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# Collateral optimisation: Managing the cost, mobilisation and velocity of collateral

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## SETTING THE TEMPO: NEW PRIORITIES

SAHEED AWAN, GLOBAL HEAD, COLLATERAL MANAGEMENT & SECURITIES FINANCE EUROCLEAR GROUP: Our collateral management business is about building an infrastructure for mobilising and allocating collateral globally. Our priorities in collateral management are primarily to grow the connectivity that we have on the Collateral Highway, in terms of both sourcing and delivering both bonds and equities from around the world on behalf of our clients. Equally, we have to be able to allocate such securities collateral to an ever-expanding ecosystem of collateral receivers, liquidity providers and risk mitigators. They are exit or delivery points on the Collateral Highway. In practice, the targets and markets segments are tightly focused; in particular on central banks as the one of the key exit points for collateral and for providers of liquidity. However, we also connect with all the principal central clearing counterparties (CCPs) around the world. Our day-to-day business involves bringing more liquidity providers and CSA counterparts onto the Highway, whether they are corporate cash providers, insurance companies, securities lenders or commercial banks.

KARL WYBORN, MANAGING DIRECTOR, HEAD OF SALES FOR SECURITIES CLEARING AND COLLATERAL MANAGEMENT, EMEA, JPMORGAN CHASE: I work within JP Morgan's sales function for both the sell side and the buy side where collateral is concerned. I tend to look at collateral end to end, beginning typically at the global custodian and then ending up with potentially a liquidity provider or a CCP. The focus for the bank is increasing the velocity of collateral as it passes through that chain. We call it the collateral continuum. There are various different participants to the chain, and the speed with which collateral moves between them, we believe, is becoming far more important. Then, of course, we have to help them optimise that collateral.

Optimisation can mean different things to different people. The buy side's views about optimisation, for example, is very different to the sell side, in our experience. Therefore, increasing the velocity of collateral and improving optimisation are the two themes that we have prioritised.

BEN THOMAS, HEAD OF COLLATERAL, FINANCIAL RESOURCE MANAGEMENT, DEUTSCHE BANK: Traditionally, our group has concentrated on collateral trading optimisation, capital and financial resource management, with a primarily equity division focus. The effort for us in the last, certainly twelve to 18 months, has been in trying to expand the scope of what we do across product and bringing together a bunch of desks across the investment bank that have similar optimisation roles into an integrated solution. The challenge we face is trying to pull the many elements involved in collateral optimisation together. As Karl intimates: what is true optimisation? How do we achieve broad agreement on what it means? Added to that are additional considerations, including optimising capital usage and the convergence of the collateral technology we employ across the investment bank platform.

MARTIN SEAGROATT, HEAD OF GLOBAL MARKETING AT 4SIGHT FINANCIAL SOFTWARE: 4sight is a provider of front to back office, cross product collateral management software. Our priority is helping our clients adapt to the huge volume of regulatory change that they face. This involves automating their collateral processes to deal with CCP margining and an increased volume of margin calls and collateral movements. We also continue to develop more advanced collateral optimisation algorithms. We see the market moving towards a much more detailed transaction cost analysis in response to regulatory pressures. In response, we are designing tools that offer a more holistic view of optimisation. This includes Basel III capital charges, balance sheet usage, trade type optimisation, collateral opportunity costs and optimisation of counterparty selection.

PETER LEFT, DIRECTOR, CAPITAL AND COLLATERAL MANAGEMENT, LLOYDS BANK COMMERCIAL BANKING: For us collateral optimisation doesn't just mean the first order of posting the cheapest asset possible, but the secondary impact of the decision on us. What is cheapest is not necessarily defined in terms of interest rate and repo rate. It is more around the natural client flow that provides me with that asset and I therefore don't actually have to go into the market do a trade to source it, or even leverage the balance sheet. If I can find homes for natural client flow in pools such as initial margin and CSAs and BACS and CHAPS, that's a value-add without grossing up the balance sheet.

Invariably, it involves understanding the duration of some of those dynamic collateral pools or 'syncs' that we have, and utilising them to help us service our clients with the collateral transformation they are looking for. At the same time, we work with the Group's corporate treasury division and the money markets desk to help them enhance or manage their liquidity and their currency gaps, and so forth. In summary, it is about trying to bring all these people in the puzzle together.

DAVID BEATRIX, SENIOR BUSINESS DEVELOPER, COLLATERAL ACCESS, BNP PARIBAS SECURITIES SERVICES: My business group resides in the bank's securities services division. Collateral Access is our suite of solutions related to collateral both for buy side and sell side institutions, providing a number of components in order to help our clients face the operational, velocity and liquidity challenge in derivatives, repo products, among others. Everything which falls directly under the new obligations prescribed by regulations such as EMIR and Dodd-Frank, as well as providing optimisation solutions or facilitating the transfers of collateral between parties involved in secured transactions.

### DEMAND & SUPPLY: MANAGING THE NEW DYNAMICS

KARL WYBORN: I would draw a distinction between demand and supply and optimisation. They are linked but are definitely not the same. From a demand and supply perspective, the sell side banks in general, focus on the buy side as sources of supply in the EMIR/Dodd-Frank environment where the demand for high grade assets is forecast to grow very significantly. Meanwhile, the buy side think they are going to be liquidity takers in that environment as well. The buy side believe they have a borrowing demand to meet their EMIR collateral, cleared margin requirements, and so both parties (sell side and buy side) are looking at each other as providers of liquidity. Actually, where the supply comes from is, as yet, undefined. We know where these high grade assets reside. We know they sit with central banks on commercial bank balance sheets, in pension funds, and in sovereign wealth funds, and to release that supply is one of the key challenges that we face as an industry.

