bank ownership, real estate markets, insurance, and control of non-financial firms. This variable has been collected from the World Bank Regulation and Supervision Dataset and ranges from 4 (low restrictions) to 16 (high restrictions).

In Table 1 we present the basic descriptive statistics of our variables of interests and the correlation matrix. As can be seen, there is an important variation among countries in terms of GDPpc growth, being Indonesia the country with the highest value (5.47%) and Argentina the one with the lowest value of the dependent variable (1.12%). In Panel B, we can appreciate negative correlations among all the variables exhibited and the dependent variable, except the variable Restriction on Bank Activities that presents a positive association with GDPpc growth.

Table 1: Descriptive statistics and correlations

This table shows the mean values of the main variables of interest and their correlations. *GDPpc Growth* is the annual growth rate of per capita GDP. *Liquidity Support* is the percentage of the total deposits and foreign liabilities of the banking system, *Increase in Public Debt* is computed as the amount of public debt expressed as a percentage of public debt. *Bank Holidays* is a dummy variable that indicates whether the government introduced restriction on deposit withdrawals or a bank holiday. *Asset Purchases* is a dummy variable defined based on significant asset purchases as those exceeding 5% of GDP. *Bank Recapitalization* is a dummy variable defined as the recapitalization costed established on the percentage on the GDP. *Creditor Rights Protection* is an index that refers to the degree to which collateral and bankruptcy laws to protect the borrowers and lenders. *Restrictions on Bank Activities* is an index measuring the legal restriction on non-traditional bank activities *Output Loss* is the cumulative sum of the differences between actual and trend real GDP over the period. ***; ** and * indicate statistical significance at 1, 5, and 10 percent, respectively.

PANEL A: Descriptive Statistics

	GDPpc Growth	*Liquidity Support*	*Increase in Public Debt*	*Bank Holidays*	*Assets Purchases*	*Bank Recapitalization*	*Creditor Rights*	*Restrictions on Bank Activities*	*Output Losses*
Argentina	1.1233	27.5625	11.7125	1.125	0	0.125	3	8	17.725
Cameroon	3.0216	9.2958	3.6125	0	0	0	6	6	22.9916
Chile	4.7020	10.9791	18.3125	0	0.2916	0.2916	4	9	1.7916
Finland	2.7930	1.1458	9.0833	0	0.2083	0.2083	7	6	14.5
Indonesia	5.4783	3.5833	14.0833	0	0.2083	0.2083	4	10	14.375
Japan	2.6526	0.3333	8.6875	0	0.2083	0.2083	5	8	9.375

PANEL B: Correlations

	GDPpc Growth	*Liquidity Support*	*Increase in Public Debt*	*Bank Holidays*	*Assets Purchases*	*Bank Recapitalization*	*Creditor Rights*	*Restrictions on Bank Activities*	*Output Losses*
GDPpc Growth	1.0000								
Liquidity Support	-0.3368***	1.0000							
Increase in Public Debt	-0.3843***	0.2750***	1.0000						
Bank Holidays	-0.1815**	0.5588***	0.2094**	1.0000					
Assets Purchases	-0.2468***	0.1553*	0.7487***	-0.0880	1.0000				
Bank Recapitalization	-0.2972***	0.1794**	0.8683***	0.2089	0.9265***	1.0000			
Creditor Rights	-0.0137	-0.2574***	-0.1154	-0.2827***	0.0239	-0.0523	1.0000		
Restrictions on Bank Activities	0.1761**	0.0292	0.1468*	0.0236	0.1408*	0.1400*	-0.7774***	1.0000	
Output Losses	-0.4902***	0.3732***	0.6195***	0.2325***	0.4560***	0.5456***	0.0610	-0.1255	1.0000

3.4. Econometric models

In order to study the potential effects of the different crisis containment and resolution policies on economic growth in this study we define a linear regression model with several specification testing both the global and the cross-country effect of crisis intervention measures.

First, we define a basic model through which we examine the global impact of both containment and resolution policies on economic growth. Second, taking the basic model as a starting point, we develop an extended model allowing us to test if the global effect of crisis policies is homogenous across countries or, on the contrary, it could be different depending on country-level characteristics in terms of institutional and regulatory characteristics.

