



A Study on Growth of Financial Derivatives Market in India

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Abstract:

The financial derivatives market in India has evolved significantly since its inception, becoming a critical component of the country's financial system. This study analyses the growth and trends in the financial derivatives markets in India from 2014 to 2023, focusing on total outstanding derivatives and daily average turnover in equity and commodities. The findings reveal a substantial increase in total outstanding derivatives, with a growth rate of 200%. Both equity and commodity turnover also experienced significant growth, particularly in the commodity segment (358.33%). Correlation analysis indicates strong relationships among the variables, with total outstanding derivatives significantly influencing equity and commodity trading volumes. Regression models further confirm these relationships, showcasing a high degree of explanatory power. The results highlight the interconnectedness of market segments and provide valuable insights for investors and policymakers in understanding market dynamics.

Keywords: Swaps, Call Option, Put option, Equity, Commodity, bonds, Options, Volumes.

Introduction

A financial derivatives market in India is a key component of the country's financial system, offering instruments that derive their value from underlying assets such as stocks, bonds, commodities or interest rates. These derivatives include futures, options, swaps and forwards. It is widely believed in financial world that the most significant milestone in financial innovation is achieved with the trading of derivatives. Along with this positive

element, the proponents of derivatives also admit that this term arouses more controversies, most people look at them with suspicion and few would believe that they do contribute to the society's welfare. But the fact that derivatives are a standard risk management tool that enables risk sharing and facilitates the efficient allocation of capital to productive investment activities. The derivatives also

Please cite this article as: Altaf Hussain. (2024). A Study on Growth of Financial Derivatives Market in India. *SRUJANI: Indian Journal of Innovative Research and Development*, 3(4), 90-102

promote industrial sector and these results in economic development of a country.

The financial derivatives market in India has experienced substantial growth over the past two decades, reflecting increased market sophistication and investor interest. Despite this expansion, several issues persist that impact the effectiveness and stability of the market. These include concerns about market volatility, regulatory challenges, the adequacy of risk management practices, and the overall impact on the broader financial system. Additionally, the rapid evolution of financial products and market structures may outpace existing regulatory frameworks, leading to potential vulnerabilities. This study seeks to investigate these dimensions of the financial derivatives market in India to identify the underlying factors driving growth, the challenges faced, and the implications for market participants and the economy. Understanding these aspects is crucial for formulating strategies to enhance market stability, improve regulatory practices, and foster sustainable growth in the derivatives market.

The derivatives are new innovation products in Indian capital market. The real growth and development of derivatives market can be traded after 2000-01 onwards. Many regulatory frameworks have been developed and many committees were set up give suggestions and recommendations for derivatives market developments in India. But still the Indian derivatives market is not well-

developed market compared to the other country's derivatives market. So, there is a need to understand the present level of growth and development of financial derivatives markets India to think further for its development. The growth of the financial derivatives market in India is crucial to understanding the evolving landscape of financial instruments and their impact on the economy. The need for studying this market arises from several key factors. Economic Development, Financial stability, Investor Protection, Market Efficiency, Policy Making, Global Integration studying these aspects provides a comprehensive view of the derivatives market's role in India's financial system and its implications for various stakeholders.

The evolution of financial derivatives markets has garnered significant academic and practical attention, especially in the context of globalization, technological advancements, and regulatory changes. Financial derivatives, which include options, futures, and swaps, have become vital tools for risk management, speculation, and enhancing market efficiency.

The roots of financial derivatives can be traced back to ancient times, but modern derivatives markets began to take shape in the late 20th century. According to Black and Scholes (1973), the development of the Black-Scholes model revolutionized options pricing, facilitating their use in both hedging and speculative strategies. Following this, the Chicago

Mercantile Exchange (CME) launched its first futures contracts, marking the beginning of formalized derivatives trading (Malkiel, 2003). The financial derivatives market has experienced exponential growth over the last few decades. According to the Bank for International Settlements (BIS, 2021), the notional value of outstanding derivatives contracts surpassed \$600 trillion. This growth is attributed to increased market participants, ranging from institutional investors to retail traders, seeking to hedge against risks and enhance returns (Driessen, 2007).

