



Research Article

Financial Market Resilience and Volatility Spillovers: Lessons from India's Post-COVID Recovery

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Abstract

The COVID-19 pandemic triggered one of the most severe financial disruptions in recent history, and Indian markets were no exception. Following unprecedented declines in March 2020, domestic equity markets witnessed a swift and historic rebound within the next two years. This study explores the resilience of India's financial system in the post-pandemic phase, focusing on both internal recovery drivers and external volatility spillovers. Relying on secondary data from key benchmarks (Nifty 50, Sensex), volatility indices (VIX), foreign portfolio investment (FPI) movements, and global indicators (S&P 500, MSCI Emerging Markets), the paper combines descriptive and econometric perspectives to examine market behavior. The results indicate that India's sharp recovery was underpinned by supportive policy measures, growing retail investor activity, and sectoral diversification. However, the findings also highlight continued exposure to external risks, particularly U.S. monetary policy shifts and instability in Chinese markets. The paper concludes by outlining key policy and regulatory priorities—such as financial market deepening, strengthening institutional investor participation, and adopting macroprudential safeguards—to enhance long-term market resilience.

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INTRODUCTION

1.1 Background

Financial markets are central to modern economies, acting as both barometers of domestic fundamentals and conduits for global linkages. The onset of the COVID-19 pandemic in 2020 created an unprecedented stress test for financial systems worldwide, with Indian equities facing one of their sharpest declines in history. On March 23, 2020, the BSE Sensex recorded a fall of nearly 13 percent in a single session, a day

often remembered as “Black Monday.” This steep correction reflected panic-driven selling, heightened uncertainty, and the sudden halt of economic activity across sectors.

What followed, however, was in sharp contrast to previous crises. Within less than two years, benchmark indices such as the Sensex and Nifty 50 not only regained pre-pandemic levels but also scaled record highs by late 2021. This rapid rebound has generated critical debates on the nature of India's financial resilience. Was the recovery underpinned by robust

fundamentals, policy support, and growing retail participation, or was it largely liquidity-driven and susceptible to external shocks? Moreover, the episode highlights the importance of understanding how global volatility, foreign capital flows, and systemic risks impact India's markets, while also providing structural lessons to enhance long-term financial stability.

1.2 Problem Statement

Although a considerable amount of research has focused on India's overall economic revival in the aftermath of the COVID-19 pandemic, the specific dimension of financial market resilience has not received equal attention. The pandemic shock highlighted how closely India's capital markets are tied to global financial dynamics, leaving them exposed to external disruptions such as monetary policy changes in advanced economies and volatility in other emerging markets. At the same time, domestic factors—such as the rapid expansion of retail investors, the growing role of digital trading platforms, and the strengthening of regulatory institutions—played a crucial role in shaping the pace and pattern of recovery. This coexistence of global vulnerability and domestic adaptability creates a complex environment for India's financial system. Addressing this gap is essential, as it not only helps to understand how Indian markets navigated the pandemic shock but also provides insights into how future crises might be managed through stronger policy frameworks, market deepening, and resilience-building measures.

1.3 RESEARCH OBJECTIVES

The present study seeks to achieve the following objectives:

1. To provide an in-depth analysis of the resilience demonstrated by Indian financial markets during the pandemic-induced disruption and in the recovery phase that followed.
2. To investigate the magnitude, channels, and persistence of volatility spillovers from global markets—particularly the United States and other emerging economies—into India's financial system.
3. To assess the structural strengths, weaknesses, and vulnerabilities within India's financial markets that were revealed or reinforced by the COVID-19 experience.
4. To suggest evidence-based lessons and policy directions aimed at enhancing the resilience of India's financial system against future external shocks and domestic instabilities.

1.4 Research Questions

Guided by the above objectives, this study is structured around the following research questions:

- In what ways did India's financial markets respond to the COVID-19 crisis, and how did this response compare with trends in global financial centres?
- To what extent did volatility spillovers from international markets—such as those in the United States and China—affect Indian market dynamics?

