



**AJATE**

**AFRICAN JOURNAL**

*of*

**APPLIED AND THEORETICAL ECONOMICS**

Published By: Department Of Economics, University Of Port Harcourt.

— ISSN: 0795 - 333X

# DERIVATIVE INSTRUMENTS AND THE CAPITAL MARKET: AN INVESTIGATION

by

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## **ABSTRACT**

*The paper focused on assessing derivative instruments in the capital market. A global review of derivative markets was carried out and it was found that the instruments have continued to be accepted for and integrated in the financial assets portfolio of firms in developed economies because of their liquidity impacting and risk reduction characteristics. However, emerging markets like Nigeria are yet to enjoy the full benefits of trading on derivative market instruments. This calls for proper enabling environment, economic empowerment of the citizens as well as public enlightenment of derivative market instruments as the first consideration.*

## **1. INTRODUCTION**

Management of organizations are constantly formulating policies and discovering strategies for ensuring the growth of the corporate existence of the company as well as the achievement of the wealth maximization objective of shareholders. The survival of any organization depends on their expertise and ability to carve out niches and realize them too. Even when these niches are carved out, management is constrained by the level of risk associated with the available opportunities as well as the liquidity position of the firm. Given these constraints, it behooves on management to find a way of escape to ensure continuity in business. Fortunately, the financial derivatives markets provide an enabling environment and instruments that reduces risk exposure as well as impacting liquidity.

Derivatives markets or financial derivatives market consists of the entire regulation, instruments/facilities, institutions, methods, processes and procedures provided by the monetary system for the purchase and sale of derivative financial claims. Thus derivative financial (contingent) claims as the name implies instruments that derive their prices, price index, exchange rate or interest rate from the performance of underlying cash markets, specifically money and bond markets, the foreign

exchange markets and stock exchange markets. Thus, they derive value from associated assets. Many companies across the globe have made use of these derivatives as either a risk management device and/ or a liquidity impacting option. Some of these companies have gained from this strategy while others experienced some margin of losses. The use of one or more of the instruments may payoff better than the use of the others. This paper is aimed at investigating the derivative market and their instruments. This is with a view to assessing the viability of these instruments and the possibility of using it as liquidity – enhancing and risk – transferring tools. But then, it is important to have a conceptual understanding of the derivatives markets since it is a virgin topic with little or no reference in most of the emerging markets like Nigerian capital market.

## **2. MARKET DERIVATIONS: AN OVERVIEW**

The origin of derivatives is traceable to the Minneapolis Grain Exchange, who in 1891 introduced a clearing house offset, a mechanism that allows a participant to close out a position simple by undertaking an opposite trade (Remolona, 1992-93:29). But in United States of America, derivatives are traceable to the founding of the Chicago futures exchanges in the mid-nineteenth century. The market's modern history starts with the trading of financial and foreign exchange futures on the International Monetary Market of the Chicago Mercantile Exchange (CME) in 1972 and with standardized stock option contracts on the Chicago Board Option Exchange in 1973 (Abken, 1994:2). Today, the increased need to check increasing risk exposure of firms and enhancement of their liquidity position has made derivatives markets to gain acceptance across the globe especially among developed financial markets of the world. They are currently under regulation as new derivative instruments emerge. For instance, the early 1980s saw the emergence of interest rate and currency, swap market. Let us note here that as derivatives are gaining prominence in the international financial markets, our local financial markets are yet to embrace it, probably because of level of development of the market as well as environmental/ societal factors including lack of awareness.

Essentially, derivatives markets consist of Exchange Markets and Over-the-Counter (OTC) markets. Exchange markets are organized exchanges such as European Options Exchange (EOE) of Netherlands, Financial Future Market Amsterdam (FTA) of Chicago Board of Trade (CBOT), Stockholm Options Exchange

(OM) of Sweden, London International Financial Futures and Option Exchange (LIFFE), etc that trade on standardized financial futures and options contracts (see table I for others). The market provides for a clearing house as a counter party to reduce the risk associated with each transaction. Thus, the standardization of contracts together with clearing house offset serves to limit transactions costs and as well as foster high degree of liquidity in the exchange markets. The market trade on instruments called exchange - traded derivatives, which are essentially public transactions. They are not intermediated by financial institutions but are arranged openly through an organized futures or options exchange. The market is highly regulated by government agencies. The most common instrument traded in this market are the options and futures contracts. They (instruments) provide more liquid in excess of those in the cash markets. Exchange markets are extensively regulated by government agencies, unlike OTC markets.

