Twenty-Ninth Meeting of the
IMF Committee on Balance of Payments Statistics

Washington D.C., USA
October 24–26, 2016

BOPCOM—16/22

Comparison of BIS Financial Derivatives Statistics

Prepared by the Bank for International Settlements

September 2016

Comparison of BIS derivatives statistics

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A lot of information about derivatives is collected in various international datasets, mainly by the BIS, but demands from users for better derivatives statistics raise questions about what should be collected. The first phase of the G20 Data Gaps Initiative (DGI), which was launched in 2009 to close data gaps revealed by the crisis, recommended improvements to credit derivative statistics, and the second phase, launched in 2015, recommended investigating other improvements to derivatives statistics (IMF-FSB (2015)). Each set of derivatives statistics collected by the BIS was designed for a particular analytical use. Consequently, the statistics are neither closely integrated nor easily combined. Also, changes in derivatives markets pose challenges to the uses that the statistics were originally designed to meet (Tissot (2015)). There may be scope to increase the benefits of existing derivatives statistics, and reduce the overall costs, by merging some datasets and streamlining others.

This note is intended to motivate discussions about possible changes to BIS derivatives statistics. It follows up on recommendation 6 from the second phase of the DGI, which asks the BIS to review the derivatives data collected for the international banking statistics and the semiannual survey of over-the-counter (OTC) derivatives markets. The note provides background for these discussions by summarising what statistics are currently collected, highlighting overlaps in coverage, analysing key differences in definitions, and discussing the prospects for obtaining aggregated data from trade repositories. It points to some possible improvements but does not recommend specific changes; more analysis of the uses of derivatives statistics is needed before deciding on recommendations.

The note focuses on outstanding positions: the fair and notional value of derivatives contracts at a point in time. Overlapping coverage and differing definitions are mainly issues for statistics on positions. The case for streamlining statistics on turnover in derivatives markets is weaker because currently very little information is collected about turnover.[2]

Summary of existing statistics

Under the auspices of BIS-hosted committees, particularly the Committee on the Global Financial System (CGFS), the BIS compiles outstanding derivatives positions in

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[2] The turnover of foreign exchange and interest rate derivatives is captured in the BIS Triennial Central Bank Survey (covering over-the-counter markets, albeit at a triennial frequency) and the BIS exchange-traded derivatives statistics (covering organised markets, at a monthly frequency).

five different sets of statistics. These are explained briefly below and summarised in Tables 1 and 2.[3]

Locational banking statistics (LBS). The LBS capture the gross fair value of reporting banks' derivative assets and liabilities, on an unconsolidated basis. However, derivatives are not separately identified; they are reported under "other instruments", mixed with equities and instruments other than loans, deposits and debt securities. These "other instruments" are broken down by country and sector of counterparty as well as currency.

Consolidated banking statistics (CBS). In the CBS, banks report their derivatives positions on a consolidated basis. Derivative assets with a positive fair value are reported separately from other assets, and contracts with the same counterparty may be netted where covered by a legally enforceable bilateral netting agreement.[4] Derivative assets are broken down by country of counterparty, but derivative liabilities are reported without any breakdown. The notional amount of protection sold through credit derivatives is reported under guarantees extended (after subtracting cash collateral), broken down by country of counterparty.

Institution-to-aggregate granular statistics to be reported to the **International Data Hub** (IDH) as part of Phase 3 starting in 2017.[5] For the IDH Phase 3 statistics, banks will report derivatives on a consolidated basis and, in the derivatives template, contracts with the same counterparty will not be netted. Derivatives will be reported at gross positive and negative fair value as well as the notional amount, broken down by instrument and asset class. The notional amount of foreign exchange derivatives will be reported with additional breakdowns by currency, maturity and direction of the position. No break down by counterparty will be reported.

Coverage of derivatives statistics — Table 1

	Unconsolidated positions (residence basis)		Consolidated positions (nationality basis)	
	All sectors on all sectors	Banks on all sectors	All sectors on all sectors	Banks on all sectors
All markets	IIP[1]	LBS	IFRS	CBS IDH-3
Exchanges	XTD			
OTC markets		OTCD (turnover)		OTCD (outstanding)

CBS = BIS consolidated banking statistics; IDH-3= International Data Hub Phase 3; IFRS = international financial reporting standards; IIP = international investment position; LBS = BIS locational banking statistics; OTCD = BIS OTC derivatives statistics; XTD = BIS exchange-traded derivatives statistics.

