

# Derivatives Market Development

Key Success Factors in Building a New Derivatives Market



A White Paper from Alberta Market Solutions Ltd. (October 2003)

## Table of Contents

Overview and Scope.....	1
Market Environment.....	3
Legal and Regulatory.....	9
Participants.....	11
Market Development.....	14
What Next?.....	21

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## OVERVIEW AND SCOPE

### Introduction

This paper describes the major factors influencing the viability of a new derivatives market. It is targeted primarily at emerging markets or markets that do not yet have a derivatives market infrastructure and is intended as a guide to understanding the major factors determining the appropriateness and likelihood of success in developing a new derivatives market.

Most of the discussion here relates to the establishment of exchange-traded derivatives in a formal, regulated environment. This does not mean that the issues raised do not apply to over-the-counter (OTC) markets. But since OTC markets are each unique in their own way, it is harder to draw generalized conclusions about how a particular issue affects them – one would need to look at the specific OTC market under consideration and see what observations are applicable. This, incidentally, illustrates one of the advantages of an exchange-traded derivatives market: the fact that they trade standardised products opens access to a much broader range of users (the other big advantage is that trades are nearly always cleared through a central counter-party which greatly reduces risk of default, compared to an OTC market.).

Many, if not most, new derivatives markets will be interested in launching commodity-based contracts even if their initial inclination is to focus on equity derivatives<sup>1</sup>. However,

<sup>1</sup> Until the invention of Eurodollar futures at the CME and Treasury Bond futures at the CBOT, virtually all derivatives were commodity based and futures exchanges evolved their equity derivatives on the back



each commodity class (metals, agricultural, energy etc.) has unique characteristics and, even within a class, there can be considerable diversity. So a proper analysis of the issues facing the launch of a commodity derivatives contract belongs in a more detailed presentation than this one. Some of the key issues specific to commodities are covered on page 18, *Commodities*.

Many market operators are already trading equities and so the issues faced in launching equity derivatives will be of particular interest to them. Equity derivatives pose their own distinct set problems and many of these are outlined in this paper (see pages 6, 7, 10 and 14).

The main objective of this paper is to identify the winning conditions for a successful derivatives market. What characteristics need to be in place and what pitfalls should be avoided when a market operator sets out to create a new derivatives market?

## Derivatives

For completeness, let us define what we mean by a “derivative.” As the name suggests, it is a financial instrument whose value is “derived” from something else – either another financial instrument or an index or measurement of some kind (e.g. the weather). But describing it in these terms does not really uniquely define it – after all, symbol MSFT on NASDAQ “derives” its value from a set of investors’ beliefs and sentiments about fundamentals, technical trends, hot tips etc. but it is not a derivative. Better to look at it this way: while a conventional spot market (e.g., a stock market) trades “assets,” a derivatives market trades “promises.” A spot market always deals in the delivery of physical products or assets and each transaction results in a change of ownership. In contrast, a derivatives contract only deals in the sale and purchase of a “promise” – a promise to deliver something or pay something, given certain conditions. A

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of their commodity experience. Recent history has reversed this: Eurex – the world’s biggest derivatives exchange – started as an equity and debt derivatives exchanges and only later added commodity derivatives. Now, the Eurex model looks more likely to be emulated by most nascent markets.

derivatives contract might result in physical delivery or it might not – the delivery mechanism is not the defining characteristic, indeed the delivery may well be handled by the spot market infrastructure.

Because it is a contract, full payment for the underlying contract value does not need to be made up front when a derivative is traded. Instead, the market merely demands some security against potential price fluctuations (i.e., margin for futures positions and short option positions) or payment of a premium in the case of an options holder. This is what gives such great scope for leverage and this is why derivatives are popular with speculators seeking disproportionately high returns.

There are fundamentally two types of derivatives: futures and options. Other sub-types exist within these two broad categories – forwards, for example, are like futures except that cash settlement always occurs at the time of the original delivery date rather than at the time the position is closed out. There are also different types of options: their exercise style can vary (“American style” means the holder can exercise any time; “European” means the holder can only exercise on the expiry date<sup>2</sup>) and “exotic” options can have unusual conditions attached to their value such as barrier options which are only exercisable if the underlying asset reaches a certain price level. But exotics only exist in the OTC markets: no exchange has yet launched trading of exotic options and they have limited popularity.

Exchange-traded derivatives offer several advantages over OTC derivatives: They are standardised, meaning that their contract terms are consistent from one instrument to another – this introduces fungibility into what would otherwise be a free-for-all. Exchange traded derivatives are more likely to have guarantees of liquidity through the provision of market makers and to have minimal counter-party risk since trades are generally novated through a central clearing counter-

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<sup>2</sup> There are others too such as the little-known Japanese style which can only be exercised on a Thursday!



party. They are subject to investor-protecting regulation.

All of these benefits have their flip-sides however which the OTC market is able to exploit: the absence of standardisation means that the OTC market offers flexibility; the absence of exchange provided liquidity means trading costs are lower and most professionals probably appreciate that the lighter regulation that exists in the OTC market. Nevertheless, from the perspective of the non-professional in particular, exchange-traded derivatives do offer meaningful advantages. Non-professionals would most likely not use derivatives at all if they were not exchange-traded. As a result, OTC derivatives markets are almost exclusively used by professionals and institutions<sup>3</sup>.

#### **An observation on B2B markets**

It is worth noting parenthetically that many B2B markets are effectively derivatives markets in nature. With the exception of spot forex, it is hard to think of a fungible continuous auction market where the trading, clearing and settlement models resemble the conventional securities market and its associated CSDs. But many of the potential B2B markets strongly resemble the derivatives model. (In this context, “B2B” means B2B exchanges where buyers and sellers trade agreed, well-defined contracts in contrast to the broader world of B2B “e-commerce” which can include almost any commercial transaction conducted via an electronic network).

B2B markets mainly deal in forwards, not futures. Futures are a more “advanced” form of forwards in the sense that, in a formal centrally cleared futures market, the ordinary physical contract (to trade something for delivery at later date at a fixed price) is converted into something that has some additional, rather special, characteristics. A futures contract is fungible, it contains minimal counter-party risk and its cash flow can be immediately realised at any time. None

of these things are necessarily true of forwards.

The B2B market comprises the ordinary daily dealings of buyers and producers. The participants in most B2B markets will tend to think of their market as consisting of physical sales-and-purchase contracts. Many of them would be surprised to learn that these contracts have a technical label, namely “forwards.”

Users of derivatives perceive their marketplace differently. Their physical market and the derivatives markets are just different aspects of their overall risk profile. They have arrived at this state because there is an exchange, clearing and banking infrastructure which provides all the standards and procedures to allow this to happen: fungible contract definition, novation, standardised daily settlement procedures, margining, exchange-for-physical etc. Futures just do not exist outside that exchange infrastructure.

Hence, almost by definition, continuously-traded fungible B2B markets consist of forwards. Of course things are not so neatly compartmentalised; many B2B markets are used by practitioners who have long been users of derivatives markets. But the point to note is that the futures contract is an evolutionary product that has nearly always developed from an existing physical forwards market.

Many exchanges, even those in less developed markets, may contain infrastructure, which can be adapted to create a fungible B2B market. So it is feasible that a derivatives market may develop via that route, especially in very high volume markets such as energy.

#### **MARKET ENVIRONMENT**

A successful derivatives market requires the right overall environment in order to flourish. Some financial authorities suffer from a “Me-too” syndrome, which assumes that, in order to take their place in the ranks of markets-to-be-taken-seriously, they must have a derivatives market. But it is important to study each case to see whether the conditions are right – in some cases it may be better to wait.

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<sup>3</sup> The one exception to this would be the forex market where banks offer retail and small business customers derivatives products which are effectively traded OTC.



The major environmental elements determining success are discussed here.

