**Indian Institute of Management Calcutta**

**Working Paper Series**

**WPS No. 803**
**December 2017**

# Recent Trends in Macro-financial Policies: The Toolkit and Early Warnings

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**Abstract:** Since the brewing up of the global financial crisis, macro-financial policies have entered the toolkit of macroeconomic policy makers in a big way. In particular, Central bankers all over the world have taken a keen interest in adopting macro-financial tools for containing systemic financial risks. In some sense the relationship b(r)-Cieen macro-financial policies and monetary policy is complementary in nature. In this backdrop this paper looks into four related issues: (a) meaning or understanding of what systemic risks mean; (b) measurement of financial linkage; and (c) policy tools for containing systemic risks; and (d) development of early warning exercise. Admittedly, identification of systemic risks are far more difficult than adopting traditional counter-cyclical stance of the standard monetary and

Third, even in the finance literature there is emphasis on the invisible hand via the application of efficient market hypothesis whereby stock prices reflect and incorporate all relevant information. Implicitly therefore the role of financial policies would turn out to be superfluous (Fama, 1970).

The situation changed quite drastically after the emergence of the global financial crisis. There was

factors has been costly. Accordingly, there been an enkindling of interest in handling financial risks within the macro policy structure.[3] What have been the contours of such emergence of interest? How do we measure the build-up of system-wide risk in the financial sector? How do we mitigate such risks? The present paper delves into some of these questions. Two issues are important in particular: (a) how to measure the financial sector linkage / vulnerability and the associated systemic risks? and (b) having identified the sources of financial vulnerability, how to mitigate them?[4]

The rest of the paper is organized as follows. Section 2 discusses the context for taking macro-financial policies much more seriously. While issues relating to identification and measurement of systemic risks are taken up in section 3, section 4 looks into the specific measures that are applied to mitigate such risks. Section 5 takes up the issue of early warning exercise in this context. Section 6 concludes.

## 2 Taking Macro-financial policies seriously: The Context

### *The Existing Literature*

Notwithstanding the negligence of financial factors in economic policies, there has been no dearth of financial crises both in the developed economies as well as emerging

specific, displacement, overtrading, monetary expansion, revulsion and discredit characterized the nature of capitalist economies. Minsky's "financial instability hypothesis" argued that bank loans tend to go through three distinct stages, viz., the Hedge, the Speculative and the Ponzi stages. In the hedge stage both banks and borrowers are cautious whereas in the speculative stage banks begin to extend loans in which the borrower can only afford to pay the interest. In the Ponzi stage, even payment of interest becomes difficult. Nevertheless, because of the reasons referred to earlier, such contributions to the emergence of financial crises have mostly been relegated to the background and have hardly been included in mainstream literature on economic policies.

While financial factors have been largely neglected in the mainstream literature, there have, however, been some notable exceptions in recent times. Illustratively, Bernanke and Gertler (1989) have tried to incorporate the so-called financial accelerator and established

Later, Kiyotaki and Moore (1997) constructed a model in which durable assets play a dual role both as factor of production as well as collateral for loans. The dynamic interaction between credit limits and asset prices in

weighted sum of bank's assets (with weights reflecting the extent of riskiness of the assets).[6] Subsequently these capital adequacy norms were extended to include capital for accommodating risks covering credit, operations and markets to form what is commonly known as Basel II norms.

Notwithstanding such policies of capital adequacy norms and deposit insurance the sub-prime crisis of US residential mortgage market that started in 2007 did turn into a full-fledged global financial crisis and went on to haunt the global economic and financial scenario till date. In fact, it is now widely believed a single-minded focus of many of the central banks on inflation and associated low inflation rate and low output variability, a false sense of complacency to macroeconomic policy makers in general and central bankers in particular with respect to financial stability and growth. In retrospect it appears that there were five elements of such a complacent policy environment: (a) gearing of monetary policy towards inflation targeting; (b) exclusion of stabilization of asset prices and exchange rate from the standard macroeconomic policy space; (c) accepting the contribution of low inflation to low output variability; (d) relegating fiscal policy to the back seat; and (e) an implicit assumption of efficiency in the financial markets whereby banks, shadow banks (like hedge funds, ass5a wherebyte(whe)6( )-139ptarkeial cris

macro-prudential policymakers relied on soft tools such as communication and market discipline to influence the behaviour of individuals and institutions and to ensure financial stability. The global crisis changed this view and a consensus emerged that hard policy measures (e.g., higher capital requirements) were required to tackle systemic risk concerns. *Consequently, macro-prudential policymakers have begun to consider the need for policy instruments to build resilience, initially within the banking sector,*

employment and welfare. Increasingly, analysis of financial sector vulnerabilities has turned out to be extremely important for stability of an economy including its real sector. Seen from this standpoint, the policy tool kit of an economic policy maker needs to include policies to handle such risks. It is, thus, no wonder that in the aftermath of the global financial crisis, there has been spurt in research as well as policy interest in macrofinancial policies.

