Banks Resolution and Liquidation Regimes

A Comparative study within the G-20

By

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List of Acronyms

ACPR:	French Prudential Supervision and Resolution Authority
AMF:	French Financial Markets Authority
APRA:	Australian Prudential Regulation Authority
ASIC:	Australian Securities and Investments Commission
BCBS:	Basel Committee on Banking Supervision
BdF:	Banque de France
BHC:	Bank Holding Company
BIA (Canada):	Bankruptcy and Insolvency Act
BIS:	Bank for International Settlements
BoE:	Bank of England
BRRD:	Bank Recovery and Resolution Directive
BU:	Banking Union
CAR:	Capital Adequacy Ratio
CBRC:	China Banking Regulatory Commission
CBRIC:	China Banking and Insurance Regulatory Commission
CDIC:	Canadian Deposit Insurance Corporation
CMG:	Crisis Management Group
CNMV:	Spanish National Securities Market Commission
DFA:	Dodd-Frank Act
D-SIBs:	Domestic Systemically Important Banks
EBA:	European Banking Authority

EC:	European Commission
ECB:	European Central Bank
EME:	Emerging Market Economy
EU:	European Union
FDIC:	Federal Deposit Insurance Corporation
FINMA (Swiss):	Financial Market Supervisory Authority
FSAP:	Financial System Stability Assessment
FSB:	Financial Stability Board
FSOC:	Financial Stability Oversight Council
GDP:	Gross Domestic Product
G-SIB:	Global Systemically Important Bank
IMF:	International Monetary Fund
IPAB (Mexico):	Instituto para la Protección al Ahorro Bancario
KA:	Key Attributes of Effective Resolution Regimes
LAC:	Loss-Absorbing Capacity
LCR:	Liquidity Coverage Ratio
LEI:	Legal Entity Identifier
LTV:	Loan-to-value
NDL:	Non-default loss
NPL:	Nonperforming Loan
OCC:	Office of the Comptroller of the Currency
OSFI (Canada):	Office of the Superintendent of Financial Institutions
PD:	Probability of Default
RAP:	Resolvability Assessment Process
RBA:	Reserve Bank of Australia

RBI:	Reserve Bank of India
ReSG:	Resolution Steering Group
ROE:	Return on Equity
ROI:	Return on Investment
SARB:	South African Reserve Bank
SDIF (Turkey):	Savings Deposit Insurance Fund
SIBs:	Systemically Important Banks
SIFI:	Systemically Important Financial Institution
SRB:	Single Resolution Board
SRF:	Single Resolution Fund
SRM:	Single Resolution Mechanism
SSM:	Single Supervisory Mechanism
TLAC:	Total Loss-Absorbing Capacity
WB:	World Bank
WURA (Canada):	Winding-Up and Restructuring Act

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Chapter 1
Special Insolvency Regimes

Abstract: The establishment of a national bank system and a uniform national currency gave rise to the first noteworthy distinction between banks and nonbank corporations in the process of insolvency resolution. The ultimate goal of the special resolution regime is to safeguard financial stability. Standard judicial insolvency regimes do not necessarily take into account financial stability considerations, are typically cumbersome, and time consuming. The debate regarding the necessity of special rules for banks is not new, but was already under way early in the 20th century when a wave of bank failures swept across the United States and Europe. In the USA, for instance, Congress has chosen to keep bank insolvency resolution within the bank regulatory system, distinct and separate from bankruptcy. Other countries would enact similar legislations, isolating banks from regular bankruptcy proceedings.

1.1 General

There is a strong case for banks and other financial institutions to be subject to a special insolvency (resolution) regime. The debate regarding the necessity of special rules for banks is not new, but was already under way early in the 20th century when a wave of bank failures swept across the United States and Europe[1]. Banks and other financial institutions play a special role in a country's economy, performing financial services fundamental to the functioning of an economy, such as the provision of credit, the processing of payments and the provision of financial infrastructure services more broadly[2].

