EVOLVING EXCHANGES, EVOLVING INSTRUMENTS: WHAT ARE WE GOING TO TRADE?

CHARLES GOLDFINGER[*]

Discussion Paper
published at
2004 European Financial Markets Convention (EFMC) in Frankfort June 2 - 4, 2004

Table of contents

---

[*] Managing Director, Global Electronic Finance Management SA, Brussels and Group Strategy Director, Capital Accumulation Ltd, London. This paper benefited from the financial support of Federation of European Securities Exchanges (FESE). However, views expressed in the paper are solely of the author and cannot be construed to reflect official positions either of the secretariat of FESE or of its members, or of Capital Accumulation Ltd.

INTRODUCTION

Any discussion of the future of securities exchanges will be incomplete without addressing the question of the changing mix of instruments and products traded on the exchanges.
Colloquially, exchanges are still thought of as markets for listing and trading of equities and, to a lesser extent of fixed income instruments. Yet, this is a somewhat misleading view. The range of instruments traded on exchanges has increased dramatically since the early 1980s. "Classical" single equities constitute a shrinking segment of the trading mix. They are losing market share to the derivative instruments, either based on equities or on financial variables such as interest or exchange rates.
A declining share of the 'classical' equities is the starting point of this paper. New instruments can no longer be treated as ancillary or sideline activity of the exchanges but have to be considered as integral if not central part of their core business.

Given their diversity, the definition of derivatives is a subject of extensive and often heated debate. For the purpose of this paper, we propose to use the definition given by Alfred Steinherr:

> " Derivatives are pragmatically considered as contracts whose payoffs are based on a continuously measurable underlying asset or performance."[1]

It is essential to add that such contracts are financial and tradable.
Derivatives differ considerably from traditional instruments. They are a vast, heterogeneous and constantly evolving universe. They are subject to the dynamics of product lifecycle, which make their trajectory often explosive in their ascent as well as in their decline. Volatility affects not only their prices but their market importance or even their very existence.
The evolution of derivatives and its underlying dynamics constitute the main topic of this paper. We believe that in the coming years, the current range of derivatives will undergo substantive transformations and new categories will emerge. These are likely to include industrial capacity, environmental protection, socio-economic and political as well as entertainment derivatives. We shall look at key attributes and characteristics of these categories.

The evolution of derivatives is likely to have far-reaching implications for the competitive positioning of exchanges and for the public policy toward financial markets. In the concluding section of our paper, we shall explore some of those implications.

1. OVERVIEW OF EXISTING NON-TRADITIONAL INSTRUMENTS

1.1. Derivatives: the success story

Financial derivatives have been the true success story of financial markets of the last forty years. While the trading of commodities and related derivatives such as futures contracts is a well established market practice, and some would argue it actually predates trading of bonds and equities - coffee and other commodity futures were traded in 17th century in Amsterdam[2]- , financial derivatives are a very recent phenomenon. It can be dated precisely to the early 1970s and its emergence is due to the conjunction of three factors:

- *Institutionalisation of financial volatility*, following the end of Bretton Woods exchange regime in 1970 and generalisation of floating exchanges rates in 1973
- *Advances in financial theory*, in particular in the research on determinants of market price formation and discovery, which led to the formulation of the options theory by Black, Scholes and Merton in the early 1970s
- *Trading technology improvements,* which allowed, among other things, a close monitoring of risk positions and margin requirements and, more importantly, the cash settlement of contractual obligations.

Chicago is the undisputed birthplace of financial derivative marketplaces. The first financial futures exchange, International Money Market, was launched as a subsidiary of Chicago Mercantile Exchange in 1972 and the first full-fledged financial options exchange, CBOE, was set up in 1973.

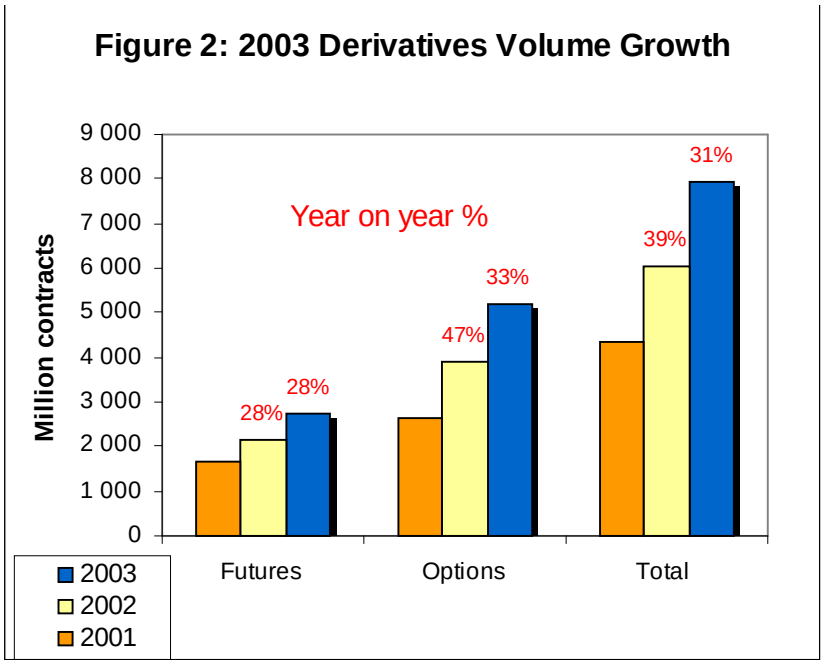
Europe was a relative latecomer to financial derivatives. First two options exchanges were launched in 1978 in Amsterdam (European Options Exchange (EOE) and in London (LTOM). However, it was only in the 1980s that the financial derivatives markets gained real momentum:

- The first futures exchange in Europe, London International Financial Futures Exchange (Liffe), was launched in 1982
- The first privately held options and futures market, OM, was launched in Stockholm in 1984
- French derivatives markets, Matif (for futures) and Monep (for options) were launched in 1986 and 1987 respectively
- The first fully electronic financial derivatives exchange, Soffex, was launched in Switzerland in 1988
- Germany started developing its financial derivatives market in the late 1980s and this market, DTB was not launched until1990

Despite its late start, European financial derivatives' trading has rapidly caught up with US markets. By early 2000s, Eurex, born from a merger between Soffex and DTB in 1994, became the largest derivatives exchange in the world.
The explosive growth of new instruments is not limited to traditional marketplaces of Europe and United States (or Japan). It also contaminated emerging markets. In 2003, the busiest global derivative contract was Korean exchange index option, KOSPI.[3]

The growth rate of derivatives instruments is considerable higher than that of classical equities. Moreover, their impact on financial markets is not only quantitative. They have become the main supplier and determinant of liquidity and, for many analysts, it is the derivatives rather than the underlying cash instruments that shape the price discovery process.[4]

Table 1



Source: IOMA, 2003

1.2. Exchange-traded derivatives: tip of the iceberg?

The growth of exchange-traded financial derivatives has been paralleled by a less visible but equally, if not more, explosive development of over-the-counter (OTC) derivatives such as currency and interest rate swaps and, more recently, credit derivatives. This is a wholesale market dominated by large international banks and not accessible to retail investors.

Again, the proliferation of OTC derivatives is a recent phenomenon that only began to take off in the early 1980s in the aftermath of developing countries debt crisis, which highlighted the need for more active risk and exposure management. According to the International Swap Dealers Association (ISDA), founded in 1985 to facilitate the development of common definition and transaction rules, the notional value of OTC derivatives market has grown from some 24 trillion dollars in 1992 to over 100 trillion dollars in 2000.