***Relation with Monetary Policy***

Before we proceed further it is important to understand the relationship between such macrofinancial and monetary policies. In no way macrofinancial policies negate the role of monetary policy rather, macrofinancial policies complement the role of monetary (and in

***Global Initiatives***

A major problem ial system is global in its reach and impact whereas its regulation is local / national. This was one of the key lessons from the global financial crisis that the world has learnt. In fact, much of the initiatives for macrofinancial policies came from a supra-national level. In its first meeting in 2009, the G20 launched a programme of financial sector reforms to increase the resilience of the global financial system. This was to be coordinated through the Financial Stability Board. Subsequently in November 2010, G20 Leaders called on the FSB, the IMF and the BIS to do,

work on macroprudential policy frameworks, including tools to mitigate the impact of excessive capital flows The G20 further

should elaborate on the progress achieved in identification of best practices, which will be the basis for establishing in the future international principles or guidelines on the design and This has been continuously emphasised by the G20 in its various summits.[7] Notwithstanding such emphasis, the third e (released on 3 July 2017) noted uneven progress in implementation across the four core areas: (a) building resilient financial institutions (such as, Implementation of Basel III capital and liquidity standards); (b) ending the fallacy of the idea of too-big-to-fail (c) making derivatives markets safer; and (d) transforming shadow banking into resilient market-based finance (FSB, 2017).

## 3 Measuring Financial Linkages

Birth and death of a firm are essential elements of the Schumpeterian process of

no exception to this general rule. However, two features of financial firms make their bankruptcy particularly costly. First, these firms are highly leveraged and hence their bankruptcy costs are higher. Second, these firms are often hugely interlinked with other financial firms; as a consequence, these firms become hugely interlinked (and often too big to fail). Seen from another angle, such financial linkage

the extent of systemic risk and the related macro-financial risks. Thus, measurement of the extent of interlinkage among these firms is of paramount importance.

Besides, in the traditional textbook setting of macroeconomics, financial intermediaries are largely seen as conduits of moving finance from households (and in some case rest of the world) to firms (and to government). This conceptualization of financial intermediaries largely neglects the intra-sectoral flows within the financial intermediaries. Over the years such intra-sectoral flows within the financial intermediaries have experienced a quantum jump. Besides, there are number of advanced countries where GDP on account of finance too has registered a huge spurt. A large financial sector (perhaps disproportionate to the real sector of the economy) requires that the macro-financial risks need to be taken seriously.

In fact, following the global financial crisis measurement of the extent of financial linkage and the consequent measurement of the extent of systemic risk has emerged as a major research area. While a full treatment of various models is beyond the scope of this paper, we confine our attention to three major methods for their ease and universality of application - (a) network approach; (b) co-VaR model; and (c) distress dependence matrix (IMF, 2009).[8]

***Network Approach***

Any network analysis begins with the construction of a matrix of inter-institution exposures that includes *gross* exposures among financial institutions. Depending upon the degree of openness - such a matrix can be constructed domestically or at cross- country levels. Even if banks used to report their broad exposures to the regulators, granular data is often difficult to get. However, as and when banks start collecting these data, even if these are not made public, propriety data can be used to arrive at a structure of the network to understand the extent of exposure and vulnerability within it (Figure 2).

[8] For example, Bisias, Flood and Lo (2012) in a US Treasury paper surveyed 31 quantitative measures of systemic risk.