[1] Eva Hüpkes (2003): Insolvency – why a special regime for banks? , IMF- Monetary and Financial Law, Vol. 3, pp. 1-35.
[2] Martin Cihak, Erlend Nier (2009): The Need for Special Resolution Regimes for Financial Institutions—The Case of the European Union, IMF Working Paper No. WP/09/200, pp. 1-31.

That is, banks are different from other corporations in one particularly important way: they issued bank notes, which is an important part of the nation's money supply[3]. Therefore, banks or other financial institutions can cause disruption and major negative externalities, such as a liquidity crunch, the fire sale of assets, and spillovers via the interbank market[4] . Bank resolution regime applies when the regulators or authorities consider the resolution to be in the public interest, safeguard financial stability, and protect taxpayers. In other words, the regulators believe that normal insolvency proceedings would inflict damage on the real economy and cause financial instability.

1.2 Banks resolution: A special regime

1.2.1 The Unsatisfactory general insolvency proceedings

Resolving a failed bank through general insolvency proceedings is difficult for a number of reasons. First, banks are characterized by significant financial fragility owing to their unique structure. Their liabilities are primarily composed of liquid deposits, redeemable at par, whereas their assets are usually long-term loans, which are often illiquid. Bank assets are also typically less transparent, which would make Debtor-in possession (DIP) financing expensive or unattainable. second, as banks perform essential roles in the functioning of financial markets and the economy, their failures can have considerable costs and externalities[5]. Thus, the primary objective of a resolution regime should be to minimize these costs. Prompt action, as opposed to the delayed and lengthy administrative bankruptcy process, is important for

[3] Thomas J. Fitzpatrick IV, Moira Kearney-Marks, and James B. Thomson (2012): The History and Rationale for a Separate Bank Resolution Process, Federal Reserve Bank of Cleveland, pp. 1-4.
[4] Martin Cihak, Erlend Nier (2009): The Need for Special Resolution Regimes for Financial Institutions—The Case of the European Union, IMF Working Paper No. WP/09/200, pp. 1-31.
[5] Phoebe White, Tanju Yorulmazer (2014): Bank Resolution Concepts, Trade-offs, and Changes in Practices, FRBNY Economic Policy Review, pp. 1-21.

resolving these institutions effectively while maintaining public confidence.

1.2.2 The special resolution treatment

The ultimate goal of the special resolution regime is to safeguard financial stability. Standard judicial insolvency regimes do not necessarily take into account financial stability considerations, and are typically cumbersome, and time consuming[6].

The approach to insolvency by the bank supervisor differs from the approach under general corporate insolvency law, at least, in two important respects[7]:

- First, the triggers for supervisory action precede the state of insolvency and the conditions for commencement of proceedings under general insolvency law. Under general corporate insolvency law, the creditor or the debtor in general, triggers the bankruptcy proceedings – in voluntary bankruptcy. The bank supervisor generally has broad authority to take remedial action and to direct a bank to cease and desist from unsafe or unsound business practices.
- Second, there are procedural differences between the banking act and general insolvency law. The role afforded to stakeholders is generally more restrictive in a regulatory procedure than in a general insolvency procedure because it is more centered on the supervisory authority and involves less negotiation.

[6] Martin Cihak, Erlend Nier (2009): The Need for Special Resolution Regimes for Financial Institutions—The Case of the European Union, IMF Working Paper No. WP/09/200, pp. 1-31.

[7] Eva Hüpkes (2003): Insolvency – why a special regime for banks? IMF- Monetary and Financial Law, Vol. 3, pp. 1-35.

