

ISDA® Research Study

Dispelling Myths: End-User Activity in OTC Derivatives August 2014

There is a perception among some commentators that only a small fraction of derivatives activity relates to hedging that benefits the 'real economy'. This analysis challenges that assumption. Publicly available data published by the Bank for International Settlements reveals that 65% of over-the-counter interest rate derivatives market turnover involves an end user on one side and a reporting dealer on the other. These participants, comprising non-dealer financial institutions and non-financial customers, use derivatives primarily to hedge risks and reduce volatility on their balance sheets.

The remaining 35% of derivatives turnover activity relates to dealer market-making and the hedging of customer transactions – vital for market liquidity and the facilitation of client trades. Without this, end users would be unable to put on risk-reducing and cost-effective hedges, potentially leading to less hedging and more balance-sheet volatility.

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INTRODUCTION

Over-the-counter (OTC) derivatives play a very important role in the risk management strategies of many firms. Whether used by global corporates to eliminate exchange-rate risk in foreign currency earnings, by pension funds to hedge inflation and interest-rate risk in long-dated pension liabilities, or by governments and supranationals to reduce interest-rate risk on new bond issuance, OTC derivatives allow end users to closely offset the risks they face and to ensure certainty in financial performance. More balance-sheet security means firms can invest for the future with greater confidence, creating jobs and contributing to economic growth.

However, publicly available data does not provide a detailed break down of derivatives market activity – such as which firms or industries use these instruments and why. Analysis on OTC derivatives markets published by the Bank for International Settlements (BIS) splits derivatives users into three generic groups:

- Trades conducted between reporting dealers;
- Trades between reporting dealers and other financial institutions; and
- Transactions between reporting dealers and non-financial customers.

As a result, there is confusion and misperception about the nature of global derivatives activity and the extent to which it is socially and economically useful. Specifically, some commentators have claimed that only a small fraction of derivatives activity relates to hedging activity that benefits the ‘real economy’, with the vast majority used for speculative purposes.

This analysis challenges these claims by looking beyond the headline BIS figures for interest rate derivatives to further explore the composition of derivatives market activity and the primary users in each of the three categories. Among the findings are:

- **Sixty-five per cent** of OTC interest rate derivatives market turnover involves an **end user** on one side and a reporting dealer on the other.
- For the purposes of this study, end users include both ‘other financial institutions’ and ‘non-financial customers’ (as per the BIS segmentation). The ‘other financial institutions’ category comprises pension schemes, regional banks, insurance companies, mortgage providers and asset managers, which use derivatives primarily to hedge risk and create greater certainty in their financial outlook.
- These non-dealer financial end users play a vital role in the real economy. To claim otherwise ignores the social and economic importance of pension schemes being able to pay future retirees what they expect, banks being willing to provide repayment certainty to borrowers through fixed-rate mortgages, and insurance companies being able to pay policyholders as promised.
- **Thirty-five per cent** of interest rate derivatives turnover comprises **interdealer market** activity, but this is shrinking fast during a period of major regulatory change. This includes new capital requirements under Basel III and the forthcoming introduction of the US Volcker rule.

- The Volcker rule will prohibit all US banks from engaging in proprietary trading from next year. Similar regulations will also be implemented elsewhere over time.
- The Volcker rule allows dealers to continue to make markets and hedge client positions – exemptions that are recognised by regulators as being critical to the smooth functioning of markets, continued liquidity, and the ability for corporates, governments and other end users to quickly and efficiently manage risk.
- Administrative activity to manage and tidy dealer derivatives books accounts for a large proportion of derivatives turnover.

BIS turnover data is the more appropriate and current metric to use in assessing OTC derivatives market activity

BIS FIGURES

Semiannual notional outstanding data

According to semiannual OTC derivatives statistics from the BIS¹, interest rate derivatives notional outstanding reached \$584.36 trillion at the end of 2013 (see box *Notional ≠ risk*). This is broken down by counterparty type, as follows:

Table 1: OTC interest rate derivatives notional outstanding (\$ billions)

	H1 2012	H2 2012	H1 2013	H2 2013
Total	494,427	489,706	561,314	584,364
With reporting dealers	139,146	116,892	104,210	96,197
With other financial institutions	316,905	338,083	421,266	469,611
With non-financial customers	38,376	34,731	35,838	18,556

Source: BIS

Note: Drop in notional traded with non-financial customers in H2 2013 attributed to reclassification of contracts with central counterparties

The non-financial customer category comprises trades between reporting dealers and corporates, governments and supranationals. This might include the use of cross-currency swaps by corporates to switch foreign borrowings into domestic currency, or the use of inflation swaps by utility companies or infrastructure providers to hedge inflation-linked revenues. Just 3.2% of interest rate derivatives notional involved these non-financial customers, representing a 50% decline from the 6.4% share reported six months earlier – a change the BIS attributes to an incorrect allocation of cleared trades in earlier periods (see *Double counting of cleared transactions* section for explanation).

Trades between dealers and other financial institutions have risen strongly over the past two years, increasing from 64.1% of total outstanding notional at the end of June 2012 to 80.4% at the end of 2013. This category includes pension funds, insurance companies, mutual funds, hedge funds, money-market funds, building societies, central banks, smaller banks and central counterparties (CCPs). This last user type is a primary driver of the sharp increase in notional outstanding with non-dealer financial institutions (see *Double counting of cleared transactions* section for explanation).

Trades between reporting dealers, meanwhile, have declined rapidly, from 28.1% of total notional outstanding on June 30, 2012 to 16.5% at the end of December 2013.

Turnover data

Turnover figures² paint a slightly different picture. According to the BIS triennial central bank survey, trading in OTC interest rate derivatives markets averaged \$2.34 trillion per day in April 2013. This is broken down by the BIS as per **Table 2**.