Over-the-counter (OTC) markets are financial markets that trade on customized swaps, option and forward contracts in bilateral deals. Unlike the organized exchange markets, OTC markets operates without the interposition of a clearing house. This makes the regulation of the market difficult. Thus, the unregulated nature of the OTC markets and lack of clearing house inhibit liquidity in the market. This also makes OTC markets to tend to be less liquid than the underlying cash markets. Generating relevant data for any decision is rather difficult because markets operate internationally over telephone lines without fixed geographical location. Transactions made in Japan may well be booked in London. This is facilitated through dealers, which are primarily the largest money - center banks, investment banks and insurance companies. Dealers typically seek to hedge their books against changes in interest rates (and other market factors). They also hedge or "lay off" risk using exchange traded futures and option contracts - for example, Eurodollar futures contracts. Dealers are paid commission on a concluded deal. This is in addition to the compensation for dealers intermediation which takes the form of a spread between the fixed rate they receive from a counter party to a swap (the ask and offer rate) and the fixed rate they pay to another (the bid rate).

Instrument traded in this markets are called over-the-counter derivatives, which are financial claims that derive their value from the level of an underlying price, price index, exchange rate, or interest rate. Some of these instruments include interest

rate swaps, forward rate agreements, caps, collars, floors, options and their foreign exchange equivalents. These instruments provide less liquid but more financial risk management device for the firm. According to Remolona (1992:29) OTC derivatives are designed primarily to reconfigure market risk rather than to provide liquidity. They are intermediated by financial institution such as commercial banks, stock exchanges and insurance companies.

Derivatives markets consist of both speculators, hedgers and arbitrageurs. Thus according to Banmol and Blinger (1979:466) speculators are individuals who deliberately invest in risky assets, hoping to obtain a profit from the changes in the prices in these assets that they expect to occur. They are those who are trying to increase the firm's risk exposure because they believe that such a strategy will yielded abnormal profits. In doing this, systemic risk – the possibility that the failure of one firm as a result of derivatives trading would trigger the failures of other firms, may arise. This is mainly because of excessive price volatility associated with speculation. Hence the rationale for the regulation of derivative market to ensure not only price stability but also market stability. Hedgers are those who attempt to reduce risk through their actions.

From the above definitions, it can be deduced that derivatives are used for either impacting liquidity or reducing risk from the primary line(s) of business of the firm depending on the liquidity of the underlying cash markets. According to Remolona (1994:29) "Derivatives of course, vary in the degree to which they serve the functions of liquidity and risk transformation. The liquidity of the underlying cash market helps determine the use of a derivative. The spot in a market for foreign exchange, for example, is itself so liquid that risk transformation is probably a more important function of exchange traded currency derivatives than of other exchange traded derivatives".

### **3 DERIVATIVE MARKET INSTRUMENTS**

Derivative market instruments are commonly called derivatives. As the name implies and as defined above, derivatives are not instrument in themselves but derive their value or worth or price from the underlying cash markets- bond market, stock market or money market. They are derivative instruments and come in different types and forms as explained below.

### **3.1 Options**

According to Baumol and Blinder (1979:460-61) an option is a contract that permits (but does not require) its holder to purchase or to sell some specified piece of property (financial assets) at a price defined in the contract. It is only an option and not an obligation to buy and sell an asset. If the owner of the option elects to "exercise the option", that is, to carry out the sale (put option) or the purchase (call option) permitted by the option, it can be done at whatever date the option holder chooses within the period indicated in the contract or at the expiration date as with European options.

Option contracts are fairly expensive to purchase, they typically run between 5 and 10 percent of the value of the stock of which they apply, depending on the duration of the option. The expensive attribute notwithstanding the instruments are still highly regarded as a good investment opportunity, because, they can be used as a protection to the investor and secondly they can be used to transform a conservative investment into a more exciting gamble—one that is capable of bringing in larger gains than the investor could otherwise have gotten with a given amount of money, but that can, of course, also be capable of producing larger losses.

Options contracts may be a call option or a put option as indicated earlier. A call option is a contract giving its owner the right to purchase a fixed number of shares of some stock at a given price (for example, 200 shares of 92 stock at a price of N51.50k) at any preferred date during the period specified. While a put option is a contract giving its owner the right to sell a fixed number of shares of some stock at a given price within a specified period.

Let us note here that options contracts are being embraced by the emerging financial markets. According to Richards (1992) in Remolona (1992: 30) options on less developed country (LDC) debt are one of the fastest growing segments of the OTC market. Infact options have been described as the most effective way to widen investors' range of choices

### **3.2 Interest Rate Swaps**

This is a type of contract in the derivatives market that provides a useful example of the risks derivatives transactions. Interest rate Swaps are typically structured and priced so that no exchange of funds accompanies the imitation of the contract. Over the life of the contract (which can range from a few months to any years),

however, one side or the other will often be required to make payments under the terms of the contract. Interest rate Swap obliges the counterparties periodically to swap the difference between a contractually determined fixed interest rate and a floating interest rate (commonly six-month LIBOR) multiplied by the notional amount of principal. Thus, one of the counterparties assumes the role of fixed rate payer and floating rate receiver, while the other counterparty acts as the floating rate payer and fixed rate receiver.

