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Resolving Bank Failures and Institutions: Is There a Link? Some Empirical Evidence**Prepared by Marlon Rawlins and Luisa Zanforlin¹**

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Abstract

Policymakers across countries have been seeking to strengthen the institutional framework to control fiscal costs and feedback effects to the real economy generated by bank failures. On a cross-section of countries, we find evidence that suggests that bank supervisors' intervention in bank failures may be positively associated with some aspects of the administrative and regulatory framework. Our results appear to hold also during times of financial instability. Finally, we find some evidence that the same institutional features may be associated with lower fiscal outlays during banking crises.

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Author's E-Mail Address: MRawlins@worldbank.org; LZanforlin@imf.org

¹ Marlon Rawlins is a Financial Sector Expert in the Finance, Competitiveness and Innovation Global Practice at the World Bank, Luisa Zanforlin is a Senior Economist in ICD. We are very grateful to Ralph Chami, Aquiles Almansi, Miquel Dijkman, Alberto Chong, Barend Jansen, Florencio López-de-Silanes, Jan Strasky for helpful comments and discussions. We are particularly grateful to Emre Ender and Laura Lorenzo for the legal review and background concepts in the paper, to Alejandra Gonzalez for helpful research assistance, and to the IMF WBG Librarians, Tatiana Goriainova and colleagues for help with accessing resources. All remaining errors are our own.

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I. INTRODUCTION

Unlike other corporates, banks' failures can bring large losses to many depositors, spread rapidly and amplify economic distress, including trigger fiscal outlays. Recent views on the effective management of bank failures are based on the notion that dealing swiftly with insolvent banks will help restore public confidence, maintain financial stability, and reduce the severity of losses. A number of studies has advocated for swift action in particular important during episodes of banking crisis (e.g., Hoelscher and Quintyn (2003); Honohan and Laeven (2005); Čihák and Nier (2009); Leckow and Gullo (2019), among others). The IMF and WB (2009) and, later, the Financial Stability Board (2014) have specified some of the desirable characteristics of the legal, administrative, and regulatory framework which would support effective resolution of situations of banking distress.²³ The Financial Stability Board specifically designed general principles to address failures of large, systemic financial entities, however such guidelines are also useful to identify the desirable features of the resolution and insolvency framework for banks more in general.

The separate bank insolvency framework should recognize the interconnectedness and depositors' trust-based nature of the banking business and thus protect financial stability as it were a public good. In particular, it should award the public authority tasked with protecting financial stability powers to act "swiftly" and "in the public interest", where special provisions safeguard third-party rights. (Jansen, et al., 2020).⁴ This would require that a sufficient degree of "independence" should be awarded to such public authority and the administrative dispute procedures should be appropriately designed.⁵ Actions taken in good faith and "in the public interest" to address bank failures should not be reversed to avoid

² "IMF and World Bank Global Bank Insolvency Initiative" Ross Leckow (2007) , "An Overview of the Legal, Institutional, and Regulatory Framework for Bank Insolvency" (IMF, 2007) and Key Attributes of Resolution Regimes of Systemic Banks (FSB 2014) or "KA". In the FSB terminology the public authority with such powers is called the bank resolution authority or RA.

³ The so-called "KA" also go beyond recommending principles for the specific legal framework but also include a wide range of potential actions to address bank failures.

⁴ For example, the creditor hierarchy established should take into account that depositors as very "special" type of creditors when seen from a financial stability point of view.

⁵ It has been seen as a good practice that the administrative process require that courts assess the lawfulness of the decision of the public authority (due process) but should not enter into the substance (merit) in the absence of any arbitrariness or manifest errors of the state authority. For example, the KAs emphasize that the courts reviewing the actions of the state authorities should focus on due process, i.e. reviewing whether the state authority acted within its powers. This would imply the review process would not enter the matter of the case but empower the state authority on the issues under its responsibility, at least at the first review.

undermining financial stability, and, where necessary, any third-party right infringed upon should only be awarded monetary compensation.^{6,7}

Across countries, there are some jurisdictions where some institutional features similar to those discussed above are present, in particular in cases where there is a recognized public interest that needs to be protected. For example, in the US, there are numerous experiences with resolving failed banks and there is significant deference awarded to the public authority's actions, when taken in good faith. In addition, the administrative proceedings, also referred to as "judicial review of administrative actions", has evolved to focus on due process (Gegenheimer 2004). However, in many other jurisdictions administrative proceedings require that any act of the public authority should be evaluated in its substantial merit (Cane 2010). In addition, in those countries where the administrative adjudication process examines the merit of the public authority's actions, when actions are found to be illegal, the administrative procedural law already establishes that an action taken illegally is automatically annulled for all practical purposes (Cane 2010). Therefore, in these countries, administrative proceedings would allow for actions to be reversed and may not allow monetary compensation of third-party rights, except in cases where there are explicit derogations. Thus, there are countries where typically administrative procedures tend to be significantly different than what would be envisaged by good bank insolvency frameworks, absent specific legislation. In this paper we ask more generally whether some characteristics of the legal, administrative and regulatory framework across countries allow for the state to protect financial stability by "swiftly" resolving failing banks.

Economic literature has long associated economic outcomes to the quality of countries' institutional framework (La Porta et al 1999) (La Porta et al 2002) (Chong and Zanforlin 2000). Among the main features, the legal origin (La Porta et al 1998), the protection of private creditor rights in commercial insolvency frameworks, the protection of investor rights in commercial law, and better corporate governance frameworks have been found to be positively associated with economic growth. A number of studies have concentrated mostly on analyzing the relationship between quality of government (La Porta et al. 1999) and regulations and economic outcomes, where "government" is understood as the way the state

⁶ To address this latter point, special safeguards should be then established, in particular the KA specify a number of them. For a discussion on the appropriate safeguards to third party rights in special resolution regimes for banks see Jansen, Rawlins and Zanforlin (2020).