¹ OTC derivatives statistics at end-December 2013, Bank for International Settlements, May 2014, http://www.bis.org/publ/otc_hy1405.pdf

² OTC interest rate derivatives turnover in April 2013, Bank for International Settlements, September 2013, <http://www.bis.org/publ/rpfx13ir.pdf>

Table 2: OTC interest rate derivatives average daily turnover (\$ billions)

	1998	2001	2004	2007	2010	2013
Total	265	489	1,025	1,686	2,054	2,343
With reporting dealers	150	323	494	800	896	816
With other financial institutions	89	142	450	747	937	1,354
With non-financial customers	27	25	79	136	221	169

Source: BIS

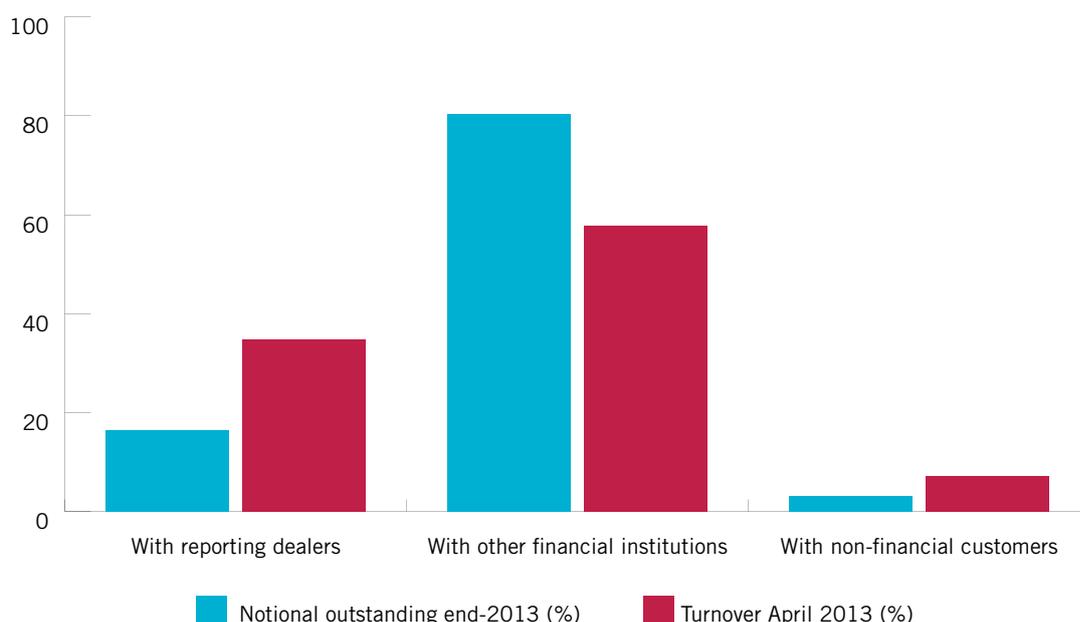
Again, the share of trades conducted with non-financial counterparties is minor, albeit higher than notional outstanding data, at 7.2% in 2013. That proportion has remained more or less stable for the past 10 years, having stood at 7.7% in 2004. Transactions between reporting dealers and other financial institutions comprised the largest sub-group in 2013, at 57.8%, but this reflects a strong increase from 29% in 2001. Meanwhile, trades between reporting dealers accounted for 34.8% in 2013, down from a high point of 66.1% in 2001.

While the same trends are reflected in both notional outstanding and turnover figures – notably, the rise in the proportion of trades with non-dealer financial institutions and the decline in interdealer activity – there are some notable differences (see **Figure 1**).

Most obviously, the proportion of trades with non-dealer financial institutions is greater in the notional outstanding data, but the share of activity with the two other user groups is higher in the turnover figures.

These differences primarily arise because of the treatment of cleared trades, and this must be considered when using the data to infer the scale of end-user versus interdealer activity.

Figure 1: Comparison of counterparty type: notional outstanding versus turnover in 2013



Source: BIS

Double counting of cleared transactions

The BIS notional outstanding data doesn't adjust for the double-counting of cleared transactions. In other words, the BIS figures would count the notional of a single trade between counterparty A and counterparty B twice when cleared: one contract between counterparty A and the central counterparty; and one between counterparty B and the clearer. A single \$10 million trade between two parties would therefore become \$20 million in notional outstanding for the purposes of the BIS data once cleared.

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The BIS argues this approach is appropriate from a counterparty risk perspective: one contract has become two through clearing, both of which could potentially end up in default³. However, it creates a bloated view of the actual risk transfer activity taking place, as well as distorting the picture of the level of trading by different types of entities. That's because all cleared trades are required to be allocated to the non-dealer financial institution bucket. So, a \$10 million interest rate swap between a dealer and corporate end user that is subsequently cleared would result in \$20 million being allocated to the 'other financial institution' segment of the BIS notional outstanding data.

Some reporting dealers had, according to the BIS, been allocating these types of transactions to the non-financial customer category – a mistake that was corrected in the December 2013 BIS figures, resulting in a sharp decline in notional outstanding with non-financial clients for that six-month period.

Given the double-counting of cleared transactions and the difficulty in attributing trades to original executing counterparties, this research will focus on **BIS turnover figures**. This represents the gross value of all new derivatives trades entered into during the observation period, and is measured in terms of the notional value of the contracts. These figures therefore reflect new activity, rather than including legacy derivatives books as per the notional outstanding figures.

Importantly, the gross amount of each transaction is captured once – only the original transactions are included within the turnover figures, and subsequent novations to clearing houses aren't incorporated again, avoiding the double-counting of cleared trades that occurs with the semiannual notional outstanding data. However, turnover figures aren't adjusted for any netting or offsets between trades, and so do not reflect actual risk exposure.

Notional ≠ risk

Any analysis of derivatives market activity should consider that notional outstanding does not reflect the amount of risk being transferred, the payments that are exchanged between counterparties, or the maximum loss that would be incurred should every derivatives contract be closed out. Instead, the semiannual BIS notional outstanding figures represent the total face value of all trades that currently exist⁴, without reflecting the mark-to-market value or considering whether transactions can be offset or netted against each other.

In this respect, OTC derivatives notional outstanding is not quite the same as open interest in exchange-traded futures and options. Exchange contracts are fungible, meaning offsetting line items cancel each other out. Open interest therefore reflects the value of those trades that have not been liquidated or offset by another transaction. Open interest in exchange-traded interest

³ Central clearing and OTC derivatives statistics, Nicholas Vause, BIS Quarterly Review, June 2011, http://www.bis.org/publ/qtrpdf/r_qt1106b.pdf

⁴ Notional value is merely a reference point for the calculation of contractual payments, rather than an amount that is actually paid by one counterparty to another. It does not reflect exposure - an on-the-run swap usually has a present value of zero at inception, and exposure only develops as markets change.

rate futures and options stood at \$57 trillion at the end of 2013, according to BIS figures⁵, much lower than the \$584.36 trillion in OTC interest rates derivatives notional outstanding.