Interest rate swaps may be short term or long-term depending on whether contracts are based on short term interest rates or long term interest rate. The contracts on short term interest rate have as their underlying cash markets the various money markets around the globe, most notably the Eurocurrency markets and the short-term Sterling market. The underlying markets for contracts on long term interest rate are the world's major bond markets, most notably, the U.S. treasury bond market, the French government bond market, the Japanese bond market, the German bond and Treasury market and the U.K. gilt market.

Many interest rate swaps specify that payments be made semiannually. If floating rates have risen above the contractually specified fixed rate, then the floating rate payer will make a payment to the floating rate receiver based on this differential. In this instance, a default by the floating rate payer will lead to a credit loss by the floating rate receiver. If no recovery is possible, the total credit loss will not consist simply of the amount of the next payment due under the terms of the swap contract but will equal the present value of the net interest payments over the remaining life of the contract. This amount is termed the replacement cost of the derivative contract (Hendricks, 1994: 8).

A popular new type of interest rate swap is the 'diff' or swap which exchanges payments based on interest rates in two currencies but makes both payments in a common currency.

### **3.3 Currency Contracts/ Swaps**

These are instruments traded in the derivative market. The underlying cash market for currency contracts is the global foreign exchange markets while the underlying cash market for the currency swap is mainly OTC market. Currency swaps are in part interest rate contracts involving the exchange of fixed rate payments in one currency for floating rate payments in another.

### **3.4 Total Return Swaps**

This is one of the credit derivatives. The swap involves the exchange of payment configuration of two counterparties payer and receiver. The payer or total return payer pays out based on the return from its holdings of a risky debt obligation or portfolio of risky debt obligation while the receiver or total return receiver pays based on the returns from a default free obligation less the negotiated compensation for taking an exposure to the risky debt. It receives the return from the underlying risky debt. The result of the swap is that the total return payer obtains the income stream appropriate for a default free obligation and the total return receiver obtains the income stream appropriate in holdings of risky debt. The reconfiguration of income stream is accomplished contractually rather than by exchanging ownership of the respective debt obligations (Moser, 1998: 3). This instrument increases cash flow certainty.

### **3.5 Credit Swaps**

This is a credit derivative involving two counterparties contingent payer and fixed payer. Under this swap arrangement, the fixed payer insure against credit events by making periodic payments of a fixed percentage of the loan's par value. On occurrence of a predefined credit event such as a loan default, the contingent payer makes a payment compensating the insured for part of its loss. Otherwise, the contingent payer pays zero. Credit swap has the features usually associated with insurance contracts. It can be structured in many ways, for example, payment for a fixed amount on default or payment proportional to loss amounts.

### **3.6 Forward Rate Agreements (FRAs)**

These are agreements on future interest rates that involve no exchange of principal amounts.

### **3.7 Futures Contracts**

This is a derivatives market instrument specifically designed and introduced by exchanges with basically one consideration of low-cost trading.

**3.8 Other types of instruments** traded in the Nigerian derivatives markets in particular and world markets in general include among others, debt-equity swaps, global depository receipts, foreign exchange contracts, commodity contracts, equity



contracts; option-like interest rate contracts like caps, floors, collars and swaptions; etc.

The above derivative instruments can be classified into two basic types, those with linear payoffs and those with nonlinear payoffs (Abken, 1994: 3-11). Linear payoff contracts are those whose value at maturity moves one for-one with the level of underlying price, price index, exchange rate or interest rate (hereafter simply referred as price). Forward contracts and swaps which are sequences of forwards with successively longer maturities, are the primary linear payoff contracts. Forward contracts fix a price on an asset for delivery at a future date. These contracts are typically priced so that they cost nothing to initiate, but as the underlying price fluctuates away from the price that prevailed at initiation they become assets or liabilities to the counter party. Nonlinear payoff contracts have payoffs that do not move one for- one with the underlying price at expiration. Option contracts have the simplest and most common type of nonlinear payoff. For example, if the price is above a call options strike price (the price at which the option holder is entitled to purchase the asses), the payoff moves one – for- one but if it is below the price, the price, the payoff is zero.

#### **4. RISKS ASSOCIATED WITH DERIVATIVES**

Every transaction is associated with one type of risk or the other depending on the source. In derivatives markets transaction, the following categories of risk arise: Market risk, credit risk, legal risk, settlement risk, operating risk and systemic risk.

