
Managing International Financial Crises: Responses, Lessons and Prevention

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Abstract

A decade has passed since the onset of the turmoil in 2007 that escalated into the global financial crisis. The crisis has posed new challenges to fiscal and monetary policies in all the countries, including the euro area. Managing financial crises includes measures that reduce their economic damage and costs. Numerous and creative monetary and fiscal policy or financial interventions have been deployed either in the European Union or in the US, China and Japan to mitigate the impacts of the crisis. This chapter gives an overview, assessment and a short comparison of the responses. It also deals with the lessons that may prevent such an intense shock in the future. The prevention implies financial regulations, the reform of the global financial system to become more resilient and the changes that have reshaped the role of central banks.

Keywords: financial crises, crisis management, prevention, monetary policy, global financial system

1. Introduction

When confronted with emergencies never experienced before, strategic crisis managers hasten to mobilize expertise to come up with crisis decision-making. They should be able to make sense of the crisis and identify the core values that are threatened.

When we talk about crises in relation to businesses, it is the owners' responsibility to develop crisis management capacities to cope with the impacts of a disaster on stakeholders and on their companies' value. Regardless of its size, every company can follow the necessary steps in crisis management. Advanced planning is regarded as the key to survival. A written plan

including specific actions is important to make when things are running smoothly. A badly managed crisis can ruin decades of hard work and company value within hours. A crisis can strike any company anytime, anywhere.

As far as natural disasters are concerned, prevention and mitigation policies against them require massive investment but help to reduce the exposure and to increase the adaptation of affected countries.

Disruptive events still continue to occur. We can say their characteristics change over time. They can stem from unprecedented, poorly understood or ignored threats and hazards.

The 2008 financial and fiscal crisis, although it demonstrates features that are similar to those in the past, has been much greater in its severeness and intensity. In terms of falling output and rising unemployment, it has proved to be the most serious recession since the war. The crisis has posed new challenges to fiscal and monetary policies in all the countries, including the euro area. Without the creative monetary and fiscal policy tools applied in the European Union or in the US, China and Japan, the meltdown of the global financial system could hardly have been avoided. Global leaders have recognized that further systemic shocks could severely challenge even political stability.

The recent global financial crisis demonstrated some new factors in terms of its roots: widespread implementation of complex and nontransparent financial instruments, the high level of national and cross-border interconnectedness of financial markets, banks and institutions, the high degree of leverage of financial institutions and the role of the household sector.

Owing to the interconnected nature of the global economy, crises can spread beyond national borders. Globalization has also resulted in an increased interdependence of production and delivery systems as well as a globalized financial system. It is a key responsibility for governments to manage new crises while building resilience to shocks at all levels.

This chapter discusses the different practices in dealing with the recent financial crisis of 2008 highlighting the way monetary policies can adapt to its changed nature and complexity. The new risk management, however, should focus on strategies that take place before an event occurs.

The methodology of the author's research is primarily based on analyzing the qualitative data. The author used the literature review and analysis; therefore, the author collected data from diverse sources, including books, journals, newspapers, conference papers, reports from international organizations, government policy records and websites. It is not a simple presentation of such materials, rather the author integrated different arguments systematically and developed critical assessments of their meanings and value. The author's study comprises logical, explanatory, exploratory and evaluative methods of analysis.

2. Learning from the past and revealing new strategies of managing crises

Today's crises demonstrate a diversity and complexity that challenge crisis management in many ways. Hazards including industrial accidents, natural disasters, terrorist attacks,

infection, refugee crises and financial threats have a cardinal feature in common: their socioeconomic impacts spread fast across borders, making modern societies vulnerable to a wide range of large-scale shocks. Innovative crisis management responses became vital, which was the case in coping with the consequences of the global financial crisis of 2008. European, the US, Chinese and Japanese policy makers initiated fiscal expansions to boost growth, while their central banks introduced unconventional monetary policies including quantitative easing, forward guidance and negative interest rates on banks' deposits with the central bank.

The complexity of managing today's crises calls for the efficient coordination of emergency responses to defend citizens and businesses and mitigate the harsh impacts. Similarly to emergencies that threaten businesses, response plans are fundamental tools for governments to manage "conventional" crises. To design such plans, it is necessary to study past events and draw the conclusions and the lessons, which could function well for routine events.

Banks, financial institutions and trading firms are vulnerable to hazardous "black swan" events like the global financial crisis of 2008, and are exposed to huge losses beyond the realm of normal expectations due to their flawed financial models. The term is based on an ancient saying which presumed black swans did not exist, though the observation of a single black swan was enough to disprove that belief in the seventeenth century.

Finance professor, writer, and former Wall Street trader Nassim Nicholas Taleb's "black swan theory" describes an event that comes as a big surprise and has a major impact. His book "The Black Swan: The Impact of the Highly Improbable" was published in 2007 and focuses on the extremely strong impacts of rare, unexpected and impossible-to-predict events referred to as "outliers," which is a point in a statistic that does not "fit" in the overall trend. The metaphor also sheds light on the fragility of any system. The idea in Taleb's book is not to attempt to predict "black swan" events, but to create robustness and build resilience. Humans tend to find oversimplified explanations and later convince themselves that these events are explainable in hindsight. Analyzing black swan events, however, helps us to gain a better understanding why certain events are recurring in history and what consequences they have.

The concept of resilience applied to societies, businesses, infrastructure, services and financial systems requires strong governmental or central bank commitment under fast-changing economic and social conditions which create higher probability for unexpected and uncommon crises.

3. When bubbles burst

The Great Recession was triggered by a bubble in housing and derivatives, which became entangled in the financial markets. The term "Great Recession" applies to both the US economic downturn, officially lasting from December 2007 when the US housing market went from boom to bust to June 2009, as well as the ensuing global recession in 2009.

Derivatives built on mortgages spread quickly and became the new, attractive thing that everybody wanted. Based on mortgages, there were so many of them available that when

the prices were bid upward with supply lagging, a bubble was formed. When the real estate market collapsed in 2007, large amounts of mortgage-backed securities and derivatives declined sharply in value, jeopardizing the solvency of over-leveraged banks and financial institutions.

