CHAPTER 1
INTRODUCTION
## CHAPTER OUTLINE

<table>
<thead>
<tr>
<th>Section No.</th>
<th>TITLE OF THE SECTION</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>Theme, Background and Applications of This Study…</td>
<td>1</td>
</tr>
<tr>
<td>1.2</td>
<td>Need for the Study ………………………………………………………………………..</td>
<td>5</td>
</tr>
<tr>
<td>1.3</td>
<td>Statement of the Problem ………………………………………………………………..</td>
<td>6</td>
</tr>
<tr>
<td>1.4</td>
<td>Research Questions ………………………………………………………………………</td>
<td>8</td>
</tr>
<tr>
<td>1.5</td>
<td>Objectives of the Study ……………………………………………………………………</td>
<td>9</td>
</tr>
<tr>
<td>1.6</td>
<td>Research Hypotheses ……………………………………………………………………</td>
<td>10</td>
</tr>
<tr>
<td>1.7</td>
<td>Thesis Outline …………………………………………………………………………</td>
<td>11</td>
</tr>
</tbody>
</table>
1. INTRODUCTION

1.1. Theme, Background and Applications of This Study

“The world has witnessed unprecedented economic globalization over the past few decades in terms of movements of goods, finance and labor. With rapid globalization, the world has become much more interdependent. … This has also heightened the risk of social, economic and environmental shocks spreading from one country to another with adverse effects and increased economic insecurity.” (United Nations report, 2010, P2)

Liberalization and Privatization as well as Globalization (LPG) are the three dominant features of the world's economic systems which have had unprecedented impact on the openness of financial markets, particularly in the emerging market economies.

Financial openness fueled by removal or reduction of restrictions in foreign ownership and the deregulation of domestic markets has provided a great deal of opportunities for greater flow of capital across national boundaries as well as among various segments of domestic markets. In such a condition, the possibility of a free access for international investor to various markets and increasing competition with more participation of investors and intermediaries has facilitated the process of interdependence of financial markets. In parallel with the growing interdependence of economies and financial markets among various countries, the interdependence of domestic financial markets within countries facilitated by advances in information technology, deregulation, liberalization, and consequently easy access of participants to various market segments, has also witnessed substantial growth.
Many financial crises that have occurred during the last few decades have testified that these phenomena are spread across the countries’ markets with greater speed as financial markets are becoming more interdependent. Therefore, in recent years the growing interdependence of financial markets among and within countries has drawn increasing attention of policymakers, practitioners, and academicians. In particular, after the USA’s stock market crash in 1987, the linkages among financial markets have been the subject of many empirical and theoretical studies. The economic and financial disorder that struck Asian markets in mid-1997 has redoubled this interest and it has become more important particularly after the global financial crisis of 2008.

Empirical evidences also have proven the financial markets’ interdependence in various countries. Gayed (1990) stated that the behavior of any market is a function of trends and behavior of other markets as well as other economic sectors. This implies the markets are influenced not only by their own unique fundamentals, but also by movements in other markets. This reciprocal influence will lead to an interrelationship of different markets over time and its consequence would be high degree of interdependence among them. Murphy (1991) conceives of a kind of causality relationship among currency, commodity, bond, and stock markets respectively. Gayed (1990) had reached similar results as Murphy did and argued that changes in commodity market cause a change in the interest rate and consequently, bond price would be influenced by the changing interest rate and this in turn would impact the stock market.

In the literature, there is greater consensus on the definition of financial market interdependence. Li, Zhang, and Willett (2012) have defined the concept of interdependence as a broad term covering the whole range of ways in which the behavior of variables is influenced by other variables. This definition indicates that
market interdependence exists when the movement in one market leads to movement in another market. Forbes and Rigobon (2002) stated that whenever markets show a high level of co-movement under all situations including crisis periods as well as more stable periods, the term interdependence is appropriate to refer to this situation. Gallo and Otranto (2004) stated that the concepts of interdependence and contagion are two means to characterize transmission mechanisms of shocks from one market to the others. They state that in the case of contagion, the implicit assumption is that one of the market has dominance on the other markets and transmission takes the form of dispersion of the event with a short lag, while in the case of interdependence this behavior is in two directions, means that each market can transmit as well as receive the shocks.

From the above-mentioned definitions mainly two concepts can be inferred comprising the cross-market co-movement and market influences from one another. Investigation of financial markets’ co-movement can be statistically accomplished by employing the correlation and integration analysis, while, measuring the influences of one market on the others is done by using the causality and volatility spillover analysis.