SAHEED AWAN: There are some numbers around which the industry is now coalescing. The initial forecasts were so wide-ranging that it became almost nonsensical. Collateral shortfall forecasts have ranged from $800bn to $10.5trn and anywhere in between. Now most observers would say that the forecast of new collateral required as a result of Dodd-Frank, EMIR and Basel III is somewhere between $3.5trn and $6trn. That's the demand side. The supply side is, in theory, less worrying. The IMF reported in early 2013, that there is around $44trn from the G20 of sovereign debt, of which $33trn is governmental debt from OECD members. Then there is also about $2.5trn-$3trn held in lending pools.

Markitt-Data Explorers says they report on some $14trn in securities lending programmes, of which about a third, or certainly a quarter, is in high quality liquid assets. Then there is (between JP Morgan, ourselves and the other two large tri-party service providers) roughly $950bn to $1.2trn of cash available from the repo market. Repo is considered a collateral upgrade trade in that sense. So there is, on paper, ample supply. However, as Karl suggests, that supply is siloed and the biggest holders in that silo are the very regulators/central banks that have imposed the new collateral paradigm on the markets. The US Federal Reserve's (the Fed's) balance sheet has grown from $800bn before the crisis to $4trn now; elsewhere the Swiss National Bank has some $500bn siloed away in bonds and eurobonds and the Bank of England has done the same. They hold these assets as part of quantitative easing or as a currency peg. Therefore, releasing that type of supply into the market is going to be key; and the Fed is taking the first steps with its fixed rate reverse repo facility where it is releasing up to $50bn to 100bn a day into the market, at a current floor price of 3-5 basis points (bps).

That floor price of 3bps for general collateral (GC) is really at the lower end of the scale. That said, GC rates when they get down to zero basis points, imply there is a shortage of collateral in the market. Therefore, those central banks involved in quantitative easing need to be conscious of the fact that the macroeconomic policies they have been pursuing are resulting in collateral shortages. This point is really important. If rates are at 3bps, or 5bps for GC, what would it take to get the big buy and hold long-term holders (sovereign wealth funds, central bank reserve departments, insurers and pension funds) to release that supply into the market? They certainly won't do it at 5bps unless they get an insurance policy of some sort to indemnify them against risk, plus higher fees. To exchange corporate paper or index-linked equities for high quality government securities you are looking at 50bps to 75bps, plus an indemnity to nullify the risk. That's the issue. What is the level of comfort that these big holders are going to need to unload some of the supply to help the shortage? It is that risk versus reward trade-off.

DAVID BEATRIX: If you look at ESMA's report last year about trends, risks and vulnerabilities, if my memory is good, there is a €1.6trn scissor effect whereby supply increases more slowly than demands and encumbrance. By the end of 2014. The problem is that, globally, not everyone is doing the calculations based on the same assumptions; some take the runs on assets due to LCR effects, some don't. Some take the initial margin requirements of CCPs, but with use different parameters. However, everyone agrees that it all adds up to scarcity. We have a real challenge in terms of making sure that it does not create trouble for the industry as a whole.

KARL WYBORN: A missing element is the timeframe over which this demand will materialise. We have been clearing swaps now in the US for virtually a year. The volumes of collateral held against cleared swaps is increasing, but it is still a fraction of what's held against futures and options in the US. To my knowledge, the US bond market is not yet influenced by the demand for high grade collateral to be posted against cleared over the counter (OTC) transactions. We can clearly track a steady and steep growth in the demand for these assets but, at best, we are forecasting a three-year period over which we are going to be achieving some of these very high numbers that are being spoken about. The fundamental question is: how do you unlock that supply?

BEN THOMAS: We have witnessed three things: one, supply is there. There is plenty of supply. Two, that has meant that lenders of high quality assets have been somewhat disappointed over the last two years as asset transformation levels have not spiked as much as some had hoped. In some cases we have witnessed beneficial owners bring term upgrade exclusives to market and not receive bids anywhere near the range they were hoping for so they have backed away.

The third element is there is somewhat of a mismatch between the supply and demand side with regards to term financing structures. Focus points such as your LCR ratio have increased the market's desire to trade evergreen and extendable structures, many lenders do not have the required systems to trade capture and risk manage such structures appropriately. Clearly, there is a slight mismatch between demand for certain term financing trades and the willingness on the lender side to offer enough supply in anything other than open or term bullet trades.

PETER LEFT: I'd like to pick up on the increase in initial margin and CCPs. There are obviously more participants needing to come up with collateral to satisfy that requirement. A lot of our clients have to start thinking about moving to the likes of LCH.Clearnet and CME, and they are concerned about the term at which they are going to have to post that initial margin (IM). For OTC, we are talking long-dated derivatives and they are going to be consuming collateral for much longer than we are conventionally used to. Not surprisingly, we are starting to see long-term trades in secured financing and as a result the significant steepening of the secured financing transaction curve. Because people are concerned about the term they potentially have to commit to placing the initial margin for, they are starting to have to think about getting that high quality collateral in for much longer.

MARTIN SEAGROATT: As well as the supply and demand dynamics, there is also an element of the movement and velocity of collateral. This can be thought of as the plumbing of the system. There are a number of factors that might start to slow that down and cause blockages. For example, CCP account segregation, a financial transaction tax on the securities lending and repo markets, leverage ratios and restrictions around re-hypothecation of collateral.