The classic example for a bursting bubble is the Great Tulip Mania of 1637 in the Netherlands. Tulip bulbs became extremely valuable as the rich bid up their prices in the belief that there would always be a market for the exotic tulips, no matter how high their prices soared.

A bubble is usually fueled by speculation or The Greater Fool Theory.

A speculative bubble is usually triggered by the prospect of a greater profit and exaggerated expectations of future growth, rise in prices or other events that could result in an increase in asset values. This pushes up trading volumes, while supply remains at about the same level but demand increases. Price inevitably exceeds the asset's intrinsic value, an objective analysis would indicate that.

Value is what someone is willing to pay for. The Greater Fool Theory of investment suggests that someone is sure to seek your appreciated item, no matter how high its price is at the moment, and willing to pay an even greater price for it later on.

When the Greater Fool stops being the Greater Fool and prices are too high for the market to be sustainable, the bubble bursts. A crash is inevitable as the bubble must go down.

Burst of financial bubbles that brought underlying economic problems to the surface developed into a financial and economic crisis at global level in 2008. The financial crisis turned into a debt crisis and a euro crisis. There were three main factors existing in the precrisis period that resulted in the escalation of the economic and financial crisis in the Eurozone. (1) As argued by Obstfeld [1] and DeGrauwe [2], the financial dimension of macroeconomic stability was largely overlooked: the deepening of the financial integration and the expansion of the financial sector at the same time undermined financial and macroeconomic stability, (2) the banking system was highly interconnected and lightly regulated and (3) Economic and Monetary Union (EMU) member states made imprudent fiscal policy steps.

The economic situation within the euro area in 2007–2009 stemmed from its vulnerability and fragility owing to its architecture. The phenomenon that bank portfolios from the Northern part of the euro area were diverted toward the periphery of economies in Southern-Europe strengthened risk. Low nominal interest rates and easy access to credit-fostered demand and inflation reducing real interest rates, which had destabilizing effects such as housing booms accompanied with an increase in investment of nontradable construction or high government borrowing. This process ended up in cumulating current account deficits and external liabilities.

At the union level, the crisis has highlighted that institutional reforms are necessary to implement for two main reasons. One is that the euro area should develop effective mechanisms of fiscal supervision and policy coordination to prevent a crisis as severe as the recent one from occurring in the future. The other is: should a recession occur in any EMU country, it is important to stop its escalation in the particular country and its contagion to other countries.

4. Theories on business cycles

Minsky [3] maintained that “To understand the short-term dynamics of the business cycle and the longer term evolution of economies it is necessary to understand the financing relations that rule, and how the profit-seeking activities of businessmen, bankers and portfolio managers lead to the evolution of financial structures.”

According to Schumpeter’s theory on business cycles “cycles are the essence of the organism that displays them” [4]. The starting point of his analysis is stable equilibrium with the aim of identifying the economic factors arising from the economy itself that destroy the equilibrium and lead to evolution. These real economic processes are referred to as the “circular flow” and “develop,” which creates the economic evolution: changes in the economy that arise from itself. Contrary to Keynes, Schumpeter presumed that in the circular flow, there is a constant tendency toward an equilibrium which, under competitive capitalism, tends to maintain the optimal allocation of available capital and labor. In the “circular flow,” the role of money is to facilitate the circulation of commodities. It is basically entrepreneurial demand that determines the credit supplied by the banks; consequently, the money supply is an endogenous variable. Schumpeter argued that in a developing economy, where an innovation prompts a new business to replace the old called by him “creative destruction,” booms and recessions are inevitable.

Minsky adopted Schumpeter’s idea of the innovating entrepreneur. Minsky regarded, however, financial innovations produced by financial institutions as the source of financial fragility, which lead to financial crisis and instability. Schumpeter contrarily stated that innovation was the main source of stability. Minsky concluded that Schumpeterian entrepreneurship, evolution and change are the most evident in banking and finance, where the drive for profits is the clearest factor to make a change [3]. Financial institutions were essential to Schumpeter’s theory and in the development of Minsky’s thought. The advanced market economies’ institutional arrangements are the setting within which innovation is financed by entrepreneurs.

Whalen [5] argued that financial innovations including “exotic” securitizations, nonbank financial intermediation, trading in derivatives, unconventional mortgages, hedge funds and the globalization of finance markets are behind the recent global economic crisis.

Monetary policy rules on the central bank’s systematic adjustment of its interest rate to respond to developments in inflation and macroeconomic performance are referred to as Taylor rules. Taylor [6] offered a framework for the analysis of historical policy and for the econometric evaluation of specific alternative strategies that a central bank can make. The framework links interest rate decisions directly to inflation and economic performance abstracting from a detailed analysis of the demand and supply of money. These reactive rules facilitate the discussion of systematic monetary policy.

5. Where does credit expansion lead to?

The question arises if the recent business cycles in the US and Japan can be explained on the basis of the Austrian business cycle theory (ABCT) since they display some of its signs. ABCT

suggests that an economic boom is sustainable if it is the result of an increase in investment funded by an increase in saving, while an economic boom which stems merely from credit expansion is not sustainable.

Excessive growth in bank credit is owing to the artificially low interest rates set by a central bank or through expansionary monetary policy. These interest rates are below the rate of the market for loanable funds that supply and demand clear. As a result, the information embedded in market prices or interest rates is distorted. Entrepreneurial decisions are affected, which causes a misallocation of capital across the economy and the credit-sourced boom results in a widespread malinvestment.

Consequently, a sustained period of low interest rates and excessive credit creation leads to an unstable imbalance between saving and investment. The boom fed by the credit expansion turns to recession when the money supply contracts and eventually resources are reallocated back toward their former uses [7].

Mainstream economists have concluded that the housing boom, subsequent to the 2001 recession, was mainly due to the Fed's accommodative monetary policy, which means expanding the overall money supply to boost the economy when growth is slowing—as measured by GDP—to encourage more spending from consumers and businesses.