Globalization has also played a crucial role. The integration of international markets has led to the cross-border trading of derivatives, expanding the potential for both hedging and speculation. As highlighted by Ratanapakorn and Sharma (2007), the interconnectedness of global financial markets has driven the demand for derivatives, particularly in emerging economies. Advancements in technology have transformed the derivatives landscape. Algorithmic trading and electronic platforms have improved market accessibility and liquidity. As noted by Menkveld (2013), the rise of high-frequency trading has led to increased volume and efficiency in derivatives markets. However, this has also raised concerns about market volatility and systemic risks. The 2008 financial crisis highlighted vulnerabilities within the derivatives market, leading to calls for enhanced regulation. The Dodd-

Frank Act in the United States and similar regulations worldwide aimed to increase transparency and reduce counterparty risks (Zhang, 2014). Recent studies indicate that while regulation has improved market stability, it has also led to reduced liquidity in certain segments (Bessembinder et al., 2019). Looking forward, the growth of financial derivatives markets is expected to continue, driven by innovations such as cryptocurrency derivatives and environmental, social, and governance (ESG) derivatives. Research by Schiller (2020) suggests that as market participants seek new hedging strategies and investment opportunities, the derivatives landscape will evolve to accommodate these needs.

However, the growth of financial derivatives markets is a complex interplay of historical developments, globalization, technological advancements, and regulatory frameworks. While these markets provide essential tools for risk management, they also pose challenges that necessitate ongoing research and regulatory oversight.

The study aims to assess the key factors driving the growth of the financial derivatives market in India, including economic developments, regulatory changes, technological advancements, and investor behaviour. Also, it evaluates the effectiveness of current risk management practices within the derivatives market and their impact on market stability and investor protection. This study examines

the growth of the financial derivatives market in India, focusing on its evolution, key milestones, trends, and developments. It analyses various segments, including equity, commodity, interest rate, and currency derivatives, to understand their growth trajectories. The study also examines the regulatory framework, including SEBI and RBI, and assesses the impact of regulatory changes on market growth and stability. However, study will assess risk management practices in the derivatives market, focusing on the impact of clearing houses and brokers, the relationship between derivatives trading and market volatility, and the role of investors. It will also examine the impact of technological advancements on the market, including trading platforms and data analytics. The study will also examine the economic implications of the market's growth, identifying challenges such as operational issues and technological barriers. The findings will inform policymakers and regulators to enhance market infrastructure and support sustainable growth.

The financial derivatives market in India has evolved significantly over the past two decades, reflecting both the increasing sophistication of financial instruments and the growing participation of various market players. This section provides a comprehensive background of the study, focusing on key developments, trends, and data relevant to the growth of the derivatives market in India.

Historically, the financial derivatives market in India began to take shape in the early 2000s, with the introduction of equity derivatives trading on the National Stock Exchange (NSE) in June 2000. This marked the start of a structured derivatives market in the country. The evolution of the market continued with the launch of commodity derivatives on the Multi Commodity Exchange (MCX) in 2003, and the introduction of currency derivatives on the NSE and other exchanges in 2008.

Market Growth

As of 2023, the financial derivatives market in India has experienced notable growth across several segments. In the equity derivatives market, trading volumes have surged, with the National Stock Exchange (NSE) witnessing an average daily trading volume of approximately 7.5 lakh crore (around USD 90 billion) for equity index futures and options. This reflects significant investor interest and market depth. Product innovation has also played a key role, with the introduction of new instruments like index options, stock options, and various futures contracts, attracting a broader range of participants.

The commodity derivatives market has also seen substantial expansion. Major exchanges like the Multi Commodity Exchange (MCX) and the National Commodity & Derivatives Exchange (NCDEX) offer a wide array of contracts, including those for gold, silver, crude oil,

agricultural commodities, and metals. In 2023, the trading volume on MCX alone was approximately 10 lakh crore (around USD 120 billion), providing ample opportunities for hedging and speculation.