3.4.1. Basic model

The basic model explains the impact of both crisis containment and resolution policies on the growth of the GDP per capita in each country. We regress the dependent variable on the set of variables related to containment and resolution measures applied in each country. Besides, country-level measures regarding the severity of the crisis period, and the impact and importance of the banking sector, as creditor rights protection and restrictions on bank activities, are also considered as control variables.

In order to obtain a more detailed and comprehensive conclusions, this basic model has been studied through different specifications. First, it has been considered to study the impact of two containments policies individually: the direct liquidity support provided by official authorities, and the increase in public debt.

In a second model specification, we have considered the impact of the two previous containment measures at the same time. Finally, we also define the model without the time fixed effects. The third model specification, as an enlargement of the basic model, in addition to the variables mentioned, and in order to study the simultaneous effect of containment and resolution policies on economic growth, we additionally include asset purchases and bank recapitalization as resolution policies, but we also add bank holidays as a containment policy. It is important to highlight that it has been study separately from the other containment policies because it is statistical highly correlated with the liquidity support variable, and we consider their simultaneously inclusion in the model could distort the results. Moreover, only Argentina applied this policy and it may cause econometric problems as it is defined as a dichotomic variable.

The equation form of our basic model could be specified as follows:

$$\Delta GDPpc_{it} = \beta_0 + \beta_1 * CONTAINMENT_{it} + \beta_2 * RESOLUTION_{it} + \beta_3 * CONTROLS_{it} + \varepsilon_{it}$$

Where i refers to the country, and t to the year. As previously explained, our dependent variable is measured as the annual growth rate of per capita GDP ($\Delta \boldsymbol{GDPpc_{it}}$). $\boldsymbol{CONTAINMENT_{it}}$ is the vector of crisis containment policies (liquidity support, increase in public debt and bank holidays). $\boldsymbol{RESOLUTION_{it}}$ refers to the set of crisis resolution policies (asset purchases and bank recapitalizations). The vector $\boldsymbol{CONTROLS_{it}}$ is composed of the control variables introduced in all the estimations (output losses, the index of creditor rights protection, the indicator on restrictions on non-traditional banking activities, and the time fixed effects). Finally, $\boldsymbol{\varepsilon_{it}}$ is the error term.

3.4.2. Extended model

On the basic model it is studied the effect of the containment and resolution policies in a general framework, without making a differentiation across countries. The proposed extended model pretends to present the impact of the variables of interest on the economic growth but distinguishing their impact between types of countries. In particular, we examine the extent to which differences across countries, in terms of the quality of protection of creditor rights and in terms of restrictions on non-traditional banking activities, may shape the effect of the crisis containment and resolution policies on GDP growth.

The first extended model will study the same presented variables of the last basic model through the differentiation between countries with high/low level of creditor rights protection. In order to define this classification, we split the sample of observations across the median value of the index of protection of creditor rights. Hence, we take into consideration a country-year observation being classified as a high creditor rights observation if the value of this index is above the median value of the total sample. While, the observations classified as low creditor rights protection are those values of the index that are below the median value of the total sample.

Both models will have two different formulations. First, all the containment policies will be considered, but without looking into resolution policies. While the second formulation will take into consideration the multiple resolution policies: assets purchases and

bank recapitalization. The set of control variables remains invariant in all the estimates.

Finally, and following the same procedure, the second extended model will study the impact of containment policies on economic growth across subsamples of country-year observations with high and low restrictions on non-traditional banking activities, respectively. The observations included in the set of high level of restrictions on non-traditional banking activities are the ones whose value of this index is above the median value of the total sample. While, the observations included inside low restrictions on non-traditional banking activities are those values that are below the median of the total sample.

As in the previous extended model, there will be two different formulations. First, it will take into account all the containment policies exhibited on the basic model, but without including resolution polices. While the second formulation will include all the set of containment and resolution policies. Both types of estimates also contain the control variables previously described.

