

FUTURE OF FINANCIAL MARKETS

DRAFT PAPER



This paper forms a basis for interaction between the participants at the Financial Technologies (FT) Group Leadership Summit in Goa, January 23-26, 2009, on the global financial system. The Summit will serve as a forum for interaction, but we are passionate about continuing to share views post-Summit too. We have therefore set up an interactive website www.futureoffinancialmarkets.com and request you to let us have your feedback through the website as and when you wish to share your thoughts. It doesn't matter whether or not you have a direct interest in our business; what does matter is that you have a stake in the wider financial ecosystem – of which we are part.

“ ...Nor is the question before us whether the market is a force for good or ill. Its power to generate wealth and expand freedom is unmatched, but this crisis has reminded us that without a watchful eye, the market can spin out of control - and that a nation cannot prosper long when it favors only the prosperous... ”

— Barack Obama
President, United States of America
Inauguration Day 20th January 2009

PROLOGUE

THE GLOBAL financial markets have witnessed phenomenal growth and transition over the past three decades. New technologies, new ideas, and a changing world order have remade the way we do business. The melding of the personal computer with the internet, fall of the Berlin Wall, the Silk Curtain lifting as India and China increasingly attract world wealth East, to the global expansion in the derivatives trade - all this combines to bring about a paradigm shift in the global financial markets.

The total value of aggregated financial assets with stakeholders in the global economy has risen from just US\$ 12 trillion in 1980 to a whopping US\$196 trillion in 2007. This is also reflected in the strengthening of the ratio of financial assets to GDP, from 109% to 359% during the same period. The risk management penetration in the financial market has also undergone a comprehensive improvement over the years with the start of new markets and new products covering new asset categories. One of the direct indicators of this is the increase in the total notional amount of all the outstanding positions of the exchange-traded derivatives jumping from an estimated US\$ 53 trillion in June 2004 to US\$ 76.9 trillion in September 2008.

While much of the growth in the financial markets is linked to the growth in global economy and trade, a great deal of it is also related to the reforms in the financial sector. Setting up of innovative institutions offering new financial services, increasing capital account convertibility, improvement in design of the financial products have all expanded the financial market manifold in a matter of a relatively short time. Technology has been the backbone of this transformation and had further boosted the integration of economies.

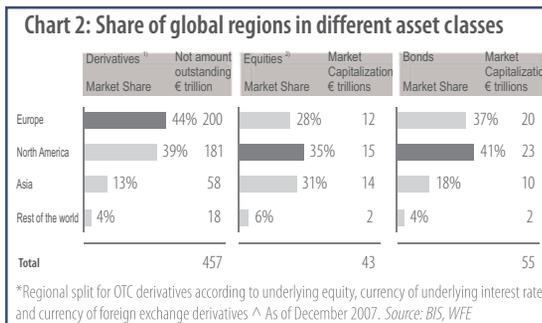
The present paper is an attempt to provide a broader picture of the global financial markets by discussing some of the main pillars of the modern- day financial ecosystems namely, equity, interest rates, bonds, currency, and commodity markets. The study then predicts the main features of future global financial system in view of ever-improving technology, continuing liberalization of trade, and strengthening of regulatory system in the face of ever-improving technology, progressive liberalization of trade, and strengthening of regulatory systems. It is concluded that future financial markets would evolve to be more accessible, transparent, liquid, and much inter-woven into global economy. The growth of developing economies, especially of China and India, will help in the geographical balancing in the strength of financial markets across the globe.

THE GROWING FINANCIAL MARKETS

Global financial markets are passing through a phase of rapid growth and transition. This represents an anthology of all the financial markets present in different countries of the world. According to McKinsey¹, the total value of comprehensive financial assets rose from just US\$ 12 trillion in 1980 to US\$ 196 trillion by the end of 2007 (see chart 1). More importantly, global financial depth - the ratio of assets to GDP - rose from 109% to 359% during the same period. This is a strong indicator of increasing risk appetite of investors across the globe. This is further strengthened by the fact that while investment in equity and private debt securities showed a positive trend during the 1980-2007 period, that in government debt and deposits assumed a negative trend. Reflecting the increasing financial integration of the economies across the globe, the cross-border capital flows touched US\$ 11.2 trillion during 2007. Freer flow of equity, debt, derivatives and trade among countries has made the entire financial system highly intertwined.



The US and European markets continue to dominate the global financial markets closely followed by rapidly growing Asian markets (see chart 2). What is also interesting is that the US and European financial markets are proportionately balanced in their spread of equity, derivative and bond segments. Asian markets, on the other hand, are focused toward equity market with a poor presence in bonds (18%) and derivative segments. While low share of bonds means less opportunity to raise capital through debt sources, low share of derivative markets in overall financial market could be an indicator of higher exposure of the Asian financial system to the risks.