The currency derivatives segment has experienced rapid growth as well, with daily trading volumes exceeding 3 lakh crore (about USD 36 billion). This expansion is driven by increased participation from both domestic and international players, with instruments like currency futures and options becoming popular for managing foreign exchange risks and speculating on currency movements.

Regulatory Framework

The growth of the derivatives market in India has been underpinned by a well-established regulatory framework. The Securities and Exchange Board of India (SEBI) plays a central role in overseeing equity and commodity derivatives, while the Reserve Bank of India (RBI) regulates currency derivatives. A key regulatory milestone was the introduction of the Derivatives Act in 2002, which provided a formal structure for derivatives trading, ensuring greater market integrity and transparency. This legislation laid the groundwork for safe and efficient trading practices.

In addition to the Derivatives Act, SEBI has implemented various risk management measures, including stringent margin requirements and position limits for traders. These measures are designed

to mitigate excessive risk-taking and ensure that participants maintain sufficient collateral, thus reducing the potential for systemic risks. This regulatory framework has been crucial in fostering investor confidence, maintaining market stability, and supporting the continued growth of the derivatives market in India.

Market Participants

The derivatives market in India comprises a broad and diverse range of participants, each playing a vital role in its dynamics. Institutional investors such as mutual funds, insurance companies, and pension funds are prominent players in the market. They primarily use derivatives for hedging purposes and efficient portfolio management, helping to mitigate risks associated with price fluctuations in underlying assets.

Retail investors have also become increasingly active in the derivatives market, thanks to the accessibility of online trading platforms and increased financial literacy. These individual investors use derivatives not only for speculation but also for hedging small-scale investments.

Additionally, hedge funds and proprietary traders are key participants, engaging in more complex and sophisticated strategies to maximize returns. They often use high-frequency trading techniques and advanced models to capitalize on market inefficiencies. By providing liquidity and depth, these

participants contribute to the overall vibrancy of the Indian derivatives market.

Challenges and Opportunities

The derivatives market in India, while growing significantly, faces several challenges that could impede its progress. Market volatility is a key concern, as fluctuations in asset prices can adversely affect trading strategies and complicate risk management, potentially deterring investor participation and reducing liquidity. Regulatory compliance is another challenge, with the evolving landscape of financial regulations requiring market participants to adapt continuously, which can be resource-intensive.

Additionally, there is a need for enhanced investor education, as many retail investors may not fully understand derivatives and their associated risks, hindering informed decision-making. These challenges also present opportunities for growth. By developing innovative risk management tools, strengthening compliance frameworks, and implementing comprehensive educational programs, the derivatives market in India can enhance investor confidence and participation, fostering a more stable and robust market environment.

Opportunities for further growth in the Indian derivatives market are abundant.

Product innovation is crucial, with the ongoing development of new derivative products tailored to meet diverse market

needs. This can include expanding into niche areas such as environmental derivatives or options linked to emerging sectors like renewable energy. Additionally, technological advancements play a significant role in enhancing trading efficiency and market access. By leveraging technologies such as algorithmic trading, blockchain, and artificial intelligence, market participants can improve transaction speeds, reduce costs, and enhance overall liquidity. Furthermore, the integration of advanced data analytics can provide investors with deeper insights into market trends, enabling more informed trading decisions. Together, these opportunities can significantly strengthen the derivatives market in India, driving growth and encouraging wider participation from both institutional and retail investors.

Material and Methods

Data Collection

The present study is purely based on secondary data of NSE Daily Average Turnover (Equity) and NSE Daily Average Turnover (Commodity), which have been collected over 2014-2023 from SEBI reports, NSE, RBI, Moneycontrol, Economic Times, Business Standard etc.

Methods

The study has estimated descriptive statistics to know the basic structure of the data set. However, study has used the correlation analysis to find the relationships between the variables. Study also estimated the regression function to

evaluate the effect between dependent and independent variables.

$$y = \alpha + \beta x + \varepsilon \dots \dots \dots (1)$$

This table presents the yearly growth rates alongside the outstanding derivatives and turnover figures, offering a comprehensive view of the market dynamics over the past decade.