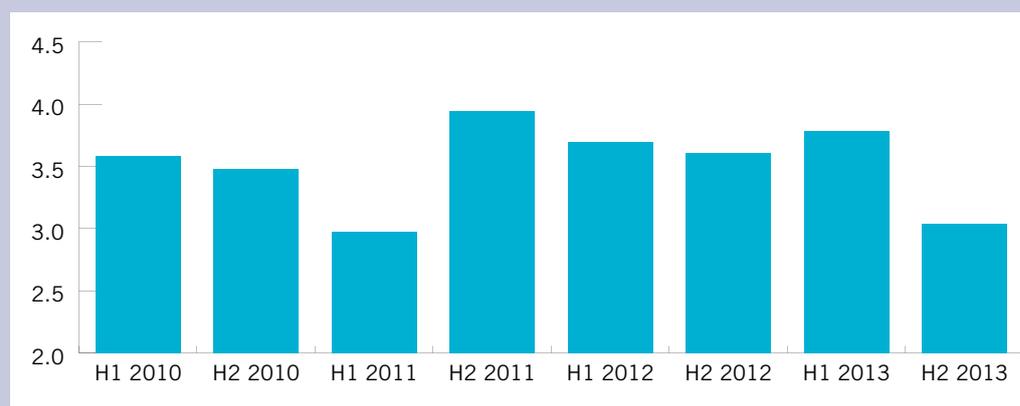
Turnover arguably provides a more comparable view of activity within the two markets on a day-to-day basis. The \$2.34 trillion in OTC interest rate derivatives average daily turnover in 2013 was less than half the roughly \$5 trillion in average daily turnover in exchange-traded interest rate contracts.

However, the BIS OTC derivatives turnover figures represent the notional value of new trades and are also not adjusted for any netting, collateral or offsets between trades – all of which significantly reduce risk exposure between counterparties.

Rather than use notional value, a more appropriate measure for assessing risk is gross market value, defined as the maximum loss that counterparties would incur if they all failed to meet their contractual payments and the contracts could be replaced at current market prices. The total gross market value of all OTC derivatives fell from \$25 trillion at the end of 2012 to reach \$19 trillion by the end of the following year – just 2.7% of outstanding notional. The gross market value of interest rate derivatives also fell, from \$15 trillion at the end of June 2013 to \$14 trillion six months later, representing 2.4% of interest rate derivatives notional outstanding.

This risk can be reduced by netting, which allows two counterparties to consolidate the payments under various swaps into a single net payment from one to the other⁶. This is recognised by the BIS in its gross credit exposure figures⁷, which fell from \$3.8 trillion for all OTC derivatives in June 2013 to \$3 trillion six months later (see **Figure 2**). That represents just 0.4% of notional outstanding. Taking the collateral that counterparties have posted to each other into account would reduce that exposure even further.

Figure 2: OTC derivatives - gross credit exposure (\$ trillion)



Source: BIS

⁵ http://www.bis.org/statistics/r_qa1406_hanx23a.pdf

⁶ If, for example, party A is required to pay \$10 million on one swap to party B, but is owed \$5 million on another swap with the same counterparty, the net payment would be \$5 million. For the purposes of BIS data, a legally enforceable netting agreement is required for netted amounts to be considered.

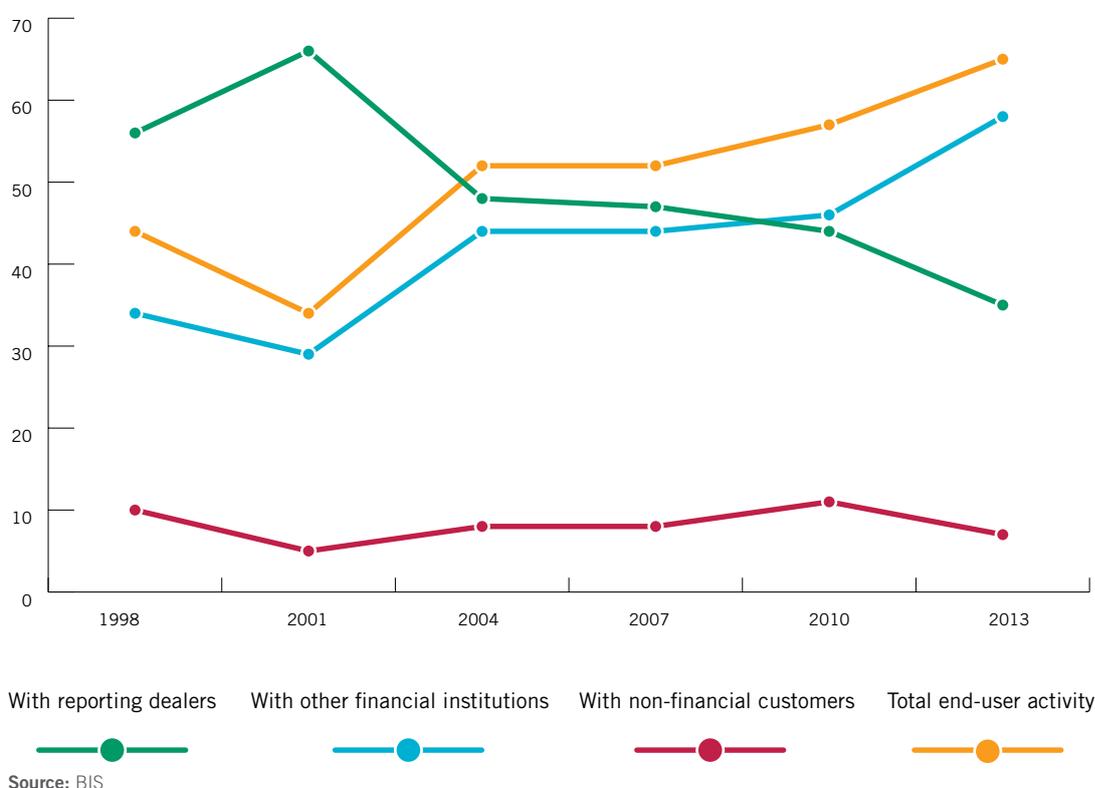
⁷ Gross credit exposure reflects the gross market value of outstanding OTC derivatives after legally enforceable bilateral netting but before collateral.

OTC derivatives end users include non-financial corporates, sovereigns and a range of financial institutions that play important roles in the global economy

END-USER ACTIVITY

End users are defined as the ultimate consumers of a product, a definition that broadly applies to two of the three generic buckets listed by the BIS: other financial institutions and non-financial customers. Entities in both of these categories would employ derivatives for a variety of hedging⁸ and investment purposes, with the aim of managing risk and enhancing returns. The share of derivatives activity involving these institutions has increased sharply over the past decade or so, climbing from just 34.1% in 2001 to 65% in 2013 (see **Figure 3**).

Figure 3: Percentage of market turnover by counterparty type



Non-financial customers

Trades between reporting dealers and non-financial clients has remained more or less stable over the past 10 years, fluctuating between 5.1% and 10.8% of total OTC derivatives turnover.

