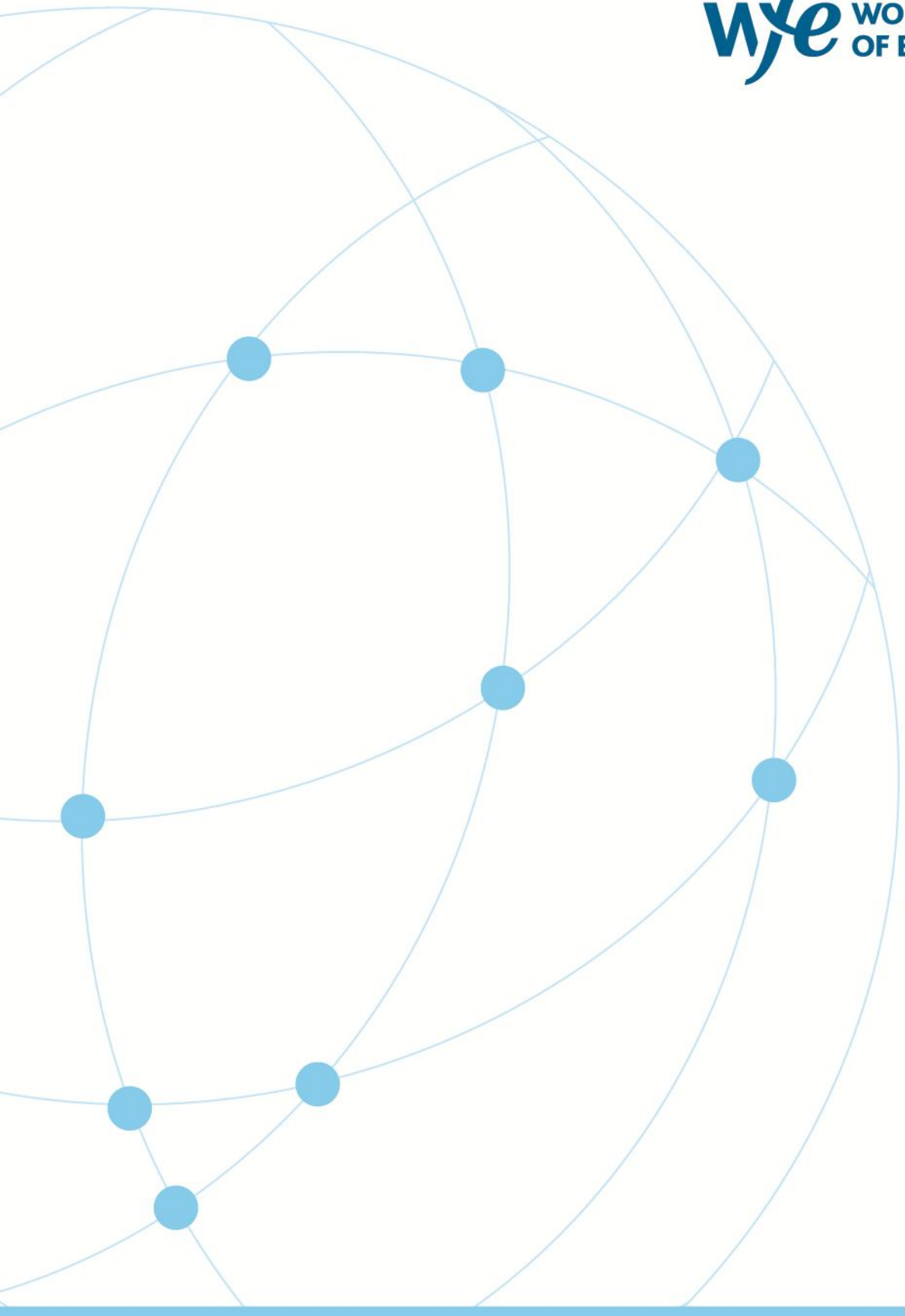
WORLD FEDERATION OF EXCHANGES



Shining a light on derivatives

25th March, 2025

Background

Established in 1961, the World Federation of Exchanges (WFE) is the global industry association for exchanges and clearing houses (CCPs). Headquartered in London, it represents over 250 market infrastructure providers, including standalone CCPs that are not part of exchange groups. Of our members, 36% are in Asia-Pacific, 43% in EMEA, and 21% in the Americas.