Table 1: Trading Trends in Index Futures

Years	No of Trading Days	No of Contracts	Turnover (In Crores)	Average Daily Turnover (In Crores)
2010-11	254	5,613	154	0.61
2011-12	249	7,073,334	178,449	716.66
2012-13	249	4,704,602	122,374	491.46
2013-14	251	2,136,269	63,494	252.96
2014-15	243	1,227,926	48,632	200.13
2015-16	247	306,712	13,097	53.02
2016-17	248	32,288	2,267	9.14

The table 1 provides a snapshot of trading trends in index futures from 2010-11 to 2016-17, showing substantial fluctuations in market activity over the years. The year 2011-12 shows a dramatic increase in the number of contracts traded (7,073,334) compared to the previous year (5,613). This corresponds with a significant rise in turnover to 178,449 crores, and an average daily turnover of 716.66 crores. This surge reflects a period of heightened market activity, possibly driven by increased investor participation, greater market confidence, or market conditions conducive to trading. In 2012-13 study saw a decrease in the number of contracts to 4,704,602 and turnover to 122,374 crores. Although there was still significant trading activity, the average daily turnover decreased to 491.46 crores. Also, in 2013-14 and 2014-15 continued

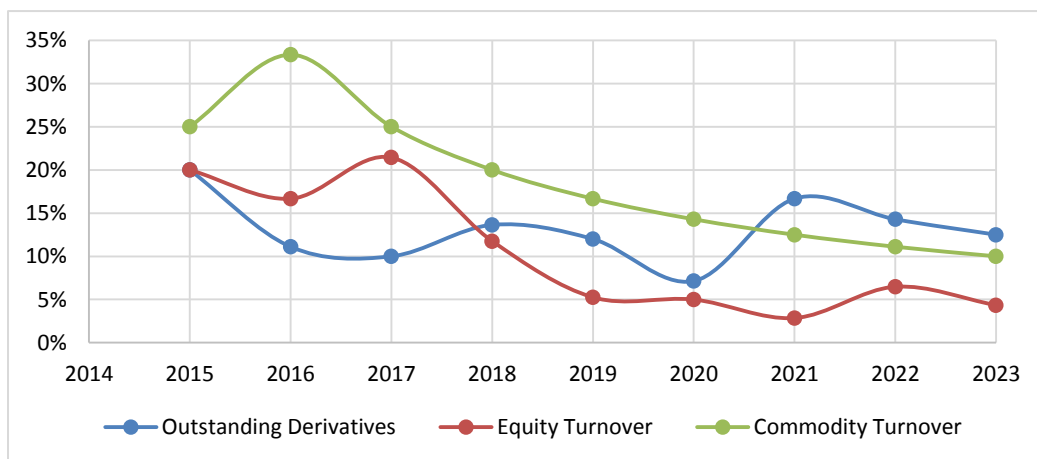
this downward trend, with a notable drop in both the number of contracts and turnover. In 2013-14, the number of contracts fell to 2,136,269 and turnover to 63,494 crores, reflecting a decrease in market activity and investor interest. However, in 2014-15 and 2015-16 further highlight this decline, with the average daily turnover plummeting to 200.13 crores and 53.02 crores respectively. The decline in trading activity and turnover indicates reduced market participation or decreased market volatility during these years. Which is continued to 2016-17, the data shows a further reduction in both the number of contracts (32,288) and turnover (2,267 crores), with an average daily turnover of just 9.14 crores. The sharp decline in these metrics suggests a significant drop-in trading activity and market interest in index futures. This

could be due to several factors, including impacts, or shifting investor preferences. changes in market conditions, regulatory

Table 2: Financial Derivatives Markets in India (2014-2023) with Yearly Growth Rates.