Various derivatives markets have now attained a size, which is so huge as to defy conventional yardsticks, and a reach, which makes them ubiquitous to the point of mythology. Yet, there is a general feeling that they are not well-known or understood. Derivatives, particularly those traded over-the-counter, are pictured, even in the mainstream business media, as a lurking and treacherous multi-headed monster. Title of 1999 book by the Chief Economist of European Investment Bank, Alfred Steinherr, "Derivatives: The Wild Beast of Finance"[5] is typical of such a bloodcurdling imagery.[*]

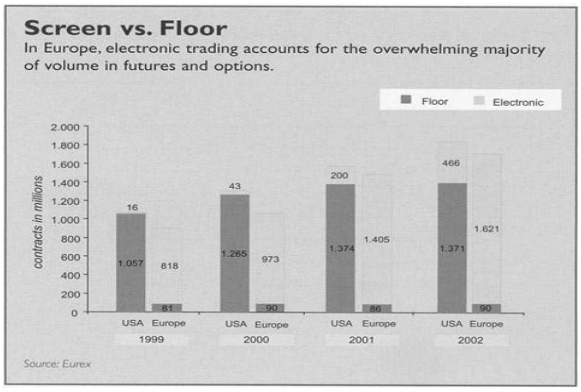
[*] Actually, the content of the book is a scholarly and objective discussion of financial derivatives and of the necessity of central banks' oversight of their development. That the author and editors choose the catchy title is indicative of the broad public perception of the topic. And Steinherr is far from isolated case. Warren Buffet, highly respected investment manager, called OTC derivatives, "financial weapons of mass destruction."

1.3. Differing evolution path: European – US differences

While the explosive growth of derivatives and exchanges trading them is a worldwide phenomenon, there are significant regional differences in the underlying development pattern. Of particular interest are the differences between the US and European development paths. Three aspects are noteworthy:

- Integration between traditional and derivatives exchanges. On both continents, derivatives marketplaces were initially set up as distinct entities from existing cash exchanges. Since then, their institutional paths have diverged. In the US, derivatives maintained their institutional autonomy. Two major Chicago exchanges remain independent from large equity exchanges, NYSE and NASDAQ. Until the advent of ETFs, both of these have struggled to gain traction in derivatives. In Europe on the other hand, all major derivatives markets are now part and parcel of mainstream exchanges. In most cases, the derivative market was taken over by the cash market (this was the case in France, Germany or Spain) but in the case of Sweden, it was the derivative market, OM, which took the initiative.
- Electronic trading approach. For a long time, US derivatives exchanges remained diffident toward the automation of their trading floors. The European exchanges, on the other hand, evolved rapidly toward electronic trading. By the late1990s, following a major battle for market share in bund futures between floor-based LIFFE and computer-based DTB, which was conclusively won by DTB, floor-trading for derivatives became a relic. The wholesale embrace of technology is considered as a major reason for the Europe's catching up with, and eventually overcoming, the US derivatives exchanges. Moreover, the latter's foot-dragging in the adoption of electronic trading has created an opening for new entrants, such as ISE, which managed to achieve US market leadership in equity options in a space of four years (between 2000 and 2004).

Table 2



Source: Van Steenis

- Public authorities' involvement. In the US, the development of exchange-traded derivatives was a typical bottom-up market innovation. In Europe, on the other hand, public authorities, particularly on the Continent, took an active interest in the new markets. French, German or Belgium governments saw the financial futures as integral part of their reform of public debt management. Similarly, the existence of active derivatives market was seen as major success factor for the launch of the euro.

For major European exchanges, with the significant exception of London Stock Exchange,[*] derivatives constitute the key determinant of their profitability and market valuation, as well as the critical element of their international strategy.

[*] It should be noted of that LSE sought to acquire LIFFE in 2001 but lost the bid to Euronext. In order to gain a foothold in derivatives, LSE acquired in 2003 London operation of the OM Group, which was then renamed London Derivatives Exchange.

According to Huw Van Steenis, leading European capital markets analyst from Morgan Stanley, the ability to innovate, to offer new products and services, will be the key differentiator in the competition among exchanges. He expects derivatives to be the primary driver of growth for European exchanges, accounting for half of all revenue growth over the next three to five years. [6]

2. AN OVERVIEW OF EMERGING INSTRUMENTS

2.1. Highly differentiated landscape

The universe of the derivatives is vast, heterogeneous and continuously evolving. While the established futures and options continue to grow robustly, a whole range of innovative instruments have been emerging over the last five years. Their appearance and subsequent performance have been driven by a variety of factors. In additional to traditional drivers - risk management, high liquidity or low transaction costs-, social and political considerations such as environmental pollution reduction or extended social protection or even anti-terror campaign began to play a role in financial instruments innovation. As we shall discuss below, their diversity and dynamism make it difficult to define a rigorous and invariant typology. However, we can provide an overview, based on their market experience and position. From this perspective, we can suggest following distinctions:

- *Successful products,* which are well established and broadly accepted. These include:
  - Portfolio trading instruments such as Exchange Traded Funds (ETF)
  - Customized equity markets derivatives such as Contracts for Difference (CFD)
- *Struggling products,* on which the jury is still out in terms of market acceptance. Of particular interest there are instruments designed to facilitate B2B capacity management in sectors such as energy or telecommunications
- *Green field products.* These are instruments to be traded on new markets, which are in the process of being created and launched. This is case of environmental markets, whether they trade weather derivatives or pollution rights
- *Blue-sky products.* These products are still in conceptual or design stage and appear far beyond the current scope of exchange-traded derivatives. Examples here include:
  - Social protection derivatives
  - Political futures
  - Entertainment futures.

Let's now review products in those categories.

2.2. Successful products

Exchange Traded Funds

Exchange Traded Funds can be defined as *baskets of securities* that are traded, like individual stocks, on an exchange. They are aimed at investors, both retail and institutional, who are looking for exposure to entire markets or sectors. They are seen as a cost-effective alternative to mutual funds and similar collective investments schemes. Their attraction is their dual nature, combining the advantages of funds and shares:

- Like funds, they track broad market and sectoral indices and therefore give their holders the precise mix of exposure and diversification defined by their investment strategy

- Like shares, ETFs can be bought and sold throughout the trading day. They can also be sold short and bought on margin. Because they are actively traded, their valuation is straightforward and immediate and avoid complications of NAV determination, which is a major operational headache for fund managers.

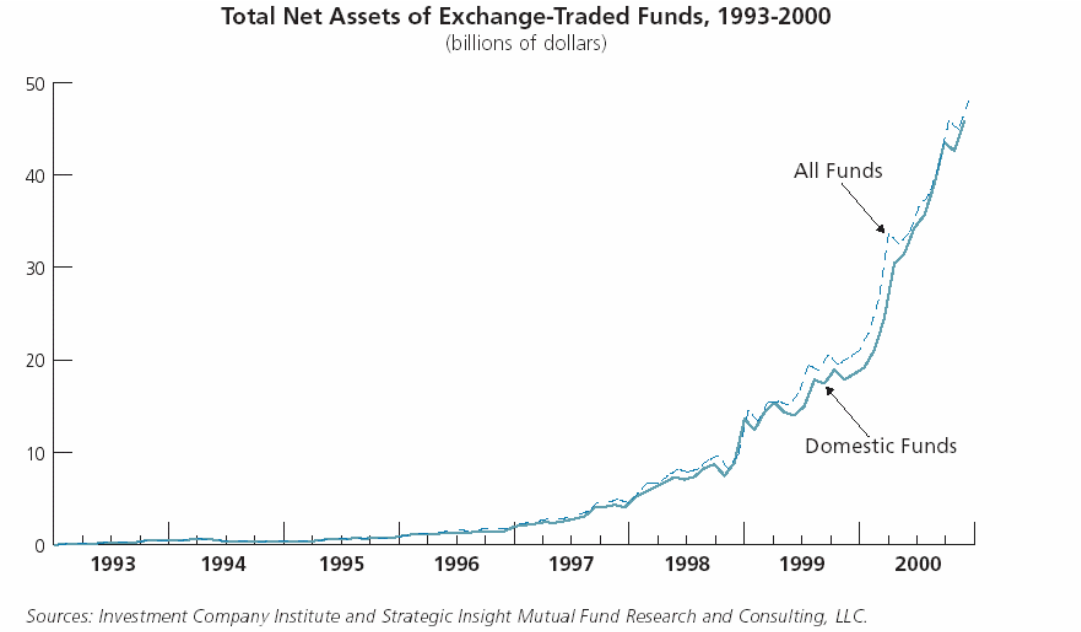
From the transaction cost perspective, ETFs charge lower annual expenses than even the least costly index mutual funds (typical annual management fees is less than 0.5%). They also offer tax advantages (which vary from country to country). However, to the extent they are frequently traded, and thus subject to trading commissions, their total transaction costs may not be significantly lower for active portfolio managers.
ETFs are a vivid proof of the triumph of modern finance theory. Their design is based on the findings of the portfolio management theory (PMT), which firmly established the benefits of broad market exposure and risk diversification. Interestingly, ETFs can be used both by the proponents of efficient markets ('random walk') investment approach, which postulates that the best strategy is to track the broad market indexes and by its critics, who believe that market averages can be beaten by a judicious choice of sectors and nimble timing. In any case, together with the options theory, the portfolio management theory has provided the conceptual underpinning of derivatives markets. In this area the symbiosis between theory and practice has been absolutely remarkable. Financial markets and their managers have shown a amazing ability to harness pertinent developments in economic theories and to integrate them into market design. On the academic side, the recognition has been remarkable: since 1981, no less than thirteen economists received Nobel Prizes for their work on financial markets.*

The global development of ETFs followed a familiar pattern:
- Launched first on a large-scale in the US by a small exchange, American Stock Exchange, in 1973
- Adopted by European markets with a five-year lag
- Integrated into the mainstream exchange business within ten years.

