*Journal of International Business and Economy* (2013) **14**(1): 87-117 (31 pages)

JIBE
Journal of International Business and Economy

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# BANKING SYSTEM RESILIENCE AND FINANCIAL STABILITY – AN EVIDENCE FROM INDIAN BANKING

## ABSTRACT

This paper while emphasising the importance of the concept of financial stability in wake of recent global financial crisis in particular and other (banking and financial) crises in general attempts to highlight the significance of the soundness of banking sector in emerging economies where banking sector constitutes a lion's share in the financial system. This study examines banking sector stability by constructing a micro vector auto regressive (VAR) model and establishes the significance of the inter-relatedness of the bank-specific variables such as; Liquidity, Asset Quality, Capital Adequacy and Profitability. Further, the paper offers a substantive review of literature on the concept of financial stability in backdrop of the ongoing definition debate for financial stability. A significant contribution of this study is that, by employing the most appropriate key determinants of banking sector soundness, the paper constructs a recursive micro VAR model to explain the interdependence and comovement of the banking stability covariates in a bank-dominated financial system that aids in understanding the dynamics of financial stability of emerging economies

*Key Words: financial stability, instability, banks, financial institutions*

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First Received: Mar. 23rd 2012
Final Revision Accepted: Mar. 27th 2013

## INTRODUCTION

En route, the robust growth in financial markets and recurrent occurrences of financial distress during the past two decades, financial stability has turn out to be an increasingly important objective in economic policymaking and has attracted renewed focus, mainly because of the dynamism of financial liberalisation and globalisation. Financial liberalisation has led to the emergence of financial conglomerates, which cut across not only various financial sectors such as banking and insurance, but also a number of countries and have led to massive cross-border capital flows. Such flows are often intermediated to speculative activities such as real estate and stock markets during periods of excessive capital inflows leading to asset price bubbles posing serious risks to the balance sheets of financial institutions as well as non-financial corporations.

Moreover, volatility in capital flows is manifested in sharp movements in exchange rates causing an adverse impact upon the balance sheets of residents because of large devaluations. Large devaluations can cause serious currency mismatches (for e.g. Asian financial crisis) resulting in large costs in terms of output and employment losses. In view of this reasoning, maintenance of financial stability has emerged as a key objective especially in the case of emerging economies as they are frequently forced to borrow in foreign currencies. Absolutely, financial stability and macroeconomic stability are intricately related. Financial stability can be vulnerable even if there is price stability and macroeconomic stability and hence cannot be taken for granted. Moreover, it is also observed that a threat to financial stability anywhere in the world is potentially a threat to financial stability everywhere. In view of that, financial stability has to shift from being an implicit variable to an explicit variable of economic policy.

This paper attempts to find some ripostes for some of the related issues of deliberation such as; does financial stability require the soundness of institutions, the stability of markets, the absence of turbulence and low volatility? and to what extent the soundness of banking sector in the case of emerging economies can help financial system. This paper is one among the evolving body of literature that underscores the significant relationship between banking system resilience and financial stability. The endeavour in this study is to analyse and understand the concept and definition of financial stability and in that backdrop analyse the banking system resilience in the case of emerging market economy like that of

India. An assessment of financial stability can be profound with quantitative references to critical conditions at which the financial system would not function healthily.

This paper begins by presenting in Section 2, the theoretical framework illustrating the recent approaches on defining and analysing financial stability placing the banking system at the epicentre of analysis. This study analyses more specifically how banking system resilience can augment financial stability in emerging market economies like that of India that successfully came out of the recent global financial crisis. The methodology involving the data and its sources and research design explaining the empirical framework and estimation of the micro VAR model of banking stability is expounded in Section 3. The results of the analyses with discussion on the findings are enunciated in Section 4, and the conclusion and policy implications are offered in Section 5.

## FINANCIAL STABILITY – THEORETICAL FRAMEWORK

### Financial stability – The definition debate

While monetary stability is commonly referred to stability of price level, price stability is often thought of as an environment where inflation does not materially affect the economic decisions. Price stability does not refer only to individual prices, but prices of an aggregate basket of consumer of goods and services. On the contrary, financial stability is not tractable to any commonly agreed definition. Indeed financial stability is often understood in layman terms as the absence of financial instability resulting from banking crisis or even extreme financial market volatility or such related financial shocks. Moreover, unlike price stability, financial stability cannot be instantly measured, modelled, or forecast.

Notwithstanding its extensive use, financial stability is difficult to define let alone measure. A sound understanding of financial stability necessitates a conceptual framework (Houben, Kakes, and Schinasi, 2004). In understanding financial stability, the first limitation has been yet there is no widely accepted model or analytical framework for assessing the financial stability as this it is still in its infant stage of development and practice, as compared with—for example—the

analysis of monetary and/or macroeconomic stability (Schinasi, 2004). The concept of financial stability is nebulous with no commonly accepted definition. However, there have been some attempts to define financial stability. Houben, Kakes, and Schinasi, (2004) considering financial stability as a continuum changeable overtime and consistent with multiple combinations of its constituent elements, define it as the ability to help the economic system allocate resources, manage risks and absorb shocks.

The best approach according to Allen and Wood (2006) is to define the characteristics of an episode of financial instability first and then define financial stability as a state of affairs in which episodes of instability are unlikely to occur. Davis (2003) identifies three generic types of financial instability. The first is centered on *bank failures*, typically following loan or trading losses, the second involves extreme *market price volatility* after a shift in expectations and the third being the one that is linked to the second, involves protracted collapses of market liquidity and issuance.

Schinasi (2004) lists the key principles for defining financial stability as; (i) financial stability is a generic concept, embodying the varied aspects of the financial system. (ii) Financial stability should not only imply that financial system should fulfill its role of efficient allocation of resources and risks, mobilizing savings, and facilitating wealth accumulation, development, and growth but it should also entail that the systems of payment throughout the economy function smoothly. (iii) Financial stability relates not only to the absence of financial distress but also to the capability of the financial system to limit, contain, and deal with such situations. (iv) Financial stability be understood in terms of the potential consequences for the real economy, and (v) financial stability be thought of as befalling along a continuum. Borio (2003) and others take a macro prudential viewpoint and state financial stability in terms of limiting risks of significant real output losses associated with episodes of financial system-wide distress.

Mishkin (1994) suggesting a more information-based definition states that financial instability occurs when shocks to the financial system interfere with information flows so that the financial system can no longer do its job of transferring funds to those with productive investment opportunities. On the other hand, Crockett (1997) proposes that financial stability refers to the stability of key institutions and markets that go to make up the financial system. Further,

Issing (2003) and Foot (2003) have suggested that financial stability is associated with financial market bubbles, or more generally, with volatility in financial market proxies as these bubbles impair financial markets efficiency; however, in and of themselves, they do not constitute a defining characteristic of financial fragility, and more generally financial instability. Suggesting institutionally oriented definitions, Haldane, Hall, Saporta, and Tanaka (2004), among others, have proposed that financial instability could be defined as any deviation from the optimal saving-investment plan of the economy that is due to financial imperfections in the financial sector. Similarly, Goodhart, Sunirand, and Tsomocos (2004, 2005, 2006a, 2006b) and Tsomocos (2003) offer definitions for financial stability that hinges upon the welfare effects on the economy and distributional consequences arising during periods of financial instability.

To sum-up, the information-based definition of Mishkin (1994) and others and the institutionally oriented one offered by Crockett (1997) and Haldane, Hall, Saporta, and Tanaka (2004) encompass essential aspects of financial stability. However, they do not capture the welfare and distributional effects, instead highlight the inefficiency and the asset price volatility that a financially unstable regime generates, and hence fail to qualify to be applied for welfare analysis. Hence, it is opined that the definition should encompass the interaction of monetary and regulatory policy, and financial instability and that can be studied in the *continuum* rather than as an extreme and discontinuous phenomenon.

The definition needs to be sufficiently flexible to encompass most of the recent episodes of financial instability and can explain a systemic financial crisis of the economy that can be reinterpreted as a case of equilibrium non-existence. Accordingly, this paper takes into consideration a constructive viewpoint and defines financial stability as a state of affairs in which the financial system can; achieve efficient allocation of resources; assess and manage financial risks; absorb the emerging shocks; ensure smooth payments and remittances; enhance equilibrium by managing asset and price volatility; and lead the economy towards benefits of economic welfare.

**Global financial crisis and financial stability**

The recent global financial crisis, also termed as 'the great recession' which resulted into a grave banking panic and threw most of the economies of the world into severe recession, is mostly attributed to several factors such as; Increasing global imbalances, build-up of excessive leverage, mismatches in financial intermediaries, regulatory and supervisory system loopholes, complex financial products carved out of mindless financial innovations. The crisis set off unprecedented panic and uncertainty about the extent of risk in the system thereby causing sudden and massive break down of trust across the entire global financial system. While banks tended to hoard liquidity, the credit, bond and equity markets witnessed huge setback resulting in massive deleveraging that hammered down asset prices, setting off a vicious cycle.