[1] Resident sectors on non-resident sectors, ie excluding positions of residents on other residents.

[3] More information is available on the BIS website under derivatives statistics. See also the CGFS's reports on derivatives statistics, eg CGFS (1996) and CGFS (2009).

[4] Derivative assets exclude credit derivatives not held for trading, which instead are reported as risk transfers at notional value.

[5] For more information about the data to be collected in Phase 3, see FSB (2014) and Tracy (2016). Data reported to the IDH are not published and are made available only to participating supervisory authorities.

Breakdowns of derivatives statistics Table 2

		Classification by counterparty			
		No breakdown	Sector	Country	Sector and country
Classification by underlying asset	No breakdown	OTCD (net)		CBS	LBS (other) IIP
	Asset class[1]	IDH-3	OTCD (gross)		
	Specific asset	XTD	OTCD (CDS)		
Memo:	Long/short[2]	IDH-3 (FX)	OTCD (CDS)		IIP (FX A9)

[1] Commodity, equity, credit, foreign exchange (FX), interest rate. [2] Direction of position.

OTC derivatives (OTCD). In the OTCD statistics, banks and other derivatives dealers report gross positive and negative fair values as well as notional amounts, on a consolidated basis. OTC derivatives are broken down by sector of counterparty (but not country) as well as by instrument, currency and asset class. Credit default swaps (CDS) are reported with additional breakdowns by sector and rating of the underlying reference entity, as well as region of counterparty. Derivatives are also reported at net market value – after netting contracts covered by a legally enforceable bilateral netting agreement – but only for OTC derivatives in aggregate and for credit derivatives, and without any other breakdown.

Exchange-traded derivatives (XTD). The XTD statistics are compiled at a contract level, in contrast to the other BIS derivatives statistics, which are compiled from balance sheet information. Positions are not consolidated; indeed no information about the counterparties to each contact is available. The BIS calculates the notional value of open interest, broken down by instrument and asset class.

In addition to BIS derivatives statistics, national data on derivatives are collected for the international investment position (IIP). Under the methodology in BPM6 (IMF (2009)), derivative assets and liabilities are captured at gross fair value, on an unconsolidated basis. Only positions with non-residents are reported, broken down by resident sector.[6] In addition, supplements to the IIP recommend the collection of notional values for foreign exchange and all financial derivatives, with breakdowns by resident sector and currency.[7]

Overlaps in coverage

Each set of statistics provides information about derivatives positions that is not available in other statistics, but some overlap to a greater extent than others. Overlap is highest between the IDH-3 and OTCD statistics and lowest between the XTD and other derivatives statistics.

The IDH-3 and OTCD statistics provide similar information at an aggregate level. They both provide information about asset classes (eg commodities, equities, credit, foreign exchange, interest rate) at fair and notional values. They are both compiled

[6] Sector of resident counterparty on total non-residents.

[7] See appendices A9-I-1b, A9-I-2b, A9-II-1b, A9-II-2b and A9-III-2b of BPM6.

from balance sheet information on a consolidated basis. In principle the IDH-3 statistics are broader in coverage because they capture exchange-traded as well as OTC derivatives, but the OTCD statistics are reported by a larger sample of banks.