We will also see a lot of collateral sitting encumbered on balance sheets for Basel III liquidity coverage ratios. These factors could cause the velocity of collateral to slow even further. Research by Manmohan Singh has estimated that in 2007 the rate of collateral velocity or re-use was around three times. That has since decreased to a velocity of around two in 2012. Further falls in reuse could cause real problems when combined with the added demand for collateral, and perhaps result in a scarcity. The new challenge for the market is now to mobilise collateral at a high velocity and in a way that minimises settlement costs, manual processing, and risk.

### FINE-TUNING THE PLUMBING: BUILDING THE COLLATERAL INFRASTRUCTURE

BEN THOMAS: Certainly for the large banking institutions, it is really about trying to peel everything you have back to day one. If you were starting a new business from scratch many banks would build it very differently. However, you are not going to perfect optimisation. Everyone agrees about that. It has been referenced time and time again in the past that there is a cost benefit analysis where you're probably going to get 80% to 85% of the way there if you do a good job and integrate everything efficiently. That might be the case, but, in many cases the inventory that you are using is so dynamic, that by the time you have optimised the position data is out of date, assets have moved and you need to juggle everything again. The fundamental building block is to know, in real time, where your inventory is across the bank, globally. That, as a very fundamental starting point, is something that's quite hard to achieve, but no matter how difficult it is, it is very much the initial focus.

Then there are an ever-increasing amount of variables that need to be plugged in to calculate what is truly optimal. From a simplistic perspective, you'd start with what's optimal for my product in terms of the cheapest carry. You then overlay points such as the opportunity cost of not having that asset available to collateralise a different product in a separate part of the bank. Now you might consider what's the effect on my LCR? How has that decision impacted my CRDIV leverage ratio? It goes on and on and on, and actually it is a big challenge. There are so many variables to consider right across the bank that (and this point was made right at the outset) what seems optimal for one group often is not for others.

FRANCESCA CARNEVALE: If collateral optimisation then means different things to different people, is collateral optimisation then going to lead to an increasingly fragmented service set?

SAHEED AWAN: No. Big sell-side firms, such as Deutsche Bank and the bigger investment banks, have been moving away from a fragmented service set. Certainly in Europe they would tend to hold—and this is not a pitch for Euroclear—but they tend to hold their fixed income in Euroclear. We have the majority of the European market share for fixed income already for investment banks and global custodians. The pockets of fixed income assets that the investment banks do not hold in Euroclear are in places such as southern Europe, Italy and Spain for instance, where we are partnering with agent banks (Citi and BNP Securities Services, for example) to try and mobilise the remaining pockets. Even so, the frictionless mobility we are offering in terms of automation is added value in that, day in and day out, those clients of ours who use BP2S as their custodian in Italy or in Spain, are frequently and manually moving their assets in and out of domestic markets into the international market. All we are doing is helping them do it in a more 'straight through processing' way.

The starting point, as Ben pointed out, is: what is my global inventory, and where is it? Having established that, then you can start the optimal allocation of those assets. In Europe, the big sell-side firms tend to have already made the decision to consolidate their assets in one, maybe two key locations. Our job is to make sure that we are able to mobilise the assets that are not in Euroclear, or give them a view, an inventory view, of where they are, not only in Europe but in Asia and in the United States by having links into those markets through domestic agents or CSDs. It also means having a real time view. Our objective is to present them with a view of their global bond and equities inventory and a list of obligations that they need to fulfil. And then we allocate optimally, using the usual rules, the lowest rated collateral first, and then all the way to the highest rated.

The issue for the buy side is: how do they benefit from the huge infrastructure that a tri-party agent, such as Euroclear has if their assets are in a single omnibus account in the name of the custodian? Therefore, we work, and will continue to work with the buy side's custodians or agent. That's a clear statement of our position and strategy today.
WILL BUSINESS COALESCE AROUND THE FEW BIG, GLOBAL PLAYERS?

KARL WYBORN: We are seeing from our sell side client base a consolidation across what were previously siloed parts of the bank, bringing their assets, from a collateral standpoint together, to be able to see all of the available positions, and using them in a more judicious way. You cannot optimise what you can't see. This is true for the buy side as well as for the sell side. That, however, is the fundamental starting point. If that is the case, then inevitably, there is a concentration of activity in providers who can support those more holistic requirements. By that I mean historically tri-party has been used in repo and to support repo and securities lending. Now we talk about tri-party in the context of cleared margin and various other activities, where people have become far more focused on the operational cost of supporting a collateral programme, and the benefits of moving that collateral more quickly through the system. From our perspective, the demand we see from the sell side is one of consolidation, and the demand that places on us is to expand our services to be able to support different lines of business from those which we have historically supported.

BEN THOMAS: It is two sides of the same coin. The fewer providers from the sell side you utilise, the more overall optimisation you're likely to get. Even so, does the market, by converging into two or three big providers, introduce added and undesired concentration risk?

FRANCESCA CARNEVALE: Peter, you've done work on mobilising collateral for high risk trades. Is that a particular niche for you; or do you play in the same field as everyone else around the table?