Some of the reasons for Asia-Pacific's lag in the government bond contracts are:

- Lack of an adequate delivery basket
- Lack of stability or continuity in government securities issuance programmes
- Restriction on hold government securities
- Equity-dominated culture
- Inadequate professional trading expertise in local bond markets

Among various derivatives products markets for interest rate, commodities and currencies have emerged strongest so far, globally. New products have also being continuously added to the derivative segment. Some of the notables in recent years include electricity, carbon credits and weather derivatives. Within the derivatives market, off-exchange or over-the-counter (OTC) segment have dominated trading. However, there has been a significant gain in exchange-based trading in the past few years on account of its superiority over OTC in terms of transparency, accessibility, economy, and efficiency. According to the Futures Industry Association (FIA), global exchange-traded derivatives volume jumped to 15.2 billion contracts in 2007 from 11.9 billion contracts in 2006 - a growth of more than 28%.

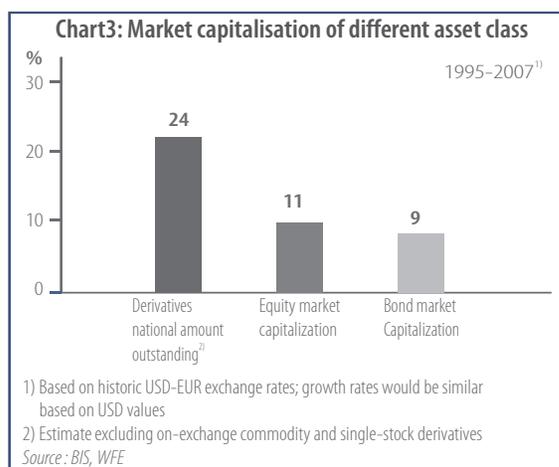
The Asia-Pacific market seems to have done well in respect of exchange-traded derivatives. With around 16% of the notional amount outstanding traded on exchanges, the exchange-traded derivatives volume in Asia-Pacific was 4.1 billion lots in 2007, second only to the North American region (6.1 billion lots). Among the major markets in Asia-Pacific, India has travelled a long way in developing the exchange-based derivatives segment in the last few years. There exists a well-developed market in various equities, metals, agri products and natural resources. Through 2008, the country saw the launch of exchange-based derivatives in currency, carbon credits, and electricity.

KEY COMPONENTS OF FINANCIAL SECTOR

Equity markets

Equities are an important class of financial instruments in today's financial markets. Bloomberg estimated the size of the world equity cash market at over US\$ 60 trillion by October 2007. With a broad and a well-developed investor base for the equity segment, companies increasingly prefer equities to other sources for raising capital. With equity market bringing in disintermediation, savings directly flow to the financial markets without being routed through the traditional bank lending and deposit operations. Further, to provide the risk management tool to the equity market and also to facilitate price discovery in equity market, various derivative products have evolved over the years. The global derivative market estimated at about US\$ 480 trillion in nominal terms (12 times the size of the cumulative GDP of the world economy) has grown by around 24% (see chart 3) in recent years. Advantages such as minimal upfront investment, allowing trade on futures prices, lower transaction costs

¹5th Annual Report, Mapping Global Capital Markets, Oct, 2008



compared to investing directly in the underlying asset, flexibility in contract specifications, and fast product innovation have made the derivatives segment in equity markets attractive to the investors. Equity derivatives are being traded through both the OTC and exchange-operated platforms. The share of exchange-operated equity derivatives fall way short of the share of OTC. According to BIS (Bank of International Settlements), only around 16% of the notional amount outstanding was traded on exchanges at the end of June 2008. Within equity OTC in equity derivatives, options have done much better than 'forwards and swaps' not only in absolute terms but also in terms of growth (see chart 4). European and US equities constitute over 80% of the OTC derivatives markets in equity.

Chart 4: Notional amounts outstanding of OTC equity-linked derivatives (by instrument and market)

Markets	Instruments	June 2007	June 2008	Annual change
US equities	Options	1,112	1,300	16.91%
	Forwards & swaps	795	764	-3.90%
European equities	Options	3,769	4,750	26.03%
	Forwards & swaps	1,289	1,384	7.37%
Japanese equities	Options	753	558	25.87%
	Forwards & swaps	35	70	100%
Other Asian equities	Options	196	452	193.88%
	Forwards & swaps	72	62	13.88%
Latin American equities	Options	81	146	80.25%
	Forwards & swaps	147	135	8.16%
Other equities	Options	207	314	51.69%
	Forwards & swaps	133	242	81.95%
Total contracts	Options	6,118	7,520	22.92%
	Forwards & swaps	2,471	2,657	7.53%

Source: Based on WFE/IOMA 2007 derivatives Survey

²Based on Bloomberg data

Though the exchange-traded equity-linked derivatives form a meagre share in total equity-linked derivatives trading, its share is picking up. The notional amount outstanding in equity derivatives increased from less than 14% at the end of December 2007 to about 16% by June 2008. Now, higher preference is accorded to the exchange-operated derivatives, as market participants here operate under the set principles of financial risk management thereby mitigating counterparty default risks. This makes it different from structured credit-linked securities such as collateralized debt obligations.