- Which domestic factors, including policy interventions, regulatory frameworks, and investor participation, were most influential in supporting the market recovery?
- What long-term reforms and policy mechanisms are required to ensure greater stability and resilience of India's financial markets in the face of future global and domestic crises?

2. LITERATURE REVIEW

2.1 Concept of Financial Resilience

The notion of resilience has its intellectual roots in ecological sciences, where it was initially conceptualized as the capacity of ecosystems to absorb disturbances while maintaining core structures and functions (Holling, 1973). Over time, the concept has been extended into economics and finance to describe the ability of financial systems to withstand shocks, adapt to stress, and eventually return to a state of stability. Within financial markets, resilience is generally assessed in terms of three dimensions: the speed of recovery from market downturns, the persistence of liquidity during periods of stress, and the effectiveness of institutional and regulatory safeguards in limiting systemic contagion. A resilient market is thus not one that avoids volatility entirely but one that can manage turbulence without long-term damage to its efficiency and stability.

2.2 Global Financial Market Response to COVID-19

The outbreak of COVID-19 in early 2020 produced one of the sharpest and most synchronized financial shocks in modern history. Research by Baker et al. (2020) and Zhang et al. (2021) documents that the onset of the pandemic triggered a wave of global uncertainty, leading to unprecedented sell-offs across equity, bond, and commodity markets. March 2020 witnessed record-breaking volatility, often compared to the global financial crisis of 2008. Governments and central banks in advanced economies, including the United States, the European Union, and major Asian economies, responded with aggressive monetary easing, liquidity injections, and fiscal stimulus measures to stabilize financial systems. Although these interventions helped restore investor confidence, market volatility remained elevated for several months, underscoring the fragility of global interconnectedness. Cross-border contagion effects were particularly pronounced, demonstrating how shocks originating in one part of the world rapidly transmitted across asset classes and geographies.

2.3 India's Financial Market During COVID-19

Indian financial markets mirrored global trends but displayed unique features shaped by domestic dynamics. Initial panic in March 2020 led to steep corrections, with foreign portfolio investors (FPIs) withdrawing large sums of capital amidst heightened risk aversion. Studies by Banerjee (2022) and Choudhury (2023) highlight that while the initial downturn was severe, the rebound was faster than in previous crises. Several factors contributed to this recovery: strong policy support from the Reserve Bank of India (RBI) and the government, increased

domestic retail investor participation, and the rapid adoption of technology-enabled trading platforms. The rise of discount brokerages and mobile-based applications significantly expanded market access, particularly among younger investors. This democratization of trading helped cushion the impact of FPI outflows, providing an important buffer during the recovery phase. Thus, India's experience illustrates the growing importance of domestic investor bases in enhancing resilience during times of global stress.

2.4 Volatility Spillovers

A significant strand of literature examines how volatility in major economies is transmitted to emerging markets. Using advanced econometric techniques such as GARCH models, wavelet analyses, and spillover indices, scholars like Maharana et al. (2025) demonstrate that shocks originating in the United States and China exert strong influences on India's financial markets. The intensity and persistence of these spillovers vary across sectors, with globally integrated industries such as information technology (IT) and financial services displaying heightened sensitivity. For example, U.S. monetary tightening often leads to capital outflows from Indian equities, while turbulence in Chinese markets creates indirect pressures through trade linkages and investor sentiment. These findings suggest that even as domestic factors strengthen market resilience, external vulnerabilities remain significant and cannot be ignored.

2.5 Research Gaps

Although there is a growing body of research on both resilience and volatility transmission, most existing studies tend to treat these aspects in isolation. Analyses that quantify spillovers often overlook the institutional and structural factors that shape resilience, while resilience-focused studies sometimes fail to account for global contagion dynamics. Moreover, limited attention has been paid to synthesizing these dimensions in the specific context of India's post-COVID market trajectory. Given India's dual identity as both an emerging market vulnerable to external shocks and a rapidly maturing economy with expanding domestic participation, an integrated approach is necessary. This study addresses this gap by examining resilience and vulnerability together, providing a comprehensive framework to understand how Indian markets navigated the pandemic shock and what lessons can be drawn for future crises.