### Traditional barriers

Until very recently, the potential for a start-up derivatives exchange was hampered by a number of factors, unrelated to whether or not there was investor demand for the trading of derivatives. These factors include:

- a) Outright hostility from politicians, regulators, the media etc. due to the poor reputation of derivatives, which have often been blamed for market crashes, excessive speculation, bankruptcies etc.
  - b) Lack of product knowledge amongst both investors and “professionals” (brokers, exchange personnel and fund managers), which limited the capability and demand for product development.
  - c) Inadequate competition in the securities industry:
    - To brokers who were unfamiliar with the product, derivatives trading sometimes appeared unattractive. They believed that the status quo – straight commissions based on the value of the underlying security – earned them higher returns than would be the case with low-cost derivatives trading. For example, the commission on an index futures contract which gave a client \$100,000 dollars of equity exposure would be many times lower than would be the commission on trading \$100,000 worth of the same basket of securities that constitute the index. A similar problem arose when brokers compared their earnings from margin trading to those available from derivatives.
  - d) An absence of affordable, efficient electronic trading platforms. This was exacerbated by a misguided belief that open-outcry trading was more suitable for derivatives (when in fact open-outcry was quite hard to implement in a start-up market). Nowadays, nobody would argue in favour of an open-outcry model for a new derivatives market.
- The local exchange often possessed an effective monopoly which had one of two effects: either they would not bother to develop the derivatives market (why should they?) or they would develop it, but out of a sense of obligation and hence with limited enthusiasm.

While some of these factors probably still prevail to varying degrees in emerging markets, lessons have been learned and it is likely that most of today's newer markets would suffer from these problems to a lesser degree simply due to better education and awareness in the world's capital markets. As will be argued later, most emerging markets should be capable of successfully developing a derivatives market in stock indexes and commodities.

### Liquidity

Without liquidity in the underlying market there is little hope of there being liquidity in any related derivatives. Liquidity in the underlying market implies there is interest in the asset itself and therefore a demand for investors to use derivatives to hedge their exposure to that asset<sup>4</sup>. Without that demand, a derivatives market would rely solely on speculators who are scarcely ever able to sustain a market on their own.

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<sup>4</sup> There are rare exceptions to this rule. For example, the relative success achieved in OTC markets with weather derivatives is not based on any identifiable underlying spot market but this is rather a special case. The demand for hedging the risk which arises from weather conditions has always existed – but it could never be traded. So there is a kind of implicit underlying liquidity.



Moreover, without that liquidity, potential market makers and other suppliers of liquidity in the derivatives market would be unable to hedge effectively. Successful derivatives markets need this virtuous cycle of hedgers in the underlying market laying off their risk in the derivatives market by trading with professionals who in turn hedge their derivatives risk in the underlying market. Speculators then provide the means to narrow bid/offer spreads by joining a market, which already has natural users.

Large, high profile underlying markets do exist which are still insufficiently liquid to support a derivatives market. Perhaps the best example of this is the property market. Attempts have been made in the past to create property price indexes which are suitable for derivatives trading but all these attempts have failed. The problem is that the property market is essentially illiquid despite the fact that it is large, important and closely monitored by diverse segments of the population<sup>5</sup>.

It is not easy to state a measurable, objective test for “adequate liquidity” but in this context, three factors need to be looked at: trade volume, size of bid/offer spread and market depth. If any one of these is “deficient”, then that is a mark of illiquidity since a low score on any one of these suggests that the market is weak from the standpoint of supporting a derivatives market.

The other problems of designing a successful derivatives contract are discussed later.

### **Derivatives markets address inefficiencies**

A successful modern<sup>6</sup> derivatives exchanges works properly when it manages to address “inefficiencies” in the underlying market.

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<sup>5</sup> However, recent attempts have been to create and trade property benchmarks, the initiative has been launched by investment banks who support the market as market-makers. It will be interesting to see if this can create a liquid market, based around those benchmarks.

<sup>6</sup> Traditionally, derivatives exchanges were formed by user associations with a common interest in coming together to trade in a convenient physical meeting place. This physical need does not really exist today.

These inefficiencies can take many forms. For example:

*Counter-party risk in the physical market.* A producer who is keen to sell forward a certain quantity of its commodity may be unable to find a buyer with satisfactory credit standing. Under a centrally cleared exchange environment, this is not a problem if the producer sells a futures contract.

*Counter-party “inflexibility”.* The same producer – if he had not used the futures market – may have difficulty getting out of the delivery obligation if he decided he did not wish to deliver. He may not be able to persuade the buyer to cancel the contract on reasonable terms. In a liquid futures market, he can simply buy back the position at a “fair” market price.

*Complexity of trade execution.* Some underlying markets are simply not capable of providing efficient execution. The most common example is index futures. In most markets, an investor who wishes to track a benchmark index may find it impossible to immediately buy or sell the full set of constituent index stocks in the right proportion. An index futures contract satisfies this requirement very well<sup>7</sup>.

*Stifling trading rules.* Many markets have trading rules that limit investors’ ability to act. The most common example is a ban or restriction on short selling. A futures or an options contract can be used to take short positions when this is prohibited, or hard to do, in the main underlying market.

*Excessive taxes.* If the underlying market is subject to taxation that increases the cost of trading, a derivatives market can provide some relief (see page 5, *Transactions Taxes & Fees* for an example).

*Barriers to trade.* If exchange controls or other trade barriers are erected – for example by a government wanting to protect its own commodity producers – a derivatives exchange within that “protected” territory can flourish where it might otherwise not i.e. the

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<sup>7</sup> But note the “competition” from exchange traded funds.



protectionism allows an island of liquidity for locals barred from using overseas exchanges. This is one of the most common reasons for commodity exchanges to flourish in emerging markets. The original Eurodollar contract at CME was created because foreign exchange transactions were subject to excessive constraints under European law at the time.

*No options tools available.* This seems simple and obvious but in those markets where there exists a demand for hedging with options, it is unlikely that any institution other than an exchange will be able to provide an adequate options service if banks have not already done so. Banks may not provide options services simply because they lack the skills and/or the capital to do it<sup>8</sup>.

A start-up exchange needs to be sure that its derivatives market addresses some of these inefficiencies. If it does not, then it is questionable whether the market will be a success.

However, it is important to note that even where these inefficiencies exist, there has to be some latent demand for a solution to the problems raised by those inefficiencies.

### **Attitude to derivatives**

One of the biggest obstacles to success in a new derivatives market is vested commercial interests who oppose the introduction of derivatives. These are covered in more detail later.

But there are always other elements who oppose derivatives on principle. There are a number of clichés such as the “tail-wagging-the-dog” – the allegation that derivatives disrupt the underlying market. There are claims that they increase volatility and encourage needless speculation. The most dramatic example of this was the collapse of Barings Bank which was widely blamed on derivatives (and even caused one Asian market to effectively pull the plug on its

planned futures market). Yet Barings was just a case of fraud, an unusual one admittedly (in the sense that the perpetrator gained nothing financially) but it was just that – fraud; it had nothing to do with derivatives per se and could just as easily have happened with stocks, bonds, forex or any other tradable entity<sup>9</sup>.

A start-up exchange needs to be aware of this opposition and be prepared to fight it with facts. The facts support the contention that derivatives are a good thing. Many studies have indicated that derivatives have either a benign or positive influence on the underlying market. So part of the process of creating a new derivatives market is to assess the level of “fear-based” opposition and prepare arguments to counter it.

### **Existing competition**

Many markets already have surrogate derivative products, which are effectively competitors to a nascent futures or options market. This point is really an extension of the arguments on page 4, *Liquidity*, namely that a derivatives market must address inefficiencies which are not met by existing products or services - but it is worth dwelling on some specific examples because they can be quite commonplace, even in emerging markets.

### **Warrants and other structured products**

Structured products are securities issued by a third-party financial institution that are designed to offer investors specific risk exposure to an individual stock, sector or other underlying asset. When they give the holder the right to acquire or sell a security at a particular price within a particular timeframe, they are called “warrants.” An established warrants market can be a very effective competitor to an options market because warrants provide the same kind of leverage but are traded just like stocks.

Warrants are nearly always classified as securities and only secondarily as derivatives.

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<sup>8</sup> To provide an options market making service to clients, a bank needs traders who understand options pricing, risk managers who understand how to monitor dynamic exposure to price volatility and adequate capital to support potential losses arising from unforeseen market events, counterparty default etc.