4. RESULTS

4.1. Influence of the containment and resolution policies on economic growth

In this section, we present the basic set of analyses examining the impact of both containment and resolution policies on economic growth. In all the estimates of Table 1, it can be appreciated that liquidity support always presents a negative and significant coefficient. Liquidity support is in general terms the most common policy applied to contain a banking crisis episode. However, results in our basic models seem to suggest that, liquidity support has a negative impact on economic growth, which implies than an increase of liquidity injection on the banking sector around the crisis years implies a decrease of the rates of economic growth. This tendency can also be extrapolated, to some extent, to the variable of Increase in Public Debt.

Laeven and Valencia (2013) had previously studied the impact of the liquidity support on the economy, and, although in their study the variable proxying for liquidity support was not significant at conventional levels, the argumentation of the negative effect on the economic growth is still valid in our case. In fact, Laeven and Valencia(2013), referring to the crisis in 2007/2008, considered that *"when banks face solvency problems and not just liquidity problems, as was likely the case for many banks during the recent crisis, bank capital and lending capacity is not restored through liquidity injections".* In our case, we are studying systemic banking crises periods and during these financial distress episodes, the problem was mainly focused on the liabilities side of the

bank. In other words, we are examining insolvency crises, instead of liquidity crisis. Indeed, it is not only a matter of liquidity support being most useful during liquidity crisis than during insolvency crisis, but also of another potential problem associated to this measure. In fact, liquidity support, aiming at counteracting tensions in the interbank market and at reducing the repercussions for the real economy, can generate other difficulties related to an excess of liquidity provision. Banking entities will be getting more liquid resources than needed and they will have more willingness to take inappropriate risks and to reduce their efficiency on the allocation of credit. Besides, another potential problem generated by an increase of liquidity of support when it is not necessary is the malfunction of the lending channel and the asset allocation channel, affecting negatively to the economic growth.

As regards of the control variables, the majority of them are significant on all the scenarios exhibited. In particular, output losses presents a negative impact on the economic growth, which indicates a lower growth rate of GDPpc in countries where the crisis hit the economy in a more negative way.

In the case of the creditor rights protection index, its effect is positive and also significant on the economic growth, which implies that higher levels of protection of creditor rights positively affects economic growth. This result is consistent with the traditional Law and Finance literature which establishes that *"when creditor rights are good, bank borrowing is easier, and therefore firms will finance their investment through debt rather than equity, leading to higher ownership concentration in equilibrium".* (La Porta et al.,1998).

Finally, in the case of restrictions on non-traditional banking activities, its coefficient is positive and statistically significant. This indicates that, in countries where the banking sector is more legally forced to only focus on traditional businesses (credits and deposits), banks could be more willing to invest on the development of lending relationships with debtors and thereby promote the well-functioning of the lending channel. This, is fact, positively affects economic performance. Consequently, the banks are more efficient on their principal activity and perform an adequate risk management.

Lastly, it can be appreciated in Table 2, the relevance of considering the year fixed effects in order to increase the goodwill of our econometric model (See R2 on Table 2).

Table 2: Effect of containment policies on economic growth

This table reports the results of the impact of containment policies on economic growth. *Liquidity Support* is the percentage of the total deposits and foreign liabilities of the banking system, *Increase in Public Debt* is computed as the amount of public debt expressed as a percentage of public debt. *Creditor Rights Protection* is an index that refers to the degree to which collateral and bankruptcy laws to protect the borrowers and lenders. *Restrictions on Bank Activities* is an index measuring the legal restriction on non-traditional bank activities. *Output Loss* is the cumulative sum of the differences between actual and trend real GDP over the period, Year fixed effects are included in columns (1) to (3) but their coefficients are not shown for reasons of space. T statistics are between parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