In general, correlation is used to identify the extent and direction of co-movement of two or more variables in terms of positive or negative coefficient. Cointegration approach is the primary tool used for analyzing market integration which occurs when changes in the prices of different assets follow similar patterns over a long period. Causality analysis is used for assessing the lead-lag relationship between two variables, where the second variable is understood as a consequence of the first, and the volatility spillover analysis includes some measures to indicate the transmission shocks from one market to another markets.
Study of the interdependence of financial markets can provide useful insight into many financial issues. According to the portfolio theory, correlation between assets returns or prices significantly affects the risk-adjusted return of the portfolio. Hence investment diversification will reduce unsystematic risk or improve the marginal returns. The integrated financial market may bring about efficiency in markets which would reduce transaction cost and arbitrage opportunities. The causality test is used to identify lead-lag relationships among variables enabling forecasting of the markets’ future trends and facilitating investment diversification. In the presence of transmission shock among markets, a shock coming from one market may have a substantial impact on other markets which is usually measured by volatility transmission approaches. Existing the high volatilities in markets can be used as an index for measuring instability in markets as well as in economies. Therefore financial market interdependence is an important subject for policy makers who are responsible for maintaining market stability. An understanding of this subject is important for investors to employ diversification and hedging strategies to enable asset allocation and risk management.

Many countries across the world, especially the Emerging Market Economies (EMEs), have made attempts to improve their financial markets. Their challenges have resulted in removal or deregulation of restrictions on pricing of different financial assets, changes in the operating framework of the monetary policy along with a shift from quantitative controls to price-based instruments which in turn led to changes in exchange market laws, accounting standards, corporate governance, and bank supervision all of which are essential in market development.

In India, during the last two decades, significant reforms have been initiated from 1991 to remove the financial structure restrictions in order to promote faster
economic development, and thereby to achieve greater efficiency, integration and transparency in financial markets (Jena, Murty & Narasimhan, 2004). These reforms have been undertaken broadly in the form of free pricing, increasing participation base in markets, introduction of new financial instruments and improvements in payment and settlement infrastructure (RBI report, 2007).

In this research, thirteen-year weakly observation data have been used to investigate interdependence among the stock, bond, commodity and currency markets in India. The data included CNX 500 index of National Stock Exchange (NSE), T-bond of government securities market (Treasury bond with sub maturity 8+years), RBI exchange rate of Indian Rupee to US Dollar (INR/USD), and MCX spot index of Multi-Commodity Exchange for the period 2000 to 2012. For obtaining more detailed results and to assess the effect of global financial crisis, the period under study has been divided into three sub-samples. The whole sample covers the period 2000--2012 and the sub-periods include 2000-2007, 2008, and 2009-2012. The data have been obtained from the websites of National Stock Exchange, Reserve Bank of India, and Multi-Commodity Exchange. Because of unavailability of data for commodity market, in this study the Wholesale Price Index (WPI) has been used as a proxy for commodity price index during the years from 2000 to 2005.

1.2. Need for the Study

Understanding the nature and level of interdependence among various financial markets is a critical issue for extensive spectrum of financial information users including policymakers, regulators and researchers on the one hand and managers as well as investors on the other.
In general, this study has three main applications. Firstly, it has reviewed the financial theories, specifically the conceptual framework of financial market interdependence, with providing supportive empirical evidence from Indian financial market. This can be useful for academician and researches in comprehending financial market relationships. Secondly, the results of this study would provide useful information for Indian policy-makers and regulators to assess the impacts of the financial liberalization and monetary policies on the financial market in the last couple of decades and most challenging issue involving in Indian markets. Lastly, the findings of this thesis present some empirical guideline for market participants to adopt suitable investment strategies.

Realization of these objectives is not possible without a comprehensive understanding of the relationship among financial markets. A profound study on the structure of financial markets’ interdependence would be useful for comprehending the financial markets’ behavior. The results of such investigation can be used in risk management, portfolio selection, hedging strategy, reduction in arbitraging, optimal allocation of funds, and reduction in transaction cost, establishment of markets stability, and many other financial activities.

1.3. Statement of the Problem

“In the span of one generation global economic interdependence has grown extraordinarily as a consequence of enormous technological progress and policies aimed at opening national economies internally and externally to competition.” (United Nation report, 2008, p1)

In the light of globalization, several factors such as international trade, foreign direct investment and monetary integration have provided strong drivers for increasing
interdependence among international financial markets. At the same time, opening and
deregulation as a consequence of liberalization along with advances in technologies of
communication have led to substantial interdependence among domestic financial
markets particularly in the emerging economies.

Financial market interdependence as a consequence of financial liberalization is
expected to affect the financial issues including investment diversification and risk
sharing, improvement in capital efficiency and reduction of capital cost (Kose, Prasad,
&Terrones, 2009; Honig, 2008). Indirect channel in which environment of financial
markets would be affected by financial interdependence consists of development of
financial markets and institutions, corporate governance improvement as well as
enhancement of macroeconomic surveillance (Kose M. A., Prasad, Rogoff, & Wei,
2006; Tobin & Sun, 2009).

However, all countries have not benefited from financial liberalization and
financial market interdependence *per se* and cannot also capture all positive effects of
liberalization. The effects of financial market interdependence extensively depend on
certain factors such as development of institutions and domestic financial sector
(Masten, Coricelli, & Masten, 2008). Some conditions should be met for enabling
countries to attain benefits of financial liberalization (Chinn & Ito, 2006). Otherwise,
these countries will be faced with the financial crisis and lower growth rates (Wei,
2006).