Of global exchange-traded equity derivatives, index derivatives showed a healthy yearly growth of 26.1% in 2007 to register 5.61 billion contracts, according to FIA. In terms of growth, stock derivatives fared even better to increase by 42.2% to clock 4.1 billion contracts in 2007. Globally, the derivatives volume is dominated by three exchanges: CME group from America, Korea Exchange from Asia, and Eurex from Europe. India is represented majorly by the BSE and NSE with MCX-SX being the new entrant trading only on currency derivatives so far. As for index derivative products across exchanges, Korea's 'KOSPI 2000' options was the topmost derivative contract with a volume of 2.64 billion lots in 2007. This was followed by the US's 'E-mini S&P 500' (traded at CME) with 0.41 billion lots. In India, the equity market is a major part of the overall financial system. In 2006, it constituted around 42% of the overall domestic financial market. The combined market capitalization of BSE and NSE, at the end of the year 2008, stood at Rs. 60.6 trillion (US\$ 1.25 trillion), despite a slowdown in 2008². Rise of institutional investors, product innovation, continuing reforms in the financial sector, high economic growth and advancement in technology were among the prominent factors behind the robust growth. Foreign Institutional Investors have shown great interest in Indian equity market in recent years in the backdrop of the improving fundamentals of the economy.

Interest rate derivatives

There is a large and growing market for interest rates derivatives in the world. In 2007, the total global volume of interest rate derivatives stood at 3.7 billion, up 17% from the previous year. In this, the short-term interest rate (STIR) derivatives registered an increase of 16.3%, whereas long-term interest rate (LTIR) derivatives increased by 18.6% (in terms of numbers of contracts traded). On the OTC front, growth in the notional amounts outstanding of interest rate derivatives increased in the first half of 2008 on the back of an average increase in the previous half. According to BIS, notional amounts outstanding of these instruments reached US\$ 458.3 trillion at the end of June 2008, 17% higher than the figures of six months previously. On exchange-traded front, the amount outstanding stood at US\$ 68.3 trillion. The significant factor in this segment is that it is concentrated in the American and European regions and, that too, predominantly on CME/CBOT, Eurex, and Liffe. There is a huge scope for growth in interest rate derivatives in Asian markets, where sovereign wealth funds and central banks are likely to play an important role.

Structure of interest rate derivatives market can be better understood by dividing the products on short-term and long-term basis. The short-term product (STIR derivatives), is largely traded on CME Group and Liffe. In 2007, the volume of this derivative increased by 21% on CME/CBOT, and 26% on Liffe. On the average, global growth in STIR futures was higher than in options. In the STIR options segment, volume growth was highest (621%) on OMX followed by Singapore Exchange (492%) in 2007. These massive upsurges indicate the scope for growth in STIR options trade, considering that the global average was only 21.7%. In the STIR futures segment, the Hong Kong Exchanges accounted for the largest proportional increase (130%) in volume terms, followed by OMX (85%) in 2007. In terms of absolute volume, however, CME led the pack with around 550 million contracts. Liffe, with around 360 million contracts, ranked second. The STIR futures market registered its highest volumes in the Americas (with around 1,100 million contracts) followed by Europe, Africa and the Middle East (around 390 million combined). The Asia-Pacific region remains underdeveloped in this segment, with a volume of less than 50 million contracts. This signifies the scope for growth in Asia-Pacific.

The long-term product (LTIR derivatives), is largely traded on CBOT and Eurex platforms. As much as 97% of global trading volumes in the options segment and 92% in the futures segment in 2007 were concentrated only on these two exchanges. The growth in volume of LTIR was much higher in case of CBOT (34%) than on Eurex (5.5%). In LTIR options, volume growth was highest (506%) at Bourse de Montreal, followed by JSE (97%). Total volume growth rate globally was 6%. In actual volume terms, CBOT led the world with 105 million contracts, followed by Eurex with 79 million. No other exchange came anywhere near these volumes with Tokyo Stock Exchange ranking third with a relatively minor share of 79 million contracts in 2007. Geographically, the potential growth region is Asia-Pacific, where volumes estimated at about 3 million contracts compared to around 108 million in the Americas and nearly 80 million in Europe, Africa and the Middle East combined. In LTIR futures, the Taiwan Futures Exchange (TAIFEX) registered the highest growth rate (272%) in this segment, 2007, followed by JSE (194%) and Brazil Mercantile & Futures Exchange (BM&F) (36%) in terms of volume. The global rate of growth was 20%. In terms of traded volumes, CBOT led the global market with around 750 million contracts, with Eurex as a close second. By geography, the Americas, and Europe, Africa and the Middle East (combined) had a lion's share of the market thus highlighting the scope for this segment in Asia-Pacific.