##### **4.1 Market Risk**

This refers to any market related factor that changes the value of derivatives position. The relevant exposure is the unhedged portion of a derivatives portfolio. Changes in the underlying price cause a change in the current market value of a derivative. This change is referred to as delta risk. There is also the volatility risk or vega risk, which occurs from the volatility of price increases and the gamma or convexity risk, which arises from the non linearity of payoffs (the sensitivity of an option's price to changes in the underlying price varies with the underlying price).

##### **4.2 Credit Risk**

This refers to losses arising from default in the payments of derivatives contracts.

### **4.3 Legal Risk**

This is the risk of possible loss arising from the inability of counterparties to enforce a derivative contract. Essentially, derivatives, for now, are mostly for industrialized countries of the world with different legal system. The different laws of these countries where derivatives are traded pose the greatest challenge to the derivatives business. Another level of complexity is that many laws that affect derivatives trading especially OTC were legislated before their advent. Derivatives counterparties risk losses because of legal actions that render their contract unenforceable. Backlogs in documenting derivatives transactions can be a source of legal risk.

### **4.4 Settlement Risk or Herstatt Risk**

This is the risk of default during the period usually less than twenty – four hours, when one counterparty has fulfilled its obligation under a contract and awaits the other counterparty. Owing to differences in time zones and other factors, most exchanges are not made simultaneously. Settlement risk is sometimes called herstatt risk because of failure of Bank Herstatt, a German bank, on June 26, 1974, to pay in dollars, New York banks for its foreign exchange transactions.

### **4.5 Operating Risk**

Operating risk is exposure to loss arising from inadequate risk management and internal controls by firms using derivatives. Broadly speaking, lack of understanding and / or involvement by a firm's management or board of directors is an operating risk.

### **4.6 Systemic Risk**

Promised Report of the Group of Ten Central Banks in Group of Thirty (1993: in Abken, 1994:10) defined systemic risk as "the risk that a disruption (at a firm, in a market segment, to a settlement system, etc) cause widespread difficulties at another firms, in other market segments or in the financial system as a whole". Thus operational lapses in one sector can cause some financial losses in another sector. Therefore, it can also be called linkage effect risk.

## **5. ASSESSING THE RETURNS OF DERIVATIVES**

Assessing the returns of individual derivatives in the derivative market may be somehow difficult for lack of relevant data / information or sketchy of it. Consequently effort is made here to

look at the rate at which companies use derivative instruments and the growth rate of these instruments at the global level. Derivatives are excessively risky. The risks associated with them as outlined above have led to losses to companies using derivatives either as a liquidity enhancing option or as a risk management device. For instance, the losses of Proctor and Gamble (\$137 million) and Gibson Greetings (\$20 million) as a result of transactions in interest rate swaps were cases widely publicized. Orange County, California and the Orange County Investment Pool (COIP) declared bankruptcy in 1994 following a \$.7 billion drop in the market value of the pool due to transaction in leveraged intermediate - term fixed - income securities are good cases. And perhaps the most spectacular example is the 1995 collapse of Barings Bank, a highly respected British Merchant Bank, due to losses of \$1.3 billion on option and futures transaction in the Japanese Stock and bond markets (Cummins, et al, 1998: 32). According to Fed. Reserve Statistics Banks Holding Companies (BHCS) in U.S.A recorded cumulative losses of \$ 19 million in ten years. According to Corigan, (1992) in Abken (1994:20) fifty largest commercial banks incurred cumulative loan change-offs (trading losses) of almost \$ 90 billion from 1985 to 1991.

These trading losses notwithstanding, derivatives trading is gaining popularity because they are sources of profit and income stability for commercial banks. For instance, U.S.A's BHCs in ten years of derivatives trading generated trading revenue of \$35.9 billion. Generally, the growth rate of the instruments in the derivated market is very encouraging. According to the International Swaps and Derivatives Association worldwide growth in notional principals for interest rate and currency swap from 1987 to 1992 shows an increasing growth trend. Interest rate swaps, denominated in single currency, grew at a compound annual rate of 33.4 percent to a year and 1992 notional amount of \$3.9 billion, currency swaps grew at 29.4 percent to a year end notional amount of \$860 billion over the same period. In the United States alone, notional value of exchange-traded interest rate and currency futures rose at 22.0 percent compound annual rate, reaching a year-end 1992 combined level of \$1.35 billion (Commodity Futures Trading Commission, 1993a in Abken, 1994:3). Year-end 1992 dollar and non-dollar caps, collars and floors were \$108 billion. The volume of new swaps originated during 1992 in terms of notional principals stood at \$3.12 trillion (105,000 contracts) whereas the volume in global exchange-traded

futures and options trading in 1992 totalled \$140 billion in notional value (600 within contracts).