⁷ For a discussion on remedies, see Jansen et al 2020. For example, the KA # 5.5 states that: "the legislation establishing resolution regimes should not provide for judicial actions that could constrain the implementation of, or result in a reversal of, measures taken by resolution authorities acting within their legal powers and in good faith. Instead, it should provide for redress by awarding compensation, if justified. In other words, it is recognized that reversing a bank resolution decision would undermine financial stability and thus these decisions should not be reversed. In practice, this awards a "special status" to the actions of the state authority in support of financial stability, so that third-party rights infringed upon during the resolution process cannot be fully re-instated, but only monetary compensation will be awarded.

authority intervenes in cases of market failures (Djankov et al 2002). Most of these studies use some codification that measures the impact of practices mandated in civil procedural codes for example, the time it takes to resolve insolvencies. In particular, Djankov et al. 2003, developed a measure of “formalisms” in civil procedures, as the number of steps to be taken to collect checks for example. Balas et al. 2007 analyze how this can also change across countries over a long period of time. They find that some qualities of the civil procedures e.g. “formalism” is strongly associated with the quality of institutions. In this respect, they shift the attention from analyzing the features of the legal framework per-se to its implementation through the procedural codes and the jurisprudence, therefore highlighting the role of legal procedures in institutional quality. In addition, a significant body of literature finds that countries that have a better overall institutional quality as well as better regulatory framework are also those that tend to have higher rates of economic growth (Jaililian, et al., 2007).

While most previous studies have focused on the characteristics of the institutional framework protecting creditor rights in civil disputes as enabling better economic outcomes, we analyze whether some characteristics of the institutional frameworks enable more bank failures to be resolved. This would require the authority in charge of financial stability to act swiftly to protect the public interest. In addition, we ask whether the institutional features associated with a higher number of banks’ interventions have been associated with “better” economic outcomes in episodes of banking crisis , as measured by the fiscal outlays of the crisis.⁸ We focus on the set of recommendations on good practices for effective bank insolvency frameworks to identify broad institutional features. In particular, we concentrate on (i) the degree of independence awarded to the public authority in charge of addressing bank failures and (ii) the administrative procedures, which address conflicts between private citizens and the state as well as on a number of alternative indicators. We acknowledge that the conclusions of our study will be limited by the detail of available data on different legal frameworks, by the complexity of administrative systems and related adjudication procedures and, in particular, by the difficulties of coding procedural differences across jurisdictions.⁹ However, to our knowledge this is the first study that seeks to analyze the relationship between some of the features of the institutional and administrative environment and their association with a potential role in supporting the public interest in financial stability, as intended by the prompt resolution of bank failures. The rest of the paper is organized as follows: Section II discusses the empirical approach and the data collection strategy; Section III presents the econometric methodology; Section IV discusses the econometric results and Section V briefly draws some conclusions.

⁸ Administrative proceedings are different than administrative regimes, proceedings are subject to procedural codes defining how the adjudication process should be conducted by the court in charge.

⁹ We do not claim we have any insight on how efficient such procedures may be, but only on whether they have allowed to address a higher number of bank failures.

II. DATA AND EMPIRICAL APPROACH

Following the practice in empirical investigations of institutional economics e.g. Djankov et al. (2003) and Balas et al.(2009),¹⁰ we analyze the effectiveness of the institutional framework through output indicators. Our variable of interest is the number of cases of bank failures which have been addressed with intervention of the authority in charge.¹¹ Data on ceased and suspended banking activities is available in the Banker’s Almanac database, broken down for instances of bank failures when supervisory action was taken to intervene in a distressed bank. The cases involve the suspension or the revocation of the banking license, or the institution put into liquidation (from now onwards referred to as NBI –number of banks intervened).¹² In such cases, it is more likely that ownership and creditor rights might have been infringed upon when the bank was intervened.¹³ Over the period 1990-2019, we find data for 142 countries and about 4500 episodes of supervisory intervention, where the total cases of banks ceasing activities was approximately 8000.¹⁴ We also identify the number of supervisory interventions for 82 episodes defined as “banking crisis” using Laeven and Valencia (2018) database (see below).

As discussed, good practices for effective bank insolvency frameworks identify, among others, two very broad features: (i) the independence of the authority in charge of resolving insolvent banks,¹⁵ and (ii) an administrative dispute process that focuses on due process, in the case of conflict between public interest and third-party rights. In economic literature, the importance of features such as “independence” of the central bank in determining policies

¹⁰ By definition, these would all be non-systemic banks.

¹¹ Our study does not allow us to make any comment or observation of the effectiveness of the set of good principles identified (i.e. KA or other), as we focus on broad characteristics of the institutional framework and we observe such characteristics long before such good principles were identified or implemented in special bank insolvency legislation.

¹² Instances of both types of actions in the same country are relatively rare. Cases of voluntary liquidation were excluded as the database allowed.

¹³ We had to exclude those cases when a failing institution merged with another entity or was provided any form state support, or nationalized, as they are not specifically identified as ceased or suspended banking activities. However, these cases are also not directly relevant to the purposes of this investigation, which focuses on those cases where the actions of the state authority might have interfered with third party rights, thus actions different than “open bank support”. To our knowledge, those cases when an institution was offered for sale after suspending shareholder rights are captured in the database. However, we lose some widely debated cases such as Northern Rock (where the specific bank resolution framework changed during the case proceedings). The dataset allows us to construct a couple of different definitions of bank resolutions which we use for robustness checks of our estimations.

¹⁴ The database includes features that to exclude cases of voluntary liquidation or general cessation of activities.

¹⁵ KA 2.3 and KA 5.5.

that would yield to better economic outcomes has been widely documented. This has also been accompanied by the development of databases codifying this notion into a quantitative index for central banks. However, less attention has been given to the role of the administrative framework in protecting financial stability as it were a public good in and thus yielding better economic outcomes. Legal scholars point out how administrative law has developed in association with the constitutional structure of countries to assert or moderate the powers of the public authority to act in the public interest (Sordi 2017).