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<sup>9</sup> Barings was also unusual in that it was the only financial “crisis” involving exchange-traded derivatives. In just about every other case, if derivatives were involved, it has been OTC derivatives, not exchange-traded.



Most markets regulate derivatives differently from securities, requiring higher tests of client suitability, for example. One of the effects of this is that, to trade futures and options, a client generally needs to open a separate trading account and sign new forms asserting that he or she understands the risks. But generally there is no need for a regular securities client to open a new account with a broker in order to trade warrants: this gives warrants a competitive advantage over options.

For those markets that have no derivatives at all, the introduction of warrants can be a useful stepping stone to introduce investors to the concept of leverage and risk management through derivatives (see 5.1.1.3 for more comment on the benefits and pitfalls of this approach).

In more developed markets, convertible bonds and warrants with complex payoffs are sometimes introduced to provide a wider range of risk management instruments to investors. But such products will tend only to thrive in markets that already enjoy broad-based and high levels of liquidity.

There is no structured product equivalent to warrants which compete with futures, however, and so the introduction of an index futures contract ought to face less competition from listed structured products. Instead competition to futures comes from another source:

### **Margin trading**

A strong tradition of margin-trading can provide an effective competitor to both futures and options. When margin trading operates efficiently (as it does, for example, in some Asian markets), it provides the same risk profile as a futures contract.

A similar effect is achieved in markets with a long settlement window such as those that operated in London, India and elsewhere until a few years ago. Because settlement only occurs at the end of the cycle, these markets behave like mini futures markets on individual stocks.

However, since margin trading is generally not available on baskets of stocks, an index

futures contract stands a good chance of success if it genuinely introduces an ability to gain exposure to a basket underlying a popular benchmark. (But things are changing: in developed markets almost everywhere, we have seen the hugely successful introduction and aggressive growth of Exchange Traded Funds (ETFs) – listed securities which actually contain the underlying stocks themselves. These will introduce new competition to the start-up futures markets. If ETFs are traded on margin, they give something very close to the risk profile of a futures contract and could provide competition to index futures. Emerging markets may well see a flourishing ETF market before they even get the chance to introduce index futures<sup>10</sup>.)

### **Foreign competition**

In some markets, a foreign competitor may already have dominated trading in the most attractive derivatives contracts. Singapore has long enjoyed success with its Nikkei index futures and repeated it with its Taiwan index futures. Many other markets have since tried to emulate Singapore, some have been successful but most have not.

In the Singapore case, the exchange took advantage of the home country being slow to develop its own market. This suggests that it may be legitimate for a home market to create a futures market solely to pre-empt foreign competition, regardless of the likelihood of success.

However, even if a foreign exchange operator has already created a competing derivatives contract, there are always significant home advantages – not the least of which is that local investors are more likely to access a home market than an overseas market. As a result, despite the fact that Singapore has been trading a Nikkei contract successfully for many years, there is a thriving Nikkei contract

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<sup>10</sup> Interestingly, the introduction of ETF's in the US, where futures already existed, generated additional liquidity in both products but the reasons for this are, in our opinion, due to certain attributes of the US market that would not necessarily prevail in emerging markets. Incidentally, the first exchange to trade ETFs was the Toronto Stock Exchange.



in Osaka (driven in large part, ironically, by arbitrage between Osaka and Singapore!)

So foreign competition need not be a serious impediment. There are many examples of attempts to set up competing contracts from offshore bases but very few indeed have been successful.

### Summary

In all these cases, the common competitive factor is that investors may already have products that partially provide the types of tools that derivatives provide - risk management, leverage, portfolio management or speculation<sup>11</sup>.

The above examples are mostly from the equity sector but the same principles apply elsewhere. The most common example is forex futures. One would think that these would be ideal candidates for all kinds of derivatives contracts, given the immense liquidity which underpins just about any forex market - yet forex derivatives are rarely a success. The problem seems to be either that the banks already adequately satisfy demand or that the banks are not motivated to support a market that might eat into their margins. Perhaps both.

### Other structural impediments

#### Trading rules

In addition to needing liquidity in its underlying market, a successful derivatives market also needs continuity. So if trading practices in the underlying spot market are subject to interference, this can affect the confidence of the derivatives market. If trade halts due to major market movements are common or individual stocks are frequently subject to suspension thus interfering with the calculation or hedging of the index, then this can seriously affect the success of the market. Similar problems can occur in commodity derivatives markets if the government imposes things like price controls. In the case of options, if there is any possibility at all of the underlying asset being suspended from

trading, then this can create havoc at the time of expiration and this is something to be studiously avoided.

The reason that continuity is important is that derivatives markets rely on up-to-date price information to operate. If there is no information available about the state of underlying market, then the derivatives markets operate less well. It is true that, in some circumstances, a suspension of the underlying can help the derivatives market because the derivatives provide an outlet for trading that is otherwise unavailable. But this may only be a short-term benefit – in the long run, if suspensions or halts are too frequent, the inability of professionals and market makers to hedge in the underlying market will drive them away from the derivatives market and this is unhealthy.

Those markets which practice price movement limits or “circuit breakers” (e.g. halting trading if the index moves 15% up or down during the day) tend also to be markets where interference of this nature is the norm and thus it is likely that price limits will be imposed on the derivatives markets too. So such limits tend to be bad for the derivatives market.

In addition to this, many other underlying market factors can affect the derivatives market: unreliable settlement procedures, excessively high minimum bid/offer spreads, awkward board lot sizes etc.

These are all inefficiencies that can work in favour of the derivatives market or against it – depending on how drastic they are. So it would be important to know which of inefficiencies are good for the market and which are bad. Perhaps this is a useful way of characterising it in a summary form:

To the extent that a planned derivatives market can avoid using the underlying market (as may be the case with many stock index futures contracts), it can exploit inefficiencies to its advantage but if it must use the underlying market (e.g. stock options) then these inefficiencies work against the interests of the derivatives market.

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<sup>11</sup> Speculators are vital to ensuring ongoing liquidity and so it is important that the new derivatives market offers them something they do not already have.



## Corporate Events

Complex share splits, mergers and re-capitalisations can negatively affect options valuations and index calculations. An environment where these are commonplace is not conducive to a successful equity derivatives market. Although such an environment suggests high volatility, which is good for derivatives markets since it increases the need for risk management tools (as long as volatility is not too high), the administrative complexity of handling these events detracts from the efficiency of the derivatives market.

## Domination by a small number of stocks

It may be difficult to introduce an index future into a market dominated by one stock or by a very small number of stocks – especially if there is a margin trading. In this case, the liquidity may be so efficiently focused on those stocks that the introduction of a futures contract has no competitive appeal. In such markets, the benchmark index will in all likelihood be dominated by those few stocks, limiting the usefulness of a separate, tradable benchmark index.

In these cases, an options market may have more appeal to investors since options provide a unique form of risk management not available via futures. Again, however, if a warrants market has already been established, the case for options may be weaker.

## High interest rate environment

High or volatile interest rates create demand for risk management using debt derivatives market and are thus “good” for an emerging debt derivatives market.

But such an environment is very bad for equity derivatives. Apart from the fact that high interest rates tend to coincide with bear markets (and derivatives trading often declines once a bear market has been established), the threat of high overnight rates can send an equity derivatives market into turmoil. This is because most arbitrage and market-making is funded by borrowing overnight funds – a high interest cost will force traders to liquidate non-cash positions which creates a downward spiral effect in the stock market. More to the point: it discourages such traders from ever

returning to the market even after the crisis is over because they fear that high interest rates will return.

## Transaction taxes and fees

If there is a transaction tax payable on underlying transactions (e.g. stocks), this will have a detrimental effect on derivatives trading (particularly options) unless the rate is exceptionally low. The same applies to exchange trading and/or clearing fees. The reason for this is that the percentage eats into the very thin margins that are available to market makers.

On the other hand, an unusually high transaction tax can be a benefit to a derivatives market if it allows the introduction of products which track the underlying asset values without incurring the tax. (Such a situation allowed OM to launch in Sweden what was until recently the only truly successful single stock futures contract ever traded – the contract died when the government abandoned the tax).

## Other local or cultural factors

It is hard to generalise here but it is worth exploring areas where local customs may have an impact on the derivatives market in addition to the “moral” ones such as a cultural aversion to gambling.