	(1)	**(2)**	**(3)**	**(4)**
Liquidity Support	-0.0349* (-1.90)		-0.0312* (-1.69)	-0.0262 (-1.59)
Increase in Public Debt		-0.0334 (-1.64)	-0.0284 (-1.39)	-0.0364** (-2.03)
Creditor Rights Protection	0.5980 (1.36)	0.9820** (2.44)	0.6666 (1.51)	0.7254* (1.69)
Restrictions on Bank Activities	0.8478** (2.20)	1.2130*** (3.16)	1.005** (2.51)	1.0725*** (2.76)
Output Loss	-0.0690*** (-5.01)	-0.0590*** (-3.33)	-0.0528*** (-2.94)	-0.0495*** (-3.03)
Year dummies	Yes	Yes	Yes	No
R^2	41.36	40.90	42.33	31.72
F-Test (p-value)	0.0000	0.0000	0.0000	0.0000
#Observations	144	144	144	144

Table 3: Effect of containment and resolution policies on economic growth

This table reports the results of the impact of both containment and resolution policies on economic growth. *Liquidity Support* is the percentage of the total deposits and foreign liabilities of the banking system, *Increase in Public Debt* is computed as the amount of public debt expressed as a percentage of public debt. *Bank Holidays* is a dummy variable that indicates whether the government introduced restriction on deposit withdrawals or a bank holiday. *Asset Purchases* is a dummy variable defined based on significant asset purchases as those exceeding 5% of GDP; *Bank Recapitalization* is a dummy variable defined as the recapitalization costed established on the percentage on the GDP. *Creditor Rights Protection* is an index that refers to the degree to which collateral and bankruptcy laws to protect the borrowers and lenders. *Restrictions on Bank Activities* is an index measuring the legal restriction on non-traditional bank activities. *Output Loss* is the cumulative sum of the differences between actual and trend real GDP over the period. Year fixed effects are included but their coefficients are not shown for reasons of space. T statistics are between parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

	(1)	**(2)**	**(3)**	**(4)**
Liquidity Support	-0.0426***	-0.0308	-0.0313	-0.0454**
	(-2.08)	(-1.65)	(-1.63)	(-2.05)
Increase in Public Debt	-0.0312	-0.0249	-0.0288	-0.0402
	(-1.53)	(-0.92)	(-0.95)	(-1.23)
Bank Holidays	0.6475			0.7046
	(1.26)			(1.28)
Assets Purchases		-0.3165		0.1188
		(-0.19)		(0.06)
Bank Recapitalization			0.0011	0.0216
			(0.02)	(0.28)
Creditor Rights Protection	0.8412*	0.6995	0.6643	0.8019*
	(1.83)	(1.48)	(1.44)	(1.66)
Restrictions on Bank Activities	1.1361***	0.0249**	1.0023**	1.0882**
	(2.76)	(2.44)	(2.34)	(2.49)
Output Loss	-0.0514***	-0.0530***	-0.0527***	-0.0494**
	(-2.86)	(-2.93)	(-2.80)	(-2.58)
Year dummies	Yes	Yes	Yes	Yes
R^2	43.13	42.35	42.33	43.20
F-Test (p-value)	0.0000	0.0000	0.0000	0.0001
#Observations	144	144	144	144

In Table 3, we jointly examine the role of both containment and resolution policies on economic growth. In column (1), we have included a less common containment policy: bank holidays. As can be seen,

however, neither bank holidays nor any resolution policy is significant at conventional levels in any of the specifications studied[6].

Nevertheless, that could not imply yet to reject the hypothesis resolution policies do have a significant effect on economic growth, due to on the basic model, we are studying the general effect of the variables without considering the type of the country they have been applied. In this sense, special attention is needed for bank recapitalization. Although its coefficient is not significant at conventional levels[7], it has traditionally appeared as significant determinant of crisis recovery in previous analysis executed, among others, by Laeven and Valencia (2013). According to the positive coefficient of this variable, it can be stated that higher recapitalization measures of banks during systemic banking crises are relevant because they are mechanisms aiming at specifically solving problems related to potential bank insolvency and not to liquidity concerns. According to Laeven and Valencia (2013), *"bank recapitalization is the most directly bank intervention policy targeted alleviate solvency problems at banks and therefore has a quantitatively important effect on the supply of bank credit".*

On the other side, in reference to other variables, liquidity support has increased its significance but not in all scenarios presented in Table 3. Liquidity support explains partially the economic growth if asset purchases and bank recapitalization are not included as resolution policies (see column 1 in Table 3). However, in the case asset purchase or bank recapitalization are included in the model (see columns 2 and 3 in Table 3), liquidity support does lose its significance.