37% are in Asia-Pacific, 43% in EMEA and 20% in the Americas. WFE's 87 member CCPs and clearing services collectively ensure that risk takers post some $1.1 trillion (equivalent) of resources to back their positions, in the form of initial margin and default fund requirements. WFE exchanges, together with other exchanges feeding into our database, are home to over 49,054 listed companies, and the market capitalisation of these entities is $116.58 trillion; around $155 trillion (EOB) in trading annually passes through WFE members (at end 2024).

The WFE is the definitive source for exchange-traded statistics, and publishes over 350 market data indicators. Its free statistics database stretches back more than 40 years and provides information and insight into developments on global exchanges. The WFE works with standard-setters, policy makers, regulators, and government organisations around the world to support and promote the development of fair, transparent, stable and efficient markets. The WFE shares regulatory authorities' goals of ensuring the safety and soundness of the global financial system.

With extensive experience of developing and enforcing high standards of conduct, the WFE and its members support an orderly, secure, fair, and transparent environment for investors; for companies that raise capital; and for all who deal with financial risk. We seek outcomes that maximise the common good, consumer confidence, and economic growth, and we engage with policy makers and regulators in an open, collaborative way, reflecting the central, public role that exchanges and CCPs play in a globally integrated financial system.

If you have any further questions, or wish to follow-up on our contribution, the WFE remains at your disposal. Please contact:

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Shining a light on derivatives

Nothing has advanced the practice of modern finance quite as much as derivatives. And in the process, it is exchanges that have played the crucial role, creating the benchmark contracts that provide a solid, trustworthy and useful foundation for all manner of risk pricing and transfer. Yet today, derivatives – and especially the exchange-traded (or listed) variety – are under pressure in various ways, and vulnerable to sub-optimal public-policy choices.

As an alternative to that, the WFE believes that the role of lit, public markets in bringing the benefits of derivatives safely to a wide range of participants should be acknowledged and embraced. The use of derivatives should be encouraged rather than discouraged, supported by financial education, because risk is inherent in financial markets, while derivatives represent the best – and sometimes the only way – to manage it. The growth of derivatives over the past decade and more is indicative of their utility and it is best that their use be encouraged, such that they can more readily be kept in a relatively controlled environment. The real risk is that regulatory, tax or other measures push customers into a less well-regulated place. As the rise of some crypto offerings has shown, this can happen quickly and broadly. And let us remember that the G20 in 2009 chose not to restrict derivatives but to ensure they were traded in the best possible environment.

This paper, prepared by the Regulatory Affairs team of the World Federation of Exchanges, analyses why derivatives exist and why the exchange-traded markets are vital to the health of the system.

It's… the Risk

By providing a way to price specific forms of risk very precisely – share prices, say, or the price of a barrel of oil – derivatives give users more power to manage risk than any other financial instruments. Thus, one can easily choose the levels of exposure that one wants – whether increased or decreased – for example, in relation to certain shares over a specified time period, and possibly in combination with existing positions. Yet derivatives are sometimes less readily accessible than securities, particularly to retail investors but also to smaller companies and public bodies, meaning that the benefits of hedging or low-cost positioning are not within such easy reach.

Another issue is that the exchanges that offer the most user-friendly form of derivatives – and provide the price formation on which the whole marketplace relies – find that more lightly regulated competitors can use that information to do their own trades, away from the public gaze. The market can end up more fragmented, to the benefit of a small number of relatively powerful intermediaries, without customers necessarily benefitting.