For example, in some societies, local clerics have the authority to declare a public holiday without giving notice. If this happens on an expiry day, it creates confusion in the options market in particular since option pricing assumes a fixed expiration day.

A similar effect can arise where outside factors regularly halt commercial activity (e.g. hurricanes or other extreme conditions).

## LEGAL AND REGULATORY

Probably the first thing that needs to be looked at before determining whether to commit resources to developing a derivatives market is the legal and regulatory environment. The potential for the law and/or regulators to scupper initiatives should not be under-estimated.



## Legality of derivatives

In many places, derivatives trading contravenes the laws – particularly those related to gambling. If the laws need to be changed there needs to be a political will to do so. This obviously can be very time-consuming and complicated if it requires convincing influential authority figures.

## Clearinghouse privileges

Even if derivatives are legal, creating the desired contract structure can be complicated. The act of novation in a clearinghouse does not, on its own, necessarily afford the clearinghouse the protection it needs to operate effectively. Clearinghouses need to be able to avoid ranking as regular creditors in the event of a bankruptcy (and thus forced to hand over margin funds which may be needed to protect their own exposure). This sometimes requires a change of law.

## Agent vs. principal

Similarly, in some legal systems, the question of whether a broker acts as agent or principal in a derivatives transaction has a crucial impact on the integrity of the clearing operation (if the broker acts as agent, then an investor may have a claim against the clearing house). Such problems do not arise so frequently in a regular CSD environment because there is no contractual relationship (i.e. no promise to perform) between the investor and the CSD.

It is worth noting that proprietary traders are an essential component of derivatives markets in that they are the providers of liquidity when “end-user” investor supply and demand is inadequate (which is generally the case with derivatives products, particularly options). Any regulations or laws banning or unreasonably inhibiting such trading will be detrimental to the market’s chances of success.

## Securities borrowing and lending

It is a little recognised fact that stock borrowing and lending (SBL) underpins the whole equity derivatives market in the same way that REPOs underpin the debt market.

Without it there can be no short-selling<sup>12</sup> and without short selling, derivatives traders cannot properly hedge (this is because short sales are a hedge for long derivatives positions). While it is probably true that a derivatives market can work without stock borrowing, particularly if it is limited to futures only, its chances of success and its value as a service to the investor is significantly enhanced by there being a liquid SBL market.

Stock borrowing and lending is still illegal in some jurisdictions. But it should be noted that this is not just a legal question – even if SBL is legal, there may not be adequate expertise or infrastructure to support SBL and it may take some time to develop.

## General

Each society will have its own legal quirks which needs to be looked into, the above being the more prominent and common examples. Suffice to say that legal costs should be high up in the list of budgeted expenditures.

## Regulatory issues

A characteristic of most capital markets regulators is this: if your proposal is new then you will be barred from implementing it until such time as the regulator has decided how to regulate it. This is not a criticism of regulators, whose job is to ensure that investors are protected and who cannot do this if they have not evaluated a new proposal properly. But the result is that even if some of the problems listed below do not exist, the regulators may find a way to make them exist.

## Licensing requirements

All brokers need to be licensed to engage in whatever activity they are doing. If the trading of derivatives is new, the regulator will first need to establish its policy on licensing

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<sup>12</sup> Because when you sell short, you are selling something you do not have. Having sold short, you still have to meet a delivery obligation – for example on T+2. If you don’t own the stock, the only way to meet that obligation is to borrow it from somebody with a promise that you will give it back to them later (e.g. when you buy back the short position at a later date). So if you cannot borrow, you cannot sell short.



and then impose its requirements on the intermediaries. Indeed this will extend to clients of those intermediaries and proprietary traders so that all market users will need to make preparations to participate in the market.

At the very least, for intermediaries this will involve a qualification system for investment advisors, involving examinations and other suitability assessments. This will also extend to the clients of those advisors so that clients will be required to sign paperwork asserting that they have read the warnings and understand the risks.

This means that the exchange will need to develop training courses and training materials and prepare users – intermediaries and investors - well in advance of the market launch.

### **Trading and clearing rules**

Most of the regulatory requirements manifest themselves in the trading and clearing rules. The rules cannot be completed until all the legal and regulatory research and negotiation has been completed. If the derivatives market is being created by the operator of an existing exchange and clearinghouse, the task of adding derivatives rules is simplified since there are many areas – particularly in the trading rules – which can be common to both markets. Nevertheless, the scale of this task should not be underestimated and it would be an unusual market operator that could draft, review and finish its new derivatives rules - with regulator approval – in less than 12 months.

### **Foreign participation**

Some regimes bar or severely limit foreign participation in their capital markets. It is commonplace to hear allegations of hedge funds and the like manipulating markets by using derivatives, especially in smaller, less-diversified markets and thus the foreigner-ban is often applied even more severely in derivatives markets than in other market segments.

For options, a refusal to allow foreign participation will probably greatly reduce efficiency. Options market maker skills, while

not necessarily the rocket science they are sometimes alleged to be, are still hard to acquire and most markets have to start by using foreign firms. This is not just a question of having the financial skills but increasingly it is a matter of technical skills in building efficient interfaces between the option pricing and risk management front office tools and the derivatives trading system. If foreign ownership is banned then this obviously makes it harder for these skills to be made available.

Limits on foreign participation may not matter quite as much in the case of futures markets where local participation can generally be relied upon to provide liquidity – at least for the more prominent benchmarks. But even for futures, a market is likely to achieve much greater success if overseas investors can use the derivatives markets for their own risk management needs and for strategy trading using arbitrage and other risk-based techniques, which can add considerable liquidity to a market.

### **PARTICIPANTS**

Participants represent an essential factor in ensuring some initial success and growing the market over the long term. Both the quality and quantity of participation are important.

#### **Brokers**

It is necessary to assess whether the brokers are prepared and whether there are enough brokers to serve the market properly. Derivatives market planners always take the risk that nobody will participate and it is hard to obtain enough meaningful up-front commitment to avoid the chicken-and-egg syndrome of there being no market without the players and no players without a market. It is nearly always a case of “build it and they will come”.

Each market is of course different but one should look out for the following attributes amongst the broker community:

- Prior experience of derivatives at some level
- An understanding of the need to market new products to clients



- A positive attitude towards the product

This last point seems a little nebulous and unhelpful but a negative broker attitude to new products is not unusual. It needs to be recognised that, even today, brokers are essential to the success of a new derivatives market and this is probably especially true in emerging markets. While it is true that brokers can be forced to provide services if there is enough demand from enthusiastic investors, the main conduit to persuade investors to use the market will, for now, continue to be the broker sales channels.

This is a problem because, to some brokers, the commercial attractions of having their clients trade derivatives compared to trading equities are just not there. They perceive that commissions are higher on stocks and that it is easier to spin stories about stocks than about derivatives. Particularly amongst older brokers, there is also the fear that they do not really understand the product and therefore neither will their clients. While it is true that the advent of on-line trading via the Internet is changing this picture, it remains a fact that a large proportion of exchange trading still involves person-to-person communication and things will remain that way for the time being.

Once the on-line method has been fully accepted, the attitudes of the brokers may come to matter much less since investors will decide what they want to trade and they will derive their inspiration about trading strategies from the general market place rather than from individual salesmen. At that time, the development strategy may well change but, until then, the brokers are vital.

The lesson here is that brokers need to be nurtured, encouraged and maybe even coerced into supporting the market.

### **Investors and users**

A truly successful derivatives market will have professional traders, retail investors and institutions all contributing in reasonable proportions and ideally, the types of brokers one targets when trying to secure participation will be ones who can provide a mix of all

three types of user. In practice, this rarely happens and the market tends to be dominated by one group or another.

### **Critical mass**

There should be a critical mass of users. This means there needs to be a variety of unconnected participants. Proprietary traders in particular can sometimes cluster within one or two dominant institutions (banks, very often) and this is not a situation that favours growth in the market.

So if the market structure is one that does not have reasonably diverse participation by people with reasonably different potential market views, then this lowers the likelihood of success for new derivatives contracts.