This activity is primarily driven by trades with corporates and governments. For instance, a corporate may decide to issue debt in foreign currency to access a new investor base or tap into cheaper funding rates, then use a cross-currency swap to eliminate interest rate and currency mismatches. Or a company might look to convert foreign currency revenue into home currency at a pre-agreed rate, eliminating earnings uncertainty. Governments, meanwhile, may look to hedge interest rate risk on new bond issuance through interest rate swaps.

In most cases, the primary aim is to mitigate risk, reduce balance-sheet volatility, and increase certainty in cash flows, allowing firms to invest in new business initiatives with greater confidence.

⁸ In order to satisfy hedge accounting requirements, changes in the value of the hedges must closely mirror changes in the value of the hedged item. This creates an incentive to ensure the hedge is customised to closely meet the hedged item to avoid balance-sheet volatility.

Other financial institutions

For the purposes of the BIS triennial turnover data, this category includes trades between reporting dealers and pension funds, mutual funds, insurance companies, central banks, hedge funds, money-market funds, building societies, leasing companies and smaller commercial and investment banks⁹.

Daily turnover of trades involving entities in this segment has steadily grown over the past decade, climbing from \$450 billion in 2004 to \$1.35 trillion in 2013. At 57.8% of total turnover, non-dealer financial end users represent the largest customer type by some distance.

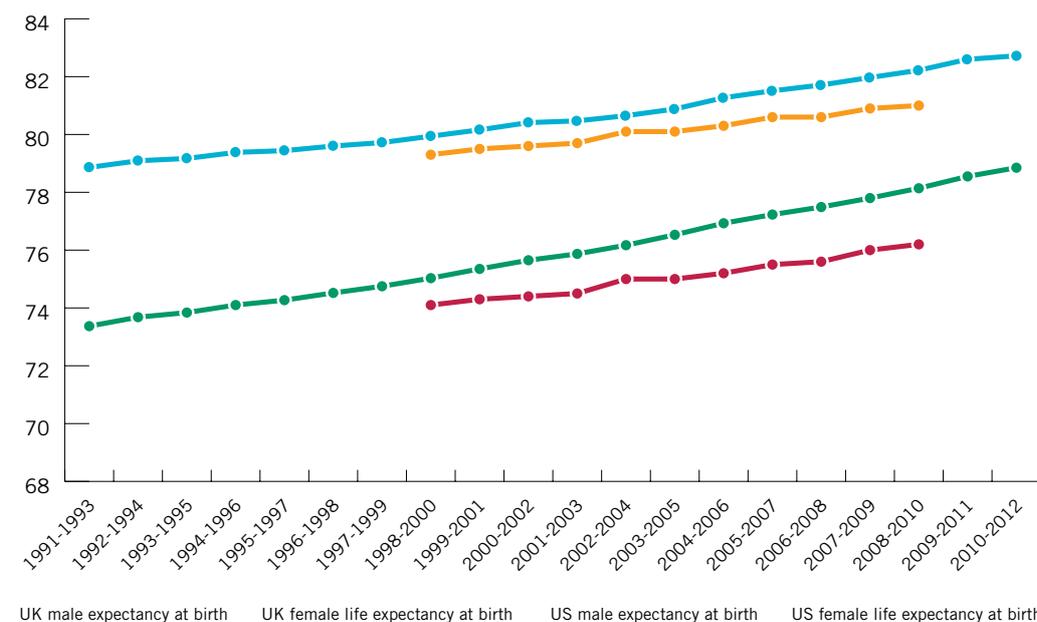
These non-dealer financial institutions use derivatives for a variety of purposes – from pension plans hedging the interest rate and inflation risk inherent in long-dated pension liabilities, to insurance firms mitigating the risk posed by guaranteed variable annuity contracts, to banks and building societies hedging the risk associated with fixed-rate mortgages. In each case, this activity serves a genuine economic purpose, as the following brief examples demonstrate.

◦ Pension funds

Life expectancy in the developed world is increasing at a rapid pace. In the US, life expectancy for males at birth has increased from 71.8 years in 1990 to 76.2 in 2010, while females born in 2010 could expect to live until 81 versus 78.8 for those born in 1990, according to the US Centers for Disease Control and Prevention.

In UK, life expectancy has increased from 73.4 years for males born between 1991 and 1993 to 78.9 for those born between 2010 and 2012. Female life expectancy at birth has increased from 78.9 to 82.7 over the same period (see **Figure 4**). The UK Office for National Statistics

Figure 4: Life expectancy in the US and UK



Source: UK Office for National Statistics and US Centers for Disease Control and Prevention

⁹ It should be noted that some of these entities – especially smaller banks and hedge funds – may, or may in the future, run market-making/dealer businesses, which would also be incorporated in this bucket. However, the reporting dealers bucket would capture the vast majority of dealer activity (it represents approximately 400 banks and securities houses from 43 countries). We therefore count the entire ‘other financial institution’ bucket as end-user activity for the purposes of this study.

predicts that one third of babies born in 2013 will live to reach 100, leading to a steadily ageing population where the proportion of those in retirement far exceeds those in work.

These dynamics have forced successive governments to acknowledge that full state-funded pension schemes (where they are offered) are eventually likely to be unsustainable in their current forms, at least at a level that pensioners will be able to realistically live on. The ability for people to provide for their own, potentially lengthy retirements has therefore become critically important – as has the need for pension plans to ensure they can meet their obligations in the future.

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This is far from certain. A climb in life expectancy will increase the size of the overall pension liability, as providers will be required to pay out to retirees for longer. Any drop in interest rates will also push up the present value of liabilities (at least, for those discounted using bond or swap rates), while at the same time making it harder to find assets that provide high enough interest income to make up the shortfall.

The results have been stark, particularly in the UK defined-benefit pension space, where a persistent low-rate environment has contributed to huge deficits and put a severe strain on some corporate sponsors. According to annual analysis conducted by the UK Pension Protection Fund (PPF) and the Pensions Regulator, the aggregate funding position of 6,150 defined-benefit pension schemes in the UK was a deficit of £210.8 billion as of March 31, 2013, up from a £204.2 billion deficit the year before. This funding level can be volatile too: a mere 10-basis-point drop in gilt yields would lead increase the aggregate pension deficit by £21.3 billion, according to analysis based on 2013 data.

This has driven an increase in liability-driven investment (LDI) strategies, where asset allocation decisions are based on the ability to meet current and future liabilities. For many of these investors, interest rate derivatives are a key part of the LDI process, with interest rate swaps, caps, floors and swaptions used to manage the uncertainty and volatility in funding levels¹⁰.