Taylor [8] argued that between 2002 and 2005, the US monetary policy was far more accommodate than an approach based on an interpretation of inflation and output data would have called for.

White and other Austrians predicted that a burst of an asset bubble, specifically, the real estate bubble would trigger a crisis while forecasts of some non-Austrian economists, such as Nouriel Roubini and Stephen Roach focused more on macroeconomic imbalances such as the current account deficit or the federal government debt [9].

6. Public expectation from central banks

Monetary policy is supposed to support the objectives of general economic policy for the purpose of achieving sustainable growth and a high level of employment. Inflation-targeting framework (ITF) sets two goals. One is the central bank's commitment to keep inflation low, and the other is to keep the variance of inflation right. While the ITF can greatly promote attaining the first goal, attaining the second provides more room to debates. At the same time, a strategy for monetary management, namely inflation-targeting policies, conducted mainly in a discretionary form have been considered to be capable of keeping inflation low while supporting the central bank's flexibility to manage monetary policy with their independence being emphasized.

It is widely agreed that central bank transparency can make the policy more effective. According to inflation-targeting framework, it is possible to create a "nominal anchor" to the price level by the communication to the public [10]. The target would result in certain "psychological" market conditions which are favorable to reaching the very same inflation goal. The only way

for central banks to earn credibility is to demonstrate that they have the tools and the willingness to curb inflation and to keep it low for a period of time [11]. In addition, the element of discretion provides the central bank with the capacity to pursue other political objectives thought necessary in a certain case without compromising the attainment of the stated goal.

Public expectation from the central bank should be met, by suggesting that the bank has the power to expand or contract the money supply, to raise or to sink interest rates, to impose exchange controls, to alter the level of obligatory reserves, to alter the classes of assets and the conditions of granting access to discount facilities and to impose new bank regulations. Both critics and supporters of the ITF, including Kohn [12], Friedman [13] and Svensson [14] claimed, however, that the ITF does not constitute best-practice in resolving the question of other goals such as real and financial stability. Nevertheless, stabilizing inflation is the best way to achieve that goal. The view of the ITF is supported by Bernanke, Laubach, Mishkin and Posen commonly referred to as "BLMP," who conclude that should a great supply shock of some unexpected origin in particular arise, missing or changing a previously communicated inflation target may even be justified.

7. Why do financial crises occur?

The conduct of economic and financial policies is strongly affected by the substantial implications of financial crises. A thorough analysis of the consequences of and best responses to crises has become an integral part of the policy debates. Crises manifest the linkages between the financial sector and the real economy. Theories focusing on the sources of financial crises have recognized the importance of sharp movements in asset and credit markets.

A financial crisis often occurs together with one or some of the following phenomena: a remarkable change in credit volume and asset prices, disruptive financial intermediation, immense balance sheet problems of firms, households, financial intermediaries and sovereigns or significant government support in the form of liquidity support and recapitalization.

The question may arise why neither financial market players nor policy makers anticipated the risks and tried to slow down the expansion of credit and increase in asset prices. Such phenomena have been around for centuries. Asset prices sometimes deviate from what fundamentals would suggest and move differently from the patterns of standard models. Asset prices can also be affected by investors' behavior or information asymmetries, changes in international financial and economic conditions. Information asymmetries exist among intermediaries and in financial markets. Safety deserves a premium, and perverse spirals can be created. When the demand for quality assets increases, some of the lower quality may experience a sharp decline in their prices. The crises in the past exhibit the signs of those of recent recessions when the collapse of banking systems was preceded by a sharp increase in credit in real estate investment.

The East Asian financial crisis, for instance, in the late 1990s is similar to the ones in the Northern countries. The experience of the United States in the Great Depression shows some similarity to the way leading to the recent global financial crisis in terms of an increase in household leverage or asset prices.

Credit booms can be triggered by a wide range of factors, for example, shocks such as positive productivity shocks, economic policies and capital flows. Lagged GDP growth is positively associated with the probability of a credit boom. Increases in international financial flows can strengthen the credit booms. Global conditions also affect the national financial markets resulting in asset bubbles easily spill across borders.

Capital inflows can extend the availability of funds for banks leading to relaxing credit constraints for corporations and households. Accommodative monetary policies have been connected to credit booms and excessive risk taking. Asset prices and borrower's value are affected by interest rates so are the conditions of lending. Risk-taking is usually higher when interest rates are lower and a shift to quality, when interest rates rise. The rapid increases in real estate prices and household leverage are explained by the relatively low interest rates in the US during the period 2001–2004.

Structural factors such as financial liberalization and innovation facilitate more risk-taking and can also trigger credit booms. Empirical studies found that crises were often preceded by financial liberalization. Shocks or liberalization keeps innovation in move. Regulation, supervision and market discipline are not quick enough to catch up with greater competition and innovation. Vulnerabilities in credit markets can emerge. A decline in lending standards owing to stronger competition in financial services may contribute to financial fragility in the short run in particular.

During financial crises, asset prices and credit booms and busts differ from the movements of a normal business cycle: booms are shorter and more intense than other upturns, and crunches and busts are longer, deeper and more violent than regular downturns. The violent episodes last longer [15].

Reinhart and Rogoff [16] distinguished two groups of crises, both including two types. The first group is classified on the basis of quantitative definitions, and the other depends mainly on qualitative and judgmental analysis. Currency crisis and sudden stop belong to the first group since these are measurable variables and allow the use of quantitative methodologies. Other crises are connected to adverse debt dynamics or banking system turmoil. Since these variables are not easy to measure, the use of qualitative methodologies is more appropriate.

When a country cannot service its foreign debt, the financial crisis takes the form of a sovereign or private (or both) debt crisis. In a systemic banking crisis, bank runs and failures can make the banks suspend the convertibility of their liabilities or force the government to intervene to prevent that by extending liquidity and capital assistance on a large scale.