At present, ETFs are one of the fastest-growing financial instrument segments in the world, as shown by the Table 3 below. Between 2000 and 2002, ETFs have seen a tenfold increase in UK trades. In the US, QQQ, ETF tracking NASDAQ 100 stocks, has considerably higher trading volume than any of its well-known components (Intel, Microsoft, Oracle, etc.)
Given the obvious advantages of ETFs, as evidenced by their widespread adoption, one may wonder why it took so long for the exchanges to launch them on a wide scale. The answer to this question is not the lack of interest: mainstream exchanges such as the NYSE were aware of the success of stock index derivatives and have been exploring feasibility of trading baskets and portfolios of securities since at least the mid-1980s. What was holding them back was the lack of appropriate technological infrastructure. It is the progress in this unglamorous yet critical area that allowed the cost-effective introduction of transparent unbundling and rebundling of underlying assets, real-time pricing and hassle-free settlement, the key attributes of ETF trading.

* Tobin; Miller, Markowitz, Sharpe; Merton, Scholes; Akerlof, Stiglitz and Spence; Kahnemann and Vernon Smith

Table 3



CFDs and financial spreads

An interesting variation on the exchange-traded derivatives is the development of OTC products, closely linked to exchange-listed instruments and geared toward retail investors. A case in point here are the CFDs, contracts for difference, which are offered by all major UK brokers. CFDs are contracts between investors and stockbrokers. They are based either on listed UK stocks or on market indexes both in the UK and abroad. Their pricing shadows precisely the prices of underlying assets. Thus CFDs allow their holders to fully participate in the economic evolution of assets, including receipt of dividends and corporate actions. Relative to shares, CFDs offer three key advantages:

- High leverage: CFD holders are eligible for 90% margin
- Ability to go short as well as long
- Fiscal exemption from stamp duty (.5% of transaction value)

At the same time, CFDs differ significantly from listed options and futures:

- They offer immediate and transparent rather than mediated economic participation
- There is no premium specific to the derivatives.
- There is no predefined expiration/delivery dates.

CFDs can be best seen as a leveraged lending and borrowing of traded instruments by brokers to their customers. Thus, in addition to trading commissions, brokers charge financing charges to customers going long and pay interest to customers going short.

Another OTC product, specific to the London market, is financial spreadbetting. It allows investor to take a view, either on the upside or on the downside, on the future evolution of a given stock. The broker gives the sell-buy spread and takes the opposite side of the trade: in case investor turns out to be right, brokers pays the initial stake multiplied by the number of winning points and, conversely, receives a similar multiple of investor's stake in case of investor' loss.

Both products have been very successful. Exact trading statistics are difficult to obtain but it is estimated that CFD account for 30% of trading volume on the LSE and that the number of investors placing spread bets has doubled between 2002 and 2003.

However, despite their success, their use remain largely confined to the UK market. In case of financial spreadbetting, this may be explained by specificity of London markets, in particular the market-making tradition, which is absent from other markets. For CFDs, the question of their international potential remains open.

2.3. Struggling products

Industrial capacity: sure bet?

This is an intriguing segment. For many knowledgeable analysts and experienced practitioners, long-term gas and electricity delivery or telecommunications bandwidth contracts were obvious candidates for the next generation derivatives markets:

- They are based on strong underlying economics. Both energy and telecommunications are subject to strong and long-lasting forces of deregulation, which disrupt the traditional supply chain relationships. The universe of potential choices for buying and selling capacity has been considerably enlarged and became more uncertain and more volatile. The need for systematic hedging became more pronounced and widespread.
- Potential players are large, well-established and sophisticated industrial firms and major financial institutions with a considerable staying power. Furthermore, deregulation attracts new entrants, with innovative ideas and different risk profiles.
- They offer an opportunity to revitalise long-established but recently distended links between commodities and financial markets

B2B experience

And yet, while it is still too early to issue a definitive judgment on industrial capacity markets, experience to-date has been rather disappointing. Many projects have been launched, particularly during the heady days of the bull market in the late 1990s. Industrial capacity contracts and B2B e-commerce markets were apparently made for each other. Yet, the lofty expectations had not been fulfilled, as evidenced by experience in two sectors seen as particularly promising: telecommunication bandwidth and energy.

Bandwidth capacity

Bandwidth capacity initiatives launched in the late 1990s included:

- London-based Band-X,
- New York-based Arbinet
- Madrid-based Iber-X
- San-Francisco-based RateXchange
- Amsterdam-based InterXion

These companies were startups, backed by private equity and venture capital. Amounts invested were often substantial: 130 millions for Arbinet, 300 million for InterXion. In 1999, start-ups were joined by a heavyweight, Enron, which announced ambitious plans to set up a trading infrastructure in partnership with Cisco. Over the next two years, Enron invested two billion dollars in bandwidth trading.

Enron woes, discussed below, are well-known. Many observers consider that bandwidth trading compounded core energy trading problems at the company. Enron and other players have seriously overestimated the market potential. Excited by runaway growth prospects of the Internet, some analysts forecast that the bandwidth trading market would reach 400 billion dollars by 2004. These optimistic expectations led to consider-

able overinvestment in network infrastructure and resulting capacity glut. As a result the bandwidth prices went into free fall of the order of 30 to 50% in 2000 and 2001. Carriers were reluctant to sell capacity at fire prices, preferring instead capacity swap agreements, which made possible to mask steep price declines. Furthermore, they were not very enthusiastic about facilitating the interconnection of their networks, which would make easier client switching to another carrier. In the absence of their commitment, it proved difficult to develop any future contracts and market was restricted to spot trading.
Thus, market projections fell way short of targets. It is estimated by Yankee Group that in 2000, the value of bandwidth trading for Enron barely exceeded 10 million dollars.

Bandwidth trading appeared to have survived the B2B market meltdown and the Enron debacle. Band-X, Arbinet and InterXion are all still in business, although they remain private and none publishes revenue and profit statements. They have survived by enlarging their offerings to hosting and other telecommunications services. From fragmentary data available, it would appear that the bandwidth trading, while fast growing, is a niche business: Arbinet claims to be the largest players with 9 billion minutes a year. This represents less than 7% of international call minutes in 2003, which in turn are less than 20% of total call minutes in relevant national markets.

Energy

Energy capacity trading markets story is more complex and ambivalent. Interest in energy and energy derivatives markets predates the advent of B2B e-markets. Contrary to telecommunications, major sectoral players, both on production and distribution side, were actively involved in market creation and management. Securities exchanges were also involved. Thus prospects for energy markets looked bright and enticing: in 2001, Salomon Brothers estimated the potential market size within five year at 700 billion dollars.

The main reason for the ambivalence of any analysis of energy market is Enron. While telecommunications constituted an interesting sideshow, energy trading was the core of its highly conspicuous strategy. If the energy market appeared for a time as the paragon of a successful new market model, it was because of Enron claims. At its peak, in 2001, the company was trading some 2.7 billion dollars worth of energy contracts a day or between 700 and 900 billion dollars a year. Moreover, it was acting as a market-maker, taking a position on each and every trade, rather than as a broker, the traditional exchange posture.