Lastly, it is worth noting that the set of control variables maintain their significance and impact on the economic growth, while the resolution policies variables have not been statistically significant, the adjusted explanation variables to explain the exogenous variable has increased not substantially (see R2 in Table 3).

[6] As previously commented, the joint inclusion of all containment policies at the same time may rise some multicollinearity problems related to the relevant correlation among them.

[7] On the model displayed, bank recapitalization is not significant at conventional levels. However, in other alternative models combining different sets of control variables, the coefficient of bank recapitalization variable was positive and statistically significant. These results, however, are not reported, for reasons of space.

4.2. Influence of the containment and resolution policies on economic growth: cross-country evidence

In previous analyses, we have examined the impact of containment and resolution policies on economic growth without taking into consideration the heterogeneity of the countries included in our sample. In our basic models, it can be appreciated how restrictions on bank activities does have a significant influence on the explanation of the economic growth, while other variables like liquidity support or creditor rights protection do have this significance in concrete specifications.

Hence, the objective of the extended version of the model is to analyse if the effect of containment and resolution policies on economic growth is homogenous across countries or, on the contrary, it varies across countries depending on particular country level-specific features. It will be also analysed if other containment or resolution measures that were not significant in the basic model due, potentially, to the joint consideration of all of them in a general overview, would be relevant in the case a differentiation strategy across countries is applied.

In order to do so, two different models will be developed. First, a model that analyses all the previous containment and resolution variables presented on the basic model but differentiating between those countries with higher creditor rights protection and the countries with lower creditor rights protection. In this case, the observations for each regression will be reduced compared to the basic model. In some cases, some variables have been omitted in the regression due to the lack a sufficient number of observations.

In Table 4, we present the results when we split our sample across the median value of creditor rights protection index. The results of the regressions across subsamples of observations with different levels of restrictions on non-traditional banking activities are shown in Table 5. In the case of containment policies, it can be observed that the effect of liquidity support and increase in public debts is more negative in countries with higher levels of protection of creditor rights. In fact, regarding the results presented in Panel B of Table 4, containment policies are not significant on the explanation of the economic growth of countries with lower levels of creditor rights protection. It appears, however, a negative and statistically significant coefficient in Panel A, referred to the set of countries with higher levels of creditor rights protection. Hence, it seems that the more positive effect of these measures takes place in countries with poorer institutional protection of creditors. This suggests a substitution effect between creditor rights protection and containment policies, which can be explained by the most negative effect that protection of creditor rights seems to foster

with regard to the liquidity support. In other words, this would imply that more developed countries, in terms of higher protection of creditor rights, are more affected by the higher incentives that banks may have to excessive risks when a more generous liquidity support strategy is applied.

Consequently, liquidity support also presents a more negative impact on economic growth in the subsample of observations above the median of restrictions on non-traditional banking activities (see Panel A of Table 5), as in the case of high level of creditor rights protection. This suggests that a higher level of restrictions on non-traditional banking activities also acts as a substitute mechanism to promote economic growth after a banking crisis. Therefore, the impact of liquidity support is more beneficial in countries where banks can enrol in other non-traditional activities and diversify risks through the investment of these liquid assets in other activities (different from the traditional ones).

In the case of resolution policies, it can be observed that, although bank recapitalization presents a global positive effect on economic growth, its impact is more positive in the case of countries with a higher level of protection of creditor rights (Panel A of Table 4). This can be explained due to the fact that, in this particular set of countries, the recapitalization strategies of banks are more important for the recovery that in the case of countries with lower levels of creditor rights protection. This suggests the existence of a complementary effect between bank recapitalization policies and creditor rights protection. Results in Panel B of Table 5 also indicate that recapitalization measures are more positive for economic growth in the case of countries with lower levels of restrictions on non-traditional banking activities. In these countries, banks are legally forced to develop traditional banking activities and it seems that bank recapitalization strategies are more effective in promoting the recovery of economic growth rates.