While a few of the monolithic global financial giants collapsed, quite a few of such venerable financial institutions came to the brink of collapse. Although the epicentre of the crisis was in the advanced economies particularly originating from the US, it soon proliferated from the financial sector to the real sector in advanced economies, concomitantly stretched geographically to the emerging market economies, and rapidly engulfed the global economy. In view of the above occurrences, Post-crisis, financial stability has turned out to be the central objective for regulators across the globe. Moreover, researchers and policy makers should also review and draw lessons from the varied episodes of financial turmoil for further strengthening financial stability in their economies (see Table 1).

**Table 1: Some notable financial crises due to systemic risk**

| Year | Episode | Main feature |
|---|---|---|
| 1974 | Herstatt (Germany) | Bank failure following trading losses |
| 1979-89 | US Savings & Loan crisis | Bank failure following loan losses |
| 1987 | Stock market crash | Price volatility after shift in expectations |
| 1990-91 | Norwegian banking crisis | Bank failure following loan losses |
| 1991-92 | Finnish and Swedish banking crises | Bank failure following loan losses |
| 1992-96 | Japanese banking crisis | Bank failure following loan losses |
| 1992-93 | Exchange Rate Mechanism crises | Price volatility after shift in expectations |
| 1995 | Mexican crisis | Price volatility after shift in expectations |
| 1997-98 | Asian crises | Price volatility after shift in expectations and bank failure following loan losses |
| 1998 | Russian default and Long Term Capital Management (LTCM) | Collapse of market liquidity and issuance |
| 2000 | Argentine banking crisis | Bank runs following collapse of currency board |
| 2000-01 | Turkish banking crisis | Bank failure following loan losses |

| | | |
|---|---|---|
| 2001 | Bursting of dot-com bubble | Speculations concerning internet companies crashed |
| 2007 | Northern Rock crisis in UK | Bank failure due to funding and liquidity problems |
| 2008-10 | Global Financial Crisis | Collapse of global financial institutions |
| 2010 | European sovereign debt crisis | Failure of PIIGS (Portugal, Ireland, Italy, Greece, Spain) countries in managing sovereign debts and fiscal prudence |

Source: Compiled by author from various sources

The frequency of incidence of financial crisis has been the highest over the past three decades or so (see Table 2). Financial crises have impacted both advanced as well as emerging market economies adversely in varying degrees.

**Table 2: Frequency of financial crisis: 1973-2007**

| Period | Banking Crisis | Currency Crisis | Sovereign Debt Crisis | Twin Crisis | Triple Crisis | Total No. of Crises |
|---|---|---|---|---|---|---|
| 1970s | 4 | 26 | 7 | – | – | 37 |
| 1980s | 40 | 74 | 42 | 11 | 4 | 171 |
| 1990s | 73 | 92 | 7 | 27 | 3 | 202 |
| 2000s | 7 | 19 | 8 | 4 | 3 | 41 |
| Total | 124 | 211 | 64 | 42 | 10 | 451 |

Source: Laeven and Valencia (2008)

An assessment of the incidence of financial crises over the past one and a half century reveals that although crisis occurs without warning, the incidence can essentially be explained in terms of the prevailing macroeconomic conditions, the financial regulatory regime, currency regime, fiscal discipline and global capital and trade flows.

**Global measures for financial stability**

Explicit pursuit of financial stability is one of the most significant lessons from the recent global financial crisis. While multilateral standard setting bodies are placing in revised norms for worldwide regulation, countries across the world are implementing new regulatory frameworks for ensuring financial stability. The Financial Stability Board (FSB), a global body established to address financial system susceptibilities and to drive the development and implementation of strong regulatory, supervisory, and other policies in the interest of financial stability is the successor to the Financial Stability Forum (FSF), which was set up by the G-7 in the wake of the Asian crisis in 1999. FSB has been set up with an expanded

membership (drawn mainly from the G-20). While FSF was exclusively focused on developed financial centres, FSB is more broadly represented.

In US, the major objectives of the legislation Restoring American Financial Stability Act of 2010 are stated as "to promote the financial stability of the United States by improving accountability and transparency in the financial system, to end 'too-big-to-fail', to protect the American taxpayer by ending bailouts, and to protect consumers/investors from abusive financial services practices". In the case of UK, The UK Financial Services Authority (FSA) is envisaging stipulation of stricter capital rules than those proposed by the Basel Committee on Banking Supervision (BCBS), particularly for systemically key banks. In a joint initiative with Financial Reporting Council (FRC), the FSA is proposing for regulatory scrutiny of the relationship between bank auditors and banks to ensure audit independence with regard to assigning valuations, particularly to complex financial instruments. The UK Stewardship Code developed by the Financial Reporting Council (FRC) is the first of its kind setting out good practices on the engagement of institutional investors with companies.

In the Eurozone, while the European Central Bank (ECB) is in charge of monetary policy, interventions on the foreign exchange markets and international and European cooperation, there are separate mechanisms in place for monitoring and assessment of financial stability. Presently, the Committee of European Banking Supervisors (CEBS) has been tasked to provide regular bank sector analysis, perform assessments on risks and vulnerabilities on the banking sector, and report its outcomes periodically to the European Union political institutions.

However, the EU has proposed the establishment of European Systemic Risk Board (ESRB) responsible for macro-prudential supervision in the EU with the important agenda being that of the "Systemically Important Financial Institutions" (SIFIs). India too has constituted an apex Financial Stability and Development Council (FSDC) for institutionalizing the mechanism for maintaining financial stability and resolving inter-regulatory disputes. The Reserve Bank Governor heads a sub- committee of the Council with the mandate to look after financial stability and inter-regulatory coordination.

**Financial stability and banking sector**

A stable macroeconomic environment is essential for banking sector stability, mainly because uncertainty about macroeconomic policies and wavering fundamentals, such as economic growth and inflation, renders it challenging for banks to assess credit risks accurately. Subdued economic growth, due to macroeconomic uncertainty or for other reasons, may impair bank soundness as it reduces the debt servicing capacity of firms and households.

Particularly in emerging economies, at present, the banking sector is by far the most important part of the financial system in all and is, therefore, also the main source of risk for financial stability. This is all the more so because the lack of well-functioning equity markets confronts banks with relatively high credit risks, as bank credit is a must (to some extent) to substitute for equity. In their surveillance of the financial system, central banks, targeting financial stability, mostly employ a wide range of tools. More often, pure financial soundness indicators widely used, but of late, structural types of models that explicitly include behaviour of economic agents have been developed by central banks for understanding financial stability.

**Financial soundness**

One of the important sources of vulnerability that can affect financial stability and lead to a financial crisis can be the weakness (such as a high level of short-term debt) in the financial structure of the economy i.e., the composition and the size of the assets and liabilities on the balance sheet. A financial crisis follows when the demand for financial assets of one or more sectors plummets and consequently the banking system fails to meet the outflows or may be unable to attract new financing or roll over existing short-term liabilities. In this direction, financial soundness matters much during the financial crisis because it gives some indication of how likely it is that financial problems would be transmitted into the real economy (see Table 3).

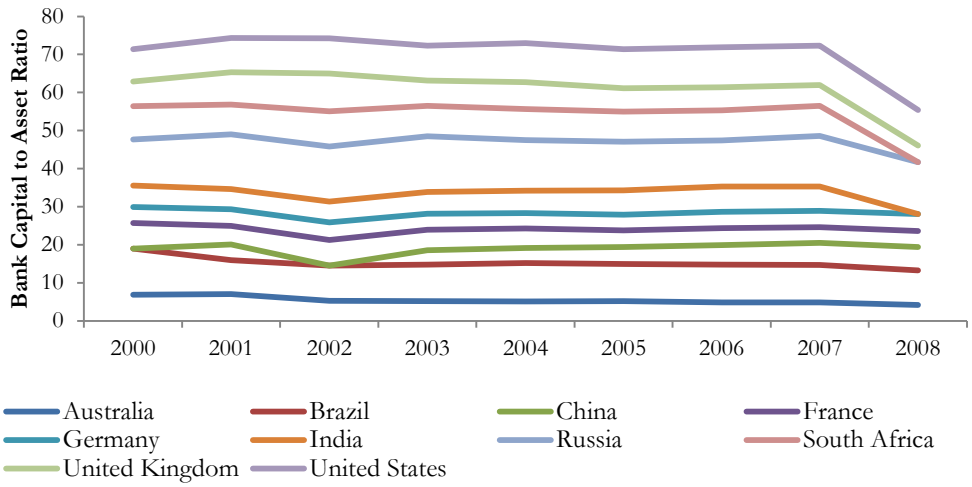
**Table 3: Core financial soundness indicators of select countries**