Derivatives are also widely used to hedge the inflation risk inherent to many pension schemes. In the UK, for instance, there is an explicit requirement to adjust pension payments by an amount linked to inflation, posing a significant risk to pension schemes. According to the PPF and Pensions Regulator, a 0.1% increase in the assumed rate of inflation would lead to an aggregate increase in defined-benefit pension scheme liabilities of 0.8%, or £10.5 billion. Inflation swaps, caps and floors are used to help insulate pension funds against the risk of high inflation.

Mitigating these risks is vital. An inability to meet future pension liabilities would either dramatically impact the income of pensioners, reducing their ability to spend, or governments would have to step in to support schemes or individual retirees. Or, in the case of corporate schemes, the sponsoring company would be required to meet the shortfall – and there are many examples, in the UK in particular, of companies being obliged to make hefty top-up payments to their defined-benefit schemes, reducing the capital available for investment and research and development.

¹⁰ See ISDA research, *Size and Uses of the Non-Cleared Derivatives Market*, April 2014, for examples of how swaptions and inflation swaps can be used by pension funds to mitigate interest rate and inflation risk. <http://www2.isda.org/attachment/NjQOMA==/FINAL%20-%20Size%20and%20Uses%20of%20the%20Non-Cleared%20Derivatives%20Market.pdf>

◦ Insurance companies

Insurance companies face a number of risks that are, in some ways, similar to those facing pension funds. A life insurance policy, for instance, would involve a regular premium being paid by the policyholder for a certain period, followed by a lump sum payment by the insurance firm following the death of the policyholder, or a stream of payments following incapacity or retirement.

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The size of the market is huge: according to an annual report on the US insurance industry by the Federal Insurance Office (FIO)¹¹, part of the US Department of the Treasury, net written premiums in the US alone were approximately \$645 billion in the life and health sector in 2012. Life insurance policies accounted for roughly 20%, annuity products comprised 53% (see box, *Variable annuities and the financial crisis*) and the remaining 27% involved accident and health insurance. All in all, the life and health insurance sector held approximately \$5.6 trillion in total assets.

There are complex actuarial assumptions on longevity that need to be taken into account by the life insurance firm, but, all else being equal, a fall in rates would increase the size of the liability posed by certain policies, while making it more difficult for the insurer to find long-duration assets that provide a high enough interest income to meet the anticipated liability. This is particularly problematic if falling rates are accompanied by declining equity markets.

An inability to meet liabilities could have a dramatic impact on the spending power of retirees, as well on those households that need to claim due to incapacity or death. Like pension plans, insurance companies use a variety of OTC derivatives to manage this uncertainty. Depending on the specific business, and the policies being offered, this can include interest rate swaps, caps, floors, swaptions, inflation swaps, equity options, equity swaps and variance swaps.

According to the FIO annual report, the five largest US insurers by assets reported more than \$1 trillion in derivatives notional outstanding in 2012. Alongside asset-liability management and the hedging of variable annuity guarantees, derivatives are also used to enhance investment income – through, for example, the sale of covered call options – and to hedge or gain exposure to illiquid bonds through the use of credit derivatives.

Variable annuities and the financial crisis

Variable annuities are a popular insurance product that can provide policyholders with a guaranteed income stream during retirement, or a pre-determined payment following the death of the policyholder. There are a variety of types available, each offering different types of guarantees, but one of the most popular is the guaranteed minimum withdrawal benefit variable annuity – a product typically used for retirement planning, which allows the policyholder to withdraw guaranteed amounts on a regular basis, regardless of the performance of the underlying assets.

These guarantees proved valuable to policyholders during the worst of the financial crisis. During the period between September 9, 2008 to October 31, 2008, the S&P 500 index lost approximately 24% of its value, decimating the value of assets backing variable annuity policies to the extent they fell below the guaranteed benefit value. According to a survey published in

¹¹ *Annual Report on the Insurance Industry*, Federal Insurance Office, US Department of the Treasury, June 2013, <http://www.treasury.gov/initiatives/fio/reports-and-notice/Document/FIO%20Annual%20Report%202013.pdf>

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2009 by Milliman¹², a Seattle-headquartered actuarial services provider, the aggregate benefit value of US variable annuities exceeded the aggregate account value by roughly \$232 billion as of October 31, 2008.

The magnitude of losses following the crisis was not as high as the exposure for two reasons. First, policyholders did not exercise their guarantees immediately. Instead, this occurs over time meaning benefits are paid over a number of years. Second, and perhaps more importantly, life insurers utilised hedging programmes as part of their risk management process.

According to the Milliman study, which combined actual client results with an industry analysis, variable annuity hedging programmes were 93% effective in recouping capital markets losses, saving US life insurers roughly \$40 billion from September to October 2008.

◦ Banks/building societies

The ability to borrow money to buy property is a central feature of Western economies – and the housing market is seen as a key barometer of economic health in many countries. The size of the outstanding mortgage debt is huge: €8.17 trillion in the US and €6.28 trillion in the European Union (EU) at the end of 2012, according to the European Mortgage Federation. The EU total included €1.55 trillion in the UK alone.

However, the availability of mortgages would become constrained without the ability of banks and building societies to hedge the risks posed by fixed-rate mortgages, or free up balance sheets and raise funding to continue lending.

Fixed-rate mortgages comprise a large share of global mortgage books, providing borrowers with certainty over their mortgage repayments. Roughly 93% of mortgages originated in the US between 2009 and 2011 were fixed rate, according to the Federal Reserve Bank of New York¹³, while loans with an initial fixed rate accounted for 75.6% of new mortgages in the UK in the fourth quarter of 2012, according to the European Mortgage Federation¹⁴.

This poses an asset-liability management issue for the lender, which may use interest rate derivatives to manage the mismatch between predominantly short duration floating-rate borrowings (deposits and wholesale financing, for instance) and its longer-term fixed-rate mortgage book. It also exposes the lender to prepayment risk – simply, the risk that borrowers may increase payments or pay off their outstanding loans early, reducing the interest income anticipated by the lender. This is very much reliant on the direction of interest rates: as interest rates fall, it becomes more likely the borrower will look to refinance at more attractive rates, meaning the duration of the loans gets shorter. Conversely, duration quickly extends as interest rates rise, due to the fact that prepayment rates slow. This characteristic, known negative convexity, means the loans rapidly lose value in a rising rate environment, but gain in value at a slower rate than normal fixed-rate debt in a falling

¹² Performance of insurance company hedging programs during the recent capital market crisis, Milliman, May 2009 http://www.milliman.com/uploadedFiles/insight/life-published/pdfs/performance_insurance_company_hedging.pdf

¹³ Securitization and the Fixed-Rate Mortgage, Andreas Fuster and James Vickery, Federal Reserve Bank of New York staff reports, January 2013, http://www.newyorkfed.org/research/staff_reports/sr594.pdf. This report also describes how the availability of securitisation markets affects the supply of fixed-rate mortgages in the US, and its findings suggest that “quantity and price decisions by mortgage originators in significant part reflect risk management concerns regarding interest rate risk and prepayment risk”.

