

## Bank Systemic Risk and Macroprudential Policy

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### Abstract

*Since the beginning of the 2008 financial crisis, the term "macroprudential" has appeared more and more often in specialized works and in researchers' discussions. After the 2008 crisis a new global financial stability framework is needed to reduce the probability and severity of a future financial crisis. This paper aims to evaluate the importance of systemic risk analysis and identification for the calibration of macroprudential policies by exploring the extensive literature on systemic risk and macroprudential policies.*

**Key words:** macroprudential, systemic risk, financial crisis, financial system, contagion

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### 1. Introduction

To maintain a stable financial system and to ensure financial stability in general, risk identification and assessment play a critical role.

What exactly is the systemic risk?

In the framework of our natural environment, the risk of our systems jeopardizing the activities of millions of people pursuing their own interests, has the potential to harm or disrupt the global ecology, resulting in a worldwide catastrophe that would eventually affect everyone. If a risk poses a considerable danger to financial stability and has serious negative effects for markets and the actual economy, it is considered systemic.

There is no universally acknowledged definition of systemic risk at this time. One way to look at it, is as the danger of an experiment in a large-scale systemic event. Several systemically significant intermediaries or markets are harmed as a result of such an incident (including potentially related infrastructures). An external shock (idiosyncratic, i.e., restricted in scope, or systematic, i.e., broad) triggered by events occurring outside of the financial system could be the spark for the occurrence. The event could also happen internally, within the financial system or the economy as a whole. When the intermediaries in question collapse or the markets in question become dysfunctional, the systemic event is severe (in theoretical terms this is often a non-linearity or regime change).

The most significant characteristic of systemic risk is that it spreads through a transmission mechanism from problematic institutions to comparatively healthier organizations. During the Global Financial Crisis, "systemic risk" became a popular term. The probability of an occurrence at the micro level of a single bank or insurance firm causing instability or collapsing an entire industry or economy is referred to as systemic risk. Consider how the financial crisis of 2007 began. It all started with a subprime mortgage crisis in the United States, which led to a liquidity and credit crisis that extended throughout all credit and financial markets as the bubble burst. Both of these reasons resulted in an unexpectedly large economic panic. The economic panic has triggered a recession across the US economy. As a result, global and trade investment has plummeted. The crisis has affected even the most wealthy and advanced countries. With the bankruptcy of investment bank Lehman Brothers, the financial crisis morphed into a sovereign debt crisis and then into a full-fledged worldwide banking crisis. The worldwide financial impact has been exacerbated by Lehman Brothers and other banks excessive risk-taking. All these implications have exacerbated the recession. The Great Recession of 2008-2009, a worldwide economic slowdown, occurred in the wake of the crisis.

## 2. Literature review

In the context of the financial crisis of 2008-2009, the literature has shown an increased interest for the financial stability, this being one of the main responsibilities assumed by the central banks, in order to combat financial crises.

Understanding the nature of systemic risk, according to Jean Claude Trichet (Jean Claude Trichet, 2009), is a prerequisite for restoring economic and financial stability and improving the banking system's future performance. Systemic risk, in the context of the economic environment, is a danger, a threat posed by developments in the financial system, which can result in a blockage, the effective collapse of this system, and the commencement of major real-economy harm. The failure of huge interconnected financial institutions, endogenous imbalances amassed over time, or some unforeseen, large-scale occurrences could all be catalysts for such developments.

Systemic risk is a phenomenon of the economy and financial system (O. de Bandt et al, 2000). In the world of medicine, pandemic diseases are the most expressive manifestation of this principle. In extreme situations, as the Middle Ages Great Plague, widespread infection with an infectious disease can wipe out a large portion of the world's population. Systemic risk is a component of the financial system that is considered in the economic area. Even if contamination can extend to other parts of the economy, the likelihood of it manifesting and being severe in the financial sector is higher. A systemic financial crisis has far-reaching implications for the whole economy.

There are two types of systemic events: weak and strong. In the weak version there are no bankruptcies or market collapses because one or more institutions or markets are not significantly impacted. If the systemic event is strong or severe, at least one institution will go bankrupt because of the shock even if the institution was solvent and would not have collapsed if the event had not occurred.

The systemic event, which is the most important part of the systemic risk concept, is made up of two parts: the initial shock and the transmission mechanism. Individual shocks or groups of shocks can be detected. Individual shocks affect only one institution at a time, whereas systematic shocks affect all institutions at the same time. The first shock is an external one. Contamination occurs when an institution's issues, such as bankruptcy, is transmitted to other institutions via various mechanisms and transmission routes. The danger, according to Borio (Borio, 2003), is endogenous because of the amplification processes, but the original shock is exogenous.

The method by which the shocks are communicated from one bank to another, from one institution to another, is the second key element of a systematic event. There are two factors that cause shocks to spread: The real channel, also known as the exposure channel, refers to the domino effect caused by real exposures in interbank markets and payment systems. Because interbank and even cross-border exposures have grown to significant sizes, issues might spread to other banks in other jurisdictions. Also, in payment systems, if one party fails to meet obligations, there is a possibility that this will affect other system participants; ii) the information channel, which refers to contagious liquidations, or the bank run.