Having said this, any market that enjoys good liquidity in its underlying market – even if it is not from diverse sources - has the potential to enjoy good liquidity in related derivatives markets, provided a sufficient number of the conditions outlined in this document are met.

### **Speculators**

Options markets often – though perhaps not always – thrive in a culture where there are few outlets for speculative trading. For example, the Scandinavian and German markets both experienced high levels of options activity by retail investors: both societies are not really renowned for their recklessness on the casino floor and yet the market penetration of options contracts was much higher there than in most other countries.

There is no hard evidence to support any correlation between a society's appetite for gambling and the success of its derivatives markets. But it can be shown that even where gambling is not a particularly popular pastime, derivatives markets can succeed.

### **Vested interests**

In any circumstances, the people who benefit from the status quo will oppose change. This platitude is the major factor in preventing innovation in the capital markets. One only has to look at the failure of the forex markets to evolve into a transparent exchange model: this must be entirely due to the fact that all



the major market makers in forex want as little transparency as possible.

And this prevails whenever a new derivatives market is introduced. A very good example of this is the warrant market (described in more detail elsewhere in this paper). Warrants are structured products that are generally call options (although there are put options too) over stocks or indices. They are issued by the trading desks of large investment banks who are the guarantors of performance and listed on the exchange. The issuers can control that market because they are the only effective market makers, especially where short-selling is prohibited. They have a monopoly on market making and that monopoly can be very profitable indeed. Very often, they do not want to risk damaging their franchise by supporting an options market that, if it were successful, might remove the high margins they enjoy from issuing and trading warrants.

This less of a problem when contemplating a futures-only market. Futures markets may well be welcomed more enthusiastically by the powerful financial institutions who will see it as an additional potential revenue stream thanks to things like index arbitrage.

So where a strong structured products market exists, it is important to be aware of how the participants in that market may not provide much support for a fledgling derivatives market. Dominant institutions want to prevent the development of an exchange-traded environment for other reasons too: for example there may be a thriving OTC options and equity swaps market which the investment banks may fear would be damaged by a transparent exchange.

There is some irony in this anti-competitive stance of the financial community because it commonly happens that the introduction of an exchange-traded product actually enhances the liquidity of the OTC market and the structured products market by providing more avenues for hedging. But users often view such arguments as more academic than actual and prefer the comfort of the status quo.

### Data vendors

Without good price distribution, it can be hard to convey price information to options market users. This is partly because of the sheer proliferation of prices - there are so many option series available.

But it is also due to the confusion that sometimes surrounds the ticker symbols for options. Because options trading began to flourish at a time when bandwidth was expensive, a kind of confusing shorthand has been used to identify symbols when disseminating prices and this has not always promoted good user-friendly practices. A start-up exchange would do well to seriously study its price dissemination policy and ensure that it has the support of the primary data vendors in distributing prices.

Also, price feeds should be given away for free or at least sold very cheap in a market's early stages so as not to discourage the vendors from carrying them.

### Market makers

This point was made earlier but it belongs in this section too. For options markets, market maker skills are essential. The market operators need to ensure that there are enough skilled people in the trading community to do the job. If necessary, powerful incentives should be offered at the outset to encourage market makers to commit to the market. Without them, an options market cannot function.

Note that this is much less of a problem with futures since the nature of the product is such that market makers are not always necessary. However, some new futures contracts can benefit from a futures market maker system and so the possibility should not be ignored. The use of market makers for futures contracts has increased in recent years; the good thing about futures market making is that it does not necessarily require a heavy investment in systems and people skills to carry it out except where the underlying market is seriously illiquid (making hedging difficult).



An account of the most important conditions required to support market making is given in AMSL's white paper, "Improving Liquidity."

## **MARKET DEVELOPMENT**

### **Product design**

"Throwing spaghetti at the wall and seeing what sticks." This is how many people have characterised the approach to product development in the world's derivatives exchanges.

For a start-up exchange, the safest approach is obviously to introduce standard products that have been tried and successfully tested elsewhere. There are very few products that satisfy this standard: index futures and index options and debt and commodity futures appear to have the highest success rate.

### **Equity derivatives**

Equities tend to be the most actively traded and closely followed financial instruments in most markets – both emerging and developed. For this reason, they are obvious prime candidates for derivatives contracts.

### **Futures**

Stock index futures tend to be the most popular and most successful equity derivatives and it is most likely that a properly designed index future on a benchmark index will succeed, provided the overall market is active and there is no existing competing contract available locally. The design of the index itself and the way in which settlement is calculated upon expiry can have important implications for the success of the contract. The settlement method needs to be one which minimises the potential for market manipulation.

Also the "multiplier" is important: the underlying value of the index needs to be high enough to make it attractive to large institutions but not so large that it shuts out the small investor. The multiplier is used to calculate the value of the underlying contract. For example, the multiplier for the S&P500 futures at the CME is \$250 per point so, when the S&P500 stands at 1000, one futures contract is equal to \$250,000. Every one point change is equal to \$250 profit or loss.

This is excellent for institutions who need to deal in size and are looking for liquidity in large chunks rather than having to fight their way through a quagmire of small orders. But it is way too much for many retail investors: the initial margin – the amount needed to open a position – can be as much as \$25,000 or more.

Some markets have dealt with this dilemma by introducing a second "mini-" futures contract and have had some success with this – the CME introduced a \$50 multiplier for the S&P500 thus offering a contract one-fifth the size of the main one. But this situation came about in the first place because of increases in market capitalisation in the years since the contract was first launched. Starting out with a mini-contract may not be necessary or wise since it runs the risk of the mini- becoming a maxi- if the index rises a great deal over time (or becoming a midget- if the index falls a lot).

In cases where the index is dominated by one stock<sup>13</sup>, care needs to be taken to avoid the index becoming nothing more than an index on that stock. The commonest solution is to apply weighting to the stocks to avoid that domination and to avoid duplication of cross-holdings. Some indexes are based on "free float" rather than on the total number of shares in issue, although this sometimes might make the concentration worse. Most markets now have indexes compiled for them by specialists such as Morgan Stanley (in a joint venture with Capital International), Standard & Poors, Salomon Smith Barney, the Financial Times etc. A start-up market will ideally want to use an index that already has some recognition and acceptance

However, some agencies charge for the use of their trademark and for this reason it may be desirable for the exchange to create its own index. Tailor-made indices have been created by exchanges in some markets e.g. The Philadelphia Stock Exchange created several indices for different market sectors purely for the purpose of trading options and were quite successful. Some of these (like SOX – the semi-conductor index) actually became

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<sup>13</sup> Like Finland, where Nokia has at times represented 80% of the entire market capitalisation.



benchmarks in their own right even though that was not necessarily the original intention.

Index compilation is an art and a science which requires a good understanding of where investors are focused now or where they may become focused in the future<sup>14</sup>.

Some exchanges may want to introduce indices on overseas markets equities or other products and trade derivatives on those – but the success rate for this has been quite poor.

### Single Share Futures

There has been much discussion about the introduction of single share futures, which have been launched successfully in the UK (the most successful being futures on foreign securities) and, so far, with less success in the US. However, other markets which have tried to introduce these have had little or no success with the major exception of OM in Sweden when transaction taxes on ordinary shares were excessively high. Once the tax was withdrawn, the contract died. In Hong Kong, share futures were introduced at a time when the minimum cost of a round-trip (taking into account exchange fees, taxes and minimum bid/offer spreads) for shares could be more than 100 basis points, share futures failed totally even though they cost as little as 10 basis points for a round-trip. It is likely that the availability of margin trading in liquid stocks made share futures an unnecessary alternative.

However, the current fashion is for the trading of share futures to be expanded and most markets are now experimenting with their own versions. The ideal conditions for success seem to be those where trading in the underlying stock is difficult to do for some reason but investor demand nevertheless exists. This certainly seems to be the case with the USF products launched with considerable success at Euronext-LIFFE.

<sup>14</sup> Note the systems implication here: implementation of trading on a “home-grown” index will require system components which can calculate and disseminate index values on a real time basis.

### Difference between futures and options

The main difference between futures and options is in their risk profiles. A future is a straight up-and-down exposure to the direction of the underlying. If the underlying rises by \$1, the long gains \$1 and the short loses \$1. The risk is “linear” and both long and short face precisely the same type of risk.