The stock of financial derivatives outstanding worldwide, as measured by open interest and notional principals, multiplied fivefold in five years to approach \$10 billion by the end of 1991. In organized exchanges, open interest in financial derivatives rose by an average of 36% a year from 1986 to reach \$3.5 billion at the end of 1991. In OTC markets, total notional principal grew by an estimated 40 percent a year during the period to soar above \$6 billion by the end of 1991 (See chart 1).

The derivatives markets have grown by type of contracts traded in the market. Charts 2,3, and 4 explain this growth. Chart 2 shows that turnover in interest rate contracts in exchange markets grew, by 21 percent a year from 1986 to 1992 and accounted for 90 percent of the absolute increase in total exchange market turnover. Trading in currency contracts rose by about 8 percent a year and accounted for less than 7 percent of the absolute increase in total exchange market turnover from 1986 to 1992. Trading in equity index contracts showed no remarkable expansion over the period 1986 to 1992. In chart 3, most of the growth in OTC derivatives, consisted of interest rate contracts followed by currency contract then equity contracts. Currency swaps more than kept pace with interest rate swaps by growing 42 percent a year from 1986 to 1991. In the OTC market, equity index options and equity swaps made up a small fraction of the market, but the last few years witnessed such tremendous growth in these contracts that they accounted for perhaps 5 percent of the absolute expansion of notional principals in the OTC market from 1986 to 1991. The OTC equity derivative market has two segments, the "off-the-peg" and the "bespoke" segments. In the off-the-peg segments, the older market, investment houses write covered equity warrants not specifically requested by investors. In the bespoke segment, the new and apparently growing market, some dealers offer equity swaps but most concentrate on highly customized equity index options, predominantly Nikkei Index Options (Remolona, 1992- 93:32). In chart 4, interest rate swaps grew at an average of 41 percent a year in notional principle from 1986 to 1991 and accounted for almost half of the absolute increase in total notional principal of all OTC derivatives. Forward rates agreements (FRAS) are growing accounting for perhaps another quarter of the total market increases. Option-like interest rate contracts is rising at 81

percent yearly but accounted for 10 percent of the total increase in the OTC market.

Derivative market is becoming a significant component of international financial market. Users of derivative instruments are increasing (see Table II). A survey conducted by twenty- six central banks, estimated the worldwide volume of derivative contracts, measured as the total notional value of derivative contracts outstanding to approximately \$55.7 billion as of the end of March 1995 (Bank of International Settlements, 1995 in Cummins, et al 1998:36). The market value of the cash flow from these contracts was estimated to be approximately \$2.2 billion. Chart 5 displays the total worldwide notional value of all privately negotiated interest rate swap, interest rate options and currency swap contracts outstanding over the period 1987 to 1996.

The automation of derivatives markets is an advantage to the growth and development of the markets. Electronic trading in the market is very beneficial as against manual trading system. Sarker and Tozzi (1998:4) distinguished then as open outcry and electronic trading as shown in the table 3 below.

### **DERIVATIVE MARKET AND THE NIGERIAN ECONOMY**

The Nigerian economy like the economies of emerging markets has little or no presence of the derivative market. The institutional and operational structures have not allowed the introduction and or development of such market. Apart from this, the illiteracy levels as well as the endemic poverty level have remained a stumbling block to the growth of derivative market. However, in Nigeria, derivatives market has been introduced with debt conversion transactions, global depository receipts, options on the CBN US Dollar Promissory notes and establishment of Abuja Commodity Market. The Commodity Exchange Market (COMEX) is set to achieve:

- i) Deepen the capital market through the introduction of new products such as options, futures and other derivatives
- ii) Protect individuals producers or commodities of their agents
- iii) Increase the earning of the producers of reducing negative agents wide fluctuations in prices of commodities.
- iv) Provide basis for risk management in the futures market.
- v) Provide a forum where producers or their agent(s) interact to facilitate efficient pricing and distribution of traded agricultural and non-agricultural commodities.