A "bank run" occurs when a large number of a bank's depositors all want payback of their deposits at the same time. This condition leads to a liquidity crisis because banks are not required to hold cash deposits and the vast majority of deposits are borrowed in the form of loans. We have a non-systemic risk if the liquidity crisis is contained to a single bank; nevertheless, if the situation worsens, even a simple rumor about a bank's liquidity concerns can swiftly spread and prompt depositors at other banks to inquire about repayment of deposits.

If the situation is not managed, it can degenerate into a financial panic, resulting in significant deposit withdrawals due to the absence of information about the shockwave that hits a bank (whether individual or systemic) or regarding physical exposures between banking institutions (information asymmetry). This exposes the entire financial system to high risk, which is known as systemic risk.

The risk of a failure that might result in the entire system, or the entire financial market, being shut down is referred to as systemic risk, rather than the failure of separate elements. In the financial context, the risk leads to financial sector cascading failures induced by financial system links, resulting in a severe economic slump.

Over the last two decades, researchers have made great progress in understanding systemic risk, particularly contagion risk.

Systemic risk can also be defined as a specific sort of financial system market failure. Banking panic, banking crises owing to decreasing asset values, contagion, and currency mismatches in the banking system, are all examples of this sort of market failure. We can add systemic liquidity crises to this list, as one of the primary issues during the 2007-2008 financial crisis was bank's accumulation of liquidity while constrained by cash or financing – thus turning financing issues into systemic liquidity risk (Van den End & Tabbac, 2012). However, the literature generally agrees that there are two dimensions to systemic risk: time series size and cross section size.

The National Bank of Romania defines systemic risk as "the risk that a financial market participant or infrastructure market participant failure to participate in an infrastructure will result in other participants and/or the infrastructure manager being unable to meet their obligations" when they become due. Probable contagion effects could jeopardize financial system stability or confidence.

According to the European Central Bank (ECB, 2009), there are two approaches on systemic risk: one "horizontal perspective" on systemic risk, which focuses on the financial system, and another "vertical perspective" on systemic risk, which considers the bilateral interaction between the financial system and the economy as a whole. In an ideal world, the severity of systemic risk and events would be determined by their impact on consumption or overall economic welfare.

Some of the studies discussed key aspects of the situation. However, significant research was needed to construct aggregate modeling frameworks that capture actual elements of financial instability, better explain endogenous accumulation and large-scale imbalances, and estimate the systemic role of intermediaries, among other things.

The fact that there are significant disparities between idiosyncratic and systematic causes, external and endogenous triggers, and sequential and simultaneous effects demonstrates how complicated this phenomenon can be.

### **3. Research methodology**

This article is based on a qualitative empirical analysis that attempts to briefly review the importance of systemic risk, analysis and early identification, for the calibration of macroprudential policies. In this sense, the research, and conclusions of some of the greatest economists and central banks were analyzed and studied.

### **4. Findings**

The possibility of a financial system as a whole can be badly impacted by big and widespread bank exposures, or by an acceleration or transmission process induced by one or more severe individual losses. (Benoit, 2017). Financial integration is responsible for banking institutions highly interconnected structure, and it has a two-fold influence on systemic risk (Cechetti, 2012).

In 2008, Lane and Milesi-Ferretti hypothesized that financial integration and economic progress had a nonlinear relationship. On the other hand, financial integration, according to Candelon (2020), boosts growth but also exposes the economy to severe consequences during crises. Two examples are banking and the stock exchange. Financial integration is both a benefit and a danger to financial stability, and the interbank market's design is "strong but weak."

There are three primary types of systemic risk in order to limit the size of the combination of these elements: the danger of contagion, the risk of macro-shock generating simultaneous issues, and the risk of releasing accumulated imbalances in time. These three types of risk are not mutually exclusive and can occur separately or in combination.

The term "contagion" usually refers to an apparent idiosyncratic condition that grows in severity as the cross-section size increases, often in a consecutive fashion. A cascading bank failure is however one scenario, in which one bank drives another to fail, even if the second bank appeared to be solvent at first. A large-scale exogenous shock that adversely affects a number of intermediaries and/or markets at the same time is the second type of systemic risk. Banks, for example, have been discovered to be susceptible to economic downturns. The organic accumulation of large-scale

imbalances in financial systems over time, as in the case of a lending boom, is the third type of systemic risk. The subsequent exposure of the imbalance (whether created endogenously or exogenously) might have a negative impact on several intermediaries and/or markets at the same time. The final two types of systemic risk are especially relevant to financial systems' pro-cyclical nature, while contagion can be just as essential.