Yet, it appears that those claims were highly dubious. More importantly, Enron is now broadly viewed as a market manipulator and has been explicitly and publicly accused of driving up electricity prices during California power crisis in 2001. As a result, the demise of Enron in 2002 has seriously damaged the overall reputation of energy markets. Many other energy companies withdrew and trading activity fell dramatically. Of the 15 largest power traders in 2000, by 2004, seven have abandoned the business and four have greatly reduced their trading activity. UBS Warburg, which bought Enron's trading operations (for no cash), has considerably reduced their scale and laid-off staff.

While the US Federal Energy Regulatory Commission (FERC) continues to maintain its faith in the virtues of energy markets, the general consensus is that their development

remains hindered by the persistence of "Enron effect." The major unknown of the energy trading market is the persistence of this effect.

Of course, each setback creates an opportunity for the bold. Thus, the withdrawal of established players created opportunities for new entrepreneurs. One of such entrepreneurs, Jeffrey Sprecher, launched in 2001 the Intercontinental Exchange (ICE), whose goal is to offer global platform for energy contract price discovery and trading. ICE has launched an Internet-based platform e-Confirm, which in May 2004 traded some 30 000 contracts. Backed by three oil majors BP, Royal Dutch/Shell, and Total Fina Elf, six top North American gas and power trading firms and four international banks, ICE has acquired in 2001 the leading European energy derivatives market, International Petroleum Exchange (IPE) in London.

European power sector was only marginally touched by the Enron folly and therefore has not really suffered from the backlash. Power market development has been steady, even measured, in sync with the deliberate and ambivalent pace of official power sector deregulation. According to PWC 2003 survey of European utilities:

> "With European markets still sitting ambiguously between liberalised liquidity and oligopoly, many fundamental issues remain to be resolved, among them the achievement of third-party network access and transparent charging mechanisms." [7]

In this area, Scandinavian countries were the leaders. A common energy trading exchange, Nord Pool, bringing together power systems of Denmark, Finland, Norway and Sweden was launched in 1993. In the last five years, some twelve energy exchanges have been launched in Europe, mostly as specialized subsidiaries of large securities exchanges. Thus, Powernext was created by Euronext, UPX and NGX were set up by OM Group and European Electricity Exchange (EEX) by Deutsche Börse. From the beginning, these exchanges sought international coverage; for instance, UPX was set up in the UK. In addition to exchange-related exchanges, few independent power exchanges were set up, notably in the UK.

Most of the new exchanges offered spot contracts, although EEX and UPX sought to capitalise on their affiliation with Eurex and OM respectively to offer a full range of energy derivatives (forwards, futures and options).

With few exceptions, such as Nord pool, which attracted over 300 participants and trades between 10 000 and 20 000 contracts per month, other exchanges suffered from lack of trading interest. This led to consolidation and restructuring. In Germany, EEX merged with its East German rival, LGX in 2002. OM has decided to pull out of energy trading altogether (except for trading systems support) and sold both UPX and NGX operations.

The key for the future development of European power energy markets is the strategy of large utilities, such as EDF, E.On, RWE or Electrabel. Past experience suggest that the active involvement of utilities is critical to the success of energy markets. This is in large part due to the overriding importance of physical delivery. On the other hand, strict and transparent rules are required to avoid conflicts of interest, which were so blatant in the Enron case. EU deregulation process mandates the setting up of TSOs, transmission system operators, to be responsible for the bulk transmission of electric power on the main high voltage electric networks. TSOs provide grid access to the electricity market players (i.e. generating companies, traders, suppliers, distributors and directly connected customers) according to non-discriminatory and transparent rules. In many

many countries, TSOs are in charge of the development of the grid infrastructure. TSOs are intended to operate independently from the other electricity market players. Not surprisingly, the leading European power exchange, Nord pool, is owned by two Scandinavian TSOs.

In practice, however, large European utilities have a strong tradition of vertical integration and may be reticent to unbundle their transmission networks, which are the main source of their profits. While they accept the need for interconnection, they prefer bilateral rather than multilateral agreements and seek less-than-complete standardisation, which would allow them to better control value transfer within the supply chain.

According to Price Waterhouse 2003 survey, utilities are beginning to recognise the importance of trading:

> " Trading has moved to play a much broader role in European utility companies' strategies, and Europe's utility leaders are moving to consolidate their trading capabilities, having faced significant 'catch-up' challenges in previous years." [8]

They have developed significant risk management expertise but are reticent to share it broadly and to prefer to use it in house in order to leverage the value of their operations. This strategy is consistent with trends observed in B2B e-markets, where co-operative industry-wide projects were abandoned in favour of private networks and "internal" marketplaces. It will be further reinforced by the persistent need for physical delivery, which would limit the scope for the development of sophisticated derivatives, largely based on cash settlement. In short, prospects for a single independent, pan-European energy market are far from auspicious.

2.4. Green field products

Environmental derivatives

Bringing together markets and politics

Energy has traditionally been a risky commodity, subject to price volatility and supply uncertainty. Oil price shock in the mid-1970s led to the explosion of all forms of oil trading, aiming to mitigate price and delivery risks.

Concerns about energy price volatility and their broader impact led in the mid-1990s to the launch of "weather derivatives." Such instruments allow energy users / suppliers, insurers and other organisations (ranging from agriculture to retailing and tourism) to offset and control the financial risks they are exposed to due to weather related phenomena, such as temperature variations or rain.

The potential capacity of markets to mitigate environmental risks triggered even more ambitious projects: why not use the derivatives markets to control not only natural but also man-made threat to the environment, such as pollution by various emissions (sulphur or CO2). Such approach would not only be economically efficient but also ethical and thus bring together, in a rare show of unity, markets and politics. Thus, weather derivatives, while promoted by market practitioners, also benefit from public support. In case of pollution trading such a support is a sine qua non condition of market launch.

Weather derivatives

Initial weather derivatives were designed and transacted by large energy trading companies. First trade was initiated in 1996 when Koch Energy (now Entergy-Koch) and Enron completed a HDD swap for the winter of 1997 in Milwaukee. Reinsurers and finan-

cial institutions soon entered the market, which then expanded to include end user industries that are affected by the weather, such as beverage sales and agriculture. According to a PriceWaterhouseCoopers survey, in 2001 the market has reached a $4.2 billion notional market value with approximately 4,000 contracts traded. By 2003, market size was estimated at 16 billion dollars.
This is largely an OTC market, usually requiring extensive customisation. More recently, attempts have been made in the US (by CBOT) and in Europe (by Liffe) to launch standardised exchange-traded weather derivative contracts. However, traditional derivatives exchanges may not find it easy to obtain volume (and hence liquidity) in weather markets since, by their nature, weather derivatives will tend to attract organisations that, at these early stages, are not familiar with or do not have access to current exchange-based markets. Also, the costs associated with entering new markets in terms of IT infrastructure, quote vendors, exchange fees and all the other tools necessary to effectively trade derivatives may discourage new entrants in the short term.
In Europe and Asia there are currently no exchange-based markets and weather risk is generally handled by 'ad-hoc' over-the-counter (OTC) arrangements between key players. The OTC markets do, however, currently suffer from difficulties in establishing accepted pricing models for weather related contracts, because the 'science' of how to correctly price weather derivatives is still very much in its infancy. The problem is further compounded by a lack of transparency. This makes price discovery for weather contracts even more difficult, particularly from the view of the 'buyer' of the contract. These problems can lead to very large spreads in OTC contracts (a sign of an inefficient market) and also the feeling amongst buyers that they may not be receiving a 'fair' arrangement from their OTC counter party.