| | Australia | France | UK | USA | Russia | China | India | Brazil | South Africa |
|---|---|---|---|---|---|---|---|---|---|
| **Capital Adequacy Ratio [CAR]** | | | | | | | | | |
| 2005 | 10.2 | 11.3 | 12.8 | 12.9 | 16.0 | 2.5 | 12.8 | 17.9 | 12.3 |
| 2006 | 10.3 | 10.9 | 12.9 | 13.0 | 14.9 | 4.9 | 12.3 | 18.9 | 12.3 |
| 2007 | 10.1 | 10.2 | 12.6 | 12.8 | 15.5 | 8.4 | 12.3 | 18.7 | 12.8 |
| 2008 | 11.3 | 10.5 | 12.9 | 12.8 | 16.8 | 12.0 | 13.0 | 18.2 | 13.0 |
| 2009 | 11.9 | 12.4 | 14.8 | 14.3 | 20.9 | 11.4 | 13.2 | 18.8 | 14.1 |
| 2010 | 11.4 | 12.3 | 15.9 | 15.3 | 18.1 | 12.2 | 13.6 | 17.8 | 14.9 |
| **Non-Performing Assets [NPA]** | | | | | | | | | |
| 2005 | 0.6 | 3.5 | 1.0 | 0.7 | 2.6 | 8.6 | 5.2 | 3.5 | 1.8 |
| 2006 | 0.6 | 3.0 | 0.9 | 0.8 | 2.4 | 7.1 | 3.3 | 3.5 | 1.1 |
| 2007 | 0.6 | 2.7 | 0.9 | 1.4 | 2.5 | 6.2 | 2.5 | 3.0 | 1.4 |
| 2008 | 1.3 | 2.8 | 1.6 | 3.0 | 3.8 | 2.4 | 2.3 | 3.1 | 3.9 |
| 2009 | 2.0 | 3.6 | 3.5 | 5.4 | 9.5 | 1.6 | 2.3 | 4.2 | 5.9 |
| 2010 | 2.2 | 4.2 | 4.0 | 4.9 | 8.2 | 1.1 | 2.4 | 3.1 | 5.8 |
| **Provisions to NPA s** | | | | | | | | | |
| 2005 | 17.6 | … | 54.0 | 154.8 | 176.9 | 24.8 | 60.3 | 179.7 | 59.4 |
| 2006 | 17.6 | … | 54.6 | 134.8 | 170.8 | 34.3 | 58.9 | 179.9 | 54.5 |
| 2007 | 18.3 | … | … | 91.7 | 144.0 | 39.2 | 56.1 | 181.9 | 44.9 |
| 2008 | 21.9 | 70.0 | 38.1 | 74.4 | 118.4 | 116.4 | 52.6 | 189.0 | 31.4 |
| 2009 | 22.6 | 63.2 | 41.1 | 57.7 | 95.8 | 155.0 | 52.1 | 156.7 | 29.6 |
| 2010 | 22.0 | 62.3 | 35.4 | 64.2 | 103.7 | 218.3 | 51.5 | 171.1 | 32.6 |
| **Return on Assets [ROA]** | | | | | | | | | |
| 2005 | 1.8 | 0.6 | 0.8 | 1.8 | 3.2 | 0.6 | 0.9 | 3.0 | 1.2 |
| 2006 | 1.7 | 0.6 | 0.5 | 1.8 | 3.3 | 0.9 | 0.9 | 2.7 | 1.4 |
| 2007 | 1.6 | 0.4 | 0.4 | 1.2 | 3.0 | 0.9 | 0.9 | 2.9 | 1.4 |
| 2008 | 0.9 | 0.0 | -0.4 | -0.1 | 1.8 | 1.0 | 1.0 | 1.4 | 2.1 |
| 2009 | 1.0 | 0.4 | 0.1 | -0.1 | 0.7 | 0.9 | 1.1 | 1.9 | 0.9 |
| 2010 | 1.2 | 0.6 | 0.2 | 0.9 | 1.9 | 1.0 | 1.1 | 2.1 | 1.0 |
| **Return on Equity [ROE]** | | | | | | | | | |
| 2005 | 25.6 | 11.8 | 11.8 | 17.8 | 24.2 | 15.1 | 13.3 | 29.8 | 15.2 |
| 2006 | 27.8 | 14.0 | 8.9 | 17.2 | 26.3 | 14.9 | 12.7 | 27.6 | 18.3 |
| 2007 | 30.2 | 9.8 | 6.2 | 11.2 | 22.7 | 16.7 | 13.2 | 28.9 | 18.1 |
| 2008 | 18.9 | -1.0 | -10.3 | -1.6 | 13.3 | 17.1 | 12.5 | 14.9 | 28.7 |
| 2009 | 17.4 | 8.2 | 2.6 | -0.6 | 4.9 | 16.2 | 13.1 | 20.4 | 15.8 |
| 2010 | 20.5 | 13.3 | 3.9 | 8.2 | 12.5 | 17.5 | 12.5 | 21.7 | 14.7 |

Data source: IMF (2011)
Note: Values are expressed in per cent.

The ratio of bank capital to assets (an approximate inverse of leverage) of select countries shows that India's ratio, though comfortable, has been below that of South Africa, Russia, UK and USA. Further, the ratio has experienced a steep secular fall during the crisis period for most of the countries (see Figure 1).

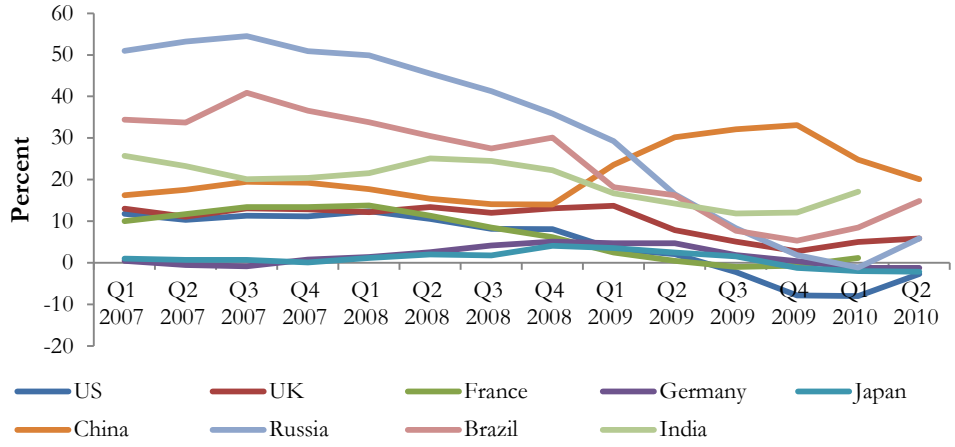
**Figure 1: Bank capital to asset ratio**




Data source: World Bank (2011)

Growth in bank credit to the private sector has decelerated in advanced economies, and lower quality borrowers lacked any access to capital market funding. Bank lending has continued to remain restricted, despite unconventional policies aimed at reviving credit to end users (see Figure 2).

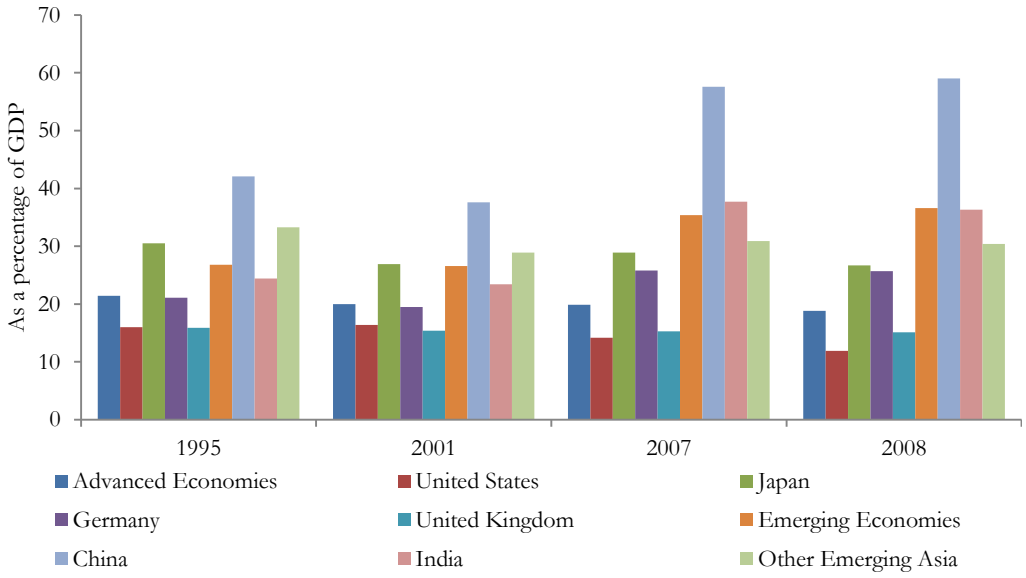
**Figure 2: Growth in bank credit to private sector**




Note: Growth rate over the corresponding quarter a year ago
Source: World Bank (2011)

In both emerging and advanced economies too, the huge global current account imbalances have been manifested in the savings investment behaviour. This is the reason why global imbalances are universally ascribed to the 'savings glut' hypothesis, according to which the US current account deficit was driven by a savings glut in the rest of the world, especially in emerging market countries (Bernanke, 2005). Even though the gap between savings and investment in the US almost doubled from minus 2.7 percent of GDP in 2001 to minus 5.6 percent of GDP in 2008, the contrary was noticed in the case of Emerging Market Economies (EMEs) where excess savings led to significant current account surpluses (see Figure 3).