The size of the systemic risk time series is linked to pro-cyclicality, which is defined as an excessive increase in assets (and risk) during the "growth" phase of the business cycle, associated with a drop in financial institution's capital base. As a result, when a financial crisis occurs, all financial institutions are at risk. The temporal dimension can be thought of as the buildup of systemic risk through time (in aggregate). It refers to the risks that are not primarily determined by a single institution's actions, but instead by group behavior, that further leads to higher volatility in the financial sector and the real economy, risk undervaluation during stages of rapid growth and overestimation during periods of recession, and reduced debt and pro-cyclicality.

"The structural dimension" stands for the allocation of systemic risk and its sources in the financial system over time. The insolvency risks offered by institutions, the concentration (similarities) of risk exposure or financing sources, the size, structure, and level of concentration of the financial system, and the direct and indirect linkages between financial institutions are all aspects to examine. The "interconnection" characteristic of systemic risk might be summarized as follows: financial institutions are so linked that when one fails, it can quickly infect other institutions via several processes, including risk counterparty, emergency asset sales, liquidity problems, and so on.

Systemic risk has two dimensions: transverse and temporal, as we have seen. Each has its own set of political ramifications.

Cross-section exposures / linkages, the first component of systemic risk, describes why a financial system-specific shock may propagate and become systemic. The focus is on how risk is allocated at any one time across the financial system.

There are two types of shocks:

- A network of interconnected balance sheets makes up the financial system. A shock to one institution may propagate to other institutions associated to it, eventually becoming systemic, because of the increased complexity of day-to-day interactions. Because of settlement and interbank links, the failure of one institution can have far-reaching consequences for other, otherwise sound institutions.
- A shock, on the other hand, can have far-reaching consequences and become systemic because of direct exposure. A nationwide decrease in commercial or residential real estate markets has this characteristic by definition. As the recent crises shown, such a widespread exposure can have a significant international impact.

A number of market flaws, including as asymmetric information, externalities and the public benefit of systemic stability, incomplete markets, and so on, lurk behind these forms of systemic risk. Financial systems are more vulnerable than other economic sectors as a result of these factors:

- i) The intensity of information and the temporal sequence of financial contracts.
- ii) The structure of financial intermediaries' balance sheets (which frequently have high leverage and maturity mismatches); and
- iii) the high degree of interconnectedness of financial operations.

When the abovementioned flaws are combined with the three characteristics of financial systems, substantial feedback, amplification, and nonlinear mechanisms emerge. Macroprudential oversight research should capture conditions of real instability, specifically modeling these traits and faults and how they can lead to severe systemic crises.

"Systemically important financial institutions" is another phrase that has to be defined.

The G20 put the issue of systemic institutions on the financial supervisors' agenda during the Pittsburgh Summit in September 2009, recommending the implementation of specific standards commensurate with the cost of a potential breach of obligations, in order to provide a framework for the activity of the world's most important financial institutions. Given the risks they bring to the financial sector and the reality of the economy, the declared goal was to stop the scenario of moral hazard associated with the presence of organizations "too big to fail" or "too interconnected-to-fail." In fact, such organizations may be enticed to take more risks if they expect public backing in the case of a crisis.

SIFIs have been classified as financial institutions whose "disorderly suffering or failure, given to their size, complexity, and systemic interconnectivity, would cause major disruptions to the wider financial system and of economic activity" since 2009. Internally, regionally, and globally, this identification is carried out. The Financial Stability Board has been tasked with identifying systemic entities (banking and insurance firms) on a global scale. CRD IV (Article 131), which states that "Member States shall designate the authority responsible for identifying, on a consolidated basis, institutions systemically important global issues," has transposed international methodologies for identifying systemically or globally important banks into European law.

## 5. Conclusions

The identification of systemic institutions allows for the transparent implementation of specific supervisory actions targeted at lowering the risks posed by these institutions as well as limiting the moral hazard associated with the implicit public guarantee they receive. As a result, institutions that have been designated as systemic are subject to additional supervisory measures, such as increased capital requirements.

Due to increased moral hazard and the expectation of being rescued, banks can take more risks than usual and this way a growing concentration in the financial system appear and this can lead to the development of systemically significant financial institutions, for example, may stimulate them to take excessive risks, over time. From this we can conclude that systemic risks, both temporal and structural are very connected. Furthermore, excessive borrowing during periods of expansion promotes a risk spike (time size), which can lead to a build-up of bank risk exposures on a micro-scale and their concentration in specific market segments (cross-cutting size) (e.g., real estate market). Pro-cyclicality establishes new, more complex linkages inside the financial system, as well as between the financial sector and the real economy, at the macro level. While imbalances accumulate as a result of excessive lending and the simultaneous accumulation of asset prices, the results of the analysis from each perspective may differ, i.e., as profitability and bank capital increase, strengthening their resilience to shocks.

Due to the discoveries in this field, new institutions have been created both at the European and country level to deal with prudence, such as the European Committee for Systemic Risk or national committees, and, at the same time, it has been proven that an effective macroprudential policy can strengthen the resilience of the financial system.

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