In India too, there is a huge interest rate derivative market. As of now, the entire derivative market on interest rate front is being catered to by the OTC segment in the form of interest rate swaps and forward rate agreements. The inter-bank rupee swap market turnover (as reported on the CCIL platform), averages around US\$ 4 billion (Rs. 16,000 crore) per day in notional terms. The outstanding rupee swap contracts in banks' balance sheet, as on August 31, 2007, amounted to nearly US\$ 1600 billion (Rs. 64,00,000 crore) in notional terms. Outstanding notional amounts in respect of cross-currency interest rate swaps in the banks' books as on August 31, 2007, amounted to US\$ 57 billion (Rs. 2,24,000 crore). Attempts are

being made to develop the futures market in interest rate derivatives. The government allowed NSE to launch interest rate futures in June 2003. However, due to wrong designing of the product, the initiative did not bear the fruit. Given the prudence of interest rate risk and the need for transparency in interest rate derivatives trading, the regulators have once again taken initiatives to launch exchange-traded derivatives in interest rate. The framework for interest rate derivative trading, which is now in the regulatory approval process, is expected to be finalized in 2009.

Bond markets

Bond and its derivative markets constitute an important part of the total financial market, especially in developed economies. With tremendous growth potential and less risky instruments, bond markets are considered safe and efficient. In 2006, the total size of international market for bond was estimated to be around US\$ 47 trillion. The US forms the biggest bond market with an outstanding volume of US\$ 25.2 trillion. Considering that there is an ever increasing issuance of bonds, (for instance, in 2006, the total bond fund net inflows increased to US\$ 60.8 billion, from US\$ 30.8 billion in 2005), the derivative market for bonds is expected to grow enormously in the time to come. Most of the transactions in the US bond market took place between broker-dealers and large institutions in a decentralized, OTC market. Bond markets in most countries remain decentralized and are marred by lower presence of exchange-traded products, compared with their counterpart underlyings, viz. stocks, currencies, commodities, etc.

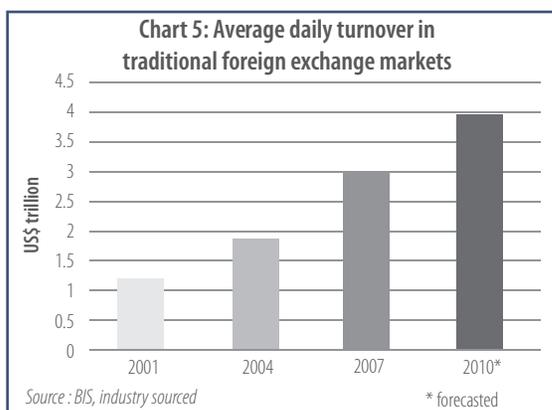
This scenario is, however, now undergoing a systemic change with formalization of the spot market for bonds. In the US, for instance, replacing of the Automated Bond System (ABS) with 'NYSE Arca's open, accessible to all-electronic design' is expected to increase the number of traded issues from 1,000 in April 2007 to 6,000 in due course. At the retail end, investment firms now enable individual investors to access the bond markets through bond funds, closed-end funds and unit-investment trusts. Exchange-traded funds (ETFs) are emerging as another alternative to trading or investing directly in a bond issue.

The bond market in India too is expanding fast. It comprises of two segments, i.e., largely dominant government securities market, and lesser dominant corporate debt market. According to BIS quarterly review (September 2008), the domestic debt securities have risen from US\$ 325.7 billion in December 2006 to US\$ 459.9 billion in June 2008. Goldman Sachs³ estimates that the total debt market of India could grow roughly to about US\$ 1.5 trillion, or some 55% of the GDP, by 2016, with backing from government through fast-paced reforms. Their estimates further suggest that the overall debt market, including the non-government segment, is expected to experience a faster growth by reaching US\$ 575 billion in 2016. This certainly augurs well for the development of the bond derivative market in the country, especially in the segment of futures trading. The future for bonds will be a centralized electronic derivative bond market, offering increased transparency thereby increasing more investor-participation in the market.