An option’s risk is “skew”. The buyer of a call option (for example), buys the right to buy the underlying for a certain price in a certain time frame. Once he has bought the option, the payoff from that option will vary according to market direction and market volatility. A \$1 rise in the market may cause the option value to rise by less than \$1 or more than \$1 (if volatility increases).

Also the profiles of the buyer and seller of an option are not equivalent. An option holder (the buyer) has limited risk – his risk is limited to the cost of the premium he paid to acquire the option. The writer (seller) has unlimited risk and his maximum gain is the premium received.

A speculator enters into a futures contract to maximise his exposure to the underlying asset and is willing to risk losses if the market moves against him. A speculator buys an option contract to participate in gains from the market moving upwards (if he buys a call, downwards if he buys a put) but does not want to bear any risk beyond the cost of the premium paid.

### Why do people sometimes confuse the two?

With futures, you pay no premium, you merely pay margin to cover the downside risk. If the market goes in your favour and you close out, you get to keep all the profits. If it goes against you lose an unpredictable amount of money.

With options, you pay a premium but no margin. The premium is a sunk cost and will be deducted from your final profits, you pay no more margin along the way and if the market goes in your favour and you close out, you get to keep all the profits less the cost of the premium (which you have paid upfront). If it goes against, you lose a predictable amount of money – the premium.

The main similarity between futures and options is that they both provide leveraged exposure to the underlying price. The main difference is that with options you pay an insurance premium to limit your potential losses. But it is the leverage aspect that appeals to speculators and since both are leveraged instruments, most speculators will compare them from this perspective. This is probably the main reason that they are confused with each other. They both allow you to speculate on market rises and falls while committing capital to only a portion of the cost of the underlying asset. This is in contrast to stock trading, where you (normally) pay the full price of the asset – unless you are trading on margin. In fact, the risk profile and cash flows when buying stocks on margin is essentially identical to the risk profile of buying stock futures. Note that the writers of options have a completely different risk profile for which there is no equivalent in futures trading. When you think about the role of option writers and the risks they bear and manage, it can be seen that the two products are really quite distinct.



## Options

Option contracts can be much harder to develop than futures since they involve concepts which are quite alien to many investors despite awareness of options being significantly higher than ever before. Index options tend to have a better chance of success than other kinds of options, partly because they are cash settled and the underlying is less subject to delivery complications than, for example, single stock options. A benchmark stock index also has a greater population of natural users who can more clearly see the benefits of trading options on an index.

For single stock options, care needs to be taken to select stocks that are suitable (see discussion earlier in 2.5.2. about avoiding too many corporate events). It is a good policy for an exchange to announce in advance the conditions under which an option class will be de-listed (e.g. continuous absence of trading for more than 90 days) so as to avoid accusations of discriminating against certain stocks.

## Warrants

It is questionable whether warrants should be included here because they are tradable under a cash market environment; they do not need a derivatives trading and clearing infrastructure. But they are derivatives and they are important products so, for completeness, they must be considered.

Warrants have become very popular in markets around the world due to the fact that they provide investors with an easily accessible instrument for taking on leveraged exposure. They tend to be most popular with retail investors. For a market that has no existing derivatives products, they are an attractive way of introducing derivatives to investors.

It should be noted that one effect of having a successful warrants market may be to dilute the demand for a traded options market; this is not always the case but it can happen. Warrants do not provide the same degree of flexibility that options traded on a formal

options exchange provide and so the warrant is, in many respects, an inferior product.

For example, one important difference between warrants and options is that warrants are generally difficult or impossible to sell short. This is because they are issued in limited quantities and there is often insufficient free float available for lending (see 3.1.3 for an account of why lending is an important pre-requisite for short-selling). However, most users want to buy options rather than “write” them given that the leverage effect is achieved by taking long positions so this difference may not be as significant as it appears, except that it limits the ability of professional traders to make competitive markets in warrants.

Another drawback is that the availability of calls, puts, strike prices and expiration dates available are determined by the issuers. In options markets, these are handled automatically so as to ensure ongoing availability of relevant options contracts.

Finally, there is higher counter-party risk for warrants than is the case with centrally cleared options because the delivery obligation resides with the issuer, rather than the central counter-party in a clearing organisation.

But warrants do have their place and so it is wise to adopt a managed programme of implementation which reflects the long term objectives of the market operator, who may want to have thriving warrants and options markets.

The introduction of warrants involves a range of legal, regulatory and market practice issues, particularly the question of financial strength of the issuer and ensuring ongoing liquidity in the warrant itself. Both issues have to be addressed by adopting an effective set of rules that allow for close monitoring of the issuing institution. The guarantor of performance for these products is the issuing institution, not the central clearing house that guarantees options performance. So that institution needs to be robust.

Also, there is no market making function for warrants, unless the exchange provides a platform. The candidate best placed to make



markets in warrants is the warrant issuer itself – this introduces potential conflicts and complexities that need to be resolved by transparent and effective regulation.

### Exchange-traded funds

Exchange Traded Funds (ETFs) are not typically regarded as derivatives but, because they provide an alternative to index futures, it is worth noting a few points about them. A number of different legal structures are used to create them but, from the end-users point of view, all ETFs are essentially the same: a means of trading a basket of securities under one stock exchange symbol. Instead of buying all the securities individually, a structure is created whereby an institution holds the securities on the investor's behalf. Each unit represents a basket of securities and investors can buy or sell many units at a time, as with regular shares.

The most popular ETFs are those based on benchmark indices i.e. the same indices as the most popular index futures are based on. Both ETFs and index futures give investors the same profile. However, there are a number of substantial differences between the two products:

- Dividends are paid into the ETF structure so that the investor actually realises the dividend income from the underlying stocks in the basket. Futures do not pay dividends.
- Index Futures have an expiry date on which the final profit or loss on the position is paid out. An investor who wants to retain exposure to the index must roll the position over, which costs money. An ETF does not expire.
- Futures can be bought or sold on margin, meaning that the exposure can often be created at a much lower capital outlay than with ETFs which, as securities, are generally subject to much tougher margin rules. The reason for this lies in the complex history of securities industry regulation.

- The value of individual futures contracts are generally many times higher than those for ETFs which makes it possible, using the futures market, to trade a much larger quantity of underlying exposure in a single trade. To trade the equivalent exposure using ETFs requires an appropriate amount of market depth in the ETF. (Of course, market rules can be changed so that this difference is eliminated but, in established markets, that is sometimes easier said than done). For this reason, large institutions use the futures markets to establish large positions more quickly - which they subsequently switch into the underlying market having established their entry (or exit) price.
- It is generally easy to enter a short position using futures and hard to do so with ETFs (because of short selling restrictions that prevail in most markets and the need to borrow the security - which may not be available at short notice)

It is apparent from this that futures are a short-term trading tool while ETFs are appropriate for longer-term position taking. The main benefit of index futures is that they are cheaper to trade in the short term and therefore attract liquidity, especially from speculators and those who need to enter or exit from a large position reasonably quickly.

But it is interesting to note that lower costs and ease of trading are not really inherent characteristics of futures themselves: with the possible exception of short selling constraints arising from the need to borrow the security, all the characteristics of futures and ETFs are “man-made”, and so any respective advantages or disadvantages could, in theory, be neutralised by changing those characteristics (e.g. by reducing the cost of margin trading for ETFs).

On balance, however, a developing market should probably support both products and allow local conditions to dictate whether one or the other – or both – will thrive.



## Index Arbitrage

It is possible to trade the “basis” of index futures contracts i.e. the difference between the underlying index value and the value of the index futures contract. In theory, the difference should be equal to the carrying (interest) cost of the basket of securities between now and the expiry date. But sometimes that difference gets distorted, creating an artificially high, low or even negative basis. Index arbitrage is used to exploit that distortion by trading the index against the underlying. This accounts for a substantial amount of futures and securities trading activity in developed markets. ETFs have made such strategies even easier to execute, to the benefit of both markets. However, the benefits are most likely to accrue to those markets that are already highly liquid.