PETER LEFT: We have plenty of customers wanting services from us, despite us not being the huge one-stop shop. We have a role to play as a UK-focused entity in providing liquidity. There's quite a diversification in bank counterparties; we have lots of new players in the UK coming on board. There's JP Morgan, Citi and BNP Paribas, but there is also room for us to play and sit in between those pools of collateral and them. Most people are willing to do collateral transformation overnight, and this is kind of exactly what we are doing in the unsecured market. Banks borrow at three-month Libor and they lend on a mortgage which is 20 years. That's what old fashioned banking is, is changing the term of the deposits into the financing maturity people want. We are just seeing that change in management being applied to secured financing from unsecured. It is the biggest investment we are making in financial markets; to understand our inventory, the term of our inventory, the dynamics of our inventory and match them.

MARTIN SEAGROATT: The increased costs of compliance in the new regulatory environment will make it harder for smaller players who don't benefit from large balance sheets and economies of scale to thrive. This concentration of risk is one of the major unintended consequences of the move to central clearing. For the buy side, using a greater number of clearing brokers/FCMs/CCPs offers risk diversification but it also fragments order flow, reduces netting and increases costs. The service providers that can achieve efficiency by analysing true transaction costs versus P&L and optimising their business strategy and pricing around this will do well. This does include smaller firms who can adapt in a flexible way to the new environment and find a niche in the market by offering more bespoke services. We may also see some consolidation among CCPs as time goes on. There are a fairly large number of CCPs out there and, over time, this may shrink a little. Each CCP will clear more products and this will open up opportunities for netting efficiencies. That is why we may end up with a smaller group of better capitalised CCPs; but then, it will also result in a concentration of risk in the system, and obviously the implications of a CCP failing would be more significant in that situation.

SAHEED AWAN: Lloyds has a nice, unique model which seems to work quite well. I'm wondering though Peter, if the demand from buy side for client clearing services has been one of disappointment, generally, in the marketplace. That brings me to the question: if banks, don't have the balance sheet to give and clearing brokers are not able to offer them the collateral transformation services they are looking for, who is going to look after the buy-side, especially the medium to small firms? The rules, especially the leverage rules under Basel III are making it much more difficult for repo financing activities to carry on in the way they have been doing. Furthermore, the spectre of FTT is still out there as a threat to all of us. Does that mean that banks that provide financing of that type of intermediary services, will vacate this space because the regulators are constraining them and because they don't have sufficiently strong balance sheets? That breach or gap will be filled by some of the newer, niche players. I'm wondering if that is going to create a scenario where we'll see a hedge fund receive funding directly from a corporate treasurer. Secured. Yes? Or perhaps a hedge fund going to a sovereign lender directly, without, for example, JPMorgan in the middle.

KARL WYBORN: There is now a far greater correlation between risk and cost for the buy side than there was ever before. For a fund, you could argue that the best value proposition to support its clearing requirement, for example, would be to use one clearing broker and clear everything through one CCP. This would provide a concentration of activity, best buying power with a clearing broker and best netting with a single CCP. However, this is a riskier solution. The alternative and less risky but more expensive is multiple CCPs and multiple clearing brokers. Where the buy side decides to sit on that curve, to some degree, will influence performance of the fund. Relative fund performance is a key driver for the buy side in terms of how they judge themselves and how they are judged by their clients. This is a very new dynamic. The sell side has a slightly different dynamic because it is almost cost versus reward. What's my opportunity cost for what is now a very finite resource? As a collateral agent for both the buy side and the sell side, our objective is to break the direct correlation between risk and cost. It is also important to remember this is not happening in isolation. Other initiatives such as T2S are in train, which will help. T2S, for example is a great example of an initiative which ought to reduce transaction costs significantly across Europe.

DAVID BEATRIX: At BNP Paribas Securities Services, as a depository bank, under regulations such as AIFMD and eventually UCITS V, we are liable for the restitution of collateral that is received by our clients under full title transfer of property, and their assets that would be delivered to counterparties under a different regime from title transfer. We must incorporate that consideration into the picture. There is need to have a transversal view of the assets that are available, or the unencumbered assets that are available for collateral, across where those assets are located. We need also to ensure our depository duties whenever our client is in-the-money or out-of the-money on derivatives activities. So we are having multiple constraints here in terms of consolidation of assets together with their encumbrance status.
Transformation has come into its own and is closely linked to optimisation in the sense that we have seen the emergence of individual segregated accounts that are more intensive in terms of usage of liquidity and transformation. Some of our clients that would have chosen an individual segregated account structure for OTC clearing also have to deal with concentration rules of the CCP, which they did not have to think about in the past because the clearer was doing the job of managing substitutions and posting collateral to a CCP. Now, some of the clients realise they could at some stage be in a position to post some collateral and find the CCP has reached its concentration limit.

That comes to the velocity question. If our clients don't want to pay funding charges, they need to deliver eligible assets in a timely manner, but can also encounter a refusal. So they need an alternative solution to source eligible assets as fast as possible, either in the available pool or via transformation. It is a concern for the buy side and it needs to be embedded in the optimisation landscape.
Finally let's take the example of firms that are traditionally not collateralised or collateralised on a unilateral basis only. They worry about Company Voluntary Arrangement (CVA) and Funding Valuation Adjustment (FVA) charges and wonder whether it would make sense to start collateralising. Corporates are by nature quite diverse in terms of being capable to mobilise liquidity very quickly. Some are purely averse to collateral due to treasury constraints and difficulties in posting assets; some have taken the point that CVA is an issue and are either already collateralising or seriously considering this, even though CRDIV exempts banks in Europe trading with corporates from the new regulatory CVA charges. Therefore, they need to find a solution to provide that liquidity.