Derivatives listed on exchanges are standardised in form, meaning they bring transactional transparency, which in turn delivers the key benefits of liquidity and market integrity. This, in a nutshell, is why the role of exchanges – and clearing houses, to neutralise the related counterparty risk – should be nurtured and favoured in public policy.

In this paper we touch on the way in which derivatives have transformed possibilities for borrowers, investors and traders and some of the ways they use derivatives. We will cover the key differences and interactions between listed derivatives and the OTC variety. We will talk about the way the market functions, including the (real) risk exposure amounts (as opposed to the notional amounts from which they are calculated). And we will look at the related question of how the current ('mark-to-market') value of a given derivative can – indeed typically must – be set against the value of other derivatives that the same party owns, which supports risk reduction via netting and central clearing.

But our main focus is on the questions that remain about crucial aspects of this market, namely the balance:

1) between lit and dark trading (recognising that the balance must take account of the need for occasional large trades); and
2) between those instruments that are traded on exchange (listed derivatives) and those that are not (ie, over-the-counter, or OTC derivatives).

These are in essence questions about the role that public markets play and why it should not be eroded. We will deal along the way with the further question – as to the difference that central clearing makes.

A Question of Policy

In the case of the lit-dark distinction, the question is not unique to derivatives. It is highly relevant to shares and other securities, too, where exchanges must constantly guard against the erosion of price discovery by private transactions. But when it comes to derivatives, the lit-dark debate is complicated by the existence of the separate, OTC-vs-listed one, where OTC products are sometimes different enough to serve a distinct or complementary purpose or audience. Sometimes….

OTC derivatives can be useful when they solve a particular problem for a particular user by tailoring the terms to their specific circumstances. For example, a company that borrows in the loan markets but then wishes to hedge the related interest rate risk, may have borrowed in an amount and tenor that do not correspond to the terms of a listed interest rate derivatives contract. And they may not have the expertise to work out an approximate hedge in those listed derivatives.

This in turn can lead to a symbiosis between the OTC and listed world. For, while OTC dealers – when they act as intermediaries, rather than proprietary traders – may sometimes be able to hedge bilateral contracts by selling an offsetting OTC instrument, they may well use listed derivatives instead, if only as a temporary hedge. They calculate the risk measures that allow them to translate from bespoke OTC terms to off-the-shelf (and typically very liquid) listed ones.[1] They work out the correct ratio of interest rate futures to hedge a swap and the same principle applies in other asset classes. In the commodities markets, for example, a dealer might use as a proxy a listed oil derivative, to hedge a forward-dated transaction in a different but not widely traded grade of oil.

But not all OTC transactions are necessarily tailored in any meaningful sense. (This is one reason why the G20 pushed for more platform trading in 2009, such that robust price formation be supported, in a fair and orderly manner, with higher built-in advantages in terms of customer protection and counterparty-risk management.)

In fact, it is easy to trade OTC contracts on the same terms that apply on exchange (size and maturity of contract), but without any of the public-good obligations associated with lit public markets. Swaps, for example, started as a completely bespoke product but relatively soon many were traded with maturity dates that coincided with interest-rate futures, only without the price discovery that exists in listed derivatives. That way, it was cheaper (for the dealers) than letting the rest of the market see what the price was.

So, the public policy choices that remain today, even after the landmark Pittsburgh G20 reforms of 2009, are not so different from what they have always been. Listed markets constitute the safe (reliable, verifiable) core of derivatives, just as they do for shares and other financial instruments, and it is vital for the health not just of listed markets but finance more generally that we ensure that they can continue to do so.

OTC market participants have a strong incentive to bypass central marketplaces, while also taking advantage of the pricing signals and liquidity that listed markets provide. So, as with share markets, it remains important to nurture the role of the core price formation that happens via listed derivatives, for the sake of those listed derivatives but also of the risk transfer market more broadly.

In this context, it is also worth bearing in mind that, in spite of the progress since 2008, there are still big issues to consider, particularly where the distribution of risk is concerned.