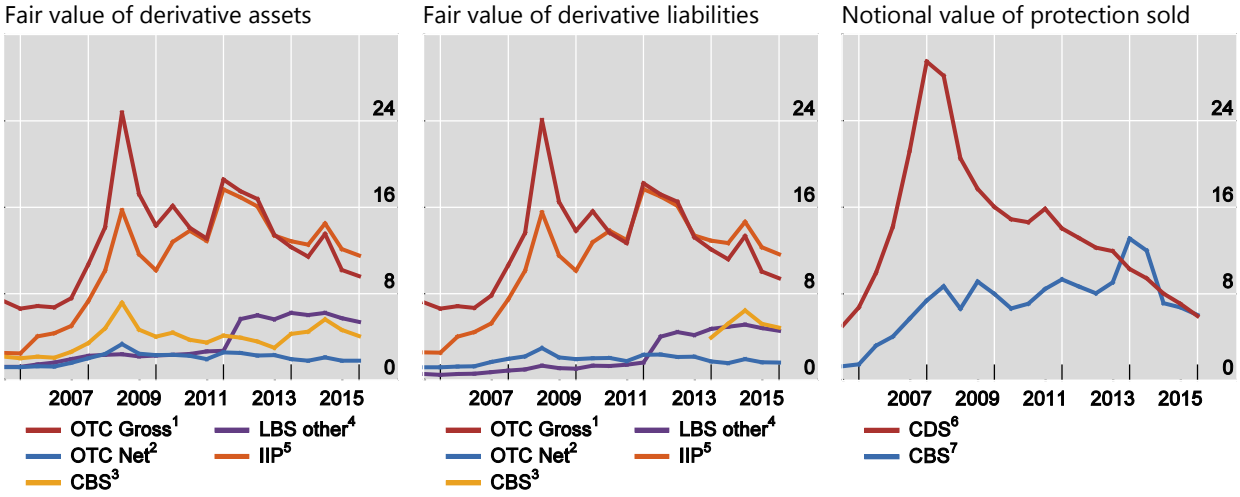
There is some overlap between the CBS and OTCD statistics. The fair value of derivative assets and liabilities is available from both. The notional amount of credit protection sold is available from the CDS statistics and captured within guarantees extended in the CBS. However, different breakdowns are collected. For example, the OTCD statistics provide information about the sector of banks' counterparties, and the CBS about the country of their counterparties. Moreover, whereas netting practices differ across reporting countries in the CBS, netting agreements are taken into account in a consistent way in the OTCD statistics, which consequently are more comparable across reporting countries.

Graph 1 compares derivatives reported in the CBS and OTCD statistics. As shown in the left-hand panel, derivative assets in the CBS lie above the OTCD statistics reported at net fair value but below those at gross fair value. This confirms that banks follow different netting practices across CBS-reporting countries. The centre panel shows similar discrepancies for derivative liabilities. The right-hand panel illustrates that while historically the CBS were a poor proxy for the CDS statistics on credit protection sold, since 2014 the two series have tracked each other more closely, perhaps owing to improvements in reporting in the CBS.

In principle the counterparty details in the CBS and OTCD statistics overlap with those in the LBS, where derivatives are reported by country and sector of counterparty as well as currency of the underlying asset. However, derivative assets and liabilities

Derivatives statistics

Outstanding positions, in trillions of US dollars — Graph 1



[1] Gross fair value of outstanding OTC derivatives. [2] Net fair value of outstanding OTC derivatives. [3] Not adjusted for discontinuities in coverage, notably in 2013–14 when banks started to report derivative assets on counterparties in their home country. [4] Other instruments, including derivatives. Not adjusted for discontinuities in coverage, notably in 2012 when banks started to report derivative positions on residents of the reporting country. [5] Financial derivatives and employee stock options. Excludes derivative positions of residents on residents. [6] Credit default swaps sold. [7] Guarantees extended.

Sources: National data; IMF; BIS consolidated banking statistics; BIS locational banking statistics; BIS OTC derivatives statistics.

are very incomplete in the LBS. First, they are not separately identified; they are part of "other instruments". Second, several of the largest LBS-reporting countries do not report derivatives, including France, Germany, the United Kingdom and the United States. Therefore, it is not surprising that "other instruments" in the LBS do not seem to be correlated with derivatives in the CBS, as shown in Graph 1.

The LBS are compiled using the same methodology as the IIP, eg unconsolidated positions on a gross basis by residence of counterparties. Therefore in principle there are synergies between derivatives in the LBS and IIP. But in practice the incompleteness of derivatives in the LBS limits these synergies, as can been seen from the weak correlation between the two shown in Graph 1.