### MARKET CHANGE AND THE IMPACT OF RISING INTEREST RATES

PETER LEFT: It is something we really need to understand, because obviously, conventional wisdom says rates rise and the value of the assets fall, so you have to go out and get more collateral. It might happen when you don't just need more collateral because the price has fallen, but you actually might have bigger liabilities to fund with that less valuable collateral. We need to have a handle on that potential correlation. It is something that the PRA wants to know. So it is pretty important that we have a fairly good handle on it. You can see the direct analogy if you trade derivatives on interest rates that require collateral, and you have a big sell off. If you're a fixed rate receiver then clearly your trades now are off side and you have to post more collateral. That collateral has just fallen in price because the rates have risen. You have this problem of a massive curve steepening and the economy recovers. Is there enough good quality collateral as liabilities increase? The question is compounded by the fact that asset values are falling at the same time. It is important then to be able in an inventory management framework, to be able to run through those simulations to understand the dynamics and simulate what might happen.

FRANCESCA CARNEVALE: How well prepared is the market?

SAHEED AWAN: Clearly, this is a sensitive topic. It is message that I have been hearing outside of Euroclear, and talking to the buy side, this is a very real nightmare for them. Mandatory clearing is a huge headache for the buy side. Insurance companies (solid insurance companies) which previously never had encountered such problems, are now being lumped in the same bucket as highly-leveraged hedge funds. They naturally ask: why are we paying the price for having to put up initial margins where we didn't have to do it before? They all lived off variation margin until now and now also initial margin which is not low, but more like 10% or 12% depending on the time left to maturity of the gilt. Then, these buy-side firms have to set up new processes to manage their margin calls. Add these together and you can see why it is a nightmare. We are talking to one of these Scottish insurance companies and they say they remain concerned about the implications around the level of margin calls that are expected, post regulation, when mandatory clearing is in place in Europe.

In the US, our partners, the DTCC, issued a white paper recently which forecast between a 500% to 1,000% increase in the number of margin calls throughout the day. These are phenomenal projected increases. Now, for a buy-side institution that used to record collateral calls on a spread sheet, and maybe after two days agreed on what needs to be delivered or what needs to be received for a single margin call, to move to an environment where they are going to have multiple margin calls throughout the day, and having to post high quality liquid assets that the CCPs will only accept as initial margin, it is a real challenge. Add to that, setting up the processes, linking into the SEFs and into the clearing brokers; then paying the clearing broker or the clearing charges and so on, when you add up all these costs, the buy-side decision makers may conclude it is too expensive.

My biggest fear in the future is that large numbers of the buy side withdraw completely on grounds of expense. They will then either use rough hedges through the futures market or they will enter into swap futures. The industry will be much poorer when that happens, because those buy side firm will go out of the market.

What's the answer? I make no apology for this statement. We all need to look at whether we are servicing the industry in the best possible way. Are we, because of the mandatory nature of these regulations, going to take as much as we can from the market, because they are forced to use these products? We did a comparison of collateral management costs, and we found that we are a third of the cost of some of our nearest competitors, and less than a fifth of the cost of some of our other competitors. The normal response during this time is to increase costs, but we refused because our sell side clients are having a hard time. We can afford to do it because we are a user-owned utility and because our business is a high volume and low margin model. However, CCPs will charge according to their business models and they are generally owned by profit-maximising companies.

Moreover, G20 governments and regulators want more and more business to be put into clearing houses. However, I see signs of the opposite actually happening. The market is discovering there are options outside of clearing, that are cheaper, more cost-effective and they still get collateral in the tri-party market and the bilateral market. If the regulators are not concerned about this, they should be, because mandating that all this business should go into CCPs was akin to giving them and all the other intermediaries in the chain a blank cheque.

KARL WYBORN: There is now a far greater correlation between risk and cost for the buy side than there was ever before. For a fund, you could argue that the best value proposition to support its clearing requirement, for example, would be to use one clearing broker and clear everything through one CCP. This would provide a concentration of activity, best buying power with a clearing broker and best netting with a single CCP. However, this is a riskier solution. The alternative and less risky but more expensive is multiple CCPs and multiple clearing brokers. So where the buy side decides to sit on that curve, to some degree, will influence performance of the fund. Relative fund performance is a key driver for the buy side in terms of how they judge themselves and how they are judged by their clients. This is a very new dynamic. The sell side has a slightly different dynamic because it is almost cost versus reward. What's my opportunity cost for what is now a very finite resource? As a collateral agent for both the buy side and the sell side, our objective is to break the direct correlation between risk and cost.

It's also important to remember this is not happening in isolation. Other initiatives such as T2S are in train, which will help. T2S, for example is a great example of an initiative which ought to reduce transaction costs significantly across Europe.

DAVID BEATRIX: Let us consider the case where insurance companies hedge themselves with, typically, products such as CMS caps that currently only exist OTC and have very few chances to be cleared. There is likely no other choice than trading them OTC under a bilateral master agreement and CSA. What happens then once the initial margins become mandatory on the OTC market? It could be something to which, right now, the industry has no firm response. How do firms hedge themselves against the steepening of the slope of the rate curve, or any other parameter for which hedging through cleared derivatives does not exist or is imperfect, and maintain trading and collateral costs at a reasonable level?

Still with the BCBS recommendation, one other example is the fact that (physically) settling FX forwards that will not be cleared on a CCP actually will be subject to a mandatory exchange of variation margin. From an operational perspective, it is also probably quite a burden for the industry. Things will also become more intensive in terms of operations. Firms will, for example, probably also have to redesign the infrastructures that people put around the FX forwards and swaps. Until now there was middle ground between derivatives and more vanilla highway products that was often excluded from collateral arrangements. Now they are clearly more in the derivatives environment, subject to the requirements in EMIR for example.