**Figure 2: Network Analysis: A Diagrammatic Structure**

**Figure 3: Network structure of the Indian banking system**



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1% chance that the value of the asset will drop more than Rs. 100 crore over any month. However, such a risk measure does not necessarily reflect the potential contribution of the institution to overall systemic risk particularly when the particular institution has exposure to others. To get rid of this lacuna, Adrian and Brunnermeier (2008 / 2014) proposed a new measure called the CoVaR that intends to capture "tail dependency and includes negative spillover dynamics in times of crises". The intuition behind the CoVaR model is simple

## Table 1 Distress Dependence Matrix: Pairwise conditional probability of distress

| **July 1, 2007** | Citigroup | Bank of America | JPMorgan Chase & Co. | Wachovia Bank | Washington Mutual | Goldman Sachs | Lehman Brothers | Merrill Lynch | Morgan Stanley | AIG | ***Row Average*** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Citigroup | 1.00 | 0.09 | 0.08 | 0.08 | 0.05 | 0.06 | 0.06 | 0.06 | 0.06 | 0.05 | **0.16** |

These default probabilities have calculated for three specific dates: (i) July 1, 2007; (ii) August 15, 2008; and a month before (August 15, 2008); and September 12, 2008. These probabilities indicate the state of systemic risks in the financial sector. Illustratively, the grand average of default probabilities has gone up from 0.23 in July 1, 2007 to 0.44 in August 15 2008, thereby indicating the deterioration in the brewing up of systemic risks in the financial system. More interestingly, in view of the fact that the probability of default of any other bank conditional on Lehman falling into distress went up substantially from 0.22 on July 1, 2007 to 0.37 on September 12, 2008 (column-average Lehman), it seems that the distress dependence matrix signalled that the market expected that a default of Lehman would cause significant disruptions to the system.

## 3 Macro-prudential Policies and Systemic Risks

Having identified (and perhaps measured) systemic risks, the next and the more key question is: how to mitigate such risks? Put differently what are the different policies that can be adopted to mitigate such risks? Before we seek for a menu of the policies that could be adopted, it is imperative to recognize that the standard monetary and fiscal policies are quite impotent in handling such risks. Hence, in the days following the global financial crisis this has been an issue of intense discussion both in the policy circles as well as the academia. Generically, these policies are being referred to as macro-financial or macro-prudential polices.

What is the rationale for macro-prudential policies then? IMF (2013) emphasised the

financial cycle should be of a key focus.[14] Fourth, stress tests of the financial system in general and banking in particular must have a macroprudential dimension. Fifth, macroprudential policy needs to be complementary

However, the brewing up of global financial crisis in 2007 changed the scenario and the motivation of EWE. Beginning in 2009, the IMF and the Financial Stability Board (FSB)

within the globa he EWE is intended to make an assessment of the low-probability but high-impact risks to the global economy (i.e., both advanced as well as emerging market economies) and devise appropriate policies

in a number of areas. Many senior policymakers are in practice unaware of the main takeaways from the EWE due to the restricted attendance and rather limited debriefing by the participants .... and it is difficult to find many concrete examples of follow up ...." (Robinson, 2014).[16]

| Table 4: Sectoral and Market Vulnerabilities in EWE | |
|---|---|
| **Source** | **Vulnerabilities** |
| 1. External Sector Risks & Vulnerabilities | Cross-border capital flows<br>External financing gaps<br>External imbalances<br>Probability of an external crisis<br>Exchange rate misalignments |
| 2. Fiscal Risks and Vulnerabilities | Rollover and financing risks<br>Sensitivity of public sector debt to adverse shocks<br>of sovereign default risk<br>Contagion risk from fiscal distress<br>The required scale of fiscal consolidation<br>Probability of a fiscal crisis |
| 3. Corporate Sector Risks and Vulnerabilities | Leverage, liquidity, and profitability<br>Stock valuation and default probabilities |
| 4. Asset Prices, Market Valuation and Bubble Spotting | Real Estate Bubbles<br>Feedback loops between NPLs and<br>Equity Market Bubbles<br>macroeconomic performance |
| 5. Financial Market Risk Attitudes | Global Financial Stability Map<br>Asset and Market Volatility |
| Source: IMF (2010) | |

## 6 Concluding Observations

In the aftermath of the global financial crisis, macrofinancial / macroprudential policies, aiming at maintaining and ensuring financial stability and geared towards mitigating systemic risks, have entered the toolbox of the policy maker. In some sense the relationship between macrofinancial policies and monetary policy is complementary in nature. Admittedly, identification of systemic risks is far more difficult than adopting traditional counter-cyclical stance of the standard monetary and fiscal policies. Methodologies of

[16] Initiated in 2011, recent Spillover reports of the IMF tried to address some of these limitations. These were initially focused on the external effects of domestic policies in five systemic economies (viz., China, the euro area, Japan, United Kingdom and the United States); since 2014 these Spillover reports shifted their attention to a more thematic approach.