**Figure 3: Savings as a percentage of GDP in select economies**

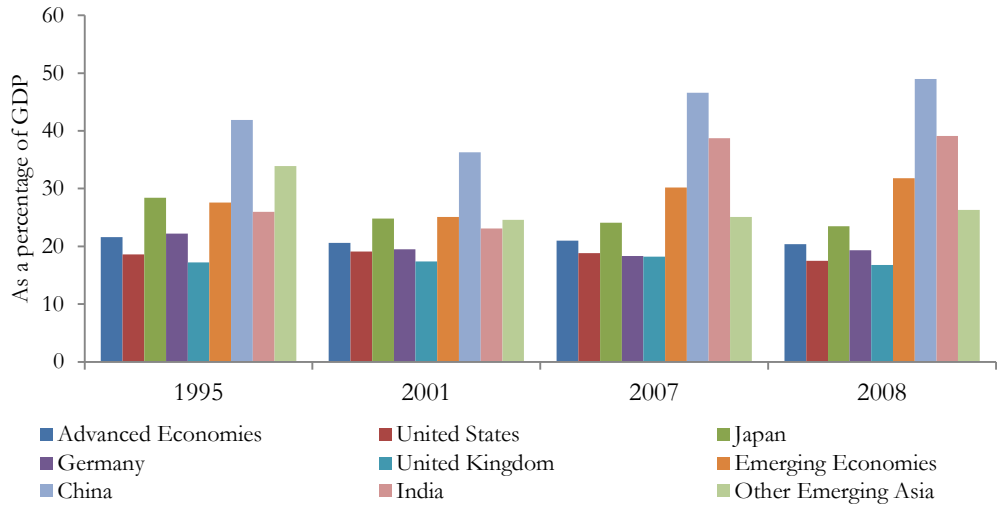



Source: International Monetary Fund. Research Dept. (2009)

The saving-investment balances also varied across EME regions in the pre-crisis period. In China, the saving rate reached 59 percent of GDP in 2008 even though China maintained one of the highest investment rates in the world of around 49 per cent of GDP. Despite the fact that India too witnessed a steep rise in the saving rate, the savings investment gap remained negative due to an

equivalent increase in the investment rate (see Figure 4). Other Asian emerging economies have experienced a modest rise in saving and investment rates between 2003 and 2007, with both remaining below the levels preceding the Asian crisis.

**Figure 4: Investment as a percentage of GDP in select economies**




Source: International Monetary Fund. Research Dept. (2009)

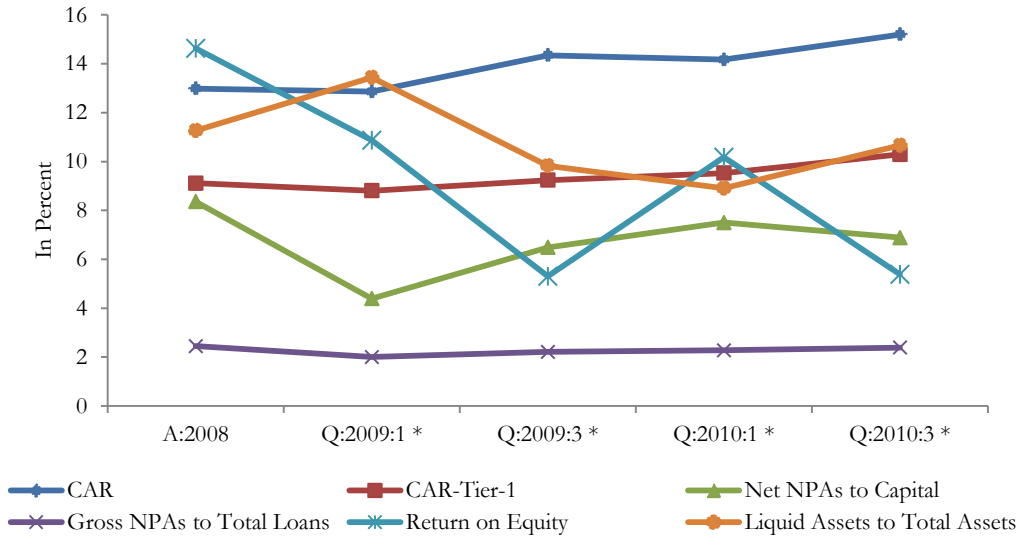
**Financial soundness in Indian banking**

Banking sector is by far the most central part of the financial system in most of the emerging economies and is, therefore, also the main source of risk for financial stability. Undoubtedly, financial soundness of banks has a significant sway on the stability of the financial system as a whole as the banking system constitutes more than 75% of the financial markets in India. The Indian banking system endured the onslaught of the global financial crisis and a factor that bolstered the normal functioning of the banking system even in the face of one of the largest global financial crisis was its robust capital adequacy.

Further, the core banking sector indicators for India like; Capital Adequacy Ratio (CAR), Capital Adequacy Ratio–Tier-1, Gross Non-Performing Assets (GNPAs) to total loans, Net Non-Performing Assets (NNPAs) to total loans and Return on Equity (ROE) have experienced downward pressure during the recent recession period (see Figure 5). On the contrary, liquid assets to total assets ratio

has moved upwards indicating the tendency of the banks to hold cash during the times of recession instead of investing in loans or investment products.

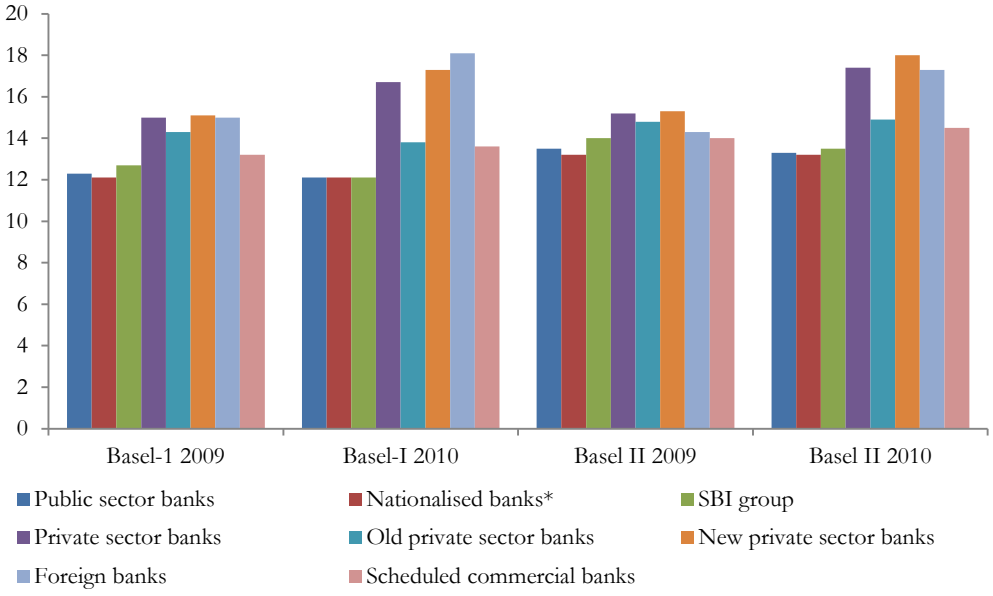
**Figure 5: Core banking sector indicators for India**




Note: * Quarterly Figures; A-Annual; Q-Quarter
Data source: IMF (2011)

Under Basel II, Capital to Risk-weighted Assets Ratio (CRAR) of Indian banks as at end-March 2009 was at 14.0 per cent, far above the stipulated level of 9 percent (see Figure 6). This suggests that Indian banks have successfully managed to meet the increased capital requirement under the amended framework. Furthermore, between March 2009 and 2010, there was a surge by about 0.5 percentage point in the CRAR reflecting further strengthening of their capital adequacy under the new framework.

**Figure 6: Capital to risk weighted assets ratio–bank group-wise (as at end-March)**




Note: * Includes IDBI Bank Ltd
Source: Reserve Bank of India (2010)

## METHODOLOGY AND DATA

In view of the fact that assessment of financial stability in general is made on a broad-spectrum of risk factors, one cannot expect a single model to capture satisfactorily all the risk factors originating and developing inside and outside the financial system respectively. Instead, a suite of models may be required. However, the objective of the ensuing segment of this paper is to analyse the salient parameters of banking sector performance and behaviour and to establish the significance of banking sector stability in the context of bank-dominated financial system of Indian economy by employing a micro model of VAR. The proposed micro VAR model involves the most relevant parameters of banking stability viz., Liquidity, Asset Quality, Capital Adequacy and Profitability.