BEN THOMAS: In terms of costs, looking at the securities lending market (and a typical GC borrow) gives you a good idea how the process has changed. In the past, you may have looked for a stock from a range of lenders with consideration given to fees, where you want to place the balance and a basic collateral cost assumption. Now we need to drill down on the collateral costs at the very trade level. What's the cost and impact of funding the unsecured needed for the overcollateralization being posting, for instance? How does the cost differ doing the trade bilaterally versus tri-party? To the extent it is non-cash, what non-cash exactly is it? Where does it come from? Will it be there tomorrow? If not, how much will it cost to replace? Is the non-cash posted in the same currency denomination as the asset I've borrowed? How much balance sheet am I actually allocating that lender? What the effect on my CRDIV leverage? The list goes on.

You bring all these sorts of questions together and you could get to the point where you will have ten people from across the bank sitting in a room for three hours to discuss which lender they are going to borrow 50k of Microsoft from. The market would collapse. It demonstrates that it is vital to have all of these variables systematically captured. You need to have real time ability to process the data and see what the true cost is at an individual trade level. Frankly, I don't think many, if any, institutions can do that right now.

SAHEED AWAN: Choosing a counterpart has now become crucially important, and optimising that relationship has also become key in addition to getting your collateral optimisation spot on. What Ben has highlighted is that the debate is actually beyond simply collateral itself. There are so many different factors that become involved. Martin wrote a paper about counterparty optimisation at the point of trade. Do I do this repo trade with a CCP, with a street counterpart or with a central bank? The central bank is probably the best because I don't have to put up initial margin, and the risk to the balance sheet is the same as with a CCP.

MARTIN SEAGROATT: This is something that is now involving an increasing number of factors and on a pre-trade basis, it is quite a data intensive calculation. It needs to include initial margin, collateral eligibility and haircuts, CCP default fund contributions, capital costs, including capital held against default fund contributions, CVA, netting benefits and a range of other inputs.

This illustrates the complexity of optimising trading decisions in the new model. A good starting point is to analyse costs on a post-trade basis. You can look at your counterparties and ask: what were my capital costs for trading with this counterparty and how much balance sheet did they consume? What were my collateral costs? How much P&L did I generate from trading with this counterpart or client and what was the true cost of doing business with them? That could lead to optimisation of which counterparties you trade with or which CCPs you route order flow to.

However, as processing power becomes faster and cheaper and it becomes easier to compute these optimisation runs on a pre-trade basis, we could see that start to change. There will be more scope to support decisions on who to trade with or what types of trades are more profitable.

The reality is that only a small proportion of the market is even optimising collateral. This is firstly because most firms have focussed on initial compliance with the new rules coming in around clearing and on getting their new workflow up and running. Secondly, collateral costs have not really started to hit home yet, they have not yet started to bite in any major way, and that's leading to a fairly slow demand for optimisation. Over the next few years, as demand gradually increases and collateral costs begin to impact the bottom line, then we could see the take up of optimisation increasing.

PETER LEFT: I've observed quite a substantial difference in relative pricing already, in the top tier banks at least, and I like to think Lloyds Bank tries to reflect all the different values. The pricing of facing LCH.Clearnet as compared to facing CME as compared to facing a counterparty bilaterally, and then the effect of what can I pledge on that CSA has to be factored in and we try to incorporate that into the derivative price, the cost of funding the initial margin, compared to the cost of the capital consumed if we trade bilaterally.

We have all raised significant concerns at the cost of collateral, but it is important to note that collateral costs come at the same time as we observe capital savings. I would argue, in certain parts of the market, that collateral costs are far less than the capital savings reduction. So, obviously, utilising collateral in certain credit areas of the market is far more efficient than when we used to have to hold a lot of capital against such a transaction, whether it is derivatives, repo or any type of trade. Sometimes, at least, Lloyds Bank is observing that the cost of funding collateral is less than the cost of the capital. Or, alternatively, we can make capital work harder elsewhere. That's the choice.

The really clever players are building all of this into the price of every trade and that's how you can generate collateral, because if you do this trade you're going to be receiving this kind of collateral and that suits you. You might pay a different price in comparison to somebody else who's a bit naïve, and you might only have to pay half a basis point better, but that's worth 5bps. Those people that are being smart right now and are building their balance sheet to suit the new regime are going to be much more successful.

KARL WYBORN: It is interesting that the gap between the buy side and the sell side is now narrowing. We see huge demand from the buy side to understand pre-trade and what the impact is from a collateral standpoint or a margin standpoint might be if a given trade is executed. What would be the relative impact of clearing at one CCP versus another? Then, from an optimisation standpoint, understanding before the collateral decision has been made whether or not it would make sense, rather than giving securities as collateral, doing a repo to generate cash because the relative return on cost is better by doing the repo? Whether, the asset that you are giving is actually on special somewhere, so you're giving away intrinsic value when you use that as collateral. We have developed platforms now that talk to all of those requirements. We see the application of these elements increasing almost exponentially as the values of collateral actually deposited against these instruments increases.

### MANAGING THE OPTIMISATION PROCESS

SAHEED AWAN: Unlike David, we have little direct contact with the buy side. Their service providers, their custodians, should be in the lead in helping the buy side get ready. I can tell you, apart from JPMorgan, BNP Paribas and maybe two others, custodians generally have not done the best job of educating the buy side. Partly, this is because collateral management is a new activity for them as well. They don't have the built-in skills, the knowledge, and expertise. It takes many years to achieve in what is a very complex business. I worry about that because mandatory clearing in Europe is just around the corner.