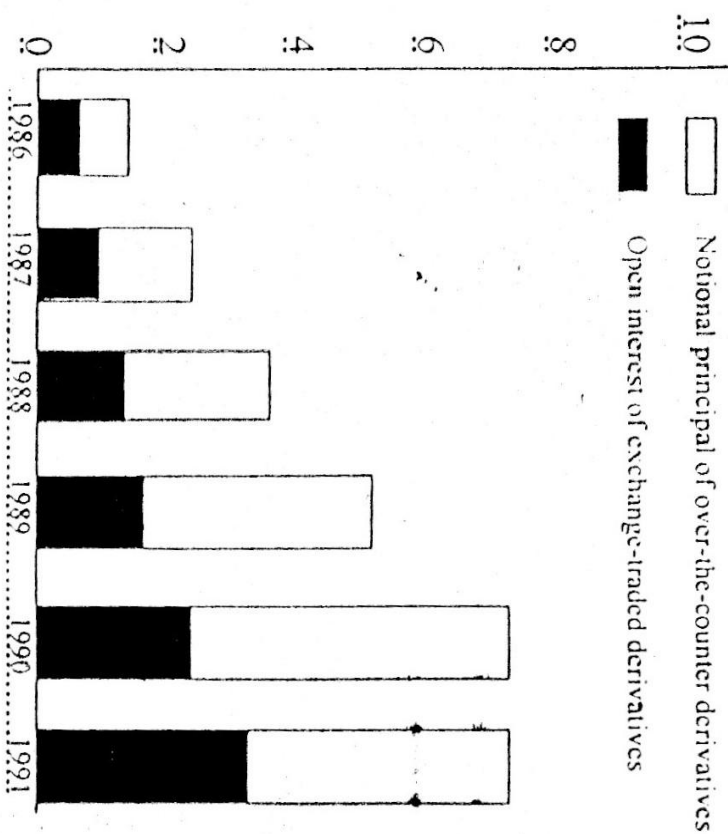
- vi) Create a link with the international commodity organizations with a view to boosting the national economy (Nzotta 2004:335-6).

The extent to which these objectives are achieved is still in question given the level of development and problems associated with the market.

### **CONCLUSION**

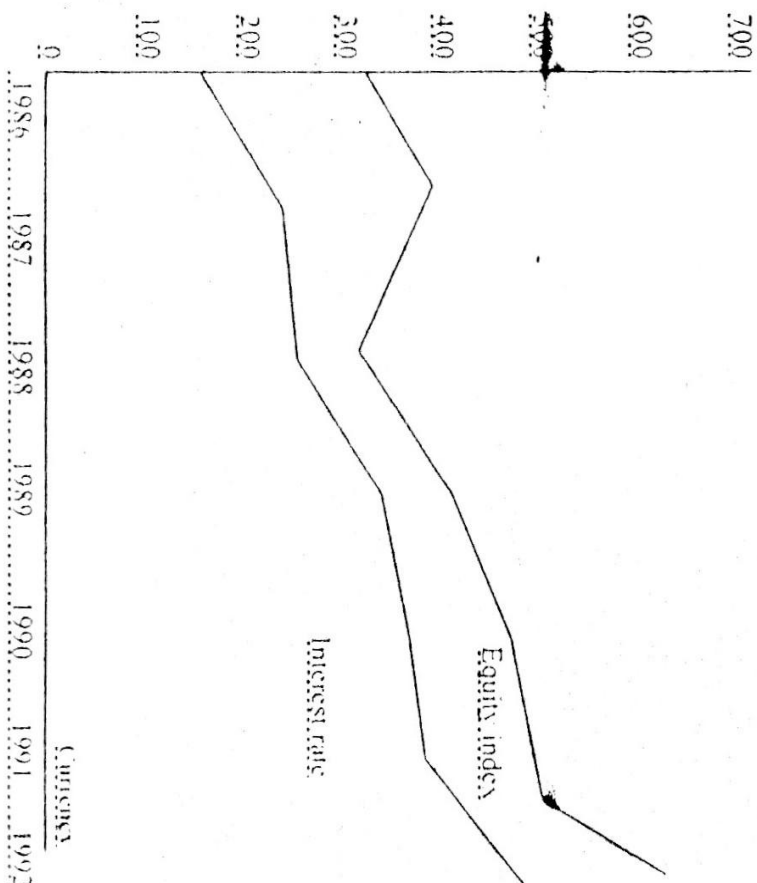
Derivative markets have come to be an important component of the structure of international financial market. The instruments in the market have continued to be accepted, embraced and integrated in the portfolio of firms because of their liquidity impacting and risk reduction characteristics. The returns of the various derivatives which is reflected on the general growth of the market and the instruments in particular is a reflection of the global acceptance of derivatives by firms. However, losses have been recorded as a result of the use of derivatives. It therefore calls for caution. Efforts should be made to ensure proper regulation of the market. The regulation should as much as possible reduce cost of transaction. Firms going into derivatives trading should have experts who are knowledgeable in this new area of business. According to Cummins, et al (1998:32), derivatives are not really different from other transactions conducted by firms. They are simply newer, and therefore many firms have acquired less experience in their management or have failed to implement appropriate accounting and control system. The message from the derivatives debacles is that countries and particularly firms should acquire the appropriate human expertise in the areas of both trading and control before entering the market. Beyond this is the provision of enabling environment, economic empowerment and creation of greater awareness among citizens of the emerging markets.