1.3 Banks liquidation

National insolvency regimes for banks are generally structured around the objective of monetizing the assets of the bank through its sale and distributing the proceeds in order to settle creditors' claims in a specified order of priority. While this objective of maximizing value for creditors is common to corporate insolvency and bank insolvency, the latter regime often includes depositor protection as an additional, and sometimes explicit, statutory objective. There are two approaches to liquidation in bankruptcy. Some jurisdictions rely on general insolvency law for the appointment of a receiver or liquidator whose task it is to realize assets and distribute the proceeds among creditors and shareholders, while other jurisdictions confer upon the bank supervisor the power to appoint a liquidator with a mandate to resolve the failing bank under the supervisor's oversight. In some jurisdictions, such as the United States and Canada, the deposit protection agency can be appointed as receiver or liquidator. Some jurisdictions provide for special court administered bankruptcy proceedings under the banking law.

1.3.1 General solvency regime

Under the general bankruptcy, liquidation (including bank's liquidation) seeks to solve collective action problems of creditors and to allocate the debtor's property among creditors in a fair and reasonable way. The purpose of the general insolvency law is to make a fair repayment of all creditors. Nonetheless, the goal of bank insolvency law is to protect the public interest and the soundness of the financial system. In China, for instance, prior to 2006, banks were subject to the general insolvency law as well as special rules in the commercial banks law. Article 71 on commercial banks stated:

> "Where a commercial bank is unable to pay the debts due, it may be adjudicated bankrupt by the people's courts according to law with the consent of the banking regulatory organ of the State Council. In this process, the people's courts shall organize the

> banking regulatory organ of the State Council and other relevant departments and personnel to form a liquidation group to make liquidation. In the bankruptcy liquidation of a commercial bank, the bank shall, after paying the liquidation expenses, the wages of the employees, and labor insurance fees, pay in priority the principals and interests of individual savings deposits."

However, the 2006 Enterprise Bankruptcy Law introduced a dual approach while dealing with bank's liquidation. The Law on Commercial Banks applies first as the special rules, and the corresponding provisions in 2006 Law on Enterprise Bankruptcy shall be applied to all other issues[8].

1.3.2 Special solvency regime

Bank reorganizations or liquidations are much more complicated than other enterprises. Especially when banks have a large number of small depositors, the general insolvency law is not enough. Therefore, many countries develop special rules for bank failures, which are different from those of other enterprises[9]. Several countries within the G-20 (i.e., the United States, Canada, Italy, South Korea, and Russia) have adopted special rules for insolvent banks, which are exempt from the general bankruptcy law. Under the special solvency regimes, banks' authorities (regulators) would seek to administer a failed bank through a provisional administration or a conservatorship. The purpose is either: (i) maintain the operations so that the bank can survive as an ongoing concern; or (ii) preserve all or part of the bank's assets so that the bank may be sold or merged with another institution[10]. In the United States, for instance, the procedure and grounds for the appointment of a receiver are generally the same as for the appointment of a conservator.

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[8] Jihong Zhang (2016): A Comparative Analysis of Application of bank Insolvency, Arizona Journal of International & Comparative Law Vol. 33, No. 1, pp. 301-315.
[9] Jihong Zhang (2016): A Comparative Analysis of Application of bank Insolvency, Arizona Journal of International & Comparative Law Vol. 33, No. 1, pp. 301-315.
[10] Heidi Mandanis Schooner (2005): Bank Insolvency Regimes in the United States and the United Kingdom, Transnational Law, pp. 385-394.

However, when the receiver is appointed for the purpose of liquidation or winding up, the receiver must be the FDIC. The FDIC has the authority to impose liability for losses of a failed bank on other commonly controlled banks. Moreover, the FDIC has broader authority to repudiate contracts of an insolvent bank that were executed prior to conservatorship or receivership, if the contracts are burdensome and repudiation is likely to promote the orderly administration of the bank's affairs.

Chapter 2
Resolution and Liquidation Regimes

Abstract: In about 60 percent of the countries, 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. Identifying vulnerabilities, which may lead to bank failure, is a persistent challenge to regulators of financial systems and market analysts. Resolution authorities are required to draw up resolution plans laying out how to deal with a failing bank, which is no longer viable, and specifying the application of possible resolution tools and ways to ensure the continuity of critical functions.