## Data and variables

The data for the analysis is sourced from the robust database of Reserve Bank of India. The variables might be considerably adopted to measure the degree of volatility and soundness in the banking sector and thereby influence the financial stability is listed here below in Table 4. For this purpose, a panel data involving weightages for the variables of bank performance and behaviour for the period from 1996 to 2009 covering 56 commercial banks in India is constructed.

**Table 4: Description of key variables**

| Variable | Description |
|---|---|
| Capital Adequacy Ratio (CAR) | Defined as the amount of regulatory capital to be maintained by a bank to account for various risks inbuilt in the banking system<br><br>Capital Adequacy Ratio=Total Capital (Tier I Capital+Tier II Capital) / (Market Risk (RWA) + Credit Risk (RWA) + + Operation Risk (RWA))<br><br>*RWA = Risk Weighted Assets*<br>The higher the ratio the better is for the bank's stability. |
| Return on Assets (ROA) | Return on Assets = Net Profit/Assets = (Net Profit/Total Income)*(Total Income/Assets)<br>The higher the ratio the better is for the bank's stability. |
| NNPA(Net Non-Performing Assets) to NA (Net Advances) | Net NPA to Net Advances = Net NPA/Net Advances<br>The lower the ratio the better is for the bank's stability.<br>Management of non-performing assets is a key to the stability and continued viability of the banking sector. |
| Liquidity Coverage Ratio (LCR) | Liquidity Coverage Ratio = (Cash+SLR+other short term investments) / Short term liabilities<br><br>The lower the ratio indicates less liquidity. |

## The model

As VARs are powerful tools for describing data and for generating reliable multivariate benchmark forecasts. Sims (1980) advocated VAR models as providing a theory-free method to estimate economic relationships, thus being an alternative to the "incredible identification restrictions" in structural models. Used wisely and based on economic reasoning and institutional detail, VARs both can fit the data and, at their best, can provide sensible estimates of some causal connections. Although VARs have limitations when it comes to structural inference and policy analysis, so do the alternatives. A *recursive VAR* constructs the

error terms in the each regression equation to be uncorrelated with the error in the preceding equations. This is done by judiciously including some contemporaneous values as regressors.

Let $Y_{it}$ be an m × 1 vector of random variables for the i-th cross-sectional unit at time t, and suppose that the $Y_{it}$'s are generated by the following panel vector autoregressive model of order one (PVAR):

$$Y_{it} = \Phi Y_{i,t-1} + \varepsilon_{it} \quad \text{.....Eqn (1)}$$

$$Y_{it} = (I_m - \Phi)\mu_i + \Phi Y_{i,t-1} + \varepsilon_{it} \quad \text{.....Eqn (2)}$$

for i = 1, 2, . . . , N; and t = 1, 2, . . . , T, where Φ denotes an m×m matrix of slope coefficients, $\mu_i$ is an m×1 vector of individual-specific effects, $\varepsilon_{it}$ is an m×1 vector of disturbances, and $I_m$ denotes the identity matrix of dimension m × m. For simplicity, we restrict our exposition to first-order PVAR models.

Available literature mentions quite a few methods for determining the weights of the variables. Mostly, these are econometric estimations with a macroeconomic model, a reduced form aggregate demand function (backward looking IS curve), or a Vector Auto Regression Model (VAR). This study opines that the weights can also be determined by way of economic arguments, such as the significance of the variable for the banking system. This study, on the other hand, feels that every variable in the index can be given equal weight. Some studies employ the combination of above methods (Goodhart and Hofmann, 2001; Gauthier, Graham, and Liu, 2004). The weighting factors are calculated by summing the coefficients of the variables and expressing them as a ratio (Montagnoli and Napolitano, 2004):

$$\textit{Weighted variable } X_i \ (W_i) = \frac{\sum \textit{Coefficient } X_{i,t,\,..n}}{\sum \left| \textit{Coefficient } X_{i..n,\,,t,\,..n} \right|}$$

By this approach, both the importance of the parameters of banking system and the changes of its composition are duly taken into account for the analysis.

Accordingly,

$$\textit{Index Variable} = \frac{\textit{Weighted variable } X_t - X_{t-1}}{\textit{Weighted variable } X_t}$$

In our model of banking stability we assume that Liquidity Coverage Ratio (LCR) is dependent on NNPA (Net Non-Performing Assets) to NA (Net Advances), Capital Adequacy Ratio (CAR) and Return on Assets (ROA).

Accordingly,

$$WLCR = f \{ WNPA, WCAR, WROA \} \quad \ldots\ldots\ldots\ldots\ldots\ldots \text{ Eqn (3)}$$

Rewriting the Eqn (2),

$$WLCR_{it} = C + WNPA_{it} + WCAR_{it} + WROA_{it} + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots \text{ Eqn (4)}$$

In the ensuing section we present the analysis and the results of the econometric

## ANALYSIS AND RESULTS

This study considers the core set of soundness indicators for the construction of the index keeping in view the applicability of these determinants to the deposit taking institutions (banking sector) in Indian financial system. *Capital adequacy* measured by regulatory capital to risk-weighted assets measures the strength of the banking system in terms of capital adequacy to sustain the challenges of adverse impacts of crisis like situations. *Asset quality* measured Nonperforming assets to total advances. *Earnings and profitability* measures are represented by Return on assets and *Liquidity* is measured by LCR. We first present the vector auto regression estimates of the variables and their residuals in Tables 5 and 6 here below:

## Table 5: Vector auto regression estimates

| | WLCR | WCAR | WNPA | WROA |
|---|---|---|---|---|
| WLCR(-1) | 0.779497 | -0.180888 | -0.264254 | 0.079174 |
| | (0.04115) | (0.17072) | (0.09425) | (0.02015) |
| | [ 18.9428] | [-1.05955] | [-2.80366] | [ 3.92924] |
| WLCR(-2) | -0.255397 | -0.514800 | -0.364963 | -0.105469 |
| | (0.04010) | (0.16636) | (0.09185) | (0.01964) |
| | [-6.36910] | [-3.09443] | [-3.97361] | [-5.37133] |
| WCAR(-1) | 0.090358 | 0.701478 | 0.138745 | 0.006088 |
| | (0.01015) | (0.04210) | (0.02324) | (0.00497) |
| | [ 8.90536] | [ 16.6639] | [ 5.97000] | [ 1.22531] |
| WCAR(-2) | -0.012079 | 0.249520 | 0.026662 | 0.012025 |
| | (0.01017) | (0.04220) | (0.02330) | (0.00498) |
| | [-1.18750] | [ 5.91272] | [ 1.14440] | [ 2.41428] |
| WNPA(-1) | -0.072334 | 0.220239 | 0.711947 | 0.016204 |
| | (0.01697) | (0.07042) | (0.03888) | (0.00831) |
| | [-4.26151] | [ 3.12748] | [ 18.3123] | [ 1.94952] |
| WNPA(-2) | 0.120170 | -0.006570 | 0.155808 | -0.018665 |
| | (0.01588) | (0.06588) | (0.03637) | (0.00778) |
| | [ 7.56727] | [-0.09972] | [ 4.28360] | [-2.40034] |
| WROA(-1) | 0.529136 | 3.124731 | -0.459356 | 0.761692 |
| | (0.08226) | (0.34127) | (0.18841) | (0.04028) |
| | [ 6.43259] | [ 9.15611] | [-2.43804] | [ 18.9100] |
| WROA(-2) | -0.655473 | -1.597008 | -0.207827 | 0.087019 |
| | (0.08776) | (0.36409) | (0.20101) | (0.04297) |
| | [-7.46902] | [-4.38628] | [-1.03392] | [ 2.02496] |
| C | 0.001560 | 0.006596 | 0.002476 | 0.001105 |
| | (0.00068) | (0.00283) | (0.00156) | (0.00033) |
| | [ 2.28889] | [ 2.33266] | [ 1.58579] | [ 3.31174] |
| R-squared | 0.971583 | 0.977988 | 0.961263 | 0.932060 |
| Adj. R-squared | 0.971240 | 0.977723 | 0.960796 | 0.931240 |
| F-statistic | 2833.512 | 3682.196 | 2056.552 | 1136.952 |
| Log likelihood | 1894.357 | 938.2267 | 1337.430 | 2374.175 |
| Akaike AIC | -5.611180 | -2.765556 | -3.953662 | -7.039213 |
| Schwarz SC | -5.550775 | -2.705150 | -3.893257 | -6.978807 |

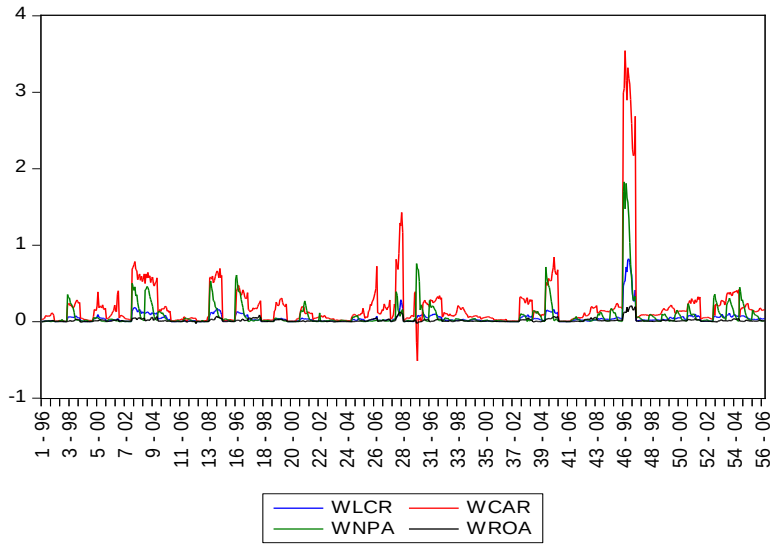
Notes: 1. Sample (adjusted): 1998-2009, included observations: 672 after adjustments
2. Standard errors in ( ) and t-statistics in [ ].