## Fixed income

In some markets, Fixed Income derivatives are dominant (e.g. Canada). This tends to be true where a large amount of Government debt is in issue and/or there has not historically been a strong equity culture (e.g. Germany, until quite recently). A successful fixed income derivatives market will also require the presence of a reasonable variety of institutions that are engaged in money management – dominance by one or two groups will not make for a liquid market.

The typical fixed income derivatives contracts are futures over a long term government benchmark bond contract together with a short-dated (90-day) interest rate futures contract, whose settlement price is based on a fixing rate assessed by a group of banks and/or the monetary authority. The fixing rate assessment method needs to be one that is broadly accepted by the financial community and it needs to be clearly accepted that this is not subject to manipulation.

Various intermediate classifications of bond can be used as the underlying for fixed income contracts and the alternatives will really be determined by the local market conditions.

The general comments made above about the likelihood of success with equity options contracts applies to fixed income also. Interestingly, there is no apparent evidence that institutions are significantly more inclined to trade options than retail investors and so the institutional bias of the fixed income markets does not mean that fixed income options are any more or less likely to be successful than equity options.

## Commodities

The first derivatives contracts were on commodities and they are still ideally suited to the creation of futures and options contracts. The good thing about commodities is that most countries have a local commodity which is of particular importance to the local community – whether it be rice, gold, palm oil or sheep – which can attract trading interest even if there already exists an international benchmark. For example, the fact that the CBOT in Chicago is the world’s largest agricultural derivatives exchange has not prevented Winnipeg in Canada from carving out space of its own with its contracts in the same time zone and geographical neighbourhood.

The scope is particularly good for perishable commodities that cannot be inexpensively shipped long distances and therefore cannot be benchmarked to international prices. Tariffs and other forms of protectionism also affect the influence of foreign benchmark prices and thus provides a climate of independent pricing which can support a commodity derivatives market.

In an equities market, most investors who want to know where the market stands will generally look not to the futures market but to the underlying price data, expressed in the form of the stock price or a stock index. But in commodities markets, the futures market itself often becomes the barometer that investors look to for price discovery. A successful commodity derivatives market can therefore be at the heart of the market and may eventually be used as the benchmark for setting spot prices as well as futures prices, creating a very important role for the exchange. This role can even become truly



international in scope. For example, consider the metals traded at the London Metal Exchange (LME): even a Japanese buyer of copper would contract to buy from a Chilean producer using LME reference pricing, as reported from the exchange in London.

For these reasons, new derivatives exchanges ought to give serious consideration to commodities. Having said this, there are more failures than successes and so it is important to identify a commodity for which natural local interest exists. A contract that exists purely to attract speculative interest will probably not last long – such contracts tend to be quickly closed down by regulators even if they are successful.

One of the main issues for commodity contracts is the method of delivery on expiration – should the contract be physically delivered or settled in cash based on a settlement price? Physical hedgers and regulators customarily prefer the former, market operators and speculators prefer the latter. This can sometimes lead to contention and much consultation and effort needs to be spent in determining which method will be used. The dangers of price manipulation are often greater in a cash-settled market than in a physically-delivered market.

It should also be noted that the creation of an index is not necessarily limited to equities; cash-settled commodity indexes can also be created and there have been some cases where resultant derivatives contracts have traded successfully.

### General

Perhaps the keywords for designing a new derivatives contract are: Simple & Relevant. The concept needs to be easy to state and for investors to understand and it needs to be relevant to the natural risk management needs of the investor.

Derivatives are supposed to be all about risk management and the importance of this should not be overlooked: an asset which does not exhibit much medium term volatility is not likely to attract enough liquidity for a derivatives contract (another reason why property futures never succeeded).

On the other hand, excessive volatility is not a good thing either. The clearinghouse needs to be reasonably confident that there will not be serious price spikes. Some exchanges “deal” with this by imposing price movement limits – but these are of limited use in preventing chronic volatility and an excessively volatile contract often stops trading altogether. Electricity prices have been subject to excess volatility and this has created problems in establishing a market in electricity products.

### Infrastructure

#### Clearing

It is sensible to allow the clearinghouse some independence from the exchange, even if the exchange owns the clearinghouse.

First, clearing house personnel need to be focussed on risk management and the best interests of all market participants without undue interference from exchange operators and governing brokers. The clearinghouse may need to take steps which may not be seen as being in the best interests of the executives of the exchange or the member firms.

Secondly, if a clearing house does suffer a major default which results in its having to use its own assets, it is not desirable that the exchange’s assets should be exposed in this way and so it should be under a separate ownership structure. In this regard, the desire of the exchange to protect its assets has the effect of creating a natural independence on the part of the clearinghouse.

It is also preferable to use an existing clearing institution for clearing new derivatives rather than setting up a new one – this makes it easier for members who will generally prefer to be members of as few organisations as possible. It also lowers costs for members and eliminates one of the set-up risks – namely that people may prefer not to subscribe for membership of a new clearinghouse<sup>15</sup>.

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<sup>15</sup> However, the received wisdom that a single clearing house is always better than multiple clearing houses is questionable. First, competition between clearing houses can be a good thing since it can promote innovation without compromising standards (assuming that the regulators are monitoring the quality of the risk



## Intermediary infrastructure

It has already been pointed out that brokers and traders form an important part of a successful derivatives market. In order to play their roles effectively, they require special tools – tools which they may not previously have needed in a market consisting solely of cash instruments.

In particular, they need front-office and back-office software which is suited to the specific needs of derivatives trading, clearing and settlement. Some of the additional features required for derivatives:

### Front Office (mainly for market makers and proprietary traders)

- Derivatives pricing tools
- Risk management software to monitor position risk
- Automated submission of quotes that can interface with the above and with the exchange

### Back Office

- Client Portfolio software able to store derivatives positions
- Margin calculation for client positions
- Exercise/assignment and allocation processing tools
- Interface between derivatives processing and underlying market processing (e.g. margin during delivery)

It is important to ensure that these tools are available to intermediaries in advance of launching the market. Many of these products are offered on an ASP model, which can be the most efficient way of ensuring their availability since this can lower the cost for the brokers and shorten the time-line for

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management). Second, monolithic clearing houses are not the only way to net and reduce risk – cross margining between clearing houses can achieve the same thing. Look at it this way: Which is worse? The Clearing House For Planet Earth going under once every 100 years or 1 small clearing house going under every 10 years?

becoming acquainted with the product, especially if accompanied by a properly planned education program.

## Promotion

This is a dimension that a traditional market operator may not have encountered before.

## Marketing

Marketing is a vital and most easily underestimated success factor in the creation of a new derivatives environment. Without good marketing, a new market cannot achieve success. The marketing needs to be targeted at all levels of participant:

*Intermediaries.* Brokers and other providers of financial services need to be sold on the idea that derivatives will help their business.

*Investors.* They need to understand how and why these tools can help them in their investment objectives. The message needs to go to both retail investors and institutions – although they may use the tools in different ways.

*General Public.* Even those who are not investors should ideally understand what derivatives are and how they work. This is particularly the case when the media and politicians, who thrive on a little controversy from time to time, launch their inevitable challenges to the idea of a derivatives exchange. The general public need to be informed of the facts and the studies which have shown the beneficial effects of derivatives in other markets i.e. their tendency to:

- reduce volatility,
- reduce the likelihood of catastrophic financial events;
- increase the liquidity of the underlying market;
- assist commodity producers and consumers to manage their business planning and financial planning and generally remove uncertainty; and
- provide useful financial tools which help all investors manage financial risk.



Sometimes this marketing effort needs skills that do not naturally arise in an exchange environment and the organisation needs to be bold in how it recruits people to take on the marketing role. The types of people who enjoy working in a regulatory environment (such as prevails in the traditional stock exchange) will probably not have the skills or inclinations to be effective in marketing derivatives.

### **Education**

The Marketing effort can only be effective if it is accompanied by a responsible and effective education program. The education program needs to be aimed at professionals and investors. As mentioned above, regulators will probably require that brokers pass an examination before being allowed to market derivatives to clients.

Training courses can also be a useful source of revenue for a derivatives exchange. In fact it is not unknown, in the early stages of a new market, for exchanges to make more money from selling training courses than from actual trading! (Of course there is a commercial argument for giving away courses for free in the hope of encouraging participation).