2.1 General

In about 60 percent of the countries, 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. The international standard recommends having resolution funding arrangements set up in advance, "so that authorities are not constrained to rely on public ownership or bail-out funds as a means of resolving firms." Bank resolution regime considers over and macro-prudential concerns by taking a systemic perspective. It may

override shareholder and creditor rights based on an ex-ante legal foundation (bail-in), and it allows reacting in a timely manner[1].

Resolution authorities are required to draw up resolution plans laying out how to deal with a failing bank, which is no longer viable, and specifying the application of possible resolution tools and ways to ensure the continuity of critical functions. The key advantage of a resolution is that it allows for some continuity and the maintenance of a bank's critical functions. Critical functions must be identified and included in the recovery plan of the institution to ensure that its viability can be restored without significant adverse impact and while maintaining these critical functions. However, if a bank goes into liquidation, all liabilities (except those exempted from the insolvency estate) fall due and the insolvency estate is protected by the imposition of a collective stay of creditor action (no further enforcement by individual creditors). A trustee is appointed to dispose of the assets and distribute the proceeds among the creditors. Resolution authorities are required, as part of their resolvability assessment for the resolution plan, to consider how the institution's "critical operations" are structured and organized. Resolution planning starts with an assessment of the feasibility and credibility of liquidation under normal insolvency proceedings.

National insolvency regimes for banks are generally structured around the objective of monetizing the assets of the bank through its sale and distributing the proceeds in order to settle creditors' claims in a specified order of priority. While this objective of maximizing value for creditors is common to corporate insolvency and bank insolvency, the

[1] Thorsten Beck, Deyan Radev, Isabel Schnabel (2020): Bank Resolution Regimes and Systemic Risk, Centre for Banking Research- Working Paper Series WP 05/20, pp. 1-66, https://www.bayes.city.ac.uk/__data/assets/pdf_file/0020/570431/Beck-et-al.-2020-CBR-WP-20-05.pdf.

latter regime often includes depositor protection as an additional, and sometimes explicit, statutory objective[2].

2.2 The Objectives of bank resolution

An effective resolution regime is critical to addressing the problems of weak or failing banks without undermining financial stability[3]. In resolving a bank, the main objectives will usually be to[4]:

- Maintain continuity of critical functions of the failing bank, such as deposit-taking, lending under committed facilities, payment and settlement, and risk hedging – especially if the bank is systemically important
- Maintain stability of the financial system
- Minimize disruption to, and adverse effects on, the wider economy
- Minimize government funding and risk absorption, and associated moral hazard
- Protect insured depositors

2.3 Types of Resolution Systems

In general, there are two types of regimes to deal with bank failure: regimes based on corporate insolvency law where proceedings are court-based, and regimes based on a special bank resolution regime where proceedings are handled by a resolution authority[5]. Prior to the

[2] World Bank (2015): Principles for Effective insolvency and Creditor/ Debtor Regimes, pp. 1-38, https://documents1.worldbank.org/curated/en/518861467086038847/pdf/106399-WP-Revided- Public-ICR-Principle-Final-Hyperlinks-revised-Latest.pdf.
[3] Dobler Marc; Moretti Marina; Piris Alvaro (2020): Managing Systemic Banking Crises- New Lessons and Lessons Relearned, IMF, pp. 1-88.

[4] Katia D'Hulster (2021): Bank Restructuring Strategies, World Bank Group, pp. 1-21, https://www.ifc.org/wps/wcm/connect.
[5] Cih´ak, M., Nier, E. (2009): The Need for Special Resolution Regimes for Financial Institutions–The Case of the European Union. IMF Working Paper No. 09/200. International Monetary Fund.

global financial crisis, bank resolution legislation across the globe varied in terms of intensity and scope, depending on national experiences with banking crises[6].