## Table 6: Vector auto regression estimates of residuals

| | RESID01 | RESID02 | RESID03 | RESID04 |
|---|---|---|---|---|
| RESID01(-1) | 0.064125 | 0.198556 | 0.239479 | -0.065434 |
| | (0.05048) | (0.20041) | (0.09937) | (0.02488) |
| | [ 1.27037] | [ 0.99074] | [ 2.41003] | [-2.62999] |
| RESID01(-2) | 0.155989 | 0.249357 | 0.297811 | -0.086597 |
| | (0.04973) | (0.19743) | (0.09789) | (0.02451) |
| | [ 3.13696] | [ 1.26302] | [ 3.04233] | [-3.53316] |
| RESID02(-1) | -0.022004 | 0.143824 | -0.143633 | 0.026743 |
| | (0.01356) | (0.05383) | (0.02669) | (0.00668) |
| | [-1.62281] | [ 2.67163] | [-5.38116] | [ 4.00150] |
| RESID02(-2) | -0.061460 | -0.164858 | -0.099944 | 0.025858 |
| | (0.01217) | (0.04832) | (0.02396) | (0.00600) |
| | [-5.05017] | [-3.41186] | [-4.17176] | [ 4.31068] |
| RESID03(-1) | 0.028644 | -0.371903 | 0.157346 | -0.013482 |
| | (0.02010) | (0.07982) | (0.03957) | (0.00991) |
| | [ 1.42484] | [-4.65945] | [ 3.97594] | [-1.36066] |
| RESID03(-2) | 0.038250 | 0.043667 | -0.129092 | -0.013305 |
| | (0.01904) | (0.07558) | (0.03748) | (0.00938) |
| | [ 2.00925] | [ 0.57774] | [-3.44471] | [-1.41799] |
| RESID04(-1) | -0.072375 | -0.816317 | 0.222810 | -0.011237 |
| | (0.09251) | (0.36731) | (0.18212) | (0.04560) |
| | [-0.78233] | [-2.22243] | [ 1.22344] | [-0.24643] |
| RESID04(-2) | 0.047441 | -0.216593 | -0.215825 | -0.199513 |
| | (0.09451) | (0.37524) | (0.18605) | (0.04658) |
| | [ 0.50197] | [-0.57721] | [-1.16004] | [-4.28290] |
| C | 0.000165 | 0.000461 | -0.002272 | 0.000312 |
| | (0.00061) | (0.00244) | (0.00121) | (0.00030) |
| | [ 0.26816] | [ 0.18890] | [-1.87753] | [ 1.02820] |
| R-squared | 0.071808 | 0.073745 | 0.108331 | 0.092294 |
| Adj. R-squared | 0.058332 | 0.060297 | 0.095384 | 0.079115 |
| F-statistic | 5.328403 | 5.483565 | 8.367759 | 7.003070 |
| Log likelihood | 1581.121 | 808.9638 | 1201.831 | 1977.301 |
| Akaike AIC | -5.614718 | -2.857014 | -4.260110 | -7.029646 |
| Schwarz SC | -5.545162 | -2.787457 | -4.190554 | -6.960090 |

Notse: 1. Sample (adjusted): 2000-2009, included observations: 560 after adjustments
2. Standard errors in ( ) and t-statistics in [ ].

**Figure 7: Movement of the covariates**




As the standard practice in VAR analysis is to report results from Granger-causality tests, impulse responses, and forecast error variance decompositions. Lag length selection criteria determines the VAR model. We select the best lag length for the VAR model employing the LR test on which Granger causality is based (see Table 7).

**Table 7: VAR lag order selection criteria**

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|---|
| 0 | 2974.600 | NA | 2.04e-11 | -13.26161 | -13.22496 | -13.24716 |
| 1 | 4671.900 | 3356.713 | 1.12e-14 | -20.76741 | -20.58416 | -20.69517 |
| 2 | 4772.759 | 197.6663 | 7.70e-15 | -21.14625 | -20.81640* | -21.01622 |
| 3 | 4782.545 | 19.00449 | 7.92e-15 | -21.11851 | -20.64206 | -20.93069 |
| 4 | 4833.983 | 98.97188 | 6.76e-15 | -21.27671 | -20.65366 | -21.03110 |
| 5 | 4873.710 | 75.72918 | 6.08e-15 | -21.38263 | -20.61299 | -21.07923 |
| 6 | 4948.348 | 140.9455* | 4.68e-15* | -21.64441* | -20.72816 | -21.28322* |

Notes: Indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Correlation does not necessarily imply causation in any meaningful sense of that word. Granger causality measures precedence and information content but does not by itself indicate causality in the more common use of the term. The null hypothesis is that $x$ does *not* Granger-cause y in the first regression and that y does *not* Granger-cause $x$ in the second regression (Granger (1969)). Based on the results of the lag order selection criterion test, we use a lag length of 6 in estimating the F-statistic and the probability values. *Granger-causality statistics* examine whether lagged values of one variable helps to predict another variable (see Table 8).

**Table 8: Granger-causality statistics**

| Null Hypothesis: | F-Statistic | Prob. |
|---|---|---|
| WNPA does not Granger Cause WLCR | 50.0629 | 6.E-21 |
| WLCR does not Granger Cause WNPA | 6.99518 | 0.0010 |
| WCAR does not Granger Cause WLCR | 80.0327 | 7.E-32 |
| WLCR does not Granger Cause WCAR | 12.6460 | 4.E-06 |
| WROA does not Granger Cause WLCR | 40.9565 | 2.E-17 |
| WLCR does not Granger Cause WROA | 37.2950 | 4.E-16 |
| WCAR does not Granger Cause WNPA | 7.61499 | 0.0005 |
| WNPA does not Granger Cause WCAR | 10.0468 | 5.E-05 |
| WROA does not Granger Cause WNPA | 0.74036 | 0.4773 |
| WNPA does not Granger Cause WROA | 32.3571 | 4.E-14 |
| WROA does not Granger Cause WCAR | 33.2965 | 2.E-14 |
| WCAR does not Granger Cause WROA | 29.0865 | 8.E-13 |

Note: Sample: 1996 – 2009, lags: 2

According to the results of (see Table 8), the P-values for all the arguments of Granger-causality are significant and hence we reject the null hypothesis and we conclude that the variables of the model are granger cause bi-directionally and therefore exists causality among the covariates.

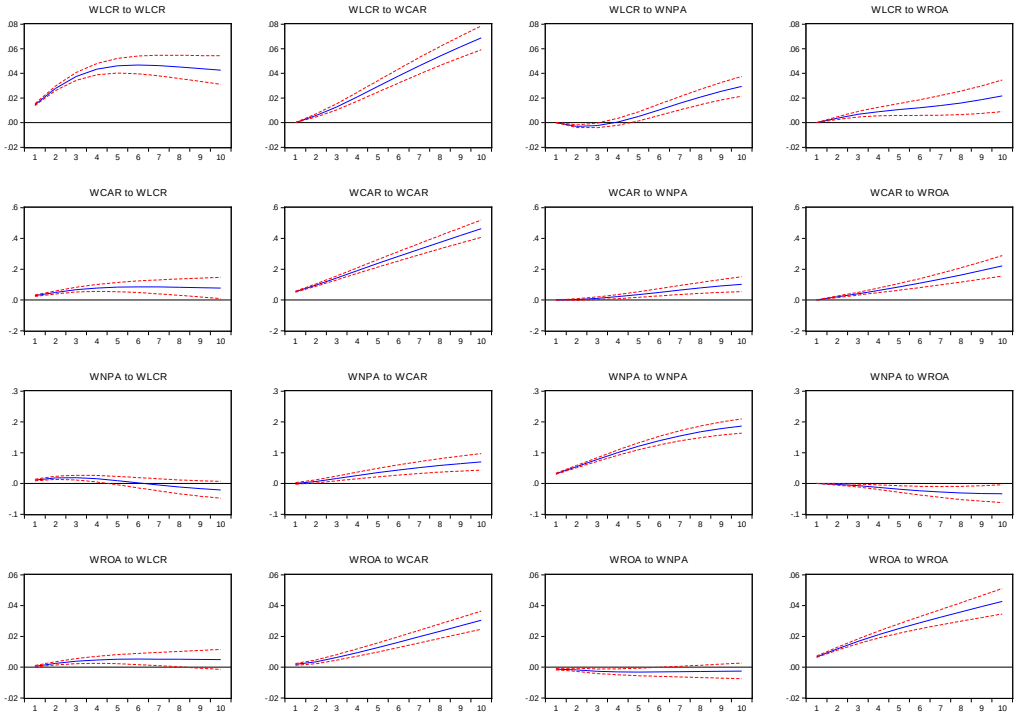
We perform multivariate LM test to test the presence of autocorrelations and the VAR Residual Portmanteau Tests and for Autocorrelations to establish the residual autocorrelations. Further, we also perform the VAR Granger Causality/Block Exogeneity Wald Tests, Residual Normality tests, and VAR

