During the recent global recession Derivative instruments were largely criticised on account of their speculative nature. Since introduction of Derivatives segment in the year 2000, it has led both interactions between the Spot and Derivative segment in Indian stock market, and concern by regulators in controlling any possible harmful influences of this new trading segment. There are different opinions on impact of Derivative segment on cash segment. It is said that the Derivative segment prices can reflect additional information, over and above that already reflected in the spot price thus can serve as a leading indicator for the spot prices. This paper analyses the introduction of the Derivative segment trading in India and its impact on the cash segment. It studies the relationship of turnover in Cash and Derivative segment.

Key Words: Derivative segment, Cash segment, Trading turnover, Time series, Correlation

Derivative Trading in India

It is said that derivatives are very hi tech sophisticated complex instruments which can be used only by large scale financial institutions for risk hedging but against these notions Derivative instruments were issued in India not only in index product but at individual stock level also which was very rare in the whole world. Need of the derivative instruments was felt in India post liberalization because derivative trading provides various benefits such as risk management, Price discovery, operational advantage, Market efficiency and opportunity to speculate. The opening of Indian economy has precipitated the process of integration of India’s financial markets with the international financial markets. Introduction of risk management instruments in India has gained momentum in last few years thanks to Reserve Bank of India’s efforts in allowing forward contracts, cross currency options etc. which have developed into a very large market. Until the advent of NSE, the Indian capital market had no access to the latest trading methods and was using traditional methods of trading. There was a huge gap between the investors’ aspirations of the markets and the available means of trading. The derivative segment performs a number of economic functions such as:

- The prices of derivatives converge with the prices of the underlying at the expiration of derivative contract. Thus derivatives help in discovery of future as well as current prices.
- It encourages cash segment business by mitigating its risk through different derivative instruments.
- An important incidental benefit that flows from derivatives trading is that it acts as a catalyst for new entrepreneurial activity.
- Derivatives markets help increase savings and investment in the long run. Transfer of risk enables market participants to expand their volume of activity.
**Cash and Derivative segment in Indian stock market**

Today Indian stock market is very sound in terms of participants from all sections, huge turnover and number of listed companies. Cash segment and derivative segment both have grown with each other. NSE and BSE are the major exchanges. Over the years Indian stock market has modernized with the use of high modern Information and Communication technology. Derivatives instruments have become part and parcel of business world. Today, derivative instruments are used in all markets such as foreign exchange, shares, commodities etc. New, sophisticated, complex and exotic tools are being developed in different markets. The innovative derivative instruments have been developed in such a manner that these are used even by a common man. Although derivatives have been in existence for long in past in one or another form but present day sophisticated, standardized derivative products are definitely a recent phenomenon. In derivative segment following four products are available;

1. Index Futures
2. Index Options (Call and Put)
3. Individual Stock futures
4. Individual Stock Options (Call and Put)
5. Interest rate Derivatives

**Objectives**

Objective of this paper is to study the impact of launch of derivative segment on cash segment of Indian stock market in terms of trading turnover. It also aims to study the correlation in the trading turnover of derivative segment and cash segment over the years.

**Research Methodology**

In this study Time series and simple correlation methods have been used. In order to study the impact of launch of derivative segment on cash segment in Indian capital market, Time series method has been applied and its results were later verified through personal interview of brokers and proprietary traders. Through time series we have calculated expected trading turnover of cash segment in 2001-02 (As all stock and Index based futures and option products were launched by this year) and compared it with the actual trading turnover (in cash segment). Correlation has also been calculated between turnover of cash and derivative segment.

**Review of Literature**

Stewart Mayhew (2000) suggested that although in many cases derivatives play role of price discovery and price stabilization but as derivatives markets are in growth stage so it is difficult to generalize any theory of derivatives impact on cash markets and emphasized the need to further research on issues like whether results in one market are applicable to another market.