Who holds all the risk?

[1] They might do this to hedge a single contract or their overall portfolio position, which requires sophisticated calculations.

Trade repositories exist for OTC derivatives business but are not joined up internationally, as the Archegos episode in 2021 highlighted all too starkly.[2] For some non-listed, retail-oriented products such as contracts for differences and binary options, which are functionally comparable to other derivatives, it is hard to get a sense as to the size of the market, partly because some may be offered online from outside a well regulated jurisdiction. Exchange-traded derivatives, with their integral central clearing arrangements, therefore, remain important to transparency as to who has which risk positions and when. The balance of regulatory incentives, as between OTC and listed derivatives, should continue to reflect this reality.

Clearing obligations were introduced as part of the 2009 G20 reforms, though only for certain types of contract. This needs to be kept under review, as trading increases. Meanwhile, any temptation to load costs onto CCPs, rather than charging the risk-taking market participants, should be resisted, in order to maintain the correct incentives for those risk takers – and CCP resources for extreme and implausible scenarios should not be allowed to undermine the cost-effectiveness of clearing or substitute for the correct oversight of the wider financial system. At the same time, it is important to recognise (notably in margining rules) economic offsets – for example between futures and options on the same underlying asset.

And it is important to ensure that the neutral risk managers at CCPs have the best possible overview of the market. Their ability to form a view as to the distribution of risk is already superior to that of any single market participant.

But risk managers at CCPs may not always have as much visibility into the health (creditworthiness) and related-but-uncleared risk positions of market participants as they, in their capacity as de facto system risk managers, would ideally have. This is an issue across all asset classes, but is particularly acute in markets with finite supply, ie, commodities, where OTC positions can easily overshadow those on listed markets.

Because CCPs do not themselves take risk positions, they do not have the conflicts of interest that market participants have. (Moreover, the fact that market participants take those risk positions makes it important to include an element of potential mutualisation of risk, via the CCP – in essence to ensure a collective commitment to good risk management practices.)

It is also worth noting that margin requirements for uncleared trades are only now, 15 years on from the collapse of Lehman Brothers, finally reaching their last stage of roll-out. Yet it is striking that, when put on the same playing field as cleared trades – where margin requirements have always been standard – we see a shift to central clearing, creating a virtuous cycle. This has been particularly visible in the last few years in foreign exchange contracts.

It is important not to let markets slip into the bad old ways and, if anything, bring more transactions into the scope of margining and possibly clearing.

How transformative were derivatives?

Shares were invented at the start of the C17th[3], essentially as a way to manage risk. With shares, greater amounts could be raised to back a venture, such as sailing from Amsterdam to the other side of the world. Thus, no single merchant needed to shoulder all the potential loss associated and, at the same time, many people could club together to achieve a bigger impact.

Derivatives bring an even greater ability to decide what risk exposures to take. The economist's jargon for this is that derivatives 'complete' markets, by allowing the fullest range of possible contractual arrangements in relation to prices. They are a powerful tool, with a small (or zero) outlay commanding exposure to a large – but often strictly notional – amount, thereby creating a tool that can hedge existing exposures and more generally support easy risk transfer.

First used centuries ago and relatively common in commodities markets, derivatives truly broke though in the 1970s, when central banks finally acknowledged that they could no longer control the price of gold or the money that it backed. As a result,

[2] Archegos was a hedge fund that built up large positions with several different banks in various jurisdictions at once, meaning that no one bank or supervisor could see the aggregate size of its position. The same happened 25 years earlier, in 1998, with LTCM.

[3] https://www.beursgeschiedenis.nl/en/the-story/

the private sector had to take on the responsibility of managing significantly greater variations that arose in currencies and interest rates, ultimately threatening international trade.

Roll forward 50 years and these powerful precision tools are routinely put to use by professionals who work in finance, not to mention a wide range of end-users, including everyone from multinational companies to individuals trading from their own homes.