Residual Heteroskedasticity Tests with without Cross Terms. However, the results are not presented here in the interest of space.

**Impulse responses**

A shock to the *i*-th variable not only directly affects the *i*-th variable but is also transmitted to all of the other endogenous variables through the dynamic (lag) structure of the VAR. An impulse response function traces the effect of a one-time shock to one of the innovations on current and future values of the endogenous variables (see Figure 8). The accumulated response is the accumulated sum of the impulse responses (see Figure 9). It can be interpreted as the response to step impulse where the same shock occurs in every period from the first.

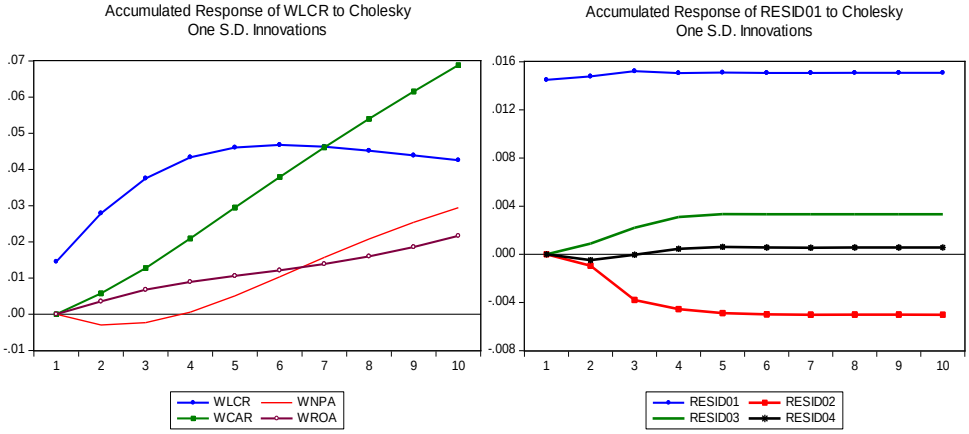
**Figure 8: Impulse responses of WLCR, WNPA, WCAR and WROA using recursive VAR**



The impulse responses for the recursive VAR, ordered WLCR, WCAR, WNPA and WROA are plotted in Figure 7. The first row shows the effect of an unexpected one percentage point increase in WLCR on all other three variables, as it works through the recursive VAR system with the coefficients estimated from actual data. The second row shows the effect of an unexpected increase of one percentage point in the WCAR on other three variables. Similarly, the third and fourth rows show the corresponding effect for WNPA and WROA.

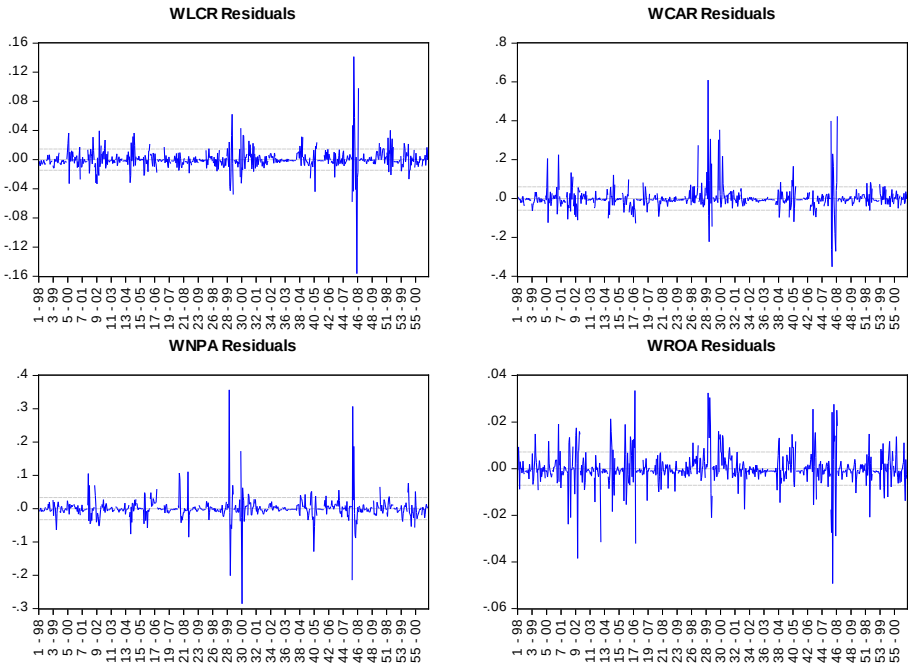
Also plotted are ±1 standard error bands for each of the impulse responses. These estimated impulse responses show patterns of persistent common variation. For example, (in the first row of Figure 7) an unexpected rise in WLCR slowly stabilizes at a level of of around 4 percent, and is associated with a persistent increase in WCAR (about 6 percent) and a moderate increases in WNPA (about 2 percent) and WROA (about 1.5 percent). Residuals of the covariates are presented in Figure 10.

**Figure 9: Accumulated responses of covariates and their residuals**




The impulse responses observed in the analysis establish that LCR, CAR, NPA and ROA are interrelated and can explain the banking system stability in the context of an emerging economy financial stability.

**Figure 10: Residuals of the covariates**




## Variance decomposition

This is an alternative method to the impulse response functions for examining the effects of shocks to the dependent variables. This technique determines how much of the forecast error variance for any variable in a system, is explained by innovations to each explanatory variable, over a series of time horizons. Usually own series shocks explain most of the error variance, although the shock will also affect other variables in the system. It is also important to consider the ordering of the variables when conducting these tests, as in practise the error terms of the equations in the VAR will be correlated, so the result will be dependent on the order in which the equations are estimated in the model.

While impulse response functions trace the effects of a shock to one endogenous variable on to the other variables in the VAR, *variance decomposition* separates the variation in an endogenous variable into the component shocks to the VAR. The variance decomposition provides information about the relative importance of each random innovation in affecting the variables in the VAR.

Table 9 displays separate variance decomposition for each endogenous variable. The second column, labeled "S.E.", contains the forecast error of the variable at the given forecast horizon.

The source of this forecast error is the variation in the current and future values of the innovations to each endogenous variable in the VAR. The remaining columns give the percentage of the forecast variance due to each innovation, with each row adding up to 100. As with the impulse responses, the variance decomposition based on the Cholesky factor can change dramatically if you alter the ordering of the variables in the VAR. For example, the first period decomposition for the first variable in the VAR ordering is completely due to its own innovation.