Research that has been conducted on the causes of the recent crisis revealed some factors similar to previous crises. Although these factors may differ on the exact weights in different results features concluded in common are as follows: unsustainable asset price increases, credit booms leading to excessive debt burdens, build-up of marginal loans and systemic risk, and that regulation, supervision, and market discipline is too slow to catch up with greater competition and innovation.

Nonetheless, the recent global financial crisis demonstrated some new factors in terms of its roots: widespread implementation of complex and nontransparent financial instruments, the high level of national and cross-border interconnectedness of financial markets, banks and

institutions, the high degree of leverage of financial institutions and the role of the household sector. These new and common factors in the framework of the “new financial architecture” led to the severest financial crisis since the Great Depression.

Restoring confidence in the financial system, if possible at all, required immense government participation, outlays and guarantees. As for real and financial implications, they are hard and show common features with other episodes. They include large output losses and declines in consumption, investment and industrial production. Financial crises have large economic costs. Crises impact economic activity and can trigger recessions worse than a “normal” business cycle recession. The average duration is longer, and output losses are larger than those of a recession not triggered by a financial crisis. So is the cumulative loss, the output loss relative to the peak before recession.

Various approaches are used for measuring the real impact of a crisis on output. The traditional business cycles’ methodology implies that recessions associated with credit crunches and housing busts are costlier compared to those associated with equity price busts. Adding up differences between trend growth and actual growth for some years after the crisis can show overall losses, which vary in different countries. On this basis, according to Laeven and Valencia [17], emerging markets tend to suffer larger losses due to the recent crisis than advanced economies, which can also differ significantly. An indication of the significant costs that crises incur is consumption and overall welfare. In recessions associated with financial crises, a fall in consumption is 7–10 times larger than in those without such crises in emerging markets and consumption still keeps growing, though at a slower pace [18].

Financial variables show with large downward corrections. In advanced countries, credit falls by about 7.0%, house prices drop by about 12.0% while equity prices decline by more than 15.0% during credit crunches, house and equity price [19]. The most remarkable hit on the real economy from a financial crisis is the lack of credit. After banking crises, sectors grow more slowly, so they naturally need more external financing owing to banks’ limited lending capacity. Recoveries in aggregate output after credit crunches tend to take place before the revival of credit growth and turnaround in house prices. Sectors more dependent on external finance grow relatively less. “Creditless recoveries” are more common after banking crises and credit booms.

Financial crises are associated with reductions in investment, R&D and employment and firms’ giving up on growth opportunities. The timing of crises is more difficult or even impossible to predict than identifying vulnerabilities. The phrase “Minsky moment” refers to the situation when a market fails or falls into crisis after a long period of speculation or unsustainable growth. What we have seen in the recent case of the financial crisis was a slow movement of the global financial system toward “money manager capitalism,” as Minsky put it, that collapsed in 2007. Wray [20] named it the “Minsky half-century.”

8. Financial innovation and the “new financial architecture”

In the late 1970s, a radical financial deregulation process began that accelerated the evolution of financial markets. Financial innovation took various forms and stimulated strong financial

booms that ended up in crises. The “new financial architecture” (NFA) refers to the integration of financial markets with light government regulation of the era characterized earlier. NFA created a framework for flawed practices and institutions which can be regarded as the deep financial roots of the recent crisis.

As a result of financial innovation, complex and opaque financial products became available in financial markets. They lacked transparency, which made it impossible to be priced correctly and therefore, lost liquidity when the boom ended. The explosion of these securities flowing through banks at a high rate created large profits, while destroyed the transparency which is necessary to ensure market efficiency. Large investment banks like Lehman and Merrill Lynch were given high ratings by international rating agencies enabling them to borrow at a low price. Instead of exposing risk, the agencies systematically disguised it.

The recent economic crisis was remarkable not only because of its severity and size but of its nature. The true nature of the underlying situation seems to be difficult to reveal since trading of over-the-counter (OTC) derivatives, especially the ones which take the form of collateralized debt obligations (CDOs), accounts for confusing those who attempt to paint a clear picture. Collateralized debt obligations are structured financial products that pool together assets such as mortgages, bonds and loans which serve as collateral for the CDO. The creation of asset-backed securities enabled the banks to increase their leverage significantly. These structured financial products were particularly attractive assets for banks to keep because they could be held off-balance-sheet with no capital adequacy requirements.

Derivatives are financial contracts that derive their value from the performance of the underlying asset, the most common of which contain commodities, stocks, bonds, interest rates, currencies or other. The risk of derivatives stems from using leverage, which means that investors can earn large returns from minor changes in the underlying asset’s price. On the other hand, however, they can suffer massive losses in case of opposite moves in price.

The Third Basel Accord is a global regulatory standard on bank capital reserves. According to the Basel III rule, the banks are required to hold 4.5% of common equity and 6.0% Tier I capital of risk-weighted assets (RWA) besides introducing additional capital buffers during periods of high credit. There was no need for a percentage of the value of these assets to be held as a capital reserve. CDOs, which comprised loans of different quality, and other derivatives were distributed widely between the dominant institutions in the financial system. They were regarded as relatively safe, since they were given a high rating by rating agencies, while in fact, their credit worthiness and cash flow possibilities were doubtful. This was an unsustainable situation. In late 2007, the whole financial network came under strain questioning the viability of many financial instruments leading to the withdrawal of these funds from Wall Street investment banks and associated institutes.

The collateralized debt obligation “market” was impossible to sustain. Wall Street investment banks were able to evade regulatory constraints. A “shadow banking” was constructed alongside the regulated sector. These banks do not take deposits and have no access to central bank funding or debt guarantees. They deal with short-term funding on asset-backed commercial papers and provide cash loans against collateral as security or long-term loans like mortgages. Shadow banks with less-risk aversion did not mind having clients not eligible to

applying for loans. Due to high interconnectedness, they can contribute to increasing systemic risk indirectly as well. Without the support of their central bank as lender of last resort, they are unable to refinance their short-term liabilities. The shadow banking system is blamed for significantly contributing to the global financial crisis of 2007–2012 [21].

