Baseline report on solutions for the posting of non-cash collateral to central counterparties by pension scheme arrangements

A report for the European Commission prepared by Europe Economics and Bourse Consult

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Executive Summary

1.1 Motivation of the study

REGULATION (EU) No 648/2012 on OTC derivatives, central counterparties and trade repositories (EMIR) is an EU Regulation designed to mitigate risks identified in the derivatives market. One of its pillars is ensuring that standardised OTC derivatives are cleared via a central counterparty (CCP). EMIR came into effect in August 2012, but "pension scheme arrangements" (PSAs) have been granted a temporary exemption from the central clearing requirement until August 2015.

The long-term nature of the liabilities of PSAs and their exposure to variables such as interest rates and inflation mean that PSAs seek to hedge against these risks. They can do this in a variety of ways, including the purchase of real assets — however the use of OTC derivatives is widespread market practice. Interest rate swaps, inflation swaps and FX forwards are commonly used instruments.

At the end of the exemption PSAs will be obliged to begin clearing their OTC derivative portfolios, at least to the extent that the instruments in these portfolios are clearable. CCPs require both variation and initial margin to be posted against all positions and, in particular, require variation margin to be posted in cash — current bilateral practice permits the posting of high-quality assets such as government bonds.

Pension funds aim to be fully-invested. Therefore the concern is that in order to hold cash to post variation margin pension funds would need to reduce their investments, which could have an impact upon investment returns. A solution to these issues would need to be found if pension schemes are to comply with the clearing requirements under EMIR without suffering a reduction in investment performance due to this siphoning of assets as margin or else passing on increased risk exposure to pensioners due to a reduction in hedging.

If the Commission feels that insufficient progress has been made by CCPs to develop appropriate solutions for the transfer of non-cash collateral as variation margin (VM), it can decide to extend the exemption from the central clearing requirement for up to three more years. This study is input into that decision.

The main objectives of this study are, therefore, to:

i) Identify the extent of over-the-counter (OTC) derivative use by PSAs, and the costs currently associated with bilateral collateralization.

ii) Identify the costs to PSAs and wider impacts if PSAs are required to meet cash VM requirements of CCPs, once the exemption of PSAs from mandatory central clearing expires.

iii) Assess a range of alternative solutions for the posting of non-cash collateral by PSAs once the exemption from mandatory central clearing expires.

1.2 Methodology

The first two objectives of the study mentioned above were met through modelling. We developed the following building blocks as part of our cost modelling:

- Development of three representative portfolios, based upon actual data obtained from the pension industry.

- Calculation of VM requirements for the representative portfolios under a range of simulated environments. The simulations included the historic market changes over the past five years, a 100bps increase in interest rates, and stressed market conditions scenarios published by the US Federal Reserve and by the European Banking Authority. These are credible candidates for the types of thought experiment and analysis which PSAs might undertake in determining how large a VM call they might be exposed to, and hence how large a cash buffer it would be appropriate to hold. In particular, the 100bps move has some currency amongst PSAs.
- Estimation of derivative usage across the EU industry such that the representative portfolios could be mapped across to the PSAs of each Member State.

The latter objective was met by examining a range of technical options for the posting of non-cash collateral and examining their feasibility, costs and impact with a range of PSAs, their investment managers, clearing members, CCPs and central banks.

In support of this this work we conducted fieldwork which was both extensive (pan-EU) and intensive (we worked closely with several PSAs seeking to understand the drivers and composition of the asset and OTC derivative portfolios that each had). The tools used included literature review, a focused survey of PSAs and structured interviews. The interview programme included PSAs, clearing members, CCPs and central banks.

1.3 Results

1.3.1 Significance of OTC derivatives to PSAs

The aggregate assets of the occupational pensions industry across the EU28 were just over €5.2 trillion in 2012. The UK, Netherlands and Denmark accounted for around 70 per cent of this, with the UK alone representing 43 per cent (around €2.3 trillion in assets).