³ Bonding the BRICs: 'A Big Chance for India's Debt Capital Market'

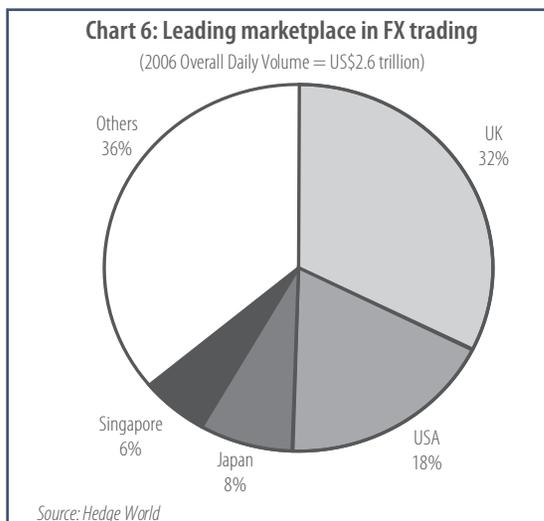
Forex markets

In any financial system globally, the foreign exchange markets represent the largest section of the overall market. According to the BIS⁴, average daily global forex turnover during 2007 stood at US\$ 3 trillion, up from US\$ 1.9 trillion in 2004. Riding on robust growth in cross-border trading, among other factors, the volume of forex trading is expected to reach an average daily turnover of US\$ 4 trillion by 2010 (see chart 5).



There are ample opportunities and reasons for the forex market to grow globally: the prime reasons being the need for transparency, cost-effective hedging, and the possibility of introduction of new currency-linked financial instruments in the near term. The process of globalization and increasing currency market liberalization process underway in the emerging economies, e.g. China, would definitely improve the growth prospects of OTC and exchange-traded forex derivatives.

Of the major currencies traded in the global forex market, the USD, GBP, Euro, and the Japanese yen hold a predominant share of the market. After reforms in the financial sector, most of the developing economies witnessed a spurt in currency market volumes, paving



way for its healthy and organic growth. Exchange-traded derivative market in currencies has been recognized by many of the developing countries to be the healthy way of developing currency markets. As of now, currency futures at the global level form only a fraction of the total derivative market in exchange rate. In 2007, 287 million currency futures and 46 million options were traded on regulated exchanges worldwide. This constituted a mere 2.2% of the total trade in currency derivatives - the remaining 97.8% was traded in OTC markets. However, the growth rate in exchange-traded currency derivatives (42% globally) has remained higher than most other derivative products in all asset classes due to the inherent advantages it provides. This augurs well for the exchange-traded currency derivatives.

Globally, the biggest market in currency options (in terms of contracts traded) is the Brazil Mercantile & Futures Exchange (BM&F). In terms of notional value, however, the biggest market is CME, where globally 73% of the notional value of currency options were concentrated in 2007. The global year-on-year growth in currency options volume in 2007 was found to be 91% - showing the rapidity of growth of this segment. Like currency options, currency futures have also shown healthy growth. Globally, the volume of trade in the currency futures market grew by 36% in 2007 on a year-on-year basis. The Chicago Mercantile Exchange (CME) is the top exchange for currency futures in terms of notional value of contracts traded. Other exchanges also rising in this segment are notably, BM&F, Korea Exchange, and MCX Stock Exchange (MCX-SX). Turnover in currency futures is, however, modest in Europe, Africa and the Middle East (as a group) and Asia-Pacific. In an effort to boost currency trading on exchange-operated platforms, many new exchanges have been set up in the recent past. In 2007, the International Securities Exchange, and JSE entered the market. The Singapore Mercantile Exchange (SMX) and Mauritius-based Global Board of Trade (GBOT), both promoted by Financial Technologies (India) Ltd., are expected to commence operations in the course of 2009. In October 2008, MCX Stock Exchange (MCX-SX) went on-stream with futures trade in the USD/INR currency pair and accounted for 50% of the market share in the first two months of operations (i.e., as at 7th December, 2008).

India has shown exponential growth in currency futures within a short span of time. The future growth of the exchange-traded currency derivatives volume largely impinges upon the awareness that is being generated about the exchange derivative segment and its benefits not only to highlight the importance of hedging but also its other advantages over the costlier and opaque OTC products in which most of the exporters/importers are already participating. Additionally, pending reforms such as expanding the product range to include cross-currency derivatives, options on currency futures targeted towards less risk-taking retail participants, and allowing trading over extended hours to help participants with an opportunity to do real-time risk hedging, would go a long way in making the markets more interconnected and useful to all the participants irrespective of the currency of their exposure. Additionally, launch of interest rate futures, likely in 2009, would go a long way in complementing the growth of the currency derivatives segment as interest rate plays a crucial role in the currency markets.

⁴ BIS Triennial Survey, December 2007

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RAPID GROWTH IN COMMODITY MARKETS - CONNECTING FINANCIAL MARKETS WITH REAL SECTOR

Global commodity derivative trading on exchanges increased by 28% in 2007 to reach over 1,500 million contracts compared to around 1,200 million contracts traded in 2006, according to FIA. Trading in contracts with underlying agricultural products grew by 32% in 2007, energy 29%, and industrial metals 30%. Precious metals trading grew by 3%, with higher volume in New York being partially offset by declining volume in Tokyo. Over 40% of commodities trading on exchanges was conducted on US exchanges and a quarter in China, according to Commodities Trading City Business Series (CTCBS). In the five years to 2007, the value of global physical exports of commodities increased by 17% while the notional value outstanding of commodity OTC derivatives increased by more than 500% and commodity derivative trading on exchanges by more than 200%, according to CTCBS. At the same time, volatility in commodity prices continued to be at higher levels as the global benchmark of commodity indices, GSCI, showed an annualized volatility of around 20% in 2007.