It is worth noting that even if derivative contracts did not exist, their effect could be synthesised from combinations of existing financial instruments. In other words, it is possible (if not very efficient), to replicate the effect of derivatives without actually trading them. For example, if I borrow money for three months and use it to buy some wheat today, the economic effect will be the same as if I buy a three-month futures contract on wheat. Derivatives just package these things up in a convenient – and therefore more tradable – form and without necessarily trading the full face value of the underlying.

The fact that derivatives are, in effect, little more than an extension of existing financial instruments, means that they need not be the preserve of the finance profession. Any investor who understands a share or foreign exchange transaction can easily bring derivatives into play as well.

On the equity side, where the free float in a given listed company may be low, or in fixed income where bonds are often held on till maturity, derivatives provide an add-on to such securities. Investors can take exposure to such securities using derivatives.

Derivatives can take many guises, but all fall conceptually into one of two sorts: either into relatively simple forward contracts (which in the transparent, exchange-traded world are labelled futures); or options, which do not bind the buyer to a later transaction and which allow one to take a view on not just the price level but on price volatility. One notable evolution from the basic forms, though, is on the options side. A warrant or certificate is a derivative that has been 'securitised', meaning that it takes the form of a transferable asset that can change hands, just as a share or bond can. This is distinct from derivatives more generally, which take the form of a contract – technically a bilateral contract – that requires a subsequent legal agreement, if a third party is to step in in place of one of the original parties to the transaction.

As a matter of practice, much of the focus in the listed (unsecuritised) derivatives world is on relatively short-dated contracts, notably those with three months till expiry. This has the beauty of maximizing the interest from a wide range of participants. Those taking a view on likely price movements can meet those who wish to avoid exposure to that same risk, rolling the hedge forward into new three-month contracts as they see fit. This is not to understate the importance of longer-dated versions of the same contracts, for example on short-term interest rates, which are in turn complemented by OTC trading in instruments such as swaps.

In practical terms, derivatives bring a whole new dimension to finance because they isolate specific risks in a very deliberate manner. So, while they achieve the same effect as combinations of transactions in existing financial instruments, they do so in a targeted way that allows the pricing of a specific risk factor or measure. Interest rate derivatives allow one to take a view on any or all parts of the yield curve, without mixing that with the varying liquidity characteristics of individual bonds or the issue of creditworthiness.

Derivatives and Risk Exposure Amounts

Derivatives are sometimes the subject of irrational hostility on the part of commentators, who fail to consider important differences between their mechanics and those of other financial instruments. This is particularly true of the cash-settled derivatives that make up a large part of the market and which entail an obligation based on the change in price of the underlying asset, rather than the absolute value.

In such contracts, I pay you the difference between an agreed price-level for, say, a barrel of oil and the prevailing price in the market at the contract's maturity. So, the amount payable might be the difference between a $75 contract rate and a price of $80 in the market at maturity – an amount of $5 in other words, rather than $75. This cash-settlement arrangement is important, because it means one can easily put on hedges, alongside existing positions.

Even when the contract calls for physical delivery – and I am contracted to pay you $75 against delivery of the barrel of oil – there will still be the chance to close out the contract early, settling any difference.

Assuming that one is on top of this (rather basic) concept of derivatives as a tool to manage market price risk, the residual risk is the counterparty risk: the risk that your counterparty will go bust before paying out on a contract that has positive market value for you.

But in practice, many participants (especially dealer intermediaries) accumulate a range of offsetting contracts, which must be netted off in the case of the bankruptcy of one of the parties.

This latter point means that the apparent large size of the derivatives market is a double illusion. Not only is the notional amount of the underlying not necessarily payable but the actual amounts on individual contracts cannot be seen in isolation. Rather, they have to be taken on an aggregate basis, with offsetting positions duly respected. (Where offsetting positions relate to the same underlying risk, for example US equities, this should be recognised, whatever the regulatory characterisation of the instrument.)