Absent more specific cross-country data, the degree of independence of the central bank is used as a proxy for the independence of the authority in charge of financial stability.¹⁶ The indicator was strengthened by interacting it with data on those countries where the central bank is also the authority in charge of resolving insolvent banks. In this way, the interactive variable ranks the degree of independence of the central bank where the central bank is also the supervisor.¹⁷ For this, a number of previous studies which constructed indexes to quantify *de jure* central bank independence with respect to different types of decisions were used. In particular, Garrida (2019), covers 182 countries between 1970 and 2012 and codes the degree of central banks' independence using the methodology developed by Cukierman et al. (1992). We also use the central bank independence (CBI) indicator as appearing in the World Bank's *World Governance Indicators* database to conduct robustness tests. We use observations for dates at the beginning of our observation period.¹⁸ The *WB Bank Regulation and Supervision Database* was used for data on entities acting in cases of bank failures (whether the central bank, a separate entity or the deposit insurance agency). This allowed for the construction of an interactive term measuring the degree of independence of bank supervisory entity and an interactive term for the degree of independence of the bank resolution authority, although these observations pertain to the year 2000.

We construct our own categories for different types of administrative proceedings using comparative administrative law literature. One of the main differences observed across

¹⁶ The public entity in charge of dealing with the proceedings relating to bank insolvency is often referred to a resolution authority (RA), which can be the same entity that supervises the banking sector, or a different entity such as the deposit insurance agency. To this date, there have been no studies codifying characteristics of bank resolution authorities. In addition, the notion is fairly "recent" as compared to the beginning date of our observation period, and thus, empirically, our proxy is the best indicator we can achieve.

¹⁷ In about 60 percent of the countries in our sample the central bank is also in charge of resolving bank failures. There are a number of countries where the resolution authority is the supervisory agency outside the central bank, a small number of countries where the resolution authority is the deposit insurance agency, and there are a number of countries that since the 2009 have introduced either specifically a resolution authority as separate entity. We have data from the BRSS survey to identify such countries as of 2019. However, as our study covers the period 1990-2019, the institutional variables should be observed at the beginning of the period. Also, each of the set of countries is not sufficient to allow us to estimate a coefficient independently. We run regression with dummies to control for the different potential effects but they were not significant. We are happy to provide the regression results upon request.

¹⁸ Garrida (2018) Cukierman et al. (1992).

countries depends on whether the administrative adjudication process focuses on merit of the matter or mostly on due process issues, at least in the first instance (Appendix I).¹⁹ Good practices for bank insolvency frameworks recommend administrative proceedings should focus on “due process”.²⁰ In addition, according to legal literature (Cane 2010), when (first instance) proceedings are based on due process, limitations to remedies, such as those envisaged for the bank resolution framework appear to be more easily established. This happens because in those countries where the proceedings focus on merit, remedies are often already established in the law.²¹ For this reason, while we have no data on the type of remedies set for cases of disputes in bank failures, we seek to identify those countries where proceedings focus mostly on procedural issues and those focusing on merit.²² We find this characteristic is associated both with the type of administrative system (whether based in civil courts or in a separate system of courts such as administrative tribunals) and also with the role and nature of the ultimate review authority for administrative disputes.²³ While the FSBs KAs focus significantly on remedies,,²⁴ for purposes of this study, we concentrate on the more general features leaving the analysis of remedies to future research.²⁵ ²⁶Our dataset

¹⁹ Cane, Peter (2010) “Judicial Review and Merits Review: Comparing Administrative Adjudication by Courts and Tribunals”

²⁰ KA principles 2.3 and 5.5, IMF (2009), Jansen et al (2020).

²¹ In particular, we note how limitations to remedies awarded by the judicial review of administrative actions are automatically admissible in some countries but in others cannot be admitted unless special legislation is present (Jansen et al. 2020).

²² The KA recommend specifically that any assessed damage should be limited to monetary compensation to avoid reversing resolution authority decisions and undermining financial stability. More in general, the KA recommendations are more demanding than stated here and also introduced long after our observation period begins, thus, in this study, we are not claiming we are “testing” the KA against actual bank resolutions.

²³ The nature of the ultimate review authority (Supreme court, High Court, Constitutional Court etc) concerns the nature of appeal process after the first instance adjudication process has taken place.

²⁴ In particular, we note how Jansen et al 2020 suggest that the limitations to the judicial review of administrative actions are in many countries automatically included in the administrative system in those countries that have a court based administrative regime but not typically in countries which have a dedicated court system.

²⁵ Historically, three major administrative systems have been identified, the common-law model; the French, or council of state model; and the procurator model. Successive reforms of the administrative system brought administrative law to deviate the “legal origin” of countries, for example, Argentina and other countries of the Latin American region have an administrative model based on the US model (Rose-Akerman and Linsdeth 2010 and Encyclopedia Britannica.)

²⁶ It is important to note we are focusing our study on those countries that have an administrative procedure that focuses on judicial review rather than merit review, as per existing legislation we were able to compile, not on those countries that introduced a special bank resolution regime after 2014. We did use available data for some robustness tests. We use the KA’s reference to “judicial review of administrative actions” to seek countries where proceedings concentrate on whether the state authorities acted within its power (state: “measures taken by resolution authorities acting within their legal powers and in good faith (should not be reversed)”. Thus, our focus on administrative proceedings that review these executive decisions on an ex-post basis. To the extent

(continued...)

identifies countries that mostly review due process in the first instance proceedings, those that mostly focus on the legality of the action across all proceedings, and those that have a mixed system which cannot be easily assigned to either of the first two categories.²⁷²⁸ We find that the first group mostly comprises of countries where the administrative adjudication procedures take place in civil courts and have a high court or supreme court as a ultimate review authority, with some exceptions. A second category is mostly comprised of countries that have an administrative system based on specialized administrative tribunals where a “*conseil d'etat*” or constitutional court has the ultimate review power, with some exceptions. The third category comprises mostly countries that have an administrative procedure that takes place in civil courts which mostly focus on the legality of the action. In these cases it would be difficult to determine ex-ante how disputes will eventually be decided because they had different types of ultimate review authorities, or did not have an administrative procedural code.²⁹ For ease of reference we call group 1 “diffuse” and group 2 “tribunals” group 3 “mixed”.