Emission trading

Markets for emission control became highly visible in the context of controversy over the Kyoto protocol. Markets for trading pollution rights appear as an interesting and economically efficient alternative to the administrative controls of compliance with Kyoto criteria. According to the leading proponent of environmental derivatives, Richard Sandor, “The European Commission has embraced capitalism as a climate protection policy tool.”[9]
While this idea may appear revolutionary in Europe, in the US, there is already a rich tradition of using markets for emission control. According to a specialized broker, Evolution markets,

> “ The trading of emissions credits […] has become a mainstream market in the US energy sector. Trading began in several US states in the 1980s in the form of emission reduction credit (ERC) programmes, which required major new sources in certain regions to 'offset' their projected emissions by purchasing ERCs from existing sources: those that voluntarily reduced their emissions.
> The first market to create a tradable commodity on a nationwide basis was the sulphur dioxide (SO2) allowance programme, promulgated under the 1990 Clean Air Act Amendments to control Acid Rain. The SO2 market was the first 'cap and trade' environmental market - allocating a finite quantity of credits to a defined group of sources (wholesale electric generating units or EGUs). Since the first transactions in 1992, SO2 trading has flourished, with participation reaching far beyond the group of regulated sources to include a variety of speculative interests that have added considerably to the market's liquidity. According to US Environmental Protection Agency (EPA) records - a conservative estimate of market activity - trading volume has increased from nine to more than 25 million tons in the past eight years, with a notional annual value of transactions exceeding $4

billion last year. Not far behind is the nitrogen oxide NOx allowance trading market, a programme designed to control the transport of ground-level ozone in the eastern US. In 1998, NOx trading began in nine states under a coalition of northeast air regulators called the Ozone Transport Commission, which regulates major industrial sources such as the steel, paper, chemical, refining and cement industries, as well as EGUs. Conservative EPA records indicate that the notional value of last year's private NOx allowance transfers exceeded $300 million. "[10]

CCX project

The success of ERC programmes, the growing popularity of weather derivatives and increasing political interest in emission trading encouraged Richard Sandor to announce in July 2002 the launch in early 2003 of a specialised market, Chicago Climate Exchange (CCX).
The CCX project has been developed by 28 large companies, including Ford, DuPont and BP America, with the cities of Chicago and Mexico City, a group that emits 700m tonnes of carbon dioxide each year, more than Britain does. The companies most interested seem to be those with experience of other pollution exchanges, either abroad—Denmark and Britain both have markets in greenhouse-gas emissions and Canada is piloting one—or in the market to trade allowances for sulphur-dioxide emissions.
Project implementation suffered delays. Issues such as how to calculate companies' baseline emissions levels and how offset projects can generate emissions credits caused tension when CCX was being designed. The National Association of Securities Dealers has devising compliance procedures to give CCX some bite. Companies that fail to meet their commitments will be judged by their peers, and may face penalties.
CCX was finally launched in December 2003. Its initial schedule of reduction has been revised: the current goal is a 1% reduction from 1999 levels in its first year of operations, and another 1% annually until 2006.
While it is too early to judge CCX success, it is worth noting that in April 2004, IPE in London has announced that it established a link-up with the Chicago Climate Exchange, Under this deal, the CCX will grant the IPE a licence to list and market its European Union products on the IPE's electronic trading platform. IPE plans to make emissions contracts available on the IPE by the end of 2004.

2.5. Blue-sky products

Environmental derivatives seek to demonstrate that markets not only generate welfare indirectly through the wealth creation but can be explicitly designed for worthy social purposes. Another American academic, Robert Shiller, sought to push this idea even further than Sandor. His objective is to use markets to mitigate social inequality and reduce poverty. Similar ideas were postulated by a British think-tank, Demos.
Can markets be used to mitigate political risks? Some researchers even sought to use market trading to control terror. Unfortunately, their ideas met with rather unfriendly reception and had to be shelved.

Socio-economic derivatives

Macromarkets for long-term income maintenance and social protection

The starting point of Shiller's projects is a deep concern about current economic trends which are likely to exacerbate and perpetuate social inequality:

" Inequality has been on the rise in virtually all rich countries. This increase appears to be due, in large part, to the information technology and its effects on an interdependent

> world economy. There are reasons to expect a longer-run tendency towards much greater inequality. […]
> Advanced technology often means that a smaller number of skilled people supply their services over a wider area, producing a "winner-take-all" effect, where only the best do well. New technology produces far more pervasive and important changes in fortunes than those caused by dishonest boards or accounting shenanigans. Such changes stem from the very stuff of capitalism, undramatic events that unfold over many years: word processors replacing secretaries, industrial robots replacing assembly-line workers, and online-learning sites replacing professors. […]
> Although new technology can mean that jobs are replaced by machines, it has often created as much employment as it destroyed, albeit of a different type. Now, though, with the pace of technological progress increasing, there is a high degree of uncertainty whether lost jobs will ever be replaced with others that are as remunerative. A possible dearth of good career alternatives for many people could generate great inequality in coming decades."[11]

Yet, paradoxically, Shiller is optimistic: the same technology that is creating inequality could also reduce it. This technology needs to be coupled with the science of risk management, which combines elements of finance and insurance to help deal with the possibility of adverse events, in much the same way as bankers and financiers minimise the risks of doing business by using currency hedging and interest-rate swaps.
Shiller outlines a vision of what he calls "macromarkets";

> " In the future these same general risk-management techniques could be applied to every individual worker, as information becomes more available, as automation reduces the costs of tailoring risk-management contracts to individual needs, and as new technology is developed to deliver such services widely.
> The requisite financial tools that will allow broad populations to insure against adverse economic events are already being developed. The most basic principle of finance and insurance is that spreading risks over large numbers of people can reduce their impact. The challenge today is to discover how to make this principle work for the greatest economic risks that most people face.
> The same information technology that helps big businesses manage risks is providing greater detailed information about individual economic risks, allowing us to form thousands and thousands of indices of incomes and prices. We are developing huge databases of information about individual incomes, and their correlation with other economic variables. These databases are increasingly accurate and up-to-date, so that they can provide the bases for settlement of risk-management contracts.
> For most individuals, the biggest risks are their pay packets or the price of their homes. It is reasonable to suppose that, in coming years, our personal financial-services software, with the assistance of professional organisations or trade unions and pension funds, will allow people to make essential contracts to reduce income risk. Individuals may be able to create financial swaps of average incomes in their region (as measured by a regional income index), thereby reducing risk. It will also be possible to create home-equity insurance contracts that protect them against a decline in the market value of their homes.
> It will also be possible to create for individuals contracts that provide incentives for them to advance their own individual careers. These would be analogous to the kind of contracts that venture-capital firms draw up for the management of young companies. An individual may then go forth and develop a highly risky personal career, acquiring specialised skills that also have a small probability of being extremely important but carry as well a risk of becoming useless. Such individual contracts could be a breathtakingly important stimulus for our economy, if they free people from career risks and allow them to be more adventurous in all aspects of their careers. We may then expect to see an explosion of individual creativity and diversity.

> The same information technology should also allow the creation of large international markets for a complex array of aggregated risks that today are not traded at all. In the not-too-distant future, we can have what will in effect be online auctions for occupational-income indices, for gross domestic product and for swaps between the GDPs of different nations. These [macromarkets] can be used by insurers and other retailers of individual risk-management services to lay off the risks that they incur by helping individuals with their risks."[12]

First macromarket experiences

In October 2002, Goldman Sachs and Deutsche Bank created a new electronic market for economic indices that represent substantial economic risks, such as nonfarm payroll (a measure of job availability) and retail sales. Based on Shiller's ideas, this new market was made possible by a sophisticated trading technology, developed by Longitude, a New York company providing software for financial markets, called the Parimutuel Digital Call Auction. It is "digital" in the sense of a digital option: i.e., it pays out only if an underlying index lies in a narrow, discrete range. In effect, Longitude has created a horse race, where each "horse" wins if and only if the specified index falls in a specified range. By creating horses for every possible range of the index, and allowing people to bet on any number of runners, the company has produced a liquid integrated electronic market for a wide array of options on economic indices.

Guaranteed economic markets or social E-Bay

The notion of 'guaranteed electronic markets' (GEMs) was developed by an UK journalist, Wigham Rowan, working for a think-tank close the New Labour, Demos, in 1997.[13] The concept is less-well defined that Shiller's macromarkets. It entails establishing a central computer service that runs many thousands of open electronic markets. These are neither order-taking systems nor crude buyer–seller matching services, but instantly reliable marketplaces in which anyone can buy and anyone can sell with confidence. These markets will bring pure electronic trade both to deals in which enormous sums change hands and to those in which low level transactions as diverse as hire of vacuum cleaners around a housing estate, consumer money lending and sale of surplus industrial polymers between small manufacturers. Every problem that could blight Internet-style matching services will have been resolved for users of these markets. Neutrality of operation is assured and so is privacy. Each transaction is detailed in an authoritative, individualised contract: payment collection is then automatic. In addition, these markets are both informed and incentivised: they help users locate trading opportunities and offer inducements to trade responsibly.