Dr Satya Swaroop Debasish (2008) confirmed, in his study of lead lag analysis in futures and spot market, co integration and lead lag relationship between spot and futures market in Indian stock market. It was observed that futures market plays price discovery role in market. Futures market are more efficient than spot market in reflecting new information and spot market follow the same. Indian traders buy and sell stocks rather than index futures and they exploit information about future trend from futures market.

N Ramanjaneyalu and Dr A P Hosamani (2008) surveyed investors to know their views about Derivative segment as there are lot of myths about derivative segment among participants. Study
revealed that majority of investors (62%) assumes that derivative instruments are meant for speculation thus they are ignorant of the main purpose of derivatives that is risk hedging. More than 50% investors take derivatives as new complex and hi tech products in reality these products can be easily used with some orientation. With this study one can understand need of orientation of common investors towards derivatives products as risk hedging tools.

Golaka C Nath (Behavior of Stock Market Volatility after Derivatives) explained the volatility of the market as measured by benchmark indices (like S&P CNX NIFTY and S&P CNX NIFTY JUNIOR have fallen after in the post derivatives period.

Gupta and Kumar (2002) did find that the overall volatility of underlying market declined after introduction of derivatives contracts on indices. Thenmozhi (2002) reported lower level volatility in cash market after introduction of derivative contracts. Shenbagaraman (2003) reported that there was no significant fall in cash market volatility due to introduction of derivatives contracts in Indian market. Raju and Karande (2003) reported a decline in volatility of the cash market after derivatives introduction in Indian market.

Different studies have shown that Derivative segment serves stock market in many ways especially by discovering prices and proving risk mitigation to cash segment trader. But it was required to understand how closely these two segments are interrelated. Present study attempts to study this relationship.

**Data Analysis and Discussion**

It is said that cash segment is the mother segment for derivative segment. India is the country with largest number of registered companies. Earlier BSE was the most popular and reliable stock exchange in India but after Introduction of NSE, it has taken over BSE in terms of turnover.

**Table 1: Turnover of Cash segment in India**

<table>
<thead>
<tr>
<th>Year</th>
<th>Turnover at BSE</th>
<th>Turnover at NSE</th>
<th>Total Turnover (Rs. in Crore)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992-93</td>
<td>45696</td>
<td>00</td>
<td>45696</td>
</tr>
<tr>
<td>1993-94</td>
<td>84536</td>
<td>00</td>
<td>84536</td>
</tr>
<tr>
<td>1994-95</td>
<td>67749</td>
<td>1805</td>
<td>69554</td>
</tr>
<tr>
<td>1995-96</td>
<td>50064</td>
<td>67287</td>
<td>117351</td>
</tr>
<tr>
<td>1996-97</td>
<td>124190</td>
<td>295403</td>
<td>419593</td>
</tr>
<tr>
<td>1997-98</td>
<td>207113</td>
<td>370193</td>
<td>577306</td>
</tr>
<tr>
<td>1998-99</td>
<td>310750</td>
<td>414474</td>
<td>725224</td>
</tr>
<tr>
<td>1999-00</td>
<td>686428</td>
<td>839052</td>
<td>1525480</td>
</tr>
<tr>
<td>2000-01</td>
<td>1000032</td>
<td>1339510</td>
<td>2339542</td>
</tr>
<tr>
<td>2001-02</td>
<td>307292</td>
<td>513167</td>
<td>820459</td>
</tr>
<tr>
<td>2002-03</td>
<td>314073</td>
<td>617989</td>
<td>932062</td>
</tr>
<tr>
<td>2003-04</td>
<td>503053</td>
<td>1099534</td>
<td>1602587</td>
</tr>
<tr>
<td>2004-05</td>
<td>518715</td>
<td>1140072</td>
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<td>2005-06</td>
<td>816074</td>
<td>1569558</td>
<td>2385632</td>
</tr>
<tr>
<td>2006-07</td>
<td>956185</td>
<td>1945287</td>
<td>2901472</td>
</tr>
<tr>
<td>2007-08</td>
<td>1578857</td>
<td>3551038</td>
<td>5129895</td>
</tr>
<tr>
<td>2008-09</td>
<td>1100074</td>
<td>2752023</td>
<td>3852097</td>
</tr>
</tbody>
</table>