To control for additional features of the institutional framework, we use previously developed indicators, such as: *countries' legal origin* ((La Porta et al. 2002), *time to resolve private sector insolvencies*, *the efficiency of government*, and *the effectiveness of the regulatory framework*³⁰ (Djankov 2003 *Doing Business* 2019) the index for administrative procedures (Balas et al 2007), and World Bank's Governance Indicators. Data for institutional quality is observed as close as possible to the date our observation period begins. We also include a dummy for countries that introduced a special bank resolution framework during our observations period to control for changes in legal framework. In addition, Balas et al 2007 dataset on relative changes in civil procedures is used for indicators in the direction of changes of administrative procedures. We use the World Bank's *Banking Regulatory and Supervisory Database* (versions 2019, 2000, 2003) to control for specific

possible, we did take into account jurisdictions that have specific laws for decision-making by agencies, such as the Administrative Procedure Act in the USA and Germany. In other countries, administrative proceedings are subject to procedural codes defining the adjudicating process in cases where there is a dispute between the private citizens and the public authority.

²⁷ Bignami F. and D. Zaring” *Comparative Law and Regulation*” (2016) and Rose-Akerman and P. Lindseth “*Comparative Administrative Law*” (2017) and (2015).

²⁸ See Appendix I for a detailed description on the compilation of administrative regimes.

²⁹ We have data with respect to which countries have implemented a special resolution framework as embodied in legislation, however the sample appears to be still too small to be able to find significant results, as the impetus to reform has mostly concentrated over the past 10 years and our observations period is thirty years long. We leave this work to future studies.

³⁰ The strength of the regulatory framework is often associated with the quality of the public services, in our case, the services preserving financial stability.

features of the regulatory environment for banks,³¹ including countries with a separate bank resolution law, those where bank insolvency proceedings are included in the banking law, and those where the commercial code governs the process.

We control for the size of a country's banking sector, which could influence the number of bank failures in any given country, and for the broader macroeconomic framework. IMF's Monetary and Financial Statistics (MFS), in the International Financial Statistics (IFS), and World Bank World Development Indicators database provided data for total credit to the private sector, consumer prices, nominal GDP and GDP in ppp terms, fiscal deficits as a percentage of GDP and current account deficit as a percentage of GDP.³² In all estimations GDP per capita in PPP terms controls for the general level of institutional development in countries.

Episodes of bank failures during episodes of banking crisis are identified by computing the length of banking crisis. For this purpose, we use Laeven and Valencia (2018) dataset which identifies the beginning of 82 banking crisis for over the period 1990-2016.³³ As the end date for such episodes is not consistently computed, we estimate the real credit cycles for each episode of banking crisis³⁴ (Appendix III)³⁵ applying the Hodrick-Prescott filtering methodology. We identify the end date for each crisis with the end of the downturn in credit after each episode.³⁶ Following Classens et al (2004) and Honohan and Klingebiel (2003), we include crisis-specific indicators, including for the level of non-performing loans, the extent of fiscal outlays as a percentage of banks' assets, and the extent of output loss per crisis as control variables.³⁷ All macro and institutional data for the subset of crisis periods are observed on the date which was closest to the year the crisis began subject to their availability.

³¹ For example, the type of laws supporting bank insolvency, whether general insolvency law or a special bank resolution law or the banking law; whether the supervisory authority is the central bank or a supervisory authority regime, and whether the resolution authority coincides with the supervisory authority

³² World Development Indicators (WDI) is the World Bank's premier compilation of cross-country data on development

³³ The beginning dates of banking crisis includes episodes of bank runs etc. see Laeven and Valencia (2017).

³⁴ Details of the identification of the end-of-crisis data are in Appendix II.

³⁵ IFS is one of the IMF's principal statistical databases which provides country data for most of the IMF members.

³⁶ Hodrick- Prescott filter to remove short-term seasonal fluctuations and identify business cycles.

³⁷ As mentioned in the introduction, the macroeconomic costs of failing banks are large and thus it is important for the framework to allow for prompt resolution.

The detailed data sources and definitions are summarized in Appendix III. Appendix III Table A3.1 shows the most important correlations. We observe that the nature of administrative procedures of countries tend to be correlated with their legal origin. Close to 50 percent of countries with a “diffuse” administrative system are common law countries with some notable exceptions. Some civil code law countries reformed extensively their administrative system, such as countries in South American region. A large majority of countries of civil code law tend to have dedicated administrative tribunals and a separate review process headed by a constitutional court or similar entity. There is little correlation between the degree of independence of the central bank and the strength of protection of private property rights across jurisdictions, suggesting the two represent very different aspects of the institutional environment.

III. ECONOMETRIC METHODOLOGY

We estimate a reduced form equation on a simple cross-section of countries where the dependent variable are the NBIs observed for the entire period 1990-2019, over a cross-section of countries. As our dependent variable is the number of times the authorities intervened in bank failures, it is limited by zero and has a significant skewness, we use maximum likelihood estimation methodology assuming Poisson distribution. We run all estimations with robust standard errors.³⁸ We observe these institutional characteristics at the beginning of the period and we also include controls for countries’ size, macroeconomic and development aspects, regional specific effects, whether a country experienced a banking crisis.³⁹ Our estimated equation is specified as follows:

$$NBI_i = c + \delta Inst_i + \alpha Dev_i + \beta Fin + \gamma X_{Macro_i} + \theta Crdum_i + \epsilon$$

Where: *NBI* is the number of times the authorities intervened in banks failures in country *i*; *Inst* are the institutional indicators for the type of prevailing administrative proceedings in the country and the independence of the central bank. *Dev* is represented by level of per capital GDP at the beginning of the sample period to control for the level of institutional development in countries, *Fin* is the size of the financial sector as represented by the share of banking sector credit to the private sector to GDP; *X* is the general macroeconomic background as represented by the average current account deficit over the whole sample

³⁸ We had to exclude three outlier countries out the 142 sample because they had about 5 times more cases than the ones with the most cases included in the set. We consider that this strengthens our case otherwise our results would be biased by the incidence of such outliers. The excluded countries belong to categories that are otherwise well represented in the sample. See Appendix II for definitions and summary statistics.