2.3.1 Administrative proceedings

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[7]. Good practices for bank insolvency frameworks recommend administrative proceedings should focus on "due process". 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. 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. 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 with the role and nature of the ultimate review authority for administrative disputes. While the FSBs KAs focus significantly on remedies, for purposes of this study, we concentrate on the more general features leaving the analysis of remedies to future research.

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[6] Thorsten Beck, Deyan Radev, Isabel Schnabel (2020): Bank Resolution Regimes and Systemic Risk, Centre for Banking Research- Working Paper Series WP 05/20, pp. 1-66, https://www.bayes.city.ac.uk/__data/assets/pdf_file/0020/570431/Beck-et-al.-2020-CBR-WP-20-05.pdf.

[7] Rose-Akerman and Linsdeth 2010 and Encyclopedia Britannica.

2.3.2 Judicial proceeding

Court proceedings play a key role in contributing to the [in] effectiveness of bank liquidation and resolution procedures. In almost all cases, claims are brought against the administrative resolution authority and in front of an administrative court. Nonetheless, the Financial Stability Board in Key Attribute 5.5 stressing the "de facto irreversibility" of resolution actions as follows:

> "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 the U.S., the principle of "judiciary restraint" was confirmed in 2013 in the United Western case by stressing that[8]:

> "The law does not invite the court to make its own judgment about whether it would have been feasible, appropriate, or even preferable, for the agency to wait [to declare the bank failing]; the sole question is whether the agency action was unreasonable" and that the Court "will not intervene unless the [agency] failed to consider relevant factors or made a manifest error in judgment."

In the same vein, under EU law, the judiciary are explicitly required to rely on the economic assessment undertaken by the supervisory/ resolution authority, which shall also be used by the court as a basis for its assessment under Article 85 BRRD[9].

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[8] United Western Bank v. Office of the Comptroller of the Currency, No. 11-0408 (U.S. District Court for the District of Columbia March 5, 2013) (Civil Action).
[9] World Bank (2021): Judicial Practice of bank Resolution – Collection of Selected EU and US Court Ruling, WB Technical Paper, pp. 1-67.

2.4 Pre-Resolution Activity

Before a troubled banking institution reaches the point where resolution is necessary, the regulatory authorities to strengthen its operations usually perform various efforts. Such actions may have included restructuring efforts that are similar to resolution transactions, in that they involve a merger with or acquisition by, a healthy institution. These efforts frequently are described as "private-sector" solutions and do not impose a cost on the deposit insurer or the government. Nonetheless, the legal authority of the responsible safety-net participants differs among countries and, in some countries, limits their ability to play a role in private-sector solutions for troubled banking institutions. Private-sector solutions require that action be taken early while acquirers are still willing to take over the troubled institution. They presuppose the existence of healthy institutions, which have the financial and managerial capabilities to combine with weaker ones and are acceptable to the authorities. A supervisory authority can be involved in two types of mergers and acquisitions[10]: unassisted and assisted. There are similarities between this approach to resolution and that of a P&A. The difference is that there is no failure of a bank, but rather a change in the troubled bank's organization and/or ownership. Often this approach is taken at a time when a bank is troubled but not yet insolvent or beyond repair.

2.4.1 Unassisted Mergers

The bank supervisory authority encourages mergers between a troubled institution and a healthier institution without providing any financial assistance. There may be nonfinancial incentives that can be provided to assist in creating favorable conditions for a merger, such as a period of forbearance or the allowance of certain preferential accounting treatments for acquired assets. Advantage: There is no cost to the resolution authority, and the troubled bank customers continue

[10] Phoebe White and Tanju Yorulmazer (2014): Bank Resolution Concepts, Trade-offs, and Changes in Practices, pp. 153- 173, https://www.newyorkfed.org/medialibrary/media/research/epr/2014/1412whit.pdf.

to receive banking services with no interruption. Disadvantage: It is important that the healthy institution not be overly burdened with problems from the troubled institution so that the merger does not adversely affect its health. This can be a difficult determination for the supervisory authority to make.