Guaranteed electronic markets would be easily accessible. The technology would be non-proprietary, with markets available via the Internet or through interactive television to anyone who has proved their identity and established a means of payment. The system's own money deposit facilities are one possibility for this, allowing a link to users' bank accounts is another.

Although technically sophisticated, the key source of value added by GEMs for users is verification. Any counterparty offered to a buyer or seller by a GEM is safe because if they did not meet the automatically enforced requirements of that market sector they would not be displayed. Achieving this security across so many diverse markets will require the companies operating GEMs to go beyond simply writing code to liaise with organisations which would set the framework for each sector.

Given the wide scope of GEMs, they can be best seen as a social version of E-bay. So far, GEMs remain a conceptual construct.

Political futures

Derivatives markets have been designed to deal with uncertainty and risk of the future. What is more uncertain than politics? It is therefore not surprising that some academics sought to apply the tools of derivative trade to the political realm. So far, such applications were mainly experimental. This, however, did not prevent them from becoming highly controversial.

Iowa Electronic Markets

Probably the best known and longest-running project in this area is the Iowa Electronic Markets (IEM), set up in 1988 by Robert Forsythe at the University of Iowa Henry B. Tippie College of Business. These markets are small-scale, real-money futures markets where contract payoffs depend on economic and political events such as elections.
One of the markets the Iowa exchange offered was in vote shares: what fraction of the vote went to the Democratic or Republican candidate? It is particularly easy to assess the outcome of such a market and to compare it with alternative forecasts, like public opinion polls.
The Iowa Electronic Markets began trading real-money futures contracts on the outcomes of political elections and have since added other topics, most notably futures on the Federal Reserve's interest rate decisions. In a study published three years ago, Forsythe and his colleagues found that over 12 years—a period covering 41 elections in 13 countries—the Iowa Electronic Markets consistently outperformed opinion polls in forecasting election outcomes. [14]

Policy Analysis Market and “Terror futures”: Unfortunate Pentagon experience

In July 2003, Pentagon's Terrorism Information Awareness Office proposed online futures trading market in which anonymous speculators would bet on forecasting terrorist attacks, assassinations and coups. Following public outcry and vocal objections raised by politicians and opinion makers in the media, the “terror futures market” project was squashed in two days after the announcement.
Yet, many serious observers, including respected Berkeley economist and New York Times columnist, Hal Varian, regretted the bad publicity and untimely demise of the project, which they deemed worthwhile. [15] “Terror futures market” was part of a the Policy Analysis Market (PAM) an experimental futures exchange developed by the United States' Defense Advanced Research Projects Agency, with the cooperation of Net Exchange, a San Diego research firm specializing in the development of online markets and based on ideas of George Mason University economist, Robin Hanson. PAM was to be "a market in the future of the Middle East", and would have allowed trading of futures contracts based on possible political developments in several Middle Eastern countries. The theory behind such a market is that the monetary value of a futures contract would be reflective of the probability of the event it is tied to occurring, as market actors rationally bid a contract either up or down based on reliable information. One of the models for the PAM was the Iowa Electronic Markets.
The variables that were at the core of the PAM design were indexes of political, economic and military activity. The most useful potential market would have been a market for futures in a "political instability index," a weighted average of various political indicators, like the number of mass demonstrations, unemployment levels, arrests and assassination attempts.

In his review of the PAM experience, Varian concluded:

> " Given the public outcry, it seems clear that there will not be a public market in assassination futures anytime soon. But there is no reason not to have a futures market in political, social and economic indicators, which is what the Pentagon's project was actually about. We desperately need better ways to forecast political instability, and the Policy Analysis Market had significant promise. It's sad to see poor public relations torpedo a potentially important tool for intelligence analysis."[16]

Entertainment trading: Importance of the "futile"

The exploration of how far the derivatives trading technologies and approach would allow stretching the reach of financial markets should not be limited to the "useful" domains of economic, social and political policies. As a matter of fact, the opposite side of the spectrum, the "futile" domain of entertainment offers as large if not a bigger potential (and more certain prospects of financial success). The challenge here is different: the applicability of market principles to entertainment is not an issue. It actually has been a well-established and widespread practice. What is sport betting if not a forward market, settled in cash? The key question here is that of regulatory acceptability. It is interesting to note that while financial markets are deemed by many to be ethically suspicious to be used as tools of social redress, financial market regulators appear to hold similar views toward entertainment trading, deemed gambling and therefore frowned upon by those in charge of investors' well-being. Thus, the Financial Services Authority (FSA), the London market regulator allows entities it oversees to offer financial spread-betting but not the sport-betting, although the former is entirely based on the latter. One may wonder whether this is not another case of the regulators lag. In practice, convergence already set in and boundaries are being blurred. Not only financial operators are borrowing from the sport betting but sport betting operators are using advanced trading technology (real time prices and margining for instance) to enlarge their product offering and customer reach. Online betting is one of the fastest-growing, if not well-known,[*] segments of B2C e-commerce and companies such as betfair.com are true Internet success stories.

Sports

So far, sports betting was entirely based on the outcome of games. It is probably only a matter of time before products are launched on sports personalities. For financial intermediaries and investors, Zidane or Beckham futures are probably a simpler and better idea than Bowie bonds, which entailed complex securitization process and had limited liquidity.

Hollywood Stock Exchange

In any case, derivatives have already met Hollywood. The Hollywood Stock Exchange® was founded in 1996 in Century City, California, to offer trades on celebrities, movies and music. Those trades are made with a currency called the Hollywood Dollar®. HSX also syndicates the data collected from the Exchange as market research to entertainment, consumer product and financial institutions and as original programming to radio, television and print media. HSX attracted venture and corporate funding and in

[*] In its May 15, 2004 issue, the Economist surveys e-commerce and its different aspects. This survey, as many others, resembles 15th century maps, with wide blank patches of unexplored areas. Not surprisingly, arguably the largest and most profitable of the B2C segments, pornography, is mentioned only in passing. Nevertheless, a special section is dedicated to entertainment. However, this section omits any discussion of online gambling and sport betting.

2001 was acquired by Cantor Index Holdings, L.P. and an affiliate of Cantor Index Limited, a leading online financial spread trading firm, owned by the leading money broker Cantor Fitzgerald. Hollywood Stock Exchange has a good track record in picking Oscar nominees.

3. NEW INSTRUMENTS: NEED FOR A DYNAMIC APPROACH

3.1. Stable segmentation: an impossible task

This overview is far from exhaustive or even systematic, as new instruments and projects emerge all the time: the ability to innovate is apparently outpacing our capacity to track it. It demonstrates however the vitality and dynamism of financial market innovations. It is important to understand its underlying dynamics. Not so much to predict which instruments are likely to be most successful, a hazardous task if past experience is any guide, but to explore their implications for competitive environment of exchanges and for public policy.

Segmentation of new instruments is a regulatory necessity, in order to allow their acceptance or refusal to list and to trade.
Generally speaking, one finds three broad segmentation criteria:

Primary function of the instrument:

- Risk reduction and transfer
- Transaction cost reduction
- Exposure capture

Interest rate futures or currency options are typical examples of instruments designed for the first function. Index derivatives embody the third function. ETFs and CFDs are intended to reduce transaction costs. However, it is clear that these functions are not only not mutually exclusive but highly complementary: successful new instruments offer a combination of three functions.

Customer segmentation

- Financial institutions
- Final investors (institutional or retail)
- Businesses

From the operational viewpoint, this is probably the most pertinent and clear distinction. Products offered to final investors need to have different risk profile and settlement characteristics than those offered to financial institutions and businesses. Futures have been traditionally a wholesale product, with a high degree of risk and physical delivery imperative. Options on the other hand, while potentially very risky, by their very nature appear well-suited to investor segments.
However, as markets develop, mapping between instrument categories and customer segments becomes more complex. Thus, futures can now be settled in cash and single market futures have been designed for retail investors.