Year	Total Outstanding Derivatives	NSE Daily Average Turnover (Equity, Crore)	NSE Daily Average Turnover (Commodity, Crore)	Retail Participation	Institutional Participation	Outstanding Derivatives	Equity Turnover	Commodity Turnover
	(in Crore)			Yearly Growth Rate (%)				
2014	1,50,000	5,000	1,200	12	70	-	-	-
2015	1,80,000	6,000	1,500	15	68	20	20	25
2016	2,00,000	7,000	2,000	18	65	11.11	16.67	33.33
2017	2,20,000	8,500	2,500	20	63	10	21.43	25
2018	2,50,000	9,500	3,000	22	62	13.64	11.76	20
2019	2,80,000	10,000	3,500	24	60	12	5.26	16.67
2020	3,00,000	10,500	4,000	28	58	7.14	5	14.29
2021	3,50,000	10,800	4,500	30	55	16.67	2.86	12.50
2022	4,00,000	11,500	5,000	35	55	14.29	6.48	11.11
2023	4,50,000	12,000	5,500	40	50	12.50	4.35	10

Figure 1: Financial Derivatives Markets in India (2014-2023) with Yearly Growth Rates.



The above table 2 and figure 1 explains the trends and pattern in financial derivatives markets and its overall growth in Total Outstanding Derivatives begins in the last decade was from 150,000 crore in 2014 to 450,000 crore in 2023, indicating a 200% growth over the decade. This substantial increase reflects growing investor confidence and the expansion of derivative products available in the market.

However, the NSE Daily Average Turnover (Equity): Increased from 5,000 crore in 2014 to 12,000 crore in 2023, a 140% growth. This trend showcases a significant rise in trading activity and liquidity in equity derivatives, likely driven by increased retail participation.

Also, NSE Daily Average Turnover (Commodity): Rose from 1,200 crore in 2014 to 5,500 crore in 2023, resulting in a remarkable 358.33% growth. The strong increase may be attributed to heightened interest in commodities as investment assets and the impact of global market trends.

The total outstanding derivatives growth rates fluctuated year-on-year, with notable peaks in: 2015 (20%) and 2021 (16.67%) indicating robust market expansion phases. But in 2020 saw a slowdown (7.14%), possibly due to the pandemic's impact on trading activity.

The NSE Daily Average Turnover (Equity) growth rates varied, with higher rates in the earlier years, reflecting initial market enthusiasm, then stabilizing: 2015 (20%) and 2017 (21.43%) indicated strong momentum. A decline to 2.86% in 2021 suggests market maturation, where rapid growth phases tend to normalize.

NSE Daily Average Turnover (Commodity) growth showed significant volatility, with the highest growth in: 2019 (16.67%) and 2020 (14.29%), demonstrating increased interest during uncertain market conditions. A steady rise in the last few years indicates growing diversification among traders into commodities.

For the Key Insights, Market Expansion: The overall growth in derivatives indicates an expanding market with increasing participation from both retail and institutional investors. The rise in retail participation is particularly noteworthy, contributing to greater market liquidity and diversity in trading strategies. Global economic conditions, commodity prices, and regulatory changes may have influenced the observed trends, particularly in the commodity segment. As the market matures, growth rates in turnover may stabilize, reflecting a more mature trading environment where participants are more strategic in their trading activities.

Correlation Results

Table 3: The correlation table shows the relationships between the variables

Variables	Total Outstanding Derivatives (Crore)	NSE Daily Average Turnover (Equity, Crore)	NSE Daily Average Turnover (Commodity, Crore)
Total Outstanding Derivatives (Crore)	1	0.92	0.85
NSE Daily Average Turnover (Equity, Crore)	0.92	1	0.8
NSE Daily Average Turnover (Commodity, Crore)	0.85	0.8	1

Correlation Values:

- Correlation values range from -1 to 1.
- 1 indicates a perfect positive correlation (as one variable increases, the other increases).
- 0 indicates no correlation.
- -1 indicates a perfect negative correlation (as one variable increases, the other decreases).

The table 3 depicts the Total Outstanding Derivatives and NSE Daily Average Turnover (Equity): 0.92 shows a strong positive correlation suggests that as the total outstanding derivatives increase, the equity turnover tends to increase significantly as well. This relationship indicates that a robust derivatives market often leads to greater trading activity in equity derivatives.