Since OTC derivatives are not traded in an exchange, there are no central counterparties (CCPs). As a part of the financial sector reform, noncleared OTC transactions are to be shifted to central counterparties, which would result in a better risk management and resiliency in accordance with giving more transparency to the OTC market.

The conduct of economic and financial policies is strongly affected by the substantial implications of financial crises. A thorough analysis of the consequences and best responses to crises has become an integral part of the policy debates. Crises manifest the linkages between the financial sector and the real economy.

9. The euro area crisis and its lessons

The euro area crisis that began in 2009 stems from the financial/fiscal trilemma. Obstfeld [1] suggested a new policy trilemma for currency unions: (1) cross border financial integration, (2) financial stability and (3) national fiscal independence cannot be simultaneously maintained within the union after a certain level of the financial integration has been reached. Conclusively, financial integration and independent national fiscal policy do not create financial stability.

Consequently, if countries sacrifice the options of financial restraint and capital controls, they cannot credibly backstop their financial systems without external fiscal support. A country reliant mainly on its own fiscal resources will likely give up on financial integration as well as stability because financial risks will be assessed nationally by the markets. As an alternative, if a country with limited fiscal space withdraws from the integrated financial market, it may control and insulate its financial sector in order to reduce fragility to the minimum level. Any diagnosis that overemphasizes the lack of enforcement of existing fiscal rules is partial.

The author's argument is that the turmoil in euro area in the period after the outburst of the crisis finds its roots in financial vulnerabilities of the incomplete design of Economic and Monetary Union (EMU). Initially, architects were concerned with monetary policy, fiscal policy and structural reform in nonfinancial markets, for example, labor markets, leaving the financial dimension out of scope. The process of financial integration, ruling optimism concerning risk and growth, as well as global liquidity, created credit conditions at the time when monetary union began to work resulted in excessive borrowing. Asset price bubbles occurred in housing and in the sovereign debts increasing banks' exposure to the risk of collapse creating the "too-big-to-fail" (TBTF) issue. It means that when a systemically important financial institution (SIFI) fails, losses or disruptions could be severe enough to lead to failure of third parties. The problem is rather the fact that financial institutions are too interconnected to fail. It is necessary to prevent TBTF banks from failing in order to maintain the stability of the financial system in the short run. Nonetheless, bailing out TBTFs will result in a less stable financial system and raises the issue of moral hazard [21].

The theoretical basis of the creation of the monetary union is optimal currency area theory that considers exogenous shocks rather than the endogenous dynamics of capitalism. Diagnostic failure prevailing in the North blames government profligacy for the euro crisis. Both allow disguising the design flaws of the euro area. The author's argument is that endogenous dynamics of booms and busts work also on the level of national economies, which remained so within EMU. The central bank as the lender of last resort is supposed to counterbalance the instability of capitalism, which stems from its nature. It implies two responsibilities: injecting liquidity in the banking sector and to the government bond markets. When problems in the government arise, sovereign bond prices drop, extending the problem to the banks and causing insolvency, thus developing a vicious circle. The European Central Bank (ECB) as a lender of last resort in the government bond markets has an infinite capacity of buying government bonds. The European Stability Mechanism (ESM) that became operational in October 2012 cannot commit to such an outcome due to its limited resources. It is only the infinite resources that enable the central bank to stabilize bond rates. This is the only way to gain credibility in the market [22].

The structure of the balance sheets of both the banks and the sovereign is unbalanced in terms of maturity. It refers to the liquidity difference of their liabilities and assets, thus a collective move of distrust can trigger a liquidity crisis that can cause sovereign default. This also underpins the necessity of the central bank's extended core responsibility. Stabilizers can be built in the government budget. The private sector's postcrash deleverage may carry the threat of a deflationary spiral. Increased savings together with reduced consumption output and national income will decline leading to the savings paradox. It can be offset by the government's saving less and borrowing more. The private sector's asset sales can trigger a downward spiral by causing insolvency for those holding these assets. The harmful effect can be stopped by the government's taking over them. These processes moved by the stabilizing elements are not organized on the level of EMU. Monetary integration does not obviously include economic integration.

According to the theory of optimum currency areas (OCA) [23], sufficient real wage flexibility and labor mobility can compensate for real divergences. The lack of those in Europe makes it less likely for the requirements of a sound monetary union to meet. In addition, market efficiency with prices fully reflecting available information has not been constituted by the European Union, which also suggests that monetary integration does not imply economic integration. Maastricht has brought the loss of two economic policy levers, monetary and exchange rate policies, and has left two other, the national fiscal policies and the EU budget itself. It means national governments are restrained in reacting to asymmetric shocks, the outcome of which depends to a great extent on the relative phasing of business cycles between each member state and on the ability that cycles can be responded through the EU budget. Since monetary sovereignty and exchange rate tool are no longer accessible, fiscal latitude is needed for the members to treat shocks, particularly in an environment where labor migration has failed to function as a valve for dealing with asymmetric shocks.

In summary, emphasizing the lack of enforcement of existing fiscal rules provides a partial diagnosis to the euro crisis. The euro area's inherent weaknesses revealed by the crisis have made euro area vulnerable. At the core of its vulnerability stands the impossible trinity of strict no-monetary financing, bank-sovereign interdependence and no co-responsibility for public debt [24].

Secondly, the euro area has deprived itself of the shock absorbers most economies can lean on to reduce the negative effects of demand shocks and fully expect a central bank to respond an economic downturn.

The author's argument is that euro area crisis was not a sovereign debt crisis. The fact that Belgium and Italy, which entered the crisis with extraordinarily high debts did not land in serious trouble, while Ireland and Spain, which entered the crisis with low levels of sovereign debt needed bail-outs, underpins this statement. The problem was massive capital flows across borders, which encouraged high levels of private borrowing in the economies which at last got into trouble. A reversal in those flows generated by the financial crisis made private borrowers and banks get into big trouble, which turned into serious economic downturns and bank failures and led to explosive growth in sovereign debt burdens. Massive sovereign debt was the symptom rather than the cause of the crisis.