Finally, regarding the effect of control variables, their individual impact varies across the different subsamples. In general, the negative effect of output losses remains, although its effect is significant in the case of the subsample of high creditor rights protection and in the case of low restrictions on non-traditional banking activities. Regarding the impact of creditor rights on economic growth, we obtain a negative effect in the case of countries that already have high levels of creditor rights protection, which may suggest the existence of an optimum level of creditor rights protection. However, the effect of creditor rights protection is more negative in countries with low levels of restrictions of non-traditional bank activities (See Panel B on Table 5), while this negative effect disappears for countries where non-traditional banking activities are less restricted. As regards of restrictions on bank activities, their global effect on economic growth is positive and statistically

significant, although their influence is more negative in countries with higher levels of protection of creditor rights (Panel A on Table 5).

Table 4: Effect of containment and resolution policies on economic growth across countries with different level of creditor rights protection

This table reports the results of the impact of both containment and resolution policies on economic growth across subsamples of country-level observations with higher and lower levels of protection of creditor rights. *Liquidity Support* is the percentage of the total deposits and foreign liabilities of the banking system, *Increase in Public Debt* is computed as the amount of public debt expressed as a percentage of public debt. *Bank Holidays* is a dummy variable that indicates whether the government introduced restriction on deposit withdrawals or a bank holiday. *Asset Purchases* is a dummy variable defined based on significant asset purchases as those exceeding 5% of GDP; *Bank Recapitalization* is a dummy variable defined as the recapitalization costed established on the percentage on the GDP. *Creditor Rights Protection* is an index that refers to the degree to which collateral and bankruptcy laws to protect the borrowers and lenders. *Restrictions on Bank Activities* is an index measuring the legal restriction on non-traditional bank activities. *Output Loss* is the cumulative sum of the differences between actual and trend real GDP over the period. Year fixed effects are included but their coefficients are not shown for reasons of space. T statistics are between parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

	Panel A: High Creditor Rights Protection			**Panel B: Low Creditor Rights Protection**	
	(1)	**(2)**		**(3)**	**(4)**
Liquidity Support	-0.8937** (-2.50)			-0.0318 (-1.38)	
Increase in Public Debt	-0.3967* (-1.94)			-0.0205 (-0.68)	
Bank Holidays		Omitted			-0.7949 (-0.96)
Assets Purchases		-19.7196** (-2.02)			-20.6697 (-0.95)
Bank Recapitalization		3.0660** (2.40)			0.5308 (0.84)
Creditor Rights Protection	-2.6232*** (-2.69)	-2.4188** (2.56)		1.8516 (0.70)	2.0359 (0.74)
Restrictions on Bank Activities	-2.3144*** (-2.75)	-2.0810** (-2.51)		0.8428 (0.58)	1.0176 (0.72)
Output Loss	0.3202** (1.86)	-0.0925*** (-5.66)		-0.0308 (-0.72)	-0.0614 (-1.31)
Year dummies	Yes	Yes		Yes	Yes
R^2	0.6918	0.6910		0.6166	0.6165
F-Test (p-value)	0.0001	0.0001		0.0037	0.0061
#Observations	72	72		72	72

Table 5: Effect of containment and resolution policies on economic growth across countries with different level of restrictions on non-traditional banking activities

This table reports the results of the impact of both containment and resolution policies on economic growth across subsamples of country-level observations with higher and lower levels of restrictions on non-traditional banking activities. *Liquidity Support* is the percentage of the total deposits and foreign liabilities of the banking system, *Increase in Public Debt* is computed as the amount of public debt expressed as a percentage of public debt. *Bank Holidays* is a dummy variable that indicates whether the government introduced restriction on deposit withdrawals or a bank holiday. *Asset Purchases* is a dummy variable defined based on significant asset purchases as those exceeding 5% of GDP; *Bank Recapitalization* is a dummy variable defined as the recapitalization costed established on the percentage on the GDP. *Creditor Rights Protection* is an index that refers to the degree to which collateral and bankruptcy laws to protect the borrowers and lenders. *Restrictions on Bank Activities* is an index measuring the legal restriction on non-traditional bank activities. *Output Loss* is the cumulative sum of the differences between actual and trend real GDP over the period. Year fixed effects are included but their coefficients are not shown for reasons of space. T statistics are between parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