There is little overlap between the XTD and other derivatives statistics. The XTD statistics provide more detailed information than other statistics about the assets that underlie derivatives contracts, albeit only for foreign exchange and interest rate derivatives traded on exchanges. The CDS statistics provide complementary information about the reference entities that underlie credit derivatives. Other statistics provide few details about underlying assets; instead they provide information about counterparties, which is not captured in the XTD statistics.

Differences in definitions

Any recommendations for merging or streamlining existing derivatives statistics must not only identify which details are of greatest benefit to users but must also address differences in definitions. In some datasets, similar concepts are defined differently.

Positions. One fundamental difference concerns how to measure outstanding derivatives positions. Positions can be measured at notional or fair value, on a net or gross basis, and before or after subtracting collateral. Each measure has an analytical use, but no dataset captures all of them.

Moreover, similar measures are defined differently in some datasets. For example, open interest in the XTD statistics is similar to notional amounts in the OTCD statistics – similar but not the same because in XTD markets offsetting long and short positions are cancelled, which reduces open interest, whereas in OTC markets positions are generally offset by entering a new contract, which boosts notional amounts. The shift of OTC contracts to central counterparties and associated increase in compression are further challenges to the interpretation of notional amounts (Tissot (2015)).

Net fair value is another example of a measure with differing definitions. Net fair value, which equals gross fair value minus amounts netted under legally enforceable bilateral netting agreements, can be calculated for a given asset class or across asset classes, and before or after subtracting collateral. In the CDS statistics net fair value is calculated only for CDS contracts, whereas in the OTCD statistics net fair value is calculated across all asset classes, eg gross negative fair value of interest-rate contracts can be netted against the gross positive fair value of foreign exchange contracts if permitted by the netting agreement.

In the OTCD statistics, the BIS labels net fair value as credit exposure. However, this measure does not take account of collateral and so could be said to overstate actual exposure. On the other hand, it also does not take account of the sensitivity of derivatives positions to movements in market prices and thus could be said to understate future exposure.

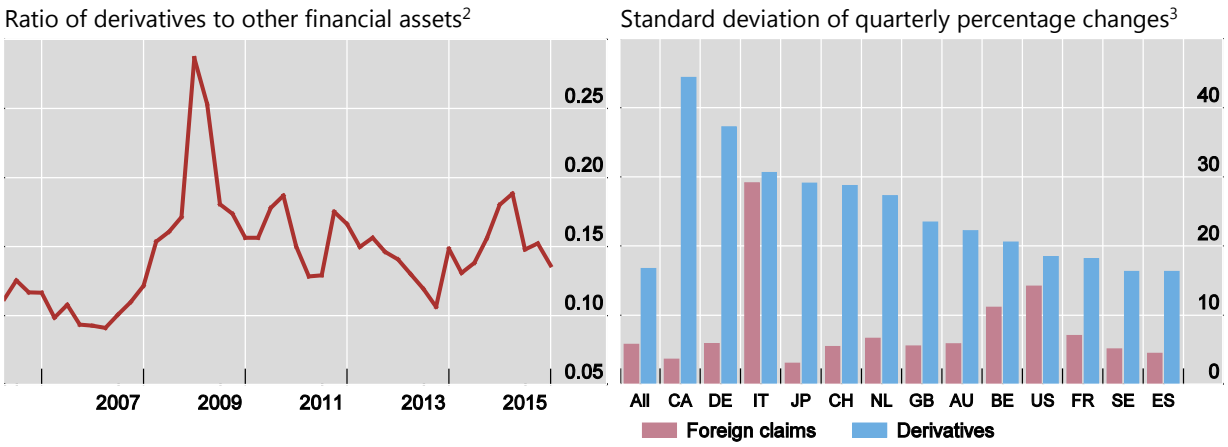
For regulatory purposes, banks are expected to adjust their current exposure by some measure of potential future exposure. In 2014, the Basel Committee on Banking Supervision (BCBS) finalised its standardised approach for measuring counterparty credit risk exposures (SA-CCR). Under the SA-CCR, derivatives exposures are calculated by summing replacement costs and add-ons that adjust for the volatility of different asset classes, multiplied by a factor of 1.4 (BCBS (2014)). Replacement costs can be calculated across asset classes – by netting set – whereas add-ons are calculated for each asset class separately.