**Impact of launch of Derivative Segment on Cash Segment in India**

Time series (method of least square) has been
applied to study the effect of launch of Derivative segment on cash segment in 2001-02 in Indian Stock market. Data of 9 years turnover in cash segment from 1992-93 to 2000-01 have been taken as dependent variable to estimate value for 2001-02. Data for 9 years was processed to SPSS and following results were produced;

\[ Y = a + bX \]

\[ (a = 656031.3, b = 254491.9) \]

Estimated turn over in cash segment for the year 2001-02 (based on method of least square) comes as follows;

\[ Y = Rs. 19,28,490.8 \]

Thus based on trend analysis turnover in the year 2001-02 should have been Rs. 19,28,490.8. Now we can compare it with the actual turnover in the year 2001-02

**Actual turnover of cash segment in 2001-02**

\[ = Rs. 8,20,459 \]

**Estimated turnover for cash segment in 2001-02**

\[ = Rs. 19,28,490.8 \]

(Based on Trend line)

Thus, it can be observed that actual turnover was around 58% less than the expected turnover as per trend line in the year 2001-02 when derivative trading was launched. Growth rate from 2001-02 to 2004-05 was very low as compared to period before launch of derivative. Thus it can be interpreted that derivative segment has taken some business of cash segment although there may be some other reasons also for this decline.

**Comparative Study of Growth in Cash and Derivative Segment**

**Table 2 : Trading Turnover in Cash and Derivative Segment**

(Rs. Crore)

<table>
<thead>
<tr>
<th>Year</th>
<th>Turnover in Cash segment</th>
<th>Turnover in Derivative segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-02</td>
<td>820459</td>
<td>103853</td>
</tr>
<tr>
<td>2002-03</td>
<td>932062</td>
<td>442343</td>
</tr>
<tr>
<td>2003-04</td>
<td>1602587</td>
<td>2142520</td>
</tr>
<tr>
<td>2004-05</td>
<td>1658787</td>
<td>2563166</td>
</tr>
<tr>
<td>2005-06</td>
<td>2385632</td>
<td>4824260</td>
</tr>
<tr>
<td>2006-07</td>
<td>2901472</td>
<td>7415276</td>
</tr>
<tr>
<td>2007-08</td>
<td>5129895</td>
<td>13332785</td>
</tr>
</tbody>
</table>

(Source : www.sebi.gov.in)

Karl Pearson's Correlation Coefficient = 0.996492156

It can be observed that there is very high degree of positive correlation between cash and derivative segment during 2001 to 2007-08. Very high positive correlation suggests that both segments are affected by same factors and investors' population is same for the two.

**Conclusion**
When Derivative segment was launched in 2000-01 it was a new segment for Indian Investors but within one year it took momentum and in 2001-02 cash segment trading dropped around 60% and almost equal to this decline was the turnover of derivative segment. Thus it can be concluded that traders in derivative segment comes from prevailing cash segment at that time. Very high degree of positive correlation also indicates that traders in both segments are closely interrelated. It may be due to the fact that derivatives instruments are available with all the brokers parallel with cash market instruments.

It can be put this way that cash segment is spring board for derivative segment. In the year 2001-02 there was two third decline in cash segment both at BSE and NSE when derivative segment trading started. Although there were some other factors responsible for this decline 2001-02 such as security scam in stock market but it can be interpreted that to some extent launching of derivative segment took away this business from cash segment.

Scope for Future Research

This paper has attempted to study the impact of launch of Derivative segment on cash segment in the year 2001-02. This paper has studied the correlation between trading volume of cash and Derivative segment over the years. This paper has covered four instruments of stock market namely stock futures, stock options, index futures and index options. Interest rate derivatives have not been covered. To further this research Interest rate derivatives behavior can be studied. Further there is need to study how correlation between cash and Derivative segment moves with changes in traders/participants because India is the country where share of retail and proprietary participants is very high.

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