³⁹ We are aware that during the observation period countries may have undergone significant legal and administrative reform processes, however, we consider the institutional change process as sufficiently slow and our administrative features as sufficiently broad for us still to be able to observe if there are significant relationships.

period; and Cr_{dum} is a control dummy which is 0 if a country did not experience a banking crisis and 1 otherwise.

In a second set of regressions, the dependent variable NBI is computed for the period of the episode of crisis. We estimate a reduced form equation as above but with the addition of specific crisis-related controls, observed at the beginning of each crisis period:

$$NBI_{iCx} = c + \delta Inst_i + \alpha Dev_{iCx} + \beta Fin_{iCr} + \gamma X_{Macro_{iCx}} + \vartheta Sev_{iCx} + lengthCx + \epsilon$$

Where: NBI_{iCx} is the number of times the authorities intervened in bank failures in country i for crisis Cx ; Dev is the level of per capita GDP at the beginning of the crisis period, Fin is the ratio of total credit to GDP at the beginning of the crisis period; X_{macro} is the level of the current account deficit at the beginning of the crisis period; $Inst$ are the same institutional indicators as in Eq(1) and Sev_{iCx} is an indicator of the severity of the banking crisis (which is represented by the peak share of NPLs and the number of months each crisis lasted) and $lengthCx$ the duration of crisis Cx measured in months.

Finally, we analyze whether there is an association between the severity of the crisis and the number of times the authorities intervened in bank failures. For this purpose, we use the data on the cost of the crisis, i.e. total fiscal expenditures relative to total assets of the banking sector:

$$Fisc_{Cost_{iCx}} = c + \mu Ni_{iCx} + \theta pol + \alpha Dev_{iCx} + \beta X_{Macro_{iCx}} + \gamma Sev_{iCx} + \epsilon$$

Where: $Fisc_{Cost_{iCx}}$ is the share of fiscal expenditures to total financial sector assets for crisis Cx ; Ni_{iCx} is the number of banks intervened in country i and crisis episode Cx ; Dev is the gdp per capita of country i at the beginning of crisis episode Cx , X_{macro} are macroeconomic indicators observed for country i in the year the crisis episode Cx began, and comprise of the current account balance to GDP; Sev are controls for severity of the banking crisis episode, we use the peak level of NPLs in the country and the duration of the crisis, and θpol indicators of the political stance of country i in crisis episode Cx . We also ran the same regressions using the monthly output loss per crisis and the number of banks resolved per month as indicators of the cost of crisis and the extent of authorities' interventions.

We test for robustness of the estimated coefficients for institutional framework by including alternative specifications for the same indicators which have been found in literature to be highly correlated, and for the key macroeconomic variables. We also tested alternative institutional factors that might be influencing the observed outcomes, such as the presence of a special bank resolution framework, the type of supervisory authority, the extent of protection of legal rights.

IV. RESULTS

In almost all estimations, we find a significant positive association between the number of times the authorities intervened in bank failures and countries with a “diffuse” administrative system which focuses on due process (diffuse system) (Table 1). We contrast this result against the more general indicator of countries’ legal origin, and we find a slightly weaker significance, albeit a higher coefficient, for countries of common law origin (Table 1 column 4). This is not a surprising result given the high correlation coefficient between countries which have a diffuse administrative system also have a common law origin. Alternative indicators of institutional quality of administrative systems, *government efficiency* and *regulatory quality*, appear to be significantly associated with NIBs [Table 1 columns 4-6].⁴⁰ There is little evidence of an association between the *strength of insolvency framework*, and thus the general protection of creditor rights, and the NIBs [Table 1 column 7]. We also do not find a significant association between the NIBs and countries’ that apply *commercial law insolvency proceedings for cases of bank failures* [Table 1 column 8]. However, the estimated coefficient on the relationship is negative as would be expected if assuming commercial insolvency frameworks are cumbersome and potentially inefficient for cases of bank failures (Jansen et al 2020).⁴¹ Since the countries that use of commercial law insolvency proceedings could also thought to have a strong leaning towards the protection of private property rights, the finding is in line with the more general indicator of the *strength of the insolvency framework* in Table 1 column (Table 1 column 7).⁴²

We find some evidence of a significant association between the degree of independence of the central bank and the number of actions taken to address bank failures (NIBs). The result is weak to alternative specifications of the independence variable however, we construct an interactive variable to identify the level of independence of the central bank for those countries where the central bank is also the banking supervisor (*interactive(..)*). The interactive variable is significant for all different specifications of the central bank independence measure.⁴³ We find that, where the central bank is also the bank supervisory authority and thus it has a well identified institutional role of preserving both price and

⁴⁰ We also run the regression standardized on population and on the subset of banks that had their licenses suspended and we found the same results.

⁴¹ The dummy variable identifies those countries that use the commercial law general insolvency framework rather than a specialized bank resolution framework as is the general recommendations. The data is constructed from the BRRS survey of the WB.

⁴² We observed two countries that had overall 10 times the amount of banking business ceased as the rest of the countries and increased by 400 percent the standard error of the distribution. We thus chose to exclude them from all regressions.

⁴³ We find a similar result for those cases where the central bank has also been identified as the resolution authority.

financial stability, NIBs appear to be significantly higher than in other countries. (Table 1 column 2-3). [Table 1 columns 4-8].⁴⁴

⁴⁴ We also run the regression standardized on population and on the subset of banks that had their licenses suspended and we found the same results.