Future exposures can be significantly different from current exposures. While derivatives do not account for a large proportion of most banks' assets, they are much more volatile than other instruments. The left-hand panel of Graph 2 shows the ratio of derivative assets to other financial assets – mainly loans and holdings of debt securities – for the foreign portfolios of banks that report the CBS on an ultimate risk basis.[8] The ratio averaged 0.15 over the 2005–15 period but jumped dramatically during periods of market stress, owing mainly to changes in the market value of derivative assets. The ratio ranged from lows of about 0.1 in 2006 to a high of almost 0.3 in late 2008, at the peak of the 2007–09 global financial crisis.

The right-hand panel of Graph 2 compares the volatility of derivative assets and other assets (as measured by foreign claims) for a selection of CBS-reporting banks. The standard deviation of quarterly percentage changes is much higher for derivative assets than foreign claims: about three times higher for all CBS-reporting banks collectively, and more than nine times higher for Canadian and Japanese banks.

Volatility of derivative assets

Foreign assets of CBS-reporting banks, on an ultimate risk basis[1] Graph 2



ALL = all CBS-reporting banks; AU = Australia; BE = Belgium; CA = Canada; CH = Switzerland; DE = Germany; ES = Spain; FR = France; GB = United Kingdom; IT = Italy; JP = Japan; NL = Netherlands; SE = Sweden; US = United States.

[1] Excluding domestic assets, ie excluding derivatives and other claims on residents of banks' home country. [2] Other assets refer to foreign claims excluding derivatives. [3] Calculated over the period end-March 2005 to end-December 2015. Quarterly changes are not adjusted for methodological breaks or movements in exchange rates.

Source: BIS consolidated banking statistics (Table B3).

[8] Any analysis of the time series properties of the CBS should be interpreted with caution because the data are not adjusted for either methodological changes or movements in exchange rates.

More generally, derivatives positions are not synonymous with risk exposures. To understand the risks borne by market participants, comprehensive information is needed about not only derivatives but also cash positions and operational activities. Such information may be available from financial statements or statistical surveys, like Australia's survey of foreign currency exposures.[9]

Location of the counterparty. Another difference across derivatives statistics is the method to identify the location of the counterparty. The LBS and the IIP refer to the residence of the immediate counterparty. The CBS refer to the residence of the ultimate obligor, after taking account of risk transfers. The CDS refer to the nationality of the counterparty, which is conceptually similar to the residence of the ultimate obligor but, in contrast to risk transfers, no criteria are provided for identifying the nationality.

For accounting and risk management purposes, banks typically base the location of the counterparty on netting sets, which bundle all contracts that are subject to the same legally enforceable bilateral netting agreement. Depending under which netting set a contract falls, the counterparty to a derivatives contract may be identified as any one of the following:

- the immediate counterparty, for example if excluded from a netting set;
- the intermediate parent, for example if the netting set covers related entities within a single jurisdiction; or
- the ultimate parent, for example if the netting set covers related entities in multiple jurisdictions but within a single corporate group.

Consolidation. A related issue is whether data should be collected on a consolidated or unconsolidated basis.[10] With the exception of the LBS and XTD statistics, other BIS statistics capture the derivatives positions of reporting banks on a worldwide consolidated basis. However, information about banks' counterparties is typically available only on an unconsolidated basis. To the extent that corporate groups transact in derivatives markets through offshore vehicles and other subsidiaries abroad, data on an unconsolidated basis may obscure a build-up of risks. That said, data on a consolidated basis may mask the complexity of derivatives markets.

Trade repositories

Looming over questions about what details and definitions from the current derivatives statistics are the most analytically useful is an even bigger question: can aggregated data from trade repositories replace current derivatives statistics? Most of the BIS derivatives statistics were introduced in the 1990s when there were few other sources of information about derivatives. Today, trade repositories are a rich source of information about derivatives. Eventually they could provide statistics that are more complete than the existing collections because trade repositories collect more details. They also capture a larger share of activity; the BIS derivatives statistics are collected mainly from banks and miss derivatives traded between non-bank

[9] See Australian Bureau of Statistics (2014).