We have noted at 1.1 why PSAs hedge, and identified some of the advantages of using OTC derivatives. The intensity of hedging effort and of derivative usage by a PSA is influenced by a variety of factors:

- The structure of the PSA, such as whether it is a defined benefit or a defined contribution scheme.
- The PSA's funding position. A fully funded PSA has sufficient assets to cover all its pension liabilities. In under-funded PSAs liabilities exceed the current value of its assets. The gap can be significant: the UK's pension funds have an aggregate funding ratio of 61 per cent. The hedging of interest rate and inflation risk is against the liabilities not the assets and managing liability risk will be particularly crucial in such under-funded funds.
- The PSA's asset allocation. This interacts with derivative use - hedging can be achieved by other means, such as the acquisition of physical assets.
- The size of the fund. Broadly speaking, there is a scale effect, with larger funds likely to have more developed derivative portfolios.
- In addition, regulators can encourage or provide incentives for hedging, which in turn make the use of derivatives more likely.

We developed a model of the relative intensity of derivative use which considered these variables. This enabled us to map across the representative portfolios to the wider EU-wide industry.

1.3.2 The costs and impacts of moving from bilateral collateralisation to central clearing and posting cash VM

The total estimated cost impact on PSAs will depend upon their reference point in setting a cash buffer. The table below summarises our estimated range of cash buffers, and the implied annual cost to PSAs in the EU28.

Table 0.1: Total annual costs of PSAs posting cash VM (EMIR without the exemption)

	Cash buffer (€bn)			Total annual cost (€bn)		
EU28 impact (100bps)	204.3	-	255.4	2.3	-	2.9
EU28 impact (historic)	109.6	-	137.1	1.3	-	1.6
EU28 impact (EBA)	301.3	-	376.6	3.4	-	4.2
EU28 impact (US Fed Adverse)	336.3	-	420.3	3.8	-	4.7

This compares to the estimated annual cost of the current bilateral arrangements of about €43 million, and of EMIR (with the exemption) of €52 million. This is a significant increase, driven mostly by PSAs increasing cash holdings in order to be able to post cash VM as and when required. (Collateral management costs also increase, but this is relatively inconsequential).

These results assume that PSAs create a cash buffer between 80 and 100% of the maximum expected VM call under each of the scenarios considered. Considering the 100bps simulation, as noted in the table, our modelling indicates that the aggregate VM call would be €204–255 billion for European PSAs. Of this, €98–123 billion (£82–103 billion) would relate to UK PSAs, and predominantly be linked to sterling assets, and €106–130 billion would relate to euro (and perhaps other currency) assets.

If all UK PSAs set the cash buffer at 80 per cent of the expected VM call, then they would need to enter into repo transactions of a value of about €25 billion. PSAs in the rest of the EU would similarly need to (reverse) repo about €26 billion. In the UK in particular this would likely exceed the daily capacity in the UK gilt repo market. In the rest of Europe capacity is less obviously constrained in the relevant parts of the European government bond repo market, but there would still be operational hurdles to overcome.

Given our views on the scale of the repo market at present (and the concern that it may be subject to future shrinkage due to increased regulatory-driven costs, even outside stressed market conditions) this implies that UK PSAs would be unlikely to set a cash buffer at below 80 per cent of the expected maximum - and perhaps the 90 and 100 per cent reference marks are more realistic indications of what UK PSAs may choose to do. PSAs based in the rest of the EU may be able to set a cash buffer further from the maximum – however the repo market is not a same day cash settlement market and PSAs would need to consider this also in determining the balance between reliance on a cash buffer and reliance on repo.

We also note that the implied conversion of pension assets into cash here is very significant, i.e. sufficiently large that a price impact on the assets themselves would be possible.

1.3.3 Technical solutions for the posting of non-cash collateral to CCPs

In the course of the study we examined seven potential technical solutions which could potentially mitigate the impact on the investment returns of PSAs arising from the posting of cash VM to CCPs. We begin briefly introducing these concepts:

- **Collateral transformation by clearing members (CMs):** This is a repo service provided by CMs in which a PSA would reverse repo securities from its portfolio and receive cash which could then be used to meet VM calls from a CCP.
- **Collateral transformation by CCPs:** This would be a repo service offered by CCPs to PSAs in which the CCP would be a principal, providing cash to the PSA in return for PSA securities and executing a back-to-back repo with a third party to raise the cash. We consider the situation that, in times of stress, the third party could be a central bank.
- **Direct acceptance of non-cash assets with pass through to receivers of VM:** Here the CCP would allow PSAs to post and receive VM in the form of securities.
- **Acceptance of non-cash assets with security interest passed through to receivers of VM:** The CCP would again allow PSAs to post VM in the form of securities. The CCP would create a security interest over the securities in favour of the VM receiver.
- **Quad-party collateral for VM security interest:** A variation of the previous solution in which the securities would be held, and the security interest created, by a custodian according to an agreement between itself, the PSA, the CM and the CCP.
- **Agency stock lending:** Here the PSA would lend securities from its portfolio and receive collateral in the form of cash from the borrower which could be used to meet VM calls.
- **Secured lending by cash-rich corporations:** A solution in which non-traditional sources of cash could be tapped to provide cash to PSAs – either through repos or secured loans – with securities being provided by the PSA to the lender as security.