2.4.2 Assisted Mergers

When an unassisted merger cannot be arranged, the government may be able to market the institution to an acquirer with an offer of direct financial assistance. The financial assistance can take the form of a purchase of preferred stock by the resolution authority or government to provide the acquirer with the capital required to allow it to absorb any losses in the portfolio of acquired assets. The provision of direct financial assistance needs to be carefully structured so as not to benefit stockholders of the acquired institution (see discussion under Open Bank Assistance). If there is a need to limit the immediate outlay of cash, the government can consider structuring an Assistance Agreement, which will provide for periodic payments to cover the costs of holding and disposing of the assets. One way to structure, the assistance would be for the government to enter into an Income Maintenance Agreement, which works where an institution has assets that are paying a below-market rate of return. The government can guarantee a certain rate of return to a merger partner on such assets, thereby guaranteeing a market rate of return on such assets for a set period of time. This approach should be undertaken only after determining that the merged institution would meet all regulatory requirements and be able to properly manage the assumed assets. Advantage: The merger partner takes over the entire book of business of the bank, with no break in service for the customers of the failing bank. Disadvantage: The government must carefully monitor the operations of the bank and properly design the transaction to make sure the acquirer is managing the acquired operations effectively and that the incentives of the acquirer in dealing with the assets acquired are aligned with the

government's interests in making an investment in the merged institution.

2.5 Large banks vs. Small or mid-size banks

Failures of large banks often have been treated differently than failures of small banks in a variety of economic and financial scenarios. Safety-net participants may seek to avoid interruptions in the provision of banking services in particular markets or regions. Such an interruption may occur where alternative banking facilities are not readily available and if the institution is resolved through a deposit payout—generally because a merger with, or acquisition by, a healthy institution cannot be arranged. The resolution authorities may be confronted by a trade-off between competing objectives and choices among these objectives may be governed by statute.

2.6 Causes of bank Failure

Banks can fail for a variety of reasons including undercapitalization, liquidity, safety and soundness, and fraud.[11] However, identifying vulnerabilities, which may lead to bank failure, is a persistent challenge to regulators of financial systems and market analysts[12]. Apart from credit risk, a bank's weakness may also stem from other risks, including interest rate risk, market risk, operational risk and strategic risk[13].

Under the Weak Fundamentals Hypothesis, Bank failures are thus information-based, as decaying capital ratios, reduced liquidity, deteriorating loan quality, and depleted earnings signal an increased likelihood of bank failure. Conversely, the "Liquidity Shortage Hypothesis" (LSH), bank vulnerability to crises stems from the

[11] Rosalind L Bennet, Haluk Unal (2014): Understanding the Components of Bank Failure Resolution Costs, FDIC. Pp. 1-48, https://www.fdic.gov/analysis/cfr/2014/wp2014/2014-04.pdf.

[12] Zuzana Fungacova, Rima Turk, and Laurent Weill (2015): High Liquidity Creation and Bank Failures, IMF (WP/15/103), pp. 1-33, https://www.imf.org/external/pubs/ft/wp/2015/wp15103.pdf.

financing of illiquid assets with liquid liabilities[14]. Key indicators of impending failure are deteriorating levels of capital adequacy, liquidity dry up, worsening of asset quality, and falling profitability. Nonetheless, some ratios provide a hint to the financial situation of a bank, such as: Loan Loss Reserve (LLR), Loan and Leases to Total Assets (LLTA), Gross Domestic Product growth rate (GDP), Real Estate Loan Ratio (RE), Tier 1 Capital Ratio (T1CR), Total Risk-based Capital Ratio (TCR), Leverage Ratio (Leverage), Non-Performing Loans Ratio (NPLR), Gross Revenue ratio (GrossRev), Return on Assets (ROA)[15].