Trading venue

Exchange-traded instruments vs. OTC-traded instruments

At one level, this criterion reflects a distinction between standardised, exchange-traded, products and customized products, traded over the counter. This distinction is not purely operational. For many analysts, it actually entails a value judgment. The bulk of criticism of derivatives, describing them for instance as "Apocalypse roulette" and a "lethal universe,"[17] aims at OTC instruments. Its implication is that derivatives exchanges are heaven, while OTC derivatives are hell and thus the only way to salvation is for OTC derivatives to migrate to regulated markets. In reality, things are considerably more nuanced. Trading venues are highly complementary and are becoming more integrated every day. Thus, many OTC instruments are now cleared through regulated entities. For instance, London Clearing House, which offers clearing services to Euronext marketplaces, launched in 2001, a facility, SwapClear, to act as central counterparty for wholesale interest swaps. By the end of 2003, the notional value of registered traded stood $26.5 trillion.

At the same time, exchanges provide their customers trading platform for OTC trades. This is particularly the case of energy trading markets, where both ICE and Nord Pool, offer such a facility.

Nor are OTC instruments confined to wholesale segments as shown above by the development of CFDs and financial spread-betting in the UK retail market.

Segmentation criteria lines are meant to be broken and blurred. Derivatives market have developed most successfully at their intersection

3.2. Development logics: commoditisation, intermediation, dematerialisation

A more fruitful approach is to look at broader logics that have been driving the development of derivatives and their interaction:

The most apparent logic is one of *commoditisation*. Its two main drivers are standardization and liquidity: the key to success of any instrument is its standardization, which makes its intelligible and accessible and therefore creates the necessary conditions for liquidity.

A closely related is the logic of *intermediation*, reflecting various components of motivation of financial intermediaries. The most often mentioned motivation is risk protection. However, intermediaries are also interested in expanding their offerings, in order to escape the logic of commoditisation and resulting pressures on profitability. Derivatives methodology offers them a priceless possibility of unbundling:

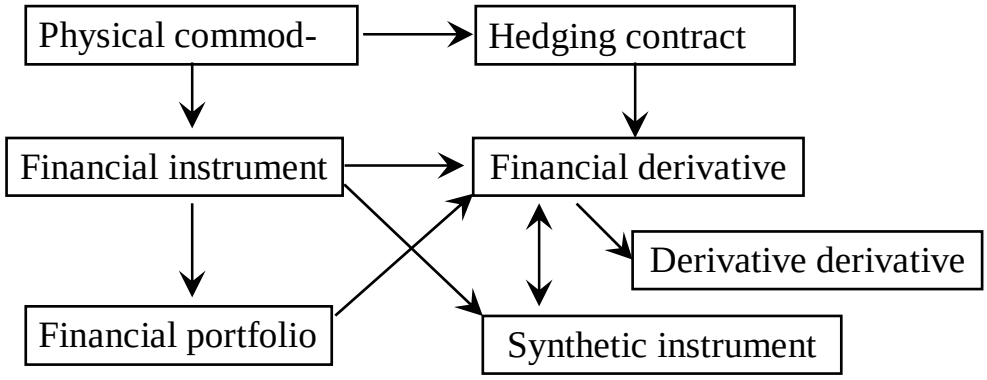
- Separating different risks: interest rates, currency, credit
- Separating benefits of economic participation from actual ownership

Intermediation logic helps to explain the rapid pace of innovation and the interplay between OTC and exchange-based instruments.

The third logic is that of *dematerialisation*. The explosive development of derivatives could not have occurred without their extensive dematerialization. It not only concerned their trading (via electronic platforms) and settlement (through book entry and cash delivery) but, importantly the very nature of instruments. Dematerialisation allowed unbundling of their underlying components and led to their greater abstraction and to a greater focus on pure notions and explicit pricing of information, uncertainty and risk.

TABLE 4

GROWING ABSTRACTION OF MARKET INSTRUMENTS



Source: GEF

Logic of dematerialisation explains an apparently startling inversion of the respective role of derivative and underlying cash instruments. Conventional wisdom is to use derivatives as convenient representation of the underlying. Derivatives methodology approaches cash instruments as bundles of derivatives. It throws a new light on their properties and helps to explain the critical role of derivative markets in price formation and discovery.

From liquidity to tradeability

As we move forward, we can expect that the logic of dematerialisation and intermediation will progressively become more important than the logic of commoditisation. This would transform the role of liquidity as a decisive success factor for new instruments. For abstract and highly customized instruments, liquidity, in the sense of large trading volume, may be hard to achieve. On the other hand, such instruments need to be tradable, which means intelligible pricing, cost-effective trading and secure settlement. All liquid instruments are tradable, however not all tradable instruments are liquid.

4. IMPLICATIONS FOR COMPETITIVE STRUCTURE OF EXCHANGES

4.1. International differences

Between EU and US markets

Financial derivatives instruments are often seen as a pure American product and their development as a vivid example of what Steinherr calls “the Americanisation of Global Finance.” It is true that financial derivatives were largely born in the US as did the underlying financial theory. On the other hand, Europe can boast an historical tradition of derivatives going back to 17th century. Furthermore, although they have not always been most innovative in their product launch, European exchanges have demonstrated their ability to develop electronic trading platforms and to leverage this ability into a global market leadership.
At present, European exchanges are well-placed in the competitive race with their existing US counterparts, whether in New York in Chicago. However, it is not sure that the

biggest competitive threats will come from there or from aggressive newcomers such as ICE or ISE, which focus on derivatives.

Between EU markets

At present, the duel between Euronext-Liffe and DG Eurex complexes is seen the royal battle for the European derivatives market crown, with other marketplaces relegated to niche playing. Yet, this may be a somewhat simplistic view. Although the London Stock Exchange is handicapped by its derivatives weakness and lack of clear strategic direction, London as a derivatives marketplace is flourishing. It is the center of OTC derivatives activities both in wholesale (swaps and credit derivatives) and retail segments (CFDs and financial spread betting). Furthermore, it is in London that critical mass of derivatives practitioners, product designers, traders and specialised brokers, back-office specialists, can be found. Regardless of the institutional battles outcome, London is likely to preserve its dominance as leading European derivatives center.

4.2. Consolidation or proliferation of exchanges?

Looking through the derivatives glass offers a new perspective on the question of consolidation of European exchanges. It introduces a dynamic dimension. The critical question is no longer: Who will control the trading of European blue chip equities or leading market indexes but: Who will grab the lions' share of new products and instruments and associated products and services? In other words, does the emergence of new products create opportunities for new entrants and if yes, where such entrants are likely to come from?

Lessons of B2B 'boom and bust': no place for amateurs

One may argue that the derivatives do not fundamentally improve newcomers' chances of success:

- One of the clear lessons of the B2B e-markets boom and bust between 1999 and 2001 is that this is not an area for amateurs no matter how entrepreneurial and well-heeled they may be. In this domain, the Silicon Valley garage model is not applicable.
- One reason for it is that neither users nor regulators of financial markets are willing to underwrite the credit and reputational risks created by such newcomers.
- A related reason is the need for in depth expertise not only in trading but also in clearing and settlement. And, on this score, existing exchanges have a strong advantage
- Another and probably more fundamental reason is the remarkable ability of incumbents to integrate innovation. Clayton Christensen's model of disruptive innovation appears less pertinent in financial sectors than in others. Financial institutions, whether retail banks, investment banks or exchanges, demonstrated time and again their capacity to internalize entrepreneurship and innovation and to turn those to their advantage.[18]

The role of users

Yet, the barriers to entry for entrepreneurs do not imply that no newcomer stands a chance to succeed. This was certainly not the case during the first wave of the financial derivatives development, where newcomers such as OM or previously peripheral players such as CME established strong and durable market positions.

In the emerging landscape, energy and environment represent critical marketplaces where battle between newcomers and incumbents will be fought. As discussed above, in those markets, involvement of users, large utilities and/or transmission service operators is absolutely critical. Those users are sophisticated and resource-rich. Furthermore, for them energy and environment trading constitute a core business. The only question is to what extent they will put their eggs in co-operative baskets and to what extent they will pursue proprietary or clubby solutions?