Table 1: Dependent variable: Number of Times Authorities Intervened (NBI) 1990-2019

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Diff. Adm Syst	0.366 (0.378)	0.710* (0.0529)			0.713* (0.0531)	0.677* (0.0636)	0.672* (0.0689)	0.747** (0.0466)
Indp. CB	0.855 (0.113)							
Interactive (independence* sup=CB)		1.320** (0.0157)	1.216** (0.0481)	1.315** (0.0436)	1.309** (0.0197)	1.375** (0.0158)	1.315** (0.0168)	1.349** (0.0176)
Common law			0.881* (0.0674)					
Strength of Institutional framework for insolvencies				-0.0543 (0.362)				
Govt. Effect.					0*** (0.0005)			
Reg. Qual.						0*** (0.0007)		
Voice and Accountability							0*** (1.50e-06)	
Gen. Insolv.								-0.180 (0.667)
Credit GDP	2.92e-05 (0.472)	6.38e-06 (0.901)	2.21e-05 (0.546)	2.15e-05 (0.689)	6.59e-06 (0.898)	3.30e-06 (0.952)	5.13e-06 (0.919)	8.26e-06 (0.882)
Oecd	-0 (0.507)	-0 (0.981)	-0 (0.983)	-0 (0.901)	0 (0.990)	-0 (0.876)	-0 (0.949)	0 (0.935)
Average BoP	-0.514 (0.165)	-0.230 (0.723)	-0.187 (0.714)	-0.246 (0.684)	-0.237 (0.714)	-0.168 (0.812)	-0.229 (0.719)	-0.242 (0.719)
Crisis Dummy	0 (0.620)	0** (0.0436)	0 (0.126)	0* (0.0872)	0** (0.0462)	0** (0.0336)	0** (0.0423)	0* (0.0784)
GDP pc PPP	1.171*** (7.1e-05)	1.099*** (0.0011)	1.332*** (0.00088)	1.011*** (0.00150)	1.085*** (0.00193)	1.218*** (0.000951)	1.047*** (0.00235)	1.163*** (0.000765)
Constant	1.777*** (0.00126)	1.594*** (0.00117)	1.415*** (0.00361)	2.412*** (0.000194)	1.601*** (0.00239)	1.526*** (0.00323)	1.694*** (0.000518)	1.500*** (0.00479)
Observations	87	77	75	76	75	75	77	75
Pseudo R2	14	28	28	22	28	30	29	29

Robust pval in parentheses

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

1/ Where variable sources and definitions are included in Appendix III: Dependent variable, NBI= number of supervisory interventions; “Diff. Adm. system”: countries with administrative review process based in civil courts and on due process; Indp. CB; “de jure” measure of central bank independence; Interactive= degree of CB independence in those countries where the CB is the supervisor; Comm. Law: countries with a common law system; Gov. Effect.: score value on indicators from a survey on effectiveness of government services; regulatory quality: score value on survey of quality of regulations; Voice and accountability; score value of a survey on de jure public sector accountability; Strength of the institutional framework for Insolvencies is a score value from a survey on de jure framework for insolvencies; Gen. Inslov.: countries where bank insolvencies are governed via the general bankruptcy procedures; supervisor=CB: countries where the supervisory authority is the CB; Oecd: countries that belong to Oecd; Average Bop: average value of CA deficit over the sample period; dummy crisis: countries that experienced a banking crisis; GDP per capita ppp; PPP value of GDP per capita at the beginning of the observation period. Credit to GDP : share of banking sector credit to GDP at the beginning of the observation period.

When considering only interventions during episodes of banking crisis, (Table 2), results remain mostly unchanged although the significance of some institutional features is overall weaker. [Table 2 columns 1-8]. For this subset of regressions in particular, the role of the central bank as a supervisor, in itself, appears to become significantly associated to the NIBs [Table 2 column2]. As in the case of the estimates on the general sample, we tested the robustness of our results against a range of alternative indicators for the institutional environment.⁴⁵

⁴⁵ The results “tranquil times”, namely the sample excluding the episodes of banking crisis, were in line with the results for the general sample.

Table 2. Dependent Variable: Number of Bank Interventions During Crisis

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Diff. Adm Syst	0.0645 (0.9)	0.514 (0.262)	0.481 (0.297)			0.335 (0.302)	0.443 (0.171)
Indp. CB	1.1** (0.04)						
Sup= CB		0.685* (0.0730)					
Interactive (independence* sup=CB)			1.026** (0.0180)	0.9*** (0.007)	1.060** (0.0121)	1.2*** (0.001)	
Legal origin: common law				0.932* (0.090)			
Strength of Institutional framework for insolvencies (DB)					-0.0102 (0.895)		
Liquidity support (L&V)						2.5e-05 (0.994)	
Interactive Independence CB (Garrida)*Supervisor=CB							0.96** (0.039)
GDP per capita PPP at beginning of crisis	9.34e-06 (0.55)	3.47e-05*** (0.0008)	3.66e-05*** (0.0008)	1.81e-05** (0.023)	2.25e-05*** (0.0002)	2.22e-05*** (0.001)	2.04e-05*** (0.005)
Credit to GDP at beginning of crisis	0** (0.04)	0 (0.569)	0 (0.848)	0 (0.293)	0 (0.820)	0 (0.551)	0 (0.355)
Length of crisis	0.027** (0.00)	0.0120** (0.0046)	0.0110* (0.0115)	0.0146** (0.001)	0.0165** (5.e-07)	0.0145*** (1.e-05)	0.0162*** (1.3e-05)
Oecd	-1.030 (0.13)	-0.414 (0.473)	-0.652 (0.306)	-0.258 (0.490)	-0.458 (0.343)	-0.371 (0.321)	-0.328 (0.353)
Constant	0.031 (0.92)	0.473 (0.176)	0.731* (0.0583)	0.452 (0.146)	0.691 (0.484)	0.491 (0.190)	0.353 (0.329)
Observations	77	74	69	65	65	63	68
Pseudo R2	29	26	27	38	51	32	30

Robust pval in parentheses

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

1/ Where variable sources and definitions are included in Appendix III, dependent variable: number of supervisory interventions during periods of financial crisis; "Diff. Adm Aystem": countries with administrative review process based in civil courts and on due process; Independence; "de jure" measure of central bank independence; Interactive= degree of CB independence in those countries where the CB is the supervisor; legal origin: countries with a common law system; liquidity support; total increase in CB liquid liabilities during the crisis period. Strength of the institutional framework is a score value from a survey on de jure framework for insolvencies; bank resolution via insolvency: countries where bank insolvencies are governed via the general bankruptcy procedures; supervisor=CB: countries where the supervisory authority is the CB;Oecd: countries that belong to Oecd; Average Bop: average value of CA deficit over the sample period;

dummy crisis: countries that experienced a banking crisis; GDP per capita ppp; PPP value of GDP per capita at the beginning of the observation period. Credit to GDP : share of banking sector credit to GDP at the beginning of the observation period.