India as an emerging economy has witnessed a substantial liberalization in order
to achieve the financial market development over the span of the last two decades. But
*de jure* financial liberalization policies are not necessarily *de facto* effective, it means
that all liberalizing polices may not have expected impact on the financial markets.
Therefore, gauging the financial markets’ interdependence as a consequence of liberalization programs in India through profound studies can provide useful information for the assessment of liberalization outcomes. This research is an effort to achieve these purposes and more specifically, this thesis attempts to examine interdependence among Indian financial markets including stock, bond, commodity and currency markets during the period from 2000 to 2012.

1.4. Research Questions

During the last twenty years, a significant progress has been achieved in terms of policy and institutional reforms in the India financial sector (Jena, Murty & Narasimhan, 2004). Moreover, the huge inflows of foreign institutional investment into Indian equity market have gained a significant momentum only after the year 2000 (Mishra, Swain & Malhotra 2007).

In both theoretical and empirical aspects, the effective financial liberalization polices as well as financial crisis are expected to have impact on the relationship among financial markets. Based on the findings relating to empirical studies, financial liberalization has dual effects on financial market regarding enhancing integration and markets co-movement as well as increasing volatility spillover effects among various markets (He Hongbo 2012).

Moreover, the global financial crisis of 2008 was sparked off in the US economy and flamed in many countries in the world especially the developed countries. Several studies have made attempts to identify the effects of global financial crisis on financial markets relationships and understanding of financial markets behavior during crisis periods has appeared as an interesting issue in empirical and academicals fields.
Therefore, a general question that needs to be answered is: to what extent have these factors affected Indian financial markets? Hence, more specifically, this study has made an attempt to answer the research questions as follows:

1. Whether and to what degree the financial liberalization and the financial crisis have resulted in correlation among financial markets in India.

2. Whether financial liberalization in India as well as financial crisis have affected financial market in terms of long run equilibrium co-movement or integration among them.

3. Whether Indian financial markets have been under impacts of financial liberalization as well as global financial crisis of 2008 from the perspective of short-run association such as causal relationship.

4. Whether and to what extent shocks and volatilities have been transmitted among the Indian financial markets as a measurement to evaluate the markets stability after initiating liberalization in India and during the global financial crisis of 2008.

1.5. Objectives of the Study

In order to assess the influence of Indian financial liberalization as well as global financial crisis, this study proposes to investigate the short-term as well as the long-term interdependence among four Indian financial markets including stock, bond, currency, and commodity markets. Specifically, the objectives of this study are determined as follows:

1. To review the theoretical and fundamental frameworks of the financial market relationship with specific reference to interdependence concept.
2. To examine the cross market correlation among stock, bond, currency and commodity markets in India.

3. To test the integration relationship among considered variables.

4. To analyze the causality relationship among the markets under study.

5. To measure the degree of shocks transmission among selected markets.

6. To assess the effects of financial liberalization in India as well as influences of the global financial crisis of 2008 on the Indian financial markets through the interpretation of the results.

1.6. Research Hypotheses

Hypotheses are formulated to investigate the relationships among the selected variables from the perspective of interdependence.

In order to achieve these goals, the basic null hypothesis of the study is formulated as: “there is no significant interdependence among Indian stock, bond, currency, and commodity markets during the period under study”. Based on the objectives of the study following hypotheses can be considered:

**H1**: “There is no correlation between stock, bond, currency and commodity markets in India during the period 2000-2012”.

**H2**: “Stock, bond, commodity and currency market in India are not integrated during the period 2000 – 2012”.

**H3**: “There is no causality relationship between selected financial markets in the period 2000-2012”.
H4: “There is no volatility spillover among the financial markets under study during the period from 2000 to 2012”.

1.7. Thesis Outline

The present thesis has been organized into six chapters. A short overview of each chapter is presented as follows:

Chapter 1 is an introduction consisting of the theme, background and applications the research, need for the study, statement of the problem, research gap, objectives and hypotheses for the study.


Chapter 3 includes conceptual framework of the study. In this chapter the fundamental theories of financial market relationship in both internal and international aspects are reviewed.

In chapter 4 the review of literature is presented which includes review of literature on internal and international financial markets as well.

In chapter 5 the research methodology of the study is presented. This chapter includes the definition, background and models of 1) cross market correlation, 2) cointegration, 3) Granger causality, and 4) volatility spillover analysis.

Chapter 6 has devoted to data analysis and interpretation of results. In this chapter firstly, the influences of three major factors namely global financial crisis, long-
term interest rate, and inflation on the Indian financial market during the period under study, i.e., 2000 to 2012 are explained. Then results of data analyses obtained from running the related tests as well as interpretation of results based on the hypotheses of the study are presented.

Chapter 7 covers a brief resume of the entire study, the main findings of the study, and the implications of the findings for policy purposes, limitations and avenues for further study on the subject.