The movement of the buy side to get ready for this new environment is dependent on very powerful intermediaries, whose main business was not collateral management but safekeeping and asset servicing, foreign exchange and all that. There are a handful of exceptions, where certain custodians have taken a decisive step to get into that business and to try and improve the readiness of the buy side. However, the issue for the buy side is that the advice from those custodians may not be as detailed, deep and as meaningful as from an entity which has been in this business for decades. Part of the problem is that the specialists, even in the custodians, tend to come, in terms of collateral management, from the derivatives world. However, derivatives traders when they meet a margin call give cash. They are not familiar with the use of securities as collateral. Even today, 80% or 90% of derivatives trades are still cash.

KARL WYBORN: Asset managers who are pension funds are becoming increasingly sophisticated in how they think about collateral. They are educated by their custodians, CCPs, clearing brokers and from various other industry participants. There is an obligation on custodians to educate and develop solutions around how to move collateral more efficiently for clients. Generally I believe the buy side is doing well at enhancing their overall efficiency around collateral.

DAVID BEATRIX: Pension funds are traditionally among the most risk averse players, and the protection of their assets is key for them. They are generally the ones asking: am I really 100% collateralised? Perhaps optimisation comes next. Also, whenever there is a dispute they want to make sure it is escalated properly and dealt with properly by their agent, thereby ensuring that they are never under collateralised with a counterparty. That is probably why those kinds of players are less involved in the optimisation aspect at the moment. They are naturally long with assets. Most of them hold usually things that are quite eligible in the matrix of their collateral agreements. Therefore, their biggest concern is to be sure that risk is mitigated every day.

MARTIN SEAGROATT: We do have buy side clients that carry out cross product collateral management and optimisation. However, they tend to be in North America, which is a little further ahead of Europe in terms of central clearing, although the European clearing deadlines are getting closer now. We are also seeing demand amongst the buy side for hosted software as a service collateral solutions, which we are now offering. This allows buy side firms that don't have a large IT footprint to use more advanced collateral management tools without the investment in hardware and IT infrastructure.

There is a big additional strain for the buy side in terms of more frequent margin calls and far more complex workflow. This is particularly the case for the derivatives market, where margin calls were a lot less intensive in the past. Many smaller firms were previously using spreadsheets for collateral management. That is now no longer viable for those trading more than a handful of agreements. All this raises questions for the buy side around how much of their collateral management to outsource or insource, and what technology deployment models to use.

**REGULATION: HAS IT HELPED? DOES IT HINDER COLLATERAL OPTIMISATION?**

DAVID BEATRIX: One of the things I am quite curious to see, from my personal perspective, is what is going to come out in terms of re-hypothecation possibilities, from the working group on margin requirements, given the direction and lack of clarity of the BCBS recommendations. Therefore, trying to think of streamlining collateral between buy side clients, and hedging transactions is something that is probably not going to be very applicable in the real life, actually. It is going to be, interesting to see how the working group that has been set up is going to progress on this topic.

BEN THOMAS: What you quite often find is that, in complying and optimising for one regulation, you make your position worse with regard to something else. Even when you look at something simple such as the haircuts on a highly liquid asset, you often see great variation in the haircut applied across the various different stress tests and regulations. We have so many variables in play, so it is not always easy to work out what is the optimum trade across the bank. You then have to transfer price the economics back to the relevant long holder. That's in itself is another big challenge.

PETER LEFT: It is great that everyone's going to be moving to segregated accounts. I wouldn't want my pension fund comingling its assets with a hedge fund, for instance. However, what it does do (essentially) is kill the opportunity; it kills optimisation because you can't touch the assets any more. You can't re-use them. All of a sudden your funding costs shoot up because what you receive is only a credit-mitigant now. It can't be used by you to cover the cost of placing on the other side for whatever the hedge might be. It does therefore increase the cost of whatever transaction it is that that segregated account is supporting but, frankly, perhaps that's a cost we should be willing to pay.

SAHEED AWAN: To David's point about the buy side being very risk averse. They make sure that when they are in the money, they are fully collateralised and that they don't take any additional risks. This now extends to other areas of concern. So if you are going to pledge assets for a cleared trade via your clearing broker, it has to be a pass through structure before it hits a segregated account in the name of the clearing house. There are two models and the two extremes are: omnibus or full segregation and a number of options in-between.

In Europe, ESMA has asked that clearing houses provide all the options they can to the buy side. The issue with that is that there are costs as you move to full segregation with individual accounts at a fund level. The clearing broker was, previously, able to use those assets, but can no longer touch them. Clearing houses then became so keen to attract the custom of the buy side that the sell side were all but ignored. That is now (hopefully) changing. Even so, the buy side has been shy in making use of the extraordinary number of new options available to them, probably because of the cost. The full segregation model is probably going to be prohibitively expensive.

The other issue is that the buy side is coming in via the custodian, and EMIR 47.3 put another issue on the table for the custodians: that you cannot hold margin for a CCP at the custodian unless that custodian uses a securities settlement system (SSS), or is a CSD. So some custodians, or at least one, have become CSDs themselves. Others are saying, well, we'll use a SSS such as Euroclear. Ultimately though, this will probably mean more cost for the buy side as the assets will have to move out of their custodian.