Finally, we investigate whether these features of the institutional framework may be also be associated with the observed severity of banking crisis. We use the fiscal cost of banking crisis -- as compared with banking sector assets -- as an indicator for severity of the crisis. Results indicate there may be an association between some of the features of the institutional framework and the severity of a banking crisis [Table 3 columns 1-5]. In particular, the independence of the central bank in those countries where the central bank is also the supervisor appears to be strongly inversely associated to fiscal costs. The indicators of quality of the regulatory environment are generally not significant but have the expected sign [Table 3. column 3-5] Interestingly an indicator for good governance is also found to be significantly inversely associated with fiscal costs of crisis [Table3 column 6]. Additionally, there appears to be a significant negative association between the extent of fiscal outlays and the NBIs during banking crisis [Table 3 column 7].⁴⁶ The relationship holds also after data are standardized to account for the different length of banking crisis [Table 3 column 8]. Interestingly, the number of times authorities intervened in failures is negatively associated with both the extent of liquidity support and the peak level of liquidity support awarded by central banks during the crises' episodes, as would be expected.

⁴⁶ We identify different turning points after the downturn in credit on the basis of the number of months with positive growth.

Table 3: Dependent Variable: Total fiscal costs of banking crisis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Diff. Adm Syst	1.477 (0.771)	-1.720 (0.762)	-0.537 (0.921)				-1.903 (0.719)	
Interactive (independence* sup=CB)	-18.70** (0.0244)	-25.4*** (0.00707)	-17.61** (0.0393)	-15.04* (0.0502)	-15.71* (0.0515)	- 17.27** (0.0318)		
Peak liq.	0.270 (0.170)							
Liq. support		0.258** (0.0410)						
Common law			0.106 (0.103)					
Strength of Institutional framework for insolvencies (DB)				-3.151 (0.358)				
Reg. quality					-1.003 (0.299)			
Rule of law						-10.63* (0.0829)		
Interactive (independence Garrida* sup=CB)							-19.44** (0.0156)	
Total actions in bank failures per month of crisis								-3.41*** (0.0057)
GDP_pc PPP	-0.001** (0.0130)	-0.001** (0.0129)	-0.001*** (0.00875)	-0.001*** (0.00962)	-0.001** (0.0133)	0.00069 (0.124)	-0.002*** (0.00394)	-0.001** (0.0107)
Current Acc.	0 (0.959)	-0 (0.511)	0 (0.891)	0 (0.960)	0 (0.977)	-0 (0.985)	-0 (0.764)	0 (0.406)
OECD	-2.303 (0.813)	-3.190 (0.751)	-0.582 (0.954)	-2.047 (0.837)	-2.252 (0.824)	4.876 (0.657)	-2.708 (0.768)	-4.808 (0.642)
Constant	38.80*** (5.5e-05)	41.94*** (1.70e-05)	41.79*** (3.06e-05)	44.45*** (1.36e-06)	52.25*** (0.0002)	37.1*** (3.e-07)	46.89*** (1.98e-06)	42.6*** (1.5e-07)
Observations	55	54	56	56	55	56	58	64
R-squared	0.335	0.338	0.300	0.289	0.300	0.326	0.327	0.189

Robust pval in parentheses: *** p<0.01, ** p<0.05, * p<0.1

1/ Where variable sources and definitions are included in Appendix III. Dependent variable: total fiscal outlay in banking crisis as a share of GDP; “Diffuse system”: countries with administrative review process based in civil courts and on due process; Independence; “de jure” measure of central bank independence; Interactive= degree of CB independence in those countries where the CB is the supervisor; peak liq: maximum level of liquidity support extended during the crisis period; liquidity support: increase in CB liquid liabilities during the crisis period; legal origin: countries with a common law system; s; Strength of the institutional framework is a score value from a survey on de jure framework for insolvencies; bank resolution via insolvency: countries where bank insolvencies are governed via the general bankruptcy procedures; supervisor=CB: countries where the supervisory authority is the CB. High income: countries that are classified as high income by WB; Average Bop: average value of CA deficit over the sample period; dummy crisis: countries that experienced a banking crisis; GDP per capita ppp; PPP value of GDP per capita at the beginning of the observation period. Credit to GDP : share of banking sector credit to GDP at the beginning of the observation period.

V. CONCLUSIONS

Following the global financial crisis, policymakers have generally agreed that it is necessary to swiftly close insolvent banks in order to avoid the propagation of negative shocks through the economy and limit fiscal outlays. As a result, there have been some agreements related to a number of institutional features that would allow to rapidly address bank failures. Such features are thought to empower the relevant authorities in protecting financial stability.

In this paper we study the relationship between some broad institutional features and the number of times the authorities intervened in failing banks. It is believed that authorities will act more freely if they are protected by the institutional framework. After controlling for macroeconomic environment and relative size of the banking sector, we analyze the association between the number of banks intervened and many indicators related to the institutional and regulatory context in a cross section of countries.

Our results suggest that both the degree of independence of the banking supervisory authority as well as the features of the administrative framework may be closely linked with the number of times authorities took action. We find a positive association between countries with a higher number of bank supervisors’ interventions in bank failures and countries where administrative procedures focus on due process.⁴⁷ Additionally, both the supervisory architecture and the degree of independence of the financial sector authority appear to be associated to the number of times bank supervisors intervened in times of banking crises. Finally, we find that fiscal costs of banking crises might be inversely associated with such institutional features.

Our results lend some support to the view that an enabling institutional framework may support supervisory interventions in addressing bank failures and concur in limiting the fiscal costs of banking crisis. We find of particular interest that the institutional features associated with a higher number of interventions in bank failures are not those measuring the strength of protection of private creditor rights, as, for example, the strength of the general insolvency

⁴⁷ As mentioned, at least in the first instance.

framework. In this respect, institutions protecting financial stability and the public goods might be very different than those designed to protect private interests. We believe that these are promising findings, which may be further investigated using more specifically tailored institutional indicators.