This is actually a – if not the – key feature of central clearing. While CCPs are well capitalised for what they do, that is not actually how they benefit the system, because they are not there to absorb risk. They are there to hold market participants to account for the risks that the latter take, by charging impartially determined levels of margin (collateral). The *quid pro quo* is that participants get much greater certainty, to the benefit of the system as a whole. And through netting, they get reduced risk exposures.

The figures usually cited for the size of the market are the notional amounts which may run to a few hundred trillion dollars. In reality, the amount that would actually change hands, if all derivatives were closed out right now, would be about one hundredth of that (or a few trillion), because it would be the mark-to-market value of the contracts, netted down to reflect economic offsets. *(See the Bank for International Settlements statistics for details*.)

Also, those mark-to-market amounts are in large part collateralised, meaning that the exposures are secured. Contrast this with the $100 trillion-plus that is actually owed by bonds around the world and one begins to get a perspective.

Again, central clearing is relevant here. CCPs ensure that good collateral ('margin') changes hands in a timely fashion and that the assets posted to back positions are a) of the highest quality and b) backed up by additional resources, in case of extreme circumstances. And, because CCPs net exposures multilaterally, the amounts of collateral that need to change hands are reduced – because the size of the obligations has been irrevocably reduced.

Even the non-cleared derivatives markets make use of some of these techniques, though bilateral netting and collateralisation lack the network efficiencies and structured approach of central clearing. And central clearing can be and is applied to contracts, even if they are not traded on a central market.

Why derivatives exist

Ultimately, a single derivative addresses a risk that is already inherent in the underlying asset. More profoundly, the company or individual entering a derivative contract has a very clear proposition, because by its very terms the derivative is a targeted instrument.

And, to return to our main theme, a key safeguard exists in the form of centrally traded contracts. While listed and OTC markets are in some ways complementary and all the better for each other's existence, it is important to keep in mind that the standardised terms in the listed domain attract a wide range of participants, meaning that there is ready liquidity in normal market size. And that means that end-customers have a way of observing prices and price formation in action, meaning that they can be more sure that they are getting a good deal – and meaning that broker dealers can demonstrate best execution, which is inherently harder to do in the by-appointment, OTC world. There is even a price history to look at, which not only reassures end-customers but attracts professional

traders and market-makers, who can devise strategies based on analysis of that price history. This ultimately bolsters the liquidity in the market.

This does all depend on market makers and clearing firms being able to run a business. And the trend in regulatory capital requirements in the past decade has worked against this, which is short-sighted and counterproductive. Bank capital rules in particular, should work with the grain of central trading and clearing – not against it.

Similarly, loading capital requirements onto trading or clearing does nothing to stop credit bubbles but does harm the ability to manage risks that are a by-product of productive investment in the future. Yet, to widespread and justified alarm, recent times have seen attempts to interpret the Basel rules as justifying penal treatment of clearing related exposures, under the Basel III 'endgame' in the US.

Another benefit of central markets is that, because the terms of listed contracts are standardised, there is no scope for ambiguity as to contractual rights and responsibilities – an issue that may arise in bespoke contracts, if due care is not exercised.

Lit trading, where prices are visible pre-trade and reported promptly post-trade has indirect benefits. It instills public confidence, contributing to a positive interaction between financial markets and society. And, in more concrete terms, it allows asset managers to easily demonstrate how they are meeting their fiduciary duties and mandates. In the case of companies, they can report to shareholders with confidence that they are operating on a market with integrity; where there is nothing to hide; and where conflicts of interest cannot prosper.

Thus, with all these benefits, it should be clear that derivatives in general are a force for good, allowing for more control of how much risk one wants to take. But, like any market, derivatives require a solid foundation in lit, public markets. The upside to all this consists of better outcomes for individual users of financial markets; for the good functioning of those markets as a whole; and ultimately for the economy that depends on those markets.

Who uses derivatives and why?