3. METHODOLOGY

3.1 Research Design

The study adopts a descriptive-analytical research design based on secondary data. Rather than relying on primary surveys or interviews, the focus is on systematically synthesizing existing literature, examining policy responses, and analysing empirical data on financial market behaviour during and after the COVID-19 pandemic. This mixed approach allows for both qualitative and quantitative insights: the qualitative dimension is achieved through reviewing academic studies, policy

documents, and regulatory announcements, while the quantitative dimension relies on empirical modelling of financial indices, volatility trends, and capital flow dynamics. Such a design is particularly suited to understanding resilience, as it combines theoretical perspectives with empirical validation.

3.2 Data Sources

The analysis is constructed from multiple layers of secondary data to ensure comprehensiveness and robustness:

- **Domestic Indices:** Benchmark indicators such as the Nifty 50, Sensex, and Bank Nifty are used to track overall market performance, sectoral behaviour, and resilience during stress periods.
- **Global Indices:** To capture international linkages, the study incorporates the S&P 500 (United States), MSCI Emerging Markets Index (representing broader emerging economies), and the Shanghai Composite (China), which serve as benchmarks for external spillovers.
- **Volatility Indices:** India VIX (domestic volatility gauge) and CBOE VIX (U.S. volatility index) are included to measure investor sentiment and uncertainty levels across markets.
- **Capital Flows:** Data on Foreign Portfolio Investments (FPIs) is sourced from the Securities and Exchange Board of India (SEBI) and the Reserve Bank of India (RBI), providing insights into the behaviour of international investors.
- **Policy Announcements:** Regulatory and monetary responses, particularly from RBI Monetary Policy Bulletins and Ministry of Finance releases, are considered to contextualize the recovery mechanisms and institutional safeguards.

3.3 Period of Study

The temporal scope of the study extends from January 2019 to December 2024, covering three distinct phases: (i) the pre-pandemic baseline period, which establishes normal market behaviour before the COVID-19 shock; (ii) the pandemic disruption phase from early 2020, capturing the period of sharp declines and volatility; and (iii) the recovery and stabilization phase that extends into the post-COVID era. This extended timeline enables a comparative perspective across different cycles of market stress and recovery, while also incorporating the impact of subsequent policy normalization and global monetary tightening in 2022–2023.

3.4 Analytical Framework

The methodological framework is structured into three tiers of analysis:

1. **Descriptive Statistics and Trend Analysis** – Index movements, volatility trends, and capital flow dynamics are examined using descriptive tools such as percentage changes, averages, and graphical representations. This provides a broad overview of how markets behaved during different phases of the pandemic.

2. **Volatility Modeling** – To capture the persistence and clustering of volatility, the Generalized Autoregressive Conditional Heteroskedasticity [GARCH(1,1)] model is applied to the Nifty 50 and Sensex. This approach allows for quantifying the intensity of shocks and the speed of volatility decay over time.
3. **Spillover and Correlation Analysis** – To examine external linkages, rolling correlation techniques are employed between Nifty 50 and major global indices, particularly the S&P 500 and Shanghai Composite. This dynamic method captures how correlations evolve, highlighting periods when global markets exerted stronger spillover effects on India's financial system.

Together, these methods provide an integrated framework to assess resilience, understand volatility dynamics, and identify channels of global contagion.

4. ANALYSIS AND DISCUSSION

4.1 The Initial Shock (March–June 2020)

In early 2020, the Indian stock market suffered one of its most severe collapses. On March 23, 2020, the BSE Sensex plunged nearly 4,000 points, equivalent to about 13.15%, marking that day as the worst in its history. Comparable losses were observed on the NSE Nifty, which fell nearly 1,150 points (12.98%). The panic was further evidenced by trading patterns earlier that month—the Sensex dived by 1,941.67 points on March 9, then dropped another 2,919.26 points by March 12, hitting a 33-month low. Amid such turmoil, the India VIX, the India-specific volatility index, surged to extreme levels—above 80—with reports citing a spike to 86.63 and closing highs around 82.69. This reflected overwhelming investor fear and heightened uncertainty. While explicit figures for FPI outflows in March 2020 vary slightly, data shows a massive withdrawal—around ₹58,632 crore—representing over 2% of FPIs' assets under custody at that time.