CCPs differ in their treatment of the risk relating to the day-to-day changes in market value of an OTC derivatives contract from that employed in bilateral settlement.[1] Bilateral settlement under a Credit Support Annex (CSA) collateralises the changes in market value, whereas CCPs actually crystallise the profits and losses, resulting in the VM actually being a settlement payment from the loser to the gainer. This is the reason that CCPs currently only accept and pay out VM in cash, cash being the most negotiable instrument. This distinction plus the fact that the novation of an OTC derivatives trade by a CCP breaks the settlement trace between the two parties to the trade are critical to the assessment of these solutions. They also lie behind the reasons why some solutions which work adequately for bilateral settlement are not suitable for CCP clearing.

Three of the solutions – Direct acceptance of non-cash assets with pass-through to receivers of VM, Acceptance of non-cash assets with security interest passed through to receivers of VM and Quad-party collateral for VM security interest – would allow PSAs to use securities to cover VM calls, without having to transform them into cash. However, this gives rise to significant drawbacks: in particular, it would entail non-cash VM contracts being offered as separate product lines to cash VM products. The

1 i.e. the risk which the posting of VM is intended to mitigate.

non-cash VM products would have lower liquidity and wider spreads than the cash products. Direct acceptance of non-cash assets with pass-through to receivers of VM would involve so much operational complexity as to rule it out.

The two solutions involving security interest would be easier to implement technically but potential differences in the law on security interests in the different Member State jurisdictions relevant to a transaction would heighten legal risk. Even if the legal uncertainty could be resolved, we would expect that the split of liquidity between cash and non-cash products would be enough to prevent the non-cash products from gaining traction.

Two of the solutions – Collateral transformation by CMs and Agency stock lending – build upon existing market competence. However they would not have the capacity to meet the full needs of the European PSAs and this capacity would probably not hold up in times of market stress.

Collateral transformation by CCPs appears to be an attractive solution, particularly in times of stressed markets. However, there are two main challenges. First, whether central banks would be prepared to offer liquidity to CCPs and whether, in practice, the conditions on which it might be offered be compatible with the solution. Second, the lack of appetite amongst CCPs to take on and manage the resulting increased risk (even with a changed appetite by CCPs it would be subject to regulatory approval) and likely concern about the ability of CCPs to maintain current levels of systemic security.

Agency stock lending can be attractive to PSAs because it can enhance investment returns, but its market capacity cannot be relied on and, at best, can only form a small part of the solution to the PSAs' needs.

Secured lending from cash-rich corporations is an interesting concept and could allow PSAs to tap into an additional pool of cash to which they currently have limited access. The investment required to develop it would require considerable commitment from a custodian or Central Securities Depositary. In addition, the cash is on balance sheets because of a lack of suitably attractive investment opportunities and has not been returned to investors due to a mix of faith in future opportunities and perhaps also the associated tax effects of returning cash to investors. These motivations may not be maintained indefinitely.

The table below summarises our assessment of each of the solutions in terms of its impact on cost and risk factors. Against each factor in the table we have assessed the relative appeal of each of the solutions.

Table 0.2: Summary of assessment of impact on cost and risk factors

	Collateral trans-formation by CMs	Collateral trans-formation by CCPs	Direct pass-through of non-cash assets to receivers of VM	Security interest in non-cash assets passed through to receivers of VM	Quad-party collateral for VM security interest	Agency stock lending	Secured lending by cash-rich corpora-tions
Impact on Investment Performance							
Impact on Swap Market							
Legal & regulatory complexity and risk							
Operational Cost							
PSAs							
CCPs							
CMs							
Operational complexity and risk							
PSAs							
CCPs							
CMs							
Investment Required							
PSAs (inc. custodians)							
CCPs							
CMs							
Counterparty Risk							
PSAs							
CCPs							
CMs							

Key: Relative Appeal
Best
Worst

The table below summarises our assessment of the capacity of the solutions – i.e. the extent to which each solution would meet the full requirement of the PSAs in both normal and stressed market conditions.