Trading on exchanges in China and India has gained in importance in recent years due to policy reform and their intrinsic status as significant consumers and/or producers of commodities. These markets continue to develop and may soon have a major say in determining the global commodity prices in what continues to be a prerogative of Western economies thus far.

In India, national online commodity exchanges came into being four decades after futures trading was banned in the country: at present, India has three national-level commodity derivative exchanges MCX, NCDEX, and NMCE with MCX leading the market with, as said earlier, an 84% share during calendar year 2008. The Indian commodity derivatives market especially on MCX has also registered exceptional growth in trading volume in recent years. On the three national commodity exchanges during 2007, the total number of futures contracts traded reached 108.14 million lots, with MCX accounting for 64% of the market. In 2008, as mentioned above, MCX held a market share of 84%.

As already stated, the commodity markets in recent years have seen an upturn in the trading volume globally as well. The commodity derivatives market grew globally at the rate of 37% in 2007 and 47% in 2006. The higher rate of growth in 2006 was driven by wider use of electronic technology (which made markets more accessible), increased thrust among players towards diversifying their portfolio, and greater institutional investment. Over 40% of commodities trading on exchanges was conducted on US exchanges and 25% in China.

A noteworthy development is the interest being shown by various stock exchanges to diversify into commodities. This is evidenced from a number of recent mergers, acquisitions and start-ups in 2007 and 2008, during which ICE acquired NYBOT and Winnipeg Commodity Exchange, CME acquired NYMEX, and Dubai Mercantile Exchange was created.

Another noteworthy point is the legislative change in Japan in 2006, following which the Financial Instruments and Exchange Law now allows stock exchanges to trade commodities, and commodity exchanges to trade non-commodity products. This legislation started being implemented in 2008 and will have a significant impact on the product offer of, and trading, on Japanese exchanges.

COMMODITY VERTICALS TRADED GLOBALLY

Energy derivatives: ICE Futures and NYMEX are the leading energy derivative exchanges, with a combined share of 91% of all energy derivatives traded worldwide. In India, MCX is the leading energy derivatives exchange in India, with a market share of 99% in value of energy futures traded on domestic exchanges during calendar year 2007, compared with a market share of 98% during 2006.

Precious metal derivatives: Precious metal derivatives trading grew by about 3% in 2007, with higher volumes in New York partially offset by declining volumes in Tokyo. MCX volume share in Indian bullion trading increased from 86% in 2006 to about 94% in 2007 in the domestic market.

Industrial metal derivatives: Trade in industrial metal derivatives witnessed trading volume of 116 million lots in 2006 to 151 million lots in 2007, a sturdy year on year growth of 30%, according to FIA. In India the traded value of industrial metals grew by over three and a half times y-o-y to 2007. MCX's share in domestic volume increased from 76% in 2006 to 96% in 2007. MCX traded copper futures became the world's largest traded futures contract with 15.4 million lots traded in 2007 second only to SHFE listed copper futures which traded 16.3 million lots during the same period.

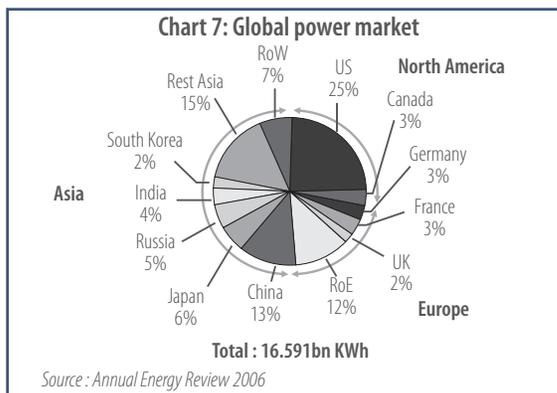
Agricultural derivatives: As a result of the European Union's Common Agricultural Policy that protects agri commodity producers from price declines, agricultural derivative markets remain weak in Europe in comparison with the Americas and Asia. However, increased prices of agri commodities have attracted financial market investors in Europe as well as in the other regional markets. Liffe remains the biggest European exchange for agri derivatives trade (11.5 million futures and 1.3 million options in 2007, up from 9.1 million and 0.7 million respectively in 2006).

Developments in the past two years in this segment include: acquisition of CBOT by the CME Group, acquisition of NYBOT by ICE Futures, and start of palm oil futures trade on Dalian Commodity Exchange, China.

UNORTHODOX COMMODITY VERTICALS

Power market

Power has experienced a surge in trading activity with market deregulation and overall rise in energy price volatility. Historically,



the fragmented physical electricity market was segregated by national and regional boundaries and, to add, lack of power storage technology created volatility in the marketplace. Since interconnectivity of electric grid systems between national power markets had effectively taken place in the recent past, it ensured best possible utilization of power supply, stabilizing prices across regions, and supporting consolidation between markets. Internationally, the drivers for the power market are:

- Formation of energy exchanges in emerging markets including India and rest of Asia-Pacific
- Increasing economic growth rates
- Integration away from country exchanges to regional exchanges
- Transition from OTC contracts to exchange-traded contracts

In addition to the above points (which are relevant globally in the longer-term), the drivers for increasing trading volume in India include:

- Further deregulation of power sector
- Increasing role of the power sector in power generation and distribution
- Adoption of competitive market models for power supply

The Financial Technologies Group set up India's first power exchange, Indian Energy Exchange (IEX), which commenced operations in June 2008 facilitating spot trade in electricity contracts. As at the end of 2008, IEX commanded an overwhelming share of the Indian market.

Weather derivatives market

The increasing need to combat price volatility in the agri commodity sector of the economy is most likely to increase the importance of weather derivatives. Amusement parks and event management companies are also potential participants in the markets for weather

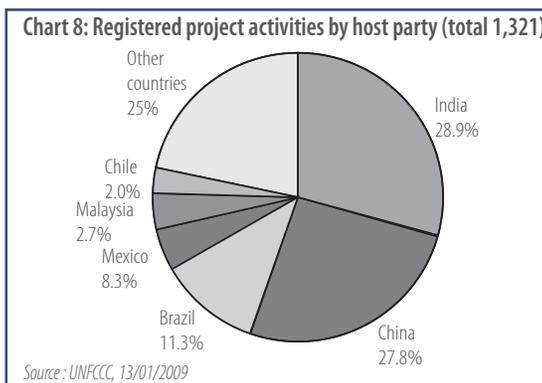
derivatives given the risks they face in their business due to weather-related events. OTC trades in weather derivatives started in 1997 in the US. In 1999, CME launched the first exchange-traded weather derivative contracts, which tracked heating degree days or the cooling degree days. At present, CME has a range of weather derivatives whose underlying include the weather in 18 cities in the US, nine in Europe, six in Canada, and two in Japan. Frost days in the Netherlands and monthly/seasonal snowfall in New York and Boston have also been added as risks covered in weather contracts. These derivatives have strong participation by the physical market stakeholders such as respective manufacturing sector and services sector (including insurance providers). In India, weather derivatives are not yet traded. But, given the vulnerability of agricultural production to the vagaries of weather, it may not be unrealistic to expect weather derivatives trade to be allowed by the regulatory authorities in the future.

Major emerging futures

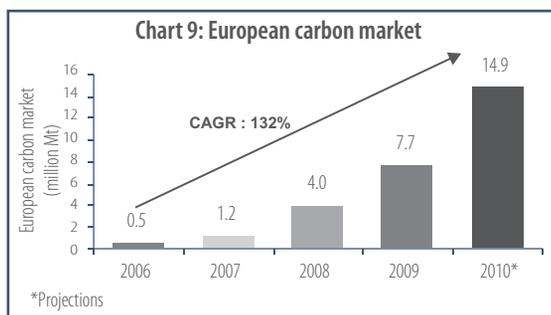
The power and carbon markets are slated to be crucial asset classes in future as economies and sectors within them are facing serious environmental issues and hence the need to develop clean fuel and energy mechanisms. These are upcoming asset classes which are still in their nascent stage but offer a promising future for exchange-traded derivatives given the volatility that is expected to prevail in the market due to the fundamental nature of these asset classes.

Carbon market

Policy initiatives designed to support clean energy consumption have spawned an entirely new market for carbon credits - a market that



continues to evolve as countries enter into environmental agreements. Around 52% of the total projects registered until June 2008 are located in India and China, the major carbon credit producers in the market. While the US market is driven through voluntary commitments to be met by cheaper voluntary emission reductions, European market participants being signatory to the Kyoto Protocol have already succeeded in establishing one to be followed by other countries with emissions cap (known as Annexure I countries) The European market for carbon credits is in its nascent phase but is slated to grow to 14.9 million tonnes by 2010 at a CAGR of 132%. All major global exchange powerhouses have been activated in the carbon emission space intensifying competition for market share.



Trading volumes in the carbon emission market are expected to be driven by the following factors:

- Emission trading is in early stages of its growth cycle; hence scope for its growth is enormous with more markets opening up.
- Increasing awareness about emission instruments.
- Increasing competitive pressure between various exchanges will encourage them to come up with innovative derivative products.

