United Nations Conference on Trade and Development

Overview of the world's commodity exchanges – 2007

Study prepared by the UNCTAD secretariat

United Nations
New York and Geneva, 2009

Note

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This document was prepared by Leonela Santana-Boado and Adam Gross of the UNCTAD secretariat, with substantial input and research assistance provided by Ms. Leticia Gennes Beltrán. The extensive contributions of Alexander Belozertsev to the sections on Russia and Ukraine are also gratefully acknowledged.

Recent publications by the UNCTAD secretariat on the subject of commodity exchanges include "Overview of the world's commodity exchanges" (2005); "Progress in the development of African commodity exchanges" (2005); "The world's commodity exchanges: Past, present, future" (Bürgenstock, September 2006); and "Report of the UNCTAD Study Group: Development impacts of commodity exchanges in emerging markets" (2007)

UNCTAD/DITC/COM/2008/4

GE.09-50237

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Executive summary

As part of UNCTAD's analytical and advisory work on commodity exchanges, this study provides an overview of the world's commodity exchanges and outlines underlying trends in exchange development. As a regular UNCTAD publication, this paper, containing information and analysis for the year 2007, is an update of earlier studies. This publication also includes relevant developments that occurred during 2008.

With the liberalization of agricultural trade and the withdrawal of government support to agricultural producers outside the OECD, there is in many countries a new need for price discovery and even physical trading mechanisms, a need that can often be met by commodity exchanges. Hence, recent years have seen the rapid creation and growth of new commodity exchanges in developing countries.

Exchanges in Asia have enjoyed the greatest success in the advancement of its commodity exchanges – the three Chinese exchanges created in the early 1990s, and the three Indian national multi-commodity exchanges, founded in 2002/3, are all now among the world's largest. Latin American exchanges are growing rapidly, after financial crises had previously impacted upon performance. Exchanges in Eastern Europe and the former Soviet Union continue to develop in parallel with the region's transition to a market economy, with renewed emphasis particularly in Russia on developing commodity markets to support its booming mineral, metal and energy sectors. In Africa, the region in which commodity exchanges have fared least successfully to date, there has been a recent flurry of activity in exchange development at a national, regional and pan-African level.

Exchange acronyms

Acronym	Exchange Name	Country
AEX	Euronext Amsterdam	The Netherlands
ACE	Agricultural Commodity Exchange for Africa	Malawi
AFET	Agricultural Futures Exchange of Thailand	Thailand
AMEX	American Stock and Options Exchange	United States
APX	APX Group (formerly Amsterdam Power Exchange)	The Netherlands, United Kingdom and Belgium
ASCE	Abuja Securities and Commodity Exchange	Nigeria
ASX	Australian Securities Exchange (formerly Australian Stock Exchange)	Australia
BCE	Budapest Commodity Exchange	Hungary
BM&F	Bolsa de Mercadorias & Futuros	Brazil
BMD	Bursa Malaysia Derivative Berhad	Malaysia
BMFMS	Bursa Monetar Finaciara si de Marfuri Sibiu (Sibiu Monetary Financial and Commodities Exchange)	Romania
BNA	Bolsa National Agropecuaria	Colombia
BOTCC	Board of Trade Clearing Corporation (now The Clearing Corporation)	United States
Bovespa	Bolsa de Valores de São Paulo	Brazil
BRM	Bursa Romana de Marfuri (Romanian Commodities Exchange)	Romania
BSCE	Belarussian Currency and Stock Exchange	Belarus
BSE	Budapest Stock Exchange	Hungary
BXS	Euronext Brussels	Belgium
CBOE	Chicago Board Options Exchange	United States
CBOT	Chicago Board of Trade	United States
C-COM	Central Japan Commodity Exchange	Japan
CCX	Chicago Climate Exchange	United States
CFFEX	China Financial Futures Exchange	China
CME	Chicago Mercantile Exchange	United States
COMMEX	Commodity & Monetary Exchange of Malaysia (now part of BMD)	Malaysia
DCE	Dalian Commodity Exchange	China
DGCX	Dubai Gold & Commodities Exchange	UAE
DME	Dubai Mercantile Exchange	UAE
ECEX	Ethiopian Commodity Exchange	Ethiopia
ECX	European Climate Exchange	The Netherlands
EEX	European Energy Exchange	Germany
EXAA	Energy Exchange Austria	Austria
FFE	Fukuoka Futures Exchange (now part of KEX)	Japan
FORTS	Futures & Options on the RTS	Russian Federation
GME	Gestore Mercato Elettrico	Italy
HKEx	Hong Kong Exchanges and Clearing	Hong Kong China
ICE	Intercontinental Exchange	United States
IDEM	Italian Derivatives Exchange Market	Italy
IEX	Indian Energy Exchange	India
IGE	Istanbul Gold Exchange	Turkey
IPE	International Petroleum Exchange (now ICE Futures)	United Kingdom
IPEX	Italian Power Exchange	Italy
ISE	International Securities Exchange (now part of Eurex)	United States
JADE	Joint Asian Derivatives Exchange (now part of SGX)	Singapore
JCCH	Japan Commodity Clearing House	Japan
JFX	Jakarta Futures Exchange	Indonesia
JSE	JSE Securities Exchange	South Africa
KACE	Kenya Agricultural Commodities Exchange	Kenya

Acronym	Exchange Name	Country
KBB	Komoditná Burza Bratislava	Slovakia
KCBT	Kansas City Board of Trade	United States
KEX	Kansai Commodity Exchange	Japan
KICE	Kazakhstan International Commodity Exchange	Kazakhstan
KLCE	Kuala Lumpur Commodity Exchange (now part of BMD)	Malaysia
KLOFFE	Kuala Lumpur Options & Financial Futures Exchange (now part of BMD)	Malaysia
KLSE	Kuala Lumpur Stock Exchange (now part of BMD)	Malaysia
KOFEX	Korean Futures Exchange	Republic of Korea
KRX	Korea Exchange	Republic of Korea
LCH	London Clearing House (now part of LCH.Clearnet)	United Kingdom
LIFFE	Euronext London International Financial Futures Exchange	United Kingdom
LME	London Metal Exchange	United Kingdom
MACE	Malawi Agricultural Commodity Exchange	Malawi
MATba	Mercado a Termino de Buenos Aires	Argentina
MATIF	Euronext Paris	France
MCX	Multi Commodity Exchange	India
MEFF	Mercado español de opciones y futuros financieros	Spain
MexDer	Mexican Derivatives Exchange	Mexico
MGEX	Minneapolis Grain Exchange	United Status
MICEX	Moscow Inter-bank Currency Exchange	Russian Federation
MME	Malaysia Monetary Exchange (now part of BMD)	Malaysia
MX	Bourse de Montréal	Canada
NAMEX	National Mercantile Exchange	Russian Federation
NASDAQ	National Association of Securities Dealers Automated Quotations	United States
NBOT	National Board of Trade	India
NCDEX	National Commodity & Derivatives Exchange	India
NCEL	National Commodity Exchange Limited	Pakistan
NEL	NYMEX Europe Ltd	United Kingdom
NMCE	National Multi-Commodity Exchange	India
Nord Pool	Nordic Power Exchange	Norway
NSE	National Stock Exchange of India	India
NYBOT	New York Board of Trade	United States
NYMEX	New York Mercantile Exchange	United States
NYSE	New York Stock Exchange (now part of NYSE Euronext)	United States
OMX	OMX Group of Exchanges	Sweden
OME	Osaka Mercantile Exchange (now part of C-COM)	Japan
OSE	Osaka Securities Exchange	Japan
PACDEX	Pan-African Commodities & Derivatives Exchange	Botswana
PHLX	Philadelphia Stock Exchange	United States
RMX	Risk Management Exchange (formerly Warenterminbörse Hannover)	Germany
ROFEX	Rosario Futures Exchange	Argentina
RTS	Russian Trading System	Russian Federation
SAFEX	South African Futures Exchange (now part of JSE)	South Africa
SCE	Sofia Commodity Exchange	Bulgaria
SFE	Sydney Futures Exchange (now part of ASX)	Australia
SGX	Singapore Exchange	Singapore
SHFE	Shanghai Futures Exchange	China
SICOM	Singapore Commodity Exchange	Singapore
SPCEX	St. Petersburg Currency Exchange	Russian Federation
TASE	Tel Aviv Stock Exchange	Israel
TAIFEX	Taiwan Futures Exchange	Taiwan, Province of China
TFEX	Thailand Futures Exchange	Thailand
TFX	Tokyo Financial Exchange (formerly TIFFE)	Japan

Acronym	Exchange Name	Country
TGE	Tokyo Grain Exchange	Japan
TME	Tehran Metals Exchange	Iran, Islamic Republic of
TOCOM	Tokyo Commodity Exchange	Japan
TSE	Tokyo Stock Exchange	Japan
TurkDex	Turkish Derivatives Exchange	Turkey
UCE	Ugandan Commodity Exchange	Uganda
UICEX	Ukrainian Interbank Currency Exchange	Ukraine
UFEX	Ukrainian Futures Exchange	Ukraine
USFE	U.S. Futures Exchange	United States
UZEX	Uzbek Commodity Exchange	Uzbekistan
WCE	Winnepeg Commodity Exchange	Canada
WGT	Warszawskiej Gieldy Towarowej	Poland
WSE	Warsaw Stock Exchange	Poland
Y-COM	Yokohama Commodity Exchange (now part of TGE)	Japan
ZCE	Zhengzhou Commodity Exchange	China
ZAMACE	Zambian Agricultural Commodity Exchange	Zambia
ZIMACE	Zimbabwe Agricultural Commodity Exchange	Zimbabwe

Introduction and overview

A commodity exchange is a market in which multiple buyers and sellers trade commodity-linked contracts on the basis of rules and procedures laid down by the exchange. In developed countries, such exchanges typically act as a platform for trade in futures contracts, or standardized contracts for future delivery. In the developing world, a commodity exchange may act in a broader range of ways to stimulate trade in the commodity sector. This may be through the use of instruments other than futures, such as the cash or "spot" trade for immediate delivery, forward contracts on the basis of warehouse receipts or the trade of farmers' repurchase agreements, or "repos". Alternatively, it may be through focusing on facilitative activities rather than on the trade itself, as in Turkey where exchanges have served as a centre for registering transactions for tax purposes.

While derivative instruments have become ever more sophisticated in both form and application, it is important not to lose sight of the fact that, at their basis, commodity exchanges perform important functions that benefit the producers, processors, traders and users of commodities in both developed and developing worlds.

As a focal point for trade in a sector, the concentration of buyers and sellers in one place reduces the transaction costs that would have been incurred in the search for a suitable counterparty. The trade that ensues enables the exchange to act as a vehicle for "price discovery", with the price level accurately reflecting the underlying conditions in the market, and "price transparency", as all actors that participate in the market can have equal access to a neutral and authoritative price level. For those exchanges that also offer forwards or futures contracts, risk transfer is a fourth function of benefit to market participants – by locking in the price for future delivery, they can "hedge" against unfavourable price movements that may occur before the delivery date.

The utility of these functions lies at the foundation of many of the world's most prominent and prestigious exchanges. For example, the London Metal Exchange was founded by metals traders in the City of London at the peak of the Industrial Revolution in 1877 to manage their price risk. With goods transported by ship, traders who had purchased large volumes of metal from distant parts of the world faced significant risk as they did not know what price they would obtain for their cargo upon its arrival in London several months later. By negotiating forwards contracts in their products at the newly established exchange, metals traders could hedge the risk of a serious decline in prices while the goods were at sea.

Another example is the Chicago Board of Trade (CBOT), situated in premises above a flour store for its first four years after being founded in 1848 by a group of Chicago merchants keen to establish a central marketplace for trade. Before that time, farmers all too often had found no buyers for the grain they had transported to Chicago. Given the high transport costs, they had been left with little choice but to dump the unsold produce in the lake.

Futures contracts only followed at CBOT in 1865. "In Chicago, where dealing in forward contracts first took on the essential characteristics of a modern futures market, dealing in futures was initially regarded in the grain trade itself as a disreputable speculative business; for more than a decade the Chicago Board of Trade refused to allow such transactions in its quarters."[1]

[1] Holbrook Working, "New concepts concerning futures markets and prices", *Selected writings of Holbrook Working*, Board of Trade of the City of Chicago, 1977.

Over time, though, virtually all developed country exchanges moved towards futures trade (a mechanism for risk transfer), as their services in physical trade (spot and forward) became superfluous (most of the exchanges that were not able to make this change disappeared; the rare exceptions include the Dutch flower auction and a cheese exchange in the USA). The factors underlying this shift have been summarized as follows[2]:

- Improvements in communications technology, which made it less important for traders to gather in one place.
- The growing concentration of trade into the hands of a few large firms, making it easier for these firms to gather information directly.
- The possibility of longer term forward contracts as a result of improving creditworthiness of those active in the commodity exchange.
- The introduction of a futures market, however small it may be in the beginning, itself reduces the relevance of an exchange as a vehicle for physical trade. This is because the prices generated on the exchange act as a reference for price negotiations between buyers and sellers, so they no longer need to buy or sell the physical goods through the exchange.

Similar factors are likely to influence, in the future, those developing country exchanges which now focus on physical trade: when their underlying physical markets change (partly because of the impact of the exchange itself), these exchanges have to evolve in order to survive.

While times and technology have moved on and exchanges often perform much broader roles than those for which they were established, the essential functions of commodities exchanges – reduced transaction costs, price discovery, price transparency and risk transfer – remain as relevant today as in the past.

Indeed, with the liberalization of agricultural trade and the withdrawal of government support to agricultural producers, there is in many countries a new need for risk management, price discovery and even physical trading mechanisms, a requirement that can often be addressed by commodity exchanges.[3] Hence, recent years have seen the rapid creation of new commodity exchanges and the continuing expansion of existing ones.

This brief report gives an overview of commodity exchanges throughout the world. The description with respect to developed countries focuses on futures exchanges, while the discussion of developing countries includes exchanges that focus on spot and forward trading but may evolve into futures exchanges in the years to come.

The focus is on commodity exchanges in the traditional sense – that is, exchanges trading agricultural commodities, metals or energy products, as opposed to financial products (Annex I). These exchanges are, however, described in the context of global futures trade, including financial contracts (Annex II). It should be noted that from their introduction in the first half of the 1970s, financial futures quickly outgrew traditional commodity futures. This pattern of rapid growth of financial futures can be seen both in established exchanges in the West and in new exchanges in other countries. For example, the Korea Exchange (KRX) has been the

[2] Holbrook Working, "Economic functions of futures markets", *Selected writings of Holbrook Working*, Board of Trade of the City of Chicago, 1977

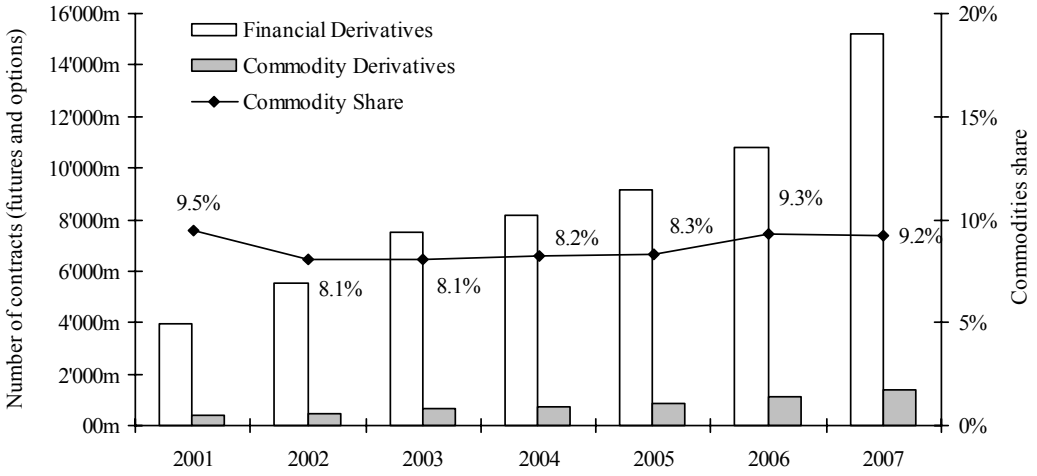
[3] This is the case not just in developing countries. See for a discussion on the EC, Amir Alizadeh and Nikos Nomikos, *Agricultural Reforms and the Use of Market Mechanisms for Risk Management*, CASS Business School / Futures and Options Association, April 2005. In the USA, the Government created a "Risk Management Agency" as part of its Department of Agriculture to help farmers shift from reliance on government to use of market mechanisms to deal with risks.

world's largest futures exchange from 2001 to 2006, falling to the second position in the world ranking in 2007. Its KOSPI 200 futures and options are stock index derivatives created in 1996. In 2006, 2.4 billion such contracts were traded, increasing 9.50 per cent, up to 2.7 billion in 2007, with options accounting for approximately 98 per cent of this total. While trading volumes have declined since a peak of 2.9 billion trades in 2003, this still represents approximately one fifth of the world's total futures trade (see Annex II). In 2007, the largest futures exchange, the CME Group, formed by the Chicago Mercantile Exchange (CME) and the Chicago Board of Trade (CBOT), traded a total of 2.8 billion on futures and options contracts.

These figures stand in stark contrast to the largest commodity contract – the New York Mercantile Exchange's (NYMEX) West Texas Intermediate Crude Oil Contract – of which only 121 million were traded in 2007 (an increase of 70.4 per cent from 2006).

Overall, commodity futures and options now account for only around 9 per cent of total futures and options volume (see figure 1 below).

Figure 1. Commodity futures and options performance, 2001-07

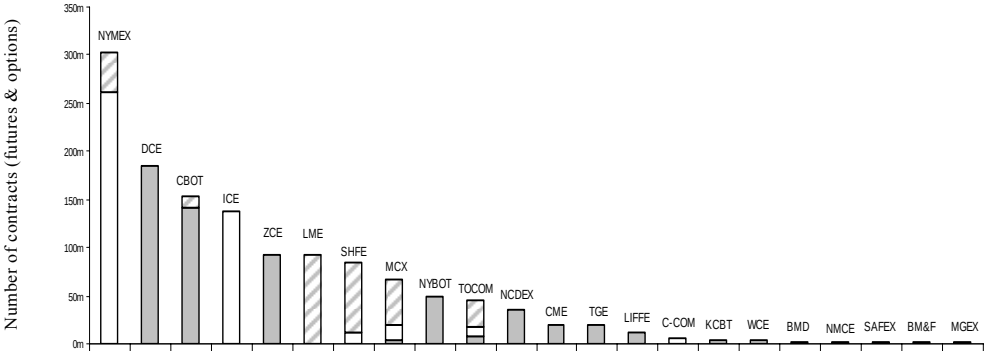


Source: Calculations made on the basis of information published by the Future Industry Association (adjusted to include volume data provided by Indian national exchanges not captured by FIA).
Note: Compound annual growth rates 2001–2007: financial derivatives 23 per cent; commodity derivatives products 23 per cent.

This number has remained relatively stable over the last four years, displaying only a very limited increase in share despite what some commentators have called a "commodity boom". In fact, growth of both commodity and financial futures has been equally rapid during this period, with a compound annual rate for each of 23 per cent. In the case of commodities, the main underlying drivers of volume growth have been the growing Asian demand for commodities stimulating a corresponding growth in commodity trading on Asian exchanges, as well as increasing prices and volatility in a number of core commodities, including but not limited to crude oil. The latter factor has boosted trading volumes on the large exchanges in the developed world which generate the reference prices for world trade – NYMEX, CBOT (now part of the CME Group) and ICE Futures US (formerly NYBOT) in the US, and ICE Futures Europe, the LME and Euronext.liffe (now part of the NYSE Euronext Group) in the UK.

At present, the most liquid commodity futures exchanges, measured in terms of traded contracts volumes, are located in nine countries, including the United States, China, the United Kingdom, Japan, India, Canada, Malaysia, South Africa, and Brazil (see figure 2 overleaf, and Table 1 in Annex 1).

Figure 2. The world's major commodity futures exchanges, 2007

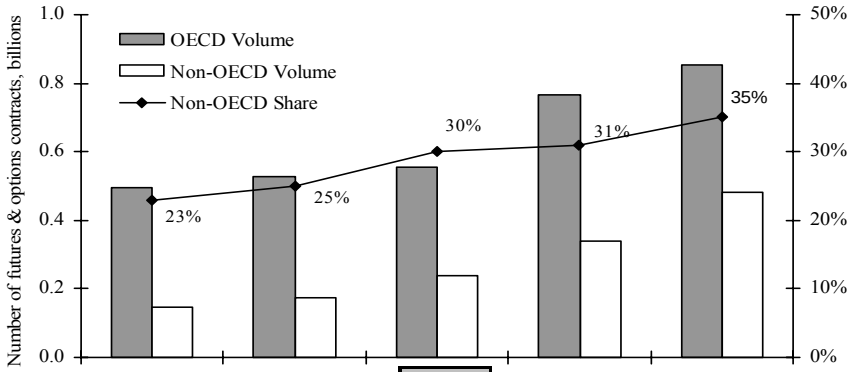


	NYMEX	DCE	CBOT	ICE	ZCE	LME	SHFE	MCX	NYBOT	TOCOM	NCDEX	CME	TGE	LIFFE	C-COM	KCBT	WCE	BMD	NMCE	SAFEX	BM&F	MGEX
Metals	41		11			92	73	48		28	1				0.03							
Energy	261		0.07	137			12	15		11	0.1				6				2			
Agriculture		185	142		93			4	49	7	35	19	19	12	0.1	4	3	2		2	2	1

Source: Exchange data (see Annex I); see table of exchange acronyms for full exchange names
Note: The data set includes only those commodity exchanges trading over one million futures and options contracts during 2007; volume is measured in number of contracts, but it is recognized that the size of contracts can vary considerably across products and exchanges

Since 2003, commodity exchanges in developing countries have experienced a rate of volume growth more than double that of their more established counterparts situated in OECD countries (see figure 3).

Figure 3. Exchange-traded commodity derivatives volumes, 2003–07

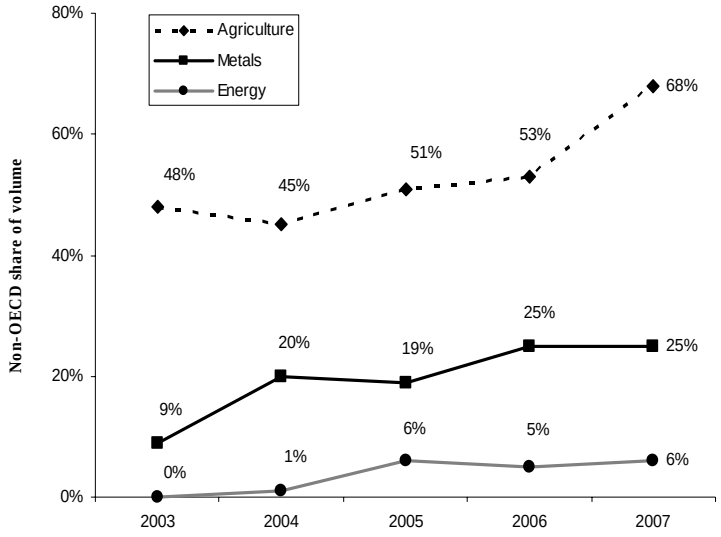


	CAGR 2003-07
OECD	14.60%
Non-OECD	34.90%

Source: UNCTAD.
Note: The data set comprises the world's leading commodity exchanges, defined as those trading over one million futures and options contracts per annum; CAGR = Compound Annual Growth Rate.