Chart 1: Exchange-traded and Over-the-Counter Derivatives  
Trillions of dollars at year-end



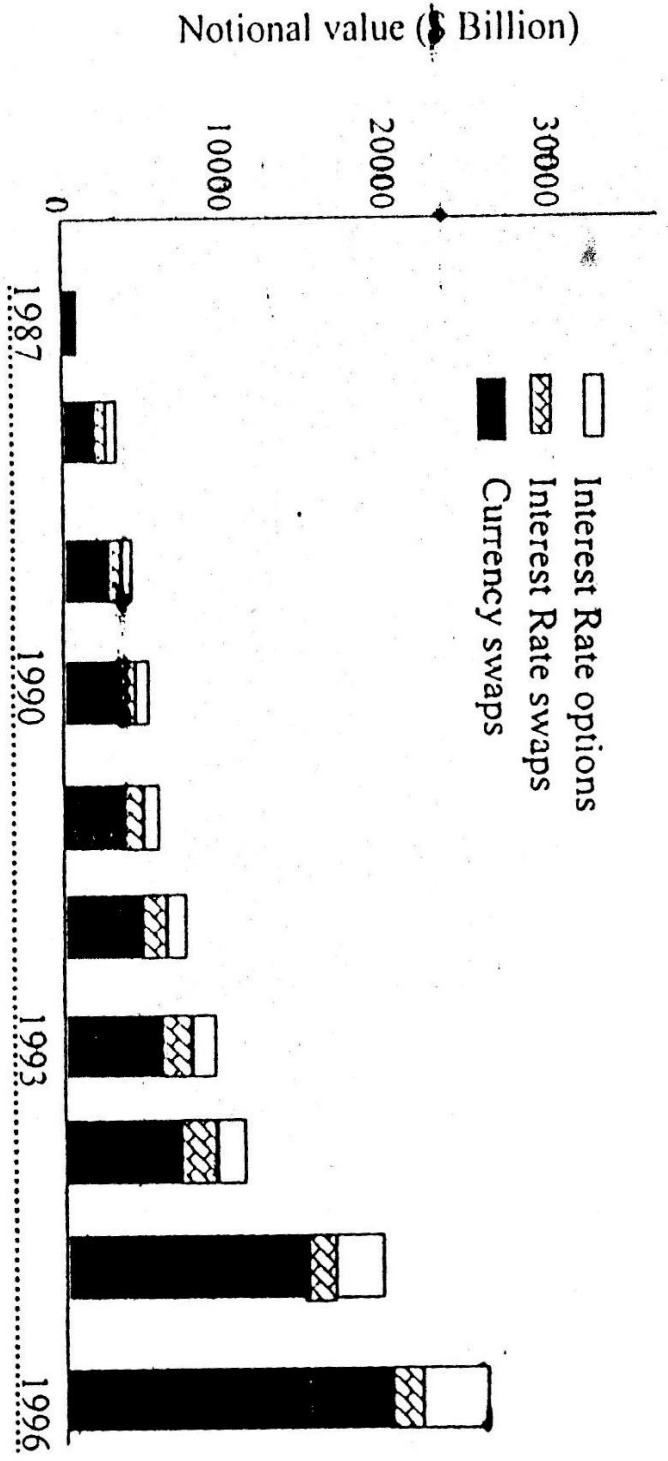
Sources: For exchange-traded derivatives, Bank for International Settlements (BIS); for over-the-counter derivatives, International Swap Dealers Association, Federal Reserve Bank of New York staff estimates and BIS estimates in Remolona (1992, 93, 29-30).

Chart 2: Exchange-traded Derivatives  
Annual Trading Volume of Futures and Options Contracts  
Millions of contracts



Sources: Bank for International Settlements, Futures Industry Association, Options Clearing Corporation, Philadelphia Stock Exchange.  
Note: Values represent combine global volume of exchange-traded futures and options

Chart 5: Total Notional Value of Interest Rate Options, Interest Rate Swaps, and Currency Swaps Outstanding, 1987 - 96.



Source: International Swaps and Derivatives Association, Inc. in Cummins J. D. et al (1998:37).



**Table 1: Derivatives Exchanges Established after 1985**

Exchange	Country	Date	Trading System
Bolsa de Mercadorias & Futuros (BM & F)	Brazil	1986	Open Outcry
European Options Exchange (EOE) <sup>1</sup>	Netherlands	1986	Open Outcry
Marche a Terme International de France (MATIF)	France	1986	Open Outcry
Stockholm Options Exchange (OM)	Sweden	1986	Electronic
Swiss Options & Finance Futures Exchange (SOFFEX)	Switzerland	1986	Electronic
Financial Futures Market Amsterdam (FTA)	Netherlands	1987	Open Outcry
Finnish Options Market (FOM)	Finlands	1988	Electronic
Guarantee Fund for Danish Options (FUTOP)	Denmark	1988	Electronic
Irish Futures & Options Exchange (IFOX)	Ireland	1988	Electronic
Osaka Securities Exchange (OSE) <sup>1</sup>	Japan	1988	Electronic
Tokyo Stock Exchange (TSE) <sup>1</sup>	Japan	1988	Electronic
Marché des Options Negotiables de Paris (MONEP) <sup>1</sup>	France	1989	Electronic
Tokyo International Financial Futures Exchange (TIFFE)	Japan	1989	Electronic
Deutsche Terminborse (DTB)	Germany	1990	Electronic
Mercado Espanol de Futuros Financieros (MEFF)	Spain	1990	Electronic
Belgian Futures & Options Exchange (BELFOX)	Belgium	1991	Electronic
Austrian Futures & Options Exchange (OTOB)	Austria	1992	Electronic
Mercato Italiano del Futures (MIF)	Italy	1992	Electronic