	Panel A: High Restrictions on Bank Activities		**Panel B: Low Restrictions on Bank Activities**	
	(1)	**(2)**	**(3)**	**(4)**
Liquidity Support	-0.00340* (-1.73)		-0.6893 (-0.32)	
Increase in Public Debt	-0.0222 (-0.94)		-0.2300 (-0.16)	
Bank Holidays		-1.1297 (-0.46)		Omitted
Assets Purchases		0.4395 (0.16)		Omitted
Bank Recapitalization		-0.0828 (-0.98)		0.8742*** (2.69)
Creditor Rights Protection	0.1324 (0.21)	0.3961 (0.57)	-2.6549** (-2.10)	-2.4564** (-2.08)
Restrictions on Bank Activities	1.7512*** (3.46)	2.0610*** (3.65)	Omitted	Omitted
Output Loss	-0.0323 (-1.01)	-0.0452 (-1.56)	0.2276 (0.21)	-0.0772*** (-3.46)
Year dummies	Yes	Yes	Yes	Yes
R^2	53.13	51.45	76.57	76.25
F-Test (p-value)	0.0004	0.0013	0.0227	0.0145
#Observations	96	96	48	48

5. ROBUSTNESS ANALYSIS

In order to demonstrate the validity of the results previously obtained, we have developed a robustness test based on a new regression model that includes the variables studied in our basic specification and an alternative control variable, namely, capital regulation index. Hence, this test will allow us to additionally consider the relevance of the strength of regulation on bank capital in each country as a different characteristic of the banking sector apart from those previously examined. This variable has been collected from the World Bank Regulation and Supervision dataset and higher values of this measure indicate stringent capital requirements. Therefore, in this new specification of our empirical model, we have removed the creditor rights index.

The objective is to demonstrate how variables statistically significant in our previous models continue to be relevant in order to explain economic growth, despite of analysing different dimensions of the banking sector proxied by different control variables.

In Table 6, we can appreciate how statistically significant variables of the basic model keep their relevance and sign. Liquidity support still presents a negative effect on the economic growth in all the estimates reported, as well as the output losses variable. Also, according to our basic results, the variable Restrictions on bank activities has a positive general effect on economic growth. However, these last two variables do loss some of their statistically significance compared with results shown in Table 1.

Overall, we corroborate the negative impact of containment policies, particularly the liquidity support, on economic growth during and after the periods of systemic banking crises examined.

Table 6: Robustness analysis

This table reports the results of the impact of both containment and resolution policies on economic growth. *Liquidity Support* is measured as the total deposits and liabilities to non-residents, *Increase in Public Debt* is computed as a percentage of GDP. *Bank Holidays* is measured as the number of months a bank institution was formally closed. *Asset Purchases* measures the amount of assets acquired by the correspondent bank authority; *Bank Recapitalization* establish the recapitalization cost on percentage of GDP. *Capital regulation* is defined as the strength of capital regulation in each country. Higher values of this variable indicate stringent capital requirements. *Restrictions on Bank Activities* is an index measuring the extent to which nontraditional bank activities are allowed in each country. *Output Loss* is the cumulative sum of the differences between actual and trend real GDP over the period. Year fixed effects are included but their coefficients are not shown for reasons of space. T statistics are between parentheses. ***, **, and * indicate statistical significance at 1, 5, and 10 percent, respectively.