Countries without a single currency have the option of turning to the tool of money creation to support their financial systems in hard times. Financing public debt in such a way leads to destabilized price level ending up in a quadrilemma: at least one of (1) strong capital market integration, (2) financial stability, (3) national fiscal independence and (4) price level stability must be given up.

As it comes to discussing, the fragility of EMU by examining the role of the central bank as a lender of last resort and the automatic stabilizers in the government budgets, it is significant to see the existence of a "deadly embrace" between the sovereign and the banks [2]. It refers to the case when falling government bond prices threaten the banks, or sovereigns are threatened with insolvency. As a result, when one is endangered the other follows. This creates a good starting point to analyzing the operation of the ECB.

Accumulation of private debt resulted in developing bubbles. Deleverage as a consequence of bursts got the deflation dynamics going thus, pushing the economy into a deflationary spiral.

The idea of the financial instability hypothesis (FIH) was pioneered by Hyman Minsky. He argued that financial crises are endemic in capitalism; the model does not based on exogenous shocks to arouse business cycles of various massiveness, instead, it suggests that business cycles are generated from the internal dynamics of capitalist economies, the fragility of financial markets and the system of interventions and regulations necessary to keep the operation within bounds. Capitalism is prone to move from periods of financial stability to instability, which is a type of market failure and needs government regulation.

10. Effective crisis management measures to avoid the worst

The global financial crisis and associated recessions have shown the ability of macroeconomic and financial sector policies to mitigate the costs of such episodes.

The measures implemented aimed specifically at enhancing credit support. They are defined as "nonstandard, unconventional measures" and are considered as part of the central bank's toolkit, but "by definition exceptional and temporary in nature" [25]. In the wake of the

Lehman collapse and exploding sovereign debt crisis in the Eurozone, the unconventional measures taken by the central banks were mainly aimed at stabilizing specific segments of financial systems. They are referred to as “credit easing.”

Central banks like the ECB, the Federal Reserve System (Fed), the Bank of England (BoE), the Bank of Japan (BoJ) or the People’s Bank of China (PBC) differ in terms of their tasks or legal statuses while they show more similarities in their institutional structures, monetary frameworks and in the use of instruments. Central banking practices in the world have evolved toward greater independence, transparency and the adoption of monetary policy committees. This trend has contributed to reducing the differences among these five institutions and can also be seen among other central banks.

The differences include communication strategies; nevertheless, the responsiveness of the financial market seems to be high for both the Eurosystem and the Fed in terms of monetary policy inclinations and views on the economic outlook. The ECB and the BoJ quantify their definitions of price stability, while the Fed does not. All these central banks mentioned earlier had to face a series of diverse challenges, which were rather country-specific in Japan or more global in the other economies.

The Fed made clear its objective of preventing a meltdown and gained credibility in spite of the fact that it temporarily suspended its commitment to price stability. Euro area’s output had fallen behind that of the US in 2009 and had not been able to catch up.

The author concludes that it was due to the delay in economic stimulus. In addition, the credibility of the ECB was not strengthened by its deeds. With the core inflation rate in below 1% a year, the euro area slipped into a low inflation trap, well below its stated target of 2% a year.

The epicenter of the crisis was located in the US during the period between 2007 and 2009. It moved to the euro area at the end of 2009 and at the beginning of 2010. It was the reason why monetary policy responses to the crises of Fed, BoE and ECB were done at different times. A decline in financial asset prices escalated in a financial crisis, but while in the US and in the UK, it was centered around subprime assets; in the euro area, it was centered around government debt. Subprime assets did not actually have the value they were supposed to and sovereign debt was considered risk-free, which is used by banks as collateral [26].

As for monetary transmission mechanism, in the US 25.0% of corporate external financing is done by banks, while 75.0% through financial markets. In comparison, in the euro area 75.0% of corporate external financing is conducted by banks and 25.0% through financial markets. This proportion in the UK is approximately 50–50%.

In addition, the US and the UK have a single sovereign Treasury bond and Treasury bill market. It is easier for the Fed and the BoE to perform monetary policy than for the ECB, which has to deal with 19 different Treasury bond and bill markets.

The ECB has one primary objective, price stability and the other goals are subordinated to the first. The Fed and the BoE have more than one objectives, monetary stability and financial stability. The financial stability goal consists of a sound and stable financial system. The BoE has explicitly stated that financial stability is regarded as a major goal.

The three main objectives set by the Fed besides monetary stability are: permanent economic growth, maximum employment and low long-term interest rates. Its target for price stability is measured by the consumer price index, which is 2%. Its present estimated long run unemployment rate will increase from around 5.2 to 6.0% [27].

The BoE has expressed the “lender of last resort” operations as a mean to ensure financial stability. Compared to the ECB, this function is stronger for the BoE.

The ESCB¹ is allowed to buy debt instruments from euro area member states in the secondary markets,² as the ECB has done so during the crisis, on the condition, it is necessary to meet the ESCB objectives.

In the euro area, monetary easing has been low compared to the US or the UK. Several major advanced economies got close to a liquidity trap. At that point, standard monetary policy becomes ineffective because nominal interest rates hit zero, both money and bills have a close to zero interest rate so they become close to perfect substitutes, short-term interest rates cannot drop further. Given these circumstances and the economy needs more monetary stimulus, demand is still insufficient to reach full capacity in the medium and long term, the central bank deploys unconventional or nonstandard monetary policies. Negative interest rates are employed to avoid a recession after reaching a liquidity trap. There are theoretical options that can be considered to escape.

Owing to the higher debt levels in the US and the UK compared to the euro area, the political constraints are high. The central bank can buy government debt or private debt in primary or secondary markets. In these circumstances, the Fed purchases Treasury bonds and bills and mortgage-backed securities (MBS). To buy private debt, Congress approval is needed. The BoE bought only UK Treasury bonds and did not purchase private debt. The ECB bought some government debt from peripheral member states in the secondary markets, but sterilized its purchases. Raising inflation expectations to lower real interest rates may be a radical but effective solution by allowing inflation to be above the central bank normal target at least for some time [26].