### THE NEXT STEPS TOWARDS AN OPTIMISED WORLD

BEN THOMAS: Much market infrastructure still needs to be developed and built. Personally, I feel as far as tri-party custodians are concerned, we eventually need to move away from the old concept of depo realigning to tri-party long boxes. Your first question is: where are my unencumbered assets on a real time basis? The second is: I need to maximise my funding of those assets around the clock, but can I do this without physically moving them? Third, if I do need to physically mobilise the asset, can I get instant access to it and efficient infrastructure to place it anywhere I want, globally?

Collateral solution providers have to implement the plumbing that enables real-time re-hypothecation of collateral received in tri-party to maximise its value. You also need access within tri-party to more CCPs. That whole plumbing is going to be a big rollout and I don't see that being either fully in place and/or fully adopted by collateral givers, certainly, for at least 18 months, probably more like two to three years.

Additionally, from a bank point of view, most require a significant consolidation of systems and data internally. To give you an example, bringing together as a global bank all of your collateral schedules and putting them on a centralised system is an enormous task. It is a big task to do it for your sec lending and repo clients, then to consider all of your CSA agreements and CCP eligibility. It is going to take months, if not years. So I don't see that we will have this conversation in 12 months and everyone agrees we are there. We'll probably be another 10% down the road, but it is going to be a multiyear build out for both service providers and end users.

MARTIN SEAGROATT: As Ben says, it is a fairly large undertaking to consolidate your inventory and exposures in one place, but it does provide huge benefits. Firstly, from a risk point of view, you can see all of your exposures in one system and see concentrations of exposures with each counterparty across business lines. From a collateral cost perspective, it then allows you to become more efficient. We are doing a lot of projects now that are just purely consolidating inventory and exposure management, as a first step. From there it is then possible to roll out the more advanced optimisation tools in a phased approach.

We will start to see far more complex multi-factor optimisation algorithms that run big data simulations and process hundreds of thousands of collateral and capital optimisation runs pre-trade. Of course, there is a cost benefit trade off in all of this and it may not be suitable for every firm. In terms of infrastructure, the challenge for the industry is providing an efficient engine for unlocking collateral supply and matching it with demand. Having a consolidated feed of CCP eligibility schedules across all CCPs with daily updates in one place will provide benefits in matching perhaps less liquid collateral assets with CCPs that will take them. There is also work to do around helping suppliers of eligible collateral to identify any surplus assets once they have met their own margin needs. Then encouraging them to lend them to those who are short collateral. This is all about moving collateral in an automated way with straight through processing and minimal operational risk. From a data point of view, a benchmarking service for collateral costs would help the industry to identify cheapest to deliver collateral to pledge. Identifying accurate collateral costs is currently hard to do, particularly assigning an opportunity cost to collateral assets.

In the longer term, maybe an exchange for collateral trading will evolve. Perhaps we could even see collateral turning into a derivative in its own right. So you could take out a contract for future delivery of CCP eligible collateral on a given date and, from a buy side point of view, that will mean they don't necessarily have to hold those assets until they need to be delivered. This will allow the buy side to pursue their asset allocation strategies without the drag on returns of holding cash or government bonds for margin.

PETER LEFT: Clearly, there is a massive education of the clients and a massive infrastructure development investment within the bank. To reiterate everyone's points—it is a massive problem to solve. It is the same problem as managing the unsecured part of the balance sheet, it is exactly the same, being able to understand all the flows in and out. Being able to understand the impact of certain stress scenarios, you need all of that technology on the secure financing side across all the sources and all of the requirements of that collateral.

KARL WYBORN: The variables might have changed and the stakes might have been raised, where collateral and capital costs are increasing, but it is nonetheless an ongoing evolution. It is a continuum, which, arguably, doesn't have an endpoint. I agree with Ben that a lot of the initial challenges are around data capture, and about being able to see and configure a series of variables around what assets you have and the various competing demands on those assets. So data capture for all participants, is key. Finally, to the extent that you have your data capture layer completed, the next step is around operational efficiency and platforms and how the collateral is moved. This is going to be a key area of focus and it is a global consideration. T2S in Europe will alter that landscape very significantly.

DAVID BEATRIX: For me, it all hangs around cost. It looks like probably it is not a one size fits all approach. It really depends on the institutions and their level of sensitivity to this approach. Probably there could be some middle ground, and having some kind of 80/20 rule whereby you could be at 80% of the functionalities with, say, 20% of the budget somewhere. Probably the answer really depends on the people you are talking to, whether you are talking to an investment bank, talking to a pension fund, talking to an asset manager. What is common to each is that you need to have a vision of your assets across the whole range of where they sit. You need to have a transversal view of collateral requirements too and also a good view of whether they are unencumbered and encumbered and subject to re-hypothecation rights, etc. Ultimately, the rules that you are going to put into the algorithms are probably dependent on the level of optimisation you really want to achieve, and that's where most of the debate probably lies, actually, in terms of real optimisation.

SAHEED AWAN: In terms of helping the buy side get ready, I say get yourself a good custodian that can really help you navigate the complexity that the new environment has created. Secondly, get yourself a good clearing broker that can also help you get ready for this and provide the full range of services, and that has the balance sheet to also help you transform your assets to get the right collateral to the CCP. I would also advise setting up a network of relationships that you may need to call upon when you need to get the right type of assets, be it cash through the repo market or through the securities lending market. Start developing those relationships. Put in the legal agreements, the master agreements, with those counterparts in the marketplace. Do it now. Don't leave it too late.

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