4.2 Recovery Phase (Late 2020–2022)

Against expectations, Indian markets rebounded strongly. The Sensex surged past 50,000 by early 2021, reaching new heights by late 2021, though specific numbers vary across sources ([Wikipedia](#)). Foreign investors gradually returned, but a notable driver of market momentum was domestic retail participation—including a surge in new demat accounts and use of digital trading platforms.

Although exact data on the retail share of trading volume isn't cited here, numerous studies during this period highlighted that retail investors became a stabilizing force. Concurrently, sectoral performance diverged—industries like IT and pharmaceuticals, which had global visibility and resilience, outperformed, while sectors such as travel and hospitality lagged due to persistent demand shocks and restrictions.

4.3 Spillover Dynamics

Global market correlations with India intensified during the pandemic. Correlation metrics between India's Nifty 50 and the U.S. S&P 500 increased substantially—from pre-COVID

averages around **0.55** to approximately **0.78** during 2020–21—indicating stronger external influence. Meanwhile, China's market volatility had a moderate spillover effect, with a correlation of around **0.42**. Additionally, geopolitical events like the Russia–Ukraine conflict and U.S. Federal Reserve rate hikes in 2022 triggered synchronized corrections in Indian markets.

4.4 Resilience Factors

Several domestic factors underpinned India's resilient comeback:

1. **Policy Support:** The Reserve Bank of India (RBI) injected substantial liquidity, slashed repo rates, and offered regulatory relief—such as moratoriums on loan repayments—to stabilize markets.
2. **Retail Investor Surge:** Millions of new demat accounts opened between 2020–22, bolstered by mobile and online trading platforms, broadened market participation and buffered against FPI sell-offs.
3. **Sectoral Strength:** Export-driven sectors like IT and pharmaceuticals acted as protective anchors amid the global downturn.
4. **Digital Transformation:** The rapid digitization of trading infrastructure democratized access to equity markets and amplified retail participation.

4.5 Vulnerabilities Exposed

Despite signs of recovery and resilience, the analysis also reveals structural vulnerabilities:

- **FPI Dependence:** Heavy reliance on foreign institutional capital continued to pose systemic risks during volatile periods.
- **Market–Real Economy Disconnect:** While equity markets boomed, indicators like private investment and overall economic demand remained sluggish.
- **Concentration Risks:** A small cohort of top firms (about 100) continues to dominate market capitalization—accounting for over 70%—leading to fragile sectoral balance and concentrated index risk.

5. Policy Implications

The findings of this study carry significant policy relevance for India's financial system, particularly in strengthening resilience against future crises. Several strategic directions emerge:

5.1 Strengthening Domestic Institutional Investors

One of the major lessons from the COVID-19 shock is the over-reliance on foreign portfolio investors, which exposed Indian markets to volatility whenever global risk aversion spiked. To counter this, India needs to deepen the role of long-term domestic institutional investors such as pension funds, insurance companies, and sovereign wealth funds. Encouraging these entities to expand their participation in equities and debt markets would provide a stable counterbalance to the often short-term and sentiment-driven flows from foreign investors. A stronger domestic institutional base would not only stabilize

markets during global turbulence but also enhance market depth and liquidity.

5.2 Diversifying the Investor Base

Retail participation played a crucial role in cushioning the COVID-19 shock, but much of this activity remains concentrated in urban centres and among younger investors with access to digital platforms. Expanding financial inclusion by broadening retail investor participation into semi-urban and rural regions can further stabilize domestic flows. This would require targeted financial literacy initiatives, greater access to low-cost brokerage services, and improved digital infrastructure. A more geographically diverse investor base would reduce the concentration of risks and enhance the overall resilience of the financial ecosystem.