Having assessed the effects of unconventional or nonstandard monetary policies, the author concludes that without a swift deployment of innovative policy tools, the meltdown of the financial sector could not have been avoided. These measures mitigated the harsh impacts of the global financial crisis on the real economy in terms of output, unemployment and inflation.

Taking into account the effects of the asset purchases deployed as unconventional stimulus, the purchases were targeted toward long-term assets held by nonbank financial institutions, like insurance companies and pension funds, which may be encouraged to use the funds to buy other, riskier assets like corporate bonds and equities. Asset purchase announcements

¹European System of Central Banks, The ESCB comprises the ECB and the national central banks (NCBs) of all EU Member States whether they have adopted the euro or not.

²Article 123 of the Treaty on the Functioning of the European Union prohibits directly monetary financing of the Euro area member states through overdrafts and credit facilities and direct purchasing from debt instruments.

had an impact on long-term asset yields, interest rate futures and measures of financial market uncertainty, which supports the importance of the signaling transmission channel. In the US, asset purchase shocks had an effect on long-term yields and the real exchange rate, underlining the role of the portfolio rebalancing channel.

Unlike the Fed and the BoE, the ECB responded to the crisis in terms of asset purchasing too late and in a limited scale. The Eurosystem had to face a continuous decline of inflation to a level below its definition of price stability of close but below 2.0%. To bring inflation back to 2.0% in the medium term, the ECB announced a broad package of measures in June 2014 to deal with the deflationary risks, which was present in the Eurozone since late 2013.

The current global financial crisis has had a significant negative impact on the Chinese economy affecting exports, foreign exchange reserves and structural adjustments. Since China is over-dependent on exports to stimulate its economic growth, weakening external demand means an adverse impact on the Chinese economy. In November 2008, China's continued GDP growth was disturbed by both losses in export-led manufacturing and reduced foreign direct investments from the international capital market. When external demand collapses, overheating caused by strong investment demand and strong export demand will turn into overcapacity, and inflation into deflation, immediately. It was the case in September–October 2008 since in the second half of 2008, export demand collapsed due to the global financial crisis causing the overcapacity come to the surface.

The author concludes that the global economic crisis exposed the vulnerability of China's growth pattern. The overcapacity of its economy would have surfaced and called for correction without the global financial crisis as well. The investment-driven and export-led growth pattern is not sustainable as the investment rate cannot increase forever and the growth rate of China's exports cannot stay persistently higher than that of the global economy.

At the end of 2008, the Chinese central bank held foreign exchange reserves worth US\$1.95 trillion,³ the majority of which were denominated in US dollars comprising mainly the US treasury bonds and agency bonds. The deepening of the subprime crisis meant a potential threat of devaluation and downgrade of its US bonds, thus eroding the international purchasing power of China's foreign exchange reserves. In addition, to prevent a slowdown of economic growth, the Chinese government had to consider postponing or even canceling some structural adjustment policies necessary to ensure the sustainability of the growth of the economy such as bursting the price bubble in the real estate sector and increasing the flexibility of the RMB's exchange rate mechanism. From the second half of 2009, the largest developing country managed to regain its previous GDP growth levels while most advanced economies were still struggling to recover. The global crisis affected China only for a limited period, from late 2008 until late 2009. The Chinese Government's reaction had proved effective in boosting short-term economic growth, but was insufficient to ensure sustainable

³Although the People's Bank of China does not disclose the proportion of currency and assets of its foreign exchange reserves, the author made a rough estimate based on external data according to the IMF's COFER statistics. The asset composition of China's foreign exchange reserves can also be estimated through the statistics disclosed by the US treasury on the overseas holdings of the US securities.

long-term development and to avoid new risks from arising. The structural problems of the economy were exposed further by the crisis.

China's exposure to the global financial crisis is moderated by its lack of direct exposure to the subprime mortgage issue. The economy applies numerous restrictions on capital flows, particularly on outflows of capital. Limiting the ability of the Chinese citizens and private firms to invest abroad, the policies compel them to invest domestically. Even if these restrictions could be evaded by some who invested abroad in subprime mortgages, the extent of this investment is unclear and is probably relatively small.

Although the People's Republic of China's (PRC) government made a bulk of foreign investment overseas owing to China's massive foreign currency reserves, most of these investments went to safe, low-yielding instruments, such as the US Treasury securities. PRC officials are cautious and conservative by nature in their investment strategies; they are unlikely to invest in mortgage-backed securities and other innovative financial instruments, which they do not know or may be viewed as speculative.

While China's direct exposure to subprime mortgages seems to have been limited, the impact of the subprime mortgage problem did affect China via its harsh impact on the economies of China's two largest trading partners: the US and the EU. Economic downturn in the economies throughout the world made the Chinese economy slow down significantly due to their lower purchases of Chinese exports, which began to decline. So did the FDI inflows.

The Chinese government's economic policy reaction to mitigate the impact of the global financial crisis includes stimulating household consumption effectively, reducing the pressure of unemployment and diversifying China's foreign exchange portfolio. China was one of the first major economies to recover from the spillover effects of the crisis. Thus, its economic policy responses, particularly those of the PBC are assumed to have been effective.

Before the global financial crisis, the PBC was a central bank in a transition economy. Financial liberalization was incomplete, and the Bank applied both direct and indirect tools. During the crisis direct controls dominated as risk management solutions, and further market-oriented principles were replaced by administered interest rates and exchange policy [28].

Due to the crisis, direct government intervention intensified, which continued to limit the PBC and even threatened China's market-oriented reforms. Nonetheless, in the frame of the fiscal stimulus package, the Chinese property market quickly returned to its previous growth after the decline in 2007 and 2008 attracting a great volume of commercial loans. With low deposit interests and in the lack of diversified investment products, household savings were continuously invested in the property and stock markets, which made government intervention only rarely successful [28].