This rapid growth has resulted in an increasing share for developing countries of overall commodity futures and options trading – currently slightly over one-third and rising fast. Moreover, when the data is disaggregated on a sector-by-sector basis (see figure 4 overleaf), it is seen that developing countries have now overtaken their OECD counterparts in a sector as critical to their development as agriculture. Rapid volume growth has also been experienced in developing country metals and energy sectors, albeit with developing country share in energy remaining low, as high and volatile international oil prices have stimulated a rapid increase in energy trading in OECD markets.

Figure 4. Sectoral growth of exchange-traded commodity derivatives volume, 2003–07



	OECD CAGR 2003/07	Non-OECD CAGR 2003/07
Agriculture	16.60%	25.30%
Metals	5.60%	72%
Energy	18%	134%

Source: UNCTAD.

Note: The data set comprises the world's leading commodity exchanges, defined as those trading over one million futures and options contracts per annum; CAGR = Compound Annual Growth Rate.

It should be emphasized that not all newly emerging commodity exchanges have progressed to the level of futures trading. Many have not even been able to sustain spot or forwards trade and have disappeared rapidly as a result. While this report does not discuss in any detail developments regarding Internet platforms for

commodity trading, it should be noted that their experiences have been even worse: the vast majority have not survived, and those that did generally did so at a level of operations much below what the initiators had expected. One notable exception is the Intercontinental Exchange (ICE), an Internet energy exchange which acquired three "brick-and-mortar" exchanges during a rapid expansion: the International Petroleum Exchange in July 2001, the New York Board of Trade (NYBOT) in January 2007 and the Winnipeg Commodity Exchange (WCE) in August 2007.

The previous edition of this paper has pointed to three trends driving change in the commodity exchange industry: demutualization, or the tendency to separate exchange management from direct ownership and trading interests; the rationalization or consolidation of commodity exchanges within countries; and increased cooperation among exchanges in different countries. These trends have largely continued. As an example of the first, the demutualization process of BM&F of Brazil took place during 2007. The second of these trends has also continued, but mainly in the developed world where exchange consolidation has taken place particularly in US and Japanese markets – the purchase of the CBOT by the CME and of NYBOT by ICE in the former, and the consolidation through merger of seven exchanges into four in the latter. In the developing world – including China, India and Russia – there remains a significant number of exchanges, especially in the commodity space. The signs are that, due in part to regulatory constraint and in part to market structures that are still in their early phases of evolution, there will probably be more rather than less exchanges in the short term. China launched trading on its financial futures exchange in early 2008; in Russia a tender was won in late 2007 by an exchange based in St Petersburg to trade commodity cash and physically derivable futures contracts on Russian oil products; and there has been talk of new national commodity exchanges being formed in India.

Cross-border cooperation between exchanges in different jurisdiction also continues, with new memorandums of understanding being signed and joint initiatives being implemented. However, consolidation is now also taking place across borders. As exchange trading of financial and commodity derivatives becomes an increasingly globalized business and as exchanges become for-profit public corporations, the high-value derivatives trade is particularly coveted in the logic of exchange merger and acquisition activity. Recent times have seen the Transatlantic "mega-merger" of NYSE and Euronext, as well as that between Eurex and the ISE. A US–Canadian link-up has seen ICE acquire WCE, while NASDAQ of the US, acquired OMX of Scandinavia in September 2007. There are also indications of further significant cross-border activities in the years ahead. A number of exchanges have long eyed the potential purchase of the London Stock Exchange, and other deals are emerging in which exchanges have been taking strategic stakes or cross-holdings in each other. This follows earlier manifestations of cross-border activity with its roots in the late 1990s, which involved the formation of regional exchanges – including Euronext (which brought together exchanges from France, Belgium, the Netherlands, the UK and Portugal) and the OMX group of Nordic and Baltic exchanges. A similar regional approach is now being explored in the developing world: Africa and Central America are exploring regional exchange formation, with regional cooperation also taking place between large commodity exchanges in Brazil and Argentina.

This edition of the paper also highlights a fourth fundamental issue that is being faced by commodity exchanges – the increasing centrality of information and communications technology as a determinant of exchange success. The transition towards the electronic trading of commodities is now in its latter stages, with almost all of the US open outcry exchanges now also trading electronically (exchanges in Europe, Asia and other emerging markets have been generally further ahead in this

respect.) This movement, itself a remarkable transformation in the way business is done in the commodities space, is triggering a second, continuous revolution powered on the one hand by the inherent tendency of technology to rapidly evolve and on the other by the increasingly fierce competitive global environment in which demutualized, for-profit commodity exchanges are now fighting for business.

The result is a stream of innovations in products, platforms and functionalities, as well as a fundamental restructuring of the relations between market actors – hedgers, speculators, collateral managers, exchanges, clearing houses, brokers, regulators, government, infrastructure providers and technology vendors – that transcends national borders and regulatory jurisdictions. For the exchange, the technology-driven era is having a profound impact on business strategy and operations in several dimensions.

Demands of key liquidity providers – market makers and institutional investors – include ever-faster execution speeds; straight-through processing as standard; the integration of value-added clearing services into the trading platform; enhanced network resilience and the deployment of cutting-edge security software and disaster recovery systems; the supply by exchanges of more – and increasingly sophisticated – market data as inputs for algorithmic trading tools whose usage has been growing and will continue to grow.

Connectivity is a priority, as rapid market growth means that bandwidth must expand to accommodate an exponential increase in the number of incoming messages from investors and in the outward supply of market data back from the exchange. In emerging markets, the imaginative deployment of technology is a critical means for exchanges to overcome deficiencies in national communications infrastructure and extend geographic reach to bring marginalized or physically remote users into the markets.

Technology is also providing a major spur for capital market convergence – i.e. the convergence of commodity futures with financial futures and securities markets. This process has been fundamentally investor-driven, as sophisticated investors, particularly hedge funds, seek to integrate their commodity market operations with those of other asset classes. Another aspect of capital market convergence that has to be addressed is the regulatory dimension. Yet with issues such as portfolio margining – a margining system in which margin levels are derived from the net market risk for a portfolio of positions across markets/asset classes – high on the agenda in Washington D.C., a regime for regulating converged capital markets may not be far off. However, technology is the critical enabler of capital market convergence – in particular, applications that enable cross-asset class investment portfolio management for traders; and platforms that enable cross-asset class market risk management for the exchanges. Once such systems are in place, there is likely to be a wave of further integration between commodities, financial futures and securities exchanges seeking ever-greater economies of scale in an era of intense global competition.

Finally, technology can provide the means for exchanges to foster ever-closer relations with their users. Customer relationship management (CRM) systems have been already deployed effectively in industries ranging from financial services to telecommunications, retail, transport and logistics. Such systems could also be used by exchanges as a mechanism to increase the service levels provided to customers. While large traders may be already using algorithms to optimize their trading strategies, algorithms embedded in CRM systems could also maximize the impact of an exchange's marketing efforts. These algorithms would be the basis for the "data mining" of client trading information, identifying the client's product focus and analysing their trading strategies. Suggestions would then be

automatically generated to incentivize greater client participation through marketing mechanisms such as transaction fee pricing that is differentiated both by client and by trading strategy; and the timely supply of resources to inform/educate/train the client about new opportunities for portfolio diversification and for the application of new trading strategies.

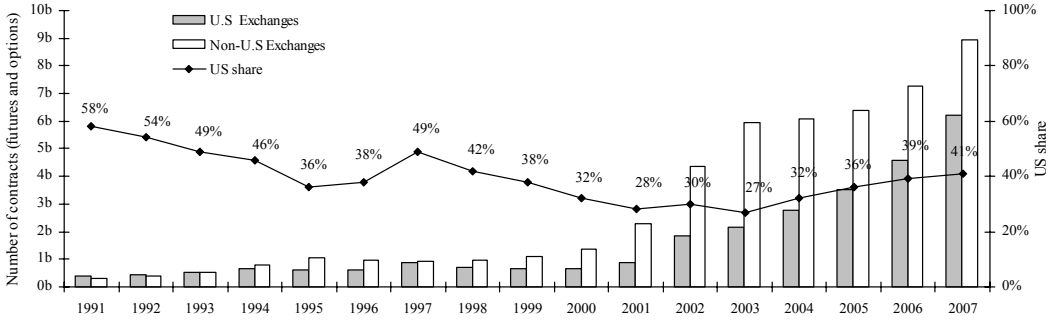
To deliver in all these dimensions, an exchange would need to make significant investments in technology. For most exchanges, faced with so many possibilities yet possessing finite resources, such investments must be highly selective, targeted to those areas where they will generate maximum returns. Such selectivity cannot be achieved without first embedding considerations about technology deployment within a broader strategic approach to exchange development. This type of approach must be constructed out of a continuous dialogue with market users about their requirements as well as a thorough understanding of the changing competitive landscape. For smaller exchanges facing far greater resource constraints, the development of close, collaborative partnerships with technology developers will be the key to surviving – and thriving – in the technology era.

That said, technology deployment is only a means to an end, and success in the future will remain – as today – contingent upon meeting the foundational value propositions on which market participation is premised: well-defined contracts in line with the requirements of market users; a well-functioning delivery system; and liquid, efficient and transparent markets built on a responsible approach to regulation and market risk management.

I. Exchanges in the Americas

Futures exchanges in the US have experienced a revival since the millennium with a compound annual growth rate of 38.6 per cent. This compares favourably with a 25.4 per cent compound annual growth rate of non-US exchanges during the same period (2001–07). 2007 was a particularly good year as volumes increased by 36.20 per cent, compared with a worldwide growth rate of 28 per cent. As a result, the US saw its share of global futures and options trading rise from an all-time low of 27 per cent in 2003 to 41 per cent in 2007. This represents a significant reversal of fortune after a long period of decline that commenced in 1991–92, at a time when US exchanges alone accounted for more than half of world futures trade (see figure 5).

Figure 5. Annual global futures and options volumes, US and non-US exchanges 1991–2007



Source: Calculations made on the basis of information published by the Future Industry Association.

Historically, organized trading in futures began in the US in the mid-19th century with corn contracts at the Chicago Board of Trade (CBOT) and a bit later, cotton contracts in New York.[4] The start for the new exchanges was difficult. For example, in the first years of CBOT, weeks could go by without any transaction taking place, and even the provision of a daily free lunch did not entice exchange members to actually come to the exchange. Trade only took off in 1856, when new management decided that the mere provision of a trading floor was not sufficient and invested in the establishment of grades and standards as well as a nationwide price information system.[5] In the 1920s, Chicago saw the birth of central counterparty clearing, an enhanced mechanism for protecting the integrity of the marketplace, which has become the prevalent clearing methodology across the world (see box 1). While US exchanges have continued to deal in commodities, for most trade in financial futures has become increasingly important since the early 1980s.

[4] While this preceded futures exchanges in Europe, forms of rice futures trading have been reported in China 6,000 years ago. In ancient Greece, Aristotle described the use of call options by Thales of Miletus on the capacity of olive oil presses (Aristotle, *Politics* 1259 a 6-23). The first organized futures market was the Osaka Rice Exchange, in 1730.

[5] Bob Tamarkin, *The Merc, The Emergence of a Global Financial Powerhouse*, HarperBusiness, 1993.

Box 1. Commodity exchange clearing systems

For derivatives exchanges, a clearing house performs two critical functions: managing the risk arising from exchange transactions, and protecting the integrity of the marketplace. Today, the practice of "central counterparty clearing" is commonplace.[6] In this system, the clearing house acts as a central counterparty to all exchange trades – as the buyer to every seller and the seller to every buyer. Assuming that the clearing house is sufficiently well-capitalized to cover any liability that arises, this minimizes the risk of counterparty default. Clearing houses are also typically responsible for administering the position monitoring and margining processes, regulating delivery of physical goods and reporting an exchange's trading data.

The first clearing house to use the "central counterparty clearing" system was the Board of Trade Clearing Corporation (BOTCC, now "The Clearing Corporation"). BOTCC was founded in 1925 as an independent organization when members of the Chicago Board of Trade (CBOT) voted to separate exchange and clearing functions. Another model is that of the London Clearing House (LCH), an independent public company which, prior to its merger with Clearnet in 2003, acted as a common clearing house for the three major London derivatives exchanges (the then LIFFE, LME and IPE) – those exchanges collectively owned a minority stake of 25 per cent. Japan now also follows this model, with the establishment in 2005 of the Japan Commodity Clearing House (JCCH), a common clearing house to clear trades at all the country's commodity exchanges.

However, not all clearing houses are independent. For example, clearing services at the Chicago Mercantile Exchange (CME), the largest US futures exchange, are provided by an in-house division. Via a "Common Clearing Link" established in 2003, the CME has also been providing clearing services to CBOT, even before the recent merger between the two exchanges.

This points to another trend in the clearing sector – the move towards clearing cooperation and integration. As exchanges demutualize to become for-profit enterprises, the selection of entity to perform the mission-critical clearing function is increasingly driven by hard-headed commercial considerations, namely performance and cost. Thus, for CBOT, when abandoning its 78-year relationship with BOTCC to establish ties with the CME, "the CME/CBOT Common Clearing Link brought together two premier financial institutions to provide operating, margin and capital efficiencies"[7] to the exchange and its users.

The economies of scale attained by those clearing houses best able to accumulate volume drives down per unit costs, not only in operational performance but also in the overhead from developing the next generation of technology necessary to administer an ever-more sophisticated marketplace.

Recent developments in Europe may represent the next step in clearing evolution – the unbundling of trading and clearing services. This is enshrined in the Code of Conduct for Clearing and Settlement signed by most major European clearing houses in November 2006, setting out a three-stage process culminating in full unbundling by January 2008.[8]

[6] Although by no means universal – even a futures market as well established as Japan's only introduced "central counterparty clearing" in 2005 (see box 4).

[7] http://www.cbot.com/cbot/pub/page/0,3181,1150,00.html; it is interesting to note that CBOT did not actually demutualize until April 2005. Nevertheless, it is clear that commercial considerations were an important part of CBOT's rationale for establishing the "common clearing link".

[8] For more details, see http://www.fese.be/en/?inc=cat&id=19

Further competitive pressure is likely to follow when developing country clearing operations are allowed to compete in the international marketplace, with countries such as India already exhibiting advantages in cost and technology development over their developed country counterparts in related sectors.

The US now hosts thirteen futures and options exchanges, with the **Chicago Mercantile Exchange (CME)** being the largest.[9] Founded in 1874, the CME was the world's third largest futures exchange in 2007, accounting for 11.7 per cent of world volume with trade of 1,775 billion futures and options contracts. This represented a growth of 26.52 per cent over the 2006 volume. Most of the CME's volume arises from trade in financial derivatives, particularly its Eurodollar interest rate futures and options. Only 20 million of the CME's contracts in 2007 were for commodities, although the exchange's commodity complex exhibited rapid growth of 18 per cent during 2007 (39 per cent in 2006), making it the 12th largest commodity exchange in the world. It is part of the CME Group,[10] the largest futures and options exchange in the world, with a trading volume of 2.8 billion in 2007 and annual growth rate of 27 per cent (see Table 1; Annex II).

In recent years, CME has broadened its commodity portfolio, supplementing its traditional livestock contracts with fertilizer, ethanol, butter and wood pulp futures, as well as non-standard products: a suite of weather indices (including snowfall, frost and hurricane contracts), real estate derivatives plus carbon emissions trading is under preparation. CME has been a major actor in promoting a new platform for exchange cooperation, the Globex Alliance. Originally incorporating five other exchanges – BM&F, Euronext, MEFF, the Montreal Bourse and SIMEX (now part of SGX) – members of each exchange benefited from trading privileges and direct access to the electronically traded products of all of the Globex markets through one single technical access point. With the migration of trading on the other large US derivatives exchange, CBOT and NYMEX (see below), to Globex, the system is increasingly becoming a standard system for world commodities and futures trading.

The **Chicago Board of Trade (CBOT)**, founded in 1848, was once the largest futures exchange in the world. By 2007, however, it had fallen to fourth place after KRX, Eurex and the CME with trade of 1,029 million contracts, 6.8 per cent of total world volume. This represented growth of 27.76 per cent over the 2006 volume. The majority of the CBOT's volume arises from trade in US Treasury Note and Treasury Bond interest rate derivatives. The exchange also offers trade in futures on the Dow Jones Industrial Average, a stock market index comprising thirty of the largest US-listed companies. The CBOT traded 154 million commodity futures and options contracts in 2007. This was only 10 per cent higher than the 2006 volume (compared with a growth of 51 per cent in the previous year), switching the exchange from the second to the third largest commodity exchange in the world. The majority of the CBOT's commodity trade is in the agriculture sector, and the exchange provides the reference price for world trade in key agro-commodities including corn, soybean and wheat. The exchange also trades a significant volume of ethanol futures and options contracts, a key instrument in the context of the recent growth in biofuel production. Recently, CBOT introduced

[9] For an overview of all US exchanges, see http://services.cftc.gov/SIRT/SIRT.aspx?Topic=TradingOrganizations&implicit=true&type=DCM&CustomColumnDisplay=TTTTTTTT . This webpage also lists US exchanges that have become dormant or have been closed down.

[10] CME Group is the largest futures and options exchange in the world. Its subsidiary exchanges are CME and CBOT, which are ranked individually the third and fourth largest futures and options exchanges in the world after KRK and Eurex. In Table 1, Annex II, the ranking only includes the CME Group as the world's largest exchange, followed by KRK and Eurex in second and third position, respectively.

trade in the Dow Jones-AIG Commodity Index Excess Return Futures and precious metals**.**

In July 2007, shareholders of the CBOT voted to merge with the CME in a near $12 billion deal after a lengthy takeover battle. The CME had launched its bid in October 2006, with the backing of CBOT management. A rival, hostile bid was launched by ICE in March 2007 which initially offered a premium over the original CME bid of as much as 10 per cent. However, CBOT shareholders decided that merging with their city neighbours was the best way forward. The combined entity is known as the **CME Group**. It is the world's largest derivatives exchange by range of products, volume and value of trade in 2007 (see Table 1; Annex II). The exchange is aiming to combining electronic trading on a single platform in 2008, as well as to start moving all open outcry trading to a single floor. However, the exchange will retain the separate CME and CBOT rulebooks for the time being. Market participants have articulated concerns that this so-called "mega-merger" might reduce competition between exchanges and lead to increased fees and barriers to entry[11] – the new entity is expected to control approximately 90 per cent of US futures and options volume (the corresponding share was 45.01 per cent in 2007). These fears might be exacerbated with the recent acquisition of NYMEX (see below) by the CME Group in August 2008.

The **New York Mercantile Exchange (NYMEX)** traded 353 million contracts in 2007, a growth of 28 per cent over 2006, and of 64 per cent compared to the previous year. Contrary to the Chicago exchanges, NYMEX is still a pure commodity exchange. It is the largest commodity futures exchange in the world (2007) by some distance – the next largest commodity exchange, DCE, followed by CBOT, trading approximately 61 per cent and half its volume respectively. NYMEX is the 11th largest futures exchange in the world, accounting for 2.30 per cent of total world futures volume. NYMEX offers trade in the energy and metals sectors (both precious and base metals), providing reference prices for global trade in prominent commodities including crude oil and bullion. The exchange's West Texas Intermediate (WTI) Crude Oil was the world's largest commodity derivatives contract in 2007, with 121 million futures and options contracts traded. With rising and volatile world oil prices, volume of the WTI Crude contracts increased by 70 per cent during 2007. Volume may also have been boosted by the migration in August 2006 of electronic trading in its energy contracts from the NYMEX Access to the CME Globex system**.** In recent years, NYMEX has expanded its portfolio to include contracts on electricity, oil and gas inventory, uranium, freight and emissions. In January 2007, NYMEX launched a soft commodity complex – comprising cash-settled contracts for cocoa, coffee, cotton and sugar – to be traded on CME Globex.

NYMEX has also been active overseas. In the Middle East, NYMEX partnered with the Dubai Development and Investment Authority to create the Dubai Mercantile Exchange (see the chapter on Asia and Oceania below). A venture in Europe, known as **NYMEX Europe Ltd (NEL)**, originated in Ireland in 2004 and transferred to London the following year. However, disappointing performance – in particular, the failure to make a dent in ICE Future's Brent Crude market – saw first the trading floor closed in June 2006 followed by the exchange as a whole in early 2007. NYMEX recently returned to Europe, however, with the purchase in November 2007 of a 15 per cent stake in the International Maritime Exchange (Imarex), a niche but highly valued Norwegian exchange specializing in freight derivatives as well as energy and emissions.

[11] See for example http://uk.reuters.com/article/governmentFilingsNews/idUKN1633499020070217

The **Intercontinental Exchange (ICE)** was established in 2000 to provide an open electronic platform for OTC energy trading. In 2001, it acquired the London-based International Petroleum Exchange (IPE), then Europe's leading open outcry energy exchange (see chapter II below). Renamed ICE Futures, electronic trading was introduced. The London subsidiary launched electronically traded WTI Crude futures in February 2006 to compete with the NYMEX contract, which was then traded only by open outcry during normal hours. ICE Futures' WTI contract rapidly ate into the NYMEX contracts' share of the market, capturing over a quarter of the volumes during the year. In 2003, ICE partnered with **Chicago Climate Exchange (CCX)** to host its electronic marketplace for emissions trading. In 2006 and 2007, ICE embarked on a wave of acquisition-driven expansion, commencing with the purchase of ChemConnect, an electronic marketplace for natural gas liquids and chemicals, in June 2006. In January 2007, the purchase of NYBOT was completed, followed by that of the WCE in September (see below). The ultimately unsuccessful bid for the CBOT fell in between the two acquisitions.

Three other US exchanges offer trade in commodities. The **New York Board of Trade (NYBOT)** was established in 1998 with the merger of the New York Cotton Exchange (founded 1870) and the Coffee, Sugar and Cocoa Exchange (founded 1882). In 2007, the exchange traded 50 million commodity contracts (25.2 per cent annual growth) with a small volume of equity index financial futures contracts. The NYBOT is the world's ninth largest commodity exchange and the 30th largest futures exchange overall. It sets worldwide reference prices for several key commodities, including cocoa, coffee, cotton, sugar and frozen concentrated orange juice. In January 2007, NYBOT was purchased by ICE and renamed ICE Futures US (the sixth largest futures exchange in the world in 2007). Subsequently, electronic trading was introduced with plans to close down the floor in mid-2008 despite the protests of some traders. The **Kansas City Board of Trade (KCBT)** and **Minneapolis Grain Exchange (MGEX)** are smaller exchanges offering trade in grain futures mostly for the domestic market. The KCBT traded four million contracts in 2007, making it the 16th largest commodity exchange (12 per cent annual growth) and the 46th largest futures exchange overall. The MGEX traded 1.8 million contracts in 2007, making it the 22nd largest commodity exchange (10 per cent annual growth) and the 47th largest futures exchange overall. Since December 2004, contracts of both KCBT and MGEX have been hosted on e-cbot (keeping their open outcry floors). After the merger of CBOT with the CME, both exchanges were planning to migrate their electronic trading to the CME Globex system in January 2008.

In February 2004, Eurex opened up **Eurex US** to challenge the CBOT's dominant position on US Treasury Futures. Eurex US volume fell precipitously in 2005 by 64 per cent and by a further 94 per cent in 2006, ending the year with trade of just 0.1 million contracts. In October 2006, the Man Group, a global brokerage, acquired 70 per cent of the exchange and renamed it the **US Futures Exchange (USFE)**. However, its volume continued to fall in 2007 up to 94 per cent, with trade of 0.008 million contracts. Since the acquisition, a number of novel products have been introduced or planned to supplement the existing array of equity index and currency futures. These include futures on the high-growth Bombay Sensex equity index, credit derivatives, renewable energy futures and event-based futures, including a futures contract that allowed investors to take a position on the fate of the CBOT at the time of the competing takeover bids for it from the CME and ICE.

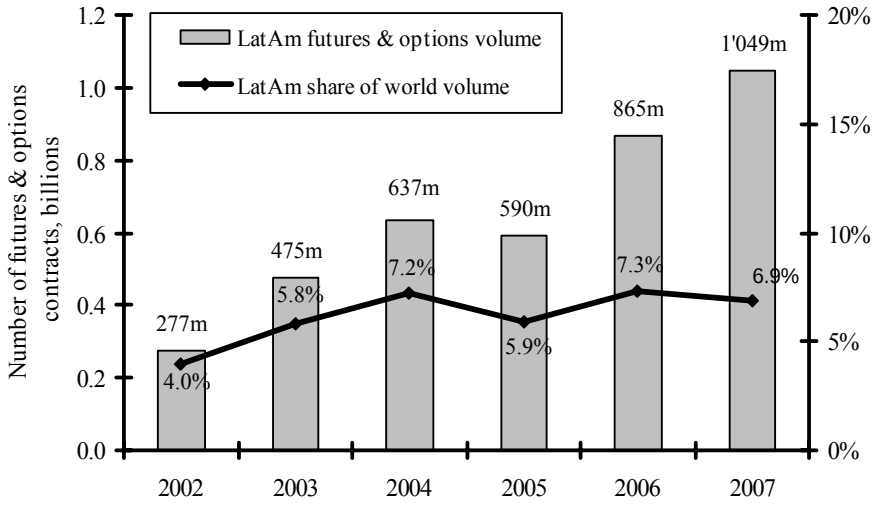
The United States has a considerable number of other institutions that feature among the world's major derivatives exchanges. The largest of these trade exclusively financial futures and include the **Chicago Board Options Exchange (CBOE)**, the fifth largest exchange in 2007 with 945.6 million contracts traded (40

per cent annual growth), the **International Securities Exchange (ISE)**, the sixth largest with 804.34 million contracts traded (35.9 per cent annual growth), the **Philadelphia Stock Exchange (PHLX)**, the eighth largest with 408 million contracts traded (49.40 per cent annual growth), and the **American Stock and Options Exchange (AMEX)**, the fourteenth largest with 240.4 million contracts traded (22 per cent annual growth).

While the exchanges in **Canada** are old, they are of fairly minor importance. The largest is the **Bourse de Montréal (MX)**, which was founded in 1874 and ranks 32nd in the world, with 42.7 million financial futures contracts traded in 2007 (5.43 per cent annual growth). The country's agricultural futures exchange, the **Winnipeg Commodity Exchange (WCE)**, traded 3.43 million contracts on wheat, barley and canola (rapeseed) in 2007 (18 per cent annual growth). The WCE is the 17th largest commodity futures exchange in the world. In December 2004, the year it celebrated its 100th anniversary of futures trading, the exchange became the first in North America to give up its open outcry floor and move to a fully electronic trading system (in effect, it started trading on Chicago Board of Trade's electronic trading platform, e-cbot). In September 2007, the WCE became the second North American futures exchange after the NYBOT to be purchased by ICE.

Since the crisis years of the early 2000s, the performance of derivatives exchanges in **Latin America** has accelerated well (see figure 6 overleaf), growing at a rate more than double the world average. Between 2002 and 2007, the markets have grown at a vigorous compound annual growth rate (CAGR) of 30.48 per cent, compared with the world average CAGR during the same period of 19.74 per cent. This rapid growth has led to a significant rise in Latin America's share of world derivatives volume, from 4 per cent in 2002 to 6.9 per cent in 2007. Although 2006 saw another impressive year of growth, with the Latin American rate outstripping the world average by 44 per cent to 20 per cent, in 2007, the annual growth for Latin America was 21.27 per cent, as against 28 per cent for the world growth rate.

Figure 6. Performance of Latin American derivatives markets



Source: UNCTAD analysis based on FIA and exchange data.
Note: 2007 volumes sourced from exchanges, and total 2007 world volume extrapolated from FIA Jan–Oct 2007 volume data.

Founded in 1890 but trading under its current name since 1967, **Bolsa de Valores de São Paulo (Bovespa)** is Latin America's largest stock exchange and the centre in **Brazil** for trading equity and private fixed-income securities. Bovespa was the first exchange to launch derivatives in Brazil when it introduced options on stocks in 1979. Alongside equity cash and derivatives contracts, Bovespa offers trade in indices, corporate bonds, subscription warrants and Brazilian Depository Receipts (BDRs), which are certificates representative of stocks issued by foreign companies. Bovespa was the world's 10th largest derivatives exchange in 2007, trading 367.7 million contracts (27.90 per cent annual growth).

Latin America's largest and most important commodity exchange is the **Bolsa de Mercadorias & Futuros, (BM&F)**, also situated in São Paolo, Brazil. Founded in July 1985, the BM&F traded 426.36 million derivatives contracts in 2007, a volume growth of 50.40 per cent over 2006, making it the world's seventh largest futures exchange. This ranking was low compared with previous years – in 1997 BM&F was the fourth largest exchange – but the 1999 Brazilian devaluation severely impacted trading volumes. The majority of BM&F's trade is focused in financial futures, including interest rate, equity index and currency derivatives. However, the BM&F also conducted trade in 2.20 million commodity futures and options contracts in 2007, making it the 21st largest commodity exchange in the world (49 per cent annual growth). BM&F's commodity complex arose from its merger with the São Paulo Commodities Exchange (BMSP), created in 1917. The BMSP was the first Brazilian institution to offer forward trading and traded a range of agricultural commodities, especially coffee, live cattle and cotton – commodities now traded by BM&F, as well as corn, soybean, sugar, ethanol and gold.

The exchange also launched in 2005 the BM&F Carbon Facility, an electronic trading system for the generation and trading of carbon credits under the Kyoto Protocol's Clean Development Mechanism. The first carbon credit auction was held in September 2007, when 808,450 carbon credits held by the São Paulo Municipal Government resulting from a Landfill Gas to Energy Project were sold to Fortis Bank, one of fourteen participating institutions, for a total amount of over €13 million. Collaboration in development of the carbon emissions market was one of the motivating factors behind a recent deal between the BM&F and US-based CME Group, in which the institutions agreed a cross-shareholding arrangement.

Growth at BM&F has been driven by the progressive engagement in the markets of Brazilian industry and foreign investors, the latter now accounting for some 20 per cent of liquidity on the exchange, as well as the upgrade in ratings of Brazil's sovereign debt. The exchange did well on the road to demutualization with the authorization to implement given by the BM&F Board of Governors in 2006. The final demutualization took place at the end of 2007.

While the BM&F offers an important mechanism for Latin American price discovery and risk management, it does not yet rival the large US exchanges in setting references for world trade. To enhance the region's role in world price discovery as Brazilian agriculture rapidly expands, and in particular with the deepening of export links to fast-growing Asian markets, the BM&F is looking to integrate Latin American agro-commodity markets and to build close operational relationships with Asian exchanges. Thus, the BM&F and the Rosario Futures Exchange (ROFEX) of Argentina agreed in 2004 to work towards establishing a joint electronic soybean futures market operated by both organizations. The objective is to create a market that offers efficient hedging and minimizes basis risk for the Latin American producer community market, as well as to increase the pricing power of the largest producer markets. In 2007, integration tests between the BM&F's GTS and ROFEX's e-Rofex systems were initiated via the Financial Information Exchange (FIX) protocol, a standard international trading language.

This is a key stage in the integration process, and further developments are expected. The BM&F has also taken a lead in developing South–South commodity trade between Brazil and China, particularly in the area of soybeans. On behalf of the industry, BM&F established an office in Shanghai in 2004 to facilitate linkages between Brazilian producers and Chinese importers. Conferences, visits and roadshows have been held bringing together industry stakeholders from both countries. A mechanism is also being established jointly with China's Dalian Commodity Exchange (DCE) to enable the Chinese soybean industry to purchase direct from Brazil, hedging through the BM&F soybean futures contract and taking delivery at the main Brazilian soybean export corridor of Paranagua.

The BM&F has also been active in supporting the physical commodity markets in Brazil through its **Brazilian Commodity Exchange** subsidiary**.** Launched in 2002, the Brazilian Commodity Exchange is a dedicated agribusiness exchange that creates a link between agriculture, commerce, industry, finance and government. The objectives of the exchange are to upgrade and commercialize the agricultural sector and to provide a reliable and transparent mechanism for the exercise of government agricultural policy. The exchange united the previously separate exchanges from a number of states which become regional operation centres with members trading on an electronic platform accessible via the Internet. BM&F provide the clearing and settlement functions. Services offered by the Brazilian Commodity Exchange include trading in physical commodities and forwards contracts, a mechanism for registering and trade of financing instruments, auctions of government inventories, and a secondary market for securities, public tenders and private acquisitions.

In March 2008, Bovespa and BM&F merged, aiming to creating the world's third-biggest publicly traded securities exchange and the largest in Latin America. The new exchange will be temporarily called Nova Bolsa. There are 29 other commodity exchanges operating in Brazil, spread throughout the country.[12] They trade largely in commodities for immediate or forward delivery, but an electronic network linking most of the country's exchanges also makes it possible to trade in futures contracts.

Argentina has a long tradition in futures markets, but their activities have from time to time been circumscribed by detailed government regulation which has limited the use of exchange services. The national exchange network consists of 11 markets which mainly trade in agricultural commodities, including one of the world's oldest commodity futures exchanges, the **Bolsa de Cereales**, dating back to 1854. Its futures market, **Mercado a Término de Buenos Aires (MATba)**, was founded in 1909 and offers trade in futures and options on four commodities – wheat, corn, soybean and sunflower seed. MATba temporarily suspended operations in 2002 during the Argentinean economic crisis and has not fully recovered to earlier levels. Having achieved a volume of 246,000 contracts in 2000, MATba's 2007 performance reached 177,564 contracts (20.67 per cent annual growth), making it the 52nd largest futures exchange in the world. The larger **Mercado a Término de Rosario (ROFEX),** the 37th largest commodity exchange in the world, traded 25.4 million futures contracts in 2007, a rise on the previous year of 39.6 per cent. The majority of ROFEX volume lies in financial futures, though it did trade a small volume of agricultural futures and options contracts on wheat, corn and soybeans.

[12] They are listed on the website of Banco do Brasil, which provides their electronic trading network: http://www.agronegocios-e.com.br/leilao/informacoes.lel A few of the exchanges are not active; three quarters do not have their own website.

Although **Mexico** is Latin America's second biggest economy, it only introduced a futures exchange comparatively recently in 1998. The **Mexican Derivatives Exchange (MexDer)**, which trades financial futures only, has experienced rapid growth, turning over 229 million contracts in 2007 which positioned the exchange as the world's 15th largest futures exchange in the world, with an annual growth rate of 16.80 per cent. MexDer traded 275 million contracts the previous year, as the 11th largest futures exchange the world over the same year. In 2004, MexDer occupied the ninth position in the world ranking, when the exchange traded a volume of 210 million contracts. However, 2005 proved catastrophic for MexDer – a near 50 per cent decline in volume reduced MexDer to 108 million contracts and the 15th largest derivatives exchange. Its TIIE 28-Day Interbank Rate Futures[13], the world's fourth most traded derivatives contract in 2004 accounting for 98 per cent of exchange volume, experienced the largest decline of any derivatives contract in the world in 2005 – 52 per cent. This was the result of a combination of factors – greater stability in interest and exchange rates, the imposition of higher margin and capital adequacy requirements by the Central Bank and an increase in the withholding tax on foreign investors. If the decline was precipitous, so has been the recovery. The TIIE 28-Day contract grew by 165 per cent and overall exchange volume by 154 per cent to reach 275 million contracts. This was driven by the relaxation of the withholding tax, the introduction of the FIX trading protocol and the implementation of several regulatory reforms. As a result, MexDer rose again to claim the 11th ranking among the world's derivatives exchanges, with the TIIE 28-Day contract as the world's fifth most traded, dropping again to 15th position in the ranking in 2007.

A major private sector group in **Chile** proposed the creation of a commodity futures exchange in the late 1980s. The proposed exchange would trade in domestic food grains and fishmeal. In 1993, the Government included the establishment of an exchange in its programme (and adopted a law to make it possible), but a significant step forward was only taken in 2003, when an Argentinean consultancy firm was recruited by the Ministry of Agriculture to do a feasibility study. Following this study, an exchange, **Bolsa de Productos de Chile**, was formally established in March 2005 and trades wheat, corn and wine.

There are also established commodity exchanges in **Bolivia, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Honduras, Nicaragua, Panama, Peru** and **Venezuela**. These were created mostly in response to the liberalization of domestic trade as a mechanism for organizing domestic agricultural trade flows. The oldest of these, in Colombia, dates from 1973, and the Ecuador exchange dates from 1986, while all the others have been established since 1992. Most of the products traded are agricultural (with some processed products traded in a few countries), but the Government of Colombia has been examining the possibility of introducing a commodity exchange for emeralds. The trading possibilities offered by the exchanges vary widely. Most provide a forum for trade in physical commodities but some, such as the **Agricultural Exchange of Venezuela**, also enable forward trading. In Colombia and the Bolivarian Republic of Venezuela, the exchanges also trade the "credit" part of warehouse receipts and have arranged livestock securitizations to improve rural financing (see box 2 below).

Latin American exchanges have been at the forefront of developing innovative applications for exchange mechanisms to address challenges in the underlying markets. This has typically arisen as a response to the fluctuating level

[13] See: Top 20 derivatives contracts by volume; http://www.futuresindustry.org/downloads/fimag/2007/mayjune/may-june_Volume.pdf

of government intervention in agriculture, forcing the exchanges to innovate new forms of market in which they can maintain niches for themselves. Two prominent examples include the **National Commodities Exchange, Panama (BAISA)**, which distributes tariff quotas negotiated as part of Panama's WTO accession agreement using transparent exchange mechanisms, while the **Honduras Commodities and Services Exchange (AGROBOLSA)** registers and processes Honduran import transactions as part of its operations.[14]

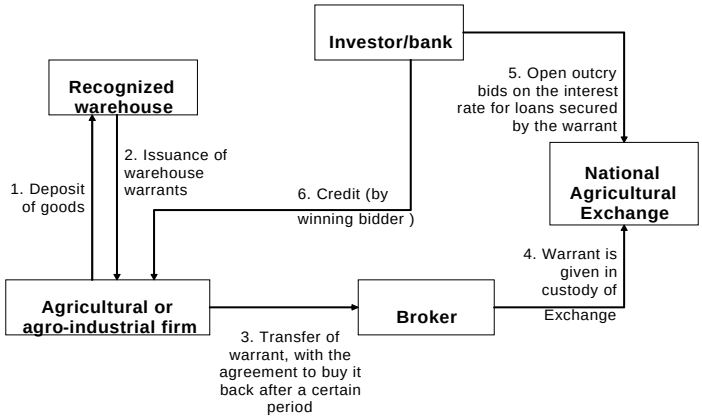
The Association of Latin American Exchanges (APBP) was created in October 1994 in Buenos Aires, Argentina at the Second Regional Meeting of Commodity Exchanges, the first such event having taken place in Guayaquil, Ecuador the previous year. Since then, annual regional meetings have been held in various Latin American capitals, the last being in the Dominican Republic in 2005 (the 2006 meeting, scheduled for Venezuela, was postponed.) The objective of the Association is to increase the exchange of information between national exchanges on issues related to best practice, innovative mechanisms, regulation, etc. In the long term, the Association is viewed as a tool for regional integration. Some attempts have been undertaken in this direction, including the **Central America Regional Commodity Exchange Project**, at the time a joint partnership between the Inter-American Institute for Cooperation on Agriculture (IICA), and the Canadian consortium, Agriteam Canada Consulting Ltd, originating in 1996. There was then some discussion on the subject within the framework of MERCOSUR and the Andean Pact. In early 2007, a number of commodity exchanges situated in Central America once again began exploring possibilities for creating a regional commodity exchange.

Box 2. Repo trading – securing finance for commodity producers in Latin America

Where an economy is to a certain extent disorganized and markets are imperfect, the presence of an exchange can impose discipline on the commodity sector. A well-functioning exchange acts as an "island of excellence", and can extend high levels of performance and integrity attained in its core functions to other areas of commodity sector activity.

For example, exchanges in Colombia and Venezuela have developed innovative solutions that use exchange functions to provide commodity producers with access to relatively cheap sources of finance through trade in producer repurchase agreements, or "repos" (see diagram 1 below).

Diagram 1. Exchange-traded agricultural repos



[14] See "The World's Commodity Exchanges – Past, Present, Future" (2006), a joint publication of UNCTAD and SFOA, available: www.unctad.org/commodities

Commodities are stored with accredited collateral managers, who take responsibility for quality grading and issue receipts. This receipt is then transferred to an exchange broker and the owner of the commodities signs a repurchase agreement to buy it back at a given price after a certain period. This repo can then be auctioned on the exchange, the purchaser knowing that it would be entitled to a cash sum at a defined point in time with the payment guaranteed by the broker and further underwritten by the physical goods in the storage facility. The sum paid by the winning bidder is then channelled to the commodity producer to invest in production.

Not only does the commodity producer have access to more financing than would otherwise have been available, but that finance is also provided on better terms due to the reduced level of risk faced by investors.

In 2000, Colombia's Bolsa National Agropecuaria (BNA) introduced a similar, albeit more complex, system for structuring repos around future receivables rather than existing stocks. Several series of securities were successfully issued, with strong interest from both producers and investors – BNA expects to issue securities worth some US$4–5 million every 45 days. Without the repo trading mechanism provided by the likes of BNA, banks and other lenders would most likely not be interested in exposing their own capital to agricultural credit risks. It can be seen, therefore, that the exchange provides an innovative product to capital market investors while securing access for commodity producers to relatively cheap working capital.

II. Exchanges in Europe

Two giants of the derivatives world are based in Europe. **Eurex**, headquartered in Frankfurt, **Germany**, is the world's third largest futures exchange. The entity arose as a result of the merger of the Deutsche Terminbörse (DTB) of Germany and the Swiss exchange, Soffex, in autumn 1998. In 2007, it accounted for 12.5 per cent of world volume, trading 1,900 million contracts (a growth of 24.5 per cent over 2007). Eurex was directly introduced electronically and its consequent advantages in cost, speed and efficiency forced many of its competitors to introduce electronic trading platforms as well, either operating the two systems on a side-by-side basis (as at the CME or the LME) or replacing open outcry altogether (as at Euronext.liffe or the former IPE, now ICE Futures). Eurex volume comes exclusively from trade in financial derivatives, including interest rate, equity and equity index futures. In April 2007, Eurex acquired the US-based International Securities Exchange to form the largest transnational derivatives marketplace. The merger is expected to create leading global volume positions in individual equity, equity index and interest rate derivatives, with the combined entity's volume in 2006 behind only the Korean Exchange and the merged CME-CBOT exchange group.

Euronext, established in 1998, was set up as a **pan-European** "one company, three centres" structure following the merger of Amsterdam Exchanges (AEX), Brussels Exchanges (BXS) and Paris Bourse (MATIF). This created the first totally integrated cross-border single currency derivatives market. In late 2001, the London International Financial Futures Exchange (LIFFE) was also integrated into Euronext, and in February 2002, Portugal's Bolsa de Valores de Lisboa e Porto Exchange merged with Euronext to become Euronext Lisbon. The integrated derivatives business of the combined entity is now known as Euronext.liffe. In 2007, the exchange was the fifth largest in the world, accounting for 6.24 per cent of world volume and trading 949 million contracts (an increase of 30 per cent over 2006). The majority of trade is in financial futures, including interest rate, equity and equity index products. However, Euronext.liffe offers trade in a range of commodity contracts, with most of the volume arising from trade in Robusta coffee, cocoa and white sugar. The exchange provides the reference prices for world Robusta coffee trade. Total commodities trade in 2007 stood at 12.7 million contracts, a growth of 30 per cent over 2006, making it the world's 14th largest commodity exchange. In 2006, Euronext agreed to merge with the New York Stock Exchange (NYSE), creating the world's first transatlantic stock and derivatives exchange group. In doing so, a rival bid, from Deutsche Börse – one of the parents of Eurex, was edged out. The combined entity, known as **NYSE Euronext**, was formally launched in April 2007 and brings together six cash equities exchanges in five countries and six derivatives exchanges.

The **United Kingdom** hosts three major futures and options exchanges. The biggest is LIFFE, now part of NYSE Euronext as detailed above. LIFFE experienced a difficult time around the turn of the millennium – its 2001 volumes were similar to those it had reached in 1997 because of the "capture" by Eurex of a significant volume of LIFFE's trading in Bund futures. However, since its integration into Euronext, LIFFE's trading volumes have grown significantly, both in commodities and overall.

A second UK-based exchange to have been taken over by a foreign entity is the former International Petroleum Exchange (IPE), an exchange specializing in futures trade on Brent Crude Oil. It was renamed **ICE Futures** subsequent to its 2001 acquisition by the Atlanta-based Intercontinental Exchange (ICE). The exchange also changed from an open outcry market to an electronic system and

began to introduce a range of new products, a move rewarded by large gains in trading volumes. Starting as the smallest of the UK commodity exchanges at the time of acquisition, it leapfrogged the London Metal Exchange (LME) in 2006 to become Britain's largest. It also became the fourth largest commodity exchange in the world and the 21st largest futures exchange overall. This reflected the 120 per cent annual volume growth that lifted trading to 93 million contracts, making ICE Futures the fastest-growing commodity exchange in the developed world and the third fastest overall behind two of the three Indian national multi-commodity exchanges. In 2007, the exchange doubled its trading volume at an annual growth rate of 49 per cent and a total of 138.47 million of commodity contracts. It remained the fourth largest commodity exchange in the world and the 16th largest futures exchange overall, with a total traded volume of 195.7 million contracts and annual growth of 39.5 per cent. Since April 2005, ICE Futures has also listed ECX Carbon Financial Instruments, a mechanism for emissions trading whose marketing is managed by the **European Climate Exchange (ECX)** situated in Amsterdam and cleared through LCH Clearnet.

The **London Metal Exchange (LME)** thus remains Britain's only independent major commodity exchange. Founded in 1877, the LME specializes in non-ferrous metals and – since May 2005 – plastics. In 2007, with trade of 92.9 million contracts (7 per cent annual growth) it was the world's sixth largest commodity exchange (and the 25th largest futures exchange overall). The LME's role in discovering world metal prices is still predominant. Some analysts had been suggesting that the competing Shanghai Futures Exchange (SHFE) was starting to lead, rather than follow, LME in price discovery, particularly in copper. Contrasting performances between LME and SHFE in 2007 – volume at the former increasing by 6.8 per cent whilst volume at the latter decreased by 47.2 per cent – may weaken such claims. The LME has long been in the process of developing a steel contract. Recent developments have seen the release of two regional physically delivered steel billets contract specifications, with trading to commence in April 2008.[15]

Another leading European derivatives exchange is the **OMX** group of **Nordic and Baltic** exchanges, headquartered in Sweden. OMX was the world's 18th largest futures exchange in 2007 with a volume of 142.5 million contracts (15.7 per cent annual growth). OMX has also supplemented its trading operations with business lines that provide market information and technology solutions. At the end of 2003, trading ceased at the OMX-run Pulpex, an exchange offering paper pulp futures, as a result of inadequate participation in the market. In 2007, OMX became the target of rival takeover bids as the trend for consolidation across derivatives exchanges increased. In September 2007, it was announced that US-based NASDAQ and Borse Dubai had resolved their own takeover battle with a joint deal for the exchange which would see NASDAQ ultimately take control of OMX with Borse Dubai receiving a 20 per cent stake in NASDAQ and a 28 per cent position in the London Stock Exchange. Their stake in OMX currently stands at 47 per cent. At the same time, the Qatar Investment Authority increased its stake to nearly 10 per cent of OMX, and there was speculation that this was a prelude to its own takeover bid. However, the acquisition of OMX by NASDAQ was ultimately completed in early 2008.

A second exchange based in the Nordic region is the **International Maritime Exchange (Imarex)**, launched in 2001 and located in **Norway**. The exchange specializes in freight derivatives – including tanker futures, dry bulk futures and freight options – and is the only regulated freight marketplace in the world. Imarex also offers trade in electricity, emissions and fuel oil. More recently,

[15] See: http://www.lme.co.uk/5792.asp

cash-settled salmon futures in conjunction with another niche Norwegian exchange, **Fishpool,** were launched in May 2006. Imarex traded 246,098 contracts in 2006 to the tune of US$ 6 billion. Recently, NYMEX of the US took a 15 per cent strategic stake in the exchange. In November 2007, Imarex reached a new volume record, trading 55,624 contracts for a value of US$ 2.6 billion, up 85 per cent compared with the same period of the previous year.

Two other mid-sized Western European exchanges which focus on financial futures are **MEFF Renta Variable** of **Spain**, the world's 29th largest derivatives exchange, and the **Italian Derivatives Market (IDEM),** the world's 34th largest. Both these exchanges experienced reasonable growth in 2007, with the former growing 10.4 per cent to a volume of 51.8 million contracts and the latter by 17.4 per cent to 37 million contracts. MEFF focuses on the trading of Spanish 10-year Notional Bonds, on its equity index IBEX 35, and since 2001, on single stock futures with which it has had great success. IDEM is exclusively equity derivatives-focused, with trading on the S&P/MIB index and single stocks. In 1999, MEFF and IDEM formed Euro GLOBEX, a pan-European network which brought the exchanges together with MATIF (now part of Euronext) in an alliance to interconnect trading systems and allow single-screen access to the products of participating exchanges.

In **Austria**, the **Wiener Börse** traded 1.3 million financial futures contracts in 2007 (0.41 per cent annual growth), making it the world's 49th largest exchange. The Vienna Commodity Exchange, founded in 1872 and merged with the Wiener Börse in 1876, remains a separate department within the institution. However, trade has always been marginal and focus has been on support services such as arbitration and market information. In Germany, the exchange formerly known as Warenterminbörse Hannover (WTB) was turned into the **Risk Management Exchange, Hannover (RMX)** as of April 2006. Created in the late 1990s, the RMX offers agricultural futures contracts for the EU market with a focus on potatoes and a smaller volume of livestock. Its volume remains small, with 56,677 contracts traded in 2007. This, however, represented a decrease of 8.2 per cent compared with 2006 levels. Elsewhere in Western Europe, there are a number of exchanges that have been formed to facilitate trade in electricity (see box 3 below).

Box 3. Electricity exchanges

With the reduction of government controls over electricity generation and distribution in Europe, several exchanges have been created in recent years to act first as a forum for physical and futures trade of electricity. The leading exchanges include **Nordpool** in Scandinavia, **EEX** in Germany (in which Nordpool has a 17 per cent stake), **Powernext** in France, the Anglo-Dutch exchange **APX** (formerly Endex and UKPX), **EXAA** in Austria, **GME** and **IPEX** in Italy and **OMEL** in Spain.

Nordpool EEX, Powernext and APX have introduced futures contracts (electricity futures can be physical – delivery is obligatory – or financial – the contract will be cash-settled; unlike other futures contracts which are either one or the other, the two types of contract often trade in parallel). Of these exchanges, the EEX had the largest volume of futures trade in 2006 accounting for 1,044 TWh of power, ahead of Nordpool (766 TWh), Powernext (83 TWh) and Endex (32 TWh).[16]

Up until now, the exchanges have been national in nature. However, with moves towards integration of European power networks on the cards spurred by the European Commission, consolidation among these exchanges appears imminent. In June, Germany, France and the Benelux countries signed an agreement on power market coupling to take effect from 2009. In October, the EEX and Powernext boards approved a cooperation agreement between the exchanges with a view to creating a pan-European power spot market. Nordpool is said to be lukewarm towards these moves, but EEX still hopes to include its shareholder in the cooperation agreement.

[16] Banks, J. "European Power Trading: Competition and Complexity", *Futures Industry Magazine*, May/June 2007 (available: http://www.futuresindustry.org/fi-magazine-home.asp?iss=176).

The large established energy exchanges, NYMEX and ICE Futures, have also introduced electricity futures contracts. In Asia, the SHFE is examining the possibility of introducing a Chinese electricity contract, while in India, Financial Technologies (parent of MCX) and the Power Trading Corporation have jointly established the **Indian Energy Exchange (IEX)**. The IEX received approval from India's Central Electricity Regulatory Commission in August 2007 and is due to commence operations in the near future. A separate initiative for an Indian power exchange involving NCDEX is also believed to be under preparation.

The **Budapest Stock Exchange (BSE)** of **Hungary** is the largest derivatives exchange in the European transitional economies and the 40th largest derivatives exchange in the world. In 2007, it traded 18.8 million financial futures contracts – an increase of 28.23 per cent over 2006 volumes, following on from a more than 100 per cent rise over 2004 and 64 per cent over 2005. Most of the volume comes from trade in currency futures with small volumes of equity and equity index products. In October 2005, BSE absorbed the **Budapest Commodity Exchange (BCE),** Hungary's agricultural commodities exchange (although it also traded financial futures in addition to its grains and livestock contracts). In its 10 months of trading as an independent exchange, BCE traded 570,000 contracts in 2005, a fall of over 50 per cent compared with the full-year volume for 2004. Now operating as the Commodity Section of the BSE, the former BCE's commodity markets have all but dried up in 2006 with the exchange reporting only 9,635 commodity derivatives contracts – from a range of grains and oilseeds contracts – traded during that year. Both BSE and BCE had signed an MOU with NYMEX in April 2005 with a view to jointly developing an Urals crude oil futures contract in Budapest. As yet, this contract has not been brought to market.

Founded in 1991, and situated somewhat ironically in the building of the former Central Committee of the **Polish** Communist Party, the **Warsaw Stock Exchange (WSE)** is the second largest derivatives exchange in the region. In 2007, it traded 69.3m mainly stock index futures contracts, 39.14 per cent higher than in the previous year, making it the world's 42nd largest futures exchange. The much smaller **Warsaw Commodity Exchange (WGT)**, founded in 1995, deals in small volumes of futures and options on agricultural products (milling wheat, feed wheat and live hogs) as well as some currency and interest rate futures. WGT also boasts the largest spot commodity market in Europe, introduced in 2001 and powered by Poland's largest B2B trading platform. The WGT is part of the Polish Commodity Exchange network, which comprises some 18 exchanges spread throughout the country.

In the **Czech Republic**, there are five commodity exchanges trading not only the agricultural products normally found in exchanges operating in liberalized economies but also timber, ores, paper products and construction materials. These exchanges, the most prominent being in Brno and Prague, are all limited to trading in the spot market – other types of contract are not currently permitted under Czech law, although this may soon change. In **Slovakia**, the **Bratislava Commodity Exchange (KBB)** trades an array of spot contracts for agricultural, industrial and timber products, as well as emissions allowances. There is also a trade in warehouse warrants for agricultural products. In **Slovenia**, an electronic exchange, **The Exchange of Ljubljana**, started trading in 1995. It offers a range of currency futures contracts and two grain futures contracts. Trade has been quite limited so far.

Other commodity exchanges have been created since 1990 in **Romania** and **Bulgaria**. Futures contracts are traded on seven grains contracts at the **Sofia Commodity Exchange (SCE)**, and on foreign currencies (Euro, dollars, etc) and interest rates at **Romania's Sibiu Monetary Financial and Commodities**

Exchange (BMFMS), founded in 1997. The **Romanian Commodities Exchange (BRM)**, opened in 1992, offers spot and forward trade in grains, oil products and some metals.

Exchanges offering commodity spot trading flourished in the Soviet Union during the period of Gorbachev's reforms and in the early years after the USSR's collapse, with hundreds of institutions established across Russia, Ukraine and Kazakhstan. However, the sector stagnated in the late 1990s and 2000s, with many of these institutions closing down. Those that did survive, approximately fifty in Russia, thirty in Ukraine and fifteen in Kazakhstan, have broadened the scope of their operations to include various kinds of brokerage operations or to serve as a marketplace for state-organized auctions or tenders for government procurement activities in commodities such as grains, energy products and even real estate.

The first attempts to develop modern commodity derivatives trade were undertaken at the Moscow Commodity Exchange and the Russian Commodity and Raw Material Exchange in the early 1990s, with attempts to launch wheat, sugar and oil futures. In the mid-1990s, exchanges in St. Petersburg, Novosibirsk, and Krasnodar also attempted to develop futures and options trade on grains, sugar, energy products, metals and lumber. None of these efforts came to fruition, however, due to the lack of strong and reliable clearing systems and well-developed delivery procedures.

Only in mid-2006 did **Russia** successfully introduce commodity derivatives. A flurry of commodity market development activity followed President Putin's State of the Nation address to the Russian Duma in May 2006. In it, he cited as a national priority the establishment of exchange-traded energy futures contracts. This is widely viewed as a means by which the influence of the now freely convertible rouble can be extended. These contracts are still in their early stages, however, and financial futures continue to account for the vast majority of Russian derivatives volume.

The electronic futures and options exchange, **FORTS,** remains the fastest-growing Russian market. FORTS is the derivatives arm of the RTS Stock Exchange and was created in August 2001 after the merger of the derivatives division of the St Petersburg stock exchange and the Moscow-based electronic stock market RTS (Russian Trading System[17]). The exchange traded 90 million derivatives contracts in 2006; between January and March 2007 alone, its trading volume was 25.7 million contracts. In 2007, the electronic exchange reached a volume of 144.9 million contracts traded or 297.4 billion US dollars. Compared with 2006, the number of trades increased twofold. Most of these contracts were on equity and equity index products. Four energy contracts – Urals oil, diesel oil, aviation oil and black oil – plus gold and silver contracts were also launched on the exchange during 2006, all of which are cash-settled. The Urals oil, diesel oil, sugar and gold contracts are now trading with significant liquidity**.** FORTS is currently developing a range of weather derivatives, with a launch planned for early 2008.

The **Moscow Inter-bank Currency Exchange (MICEX)** offers trade mainly in currency futures. Since mid-2006, the exchange also trades interest rate futures on the MosIBOR overnight rate and the 3-month MosPrime rate; in June 2007, it introduced equity index futures. Through its **National Mercantile Exchange (NAMEX)** commodity-focused subsidiary, MICEX plans to introduce grain futures trading by spring 2008 with delivery points across the grain-producing regions of the country, including the Rostov and Krasnodar regions. Since 2002, NAMEX has facilitated trading for government grain procurement interventions,

[17] See: http://www.rts.ru/a17726/?nt=120

bringing together traders in six of Russia's regional commodity exchanges in the sale of 4.4 million tons of grain. Lower volumes are also being traded at two exchanges in St Petersburg, the **Commodity and Stock Exchange 'St Petersburg'** and the **St Petersburg Currency Exchange (SPCEX)**, the latter also a subsidiary of MICEX.

In June 2007, the Russian Government signed a strategic agreement with NYMEX of the US to develop an oil exchange in Russia. A tender was won in November 2007 by an exchange based in St Petersburg. To start, it would trade commodity cash and physically deliverable futures contracts on Russian oil products, initially the Russian Export Blend Crude Oil (REBCO/Urals), denominated both in local and foreign currencies. The new exchange would be assisted by a Russian Government decree as of June 2007, obliging companies in which the state owned a stake greater than 25 percent to buy more than fifteen percent of their crude oil at the new exchange. In June of this year (2008), the Federal Service for Financial Markets decided to issue a trade license for the new International Commodity Exchange to be based in St Petersburg.

Separately, a network of approximately fifty regional commodity exchanges operates across Russia. Most are located in Russia's major provincial centres and operate cash markets only. Many participate in auctions by federal or regional government entities. These auctions are a means for the State either to support prices in strategic commodities such as grains and coal or to regulate access via quota to scarce resources (for example, the **European Asian Exchange**, registered in Moscow, was an entity involved in the auction of fish stock quotas).

In **Ukraine**, there is currently no futures and options trade, either in commodity or financial derivatives. The **Ukrainian Interbank Currency Exchange (UICEX)** runs occasional cash auctions in some energy items such as gas and heating oil, but the exchange is not yet fulfilling its potential, with much of the currency trade taking place on the domestic inter-bank currency market. Previously, the Ukrainian government announced its intention to develop a **Ukrainian Futures Exchange (UFEX)**, but this has yet to come to fruition. More recently, President Yushchenko announced a plan to develop the Centralized Grain Exchange in Ukraine. A working group has been established in this regard to initiate the process of its establishment and the development of appropriate legislation. Approximately thirty agricultural commodity exchanges exist around the country. Some have tried to develop spot markets, though without much success despite some support from US agencies. The activities of many of these regional entities are limited to the stamp-tax registration of cash contracts for export, essentially fulfilling a bureaucratic rather than a trading function.

Both the **Belarussian Currency and Stock Exchange (BSCE)** and the **Kazakhstan Stock Exchange (KASE)** deal in a small number of futures contracts on foreign currencies, the latter also trading a futures contract on the yield of Kazakhstan international securities. There are also fourteen registered commodity exchanges in Kazakhstan, organized on a regional basis, of which four are operational. All are members of the Exchange Union of Kazakhstan, which is inactive. Even on the largest exchange, the **Kazakh International Commodity Exchange (KICE)**, the volume of real trade is very small – virtually all of its income is derived from the registration of transactions that take place outside of the exchange and most of these (voluntary) registrations are by the Food Contract Corporation, a major shareholder in the exchange. KICE tried but failed to introduce futures contracts in 1996.

The **Uzbek Commodity Exchange (UZEX)** of **Uzbekistan** trades cotton, metals, oil products, and other raw materials via auctions. Some work has also been

done in **Kyrgyzstan** on the possibilities for introduction of a commodity exchange for locally traded agricultural commodities.

Exchanges have existed for a long time in **Turkey**. Around 20 of them engage in active commodity spot and, to some extent, forward trade (others are called exchanges, but in fact, only act as centres for the registration of commodity trade transactions). The oldest, in Izmir, traces its origin back to 1891. These exchanges act as physical trading centres, to which ranges of commodities are brought for inspection and immediate sale and in which forward contracts are agreed upon. Some of these exchanges have been appraising the possibility of introducing more sophisticated forms of trade, based on warehouse receipts and even futures contracts.

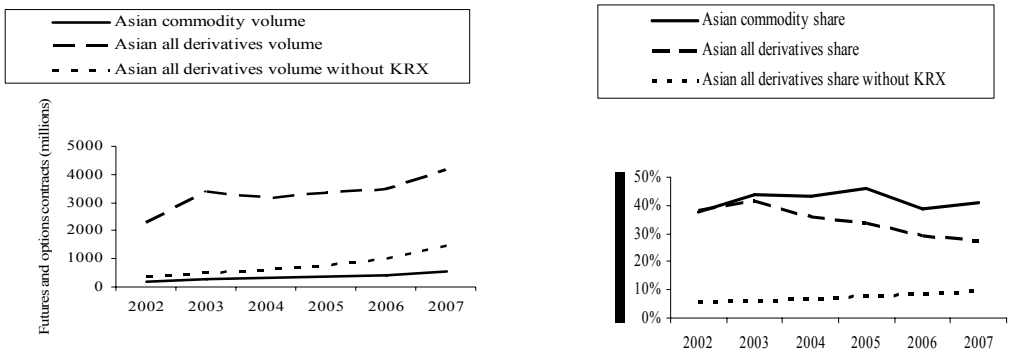
In July 1995, the **Istanbul Gold Exchange (IGE)** was opened with the objectives of liberalizing the Turkish gold sector, international markets integration, rationalizing the gold imports and introducing gold-based financial instruments. Since then, gold imports have been handled through the members of IGE. In 1997, the IGE's gold futures and options market was launched, the first derivatives market in Turkey. Silver and platinum trading in an organized market was inaugurated in 1999, and since then the market has been growing in terms of import and transaction volumes.

After years of preparation, the **Turkish Derivatives Exchange (TurkDex)**, headquartered in Izmir, was finally granted regulatory approval in early 2002 to introduce futures contracts. It launched electronic trading of financial, cotton and wheat futures in February 2005 and went on to introduce gold trading at a later stage. TurkDex's commodity contracts have not yet become liquid. However, its currency and equity index futures have now started to perform well. After a total volume of 24.8 million contracts traded in 2007, increasing from 6.8 million contracts in 2006 and a near 300 per cent increase in 2005 (1.8 million contracts), the TurkDex has become the world's 38th largest futures exchange.

III. Exchanges in Asia and Oceania

Asian derivatives exchanges accounted for 30 per cent of the world's derivatives trading volume in 2006 (see figure 7 and Annex II).

Figure 7: Performance of Asian derivatives and commodity exchanges



Source: UNCTAD analysis based on FIA and exchange data

Asia's share of derivatives has been falling in recent years. However, this almost wholly reflects declining trade in the Korean Exchange's Kospi 200 contract over recent years. While Kospi trade has declined by 500 million contracts over the period analysed above, the KRX is the second largest futures exchange in the world by some 2,709 million contracts, after the merger of the CBOT and CME into the CME group, which traded a volume of 2,805 million contracts during the same year (2007). If KRX is excluded, Asian share of total world derivatives has increased steadily over the period, reflecting a near tripling of volume. In commodities specifically, Asian share grew rapidly from 38 per cent in 2002 to 46 per cent in 2005. However, a spike in trade, especially on the US exchanges following a rise in prices and volatility of many globally traded commodities, coupled with a slump in Japanese commodity volumes due to industry restructuring, saw Asia's share fall back to 39 per cent in 2006, despite 21 per cent growth in underlying Asian commodity derivatives volumes during the year. Despite this reverse in 2006, Asia's share recovered to 41 per cent in 2007, recording annual growth of 29 per cent.

Japan is the location of the world's first organized futures market, the Osaka Rice Exchange, which was established in 1730. However, the evolution of the Japanese marketplace has diverged considerably from that of Western markets in several respects: first, the structure of Japan's commodity futures markets remains distinct from that of its financial futures sector, with separate regulatory frameworks and trading practices. Second, until a short while ago trade in commodities accounted for the bulk of the futures trade in Japan. Only recently have exchanges trading financial futures – including the **Osaka Securities Exchange** (109 million contracts in 2007), the **Tokyo Financial Exchange** (42.6 million contracts) and the **Tokyo Stock Exchange** (33 million contracts) – undergone strong growth in their derivatives volume. The previous year, 2006, marked the first year that more financial than commodity futures were traded in Japan.

Whereas the financial futures market underwent a "big bang" in the 1980s, the commodities sector "resisted reform and suffered from deficient monitoring and compliance."[18] As late as 2003, for example, no Japanese commodity exchange

[18] Futures Industry Association, 'Japan: The big bang, finally', *Futures Industry Magazine*, May/June *2005,* http://www.futuresindustry.org/fimagazi-1929.asp?a=1041

acted as a central counterparty for trades conducted in their exchange, which meant that every transaction left both buyer and seller exposed to significant risk. However, the collapse of a large brokerage firm, Tokyo General, in 2004 led to the fundamental transformation of the sector's regulatory framework (see box 4 below), encapsulated in an amendment to the country's Commodities Exchange Law that came into effect on 1 May 2005. This laid the foundations for the so-called Japanese "big bang", structural changes in Japanese commodity markets that have resulted in fundamental shifts in the way the sector operates. Major changes have included the introduction of a common clearing house – the **Japan Commodity Clearing House (JCCH)** – which operates as a central counterparty for trade on all the Japanese exchanges; a tougher regime for safeguarding customer assets; and stronger regulation of intermediaries in their dealings with clients.

Box 4: Regulation – creating an appropriate framework for the commodity futures market in Asia

Whereas a properly functioning derivatives industry can be an integral component of a country's capital market structure, periodic financial crises[19] have demonstrated that a robust framework of regulatory oversight is necessary to ensure the integrity of these markets.

Regulation serves a number of essential functions: to protect investors from unscrupulous or irresponsible practices by exchanges, counterparties or intermediaries; to uphold financial integrity through effective management of systemic risk; and to guard against attempts to manipulate the market by domestic or foreign investors (the issue of regulating foreign investors presents exchanges and regulators with the imperative of establishing working relationships with their foreign counterparts for the purposes of vetting the suitability of foreign investors wishing to enter the market, and allowing for a system of effective sanctions should market regulations be breached). These regulatory functions can be carried out both by exchange self-regulation and by oversight from an independent or a governmental regulatory agency, ideally with the two activities structured to complement each other.

Two examples from Asia point to differing approaches in commodity futures market regulation.

In Japan, 2005 saw a radical transformation of the country's regulatory framework for commodity futures trade. This was prompted in part by events at a large brokerage, Tokyo General, where misuse of customer funds, inadequate protection against counterparty risk and the false reporting of data led to the collapse of the firm and resulted in significant customer losses. An amendment to the country's Commodities Exchange Law, which came into effect on 1 May 2005, has resulted in wholesale reform of the industry, with many of the changes introduced to directly address the challenges posed by the Tokyo General affair.

Most critically, a common clearing house has been established to act as a central counterparty for trading at all Japanese commodity exchanges (prior to the amendment, only TOCOM had set up its own clearing house in mid–2004). This clearing house is jointly controlled by all exchanges and augmented by a new law to separately designate clearing and non-clearing members. Other important reforms include higher minimum capital requirements with an "early warning system" in place to flag potential breaches before they occur; new rules to ensure that brokers meet tightened customer fund segregation requirements; and stricter procedures governing the customer sales conduct of intermediaries in a market characterized by a heavy volume of retail transactions.

China's approach to futures market regulation has been conditioned by a history of uncontrolled growth and then crisis following the initial emergence of its futures markets in the early 1990s. At least ten major scandals occurred in domestic exchanges between 1994 and–1997 which, coupled with losses of over US$1 billion by Chinese traders active in overseas futures markets,[20] prompted two market rectifications by the regulator, the China Securities Regulatory Commission (CSRC), over a seven-year period between 1993 and 2000.

[19] Crises hit not only emerging markets such as Russia and China in the mid–1990s. The Barings, LTCM, Enron and Tokyo General scandals also rocked established British, American and Japanese markets over a similar period.
[20] Xueqin, W. and Gorham, M. (2002) 'The Short Dramatic History of Futures Markets in China', *Global Financial Markets*, Spring 2002.

During these rectifications, the number of exchanges, brokerages and futures contracts were slashed and whole classes of contracts were removed – most notably, financial futures after two back-to-back scandals involving bond futures contracts at the Shanghai Stock Exchange in 1995. A common set of exchange rules were drawn up, and the exchanges were brought much more under the control of the CSRC. Finally, the activities of Chinese traders overseas were strictly curtailed while China's markets remained closed to foreign investors.

In contrast to the "big bang"-style revolution that characterized the re-regulation of Japanese markets, the process of liberalizing these now tightly regulated Chinese futures markets has been cautious and evolutionary, an approach assisted by the futures industry's exemption from China's WTO accession commitments to open its markets.

The cautiousness of the Chinese approach is typified by the experience of the three commodity exchanges when seeking to introduce new commodity futures contracts (leaving aside the question of financial futures and exchange-traded options, both of which are presently banned in China). After the rectifications, there were only twelve futures contracts trading on the three remaining exchanges. Since that time, the introduction of new contracts had been limited to just one per exchange before 2006 – a new corn futures contract at DCE, fuel oil at SHFE, and cotton at ZCE, with all three introduced in 2004 and none at all in 2005. The process has been laborious, both in terms of the research and development effort required for each contract and also in obtaining approval from the CSRC and other State agencies with an interest in the sector – "for some products, over 10 ministries and commissions have to weigh in before a new contract gets a green light".[21] Compare this with India where each of the new national exchanges already trades over 50 contracts less than four years after their establishment, with many more in the pipeline.

Subsequently, Japan's commodity exchanges have gone through a process of consolidation since the early 1990s. Of 17 exchanges that existed in 1994, only 7 remained in 2005. A new phase of consolidation occurred in 2006, with the smallest exchange by volume, **Yokohama Commodity Exchange (Y-COM)** being merged into the **Tokyo Grain Exchange (TGE)** in April. A second merger occurred in December 2006 between the fifth and sixth largest exchanges, the **Kansai Commodities Exchange (KEX)** and the **Fukuoka Futures Exchange (FFE).** Finally, the fourth largest exchange, **Osaka Mercantile Exchange (OME)**, merged into the **Central Japanese Commodity Exchange (C-COM)**, the third largest exchange with effect from January 2007. During this period, only the **Tokyo Commodity Exchange (TOCOM)**, the largest of Japan's commodity exchanges, has remained in the same state.

It is not surprising, therefore, that volumes on the surviving Japanese exchanges have suffered during this period of structural change. Each experienced significant falls in trading volume in 2005 and 2006. At TGE, volumes declined by 1 per cent in 2005 followed by a further 25 per cent drop in 2006. The opposite occurred in 2007, when TGE experienced an increase of volume traded of three per cent. The volumes at C-COM and KEX have fallen even more precipitously over the last three years: the former suffered a continuous decline of 34 per cent in 2005 compounded by a massive 59 per cent crash in 2006 and a 27 per cent fall in 2007; the latter dropped, over the same period 2005–2007, 67 per cent in 2005, a further 83 per cent in 2006 and 48 per cent in 2007. TOCOM avoided the worst of this, perhaps reflecting the lack of a post-merger integration challenge, shedding 17 per cent in 2005, increasing by 3 per cent in 2006, and then falling again by 26 per cent in 2007.

TOCOM was created in November 1984 through the consolidation of three existing exchanges: the Tokyo Textile Commodities Exchange, the Tokyo Rubber Exchange, and the Tokyo Gold Exchange. In the 24-hour global trading environment, TOCOM has emerged as an influential exchange on a par with exchanges in New York, Chicago and London, dealing in gold, silver, and platinum futures as well as several other precious metals. TOCOM traded 47 million

[21] FIA Magazine, "China: The fall and rise of Chinese futures, 1990–2005", *Futures Industry Magazine*, May/June 2005, http://www.futuresindustry.org/fimagazi-1929.asp?a=1038

contracts in 2007, making it the 10th largest commodity futures exchange in the world and the 30th largest futures exchange overall, falling from the 6th and the 25th positions, respectively, occupied in 2006.

The second largest futures and options exchange in Japan is the TGE, which trades a range of agricultural commodities as well as raw silk since the acquisition of Y-COM. Fifteen million contracts were traded in 2007, making it the world's 13th-largest commodity futures exchange and the 39th largest futures exchange overall. In early 2004, TGE launched the world's first vegetable index futures contract, a cash-settled contract reflecting the daily average weighted price per kilogram of 14 vegetables at prominent markets in the country.

C-COM was formed in 1996 by the amalgamation of the Toyohashi Dry Cocoon Exchange, the Nagoya Grain and Sugar Exchange and the Nagoya Textile Exchange. It is now the third largest exchange in Japan and traded 6.5 million contracts in 2007, mainly energy futures but also some metals and rubber contracts since the acquisition of the OME. C-COM was the world's 15th largest commodity futures exchange in 2007 and the 44th largest futures exchange overall.

Finally, KEX was formed in 1993 by the merger of the Osaka Grain Exchange, the Osaka Sugar Exchange and the Kobe Grain Exchange. It offers trade in frozen shrimp, coffee, corn, soybean, azuki beans, broiler chicken and sugar. The 2007 volume stood at 0.16 million contracts, falling 48.27 per cent when compared with 2006. KEX is the world's 53rd largest futures exchange.

In 2007, the **Republic of Korea** accounted for just over 17.8 per cent of total world volume (21 per cent in 2006). This figure is explained by the KOSPI 200 stock index contract traded on the **Korea Exchange (KRX)**, the entity that emerged from a triple merger in early 2005 between the country's three leading exchanges – the Korea Stock Exchange (KSE), the Korea Futures Exchange (KOFEX) and the Kosdaq Stock Market. Despite a fall of 5 per cent on 2005 volumes, the KOSPI 200, with 2.47 billion contracts traded in 2006, remained by far the world's most traded derivatives contract by volume – the second most traded contract was the CME's Eurodollar contract with 2006 volume of 771 million contracts. In 2007, KOSPI 200 had a volume of contracts traded of 2.7 billion and a 9.48 per cent increase over 2006, making it the second-largest futures exchange in the world after the CME group (with a volume of 2.8 billion contracts in 2007). Initial growth of the KOSPI contract was driven largely by retail participation, although now institutional and foreign investors account for the bulk of trading. Whereas KOFEX had earlier shown an interest in listing commodity derivatives, launching gold futures and signing an MOU with TOCOM to diversify into energy products, the former did not become liquid and the latter has not yet borne fruit within the merged KRX entity.

Like Russia, **China** had dozens of commodity exchanges at the beginning of the twentieth century. These mostly disappeared during the 1930s, and after a long wait, the first commodity exchange – the China Zhengzhou Grain Wholesale Market – was re-established in 1990. More than 40 had appeared by 1993, as China accelerated the transformation from a centrally planned to a market-oriented economy. The main products traded were agricultural staples such as wheat, corn and in particular soybeans – commodities that have long been considered strategically important by the Chinese government, both for economic development and political stability.

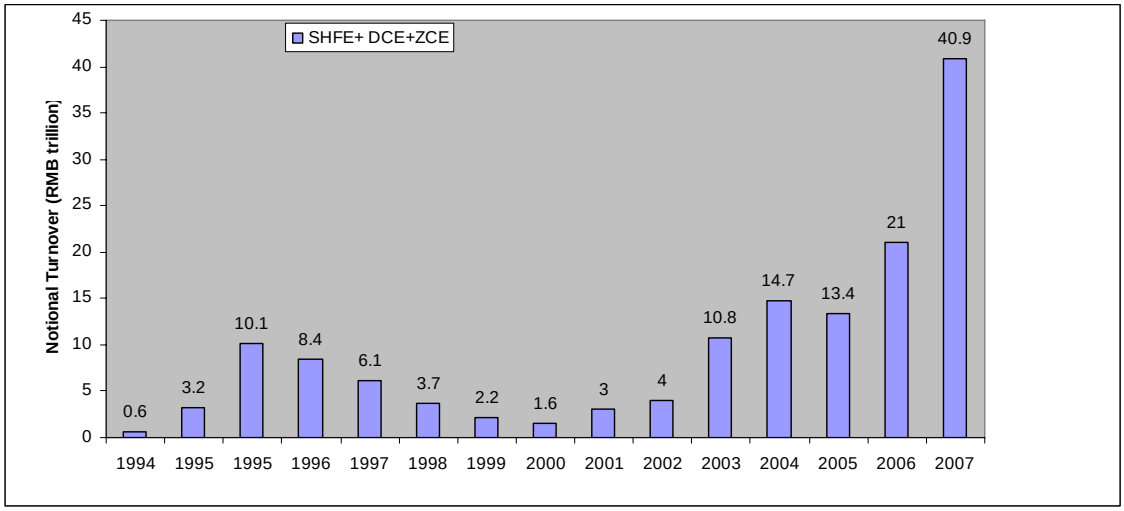
However, the initial period of development – from 1990 until the middle of the decade – took place in a context characterized as "regulatory chaos".[22] The State regulator, the China Securities Regulatory Commission (CSRC), was not

[22] Yueqin and Gorham 2002 – see footnote 16 above.

established until October 1992, two years after the first commodity exchange was founded and with an initial remit to regulate the securities markets only. The first commodity futures contracts started trading in May 1993, also in Zhengzhou, proliferating rapidly in a context lacking a uniform centralized regulatory framework. At least 10 major scandals occurred in domestic exchanges between 1994 and 1997. Coupled with estimated losses of over USD1 billion by Chinese traders active in overseas futures markets, the CSRC was compelled to intervene. Its actions are categorized as two market rectifications, but these took place across a lengthy period between 1994 and 2000. The first reduced the number of exchanges down to fifteen, and the second in 1999 further reduced the number to just three: the **Dalian Commodity Exchange (DCE)**, the **Zhengzhou Commodity Exchange (ZCE)** and the **Shanghai Futures Exchange (SHFE)**.

The growth profile of the industry has largely followed its changing regulatory dynamics (see figure 8 overleaf), with notional value in precipitous decline as the market underwent radical restructuring in the mid- to late 1990s. Since 2000, however, the market has exhibited healthy year-on-year growth which has propelled its three exchanges towards the top ranks of global commodity exchanges. This has reflected a more secure environment for investor participation in the markets and the imposition of a robust regulatory regime. In 2006, the regulator started to relax some of the most stringent restrictions. The three exchanges were given permission to launch contracts on new commodities after no new product were launched during the previous year. Further growth should be driven after the introduction of a new regulatory framework in April 2007 facilitating the introduction of financial futures at the **China Financial Futures Exchange (CFFEX)**, inaugurated in September 2006 and located in Shanghai. The new regulatory framework no longer prohibits financial institutions from futures trading or associated activities; allows intermediaries to provide a broader range of services than pure brokerage; and lays the foundation for the introduction of new products, including index and options trading.

Figure 8. Notional value of futures traded on Chinese exchanges



Source: FIA and exchange data.

The future growth of the market will to a large extent depend on the evolving regulatory scenario. The requisite permissions for launching options and index trading are believed to be imminent, but as yet remain prohibited although in 2007 the CFFEX was at last able to launch its first products on an index of 300 "A

shares" traded on the Shanghai and Shenzhen Stock Exchanges. Moreover, indications suggest the first participation of foreign investors in Chinese futures markets will come in the financial futures sector with extensions to the country's existing Qualified Foreign Institutional Investor (QFII) scheme which apply only to equity markets. However, there are no indications as of yet that foreign participation will also be allowed in the commodity futures markets.

Founded in 1993, the DCE was the world's largest agricultural futures exchange by contract volume – its 185 million agri-contracts traded in 2007 places it narrowly ahead of the 154 million traded on the US-based CBOT. In 2006, the DCE also operated the world's most liquid market by volume for corn – the DCE Corn was the world's largest agricultural futures contract with 65 million traded contracts. Moreover, the DCE offered the world's largest market for non-transgenic soybeans and a highly liquid contract for soymeal, the world's third most liquid agricultural futures contract with 32 million contracts traded. The DCE started trading soybean oil futures as of January 2006, and most recently in 2007, linear low-density polyethylene (LLDPE, a raw material in plastics) and palm oil. Other potential contracts currently being assessed include live hog and ethanol, while options and a weather index contract are also being readied in the event that regulatory permission is granted for these instruments. The exchange's corn and soybean futures prices have become important references for Chinese industry. A broad-based farmer education programme conducted by the exchange, the "1,000 villages, 10,000 farmers"[23] initiative, is training farmers to use this information to form more accurate expectations about future price development across the two crops, improving their planting, harvesting and selling decisions as a result. The DCE's volume has been the largest in China since 2000, although the SHFE – mainly focused on metals – is the largest in terms of notional turnover. In 2007, the DCE traded 185 million lots and a 54 per cent increase over 2006, making it the world's second largest commodity exchange by volume and the 17th largest futures exchange overall.

The SHFE was formed in 1999 after the merger of three Shanghai-based exchanges – the Metal, Commodity, and Cereals & Oils Exchanges. It deals primarily in industrial products, offering futures contracts in copper, aluminium, natural rubber, fuel oil and – since March 2007 – zinc. During 2006, the exchange saw a strong performance, its volumes increasing by 72 per cent to 58 million contracts, making it the seventh largest commodity exchange in the world and the 27th largest futures exchange overall. Over half of the exchange's 2006 volume came from trade in rubber, a sector which posted a 174 per cent rise in volume to become the world's ninth largest commodity derivatives contract. There was also strong growth in aluminium trading and fuel oil trading, which more than made up for a second year of significant decline in SHFE's once highly liquid copper contracts. In September 2007, regulatory approval was granted for the SHFE to list gold futures contracts. That same year, SHFE's trading volumes dipped to 85 million lots and an annual increase of 47 per cent. In the 2007 world ranking, SHFE was the seventh largest commodity exchange, remaining the 27th largest futures exchange in the world.

Founded in 1990 as the China Zhengzhou Grain Wholesale Market, the ZCE was the earliest commodity exchange in Communist China and the first to launch commodity futures trading in 1993. In 2006, it was China's third largest exchange, trading 46 million lots, an increase of 63 per cent over the previous year – making it the world's ninth largest commodity exchange by volume and the 30th largest futures exchange overall. Building on its trade in two forms of wheat and

[23] See: http://www.dce.com.cn/portal/servlet/ServletGate

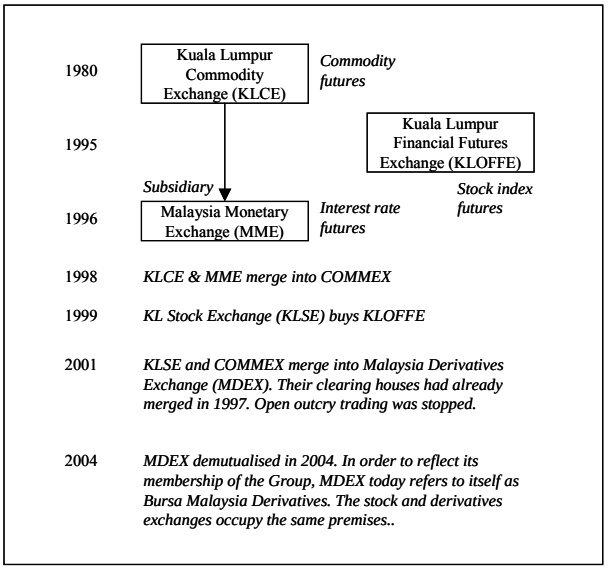
cotton, recent years have seen the launch of contracts on four new commodities by ZCE – white sugar and pure terephthalic acid (PTA, a downstream petrochemical product) in 2006, and rapeseed oil in 2007. While cotton had shown prolific growth in 2004-5, trading suffered a disappointing downturn in 2006. However, lost volumes have been offset by the new white sugar contract, which posted a volume of nearly 30 million contracts in its first year of trading. In 2007, the ZCE traded 93 million lots with an impressive annual growth of 101 per cent over the previous year.

In the Hong Kong Special Administrative Region of China, the **Hong Kong Exchanges and Clearing (HKEx)** is the world's most highly capitalized exchange with a market value of US$ 36 billion, narrowly ahead of the merged CME Group and considerably larger than NYSE Euronext. This valuation reflects the exchange's strategic advantage as an established international financial centre with close links to the fast-growing Chinese market. In 2006, HKEx traded 43 million contracts, a 68 per cent increase over the previous year, making it the world's 33rd largest futures exchange. Trading was concentrated in equity and equity index financial futures. In mid–2007, however, the exchange engaged consultants to examine the feasibility of introducing trade in commodity futures, including agriculture, metals and energy products, as well as emissions products. That same year, i.e. 2007, the exchange had an annual growth of 105 per cent, trading 88 million contracts, thus lifting the exchange to the position of the 26th largest futures exchange.

In Taiwan, province of China, the **Taiwan Futures Exchange (TAIFEX)**, created in 1998, continued to grow in 2006 reaching 114.6 million traded contracts, mainly from trade in equity index options. Volume on the exchange was 24 per cent higher than 2005 but posted significantly lower growth rate than in previous years. In March 2006, gold futures were launched, a cash-settled contract based on London Gold Market Fixing prices. To date, however, liquidity remains very low. In 2007, the exchange traded 115.1 million contracts, representing only a 0.48 per cent increase over 2006. The exchange was the world's 21st largest derivatives exchange in 2007.

Malaysia hosts the **Bursa Malaysia Derivatives Berhad**, part of the Bursa Malaysia Group, the product of multiple mergers and acquisitions in the country's capital market structure (see diagram 1).

Diagram 1. Evolution of Malaysian exchanges



Commodity futures trading in the country – and indeed in Southeast Asia – originated with the Kuala Lumpur Commodity Exchange (KLCE), founded in July 1980. Trading commenced with crude palm oil futures (FCPO) on an "open outcry" trading floor. Contracts were subsequently launched for rubber, palm kernel, tin, cocoa, RBD palmolein and crude palm kernel oil (FCPKO). All except FCPO and FCPKO have since been delisted. After the initial proliferation of exchanges and clearinghouses in the country, ultimately a single exchange – the country's national stock exchange – has emerged for the trading of commodity futures and financial futures.

Bursa Malaysia Derivatives currently offers eight futures contracts, including two commodity contracts – FCPO and FCPKO. The palm oil contracts have consistently accounted for over 50 per cent of exchange volume since the formation of the integrated derivatives exchange. Bursa Malaysia also provides the price reference for the world palm oil industry, a unique achievement for an exchange situated in the developing world. Reference prices for every other exchange-traded global commodity are generated on exchanges situated in the developed world, often far from the producer markets. In Malaysia, however, the largest producer country of palm oil is also the location for the exchange, which generates its reference price. However, for Bursa Malaysia and the KLCE before it, attempts to develop other commodity futures contracts, as well as new instruments such as options, have been unsuccessful to date. The exchange traded 6.2 million contracts in 2007, of which 2.7 million were for commodity futures, almost all of them on FCPO. That made it the world's 45th largest derivatives exchange and the 18th largest commodity futures exchange, by trading volume. Growth for Bursa Malaysia Derivatives was 49.07 per cent in 2007. The previous year, growth came to 69 per cent, which included a 95 per cent surge in palm oil trading, largely as a result of the launch of the Malaysian Government's National Biofuels Policy which placed a heavy emphasis on the use of palm oil as a source for biofuel production. Consequently, substantial new interest has been generated in the market, with significant uplift of volume and volatility.

The **Agricultural Futures Exchange of Thailand (AFET)** began operating in May 2004 and is the country's sole commodity futures exchange. The idea of establishing an agricultural futures exchange in Thailand originated in 1979, although the appropriate regulation was enacted only in 1999 with provisions for AFET to be set up. The exchange launched trading with natural rubber in May 2004 and a second contract, white rice, was listed in August the same year. Trading volumes were slow to take off, and other contracts were launched in 2005 and 2006. These included a tapioca starch premium grade contract, as well as contracts for tapioca chip, latex and Standard Thai Rubber. Volume in 2006 stood at 112,000 contracts, a growth rate of 33 per cent compared with on the previous year. Some 73 per cent of AFET contracts traded during that year were in rubber, with the remainder mainly accounted for by tapioca chip and latex (tapioca starch and white rice had only minimal volumes). The volume of contracts traded in 2007 declined to 89,966 contracts (a drop of 19.6 per cent). Another exchange, the **Thailand Futures Exchange (TFEX)**, established in 2004 with trading launched in April 2006, offers trade in financial futures on the country's SET50 equity index. In 2006, volumes stood at nearly 200,000 contracts, falling to 129,966 contracts traded in 2007, a decrease of 35.4 per cent.

Singapore is home to the **Singapore Exchange (SGX)**, formed in 1999 by the merger of two well-established exchanges, the Stock Exchange of Singapore (SES) and Singapore International Monetary Exchange (SIMEX). A total of 44 million financial futures were traded in 2007 on interest rate and equity index instruments (annual growth of 20.79 per cent), making the SGX the world's 31st

largest exchange concentrating on financial futures. There is a much smaller exchange which derives from the former Rubber Association of Singapore, privatized in 1992 and renamed the **Singapore Commodity Exchange (SICOM)** in 1994. The exchange conducts trade in a variety of rubber contracts, with Robusta Coffee also listed but not currently liquid.

In August 2005, SGX signed a memorandum of understanding with the CBOT to create a new exchange, the **Joint Asian Derivatives Exchange (JADE)**. The exchange aimed to trade Asian-based commodities on CBOT's electronic systems with contracts cleared by the SGX Derivatives Clearing House. Trading commenced in September 2006 with a TSR20 Rubber contract, with a crude palm oil contract also launched in June 2007. Neither contract has managed to attain significant liquidity, and in the wake of the CBOT's integration into the CME Group, SGX announced in November 2007 that it would be purchasing its partners' stake in JADE further to an earlier announcement that all JADE trading would be migrated to SGX's own QUEST trading platform.

In **Indonesia**, the introduction of a commodity exchange has been under discussion since the early 1980s. After the signing of the necessary presidential decrees in 1997, the **Jakarta Futures Exchange (JFX)** was formed in 1999 and began trading coffee and palm oil in 2001. Due to difficulties with these contracts, trading was suspended in 2002 and JFX now trades gold and olein. There are plans to launch cocoa, pepper, rubber and plywood futures and options on futures at a later date, although the current focus is in overcoming regulatory challenges in order to lay foundations for market development in the future. Meanwhile, in **Viet Nam**, as the country integrates into the WTO since its accession in January 2007 and as its external trade grows rapidly, regulatory frameworks are being examined within which a possible commodity exchange could operate.

The largest futures exchange in **Australia** during 2006 was the **Sydney Futures Exchange (SFE)**. The SFE commenced trading in 1960 as the Sydney Greasy Wool Futures Exchange and by the mid–1960s had become one of the world's leading wool futures markets. In 2006, with volume of 78 million contracts (23 per cent annual growth), it was the largest futures exchange in the Oceania region and the 24th largest futures exchange in the world. The SFE traded approximately 75,000 commodity contracts in 2006 of which most were for electricity with a small volume of wool. All contracts from the **New Zealand Futures and Options Exchange**, already a wholly owned subsidiary of the SFE, were migrated to the SFE in March 2004. The **Australian Stock Exchange (ASX)** also accrued a significant volume of derivatives trade. Some 22 million contracts were traded during the year (a 4 per cent annual decline), mostly on equity options, but also including 130,000 grain futures contracts. In July 2006, the two Australian exchanges merged to become the **Australian Securities Exchange**, also known by the acronym ASX. The SFE, operated by ASX, traded over 92 million contracts in 2007. The total growth was 46 per cent from 2005 to 2007, registering volume records in 2007. The largest monthly transacted volume in its history took place in March with approximately 11.33 million contracts traded – an increase of 30 per cent compared to the same period the previous year (2006). Alone, the exchange would occupy the 25th position in the world ranking of largest futures exchanges. However, as part of ASX, it is the world's 20th largest futures exchange in the 2007 ranking, since the same year, ASX traded a total volume of 116 million contracts, with an annual increase of 15.4 per cent.

In **India**, rapid market growth has occurred in recent years across both financial and commodity derivatives sectors. The **National Stock Exchange of India (NSE)**, incorporated in 1992, has risen dramatically to become the ninth largest derivatives exchange in the world with 379.8 million equity index and single

stock contracts traded in 2007 and an annual growth rate of 95.32 per cent over 2006 volumes (48 per cent over 2005).

Commodity markets have a much longer history in the country. India was one of the world's first adopters of commodity exchanges, with the earliest dating back to the Bombay cotton-trading community in the 1880s. The first organized futures market, also for various types of cotton, appeared in 1921 and trading subsequently proliferated by the time of the country's independence into a wide array of institutions and commodities in major trading centres. In the 1940s, trading in forward and futures contracts as well as options was either outlawed or rendered impossible through price controls. This situation remained until 1952, when the Government passed the Forward Contracts Regulation Act, which to this day controls all transferable forward contracts and futures. During the 1960s, the Indian Government either banned or suspended futures trading in several commodities.

Government policy was loosened in the late 1970s. Exchanges made an initial comeback with a number of small "regional" exchanges focused on individual commodities, used and operated by local or regional trading communities. Volumes have remained low and market participation has been confined largely to prominent trading houses. As agricultural growth continued to lag overall GDP growth, and with cash markets fragmented and infrastructure-deficient, the Government perceived that a more ambitious approach was needed to upgrade and catalyze growth across India's vast and diverse commodity ecosystem.

After a series of detailed investigations, the Government revolutionized the structure of commodity exchanges in the country. Major legal, regulatory and policy impediments for the development of commodity futures markets in the country were removed. Criteria were established for the establishment of a new breed of "next generation" national multi-commodity futures exchanges. Tenders were invited from operating companies, which had to comply with three basic principles:

- Exchanges would be required to offer trade across the country (in contrast to the regional exchanges)
- Exchanges would be required to operate under professional management, demutualized since inception and thus separated from vested trading interests
- Exchanges would be required to offer trading exclusively through electronic trading systems to broaden market access, in particular to rural communities

In return, the GOI would grant these institutions permanent recognition to trade any permitted commodity. As a result, three new exchanges were established in 2002/03: **Multi Commodity Exchange of India (MCX)**, **National Commodity & Derivatives Exchange (NCDEX)** and **National Multi-Commodity Exchange (NMCE).**[24]

These institutions have witnessed rapid growth in their trading volumes, which has seen them leading world commodity exchanges in only 3–4 years of operation. The three exchanges have blazed a trail in the establishment of hi-tech, low-cost, web-based trading that facilitates easy access to remote or fragmented communities dispersed across India's vast geography.

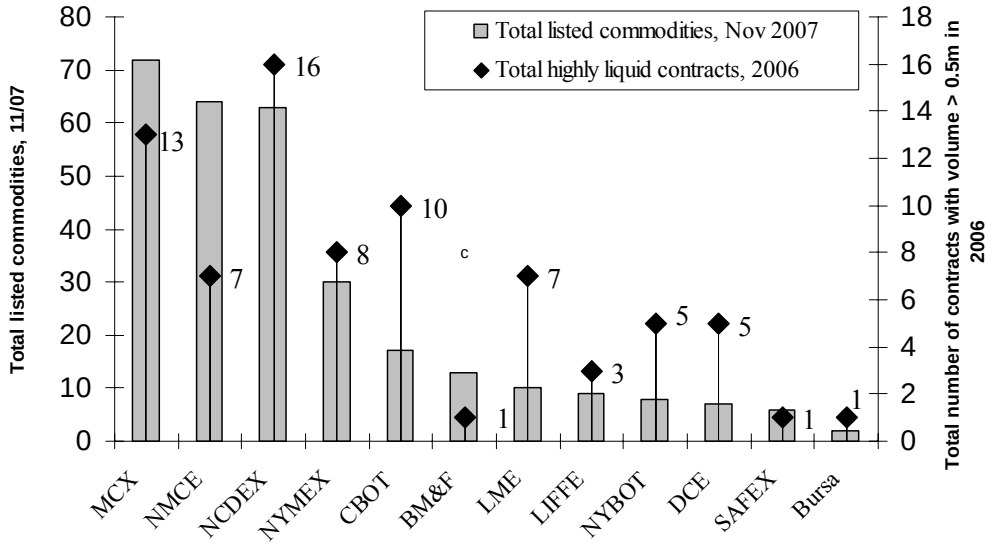
The Government explicitly encouraged each exchange to launch a broad array of contracts spanning agriculture, metals and energy sectors. Consequently, the three national multi-commodity exchanges offer trade across multiple commodities and commodity sectors, each exchange listing contracts for more

[24] A fourth – the National Board of Trade, based in Indore in Madhya Pradesh state, the largest of the existing regional exchanges – would not demutualize and was thus not granted the same status.

commodities than any other exchange in the world (see figure 9 below and the liquidity maps in annex I for further information). Liquid markets have been established in a diverse array of commodities, many unique to India. Some are clearly domestic-oriented but others – such as precious metals, raw jute, pepper, grains and oilseeds – have the potential to take on international importance.

It is important to note that market breadth has generally not been traded off for market depth. While many listed contracts remain illiquid, MCX and NCDEX have more highly liquid contracts – defined here as trading more than 0.5 million per year – than any other exchange in the world, and NMCE is not far behind. This situation has been facilitated by efficient technology systems that allow for the integration of new contracts into exchange trading and clearing systems at low cost, combined with India's abundance of educated labour that has allowed the exchanges to hire numerous competent product management, business development and research personnel to support the proliferation of traded contract proliferation. In 2007, MCX and NCDEX had a volume of 69 and 37 million contracts traded, with a 51.08 per cent increase and a 34.39 per cent decrease, respectively, over the previous year. MCX was the eighth largest commodity exchange in the world in 2007, while NCDEX occupied the 11th position in the same ranking. NMCE traded 2.7 million contracts on commodities, reflecting a fall of 73 per cent in 2007, making it the 19th largest commodity exchange in the world.

Figure 9. Portfolio breadth and depth of leading commodity exchanges



Source: Exchange data.
Note: Highly liquid contracts have been defined as those with trading volumes of greater than 0.5 million during 2006.

Other initiatives have been taken by the national multi-commodity exchanges to support market growth and broaden its impact, including in the underlying physical commodity markets. These include the establishment of dedicated collateral management agencies to improve market infrastructure and the preparation for launch of national electronic spot exchanges aimed at integrating and upgrading physical commodity trading in a similar manner to the futures market (see box 5 overleaf).

The size of market achieved so rapidly by the national commodity exchanges is all the more spectacular when the limitations still in place on India's commodity markets are taken into consideration. Options, index trading and financial futures remain off limits to the exchanges, although the market expects that at least the former two will be permitted reasonably soon. Domestic banks and mutual funds and foreign investors are still barred from participating in these markets. The timeframe for their entry remains the subject of some debate, but clearly such an event would see a further significant inflow of liquidity pushing growth even higher than the current astronomical levels. Also on the regulatory front, there have been suggestions recently that the Forward Markets Commission, the regulator of India's commodity exchanges, may grant national commodity exchange status to new entities which could provide further competition to the existing three. One such initiative is being promoted by Indiabulls, a prominent financial services company, in partnership with the Metals and Minerals Trading Corporation, India's largest trading company.

Box 5. National spot exchanges in India

India's cash commodity markets are extremely fragmented into over 7,500 distinct local markets known as "mandis". The integration of these markets has been a national priority since 2002. In September 2007, after a lengthy process to obtain regulatory clearance, this vision is likely to become a reality, with the launch of spot exchanges offering trade across the whole of India in multiple commodities through electronic platforms. Both the two leading Indian national multi-commodity exchanges, MCX and NCDEX, each currently focused on futures trading, are bringing an initiative to market – respectively named National Spot Exchange and NCDEX Spot exchange.

These platforms would trade standardized contracts in a range of commodities for immediate delivery at specified delivery centres. Delivery centres would be equipped with high-quality storage and distribution infrastructure; delivered goods would be subject to rigorous grading and certification procedures; and the platform would be integrated with collateral management services to enable easy access to financing on the basis of electronic warehouse receipts.

Benefits are likely to be widespread. Farmers would obtain direct access to markets and their dependence on intermediaries would be reduced. These intermediaries would be further squeezed out of supply chains, leading to a likely increase in farmer price realization. Direct bulk procurement by large purchasers and Government would be facilitated, without the requirement to purchase in small lots across multiple fragmented mandis. Cohesion between the futures and physical markets would be improved through the transparency of dynamic national spot pricing and a better platform for tendering or taking delivery.

Moreover, despite rapid volume growth and the broadening of market access, the impact of commodity futures trading in India remains contested. The Government is currently examining arguments that the exchanges have been a factor in driving price inflation in essential commodities such as wheat, rice and several pulses. Trading in futures contracts for these commodities was suspended following government intervention in early 2007. This action has provoked intense debate in the country about whether the exchanges really are the cause of rising commodity prices or whether recent price rises are a reflection of other trends, such as changing supply/demand fundamentals or a structural shift in commodity pricing after the introduction of the new exchanges. A committee of enquiry on the functioning of commodity futures markets in India was expected to report on the issue in late 2007.

Mumbai's **National Commodities and Derivatives Exchange (NCDEX)**, with its focus broadly on agriculture, has been affected by the suspension of trading in four agricultural contracts. Even before the suspension, however, 2006 performance had been disappointing. During the year, volumes increase by a mere 1 per cent to 51 million contracts, a marked contrast to the year before, when growth topped 390 per cent and the exchange was the second fastest-growing in the world. The earlier surge had seen the exchange leap to become the sixth largest commodity

exchange in the world, but in 2006 it dropped back to eighth largest (and the 28th largest futures exchange overall). In 2007, the NCDEX dropped from the third largest agricultural futures exchange in the world to the fifth position after the DCE of China, CBOT of the US, ZCE of China and ICE Futures US. During the year, the exchange's agricultural contracts fell by a 26 per cent, while the metal sector plummeted 51 per cent.

The **Multi Commodity Exchange of India (MCX)**, also located in Mumbai, traded 69 million contracts in 2007, attaining a volume growth of 51.08 per cent (123 per cent in 2006, making it the second fastest-growing such exchange in the world). MCX has accumulated significant liquidity in each of the agriculture, metals and energy sectors, but the bulk of volume is derived from trade in metals of both the precious and base metal varieties. During the year, MCX has climbed from 10th place to become the eighth largest commodity exchange in the world and the 28th largest futures market overall. Of particular note, MCX has become the world's third largest metal futures exchange, after the LME of the UK and SHFE of China.

Ahmedabad's **National Multi Commodity Exchange (NMCE)**, the first of the national commodity exchanges to commence trading, has finally begun to experience some of the growth that characterized the early performance of the Mumbai-based exchanges. After three years of undistinguished performance, NMCE became the world's fastest-growing exchange in 2006 with a 538 per cent growth rate, conducting trade in 10 million agricultural contracts. This reversed the previous year's 57 per cent volume decline, when large volumes of trade had shifted to NCDEX and MCX. Consequently, the exchange leapt from being the 19th largest to the 14th largest commodity exchange in the world in 2006. Unfortunately, a new reverse in trade volume during 2007 saw NMCE drop back to 19th position in the ranking of largest commodity exchanges in the world. Its trading volume fell 73 per cent, with a total of 2.7 million contracts traded during the year.

Despite being surpassed in terms of volume and importance by the new national exchanges, there still exist 21 regional commodity exchanges in India. The largest of these is the **National Board of Trade (NBOT)**, situated in Indore, with trade focused on soybeans, rapeseed and their respective products. Two of the other better-known regional commodity exchanges are the **Bombay Commodity Exchange** (formerly the Bombay Oilseeds and Oils Exchange), founded in 1950, and the **International Pepper Futures Exchange**, founded in the southern Indian city of Kochi in 1997 and operating under the auspices of the India Pepper & Spice Trade Association, which dates back to 1957. In late 2007, the Indian commodity market regulator initiated an exploratory process about how these regional exchanges might be reinvigorated, perhaps by adapting integrated trading models such as that used by Euronext.[25]

Private-sector groups in **Pakistan** have long been calling for the re-establishment of a cotton exchange, which last operated in Karachi in the 1930s. The National Commodity Exchange Limited (NCEL) was incorporated in 2002, although numerous institutional and legal problems meant that trading did not commence until May 2007, when a gold contract was launched. Volume growth has been disappointing, however, with only 1400 contracts traded between May and November. As Pakistan is the world's largest exporter of cotton yarn, cotton futures, which would give the country greater exposure in international markets, is another priority commodity for NCEL. This, however, has proved controversial and the country's Security and Exchange Commission has yet to provide a green light in this area. Along with rice, sugar, wheat and cotton seed oil cake, NCEL also hopes to introduce financial futures at a later stage.

[25] http://www.financialexpress.com/news/FMC-against-closure-of-regional-commexes/229264/

The Government of **Sri Lanka** has been looking at the possibility of an exchange for both domestically traded and export commodities, including tea, and is now actively promoting the emergence of forward trading of a range of vegetables. At the same time, with a view to developing a financial futures market, the Colombo Stock Exchange is pursuing the establishment of a derivatives market as part of the capital market development programme of the Securities and Exchange Commission of Sri Lanka, and with the input of the NSE of India. As a preliminary step in this direction, a workshop for potential market participants and market intermediaries was conducted during October 2007.

There are two functioning commodity exchanges in **Iran**, the **Agriculture Stock Exchange**, inaugurated in September 2004, and the **Tehran Metals Exchange (TME)**, inaugurated in September 2003 and which trades mostly in steel with smaller volumes of aluminium, copper and zinc. Plans for a third exchange to offer trade in offering Euro-denominated trade in fuels and petrochemicals – known provisionally as the **Iran Oil Bourse** and to be located on the Gulf island of Kish – gained some momentum in mid–2006, with planned openings announced both for March and September.[26] Both these launches were missed despite the purchase of a building in July 2006. Since then, the launches have been put on the back burner, as Iran has focused its marketing efforts on persuading purchaser countries to pay for Iranian oil in currencies other than the dollar, and as the participating ministries attempt to devise effective structures for a possible exchange.

Significant activity taken place in **Dubai, United Arab Emirates,** over the last two years. Formation of the **Dubai Gold and Commodity Exchange (DGCX)** was announced in November 2004. Active parties include the Dubai Metals and Commodities Centre, the Indian exchange, MCX, and its promoters, Financial Technologies (India) Limited. DGCX commenced trading one year later with the launch of its gold contract. Silver was subsequently introduced in March 2006 and currency futures (Euro, Pound Sterling and Japanese Yen) followed in June. Fuel oil, steel and a rupee-dollar currency contract have also been introduced, with plastics, freight and cotton products are all being considered for future launch.

A second Dubai-based project, the **Dubai Mercantile Exchange (DME)**, was announced in mid–2005 following a memorandum of understanding between Dubai Development and Investment Authority and the US exchange, NYMEX. The exchange commenced trading in June 2007 with an Oman Crude Oil Futures contract, providing price discovery for Middle East Sour Crude Oil and the region's first physically settled energy futures contract. The Governments of both Dubai and Oman have moved to price their physical sales according to DME settlement prices. By September 2007, the exchange topped 100,000 traded contracts with a value of over USD 5 billion.

In **Israel**, the **Tel Aviv Stock Exchange (TASE)** offers derivatives trading on its flagship TA-25 equity index and on the shekel-dollar exchange rate. The vast majority of trade is in the former, with volume totalling 104.3 million contracts in 2007 – annual growth of 25.68 per cent – making it the 23rd largest derivatives exchange in the world.

[26] http://iran-daily.com/1386/2812/html/focus.htm

IV. Exchanges in Africa

The **SAFEX Agricultural Products Division of the JSE Exchange, South Africa** is the continent's only commodity futures exchange, and the only commodity exchange in Africa that has truly withstood the test of time. The South African Futures Exchange (SAFEX) was established in 1988 and has overseen the development of one of the leading emerging commodity markets. For a long time, SAFEX only traded financial futures. However, the creation of the Agricultural Markets Division (AMD) in 1995, shortly before the large-scale deregulation of South African agriculture, led to the introduction of a range of agricultural commodity derivatives contracts. In August 2001, the members of SAFEX, incorporating both the financial and agricultural markets, accepted an offer by the JSE Securities Exchange, South Africa's national stock exchange, to buy them out. The Agricultural Products Division of the JSE Securities Exchange was established to take over the functions of the old AMD.

The JSE traded 329.6 million futures and option contracts in 2007, 2.4 million agricultural contracts (annual growth of 24 per cent) and 327.2 million financial contracts (annual growth of 213.80 per cent), making it the world's 20th largest commodity futures exchange and the 13th largest futures exchange overall. As well as trading the largest volume of single stock futures of any exchange in the world, JSE/SAFEX offers liquid futures and options markets for white and yellow maize, bread milling wheat, sunflower seeds and more recently soybeans. Of particular note is the development in South Africa of a vibrant options market. JSE/SAFEX has the highest volume of options traded by any commodity exchange in the developing world, and this has been one of the major driving factors for high farmer participation in the market. JSE/SAFEX also operates an extensive delivery system incorporating a network of 170+ grain silos which, combined with a highly effective warehouse receipt system, has integrated the commodity and financial sector and facilitated the substantial flow of finance to farmers.

JSE/SAFEX is widely recognized as the price discovery mechanism for grain in the southern African region and its prices are quoted in several neighbouring countries. During the 2005/6 and 2006/7 seasons, the Government of Malawi used an innovative structured solution based on JSE/SAFEX instruments for maize price- and supply-risk management. This solution, facilitated by the World Bank and intermediated by a South African bank, enabled Malawi to effectively manage both maize surpluses and deficits, addressing humanitarian needs and overcoming price and transportation uncertainties without distorting local markets. While expansion of JSE/SAFEX trading and physical delivery systems across the region has faced barriers related to actual or potential controls on the free flow of goods and capital, this may change in the future as regional approaches to commodity market and exchange development become priorities in southern and eastern Africa.

Whilst JSE/SAFEX remains the only functional commodity futures exchange on the continent, elsewhere in Africa recent years have seen a flurry of activity in exchange development at both a national, regional and pan-African level.

In **Malawi**, there are currently two functioning exchanges in the country. The **Malawi Agricultural Commodity Exchange (MACE)** originated in September 2004 from a public–private partnership with support also coming from academia and the NGO sector. A marketing information system was first developed with an information hub receiving price, volume and trade information on 45 commodities from trading centres around the country. This is then assessed, integrated and disseminated back to those centres. Subsequently, the information

hub has begun to facilitate trade between centres as exchange staff link buyers and sellers in different markets who have submitted bids and offers.

The **Agricultural Commodity Exchange for Africa (ACE)** commenced trading operations in November 2006. ACE is a regional commodity exchange owned by its members who are situated in South Africa, Zambia and Zimbabwe as well as Malawi itself. It was until recently funded by donor agencies through the National Smallholder Farmers' Association of Malawi, (NASFARM). Its mission is to establish a regional commodity exchange of the highest integrity, available to all people in Africa and acceptable to international traders, based on an open and free market system. Some of the services that ACE provides are reliable market intelligence/information, both pre and post harvest; linking buyers and sellers; and agreeing quality standards. As of June 2007, it had traded over 6,800 metric tonnes of commodity, including nearly US$ 3 million of smallholder-produced crops. Currently, it is investigating the possibilities for launching a similar exchange initially in Zambia and then in other African countries, with a view to creating an integrated regional market across southern and eastern Africa.

In **Zimbabwe** and **Zambia**, exchanges were launched in the mid–1990s subsequent to agricultural market liberalization but both foundered on government interventions in their core maize markets. Farmers established the **Zimbabwe Agricultural Commodity Exchange (ZIMACE)** in 1994, in response to the gradual liberalization of State-controlled agricultural marketing. The Exchange conducted spot and forward transactions and mostly handled agriculture produce, in particular corn, although the trading volumes of wheat contracts saw a steady increase. A policy reversal has de facto led to a halt of the exchange's operations. The **Zambia Agricultural Commodity Exchange (ZAMACE)** was founded in 1994 and conducted spot and forward transactions in wheat, corn and other agricultural products. Its success led to the development of the Kapiri Commodity Exchange in Zambia's central province and the Eastern Agricultural Commodity Exchange in Zambia's eastern province, both of which were launched in 1997. However, policy reversals which brought government intervention in the corn market saw the demise of these exchanges. ZAMACE was recently re-established, with plans for linkages with ACE in Malawi.

The **Kenya Agricultural Commodity Exchange (KACE)** was set up in 1994 to provide the basic services of a commodity exchange. The products meant to be traded were agricultural commodities such as cereals, dairy products and cotton. Faced with fragmented markets, government intervention and significant infrastructural deficiencies, trade has always been minimal, however. Instead, focus has been on information dissemination, with KACE acting as a provider of paid-for price information, a business model supported by private sector partnerships and aid donor funding.

The **Ugandan Commodities Exchange (UCE)** was incorporated in 1998 as a private sector initiative covering four major promoters, including representatives of the country's farmer associations and cooperatives. The exchange launched in 2002, offering physical trade in six commodities – coffee, sesame, maize, beans, soybeans and rice. However, the exchange has now temporarily suspended trading due to operational and systems constraints, and is instead pursuing implementation of a warehouse receipt system through a private collateral management entity to upgrade the physical infrastructure in the market.

Exchange formation is at an advanced stage in **Ethiopia.** A high-level report in November 2005 recommended that the country develop "an integrated commodity exchange development initiative which would include developing all the

components of the system, including the warehouse receipts system".[27] In January 2006, a Task Force was constituted by the Ethiopian Ministry of Agriculture and Rural Development to critically evaluate market development in the country. Its report confirmed that a commodity exchange could bring significant advantages to the country's agricultural sector. Subsequently, the **Ethiopia Commodity Exchange (ECEX)** Project commenced in July 2006. A blueprint and timeline was devised. As per the blueprint, appropriate legal and regulatory legislation was enacted in early 2007. ECEX became operational in April 2008, initially offering physical trade in strategic grain, oilseeds, spices and tropical beverage crops, with later phases of market development envisaged to include receipt-based and futures trading.

Nigeria's Abuja Securities and Commodity Exchange (ASCE) started electronic trading in securities in 2001. However, the Government stepped in to reorient the exchange towards agriculture with a view to boosting sector performance and promoting commercial farming. Agricultural spot trading commenced in July 2006 with six listed products, including maize, soybean, sorghum, sesame seed, millet and cowpea. In the future, ASCE plans to gradually introduce trading in warehouse receipts and eventually evolve into a futures market trading commodity futures and options.

In **Ghana**, a workshop of key stakeholders in November 1999 identified the need to develop a commodity and financial futures exchange in the country. Building on this, a strategic vision has been defined through a public–private partnership overseen by the national financial regulator, the Securities and Exchange Commission (SEC), Ghana. The vision calls for the initial development of a commodity-backed warrant scheme to facilitate the transition to paper-based trading and stimulate necessary upgrades to infrastructure and practices. Subsequently, a **Ghanaian Commodities Exchange** would be established to conduct trading, first in physicals, with later development towards an over-the-counter forward market with future physical deliveries, and ultimately futures trading.

In **Egypt**, futures markets have a long history dating back to the early twentieth century among the country's vibrant cotton trading community.[28] In the 1950s, however, the Alexandria Cotton Exchange closed as agriculture was brought under State control. There has been periodic discussion of reviving the exchange, but as yet this has come to nought. Since the turn of the millennium, however, as part of a broader financial sector reform programme, an action plan has been developed under government auspices "to establish a commodity exchange under the umbrella of a derivatives market that will include futures and options contracts".[29] Two working groups have been established, one focusing on market participants, including a broad-based stakeholder education process, and the other focusing on regulatory issues, which has included the drafting of a new chapter in the country's Capital Market Law. Also in Egypt, the **Agri Commodity Exchange Company**, a subsidiary of the Egyptian Company for Production, Exporting and Marketing of Agricultural Crops (EPEMAC) – a partnership between the Ministry of Agriculture and the private sector, acts as an information centre for agricultural market participants.

[27] Eleni Z. Gabre-Madhin and Ian Goggin, "Does Ethiopia need a commodity exchange? An integrated approach to market development", Ethiopian Development Research Institute Policy Working Paper No. 4, p22

[28] Raafat, S. "The Rise and Fall of Alexandria's Cotton Exchange", Egyptian Mail, 01(11/07, available: http://www.egy.com/landmarks/97-11-01.shtml

[29] "The Development Role of Commodity Exchanges in Egypt", a paper presented by the Government of Egypt at the UNCTAD Expert Meeting on the Trade and Development Implications of Financial Services and Commodity Exchanges, 03/09/07, available: http://www.unctad.org/sections/wcmu/docs/c1em33p22_en.PDF

Elsewhere, in **Côte d'Ivoire**, there is a "Bourse" for cocoa and coffee but it has so far not managed to develop any real business. **Africanlion**, a web-based coffee exchange based in East Africa, has not built up significant volumes.

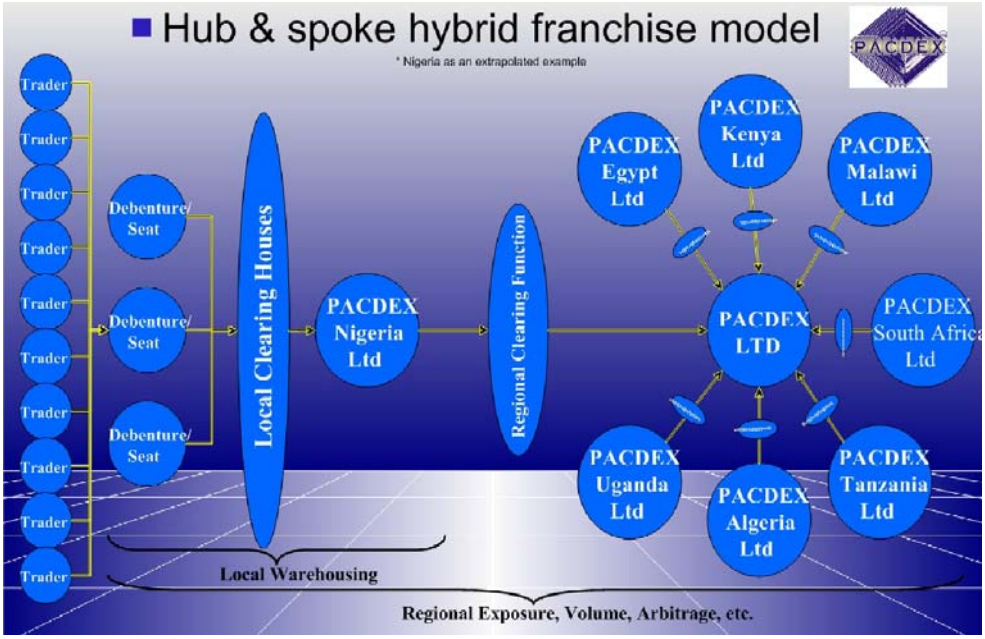
Three African regional organizations are proactively exploring possibilities for a regional approach to commodity exchange development. The **Common Market for Eastern and Southern Africa (COMESA)**, under the auspices of its Agricultural Marketing Promotion and Regional Integration Project (AMPRIP), is taking a two-pronged approach by supporting the development of existing national initiatives in its region while fostering increased collaboration and linkages among these initiatives. To this end, a central hub for the region is being considered. On the one hand, this would coordinate the sharing of experience and best practice among national exchange initiatives. On the other, it would collect and disseminate exchange-generated information across the region. COMESA has organized commodity exchange "study tours" to Malawi and Kenya in 2007 to bring together different stakeholders, including representatives of exchanges, government, farmers' organizations and the private sector. **L'Union Economique et Monétaire Ouest-Africaine (UEMOA)**, a customs and monetary union of eight West African States, has also been studying the potential for a regional commodity exchange in the West Africa region. Likewise, **the Economic Community of Central African States (ECCAS)** recently studied the feasibility of creating a regional commodity exchange to benefit from the existing regional stock exchange located in Gabon (BVMAC), and the Douala Stock Exchange in Cameroon, which could host an agricultural commodity department to facilitate trade in commodities within the region.

A pan-African exchange was originally envisaged as an "instrument of integration" in the Abuja Treaty establishing the African Economic Community, 1991 (article 46 (d)), the forerunner of the **African Union (AU)**. However, it was not until the Arusha Declaration and Plan of Action on African Commodities, issued at the African Union Conference of Ministers of Trade in November 2005, that serious moves in this direction were established. The Arusha Plan of Action included the "establishment of commodity exchanges and a call upon the African Union to establish a forum for discussions on the implementation of commodity exchange initiatives, and in particular, to enable private sector parties to discuss such initiatives, their requirements and potential obstacles" (article 7 (a)).[30]

Consequently, the **Pan-African Commodities & Derivatives Exchange (PACDEX)** was conceived, which received support from the AU and UNCTAD, among others. The PACDEX model was to site a hub in Botswana that would link together local exchange platforms as well as warehouses in various countries. The local exchanges would use a common trading system and "back-office" for trade across commodity sectors – agriculture, metals and energy – as well as currencies. Apart from enabling domestic trade, the shared platform would make it possible to match trades from commodity exchanges in different participating countries. Diagram 2 gives an overview of the structure, indicating some of the potential participating countries and elaborating (using the example of Nigeria) how each country "franchise" could look.

[30] Available: http://www.common-fund.org/download/actualiteit/ARUdec.pdf

Diagram 2. The PACDEX hub-and-spoke model



This hub-and-spoke "franchising" model would overcome the problem of high set-up costs that small African markets may struggle to recuperate, while a common technology platform is likely to generate greater liquidity and price discovery that would better enable African commodity producers to market their commodities and manage their risk. At present, the status of PACDEX is unclear.

A second pan-African exchange initiative, initially to be based in Mauritius, is also being pursued. The Government of Mauritius had been examining the possibilities of setting up a commodity exchange in the country, eyeing the country's advantageous location between Africa and Asia and its attractive regulatory environment as an offshore financial centre. In late 2006, a joint announcement was made by the country's Financial Services Commission and Financial Technologies of India Ltd (the promoter of the MCX in India), that approval had been given for a pan-African commodities exchange to be established in Mauritius, subsequently entitled the Global Board of Trade (GBOT).[31] No further announcements on this matter have been put in the public domain.

However, another exchange promoted by Financial Technologies of India Ltd, operating under the name Multi Commodity Exchange of Africa ("MCX Africa"), has been established in Botswana. This exchange, operating on a similar model as PACDEX, has obtained a trading license and expects to become operational across Africa during 2009, bringing modern financial instruments to the region and facilitating efficient and cost-effective means of cross-border trading and clearing.

The ICX unit of Sandbox, a private company based in South Africa, is also active in various countries in Africa, including Uganda, providing a national platform for tracking grain electronically via warehouse receipts. Their development model emphasizes pre-exchange aggregation, by producer organizations or other parties, which is of particular importance in Africa where producers are often small-scale and lack the infrastructure and capacity to directly access markets themselves.

[31] http://www.gov.mu/portal/sites/ncb/fsc/download/confpan.pdf

Sandbox aims to establish a network of physical commodity exchanges across Africa, which can ultimately be connected electronically to enable trading across borders. In 2006, Sandbox merged with Comdaq, a firm based in the UK, India and the Caribbean, that provides systems and support and manages equity and commodity exchanges in those countries, as well as in Nepal.

Summary of findings

With the liberalization of agricultural trade and the withdrawal of government support to agricultural producers outside the OECD, there is in many countries a new need for risk management, price discovery and even physical trading mechanisms. This requirement can often be addressed by commodity exchanges trading agricultural goods, metals and energy products.

It is in this context that the recent period has seen the rapid creation and growth of new commodity exchanges in developing countries. Some have progressed from offering spot and forwards contracts to the level of futures trading. Others have just as quickly disappeared.

Developing countries in the **Asia and Oceania** region have enjoyed the greatest success in the advancement of their commodity exchanges. The new Indian national multi-commodity exchanges have exhibited dramatic volume growth since their establishment in 2002/3, driven by a dynamic high-tech, low-cost business model. From the late 1990s, the three Chinese commodity exchanges – DCE, SHFE and ZCE – have grown in importance and their future growth seems likely given an increasingly facilitative regulatory environment. As well as the successful exchange in Malaysia which generates the reference price for the world palm oil industry, recently established or restructured exchanges in Dubai, Pakistan, Indonesia and Thailand remain operational, and new initiatives are being explored in Iran, Sri Lanka and Viet Nam. Reflecting the ongoing growth in importance of Asia to the global economy, and as correctly anticipated in the 2004 version of this document, five of the world's ten largest commodity futures exchanges in 2007 are situated in developing Asia.

In the 1990s, commodity exchanges were established across **Latin America**, mostly in response to domestic liberalization. However, long-standing exchanges have existed in some of the larger countries, including Brazil and Argentina, dating back to the early twentieth century. The financial crises that hit the region from the late 1990s onwards made a significant impact upon these exchanges, and MATba of Argentina even had to temporarily suspend operations in 2002. Since the early 2000s, however, derivatives exchanges in Latin America have exhibited rapid growth more than double the world average. Moreover, Latin American exchanges have been at the forefront of developing innovative applications for exchange mechanisms to address challenges in the underlying markets. This has typically arisen as a response to the fluctuating level of government intervention in agriculture, forcing the exchanges to innovate new forms of market in which they can maintain niches for themselves.

European transition economy exchanges fall into three categories. Some, including Poland, Hungary, Bulgaria and Slovenia, have established domestically oriented commodities futures exchanges. Turkey has also had a futures exchange trading in both commodity and financial futures since 2005 while Russia has supplemented its financial derivatives markets with commodity instruments in 2006. Other futures exchanges in Romania, Belarus, Ukraine and Kazakhstan trade in currency futures. Finally, countries including Romania, the Czech Republic, Slovakia and Uzbekistan have active commodity exchanges that trade spot and forwards contracts for agricultural products but not yet futures.

With the exception of SAFEX (now part of JSE) in South Africa, to date **Africa** has been the region with the least success in developing commodities exchanges. Exchanges in Zimbabwe and Zambia have failed due to changes in government policy. Others in Uganda and Kenya have also struggled to establish themselves as significant entities for facilitating price discovery and risk transfer.

However, recent years have seen a flurry of activity in exchange development at both a national, regional and pan-African level. Exchanges have been established in Nigeria, Malawi and Ethiopia, and new initiatives are making progress in Ghana, Egypt, Zambia and Mauritius. At a regional level, COMESA, the regional organization for southern and eastern Africa, is actively supporting development of national exchanges and looking to facilitate regional linkages. The Pan-African Commodities and Derivatives Exchange (PACDEX), with a hub-and-spoke model built upon a common technological platform, is one of several possible continent-wide initiatives that offer promise in overcoming the cost and liquidity hurdles that African exchanges have historically encountered.

Developed country exchanges still determine the prices at which most world market trade takes place – CBOT, NYBOT and Euronext.liffe for agricultural goods, LME for metals, NYMEX for energy products, and to a lesser extent TOCOM in all three sectors. **North America** has experienced a revival in its volume share of world derivatives trade since the millennium, with a strong 2007, and NYMEX remains the world's largest commodity exchange by some distance ahead of the DCE and CBOT, in second and third place, respectively. Exchange consolidation is becoming even more apparent, as evidenced by the mega-merger between the CME and the CBOT that spawned the CME Group, the world's largest futures exchange. With the acquisition of NYMEX, the CME Group is now also the world's largest commodity exchange. In **Western Europe**, Eurex experienced healthy growth in 2006 prior to its acquisition of the ISE in early 2007. In that year, Eurex and ISE increased their contracts volume in 24.50 per cent and 35.90 per cent, respectively. Euronext.liffe exhibited a slight decrease in volumes before its merger with the NYSE, while NYSE Euronext Total posted annual growth of 38.62 per cent in 2007. Meanwhile in **developed Asia**, Japanese commodity exchanges have experienced a difficult time subsequent to a major restructuring of the industry, while the KRX of the Republic of Korea, an exchange that trades financial futures, was the world's second largest futures exchange in 2007, after the CME Group.

This study has identified the continuation of three major trends driving change in the commodity exchange environment. Exchanges in both the developed and the developing worlds have looked to demutualize in order to establish their credentials for good governance, provide a framework for self-regulation and secure the confidence of investors and traders alike. Second, there has been consolidation of commodity exchanges within countries, a trend which is still continuing in developed markets including the US and Japan. However, in the developing world – including China, India and Russia – there remains a significant number of exchanges, especially in the commodity space. The signs are that, due in part to regulatory constraint and in part to market structures that are still in their early phases of evolution, there are likely to be more rather than less exchanges in the short term. Third, cross-border cooperation between exchanges in different jurisdiction also continues, with new memorandums of understanding being signed and joint initiatives taking place. However, consolidation is now also taking place across borders. As exchange trading of financial and commodity products becomes an ever-more globalized business and exchanges become for-profit public corporations, high-value derivatives trade is highly coveted in the logic of exchange merger and acquisition activity.

A fourth fundamental issue being faced by commodity exchanges is the increasing centrality of information and communications technology as a determinant of exchange success. The transition towards the electronic trading of commodities is now in its latter stages. This movement, itself a remarkable transformation in the way business is done in the commodities space, is triggering a second, continuous revolution powered on the one hand by the inherent tendency of

technology to rapidly evolve and on the other by the increasingly fierce competitive global environment in which demutualized, for-profit commodity exchanges are now fighting for business. The result is a stream of innovations in products, platforms and functionalities as well as a fundamental restructuring of the relations between market actors – hedgers, speculators, collateral managers, exchanges, clearing houses, brokers, regulators, government, infrastructure providers and technology vendors – that transcends national borders and regulatory jurisdictions. For the exchange, the technology-driven era is already having a profound impact on business strategy and operations in several dimensions.

UNCTAD will shortly publish the Report of the UNCTAD Study Group on Emerging Commodity Exchanges, "Development Impacts of Commodity Exchanges in Emerging Markets". Country case studies incorporate an empirical impact assessment of five leading emerging commodity exchanges in Brazil, China, India, Malaysia and South Africa.

Annex I

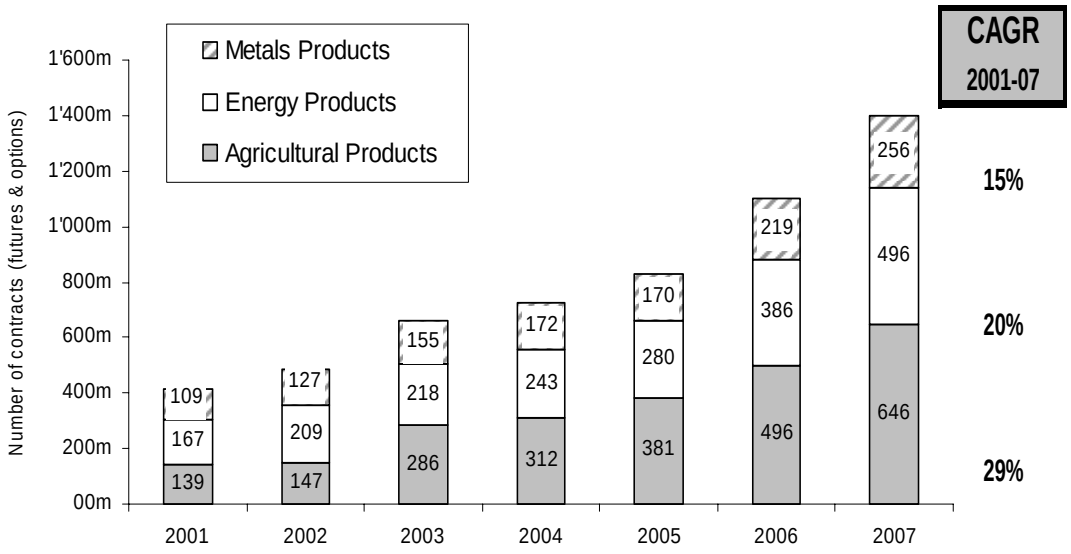
Commodity data

Table 1. The world's major commodity futures exchanges, ranked in order of total number of contracts traded in 2007 (in '000 of contracts)

2007 Rank	2006 Rank	Exchange		Energy		Metals		Agriculture		Total
				Futures	Options	Futures	Options	Futures	Options	F&Os
1	1	New York Mercantile Exchange	2007 volume	190'086	71'140	36'534	4'837			302'597
		(NYMEX, US)	Annual change (%)	-1%	31%	44%	-11%			9%
2	3	Dalian Commodity Exchange	2007 volume					185'614		185'614
		(DCE, China)	Annual change (%)					54%		54%
3	2	Chicago Board of Trade	2007 volume	73	6	11'324	117	115'104	27'567	154'191
		(CBOT, US)	Annual change (%)			-7%	-40%	8%	27%	9.60%
4	4	ICE Futures	2007 volume	137'188	244					138'470
		(formerly IPE, UK)	Annual change (%)	48.18%	76.80%					49.30%
5	9	Zhengzhou Commodity Exchange	2007 volume					93'053		93'053
		(ZCE, China)	Annual change (%)					101%		101%
6	5	London Metals Exchange	2007 volume			85'736	7'179			92'915
		(LME, UK)	Annual change (%)			9.10%	-12.70%			7%
7	7	Shanghai Futures Exchange	2007 volume	12'005		73'559				85'564
		(SHFE, China)	Annual change (%)	-5.70%		280%				47.20%
8	10	Multi Commodity Exchange	2007 volume	15'672		48'336		4'938		68'946
		(MCX, India)	Annual change (%)	138%		57.12%		-40.41%		51%
9	11	New York Board of Trade	2007 volume					37'017	12'959	49'976
		(NYBOT, US)	Annual change (%)					31%	11.12%	25.26%
10	6	Tokyo Commodity Exchange	2007 volume	11'370		28'639	0	7'062		47'071
		(TOCOM, Japan)	Annual change (%)	-41.30%		-17.30%	-100%	-27%		-26%
11	8	National Commodity & Derivatives Exchange	2007 volume	180		1'733		35'483		37'396
		(NCDEX, India)	Annual change (%)	44%		-50.80%		-25.60%		-27.2
12	13	Chicago Mercantile Exchange	2007 volume					17'697	1'268	20'557
		(CME, US)	Annual change (%)					8%	28%	18.30%
13	12	Tokyo Grain Exchange	2007 volume					19'672	0	19'672
		(TGE, Japan)	Annual change (%)					3%	-100%	2.80%
14	15	Euronext.LIFFE (EU)	2007 volume					11'497	1'287	12'784
			Annual change (%)					26%	77%	29.70%
15	16	Central Japan Commodity	2007 volume	6'329		32		188		6'549
		Exchange (C-COM, Japan)	Annual change (%)	-29.50%		77.70%		1466		-27.30%
16	17	Kansas City Board of Trade	2007 volume					4'318	352	4'670
		(KCBT, US)	Annual change (%)					-9.30%	-31.70%	-11.50%
17	18	Winnipeg Commodity Exchange	2007 volume					3'396.90	33.152	3'430.05
		(WCE, Canada)	Annual change (%)					18.40%	18.40%	18.40%
18	19	Bursa Malaysia Derivatives	2007 volume					2'794		2'794
		(BMD, Malaysia)	Annual change (%)					25.29%		25.29%
19	14	National Multi-Commodity	2007 volume							2'705
		Exchange (NMCE, India)	Annual change (%)			-100%		-100%		-73.30%
20	20	JSE/SAFEX	2007 volume					1'726	676	2'402
		(South Africa)	Annual change (%)					20.80%	31.70%	23.70%
21	22	Brazilian Mercantile & Futures	2007 volume			0	0	2'220	0	2'220
		Exchange (BM&F, Brazil)	Annual change (%)			-100%	-100%	69%	-100%	48.50%
22	21	Minneapolis Grain Exchange	2007 volume					1'792	34	1'826
		(MGEX, US)	Annual change (%)					11%	-15%	10.30%

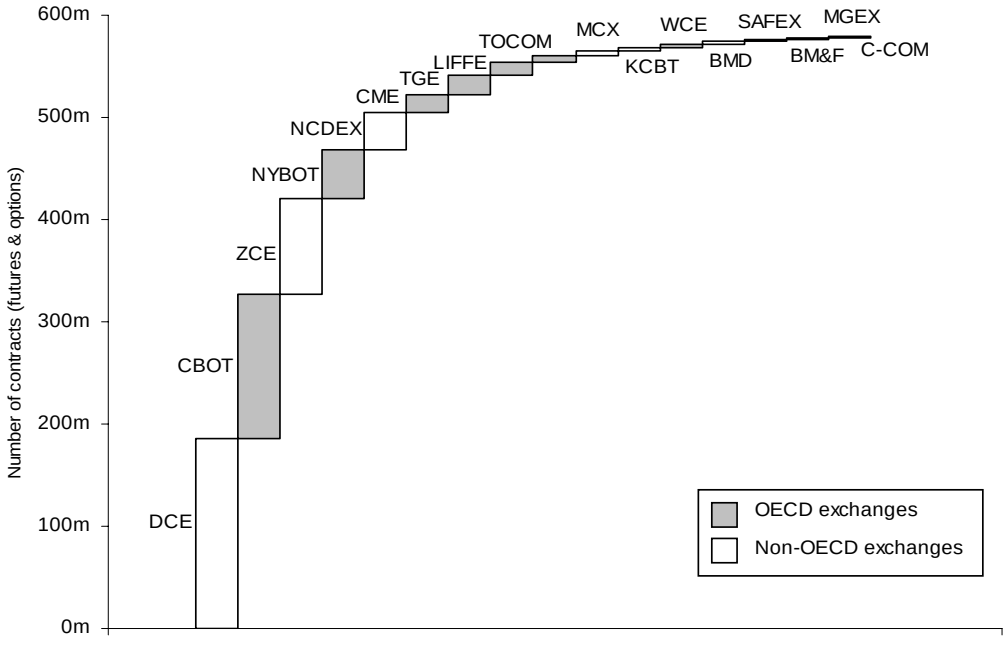
Source: Exchange data.
Note: The data set for this table and figures 11-16 includes only those commodity exchanges trading over one million futures and options contracts during 2007.

Figure 10. Sectoral growth 2001-07



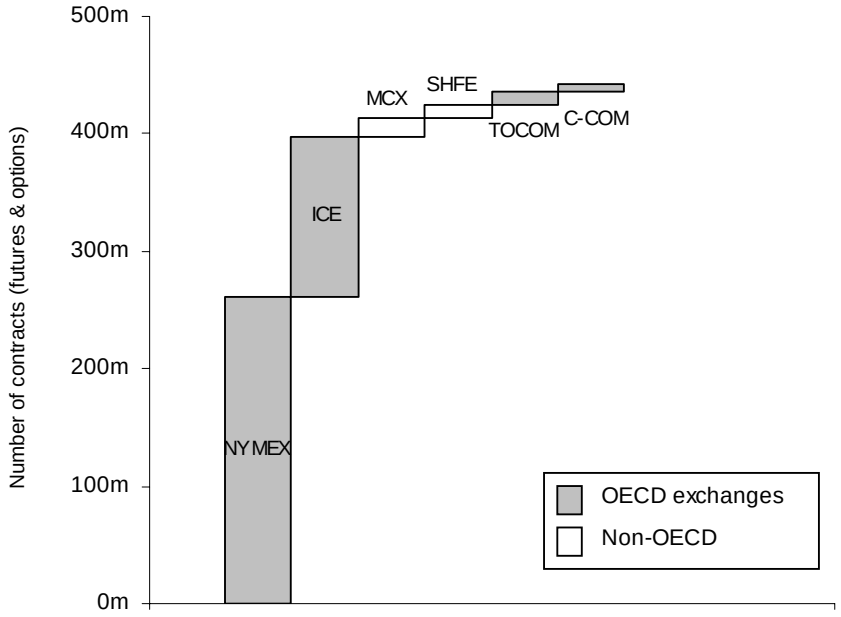
Source: Calculations made on the basis of information published by the Future Industry Association (adjusted to include volume data provided by Indian national exchanges not captured by FIA).

Figure 11. Leading agricultural commodity exchanges, 2007 (total contracts: 579m)



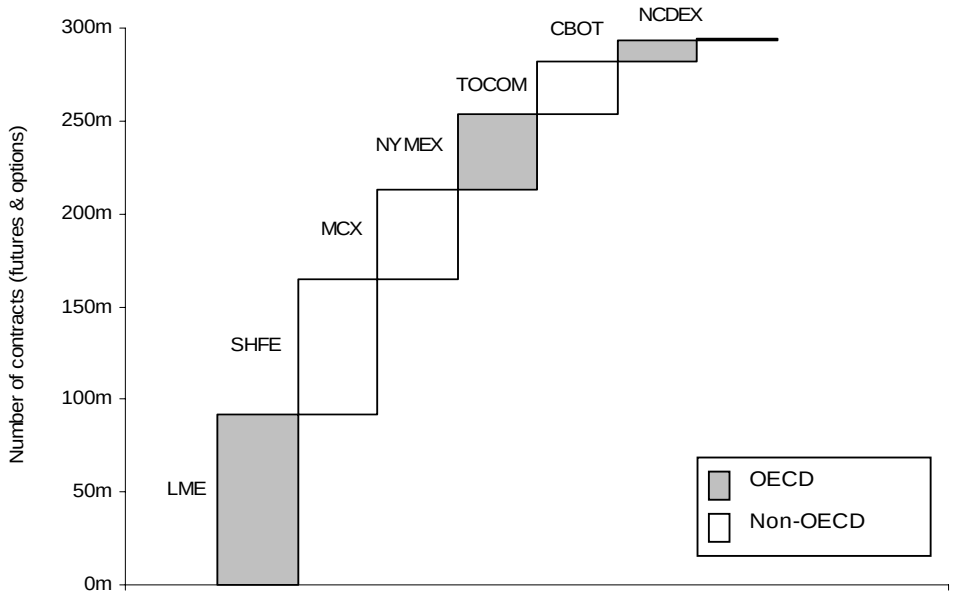
Source: Exchange data.
Note: Accumulative trading volumes.

Figure 12. Leading energy commodity exchanges, 2007 (total contracts: 442m)



Source: Exchange data.
Note1: C-COM energy data includes eggs contracts.
Note2: Accumulative trading volumes.

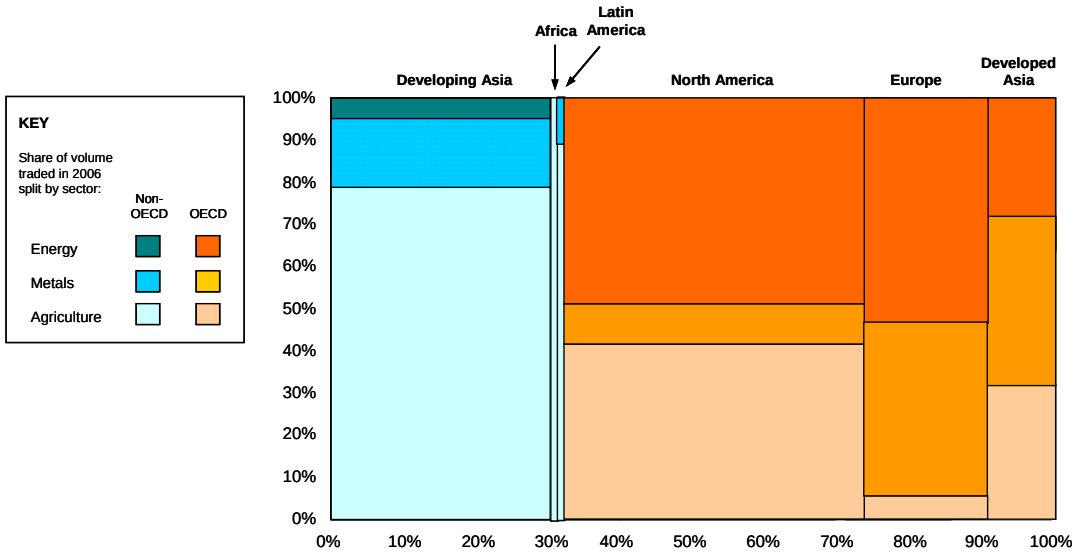
Figure 13. Leading metals commodity exchanges, 2007 (total contracts: 294m)



Source: Exchange data.
Note: Accumulative trading volumes.

Exchange-traded commodity derivatives: Liquidity mapping

Figure 14. Liquidity map – the share of exchange-traded commodity derivative volume by region and by sector



Source: UNCTAD analysis of exchange data.
Note: available data 2006.

Explanation and interpretation

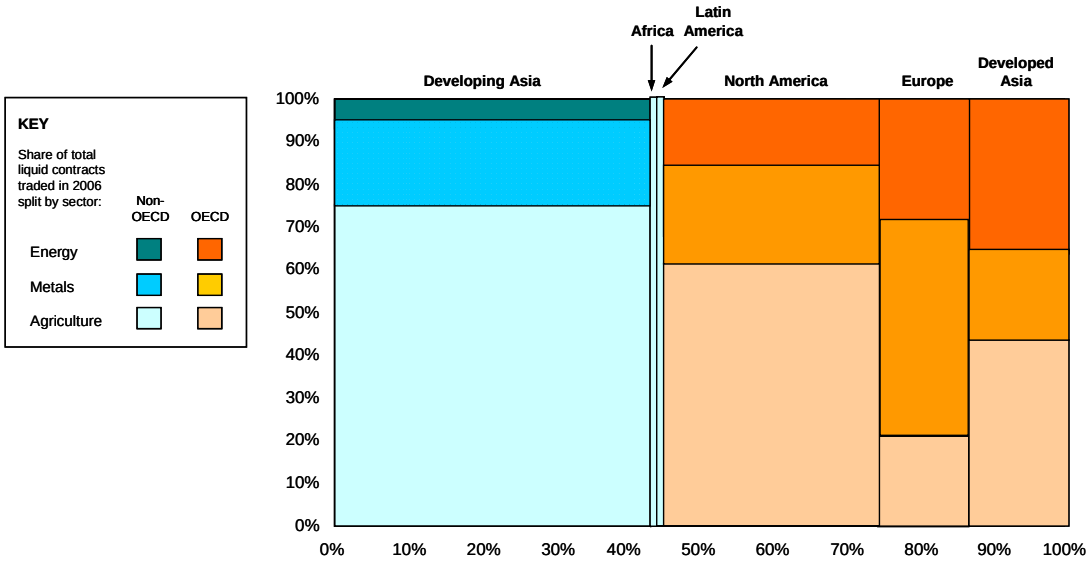
To construct this liquidity map, volumes (i.e. number of futures and options contracts traded during 2006) at each of the world's major commodity derivatives exchanges – defined for the purpose of this analysis as those exchanges trading more than one million commodity derivatives contracts during 2006 – were split according to sector (agriculture, metals, energy) and then aggregated by region. During 2006, there was a total of 1.1 billion exchange-traded commodity derivatives contracts traded.

By reading horizontally across the chart, one can see the share of total exchange-traded commodity derivatives volume that is traded in each region. As such, this chart demonstrates how Developing Asia, where 334 million contracts (equivalent to 30 per cent of total volume), is second only to North America in terms of traded volume. When combined with the 92 million contracts traded in developed Asia, the Asian region as a whole accounts for 39 per cent of the world's total exchange-traded commodity derivatives volume. When Developing Asia is combined with the other developing regions, Africa (2 million contracts) and Latin America (1 million), the developing world as a whole accounts for 32 per cent of world volume.

By reading vertically up the chart, one can see, within each region, the split of volume between the three commodity sectors. Therefore, one can see that Developing Asia has a clear focus on agriculture, with 78 per cent of volume in this sector. This focus may be interpreted to reflect an effort by the exchanges to address the development concerns of countries such as China and India in which a large proportion of the population are engaged in the agricultural economy. This contrasts with Developed Asia, where only 31 per cent of volume is in agriculture. Another

contrast is with Europe, which has the lowest share of volume in agriculture. With the Common Agricultural Policy still mitigating many of the risks faced by European farmers, it is not surprising that most exchange-trading in commodities is in the metals and energy sectors.

Figure 15. Liquidity map – the share of liquid exchange-traded commodity derivatives contracts by region, and by commodity sector



Source: UNCTAD analysis of exchange data.
Note 1: available data 2006.
Note 2: Liquid contracts are defined as those trading over 0.5 million contracts during 2006.

Explanation and interpretation

This chart is slightly different. Here, rather than analysing total volume, the chart analyses the number of liquid exchange-traded commodity derivatives contracts traded per region. For the purpose of this analysis, liquid contracts are defined as those trading over 0.5 million contracts during the year. During 2006, there were 109 liquid contracts.

To construct the liquidity map, every liquid contract at each of the world's commodity derivatives exchanges was identified and then classified according to region and sector (agriculture, metals, energy). Again, Developing Asia is clearly seen to have a high proportion (73 per cent) of liquid contracts trading on agricultural commodities. This contrasts with Developed Asia, where only 47 per cent of liquid contracts are agricultural, and Europe, with 21 per cent ((Europe has three liquid agri-contracts – the globally-traded Euronext.liffe contracts on Robusta coffee, cocoa and white sugar).

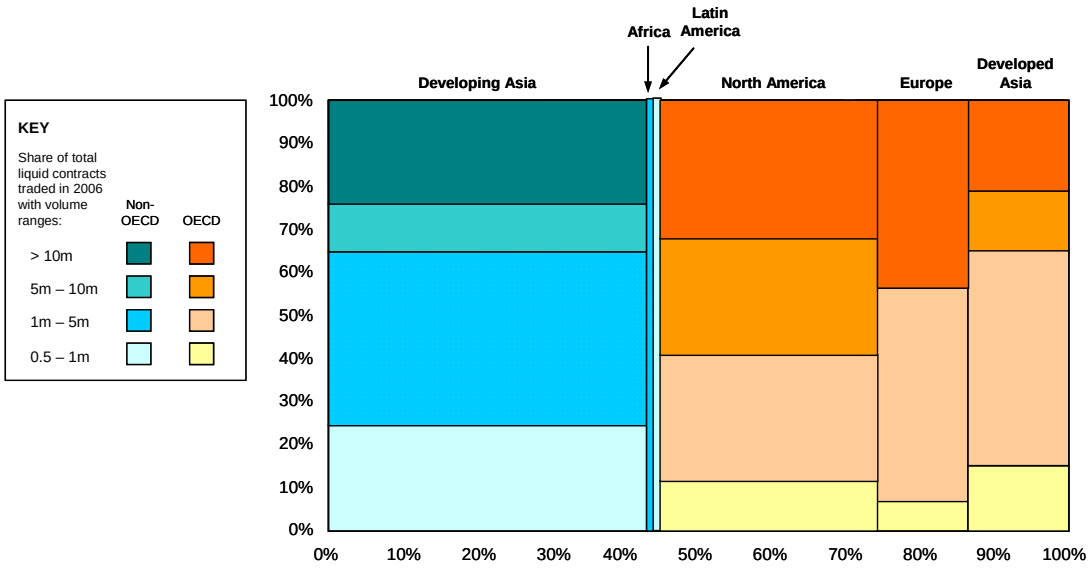
It is perhaps unexpected that as much as 60 per cent of North American liquid contracts are agri-focused. These are traded on exchanges such as the CBOT, NYBOT and the CME (as noted earlier in the report, NYMEX, the large energy and metals exchange, also launched a suite of agri-commodity contracts in 2007).

By reading horizontally across this chart, rather than seeing share of volume, one can see the share of total liquid exchange-traded commodity derivatives contracts that is traded in each region. As such, this chart demonstrates how

Developing Asia, with 49 liquid contracts (equivalent to 45 per cent of total liquid contracts), is home to the trade of more liquid exchange-traded commodity derivatives contracts than any other region in the world. This reflects in particular the high number of liquid contracts developed on the three Indian national multi-commodity exchanges (see figure 9 in Chapter III above). When combined with the 14 liquid contracts traded in developed Asia, the Asian region as a whole accounts for 58 per cent of the world's total liquid exchange-traded commodity derivatives. When Developing Asia is combined with the other developing regions, Africa and Latin America, each of which have 1 liquid contract, the developing world as a whole accounts for 47 per cent of the world's total liquid exchange-traded commodity derivatives.

For the moment, most developing Asian commodity exchanges – namely, the three each in China and India – remain closed to foreign participation (Bursa Malaysia is an exception in this respect). Thus, their achievement in developing so many liquid contracts despite the limitations in place is a significant one. Moreover, their eventual opening up – perhaps in the near future – is likely to draw substantial interest from international commodity actors and speculators alike, both types of participant being drawn to liquid markets.

Figure 16. Liquidity map – the share of liquid exchange-traded commodity derivatives contracts by region, and by volume band



Source: UNCTAD analysis of exchange data.

Note 1: available data 2006.

Note 2: Liquid contracts are defined as those trading over 0.5 million contracts during 2006.

Explanation and interpretation

This chart follows a similar logic to the previous one. Here, however, the vertical axis depicts a split of contracts into defined volume bands (0.5–1 million contracts during 2006, 1–5 million contracts, 5–10 million contracts, and more than 10 million contracts). During 2006, there were 109 liquid contracts, of which 29 (or 27 per cent) were in the highest volume band.

By reading vertically up the chart, one can see, within each region, how highly liquid its contracts are (according to the predefined volume bands). Therefore, one

can see that Europe has the highest proportion of highly liquid contracts – 6 of its 14 liquid contracts (or 43 per cent) traded with a volume greater than 10 million contracts in 2006. North America has 10 of its 30 liquid contracts (or 33 per cent) trading with similarly high levels of volume. Developing Asia also has 10 liquid contracts trading with a volume greater than 10 million contracts in 2006; however, this accounts for a smaller proportion (20 per cent) of its total liquid contracts than in the US.

Annex II

Global futures and options data

Table 1
Top 15 World Futures and Options Exchanges
Volume by Calenda Year, millions of contracts (ranked by 2007 volume)

Rank 2007	Rank 2006	Exchange	Country	2002	2003	2004	2005	2006	2007	change 2006/07
1	3	CME Group	US	-	-	-	-	2209	2805	27%
2	1	KRX	Korea	899.9	1932.7	2586.8	2593.1	2474.6	2709.1	9.50%
3	2	EUREX	Germany	801.2	1014.9	1065.6	1248.7	1526.8	1899.9	24.50%
4	5	EURONEXT/LIFFE	EU	696.3	695	790.4	757.9	730.3	949.02	29.90%
5	6	CBOE	US	267.6	283.9	361.1	468.2	674.7	945.6	40%
6	7	ISE	US	152.4	245	360.9	448.7	592	804.34	35.90%
7	9	BM&F	Brazil	101.6	120.8	183.4	199.4	283.6	426.36	50.40%
8	12	PHLX	US	89	112.7	133.4	162.6	273.1	408	49.40%
9	15	NSE	India	13.3	43.1	75.1	131.7	194.5	379.9	95.30%
10	8	Bovespa	Brazil	90.9	177.2	235.3	268.6	287.5	367.7	27.90%
11	10	NYMEX	US	133.7	137.2	161.1	204.6	276.2	353.4	28%
12	14	NYSE Arca (Pacific Exchange)	US	85.4	86.2	103.3	144.8	196.6	335.8	70.80%
13	19	JSE (South Africa)	South Africa	-	-	-	-	-	329.6	213.80%
14	13	AMEX	US	186	180.1	202.7	201.6	197	240.4	22%
15	11	MexDer	Mexico	84.3	173.8	210.4	108.2	275.2	229	-16.80%
			Sub Total	4503.4	6297	7874.8	8703.2	10191.3	13183.12	29.35%
			Total	5993.4	8137.6	8866.5	9972.6	11859.3	15186.7	28.05%

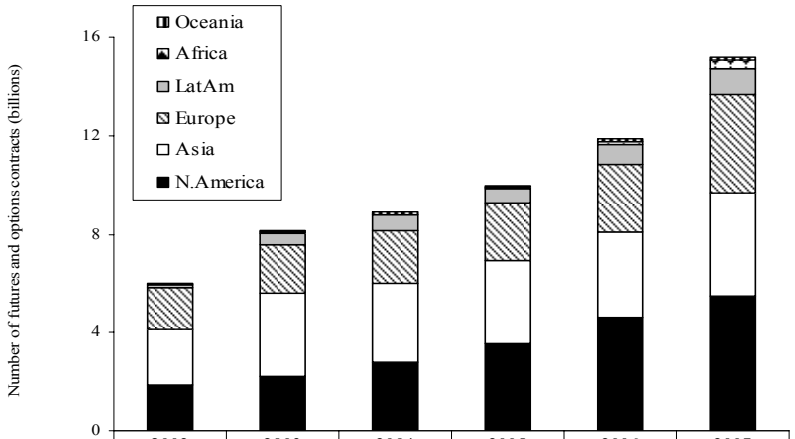
Source: Information published by the Future Industry Association, 2008.
Note: The CME Group is the merger between CME and CBOT. The merger took place in July 2007.
CBOT volume traded (2007): 1029.6 million contracts. CME volume traded (2007):1775.4 million contracts.

Table 1 A
Top 15 World Futures and Options Exchanges
Share of World Volume by Calendar Year (ranked by 2007 volume)

Rank 2007	Rank 2006	Exchange	Country	2002	2003	2004	2005	2006	2007
1	3	CME Group	US	9.30%	7.90%	9.10%	10.90%	11.80%	18.47%
2	1	KRX	Korea	15.00%	23.80%	29.20%	26.00%	20.90%	17.83%
3	2	EUREX	Germany	13.40%	12.50%	12.00%	12.50%	12.90%	12.51%
4	5	EURONEXT/LIFFE	EU	11.60%	8.50%	8.90%	7.60%	6.20%	6.24%
5	6	CBOE	US	4.50%	3.50%	4.10%	4.70%	5.70%	6.22%
6	7	ISE	US	2.50%	3.00%	4.10%	4.50%	5.00%	5.30%
7	9	BM&F	Brazil	1.70%	1.50%	2.10%	2.00%	2.40%	2.80%
8	12	PHLX	US	1.50%	1.40%	1.50%	1.60%	2.30%	2.70%
9	15	NSE	India	0.20%	0.50%	0.80%	1.30%	1.60%	2.50%
10	8	Bovespa	Brazil	1.50%	2.20%	2.70%	2.70%	2.40%	2.42%
11	10	NYMEX	US	2.20%	1.70%	1.80%	2.10%	2.30%	2.32%
12	14	NYSE Arca (Pacific Exchange)	US	1.40%	1.10%	1.20%	1.50%	1.7	2.21%
13	19	JSE (South Africa)	South Africa	-	-	-	-	-	2.17%
14	13	AMEX	US	3.10%	2.20%	2.30%	2.00%	1.70%	1.58%
15	11	MexDer	Mexico	1.40%	2.10%	2.40%	1.10%	2.30%	1.50%
			Sub Total	75.10%	77.40%	88.80%	87.30%	85.90%	86.80%

Source: Calculations made on the basis of information published by the Future Industry Association, 2008.

Figure 16. Global futures and options – volume by region 2002–2007

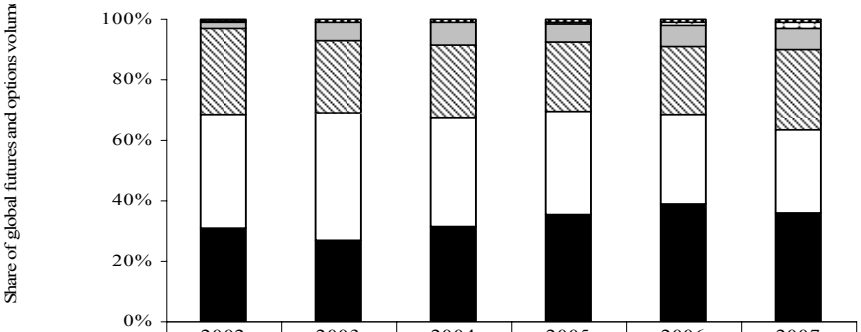


CAGR 2002/07	
Oceania	26%
Africa	60%
Lat.Amer	59%
Europe	18%
Asia	13%
N.Amer	24%
Growth 2006/07	
Oceania	15.70%
Africa	214.20%
Lat.Amer	21.20%
Europe	49.90%
Asia	20%
N.amer	18.50%

	2002	2003	2004	2005	2006	2007
Oceania	37	62	75	88	102	118
Africa	31	33	38	51	105	330
LatAm	102	475	637	590	865	1048.2
Europe	1717	1953	2123	2319	2682	4020
Asia	2246	3422	3189	3369	3498	4197.2
N.America	1861	2192	2819	3556	4617	5472.4

Source: Calculations made on the basis of information published by the Future Industry Association.

Figure 17. Global futures and options – regional share 2002–2007



	2002	2003	2004	2005	2006	2007
Oceania	0.60%	0.80%	0.80%	0.90%	0.90%	0.80%
Africa	0.50%	0.40%	0.40%	0.50%	0.90%	2.20%
LatAm	1.70%	5.80%	7.20%	5.90%	7.30%	6.90%
Europe	28.60%	24%	23.90%	23.30%	22.60%	26.50%
Asia	37.50%	42.10%	35.90%	33.80%	29.50%	27.60%
N.America	31.10%	26.90%	31.70%	35.70%	38.90%	36%

Source: Calculations made on the basis of information published by the Future Industry Association.