DYNAMICS OF FINANCIAL STRESS AND ECONOMIC PERFORMANCE

DYNAMICS OF FINANCIAL STRESS AND ECONOMIC PERFORMANCE: INSIGHTS AND ANALYSIS FROM THE WORLD ECONOMY

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Preface

This book attempts to understand the complex non-linear dynamics of the financial system stress (financial crisis or extreme events) and the economic performance as a whole. To some extent, the book is presented in a lucid style for the benefit of nontechnical readers; otherwise, the details of the analysis are very technical in nature. *Dynamics of Financial Stress and Economic Performance: Insights and Analysis from the World Economy* is predominantly an independent research study of Ramesh Babu Thimmaraya as part of the broader ongoing work on "Sovereign Country Profiles and Economic Partnerships." Section 2.2.10 (India – Financial System Analytics) and Section 4.2.9 (India – Causal Patterns and Multivariate Analysis) are co-authored with Prof M. Venkateshwarlu, and I am very thankful to him for his support.

Vocational readers who wish to understand the topic quickly may wish to read Chapter 5 (Interpretations and Global Outlook) in isolation. However, curious scholarly readers may prefer to read the entire book in detail. The reader can reach the corresponding author through an email (rameshbabu.thimmaraya@gmail.com) for further discussions or suggestions that may follow in response to the heavily technical nature of the book. The corresponding author teaches graduate courses such as Theory of Optimisation, Stochastic Calculus & Financial Engineering, Risk Management & Modelling and Quantitative Behavioural Finance. I am very thankful to Pankaj for helping me with the data. I also express my sincere thanks to Karthik for supporting me in writing this book.

I owe a very special thanks to my friends Shalu and HariGanesh for working with me; without their support, it would have been difficult to complete this book.

Executive Summary

The financial stress of 2008 has propelled the whole world into its most severe recession since the Great Depression. Despite the significant risk posed by the financial stress (virtual economy) to the real economy, the interaction dynamics between financial stress and economic performance is complex and not well understood. Financial stress has the potential to significantly change household spending behaviour, which becomes all the more complicated particularly during economic hardships, creating policy confusions for governments and regulators. However, important gaps remain in our general understanding of this critical relationship.

Until the recent global financial crisis of 2008, the majority of macroeconomic forecasting models did not include variables that signal the financial market movements such as stock market volatility, capital market spreads and indicators of other misalignments in the banking system. As a consequence, the traditional macroeconomic models significantly underestimated the scope of the global financial crisis, and this has focused recent attention on considering financial market variables in economic models.

The extreme conditions of high stress with low economic demand and low stress with high economic demand are observed in many countries. Likewise, there are many other such possible states for the economic system to attain and many such states are possible for the financial stress to interact with. This makes the entire process complicated and thus difficult to understand; a detailed analysis is, therefore, required to understand it more quantitatively.

The literature related to the understanding of the dynamics of financial market shocks on the whole economic system at a global level is rather scarce. To make it more generic, the present study analyses 12 major sovereign economies around the world: United States, China, Japan, Germany, India, United Kingdom, France, Canada, Italy, Russia, Brazil and Australia. This book is an attempt to understand the complex non-linear dynamics of the financial system stress (financial crisis) and the economic performance as a whole by developing a novel analytical framework.

The schematic of the book is presented in five parts:

(1) The first part deals with a brief introduction of the title, the importance of the study, relevance to the present global economic dynamics and a brief review of the literature.
(2) The second part deals with the construction and interpretation of global stress in stock markets, bond markets, Forex markets and the banking system which are the four major pillars of the financial system. Further, a single financial stress index has been computed for each country which serves as a proxy for financial system stability. The analytics computed from the

financial stress brings important insights about the magnitude of financial system shock and financial system recovery across the globe.

(3) The third part deals with credit expansion patterns in the government debt, stock market capitalisation, and bank lending. Analysis of the dynamics of credit expansion and their behavioural patterns bring key insights into the availability of liquidity and money supply vis-á-vis the financial shock and economic development in each country.

(4) The fourth part deals with the dynamic interaction of the financial system with the economic system. The study of this dynamic interaction helps in understanding the impact of financial system stability on the real economy and vice versa. Understanding the important connections and feedback mechanisms of the financial and economic systems will enormously infer the controllability (regulatory predictability) of these complex systems. Further, the discussions on modelling mysticism and analytics on economic model risk and shock penetration recovery are detailed in this part.

(5) The final part discusses the dynamics of financial system stress and multidimensional analysis of the global economic system with reference to the impact of the financial shocks. The multisystem dynamic analysis provides an overall understanding of the global economic extremities like financial bubble formations (stock market, bond market and banking system bubbles), economic demand and monetary analytics, price stability and money supply bubbles and so on. To conclude, this section discusses important insights from the present study and predicts major changes in the global economic fundamentals in the future.

Important observations and insights from the study are as follows:

- The competing 'capital' in the global financial markets flow mostly into 'fast'-growing economies which pressurises sovereign governments to adopt policies for 'faster' growth or quick recovery. These policies may create an artificial and unsustainable positive feedback to the financial system in the short term. Since the financial and economic systems are highly nonlinear and have a high probability of attaining a state of instability, understanding the nonlinear dynamics of these may help in attaining progressive limit cycle dynamics, thus indicating long-term stability.
- The real economic uncertainty is a continuous variable if the financial market hides it because of inertia (procyclical regulations, herd behaviour, top investors holding big sizes and so on), this uncertainty will eventually explode leading to a potential crisis. However, moderate bubbles in the financial markets are not a bad idea in the long run; the experience of dealing with this randomness by itself will help markets to operate more independently (leading to self-sustainability of markets in the long run) during severe economic hardships.
- It is observed that most of the economic system variables have low-frequency dynamics; thus, an abrupt change to the economic variable through a well-thought out policy or any random policy (due to pressure from other external factors) mostly creates disequilibrium in the system. Individual sovereigns

have to calibrate their economic frequency dynamics, and the calibration method should capture the sovereign financial system behaviour to decide the magnitude of perturbation to the regulatory and economic variables.

- The abrupt volatilities in Forex markets are largely nonmodelable, which, in turn, motivates sovereign economies to peg their currencies (or maintain large Forex reserves or maintain artificial trade surplus and so on). These actions will always create disequilibrium, thereby creating serious concerns particularly during economic hardships. The existing brute-force methods of global economic interaction are very rigid (the pattern of international capital flows) leading to a suboptimal state; on the other hand, the global economic interaction based on an individual country's "sovereign profile" is more optimal.
- More research is clearly required at an individual country and international level to develop innovative methods of capital flows since the existing methods are very rigid and volatile. Thus, new economic thoughts should devise methods to bring all the countries (including small countries) into the global economic space. Well-developed or large emerging countries should perform the role of local optimal (for capital/trade) to other compatible economies. This change will bring economic development to small countries and will eventually transform the mature/developed countries into self-sustaining and stable economies.
- Analysis from the present research indicates that most of the polices (including government spending) in the advanced economies are motivated to restore a low unemployment rate. Given the current population changes, technology dynamics (finding ways to reduce labor hours) and evolving global labor markets; sovereign governments should rethink about its policies of public welfare. Managing a real unemployment rate of 40% (non-robust estimate) may not be very far from today for most of the countries around the world.