- Loan Loss Reserve (LLR)

Banks and credit unions are in the business of lending money to individuals, families and businesses. However, not every loan is repaid in full; in fact, many banks lend to risky borrowers by charging high interest rates. To stabilize earnings and remain solvent in bad times, banks estimate losses and seek to hold enough capital to absorb future write-offs. Loan loss reserves (LLRs) are types of insurance and credit enhancement that help banks and lenders mitigate estimated losses on loans in the event of defaults or non-payments. LLR are funds set aside in the form of cash reserves, or through accounting-based accrual reserves, to cover losses on loans, accounts, and notes receivable or for related purposes that the CDFI Fund deems appropriate. SDLP grants can be used to establish LLRs in order to defray the costs of offering small dollar loan products. The nature of the Loan Loss account is described as a contra account to gross loan outstanding. This particular ratio is used to identify and measure the performance of the existing loan portfolio of the company as a comparison to other players in the market. The formula is:

[14] Idem.

[15] Li, Qingyu (2013): What Causes Bank Failures During the Recent Economic Recession?", Honors Projects. 28.
https://digitalcommons.iwu.edu/busadmin_honproj/28

Loan Loss Reserve Ratio = (Loss Loan Reserves) / (Gross Loan Portfolio)

- Loan and Leases to Total Assets (LLTA)

The loans and leases to assets ratio measures the total loans and leases outstanding as a percentage of total assets. Loans and leases represent the largest single asset category on the banking industry balance sheet. The higher this ratio indicates a bank is loaned up and its liquidity is low. The higher the ratio, the riskier a bank may be to higher defaults. Put differently, a very low or rapidly declining loans-to-assets ratio typically is seen as a very bad signal for an individual bank[16].

The formula is:

$$\mathrm{TD/TA} = \frac{\text{Short-Term Debt} + \text{Long-Term Debt}}{\text{Total Assets}}$$

- Gross Domestic Product growth rate (GDP)

The GDP growth rate compares the year-over-year change in a country's economic output to measure how fast an economy is growing. Usually expressed as a percentage rate, this measure is popular for economic policymakers because GDP growth is thought to be closely connected to key policy targets such as inflation and unemployment rates. If GDP growth rates accelerate, it may be a signal that the economy is overheating and the central bank may seek to raise interest rates. Conversely, a shrinking (or negative) GDP growth rate send a signal to central banks that rates should be lowered and that stimulus may be necessary. The GDP can be determined via three primary methods. All three methods should yield the same figure when correctly calculated. These three approaches are: (i) the expenditure

[16] William R. Emmons (2022): Have Fed Asset Purchases Reshaped Bank Balance Sheets? Part 1, Federal Reserve Bank of St. Louis, https://www.stlouisfed.org/on-the-economy/2022/january/have-fed-asset-purchases-reshaped-bank-balance-sheets-part-1.

approach, (ii) the output (or production) approach, and (iii) the income approach.

(i) The expenditure (or spending) approach

The expenditure approach calculates spending by the different groups that participate in the economy. The U.S. GDP is primarily measured based on the expenditure approach. This approach can be calculated using the following formula:

GDP=C+G+NX

Where=Consumption;
G=Government spending;
I= Investment;
NX=Net exports.

(ii) The Production (Output) Approach

The production approach is essentially the reverse of the expenditure approach. Instead of measuring the input costs that contribute to economic activity, the production approach estimates the total value of economic output and deducts the cost of intermediate goods that are consumed in the process (like those of materials and services). Whereas the expenditure approach projects forward from costs, the production approach looks backward from the vantage point of a state of completed economic activity.

(iii) The Income Approach

The income approach represents a kind of middle ground between the two other approaches to calculating GDP. The income approach calculates the income earned by all the factors of production in an economy, including the wages paid to labor, the rent earned by land, the return on capital in the form of interest, and corporate profits. The formula is: