THE NATURE OF THE DERIVATIVE MARKET TRANSACTIONS TRADED IN THE JOHANNESBURG SECURITIES EXCHANGE

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Abstract

The main objective of the study was to assess and understand the nature of derivative products traded in the Johannesburg Securities Exchange (JSE) by analysing daily transactions consisting of deals and contracts concluded, as well as notional values of derivatives traded in the review period. Analysed data found that the South African derivative market continues to grow and evolve with the consistent introduction of new derivative products such as the "can do" derivatives, IDX derivatives that are now being traded at the JSE. The evolvement and growth is confirmed by the fact that the total derivative deals in the JSE has also grown by 16.6% (CAGR) from 2006. The study further found that the equity index remains the largest derivative for both options and futures.

Keywords: Johannesburg Securities Exchange, Options, Futures, Equity, Commodities, IDX and Dividends

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1. Introduction

A large financial derivatives market has developed over the past two decades. This market includes interest rate and currency swaps, options, and credit derivative obligations. For example at the end of 2003 the Bank for International Settlements estimated the notional value of all over-the-counter derivatives at $197 trillion and the value of derivatives outstanding traded on organized exchanges at $17 trillion for futures and $29 trillion for options (Bank of International Settlement, 2003).

South Africa has not been left behind in this derivative market development. In South Africa, the exchange trading in derivatives occurs in the Johannesburg Securities Exchange (JSE) and the derivative trading house is known as the South African Futures Exchange (SAFEX). SAFEX was acquired by the JSE in 2001 and according to the JSE; SAFEX went on to become the leader in both equity and agricultural derivatives trading in the South African market.

The JSE was established in 1887 with the discovery of gold in South Africa. This discovery led to the establishment of the exchange in order to be able to raise money for the booming mining and financial industry. The JSE is located in the South Africa's financial district, Sandton and it had a total of 394 listed companies and its market capitalisation as of 11 January 2013 was R8 620 079 096 030 (R'trillion) (Johannesburg Securities Exchange, 2013).

Bartram, Brown and Fehle (2003) conducted a survey on the popularity of derivative instruments in South Africa and they found that derivatives are very popular amongst South African companies as 90% of South African companies and financial institutions made use of some form of derivative instruments. Recently, the International Monetary Fund (IMF) paper on monetary and capital markets found that South Africa's derivatives market has grown rapidly in recent years. Further, the IMF's paper notes that the recent growth has supported capital inflows and helped market participants to price unbundle and transfer risk (Adelegan, 2009).

2. Objectives

The main objectives of this paper are stated follows:

- This main objective is to assess the nature of derivative products traded in the Johannesburg Securities Exchange (JSE); and
- Once the nature of derivative product traded in the JSE is understood, by analysing daily transactions consisting of deals and contract concluded, as well as notional values involved from the year 2001, this study would be in a position to track and highlight how the exchange traded derivative market has evolved in South Africa.

These objectives aim at providing the key information on the relative contribution of each derivative product to the overall derivative market turnover in the Johannesburg Securities Exchange (JSE). Understanding the evolution of the derivative market transactions by trailing the key salient movements in the Johannesburg Securities Exchange (JSE) would paint a picture of the confidence derivative market participants have on the South African market. The salient movements are critical for the general performance of the country as it is generally accepted that well-developed capital markets generate many economic benefits, including higher productivity growth, greater employment opportunities, and improved macroeconomic stability (Dudley & Hubbard, 2004).

An important element why South Africa's derivative market should evolve and mimic the major derivative centres is that in 2010 South Africa became a member of the BRICS nations which consist of emerging economies of Brazil, Russia, India, China and South Africa. To facilitate liquidity and investments on behalf of the African continent through the "launching pad" approach; South Africa should ensure that it grows and that it has efficient capital market.

A further argument for well-functioning capital market in South Africa is that South Africa is a regional anchor in terms of the size of its economy. It is the largest trading partner for the rest of sub-Saharan Africa, accounting for over a third of the region's GDP and about 40% of its exports (IMF, 2012). It is the 27th largest economy in the world and Africa's number one (1) economy (World Bank, 2013). As such, the well-functioning of South Africa's capital market is vital for the facilitation of capital for this region.

3. Methodology and approach

To determine the evolution of the derivative market transaction in the Johannesburg Securities Exchange (JSE), the questionnaire containing questions on the classification of exchange participants, nature of derivative products traded, number of deals concluded and derivative contracts entered into as well as the notional value of contracts was designed.

To eliminate the risk of not populating the correct information, several telephonic discussions were requested and held with Johannesburg Securities Exchange (JSE) the purpose being populating the designed questionnaire. Following discussions, an understanding of the nature of data required was formed. This was followed by a process where the Johannesburg Securities Exchange (JSE) made available all derivative market transactions from 2001 until December 2012. However, for the purpose of determining the evolution of the derivative market transaction in the Johannesburg Securities Exchange (JSE), three (3) sets of periods were defined and covered as follows:

- January 2006 - December 2006
- January 2009 - December 2009
- January 2012 - December 2012

The rationale behind selecting data from 2006 onwards was due to the observation that data from 2001 to 2005 appeared to be insignificant as there wasn't sufficient transactions appeared on the data for that particular period.

4. Review Of Related Literature

In the global derivative study, The Group of Thirty (1993) defined derivatives as a contract whose value depends on (or derives from) the value of an underlying asset, reference rate or index. This definition is consistent with that of Whaley (2006) and recently the CFA Institute (2010) where all agree that the instrument is termed a "derivative" because it derives its value from that of the underlying asset.

Two forms of derivatives namely; the forward commitments and contingent claims exist. Table 1 below demonstrates the difference between the forward commitment and contingent claims (options).

Table 1. Forward Commitment and Contingent Claims

	Forward Commitment	**Contingent Claim (Option)**
Descriptions	1. A forward commitment involves the buyer agreeing with the seller to acquire an underlying asset at a future date, and at a price that has been agreed in advance. 2. The contracting parties also take time to agree on when and where delivery will take place as well as the exact identity of the underlying asset.	1. A contingent claims or options refer to those derivatives in which the payoff occurs if a particular event takes place. 2. An option (share) enables the holder to buy shares at a predetermined strike price in the future. In this case, the share option derives its value from the current price of the underlying share relative to the option strike price.

Source: Authors own illustration (definitions obtained from National Treasury, 2010)

With regards to the market for trade, the CFA Institute (2010) indicates that both the forward commitment and the contingent claim (option) derivatives could be traded on an organised exchange market, or over the counter. Should the forward commitments gets exchange traded, they then get classified as futures contracts. Johnson (1960) defined future contracts as a promise of a seller to deliver within a specified period, and a promise of a buyer to take delivery of a standardised quantity and quality of a commodity at an agreed price that is readily adaptable by its homogeneous nature to being traded on an exchange

On the other hand, should forward commitments get traded over the counter, they then get categorised as either forward contracts, or swap agreements. The CFA Institute (2010) defines a forward contract as a situation where the prospective buyer agrees to buy from the seller an underlying asset at a predetermined future date, and at a price established at the inception of the contract. The CFA Institute (2010) further indicate that the forward contracts are customised as they are over the counter agreements as opposed to being standardised as is the case with futures contracts (CFA Institute, 2010).

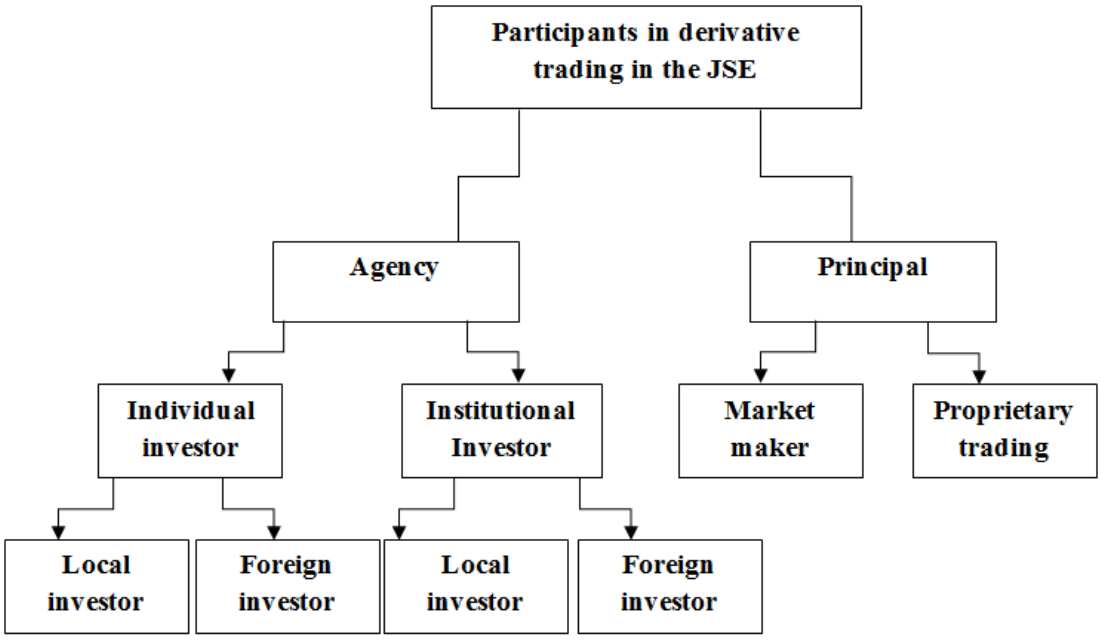
As indicated in the discussions above, derivatives are either traded over the counter (OTC) or on the stock exchange (exchange traded derivatives). The focus of this study is on the evolution of derivative market transaction taking place in the stock exchange environment in South Africa (i.e. derivative transactions traded in the Johannesburg Securities Exchange). According to Whaley (2006), the main attributes of exchange traded derivatives are standardised contracts, a clearing house, and a system of margining as well as market transparency.

There exist different purposes for trading in derivatives. Derivatives could be used the purposes of risk management, hedging, arbitrage and speculation (Whaley, 2006). For the CFA institute (2010) when financial derivatives are traded, there is a price discovery that takes place, for example, futures markets provide information about the value of the underlying asset upon which the futures are based. Price discovery can be explained by comparing various spot prices in different geographic locations and selecting, as a proxy, the price of the contract with the shortest period to maturity then serves as the price for the underlying asset. In addition, the prices of all futures contracts can be used by those who trade in contracts as a substitute for the uncertainty of future prices.

5. Classification Of Derivative Trading Participants In The Johannesburg Securities Exchange

Figure 1 below demonstrates the derivative trading participants in the Johannesburg Securities Exchange (JSE). The information assessed for the purpose of determining the evolution of the derivative market transaction in the Johannesburg Securities Exchange (JSE) comprised on the derivative market transaction entered into and concluded by the participants classified in Figure 1 below:

Figure 1. Classification of participants in the JSE derivative trading

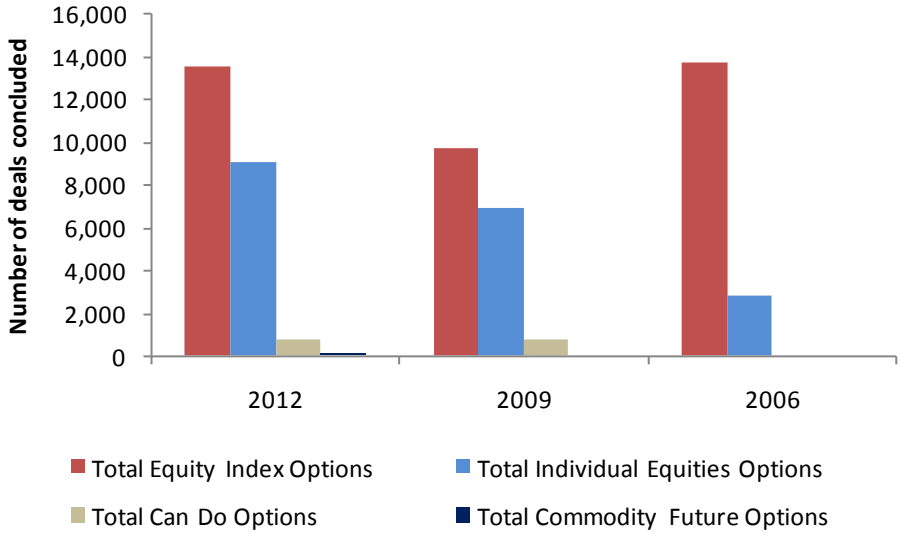


Source: Authors own illustration (Information obtained from JSE)

6. Research Findings

6.1 JSE Options deals

Figure 2. JSE Options deals entered into



Source: Authors own illustration

Table 2. JSE Options deals entered into

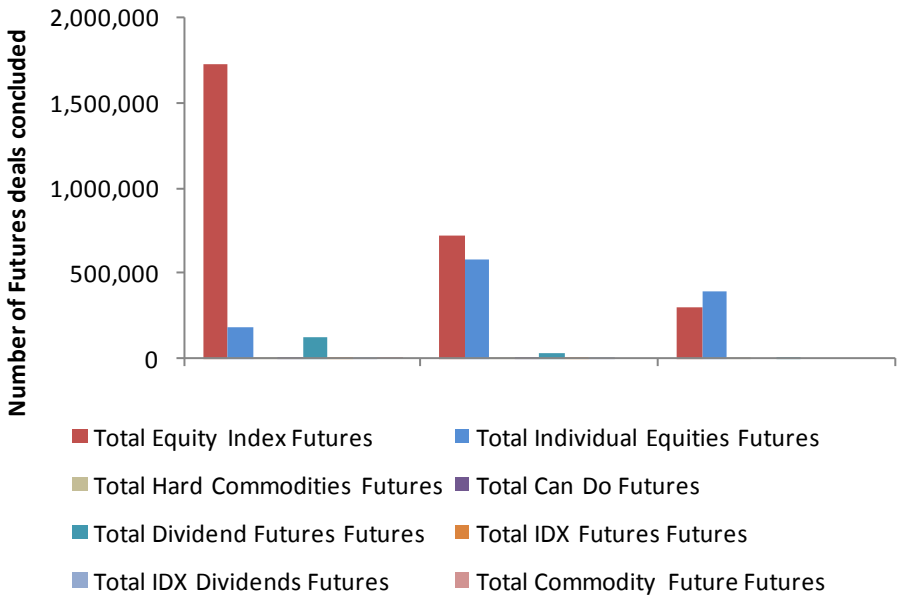
	2012	2009	2006
Total Equity Index Options	13,515	9,742	13,699
Total Individual Equities Options	9,102	6,960	2,835
Total Can Do Options	751	806	0
Total Commodity Future Options	90	0	0
Total Options	**23,459**	**17,508**	**16,534**

Source: Authors own illustration

Table 2 and Figure 2 above demonstrate the number of option deals entered into at the Johannesburg Securities Exchange. From the analysis of data, it is apparent that the equity index options are the largest options deals that are entered to contributing 57% of all option deals entered into. This is followed by the individual equity options which contribute 39%. Interestingly, the "can do options" were not traded at the JSE in 2006. As the derivative market evolved, the "can do options" started being traded in 2009.

6.2 JSE Futures deals

Figure 3. JSE Futures deals entered into



Source: Authors own illustration

Table 3. JSE Futures deals entered into

	2012	2009	2006
Total Equity Index Futures	1,732,503	717,856	301,446
Total Individual Equities Futures	177,014	577,109	392,014
Total Hard Commodities Futures	23	6	122
Total Can Do Futures	2,012	757	0
Total Dividend Futures Futures	128,672	33,125	536
Total IDX Futures Futures	2,485	169	0
Total IDX Dividends Futures	2,059	53	0
Total Commodity Future Futures	4,798	0	0
Total Futures	**2,060,537**	**1,329,075**	**694,118**

Source: Authors own illustration

Table 3 and Figure 3 above demonstrate the number of futures deals entered into at the Johannesburg Securities Exchange. From the analysis of data, it is apparent that the equity index futures are the largest options deals that are entered to contributing 84% of all futures deals entered into. This is followed by the individual equity futures and dividend futures which both contribute 9% and 6% respectively. As noted earlier, the "can do futures", IDX futures and IDX dividend futures were not traded at the JSE in 2006. As the derivative market evolved, these futures began to be traded in 2009. The commodity futures began to be traded in 2012.

Table 4. Consolidated JSE Futures and Options deals entered into

	2012	2009	2006
Total Equity Index Options	13,515	9,742	13,699
Total Individual Equities Options	9,102	6,960	2,835
Total Can Do Options	751	806	0
Total Commodity Future Options	90	0	0
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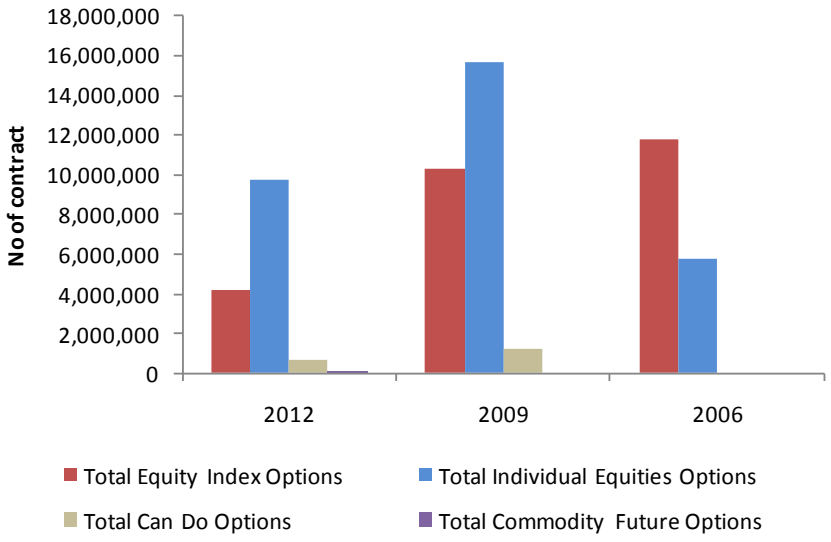
Total IDX Dividends Futures	2,059	53	0
Total Commodity Future Futures	4,798	0	0
Total Futures	**2,060,537**	**1,329,075**	**694,118**
Grand Total	**2,083,996**	**1,346,583**	**710,652**

Source: Authors own illustration

Table 4 above demonstrate the total number of both futures and options deals entered into at the Johannesburg Securities Exchange. From the analysis of data, it is apparent that futures are the most traded derivatives in the Johannesburg Securities Exchange as they contribute 99% (2009 and 2006: 99% and 98% respectively) of derivative trade. Overall, the total derivative deals in the JSE have evolved and grown 16.6% (CAGR) from 2006.

6.3 JSE Options Contracts concluded

Figure 4. JSE Options Contracts concluded



Source: Authors own illustration

Table 5. JSE Option Contracts concluded

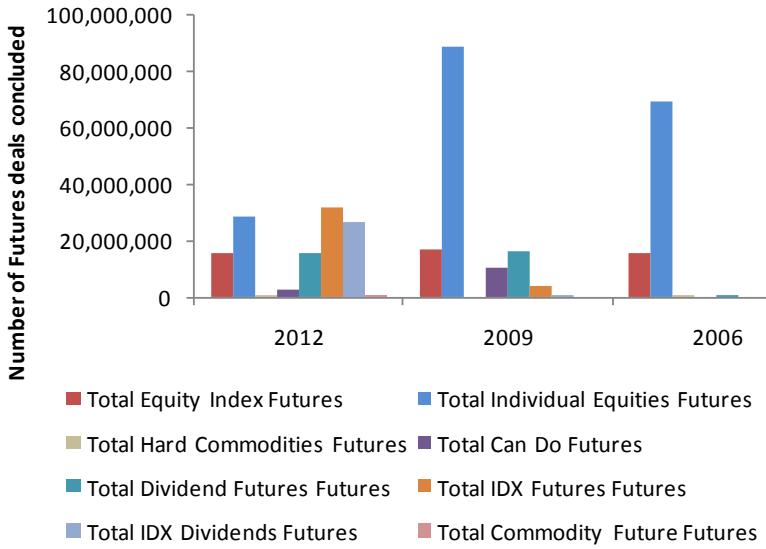
	2012	2009	2006
Total Equity Index Options	4,225,710	10,326,359	11,801,030
Total Individual Equities Options	9,783,374	15,670,869	5,751,832
Total Can Do Options	723,393	1,247,761	0
Total Commodity Future Options	3,911	0	0
Total Options	**14,736,959**	**27,244,989**	**17,552,862**

Source: Authors own illustration

Table 5 and Figure 4 above demonstrate the number of options contracts entered into at the Johannesburg Securities Exchange. From the analysis of data, it is apparent that the individual equities options have the largest options contracts concluded contributing 66% of all options contracts concluded. This is followed by the equity index options which contributed 29% and the "can do options" which contributed 5% in all contracts concluded. As shown earlier, the "can do options", IDX futures and IDX dividend options were not traded at the JSE in 2006. As the derivative market evolved, these options began being traded in 2009. Again, it is worth noting that the total commodity futures began to be traded in 2012.

6.4 JSE Futures Contracts concluded

Figure 5. JSE Futures Contracts concluded



Source: Authors own illustration

Table 6. JSE Futures Contracts concluded

	2012	2009	2006
Total Equity Index Futures	15,751,595	16,737,684	15,514,520
Total Individual Equities Futures	28,806,202	88,791,925	69,663,332
Total Hard Commodities Futures	157	8	23,974
Total Can Do Futures	2,663,021	10,619,562	0
Total Dividend Futures Futures	15,944,897	16,364,671	423,931
Total IDX Futures Futures	31,602,019	4,322,148	0
Total IDX Dividends Futures	26,774,209	171,847	0
Total Commodity Future Futures	64,463	0	0
Total Futures	**122,304,825**	**137,007,845**	**85,625,757**

Source: Authors own illustration

Table 6 and Figure 5 above demonstrate the number of futures contracts concluded at the Johannesburg Securities Exchange. From the analysis of data, it is apparent that the IDX futures are the most prominent contracts as they are the largest futures contracts concluded contributing 26% of all futures contracts concluded. Interestingly, data suggest that the IDX futures are new as they were introduced into the JSE derivative market in 2009. The IDX futures are followed by the individual equities futures and IDX dividend futures which both contribute 24% and 22% of contracts concluded respectively. As noted earlier, the "can do futures", IDX futures and IDX dividend futures were not traded at the JSE in 2006. As the derivative market evolved, these futures began to being traded in 2009. The total commodity futures began to be traded in 2012. Since the introduction of these new derivatives, contracts concluded have been steadily increasing demonstrating that the futures derivative market is evolving.

Table 7. Consolidated JSE Futures and Options contracts concluded

	2012	2009	2006
Total Equity Index Options	4,225,710	10,326,359	11,801,030
Total Individual Equities Options	9,783,374	15,670,869	5,751,832
Total Can Do Options	723,393	1,247,761	0
Total Commodity Future Options	3,911	0	0
Total Options	**14,736,959**	**27,244,989**	**17,552,862**
Total Equity Index Futures	15,751,595	16,737,684	15,514,520
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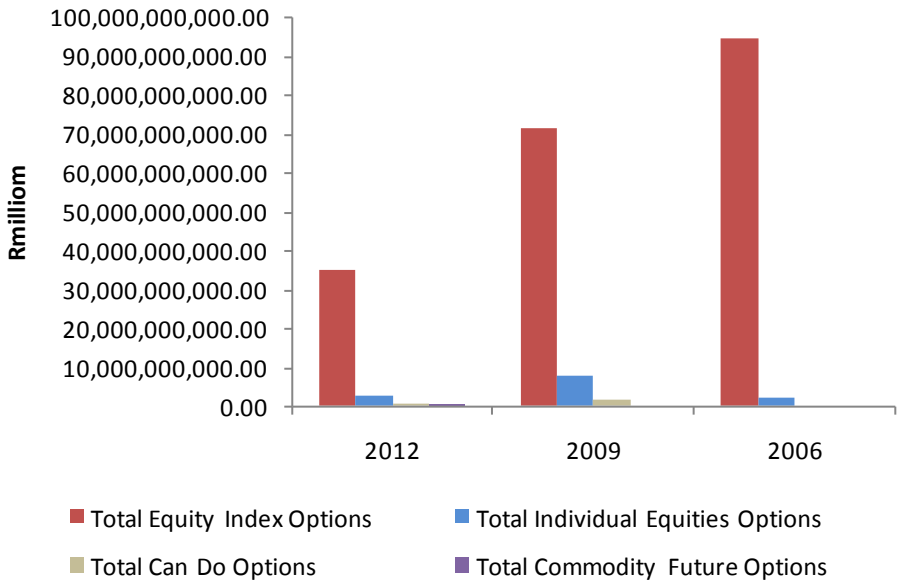
Total Commodity Future Futures	64,463	0	0
Total Futures	**122,304,825**	**137,007,845**	**85,625,757**
Grand Total	**137,041,784**	**164,252,834**	**103,178,619**

Source: Authors own illustration

Table 7 above demonstrate the consolidated number of both futures and options contracts concluded at the Johannesburg Securities Exchange. From the analysis of data, it is apparent that futures are the most traded derivatives in the Johannesburg Securities Exchange as they contribute 89% (2009 and 2006: both at 83% respectively) of derivative trade. Overall, the total derivative deals in the JSE have evolved and grown 4.1% (CAGR) from 2006.

6.5 JSE's Options Notional Amounts involved

Figure 6. JSE's Options Notional Amounts involved



Source: Authors own illustration

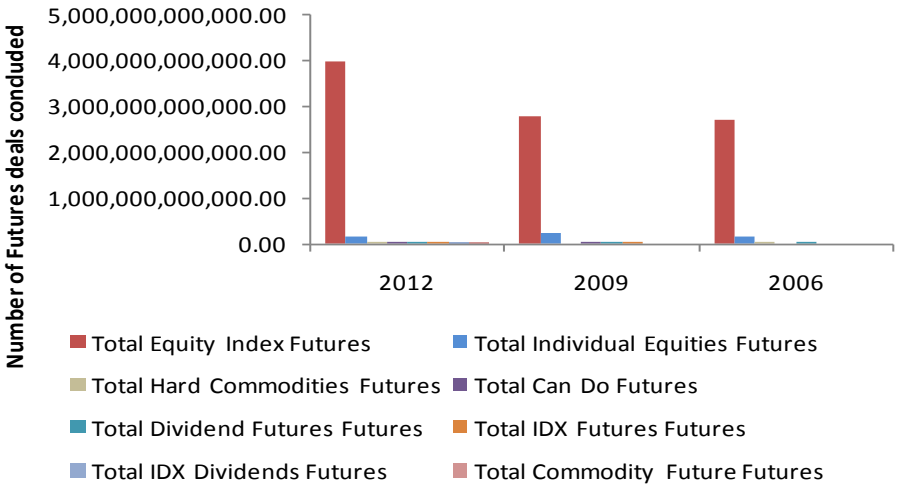
Table 8. JSE's Options Notional Amounts involved

	2012	2009	2006
Total Equity Index Options	34,941,741,035.41	71,687,168,993.16	94,530,226,820.54
Total Individual Equities Options	2,805,647,092.99	8,194,434,091.65	2,126,252,609.22
Total Can Do Options	951,714,570.42	1,854,619,459.68	0.00
Total Commodity Future Options	5,410,029.00	0.00	0.00
Total Options	**38,704,626,236.91**	**81,736,222,544.49**	**96,656,479,429.76**

Source: Authors own illustration

Table 8 and Figure 6 above demonstrate the notional amounts involved over the review period. Analysing the data, the options notional amounts involved have declined by almost R58b over the last seven (7) years. Total equity index options remain the largest options in terms of notional amounts at the JSE contributing 90% (2009 and 2006: 88%and 98% respectively).

Figure 7. JSE's Futures Notional Amounts involved



Source: Authors own illustration

Table 9. JSE's Futures Notional Amounts involved

	2012	2009	2006
Total Equity Index Futures	3,984,348,667,902.48	2,799,031,257,296.10	2,719,838,071,317.99
Total Individual Equities Futures	156,029,207,969.87	245,873,492,113.07	179,266,255,533.87
Total Hard Commodities Futures	2,194,674.89	65,015.94	101,878,994.10
Total Can Do Futures	38,514,344,790.84	29,287,599,801.95	0.00
Total Dividend Futures Futures	262,908,488.48	453,614,041.15	21,041,035.48
Total IDX Futures Futures	6,340,968,170.52	678,068,988.22	0.00
Total IDX Dividends Futures	3,374,073.61	397,869.81	0.00
Total Commodity Future Futures	6,919,196,595.75	0.00	0.00
Total Futures	**4,192,426,987,262.94**	**3,075,324,495,126.23**	**2,899,227,246,881.44**

Source: Authors own illustration

Analysed data in Table 9 and Figure 7 demonstrates that the equity index futures dominate the notional amounts of contracts concluded followed by individual equities futures and the total "can do futures". It would appear in the analysis that there is a shift of preference from equity index options to equity index futures. Whilst the equity index options have declined by almost R58b over the last seven (7) years, equity index futures have increased by almost R1.3t over the last seven (7) years.

Table 10. Consolidated JSE Futures and Options Notional Amounts

	2012	2009	2006
Total Equity Index Options	34,941,741,035.41	71,687,168,993.16	94,530,226,820.54
Total Individual Equities Options	2,805,647,092.99	8,194,434,091.65	2,126,252,609.22
Total Can Do Options	951,714,570.42	1,854,619,459.68	0.00
Total Commodity Future Options	5,410,029.00	0.00	0.00
Total Options	**38,704,626,236.91**	**81,736,222,544.49**	**96,656,479,429.76**
Total Equity Index Futures	3,984,348,667,902.48	2,799,031,257,296.10	2,719,838,071,317.99
Total Individual Equities Futures	156,029,207,969.87	245,873,492,113.07	179,266,255,533.87
Total Hard Commodities Futures	2,194,674.89	65,015.94	101,878,994.10
Total Can Do Futures	38,514,344,790.84	29,287,599,801.95	0.00
Total Dividend Futures Futures	262,908,488.48	453,614,041.15	21,041,035.48
Total IDX Futures Futures	6,340,968,170.52	678,068,988.22	0.00
Total IDX Dividends Futures	3,374,073.61	397,869.81	0.00
Total Commodity Future Futures	6,919,196,595.75	0.00	0.00
Total Futures	**4,192,426,987,262.94**	**3,075,324,495,126.23**	**2,899,227,246,881.44**
Grand Total	**4,231,131,613,499.85**	**3,157,060,717,670.72**	**2,995,883,726,311.20**

Source: Authors own illustration

As noted earlier on the number of deals entered into and the number of contracts concluded on the JSE's derivative market, Table 10 clear demonstrates that futures are the most traded derivatives in the Johannesburg Securities Exchange as they contribute 99% (2009 and 2006: both at 99% respectively) of derivative notional amount traded. Table 10 further demonstrates that there is a shift of preference from equity index options to equity index futures. It is clear in Table 10 that equity index futures remain the most traded derivative contributing almost R4t of the notional amounts in the total derivative notional amount market of R4.2t.

As the derivative market evolves over time, total commodity futures which were non-existent some seven (7) years ago is now contributing a notional amount of about R7b. IDX futures have grown from a mere R678m in 2009 to R6.3b in 2013 whilst IDX dividend futures have followed a similar suite growing from R398k in 2009 to R3.4b in 2009.

6.7 Summary, Conclusions and Recommendations

Objectives of this paper were stated as the assessment of the nature of derivative products traded in the Johannesburg Securities Exchange (JSE) by analysing daily transactions consisting of deals and contract concluded, as well as notional values. By analysing and understanding the transactions involved, the study was able to highlight how the exchange traded derivative market has evolved in South Africa.

Data analysed revealed that the derivative instruments traded in the Johannesburg Securities Exchange (JSE) consisted of options and futures. Options traded comprise of equity index options, individual equities options, "can do" options and commodity futures options. On the other side, futures traded on the JSE comprises of equity index futures, individual equities futures, hard commodity futures, "can do" futures, dividend futures, IDX futures, IDX dividend futures and commodity futures.

In terms of the notional amounts involved, the equity index remains the largest derivative for both options and futures over the period under review. As the South African derivative market evolves, it was noted that derivative products such as can do derivatives, IDX derivatives have been introduced and they continue to grow. This fact is further supported by the fact that the total derivative deals in the JSE has evolved and grown 16.6% (CAGR) from 2006.

As the South African derivatives transactions grow and evolve over a period of time, there are potential threats to the financial system which could destabilise the South African economy. Threats of this nature are not entirely unfounded considering the implication of the global financial crisis. To counter this threat, South African authorities are in the process of reforming the market which includes the implementation of Basel III and Solvency Assessment and Management Framework (SAM). Further, South

Africa will also begin to address OTC derivatives reform through the framework of the Financial Markets Act.

In view of the regulatory developments in the derivative market space in South Africa, the paper recommends that the envisaged regulatory approach should not be premised from the one that is rule based, however, the one that is more focused on risk management. A focus on risk management should allow greater flexibility and should reduce the system's vulnerability to shocks.

A regulatory approach based on risk management could be something similar to that of Singapore which has developed a financial system with a robust institutional framework. During the Asian financial crisis of 1997-1998, Dudley and Hubbard (2004) for instance indicate that the Monetary Authority of Singapore responded by adopting a more risk-based approach to banking regulation and by fostering the development of the capital markets. As a result of this, Singapore views its supervisory work as being guided by a focus on risk-based supervision rather than blanket regulation, and it seeks to reduce systemic risk rather than to prevent individual failures.

References

1. Adelegan, O.J. (2009). *The Derivatives Market in South Africa: Lessons for sub-Saharan African Countries*. International Monetary Fund.
2. Bank of International Settlement. (2003). BIS Quarterly Review, June 2004. Available: http://www.bis.org/publ/qtrpdf/r_qt0406.htm (Accessed 09 November 2013).
3. Bartram, S.M., Brown, G.W. & Fehle, F.R. (2003). *International Evidence on Financial Derivatives Usage*. Finance 0307003, EconWPA, revised 24 Jul 2003.
4. Dudley, W.C. & Hubbard R.G. (2004). *How Capital Markets Enhance Economic Performance and Facilitate Job Creation.* Columbia Business School.
5. International Monetary Fund. (2012). *South Africa: 2012 article IV consultation*. IMF Country Report 12/247. Washington, DC: IMF. Available: http://www.imf.org/external/pubs/ft/scr/2012/cr12247.pdf. (Accessed 11 November 2013).
6. Johannesburg Securities Exchange. (2013). *History of the JSE.* Available: http://www.jse.co.za/About-us/History-Of-The-JSE.aspx (Accessed 24 October 2013).
7. Johnson, L.L. (1960). The Theory of Hedging and Speculation in Commodity Futures. *The Review of Economic Studies, 27* (3), pp. 139-151.
8. National Treasury. (2010). *An Examination of the South African OTC Derivatives Markets to Recommend Measures for Strengthening their Regulatory Oversight*. Available: http://www.treasury.gov.za/legislation/bills/2012/FMB/Annexure%20C%20An%20examination%20of%20the%20OTC%20derivatives%20market%20(Skerrit).pdf (Accessed 24 October 2013).
9. The Chartered Financial Analyst Institute. (2010). *Derivatives and Alternative Investments.* Pearson Custom Publishing.
10. The Global Derivatives Study Group. (1993). *Derivatives: Practices and Principles*. Washington, D.C.: The Group of Thirty (July).
11. Republic of South Africa. (2004). *The Securities Services Act of 2004*. South Africa: Pretoria
12. Whaley, R. (2006). *Derivatives: Markets, Valuation, and Risk Management.* Hoboken: John Wiley & Sons.
13. World Bank (2013). *World Development Indicators*. Washington, DC: World Bank. Available: http://data.worldbank.org/data-catalog/worlddevelopment (Accessed 06 November 2013).