¹⁴ European Mortgage Federation quarterly statistics: <http://www.hypo.org/Content/Default.asp?PageID=422>

rate environment. Mortgage lenders tend to hedge this risk through derivatives, including interest rate swaps, swaptions and caps and floors.

If this risk wasn't hedged, then lenders would likely be unable to allow early prepayment of fixed-rate mortgages, at least without a hefty penalty fee being charged to the borrower.

That's not the only reason for participants in the mortgage market to use derivatives, however. Many lenders look to transfer risk, reduce capital requirements and raise funding by issuing mortgage-backed securities (MBSs). In the US alone, there was \$1.22 trillion in non-agency residential MBSs outstanding at the end of 2012, with a further \$5.66 trillion in agency MBSs, according to the Securities Industry and Financial Markets Association¹⁵. Covered bonds – debt securities where investors have recourse to the issuer and a pool of assets that typically remain on the issuer's balance sheet – have also become an important source of long-term financing for mortgage lenders (the dual recourse to issuer and collateral means these instruments usually pose a lower cost of financing for the issuer than unsecured debt, or even mortgage-backed securities). Outstanding covered bond issuance reached €2.8 trillion globally at the end of 2012, according to the European Covered Bond Council¹⁶.

Both securitisation vehicles and covered bond issuers typically use derivatives to manage interest rate and currency risks in the mortgage pool. In the latter case, interest rate and currency swaps are used to ensure the disparate fixed and floating cash flows from the underlying mortgages, potentially denominated in different currencies, are sufficient to meet the fixed coupon payments on the covered bonds. Without that certainty, these securities would typically receive lower ratings from rating agencies, and would be less attractive to investors – making it more expensive for mortgage lenders to raise financing for new loans.

There are, of course, other ways for banks and building societies to raise funding. But with unsecured borrowing still difficult for many financial institutions, and central banks likely to scale back their asset purchase schemes over time, covered bonds and securitisation are likely to continue to be important as financing tools.

Putting aside the social and political implications of any constraint in mortgage lending and home ownership, there are also economic consequences: any significant cost increase in fixed-rate mortgages, or reduction in mortgage availability generally, could impact the health of the construction industry – a sector that employs approximately 6 million people in the US and more than 2 million in the UK. It could also affect tax revenues – in the UK, for instance, house buyers have to pay a stamp duty land tax on all properties over the price of £125,000, earning the government approximately £4.22 billion on residential properties alone in the 2011-12 financial year.

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¹⁵ <http://www.sifma.org/research/statistics.aspx>

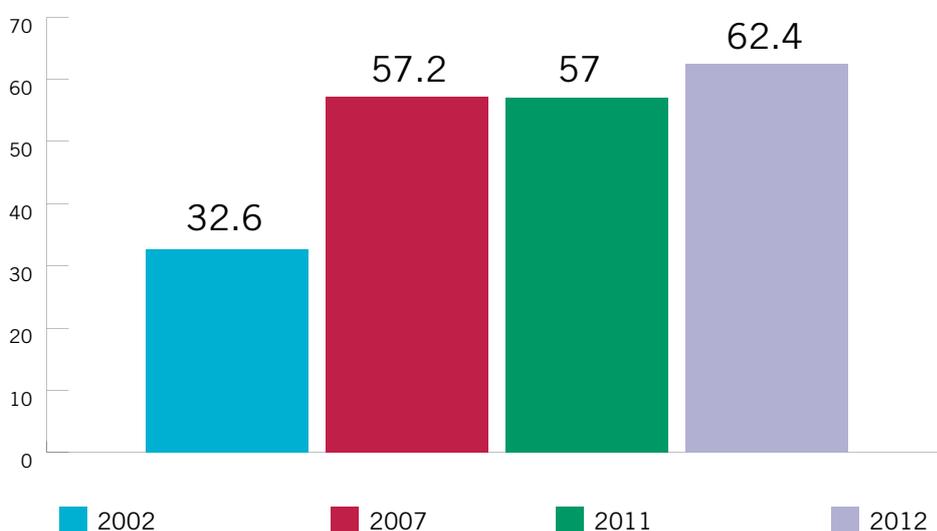
¹⁶ <http://ecbc.hypo.org/Content/default.asp?PageID=519>

◦ Asset management firms

Global assets under management are estimated to have reached \$62.4 trillion in 2012, up from \$57 trillion in 2011 and just \$32.6 trillion in 2002, according to Boston Consulting Group (see **Figure 5**)¹⁷. And this number is expected to grow, breaking through the \$100 trillion barrier by 2020 – more than six times the current annual GDP of the US – according to a forecast by consultancy PWC¹⁸. Much of this growth is likely to be driven by an increase in the number of high-net-worth individuals, the expansion and emergence of new sovereign wealth funds, and growth in the number of new defined-contribution pension plans, PWC predicts.

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52.75%
of 8,024
French asset
management
firms that took
part in an
industry survey
use derivatives
”

Figure 5: Global assets under management (\$ trillion)



Source: Boston Consulting Group

The asset management sector therefore plays a vital role in wealth creation and preservation, important factors in the well-being of the global economy. The most popular strategies in Europe and the US in 2012 included high-yield bonds, emerging market bonds and emerging market equities, with investors shifting away from traditional benchmark equity and bond funds, according to Boston Consulting Group. But regardless of the strategy, derivatives have become an important tool for managers to manage risk and enhance returns.

According to September 2013 research by professors at the Cass Business School and HEC Paris¹⁹, 52.75% of 8,024 French asset management firms that took part in an industry survey use derivatives. That follows an earlier survey of 6,809 US mutual funds by research firm Morningstar²⁰, which found 27% reported at least one derivative holding. These entities use derivatives for a variety of purposes – to hedge unwanted interest rate or foreign exchange risk, to protect portfolios against a sharp fall in markets or volatility more generally, to quickly rebalance asset allocations or take views on specific markets or sectors, and to enhance returns.

¹⁷ *Global Asset Management 2013: Capitalizing on the Recovery*, Boston Consulting Group, July 2013, <http://www.bcg.de/documents/file139325.pdf>

¹⁸ *Asset Management 2020: A Brave New World*, PWC, February 2014, <http://www.pwc.com/gx/en/asset-management/publications/pdfs/pwc-asset-management-2020-a-brave-new-world-final.pdf>

¹⁹ *The Unintended Consequences of Banning Derivatives in Asset Management*, Alessandro Beber, Cass Business School, Christophe Pérignon, HEC Paris, September 2013, https://studies2.hec.fr/jahia/webdav/site/hec/shared/sites/perignon/acces_anonyme/bp.pdf

²⁰ <http://www.sec.gov/comments/s7-33-11/s73311-23.pdf>

For instance, out-of-the-money equity index put options could be used to obtain downside protection on equity portfolios, insulating investors against a market crash. Investors can either use exchange-traded options with standardised contract terms, or tailor the contract to meet their exact requirements by specifying a non-standard size, expiry and/or strike price via the OTC market²¹.

Alternatively, investment managers could use equity swaps and options to temporarily reduce or ramp-up exposures to a particular security, sector or market in response to changing market conditions. That could be done without the use of derivatives – the asset manager could physically sell securities to reduce exposure in falling markets, then buy them back as markets recover – but that would come with high transaction costs. It would also create problems for those mutual funds with mandates that require them to stay fully invested. Derivatives enable managers to manage risk flexibility, without requiring them to change or rebalance their physical asset allocations.

Asset managers could also use derivatives to diversify and efficiently gain exposure to an entire market – through equity index swap or option overlays, for instance – or to enhance performance through the sale of options. In the latter case, a manager might look to monetise a view that markets will remain range-bound by selling out-of-the-money index calls and puts.

In short, derivatives are used to help asset managers preserve and create wealth – vital for the financial security and spending power of investors, and an essential component in the health of the economy.

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Hedge funds and derivatives

Hedge funds usually cater for sophisticated investors, and aim to outperform market returns via an assortment of investment techniques, including the use of leverage. In this sense, their primary aim is the creation and preservation of wealth for their investors, as with other parts of the asset management industry. However, these vehicles have become increasingly important providers of financing to the economy, contribute to market liquidity and help facilitate risk transfer by taking on exposures that other entities may be looking to shed.

In terms of assets under management (AUM), the hedge fund sector is relatively small in scale compared with the global asset management industry – \$2.6 trillion in the third quarter of 2013, according to estimates from the UK Financial Conduct Authority (FCA)²².

Use of leverage, however, can mean they have a larger footprint in financial markets than their AUM might imply. According to an FCA survey of 106 hedge funds managed in the UK, representing \$345 billion in assets, total gross notional exposure reached \$22.2 trillion as of September 2013. Approximately 98% of that related to derivatives – although the top 10 largest funds accounted for the lion's share, at roughly 87% of notional exposure. The FCA, however, recognises that gross notional exposure is not a measurement of risk, and does not take hedging, netting and offsets into account²³.

Meanwhile, portfolio turnover reached \$210 trillion over the year to September 2013²⁴, again largely

²¹ See *Central Clearing in the Equity Derivatives Market*, ISDA Study, June 2014, for an explanation of the characteristics of exchange-traded and OTC equity derivatives products. <http://www2.isda.org/attachment/NjU1Ng==/Central%20clearing%20in%20the%20EQD%20market%20FINAL.pdf>

²² Hedge Fund Survey, FCA, March 2014, <http://www.fca.org.uk/static/documents/hedge-fund-survey.pdf>

²³ The FCA defines gross notional exposure as the absolute sum of all long and short positions, including gross notional value (delta-adjusted when applicable) for derivatives. It acknowledges that gross notional exposure “does not directly represent an amount of money (or value) that is at risk of being lost. It is a reference figure used to calculate profits and losses”. It further recognises that this figure does not reflect netting or collateralisation.

²⁴ The FCA defines turnover as the absolute sum of all trades, using market value or gross notional exposure where applicable.

driven by the 10 largest hedge funds, which comprised 84% of total activity. The FCA found 70% of that annual turnover related to interest rate derivatives – although only 63% of derivatives volumes involved OTC instruments. More than 59% of OTC trades were centrally cleared, and use of collateral to mitigate exposures was widespread, the FCA found. A quick back-of-the-envelope calculation suggests 17% of daily OTC interest rate derivatives turnover could be attributed to these funds.

INTERDEALER ACTIVITY

The interdealer market largely comprises market-making activity and the hedging of customer trades

The remaining turnover volume is attributed to trades between reporting dealers – a segment that is often portrayed as purely speculative and contributing little to the economy at large. That view is incorrect and ignores the market-making role of dealers, and the regulatory constraints that have been imposed on banks since the financial crisis.

Reporting dealers for the purposes of the BIS turnover study are defined as those firms that participate as reporting institutions in the BIS triennial derivatives survey. This comprises approximately 400 large commercial and investment banks and securities houses in 47 countries, including their branches and subsidiaries worldwide²⁵.

The proportion of OTC interest rate derivatives turnover that can be attributed to this segment has fallen steadily over the past 12 years, from 66.1% in 2001 to just 34.8% in 2013. But this decline in interdealer market activity has accelerated over the past four years, having held relatively steady at between 43.6% and 48.2% between 2004 and 2010.

This coincides with regulatory changes that will prevent banks from engaging in proprietary trading. US regulators are further along in implementing these restrictions than other countries, finalising the details of section 619 of the Dodd-Frank Act – better known as the Volcker rule – in December 2013²⁶. European regulators are in the process of drawing up equivalent legislation in the European Union, while UK legislators have passed a law requiring retail banking operations to be ring-fenced from investment banking arms by 2019, based on recommendations from the Independent Commission on Banking published in September 2011²⁷.

Despite the fact none of these rules are fully effective yet – the Volcker rule will be the earliest, coming into full force from July 21, 2015 – many banks have already begun adapting their organisations and closing or selling proprietary trading operations. At the same time, increases to regulatory capital requirements under Basel III have further encouraged banks to slim down or exit non-core business lines and reduce risk-weighted assets.

These changes, and particularly the ban on proprietary trading, mean a large proportion of interdealer activity will likely be related to market-making activity and the hedging of customer transactions²⁸. These are key functions – unless dealers are continually active in the market, they may not be in a position to respond to client requests – and their importance to the smooth

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²⁵ It should be noted that any activity where a reporting dealer is acting as an end user (for instance, asset-liability management hedging or the hedging of corporate loan books) would fall into the 'reporting dealer' bucket. For the purposes of this paper, however, we count it all as dealer activity.