	(1)	**(2)**	**(3)**	**(4)**
Liquidity Support	-0.0532**	-0.0432**	-0.0446**	-0.0580***
	(-2.59)	(-2.54)	(-2.59)	(-2.68)
Increase in Public Debt	-0.0279	-0.0321	-0.0348	-0.0480
	(-1.34)	(-1.18)	(-1.15)	(-1.46)
Bank Holidays	0.4231			0.6052
	(0.84)			(1.08)
Assets Purchases		0.5252		0.8708
		(0.34)		(0.43)
Bank Recapitalization			0.0249	0.0270
			(0.40)	(0.34)
Capital Regulation	-0.1645	-0.1083	-0.1013	-0.1667
	(-0.55)	(-0.37)	(-0.34)	(-0.55)
Restrictions on Bank Activities	0.6576*	0.6076*	0.5825*	0.6320*
	(1.93)	(1.80)	(1.68)	(1.79)
Output Loss	-0.0494***	-0.0509***	-0.0491*	-0.0464**
	(-2.65)	(-2.73)	(-2.56)	(-2.35)
Year dummies	Yes	Yes	Yes	Yes
R^2	41.61	41.32	41.34	41.96
F-Test (p-value)	0.0001	0.0001	0.0001	0.0001
#Observations	144	144	144	144

6. CONCLUSIONS

The aim of this project was to contribute, through an academic perspective, to the analysis of the effects of containment and resolution policies across countries during and after systemic banking crises. Although there is an extensive literature based on the study of the general effects of measures undertaken in order to recover from a systemic banking crisis, our point was to analyse more deeply the main differences on the impact of these measures among countries, paying special attention to their effect on the banking sector.

Specifically, our objective was to review, based on part of the economic literature, if recommended measures suggested and applied under the supervision of determined economic and financial international organizations during systemic banking crises, do differ on their effect on the recovery of the economy, among countries with different legal and institutional characteristics.

In order to do so, a linear regression model procedure was developed. We have defined several specifications of our econometric models to test both the global and the cross-country effects of crisis intervention measures. The model explains the impact of crisis containment and resolution policies on the growth of GDP per capita on a sample of six developed and developing countries that, according to Laeven and Valencia (2018), have experienced, at least, one episode of systemic banking crisis during the period 1980-2003.

Our model was constructed by studying the impact of the containment and resolution policies on economic growth, without differentiating among types of countries. It has been found statistically significant the effect of containment policies, such as liquidity support, as well as control variables proxying the characteristics of the banking sector, such as the level of legal, restrictions on non-traditional banking activities and the severity of the crisis period, proxied by a measure of output losses. This implies that the higher the support given to banks via liquid assets and the higher the losses on the banking sector provoked by the crisis, the slower the recovery of the economy. Besides, through a general perspective, resolution policies do not have a significant impact on the recovery of growth. Our results are also consistent with a positive effect of stronger restrictions on non-traditional banking activities on economic performance.

However, when we exploit the heterogeneity of our sample of countries regarding the level of protection of creditor rights and the level of restrictions on non-traditional banking activities, our results seem to be more accurate. In particular cross-country analysis allows us to differentiate two patterns. First, that control and containment policies that were significant on the general model continue to be in the majority of the scenarios exhibited. Second, specific resolution policies do have

a more relevant influence in countries with higher protection of creditor rights and higher restrictions on non-traditional banking activities, than in countries below the median value of these variables.

This final statement is consistent with the hypothesis posed at the beginning of this project. Although it has been proved that not all countries suffer the same consequences from a systemic banking crisis episode, it is not completely understandable that the same homogenous policies and measures are applied. Consequently, and as a direct implication of the results of this project, there is a need of deepen in the debate of a possible modification on the resolution policies schemes promulgated by policymakers. In particular, according to our results, in order to provide a better and more suited model to predict systemic banking crisis worldwide and to prevent their most negative effects, it is necessary to take into consideration the differential aspects of each country in terms of their own legal and institutional characteristics.

Certainly, further extensions of this research are needed. Through a critical and constructive assessment, it can be highlighted that the sample could have been larger, both in terms of countries and periods examined. However, we think that this brings the opportunity to develop further research focusing on more countries and more recent financing crises, like 2008's Global Financial Crisis. Particularly interesting would be to examine policy interventions on the current global crisis generated by the Covid-19, where banks will become a critical piece of the recovery puzzle.

7. APPENDIXES.

Annex 1: Systemic Banking Crisis Episodes per country and year.

	Years																							
Country	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Argentina																								
Cameroon																								
Chile																								
Finland																								
Japan																								
Indonesia																								

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