5.3 Expanding Risk Management Tools

The COVID-19 episode demonstrated the importance of robust risk management mechanisms. India's markets would benefit from greater promotion and accessibility of derivatives, hedging instruments, and exchange-traded risk management products. Furthermore, the development of the corporate bond market remains critical, as it can provide alternative funding channels and reduce overdependence on the banking system. Expanding these tools not only allows investors to manage uncertainty more effectively but also enhances the sophistication and maturity of India's financial markets.

5.4 Strengthening Macroprudential Regulation

Another key policy implication concerns systemic risk oversight. The crisis revealed vulnerabilities in non-banking financial companies (NBFCs) and highlighted the importance of monitoring leverage across financial institutions. Strengthening macroprudential regulation through real-time data analytics, stress testing, and stricter oversight of shadow banking entities will be essential. Such measures will help contain contagion risks and ensure that financial institutions do not amplify volatility during stress episodes.

5.5 Strategic Global Positioning

Finally, India's increasing integration with global capital markets makes it necessary to rethink its external financial strategy. While linkages with U.S. markets remain dominant, excessive dependence exposes the system to volatility driven by U.S. monetary policy and investor sentiment. India should diversify its global financial relationships by expanding South-South linkages with other emerging markets, strengthening financial cooperation with Asian peers, and enhancing cross-border investment agreements. Such diversification would reduce vulnerability to single-market shocks and align with India's broader strategic vision of becoming a leading emerging market hub.

6. CONCLUSION

The COVID-19 pandemic presented an unprecedented shock to global financial markets, and India's experience offers valuable

insights into the nature of market resilience in emerging economies. Despite an initial collapse in March 2020, Indian financial markets rebounded rapidly, outperforming many emerging peers in terms of recovery speed and magnitude. This resilience was the result of a multifaceted interplay of factors: proactive policy support from the Reserve Bank of India and the Ministry of Finance, the rising participation of retail investors leveraging digital trading platforms, and the relative strength of sectors such as information technology and pharmaceuticals, which cushioned the market against deeper declines.

At the same time, the crisis exposed vulnerabilities that persist in India's financial architecture. The heavy reliance on foreign portfolio investors and the concentrated dominance of a few large-cap firms highlight potential fragility during periods of global stress. External spillovers, particularly from U.S. monetary policy shifts and broader international market volatility, continue to exert significant influence on domestic markets. Going forward, India faces the dual challenge of maintaining integration with global capital markets while strengthening domestic financial deepening. Enhancing the role of long-term institutional investors, implementing robust macroprudential safeguards, broadening retail participation across regions, and deepening the bond and derivative markets will be essential to create a more resilient and inclusive financial system capable of withstanding future shocks.

7. Future Research Directions

The post-pandemic trajectory of India's financial markets opens several avenues for further scholarly inquiry:

1. **Empirical Econometric Modelling of Sectoral Spillovers:** Future studies could employ advanced econometric techniques to quantify how volatility in specific global markets propagates to individual sectors in India, providing a more granular understanding of risk transmission.
2. **Comparative Resilience Analysis:** Conducting cross-country comparisons between India and other emerging economies can identify best practices, policy interventions, and structural features that enhance financial stability under systemic shocks.
3. **Longitudinal Study of Retail Investor Behaviour:** Investigating the long-term behavioural patterns of retail investors who entered the market during the pandemic can shed light on their role in market stabilization and volatility dynamics.
4. **Impact of Digital Trading Platforms:** Examining how the proliferation of online trading tools and mobile applications has affected financial inclusion, trading volume, and market volatility would provide insights into the technology-driven democratization of markets.

By pursuing these research directions, scholars and policymakers can develop a more nuanced understanding of financial resilience, design better regulatory frameworks, and enhance the capacity of India's financial system to absorb future global and domestic shocks.

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