4.3. Internal outlook and posture of securities exchanges

Securities exchanges in general and the European exchanges in particular have undergone fundamental changes in all aspects of their business in a relatively short timespan. From clubby non-profit co-operatives they have become aggressive profit-driven public companies. Some of them emphasise their technological prowess, other their market depth and diversity.
Yet, their transformation is far from over. Constantly changing mix of offerings and products is bound to have a deep impact on their outlook and posture. Exchanges will have to learn how to manage product lifecycle: incubating new products, timing their roll-out and, if necessary, precipitating their withdrawal. They will have to become more adept at customisation and personalization of their products as boundaries between OTC and exchange-traded products will continue to blur. At present, they see other securities exchanges as competitors. They also are beginning to compete with their erstwhile owners and present major customers, large financial institutions. As e-commerce progresses, they will need to confront challenges from businesses such as e-Bay, which already became a large B2B market (for used industrial equipment for instance).

5. PUBLIC POLICY ISSUES

5.1. Contentiousness

One thing should be clear from this overview: the derivatives are unlikely to wither away. If anything their visibility and importance in the public policy debate is likely to increase, particularly if financial derivatives are to be used as support of social and environmental policies. Such use will not eliminate the controversy about potential risks of derivatives. For one thing, the controversy is almost theological in nature, with protagonists basing their arguments as much on their deeply held convictions as on objective and empirical analysis. For another, while the derivatives may mitigate the problem they are meant to address they may not eliminate it completely.
In any case, the actual impact of derivatives is difficult to assess, given the difficulty of establishing appropriate comparison benchmarks. Do the derivatives contribute to a more frequent occurrence of financial crises or to do they increase the resilience of financial systems. In their absence, would the crises be less frequent or more disruptive? There are no definite answers to these questions. Yet, it is likely that the use of derivatives as a price discovery mechanism for a broad range of topics may contribute to a greater price volatility. To the extent that the ascendance of markets is not well understood and widely seen as a dictatorship of blind economic forces, it can generate a strong social backlash.

In the case of social derivatives, their widespread use is likely to raise the specter of 'moral hazard': the existence of income insurance programs may induce reckless behaviour, work avoidance and excessive spending. Shiller addresses the moral hazard issue directly but it is not certain that he has fully convinced the skeptics.

One possible solution to the growing contentiousness could be the creation of controversy futures markets. Such markets would allow a closer monitoring and maybe even an economic valuation of shifts in opinions and judgments. They would crystallize Keynes' idea of the "beauty context": it is not enough to judge an idea on its merits, one has to take into consideration what opinions and views of other judges.[19] Derivatives technologies offer a structured approach to the aggregation of conflicting views and opinions.

5.2. Regulation

Regulators will need to adopt a greater flexibility in their definition and acceptance of derivatives. Can the mutual recognition principle, today applied across geographical boundaries in the EU, be extended across sectors? For instance, can a company authorised to offer sporting bets automatically be licensed for financial spread-betting and vice-versa, can a financial spread-betting supplier offer sport betting to his customers. Regulators are already showing flexibility in their treatment of customized derivatives. The proposed Multilateral Trading Facility, to be authorized as part of the new EU Investment Services Directives, can be seen as regulatory response to standardization/personalization dilemma.[20]

Yet at the same time, regulators have to remain vigilant to ensure the level-playing field. Will energy exchanges, controlled by utilities or TSOs be subjected to similar regulatory regime as financial exchanges? What should be the treatment of private exchanges and electronic auction platforms? Should it be uniform or differentiated in function of size and market power of the exchange?

As the derivatives become more important in revealing price discovery across new socio-economic areas, regulators will need to ensure the integrity of the process so as to avoid price manipulation. This is going to an even more challenging task than for mainstream securities, due to the key role of users in capacity markets and the growing abstraction of derivatives instruments. Statistical indicators such as the unemployment rate or the budget deficit are already highly controversial. Will their use as a basis for socio-economic derivatives made them less or more reliable?

Finally, should the derivatives be used to reduce the burden of regulatory oversight and increase regulatory efficiency? All market participants complain about increasing costs of regulation yet we sorely lack mechanisms to calibrate and allocate these costs. If we were to consider regulatory licenses as put options granted by regulators to underlying entities could we value such options? Is regulatory derivatives market a blue-sky idea or a concept worth further exploration?

BIBLIOGRAPHY

Allen, F., Morris, S. and Hyun Song Shin, "Beauty Contests and Iterated Expectations in Asset Markets", Cowles Foundation Discussion Paper No. 1406, April 2004

Banks, E., Exchange-Traded Derivatives, Wiley, May 2003

Damodaran, Ah and Subrahmanyam, M.. "The Effects Of Derivative Securities On The Makets For The Underlying Assets In The United States: A Survey," Financial Markets, Institutions and Instruments, 1992, v1(5), 1-22.

Evolution Markets, LLC, "The evolution of the environmental markets," 2004

Forsythe, R., Rietz, T. and Ross, T., "Wishes, Expectations and Actions: A Survey on Price Formation in Election Stock Markets," The Journal of Economic Behavior and Organization, 39, 1999

Goldfinger, C. "Innovation in financial services," Communications and Strategies, November 2002

Goldfinger, C. "ISD II Directive debate about trading venue diversity: The tree and the forest," FESE Convention, London, June 2003

Greenspan, A. , "Over-the-counter derivatives, " Committee on Agriculture, Nutrition and Forestry, United States Senate, February 10, 2000

Hanson R et al, "The Policy Analysis Market: An Electronic Commerce Application of a Combinatorial Information Market," EC'03, JUNE 9-12, 2003,

IOMA Derivatives Market Survey 2003, WFE, 2004

Kambil, A. and van Heck, E., Making Markets, Harvard Business Press, 2002

Liss, D., Coffee Trader, Random House, 2003

Markillie, P, "A perfect market: A survey of e-commerce," Economist, May 15, 2004

McMillan, J. Reinventing the Bazaar, Norton 2002

Price WatehouseCoopers (PWC), Energy trading, Re-establishing sound foundations, 2002

PriceWaterhouseCoopers (PWC), Movers and Shapers 2003 Utilities – Europe

Rowan, W., Guaranteed electronic markets the backbone of a twenty first century economy?, Demos, 1997

Sandor, R., "The convergence of environmental and capital markets: another step", Environmental Finance, November 2001.

Scott, Louis O. "The Information Content Of Prices In Derivative Security Markets," International Monetary Fund Staff Papers, 1992, v39(3).

Shiller Robert, "Risk management for the masses", Economist, Mar 20, 2003

Shiller Robert, The New Financial Order: Risk in the 21st Century, Princeton, 2003

Steinherr, A., Derivatives: The Wild Beast of Finance, Wiley, 1999

Tamarkin, B. , The Merc, the Emergence of a Global Financial Powerhouse, Harper, 1993

Gosmano, J. and Ware, A. "ICE Benefits From Enron Concerns, Reports Surge in Trading Volumes," The Oil Daily, November 14, 2001

Thomson, R, Apocalypse Roulette: Inside the Lethal World of Derivatives, MacMillan 1998

Tsetsekos, G. and Varangis, P., "The Structure of Derivatives Exchanges: Lessons from Developed and Emerging Markets, "The World Bank, December 1997

Varnholt, B., "Six Recent Reports On Financial Derivatives: A Critical Appraisal", IFCI, Geneva, 1995
Van Steenis, H., "The Outlook for European Exchanges: Investors Demand Innovation and Bold Moves," Financial Industry Magazine, Outlook 2004
Varian H., "A good idea with bad press," The New York Times, July 2003

Notes

[1] Steinherr, p. 19
[2] Liss
[3] IOMA, 2004
[4] Scott, Damoradan
[5] Steinherr
[6] Van Steenis, 2004
[7] PWC,2003
[8] ibid
[9] Sandor, 2001
[10] Evolution
[11] Shiller, Risk management
[12] Shiller, ibid
[13] Rowan
[14] Forsythe
[15] Varian
[16] ibid
[17] Thomson
[18] Goldfinger, Innovation
[19] Allen
[20] Goldfinger, ISD