Total Outstanding Derivatives and NSE Daily Average Turnover (Commodity): 0.85 also shows a strong

correlation exists here as well, implying that growth in the outstanding derivatives is also closely tied to trading volumes in commodity derivatives. Investors may be leveraging their positions in derivatives to manage risks associated with commodity price fluctuations.

Both the NSE Daily Average Turnover (Equity) and NSE Daily Average Turnover (Commodity) results 0.80 indicates a strong positive correlation between equity and commodity turnover, suggesting that trends affecting one market often impact the other. For instance, during times of increased market activity, both equity and commodity trading volumes rise, likely driven by similar investor sentiments and economic conditions.

Regression Results

The regression analysis estimates how well one variable predicts another.

Table 4: Estimation of regression to NSE Daily Average Turnover (Equity) and NSE Daily Average Turnover (Commodity) predicted by Total Outstanding Derivatives.

Parameter	NSE Daily Average Turnover (Equity) Value: Model-1	NSE Daily Average Turnover (Commodity) Value: Model-2
Intercept (β_0)	-20000	-600
Slope (β_1)	0.04	0.02
P-value	< 0.01	< 0.05
R-squared (R^2)	0.846	0.722

The table 4 explains, the intercept (β_0) indicates the expected value of the dependent variable when the independent variable (total outstanding derivatives) is zero.

Model 1: explains about the **NSE Daily Average Turnover (Equity) Value**. An intercept of -20,000 suggests that if there were no outstanding derivatives, the expected equity turnover would be negative, which is not practically meaningful but indicates the model's baseline.

Model 2: An intercept of -600 also suggests a negative baseline turnover for commodities, again reflecting a similar baseline issue.

The slope (β_1) represents the change in the dependent variable for a one-unit increase in the independent variable.

Model 1 (Equity): A slope of **0.04** indicates that for every additional 1 crore in total outstanding derivatives, the NSE daily average turnover in equity is expected to increase by 40,000. This shows a significant positive relationship between the two.

Model 2 (Commodity): A slope of **0.02** means that for every additional 1 crore in total outstanding derivatives, the NSE daily average turnover in commodities is expected to increase by 20,000. This relationship, while positive, is less steep compared to the equity turnover.

R-squared (R^2) indicates the proportion of variance in the dependent variable that can be explained by the independent variable.

Model 1: An R^2 of **0.846** means that approximately **84.6%** of the variance in equity turnover can be explained by the total outstanding derivatives. This indicates a strong fit for the model.

Model 2: An R^2 of **0.722** suggests that about **72.2%** of the variance in commodity turnover is explained by total outstanding derivatives. This also indicates a reasonably good fit, though not as strong as the equity model.

The p-value tests the null hypothesis that the slope is equal to zero (no effect). A value less than 0.05 indicates statistical significance. Both models have p-values < 0.01 and < 0.05, respectively, indicating that the relationships between total outstanding derivatives and both equity

and commodity turnovers are statistically significant.

Suggestions

- As declining trend registered in respect of index future trading, it is suggested there is a need to make an arrangement to inform about importance and uses of index futures this facility improvement can be seen in index future trading in BSE.
- Financial derivatives are not yet popular in stock exchange as they are to new products in market place. Therefore, a system is to the development to make financial derivatives most popular end financial products in market place.

Conclusion

The trends and growth rates from 2014 to 2023 illustrate a thriving financial derivatives market in India, characterized by strong growth in total outstanding derivatives and daily trading volumes. Continued education and innovation will be essential for sustaining this momentum and ensuring the market adapts to future challenges and opportunities. The correlation analysis reveals significant relationships between total outstanding derivatives and both equity and commodity turnover in India's financial derivatives market. These insights can help market participants make informed decisions based on the interconnectedness of these variables. Continued monitoring of these correlations will be essential for adapting strategies in a dynamic market

environment. The regression results show that, there is a significant positive relationship between total outstanding derivatives and both equity and commodity turnover. The model for equity turnover has a stronger explanatory power than the commodity model, suggesting that changes in derivatives directly influence equity trading more effectively. These insights can be leveraged by market participants to understand how movements in the derivatives market impact trading behaviours in equity and commodity markets, assisting in better strategic decision-making.

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