**Table 9: Results of variance decomposition analysis**

| Variance Decomposition of WLCR: | | | | | |
|---|---|---|---|---|---|
| Period | S.E. | WLCR | WCAR | WNPA | WROA |
| 1 | 0.014535 | 100.0000 | 0.000000 | 0.000000 | 0.000000 |
| | | (0.00000) | (0.00000) | (0.00000) | (0.00000) |
| 4 | 0.026667 | 72.61941 | 21.00196 | 2.486288 | 3.892338 |
| | | (2.77467) | (2.64470) | (0.55231) | (1.31801) |
| 6 | 0.030266 | 57.23783 | 32.01421 | 7.160574 | 3.587378 |
| | | (3.22022) | (3.20069) | (1.68502) | (1.39566) |
| 8 | 0.033300 | 47.41230 | 38.09176 | 10.85899 | 3.636939 |
| | | (3.16668) | (3.46687) | (2.34480) | (1.54223) |
| 10 | 0.035722 | 41.47237 | 41.72264 | 12.37306 | 4.431924 |
| | | (3.08329) | (3.71973) | (2.66174) | (1.92678) |
| Variance Decomposition of WCAR: | | | | | |
| 1 | 0.060303 | 21.03585 | 78.96415 | 0.000000 | 0.000000 |
| | | (2.94750) | (2.94750) | (0.00000) | (0.00000) |
| 4 | 0.110671 | 13.49430 | 74.52642 | 1.480222 | 10.49906 |
| | | (2.92918) | (3.68677) | (0.90314) | (2.41998) |
| 6 | 0.134815 | 9.291467 | 74.32057 | 3.195048 | 13.19292 |
| | | (2.36201) | (3.98561) | (1.52372) | (3.27161) |
| 8 | 0.155314 | 7.019326 | 73.10044 | 4.095404 | 15.78483 |
| | | (1.82305) | (4.50641) | (1.89310) | (4.10672) |
| 10 | 0.173355 | 5.685542 | 71.53319 | 4.259851 | 18.52141 |
| | | (1.46350) | (5.10911) | (2.06334) | (4.92028) |
| Variance Decomposition of WNPA: | | | | | |
| 1 | 0.033293 | 10.45330 | 4.10E-05 | 89.54666 | 0.000000 |
| | | (2.31471) | (0.13836) | (2.33008) | (0.00000) |
| 4 | 0.055051 | 6.097703 | 7.514617 | 84.50565 | 1.882026 |
| | | (1.47178) | (2.17065) | (2.78108) | (1.08834) |
| 6 | 0.064083 | 6.688434 | 9.529185 | 80.91078 | 2.871603 |

| | | | | | |
|---|---|---|---|---|---|
| | | (1.20047) | (2.71604) | (3.27747) | (1.66997) |
| 8 | 0.068821 | 7.650106 | 10.48979 | 78.81341 | 3.046687 |
| | | (1.67513) | (3.03932) | (3.70823) | (1.97343) |
| 10 | 0.070980 | 8.136431 | 11.19790 | 77.72246 | 2.943210 |
| | | (1.99369) | (3.29703) | (3.97792) | (2.06065) |
| Variance Decomposition of WROA: | | | | | |
| 1 | 0.007118 | 0.592220 | 6.053441 | 3.433475 | 89.92086 |
| | | (0.54288) | (1.77000) | (1.29619) | (2.22777) |
| 4 | 0.012181 | 4.456874 | 16.09711 | 1.998224 | 77.44779 |
| | | (2.09396) | (3.36136) | (1.07079) | (4.04709) |
| 6 | 0.014187 | 3.376669 | 23.49209 | 1.480018 | 71.65122 |
| | | (1.73502) | (4.33825) | (0.83589) | (4.74645) |
| 8 | 0.015846 | 2.709682 | 28.77073 | 1.206576 | 67.31302 |
| | | (1.40375) | (5.02008) | (0.67516) | (5.30725) |
| 10 | 0.017332 | 2.269778 | 32.50345 | 1.022762 | 64.20401 |
| | | (1.19579) | (5.53673) | (0.59986) | (5.75753) |

Notes: 1. Cholesky Ordering: WLCR, WCAR, WNPA, and WROA
2. Standard Errors: Monte Carlo (100 repetitions)

## Forecasting

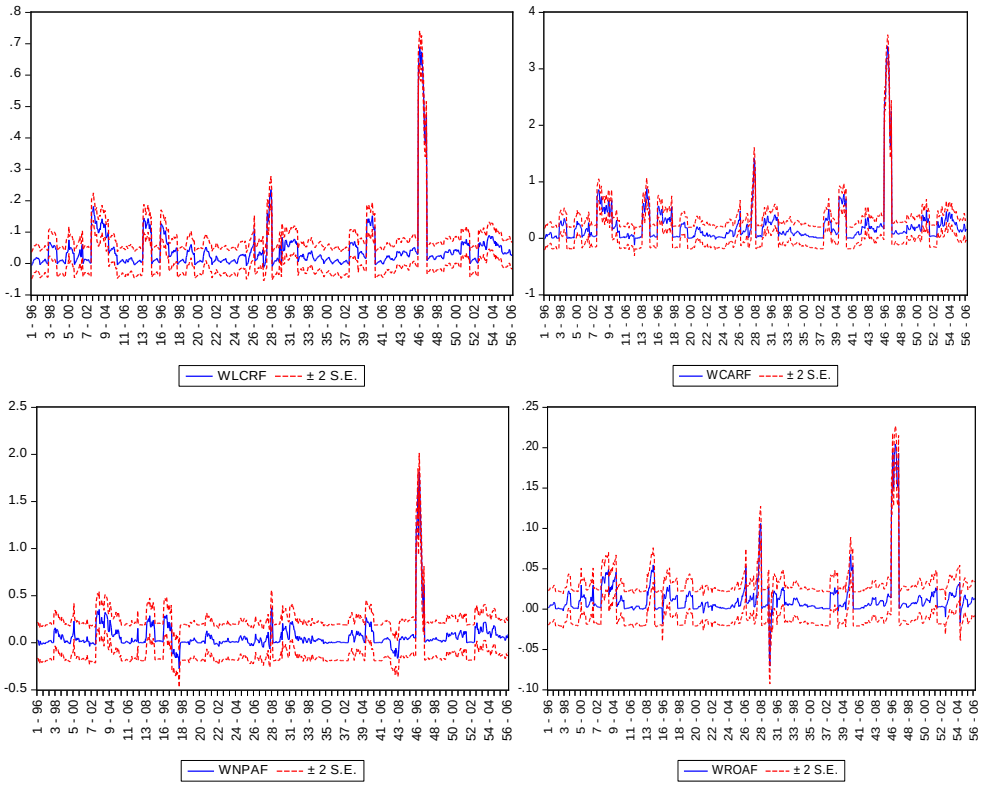
State-of-the-art VAR forecasting systems contain more than three variables and allow for time-varying parameters to capture important drifts in coefficients (Sims, 1980). Multistep ahead forecasts, computed by iterating forward the reduced form VAR, are assessed in Table 10. Because the ultimate test of a forecasting model is it's out of sample performance, Table 10 focuses on pseudo out-of-sample forecasts over the period 1996–2009 (see Figure 11).

**Table 10: Forecast statistics for the variables**

| Forecast Statistics | WLCRF | WCARF | WNPAF | WROAF |
|---|---|---|---|---|
| Root Mean Squared Error | 0.020435 | 0.095363 | 0.094401 | 0.010598 |
| Mean Absolute Error | 0.009820 | 0.046692 | 0.050487 | 0.005676 |
| Mean Absolute Percentage Error | 93.65728 | 38.29840 | 300.2287 | 73.03435 |
| Theil Inequality Coefficient | 0.108798 | 0.105338 | 0.240491 | 0.179451 |
| Bias Proportion | 0.000000 | 0.027040 | 0.013477 | 0.072535 |
| Variance Proportion | 0.019645 | 0.044505 | 0.044977 | 0.003227 |
| Covariance Proportion | 0.980355 | 0.928455 | 0.941546 | 0.924237 |

Note: Entries are the root mean square error of forecasts computed recursively for vector auto regressions

**Figure 11: Forecasting for the covariates**




## CONCLUSION

We provide in this study empirical evidence for the centrality of banking system stability for aiding financial stability in the context of banking dominated emerging economy. Employing the bank specific variables of banking stability viz., Liquidity, Asset Quality, Capital Adequacy and Profitability, this study has made two valuable contributions. First, it has analysed the banking system stability by employing vector auto regression technique and has established the interdependence and co movement of the banking stability covariates to the satisfaction of economic logic. Second, this study is unique among the evolving body of literature that underscores the significant relationship between banking system resilience and financial stability.

Further, the study has enabled us to understand that the financial system and more specifically the banking system in India has demonstrated continued stability

compared to other countries. One of the accomplishments of the Indian financial system has been safeguarding financial stability and avoidance of any major financial crisis since early 1990s till 2008 a period that has been turbulent for the financial sector in most emerging market countries.

Of late, financial stability has been explicitly signified as a key objective for public policy. Even though the multi-facetted concept of financial stability is by nature complex to abstract in a single definition, an attempt has been made to define, financial stability as a situation in which the financial system achieves efficient allocation of resources between economic activities and across time, assesses and sustains financial risks, and absorbs shocks. A well-functioning banking system is essential to sustain economic growth, both to prop up the economic activities in the short run and to allocate resources efficiently over the longer run. Indian banking system has largely withstood the global financial crisis, thanks to the regulatory approach of the reserve bank of India. Banking system development and broadening a more transparent investor friendly capital market capitalization also help strengthening financial stability.

The overall approach to sustain financial stability has to be multi-pronged. Ensuring overall macroeconomic balance, enhancement in the macro-prudential functioning of institutions and markets, and reinforcement of micro-prudential institutional soundness through regulation and supervision need to be regularly undertaken towards financial stability. Financial markets are rapidly growing by way of technology adoption, product innovation, and geographic and sectoral integration. This swift development of financial markets while contributing to enhanced financial stability may also throw up both benefits and new sources of risks to financial system.

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