FUTURE OF FINANCIAL MARKETS

General economic factors shaping the future of financial market

Having provided a backdrop of the global and Indian financial markets, it may be useful to visualize how these markets develop in its future course of journey. With continuing reforms in the financial sector, as in other sectors of the economy, markets would be getting increasingly integrated. These economies, riding on perpetual improvement in technology and specialization in production processes, would be fast expanding in both the medium and long-term, led significantly by China and India. Demand-side factors would be playing a critical role in encouraging the expansion of economy. With growing emphasis on inclusive growth and subsequent increase in demand in the backdrop of ever-increasing per capita income of the people, especially in emerging economies, demand is most unlikely to be a constraint. On the other hand, cut-throat competition among the firms would ensure that they minimize the cost of production to help them grow. All avenues of reducing cost will be increasingly exploited by the companies. To stay ahead of others, firms would also attempt to leverage the economies of scale. The cheapest source of financing will be identified with maximum benefits. Perhaps, one of the important avenues to reduce cost would be associated with mitigating the escalating risks in commodity prices, exchange rates, interest rates, etc. A firm into hedging practices would do better than the firm not into it. This in turn would underline the importance of an efficient derivative market to nations. Existence of a derivative market would also serve to smoothen volatility in the prices through the process of price discovery and risk management. The role of government in business would largely be looked upon to act as a regulator to facilitate a harmonious, healthy and safe growth of the sector, in conformity with the broad objectives set for the economy. Technology and future financial markets

Financial markets are growing faster than it was ever imagined. Cross-continent transactions are growing rapidly. New trading techniques and service suites such as algorithmic trading and Direct Market Access (DMA) employing sophisticated tools are gaining momentum thereby impacting exchange IT infrastructure both in terms of regulation and in terms of security of entire exchange operations. Technological advancements have helped market participants to realize huge cost savings as immediate benefits and promise to deliver even greater value through further business development that will come from increased liquidity and activity in the market. In fact, algorithmic trading has significantly contributed to increases in exchange-traded volumes in recent years.

Additionally, electronic trading systems (ETS) are interconnecting markets. Electronic trading aided by effective regulation has also made the task of the regulator simple in light of their role thinly divided between regulation and development. Order management systems (OMS) and execution management systems (EMS) approaching zero latency continue to converge, requiring the ability to handle multiple products, algorithms, advanced order types, and rule-based smart order routing. This will also require firms to expand data processing capacity and bandwidth on demand ensuring that the 'pipes' are large enough to accommodate peak flow of market data.

Technology initiatives will be applied to asset classes beyond equities as broker-dealers expand their electronic trading strategies, adapting algorithms for foreign exchange, derivatives, and fixed income trading. Technology provides a background of the financial system development and thus exchanges across the world are using IT to build an integrated marketplace for future.

FINANCIAL MARKETS: THE WAY AHEAD

The implementation of advanced technology in the marketplace has brought about a change in institutional structures. The trading through online electronic (internet) exchanges has helped in democratizing the markets. Owing to the enhanced technology in use, a free and fast flow of information amongst the participants has become possible, thereby denying to a large extent the advantages of privileged information that prevailed in the physical markets for financial assets. The other major benefits accrued through IT-applications have been higher level of transparency in trades that has in some way resulted in higher trade participation. In nutshell, the following would remain the key to evolution of financial markets as we go along the way:

- **Risk management to be more vigorous:** Risk management is most likely to become the hallmark of all businesses across the globe especially when the economies are globalizing and the risk management becomes a benchmark practice to keep their businesses competitive.
- **Regulated markets (i.e., exchanges) to play greater role:** Exchanges, whether stock or derivatives, will be playing significant role, fuelled by need for greater transparency and security in trades, increase in liquidity, and advancement in technology.

Increasing risk exposure will underline the role of futures exchanges, not only to facilitate risk hedging but also to mitigate the volatility in prices.

- **New asset classes to emerge:** Bolstered by an all-electronic business model with significant operating leverage, exchanges will seek to maintain market growth by adding new asset classes with high incremental margin and by attracting OTC-traded asset volumes onto the exchange platforms. It will also cover various other related intangibles covering the risk spectrum transforming 'unknowns' into 'knowns' in the financial risk management domain.
- **Market borders to fade:** Cross-continent transactions are already happening and are likely to expand; may be at a more rapid pace. New trading techniques and service suites such as algorithmic trading and Direct Market Access (DMA) employing sophisticated tools will gain momentum making markets globally

accessible to almost everyone. Most markets will be accessible through common gateways as market borders fade.

- **Government may play more decisive role:** Government policies and reforms will lay a firm and steady foundation to sustain favourable economic growth. The US government suggestion of a central clearing party encompassing all the markets under their purview including the credit default swaps provides significant insight into the tighter regulatory control the markets would face in the coming years.
- **Algorithmic trading will grow:** Technology initiatives will be applied to asset classes beyond the traditional assets as broker-dealers expand their electronic trading strategies, adapting algorithms for foreign exchange, derivatives, and fixed income trading.

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