The short answer is anyone who wants a very clearly defined risk profile. Buy copper for delivery in three months at a price that is fixed today and you have certainty over costs; or, from the seller's perspective, certainty over your profit margin. In the hands of a different market participant, the same contract could constitute a trading view, akin to buying shares in a mining company but without the uncertainty over the performance of that company's management team.

Call options, for example on shares, provide the opportunity to benefit from an upside that may be uncertain – or for the seller to earn premium in that same environment of uncertainty.

A slightly more intricate example concerns the use of derivatives alongside existing positions, such as the technique of covered call writing. Take the case where an investor (Taylor) already owns some shares (in Big Music Co.) and sells a call option on them. By virtue of this, another investor (Katy – the buyer of the call option) has the right to buy those shares in, say, a year's time, at a pre-agreed price – say $5 above where they are trading today. This option transaction provides Taylor with some income today, because Katy must pay to have the right to buy at what might turn out to be a relatively advantageous level in future. If, in the end, Big Music shares go down in value, this income will be especially welcome to Taylor, while Katy does not have to exercise the option and, by avoiding buying the shares outright in the first place, does not end up having to sell a stock position in a falling market.

If the share price does rise and Katy exercises her right to buy the shares, Taylor can cash in at a level where she is comfortable selling anyway. *(The situation is illustrated, from the point of view of the owner of the covered call, in the diagram below. The solid line highlights the extra return achieved by selling an option, up to the point where it becomes advantageous for the buyer to exercise her option, where the shareholder can no longer count on further returns.)*

Note in addition that Katy could also benefit if, at some point after buying the options, it turns out that the market starts to think that the price of Big Music Co shares will begin to move around more. At that point, the option increases in value (because there is a greater probability that it will end up being worth exercising) and Katy can sell those same options at a profit.

There are many other examples. Borrowers, who finance their business through bonds and loans, can adjust the mix of fixed and floating rate debt from time to time by using various types of interest rate contracts. And (provided they are not hampered by capital and other regulatory costs) trading firms can make a living by acting as intermediary on transactions, or bring liquidity by taking a view.

Because lit, public markets derivatives attract a wide range of participant types – hedgers, investors and traders – they can be relatively liquid. This means that entities such as pension funds who need to add to their portfolio of shares can buy futures contracts and then gradually convert them to shares. This 'efficient portfolio management' may reduce the impact on the price of the shares and thereby get a better deal for the pension funds' end-customers.

The list goes on. A combination of put options – one bought at 0.2% below today's price and another sold at 0.4% below – can be used to express a view that the value of, say, a currency will decline by around 0.3% (ie, somewhere between 2% and 4%) but not much less and not much more.

The ability to create almost any exposure or pay-off also makes it easy to create structured notes and other forms of obligation, including various types of exchange traded product, that include as one feature of their returns the effects that can be created using derivatives. Thus, I can buy an investment that, say, pays me my capital back at maturity, plus the increase in, say, a share index. The issuer hedges this obligation using derivatives and, by issuing the note, can reduce financing costs by tapping into investor demand – often including retail demand – for a particular investment theme at any given moment. (In this case, it is even more important to have the transparency that exchanges bring, because products that bundle together various features are more prone to mis-selling, when traded outside a protected environment that safeguards investors' interests first.)

In short, one can use derivatives on anything whose price can move or on anything that might affect a business, from the weather to the creditworthiness of a superpower.

And, at the end of the day, they are nothing more than what one can (with a few exceptions) replicate in the underlying markets. If I borrow a sum to be repaid in three years and invest it for two, I have in effect locked in a future borrowing rate, for the twelve months between end of year two and the end of year three. (This is a forward rate agreement.) Buy shares in proportion to how much their price rises and I achieve the same result as a call option. And so on.

It is just much more efficient to trade the derivative, because of lower transaction costs, arising from greater liquidity. And the most liquid and open market is the one on the exchange.

Covered call illustration