<sup>1</sup> EOE, OSE, TSE, and MONEP existed before 1985, but TSE began trading bond futures in 1988, while EOE, OSE, and MONEP began trading equity index contracts in the indicated years.

<sup>2</sup> EOE and FTA have announced plans for an electronic system.

Source: Remolona (1992:93,33)

**Table 2: Users of Derivative Instruments**

Author/Study	Firms included / surveyed	Percentage of Firms Reporting Derivatives Use
Non-Financials	All non-financial firms with data on both LEXIS/NEXIS and Compustat	
1992 Main	Number of firms: 3,022	25.5
1992 Dolde Survey	Survey of Fortune 500 companies Number of respondents: 244	85.0
1994 Wharton/Chase Survey	Survey of 2,000 non-financial not including Fortune 500 companies. Number of respondents: 530	35.0
1995 Wharton/Chase Survey	Survey of 2,500 non-financials including Fortune 500 companies. Number of respondents: 350	41.0
Banks	All U.S. commercial banks, 1991 Number of banks: 11,308	5.4
Sinkey and Carter	U.S. commercial banks with assets > \$1 Billion, 1991. Number of banks: 353	75.9
Insurance Companies	All U.S. life / health insurance companies, 1994 Number of life / health insurers: 1,202	9.8
Cummins, Phillips, and Smith	All U.S. life / health insurance companies with assets > \$1 Billion, 1994. Number of life / health insurers: 193	42.0
	All U.S. property / casualty / casualty companies, 1994 Number of property / casualty insurers: 1,664	6.7
	All U.S. property / casualty insurance companies with assets > \$1 Billion, 1994. Number of property / casualty insurers: 112	30.4

Sources: Bodnar, Hayt, and Marston (1996); Cummins, Phillips, and Smith (1997a); Dolde (1996); and Sinkey and Carter (1994) in Cummins J. D. et al (1998:36)

Table 3: Open Outcry and Electronic Trading Distinguished

	Open Outcry Trading	Electronic Trading
Main suppliers of liquidity	Locals	Large institutions; market-making firms.
Primary costs	Upkeep and staffing of trading floor; back-office tasks.	Upgrading of software and hardware; telecommunications costs.
Information sources	Traders' observations of market activity.	Order book; outside news sources.
Operating efficiency	Large time and labour investment; potential for errors.	Speed, accuracy, and transparency.
Possible sources of trading abuse.	Lack of precise trade records, lack of anonymity in trading.	Manipulation of orders prior to entry.

### REFERENCES

- Abken, A. (1994), "Over-the-Counter Financial Derivatives: Risky Business?" *Federal Reserve Bank of Atlanta Economic Review*, March/April.
- Baumol J. and Blinder S. (1979), *Economics; Principles and Policy*, New York: Harcourt Brace Jovarovich, Inc.
- Cummins, J. D. et. al. (1998) "The Rise of Risk Management", FRB Atlanta, *Economic Review*, First Quarter.
- Group of Thirty (1993), Global Derivatives Study Group, *Derivatives: Practices and Principles*, July.
- Hendricks (1994), "Netting Agreements and the Credit Exposure of OTC Derivatives Portfolios", *Federal Reserve Bank of New York (FRBNY) Quarterly Review*, Spring.
- McDonough, J. (1993), "The Derivatives", *FRBNY Quarterly Review*, Autumn. Vol. 18, NO. 3.
- Moser, T. (1998), Credit Derivatives: Just, in-time Provisioning for Loan Losses, FRB Chicago, *Economic Perspective*, Fourth Quarter, Vol. 1. XXII, Issue 4.
- Nzotta S.M. (2004), *Money, Banking and Finance: Theory and Practice*, 2<sup>nd</sup> edition, Owerri: Hudson-Jude Nigeria Publishers.
- Remolona, M. E. (1992-93). "The Recent Growth of Financial Derivative Market", *FRBNY Quarterly Review*, Winter.
- Sarkar A. and Tozzi M. (1998), "Electronic Trading on Futures Exchanges" *FRBNY Current Issues in Economics and Finance*, Vol. 4, No. 1, January.