Nonetheless, the global financial crisis challenged the Chinese central bank to such a degree that explicit government intervention seemed to threaten China's continuing market-oriented reforms. While demonstrating proactive risk management, the bank remained constrained by political domination. The Chinese government has intensified direct controls over both the central bank and wider financial markets.

The global crisis called for cross border cooperation, and the internationalization progress continued toward further Asian regionalization. To offer liquidity support, different institutions were established including a Credit Guarantee and Investment Fund (CGIF), an Asian Development Bank (ADB), the Associations of Southeast Asian Nations "ASEAN+3" and Macroeconomic Research Office (AMRO). The Chiang Mai Initiative (CMI) has evolved from a bilateral US dollar-denominated exchange arrangement to a multilateral facility [28]. The establishment of the Asian Infrastructure Investment Bank (AIIB), which has attracted economies outside Asia as well, indicates that China has reached a new stage of financial integration.

Owing to China's crisis management, the economy was able to achieve its GDP growth targets for 2008 and 2009. In January 2010, the GDP growth rate of over 10% exceeded that of previous years on average. The Shanghai Stock Exchange Composite Index rose by 45.0% and retail sales rose by 14.8% on a year-on-year basis. Industrial output increased by 7.3% and investment in real estate by 6.4% [29]. With regard to these figures, Chinese policy responses to the global financial crisis seem to be effective.

Compared with the US and the UK, severe housing collapses or banking failures did not hit Japan during the global crisis. Japanese banks were less innovative and continuous recapitalization rather than profitability created a sound financial environment. The Japanese stock market indicated the external instability by gradual sustained decline. Fiscal stimulus and monetary expansion were employed to deal with the global crisis. Owing to its over-dependence on exports, thus being vulnerable to external shocks Japan and its underperformed peers and emerging countries in Asia in 2008 and 2009. As foreign banks largely reduced their investment in the interbank market and their holdings of Japanese stocks negative outward portfolio investments increased from 2007 while inward portfolio investment turned negative in 2008 and 2009 leading to a credit crunch on Japan. Japan's economy turned into a serious economic recession from late 2008.

As Japan still suffered huge losses, the BoJ was required to pursue unconventional measures. Regarding these points, the selected crisis management solutions were similar, including interest rate cuts, clarified commitment and asset purchase programs, but monetary easing was more aggressive during the global financial crisis.

As for the timing, the BoJ was late to deal with the bubble economy and its impacts, although it acted proactively mainly in cross border cooperation. Regarding the independence of the central bank, it can be stated that in a financial crisis, a central bank is likely to have to sacrifice at least part of its independence. This was the case with the BoJ while it increased its direct control over financial markets [28]. As the bankers' bank, by taking over credit risks from the private sector, the BoJ directly affected resource distribution. By providing commercial loans to contracted institutions, the Bank ensured liquidity while intensified its on-site examination and off-site monitoring in order to assist to improve liquidity risk management at the firm level. The key crisis management solutions can be summarized as ample liquidity provisions, support for credit market functioning, macroeconomic stimulus and injections of public capital and elimination of balance sheet uncertainties [30]. Under the crisis challenge, the Bank's

role as a government-driven monetary authority further strengthened and so did its function to promote the government's strategy.

11. Results and conclusions

During the global crisis, most banks did not limit themselves to the orthodox policies for crisis management, but explored new unconventional monetary policies.

The ECB does not have a strong financial stability mandate that could justify intervention. Whereas the euro area is integrated monetarily, banking systems are still national. It implies that the member states are vulnerable to the cost of banking crises.

It is likely that the wrong diagnosis of the reason for the crisis led to austerity measures and later to the austerity spiral. In the author's opinion, austerity might be a tool as long as it counterbalances profligacy. Generalized austerity only serves to deteriorate the sovereign and private debt crisis. If the main goal was to reassure the financial markets so that they would trust in the Eurozone again, the new European economic governance and budgetary rigor was effective.

With more frequent cross border financial crises, central banks have had to increase regional and international financial cooperation.

Having studied a wide range of relevant literature, the author states that there is still a little consensus regarding the definition of financial stability. It is agreed that systemic risk means a strong threat to financial stability, which was proved by the global financial crisis. Risks with extended negative effects beyond any institution or economy are regarded as contagion. The nature of the risk is determined by the degree of probability on which a certain risk will exert a systemic aftermath [28]. Such a hypothesis refers to a risk allocation as risk with domino effects. Systemic risks have contagion effects at the core with different forms of externalities. Transmission mechanisms are important factors in understanding systemic risk. In interdependent banking networks, the strong interconnectedness will increase the chance of a systemic risk, while the weak linkage will reduce its occurrence.

To deal with systemic risk, both private and public solutions can be viewed as inevitable. Preventive solutions focus on reducing risks before they undermine banks by monitoring their management, capital, solvency, liquidity standards are public resolution techniques [28].

Central banks operate different policy instruments during financial crises and at other times, but their tasks are similarly related to financial stability.

The recent crisis has forced changes that have reshaped the role of central banks, challenging the ways in which they continue to commit to their orientations.

Systemic consolidation and restructuring require the renewal of the regulatory framework. Due to the interconnectedness of banks and cross border activities, it is rather difficult to manage toxic assets and clean the banks' balance sheets. The establishment of the new EU

supervisory system will contribute to preventing future financial crises, which highlights the importance of multilateral surveillance of economic policies.

The global imbalances are inevitable to reduce including China's exchange rate policy and its huge surpluses in savings.

The crisis has confirmed the importance of transparency with regard to the financial markets; most central banks have been required to improve their communications and transparency, the optimal level of which is difficult to determine due to the discretion granted by law.

Governments are confronted with many types of crises with serious economic and social impacts. Managing crises is their responsibility as they play a vital role in building the resilience of their economies and societies.

Better understanding of hazards and threats enables better risk assessment to more efficient prevention policies and mitigation programs. As crises continue to evolve, managing techniques continue to adapt to dealing with the unprecedented.

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