Table 0.3: Summary of assessment of capacity of the solutions

	Collateral trans-formation by CMs	Collateral trans-formation by CCPs	Direct pass-through of non-cash assets to receivers of VM	Security interest in non-cash assets passed through to receivers of VM	Quad-party collateral for VM security interest	Agency stock lending	Secured lending by cash-rich corpora-tions
Market Capacity (Normal Conditions)							
Market Capacity (Stressed Conditions)							

Key: Capacity to meet PSAs VM requirement
Would fully meet requirement
Would meet a small part of requirement

1.4 Conclusions

1.4.1 Potential impact of posting cash VM on retirement incomes

We have identified substantial potential cost impacts which would ensue as and when PSAs are required to post cash VM to CCPs. To the extent that PSAs pass these total costs on to pensioners, these would represent a € for € reduction in retirement incomes. Whilst it is possible that — where relevant — corporates and other sponsors of PSAs could make good any shortfall by increasing their contributions to the funds, our fieldwork does not indicate that this is a likely outcome. It would, anyway, only substitute a reduction in pensioner incomes with a reduction in corporate profits.

The annual total costs as a percentage of PSAs' AUM would represent the annual reduction in investment returns. Compounding over the life of pensioners' contributions provides the cumulated effect and gives the impact on retirement incomes. This is significant – particularly in those countries with more extensive pension industries. The cumulative cost in the 100 bps simulation is up to 3.1 per cent in the Netherlands and 2.3 per cent in the UK. The estimated impact across the EU28 for the various simulations is shown below.

Table 0.4: Indicative cumulated reduction in retirement incomes over 20, 30 and 40 years

	20 years	30 years	40 years
EU28 impact (100bps)	1.1%	1.7%	2.2%
EU28 impact (historic)	0.6%	0.9%	1.3%
EU28 impact (EBA)	1.6%	2.4%	3.3%
EU28 impact (US Fed Adverse)	1.8%	2.7%	3.7%

The key driver of these opportunity costs is the difference in return between cash and higher yielding assets (in particular government bonds). At present these spreads are relatively low: if the spreads should widen – or if PSAs chose to fund the cash buffer from assets other than government bonds – then we would expect a much more

significant impact on retirement incomes. Similarly, if PSAs focused on an alternative simulation to the 100 bps one – such as the other stressed simulations – the impact would deepen. It is also worth noting that, no matter how well prepared PSAs may be, the *actual* shocks which they may eventually face could still be worse.

1.4.2 Conclusions relating to technical solutions

No one solution stands out as the obvious candidate and there is currently little hard evidence that the industry is investing in innovative solutions to the core problem.

Our assessment is that the three solutions involving the posting of non-cash VM are not viable because of the negative impact of all three on the pricing of the contracts, the operational complexity of one of them and the legal risk of the other two. PSAs must therefore expect to have to post and receive VM in cash for cleared contracts.

A PSA would therefore have to maintain a cash buffer in order to meet potential VM calls or rely on transforming securities from its portfolio into cash at short notice using one of the solutions described or, most likely, a combination of both.

The only substantial transformation solution with any expectation of traction at present is collateral transformation by CMs. A PSA's appetite for reliance on this solution will depend on how the cost of the solution compares to the opportunity cost of maintaining a larger cash buffer instead. Critically, it will also depend on its view of the capacity of the repo market to satisfy its likely needs. There are serious concerns that the repo market, as presently constructed, could not meet the liquidity demands of the PSAs in times of stress.

Our analysis indicates that UK PSAs as a group would not be able to rely fully on the gilt repo market in the UK, and most likely other EU PSAs would not be willing or able to rely fully on euro government bond repo markets in the rest of Europe. Whilst the repo of other assets could increase the potential capacity available these other repo markets are much more susceptible to losses of liquidity in a crisis situation. As such, reliance upon them is not likely to be seen as a prudent approach. Therefore, absent any change in the size of the repo market or very substantial progress on some other technical solution, PSAs would need to create a cash buffer to cover the shortfall over and above the capacity that they judge the repo market would be likely to be able to provide. The scale of this cash buffer is likely to be substantial, with commensurate costs.

1.5 Disclaimer

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