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APPENDIX I: ADMINISTRATIVE REGIME DATA DESCRIPTION

It has been observed that where there are bank failures, legal disputes will mostly occur between private agents owning or holding liabilities of a bank and the State agency in charge of bank resolution procedures. Therefore, the nature of the dispute will have to be resolved through the country administrative system, as it is that in charge of overseeing this kind of disputes. Historically three major administrative systems have been identified across countries: the common-law model; the French, or council of state model; and the procurator model.⁴⁸ Successive reforms of the administrative system brought administrative law to deviate the “legal origin” across countries as Parliaments have adopted one or the other model in the administrative reform processes. (Sordi 2017) For example, Argentina and other countries of the Latin American regional has an administrative model based on the US model.

While other studies have codified a number of particular features of the administrative processes to assess their impact on efficiency of processes (Balas et al 2009), we construct a simpler indicator to represent different types of review process for administrative acts across jurisdictions, in particular, on where the adjudication would take place i.e. whether in administrative tribunals or in ordinary courts and on the basis of the type of highest administrative authority in the review structure. In countries with an adjudication process taking place in ordinary courts and with institution such as a high court reviewing decisions the review process typically concerns due process and centers on assessing whether the State authority acted within its powers (we call this “diffuse system”). In countries which have separate system of administrative tribunals and whether a conseil d’etat review the constitutionality of the decisions, will tend to review the whole legality of the State agency actions and thus pronounce on merit (Cane 2015). We find also a number of countries with mixed features, as a result of successive reforms of their administrative system, for example as those that occurred in the former soviet republics. (Cheng-Yi Fuang (2015) and Fenton (2015). We have different categories for these sets of countries, but we do not use them for purposes of empirical estimations, however we did use them to conduct robustness tests.

⁴⁸ Encyclopedia Britannica.

APPENDIX II: ESTIMATING THE LENGTH OF THE BANKING CRISIS

We collected monthly data on credit to the private sector by the banks on a country by country basis, in national currency units, as reported in Monetary and Financial Statistics by the IMF for the period 1990-2019. All series were deflated using CPI indexes available in IFS statistics. H-P filtering methodology was applied to the first differences of the series to extrapolate the credit cycle behavior from other factors around episodes of banking crisis as identified in Laeven and Valencia (2018).⁴⁹ This allowed to determine the length of each crisis as the period between the first month in which a crisis event is identified and the last month of the downturn in the credit cycle that follows the crisis. We identified the last month of the downturn as the month that is followed by two quarters of positive credit growth.

⁴⁹ In a couple of countries, we had to smooth outliers because of a break in the time series of credit data due to the compilation according to different Monetary and Financial Statistics Manual series.

APPENDIX III. VARIABLE LIST, DEFINITION AND SOURCES

Full variable list, definition and sources:

Variable Name	Variable source and definition
Administrative System	Scalar variable: 1 identifies countries where the administrative system takes place in courts and a supreme court or high court reviews cases; 2 countries with a separate court system for administrative cases, tribunals, where a "conseil d'etat" or constitutional court has the ultimate review power; 3 countries which used to have the old "procurator model" where the "procurator" reviewed the legality of administrative acts and cases took place in civil court; 4 countries with "mixed" models.
Legal origin: common law	legal origin. Source: La Porta et al (1998)
Strength of Institutional framework for insolvencies	Djankov (2003) Estimate; 2004 methodology. Source Doing Business WB (2019)
Regulatory Quality Estimate	Djankov (2003) Estimate. Source: World Governance Indicators (WB)
The Supervisor is the central bank	Compiled data from World Bank Survey: Bank regulation and supervisory questionnaire 2000 and 2003 v.
Independence Central Bank (Cukierman)	Degree of independence of the central bank. In Garrida 2018 which applies methodology developed by Cukierman et al. (1992).
Interactive (independence and sup=CB)	Interactive variable to identify the degree of independence when the central bank is the supervisor. Source: Bank Regulation and Supervision Database WB
Oecd	Dummy variable identifying OECD countries
Average BoP	Average level of the BOP between 1990-2019. Source World Bank, WDI.
Dummy crisis	Dummy variable with value 1 if a Country experienced a Banking crisis from Laeven and Valencia (2018)

Table A1: Summary Statistics⁵⁰

Variable	Obs	Mean	Std. Dev.	Min	Max
Failing Banks Intervened	128	45.15625	154.1767	0	1576
Average FBIs in crisis periods	109	12.84404	36.57392	0	245
Diffuse system	611/	0.4295775	0.4967681	0	1
Administrative tribunals	49 1/	0.3450704	0.477074	0	1
Independence (Cukierman)	124	0.5387097	0.2627898	0	1
Independence (Garrida)	123	0.4720054	0.1821234	0.12163	0.8815
Regulatory Quality (WGI)	139	-7.83E+13	1.18E+15	-8.92E+15	6.46E+15
Bank Supervisor = Central Bank	58	0.46789	0.501273	0	1

1/ Number of occurrences in dataset

Table A2: Correlations

	Tot FBI	Diff. Syst	Adm. ve tribunals	Com. law	CB Indp.. (Cukierman)	Interactive Indp.* Supervisor=CB	Reg. Quality (DB)	Gov. Eff. (DB)	Res. Inslv (DB)
Failing Banks Intervened	1								
Diffuse system	0.00	1							
Administrative tribunals	0.12	-0.677	1						
Common law	0.12	0.464	-0.317	1					
Independence (Cukierman)	0.1	-0.209	0.237	-0.372	1				
Regulatory Quality (DB)	0.04	0.139	0.0184	0.010	-0.088	1			
Government Efficiency (DB)	0.01	-0.167	0.187	-0.023	0.055	0.001	1		
Resolving Insolvency (DB)	0.14	0.133	0.071	0.306	-0.018	0.090	0.0639	1	

⁵⁰ We observed two countries that had overall 10 times the amount of banking business ceased as the rest of the countries and represent 80 percent of the standard error of the sample. We thus chose to exclude them from our sample.