[10] For a discussion of consolidation issues, see Inter-Agency Group on Economic and Financial Statistics (2015).

entities. Trade repository data are already being used for some analytical purposes. For example, the CDS statistics published by the Depository Trust & Clearing Corporation (DTCC) – a post-trade financial services company that provides clearing and settlement services – capture most of the CDS market and in some areas provide more information than BIS statistics.[11]

That said, currently there are significant practical obstacles to the aggregation and sharing of trade repository data. Work is advancing to address these obstacles. The Committee on Payments and Market Infrastructures (CPMI) and International Organization of Securities Commissions (IOSCO) are developing global guidance on the harmonisation of data elements reported to trade repositories and important for the aggregation of data by authorities, including unique transaction identifiers and unique product identifiers (CPMI-IOSCO (2015)). The Financial Stability Board (FSB) is developing recommendations for the governance of the global aggregation mechanism and is also following up on actions to remove legal barriers to the sharing of information (FSB (2015)). While conceptual work at the international level is foreseen to be completed by early 2018, timelines are not yet clear for either implementation at the national level or setting up aggregation mechanisms at the global level.

It seems reasonable to assume that, for a good number of years, aggregated data from trade repositories will not replace the current derivatives statistics. Beyond 2020, the BIS derivatives statistics are likely to remain key data sources for some purposes, such as analysing banks' balance sheets, providing global benchmarks, and monitoring trends in markets where trade repositories take longer to establish. More analysis of possible uses is needed to identify changes to the existing statistics that could increase their analytical benefits.

References

Australia Bureau of Statistics (2014): "Australia's Survey of Foreign Currency Exposure", www.imf.org/external/pubs/ft/bop/2014/pdf/14-18.pdf.

Basel Committee on Banking Supervision (2014): "The standardised approach for measuring counterparty credit risk exposures", March, www.bis.org/publ/bcbs279.htm.

Committee on the Global Financial System (1996): "Proposals for improving global derivatives market statistics", *CGFS Publications*, no 6, July, www.bis.org/publ/ecsc06.htm.

——— (2009): "Credit risk transfer statistics", *CGFS Publications*, no 35, September, www.bis.org/publ/cgfs35.htm.

CPMI-IOSCO (2015): "Harmonisation of key OTC derivatives data elements (other than UTI and UPI)", Consultative report, September, www.bis.org/cpmi/publ/d132.htm.

Financial Stability Board (2014): "FSB Data Gaps Initiative – A Common Data Template for Global Systemically Important Banks: Phase 2", 6 May, www.fsb.org/2014/05/r_140506/.

[11] See www.dtcc.com/repository-otc-data.aspx.

——— (2015): "Thematic review of OTC derivatives trade reporting", Peer review report, 4 November, www.fsb.org/2015/11/thematic-review-of-otc-derivatives-trade-reporting/.

Inter-Agency Group on Economic and Financial Statistics (2015): "Consolidation and corporate groups: an overview of methodological and practical issues", October, www.bis.org/ifc/publ/iagrefdoc-oct15.pdf.

International Monetary Fund (2009): *Balance of Payments and International Investment Position Manual: Sixth Edition* (BPM6), www.imf.org/external/pubs/ft/bop/2007/bopman6.htm.

International Monetary Fund and Financial Stability Board (2015): "The Financial Crisis and Information Gaps: Sixth Progress Report on the Implementation of the G-20 Data Gaps Initiative", September, www.imf.org/external/np/g20/pdf/2015/6thprogressrep.pdf.

Tissot, Bruno (2015): "Derivatives statistics: the BIS contribution", Proceedings of the 60th ISI World Statistics Congress, August 2015, isi2015.org/components/com_users/views/registration/tmpl/media/uploadedFiles/paper/121/1850/IPS089-P1-S.pdf.

Tracy, Joseph (2016): "FSB Working Group on Data Gaps Implementation", presentation at the 41st IOSCO Annual Conference in Lima, May, www.iosco.org/library/annual_conferences/pdf/41/JosephTracyDATA-Workshop3.pdf.