### **Academia**

A good relationship with local academics can be useful for two purposes: first, academics can be marshalled to provide support in making the argument described above (5.3.1) about the benefits of derivatives. Business schools tend to be enthusiastic supporters of derivatives and open markets and academics are generally respected by the public. Secondly, educational institutions can provide material and resources for running training courses<sup>16</sup>.

Academics also value the opportunity to carry out research studies on local market behaviour and the effect of derivatives in the

local market – something which can work to everybody's benefit.

### **WHAT NEXT?**

#### **Determining viability**

Having looked at all these factors, how should a market operator approach the task of deciding on its derivatives plan?

In terms of priority, it is recommended that the following issues be addressed, more or less in sequence. The broad headings that need to be addressed are those described in this paper; the specific issues to be looked at will vary from market to market.

#### **Legal and Regulatory**

Are derivatives legal? If not, can the law be changed and will it take an acceptable amount of time to change?

Is there political support for the introduction of derivatives?

#### **Intermediaries**

Is there a constituency of intermediaries who will promote and encourage use of the market?

Do those intermediaries have access to the requisite skills to service a derivatives exchange, clearing house and customer base?

#### **Underlying instruments**

Is there an investor class that actually values the ability to manage risk in the underlying instruments that are being proposed?

#### **Funding**

The creation of a derivatives market requires investment in people and systems. Is there adequate funding to create the necessary infrastructure?

If there is serious doubt about any of these issues, then consideration should be given to delaying the project until such time as those doubts can be eradicated.

#### **Project team requirements**

If all of these questions can be answered in the positive, then the process of building a market can commence. The development

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<sup>16</sup> It should be noted, however, that academics generally do not necessarily make good trainers for public courses on derivatives. Some of them may believe that everybody shares their enthusiasm for things like deriving the Black Scholes formula from first principles and this is definitely not the case. It may sometimes be better to use professional trainers.



project will contain the following responsibility groupings:

**Product development:** What will be traded and how those products will be traded and cleared.

**Technology:** Requirements capture, project management and implementation.

**Legal and Regulatory:** Conversion of operational policy into rigorously defined Rules and Procedures, liaison with regulators and government on matters in need of resolution.

**Marketing and Education:** Developing education and promotional materials and operating and administering courses.

Clearly, these roles need to be played by people with the requisite skills and experience. While derivatives experience will be important, it is only one component and the majority of the personnel involved in the project will not need in-depth derivatives skills, as long as the team has access to that expertise in the form of connections to exchanges, financial institutions, technology firms, consultants and so forth.

As with most commercial endeavours, the core of the team will, more than anything, need management and business skills – the ability to understand the task and get it done well, on time and on budget. These are almost certainly of greater importance than specific derivatives expertise, which can always be externally acquired as needed.

Also, these roles will probably carry over intact into the operational phase after going live, with the addition of an Operations team that will run the exchange and clearing on a day-to-day basis.

### Project components, costs and timeline

#### Technology

It is impossible to assess exactly how much a project should cost, the cost is clearly dependent on the proposed market's scale and complexity. A significant portion of the costs can be contained by using existing technology - perhaps that used by the stock exchange, provided the software has the requisite

flexibility to handle derivatives trading. If the intention is to trade futures only then it is probably feasible to use a cash market based system, but if options are to be traded, then it will be necessary to use a system that has been specifically built with options functionality. Few systems used by cash market exchanges today have the requisite flexibility to handle derivatives without undergoing major modifications.

A similar argument applies to the clearing of derivatives – indeed more so since the business functionality in clearing is more complex than in trading. Again there will be a requirement for specific functionality capable of handling derivatives clearing - functionality which is quite different from that used by cash market clearing systems.

For these reasons, it may be hard to use the market's existing systems and it will therefore be necessary to buy in, significantly modify existing systems or develop from scratch. The latter is only recommended if the exchange has access to the appropriate expertise because there is no point in reinventing the wheel, provided there is an adequate alternative in the form of an existing trading and clearing systems from established suppliers. If the costs of buying in are exorbitant, then an in-house build be considered but it is then important to be aware of the higher risks that are attached to that approach.

However, it is important not to look to the budgets of developed markets when assessing likely costs. Very large exchanges and clearing organisations have tended to spend enormous amounts of money building their systems. Today, there are many, many trading systems available in the marketplace. The basic tools, appropriate to the size of market that is being proposed, can be developed at a much lower cost than that incurred by larger markets.

Clearing is more of a challenge; there are few “packages” available for derivatives clearing. It is our belief that it is possible to an inexpensive derivatives clearing capability; the important thing is to clearly define requirements and adopt a technology model that is adaptive to business requirements,



rather than the other way round. Such technology does exist and is available at a reasonable price.

The creation of an effective, but inexpensive trading and clearing infrastructure can best be achieved by using a professional team that understands the business domain as well as the technology domain, and has had experience in implementing these systems before.

In the long run, costs will be kept low by adopting the same infrastructure for trading both cash and derivatives. The same applies to clearing. The benefits are not only lower costs, but a more dynamic and liquid marketplace<sup>17</sup>.

### Legal and regulatory

Legal and regulatory costs will be driven by the degree to which the existing legal and regulatory infrastructure is “derivatives-friendly”. If laws need to be changed, the costs of changing those laws could be immense since they may involve government lobbying. But if the issues are limited to regulatory policy that does not require changes to primary legislation, then costs will be much lower.

### Timeline

How long should the project take? It really depends on its complexity and the readiness of the existing environment to incorporate the new market. For a relatively simple market operated by a public exchange with an existing clearing infrastructure in place, free of major legal impediments and using flexible and proven technology, the development period could be as little as 12 months (from forming the project team to testing and going live). But this would be the exception - there can be many legitimate reasons why such a timeline cannot be met. Factors such as delays in regulatory approval, inadequate member readiness and problems with integration into the financial infrastructure (e.g. banking interfaces) can cause significant delays,

particularly if they require the co-operation and support of people who are not stakeholders in the enterprise and who are therefore less motivated to move quickly.

Most green field, start-up derivatives markets require at least a couple of years to be ready to go live.

### Risks and rewards

There are generic project risks faced in building a derivatives market and these are no different from any new business venture that involves technology. Some of the particular factors that could jeopardise a successful derivatives market launch:

- Selection of inappropriate technology – using the wrong basic platform for a market which may have its own somewhat unique requirements
- Failure to garner the support of key players throughout the project: in particular members, regulators, banks and – to some extent - investors
- Committing to a launch date too early in the process. Serious delays can be very damaging to credibility and there is no need to commit to a date until it is clear that the target can be met.
- Forgetting that regulators effectively have a veto. Regulatory approval is needed before the market can go live and that that approval can sometimes be slow in coming. It always sounds like a weak excuse to “blame the regulator”.

High trading volumes are rarely achieved and sustained from day one. It takes time for a new market to establish itself. The reward of getting it right is not merely the satisfaction of seeing good volumes on your exchange. The bigger reward is that a successful derivatives market provides investors with extremely valuable tools that allow them to manage risk, which in turn gives them greater confidence in their ability to use the market properly. This confidence is the ultimate guarantor of liquidity and integrity in any marketplace and those are the real rewards over the long term.

<sup>17</sup> See AMSL’s paper “Trading and Clearing Cash and Derivatives on the Same Platform: The Trend Towards Integration”



### Additional Reading

There is very material little published on the practicalities of creating new derivatives markets but the following documents contain some valuable insights and analyses.

From the IMF: “Global Financial Stability Report: Market Developments and Issues”, December 2002, especially Chapter IV, *The Role Of Financial Derivatives In Emerging Markets*:  
<http://www.imf.org/External/Pubs/FT/GFSR/2002/04/pdf/chp4.pdf>.

The paper places more emphasis on OTC issues where we have been discussing exchange-traded derivatives. However, this paper does focus on exchange-traded derivatives:

<http://netec.mcc.ac.uk/WoPEc/data/Articles/oupwbrobsv:15y:2000:i:1:p:85-98.html>.

From the World Bank: Lessons in Structuring Derivatives Exchanges, February 2000.