²⁶ <http://www.gpo.gov/fdsys/pkg/FR-2014-01-31/pdf/2013-31511.pdf>

²⁷ <https://hmt-sanctions.s3.amazonaws.com/ICB%20final%20report/ICB%2520Final%2520Report%5B1%5D.pdf>

²⁸ Banks typically look to offset the risk created through trading with a client by entering into hedges with other banks in the interdealer market. These hedges may be conducted on a portfolio basis, or using different derivatives instruments to those used by the client. This is permitted under the Volcker rule, subject to certain conditions.

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As much as two-thirds of derivatives transactions are administrative trades used to manage derivatives books, rather than being ‘price forming’
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functioning of markets is acknowledged by regulators. In the Volcker rule, for instance, exemptions exist for market-making and related hedges, as well as for risk-mitigating hedging by the bank (subject to the firm meeting certain requirements). Without these exemptions, regulators accept there could be a reduction in market liquidity and in the willingness of banks to facilitate client trades.

As well as market-making and hedging, a significant amount of activity can be attributed to so-called administrative trades – essentially, those transactions meant to risk-manage, consolidate or reduce derivatives books. These were identified by staff at the Federal Reserve Bank of New York during a review of OTC interest rates derivatives activity during three months in 2010. The data covers all electronically matched interest rate derivatives transactions between June and August 2010, where one of 14 large global dealers (G-14) was on at least one side of the trade. Transactions that didn’t involve a G-14 dealer, or that weren’t electronically matched, were excluded from the study.

According to their analysis, as much as two-thirds of derivatives transactions are administrative trades used to manage derivatives books, rather than being ‘price forming’ (where trades are executed at a negotiated price). These administrative trades include novations to clearing houses, internal trades, compression activities, forward rate agreement (FRA) switches, allocated trades, and amendments, cancellations and novations to other counterparties (where there is no associated fee).

This totalled approximately \$66 trillion worth of activity over the three-month period (see **Table 3**), versus \$45 trillion in notional in price-forming trades. The report acknowledges that the “inclusion of some transaction types in raw turnover data may mischaracterise the size of the market by inflating the number and volume of transactions”.

Table 3: OTC interest rate derivatives transactions identified as administrative

	Number of transactions	Daily average transactions	Notional volume (\$ billions)	Daily average volume (\$ billions)
Non-price-forming and excluded transactions types				
Compression	55,856	846	5,599	85
FRA switches	60,266	913	17,374	263
Amendments, cancellations and novations	57,183	866	11,464	174
Novations to clearing	93,032	1,410	22,780	345
Prime brokered trades	14,698	223	2,574	345
Allocated trades	21,007	318	1,144	17
Internal trades	16,803	255	4,719	71
Total	318,845	4,831	65,654	995

Source: Federal Reserve Bank of New York

Note: Amendments, cancellations and novations only include those transactions with no associated fees

The BIS turnover data excludes at least some of this administrative activity – novations to clearing houses, for instance, are not included. At around \$23 trillion in notional in the Federal Reserve Bank of New York’s figures, this makes up a significant chunk of its \$66 trillion in administrative trades. Nonetheless, the BIS figures do include some other elements, such as internal trades between desks and offices (although the BIS does exclude back-to-back trades that facilitate internal book-keeping).

Without more detail from the BIS, it’s difficult to know for sure whether all the elements identified in Table 3 are included in the BIS data. Some of these (amendments, cancellations and novations with no associated fee) might be reported in the non-financial customer segment, while FRA switches and internal trades would likely be allocated to the reporting dealer category.

The BIS acknowledges it does not differentiate between price-forming and administrative transactions, and concedes “this makes it difficult to interpret the data” it publishes²⁹. But assuming only novations to clearing are excluded, and using a revised proportional split as per the New York Fed study, it suggests as much as \$1.15 trillion of the \$2.34 trillion in average daily turnover reported by the BIS could be attributed to administrative activity.

²⁹ The *OTC interest rate derivatives market in 2013*, Jacob Gyntelberg and Christian Upper, BIS Quarterly Review, December 2013, http://www.bis.org/publ/qtrpdf/r_qt1312h.pdf

CONCLUSION

The claim that only a small fraction of derivatives activity serves an economic and social purpose is not supported by the data

The claim made by some commentators that only a small fraction of derivatives activity comprises hedging activity that serves an economic and social purpose is not supported by the data.

End users now make up the largest segment of the OTC derivatives market by some distance, accounting for 65% of derivatives turnover in the most recent BIS triennial figures. That figure has virtually doubled since 2001, when end-user business accounted for just 34.1% of turnover.

For the purposes of this analysis, end-user activity incorporates two of the three generic categories in the BIS data: non-dealer financial institutions and non-financial customers. The latter comprised 7.2% of OTC derivatives turnover in 2013, according to the latest BIS figures. These entities include corporations, governments and supranationals, which would use derivatives to hedge risks and reduce volatility on their balance sheets.

But the largest single category of user – other financial institutions – include pension funds, insurance companies, asset managers and building societies. These entities primarily use derivatives to mitigate risk or fine-tune risk/return targets: from mitigating the risks associated with providing fixed-rate mortgages, to helping preserve and increase wealth.

These all have an important economic benefit. A failure to meet future pension obligations, for instance, would decimate the incomes of retirees and potentially put a significant burden on future governments. Any reduction in availability in mortgage lending, meanwhile, would have severe economic, social and political consequences. And a deterioration in wealth from a failure to protect and risk-manage asset management investment portfolios would also impact spending power.

Much of the dealer activity likely relates to market-making and hedging of customer transactions – critical for market liquidity and the facilitation of client trades. Without this, end users would not be able to put on risk-reducing and cost-effective hedges – potentially leading to less hedging and more balance-sheet volatility.



ISDA has published other research studies on this and related topics:

- ***Size and Uses of the Non-Cleared Derivatives Market***, April 2014:

<http://www2.isda.org/attachment/NjQ0MA==/FINAL%20-%20Size%20and%20Uses%20of%20the%20Non-Cleared%20Derivatves%20Market.pdf>

- ***The Value of OTC Derivatives: Case Study Analyses of Hedges by Publicly Traded Non-Financial Firms***, April 2014:

<http://www2.isda.org/attachment/NjQzOQ==/FINAL%20-%20Betty%20Simkins%20Paper%20.pdf>

- ***Central Clearing in the Equity Derivatives Market***, June 2014:

<http://www2.isda.org/attachment/NjU1Ng==/Central%20clearing%20in%20the%20EQD%20market%20FINAL.pdf>

ABOUT ISDA

Since 1985, ISDA has worked to make the global over-the-counter (OTC) derivatives markets safer and more efficient. Today, ISDA has over 800 member institutions from 64 countries. These members include a broad range of OTC derivatives market participants including corporations, investment managers,

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