

The regulation and supervision of banks' derivatives activities: existing practices, challenges, and preliminary proposals from data perspective

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Introduction

One key function of the Hong Kong Monetary Authority (HKMA) is to promote the stability and integrity of the financial system in Hong Kong. There are about 200 authorized institutions (AIs) in Hong Kong, many of which are deposit taking banks. The total assets of AIs as of June 2010 are about HKD 11 trillion, 6 times as large as the latest annual GDP of Hong Kong and about 60% of the total market capitalization of the stocks listed in the Hong Kong Stock Exchange.

Many AIs, especially those deposit taking banks, actively engage in various derivatives activities. The total notional of the derivatives positions of all AIs as of the end of 2009 is about HKD 35 trillion and the derivatives contracts span almost all asset classes such as interest rate, FX, equity, commodity, credit and hybrid. AIs enter derivatives transactions due to the following reasons: (1) client-driven deals, which are associated with other transactions (for example, foreign currency denominated loans made) with clients; (2) proprietary trading positions, which are used by AIs to speculate market movements and to hedge market risks; and (3) market making, where AIs provide liquidity by acting as a counterparty of a transaction to facilitate price formation. Given the significance of derivatives activities conducted by AIs, it is important that derivatives activities are properly regulated and supervised. To this end, derivatives data specification and collection becomes essential. This paper is intended to present some of the current derivatives data collection practice and challenges. Preliminary proposals to overcome these challenges are also discussed. The last section uses exchange traded fund (ETF) as a case study to illustrate the data challenges.

Main risk dimensions of derivatives

In order to capture derivatives positions accurately for regulation and supervision purpose, it's necessary to understand the main risk dimensions associated with derivatives and contractual data that can be used to capture them. At the risk of oversimplification, the main risks that derivatives may induce and relevant data to reflect the risks are summarized in Exhibit 1.

Apparently the complexity of today's derivatives markets poses tremendous challenges in collecting and analyzing data, before any prudent regulatory and supervisory actions can be taken. To ensure the soundness of individual institutions, regulators and supervisors need to utilize collected data to assess whether an institution conducts derivatives transactions with a scale and complexity commensurate to its capital and market position (e.g. leader, new entrant, etc.). More importantly the risk management framework shall be scrutinized carefully to lend support to such assessment. To this end, collecting derivatives data is a necessary

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but usually not a sufficient step. Another aspect of regulatory and supervisory concerns on derivatives is beyond the soundness of individual institutions, that is, to assess any potential systemic risks arising from aggregate derivatives activities by the industry. This has become increasingly important since the Great Financial Crisis (GFC) broke out in the late 2008. Admittedly the task of identifying systemic risks from derivatives data is challenging. One possible way to achieve the macro-prudential goal is to identify institutions with largest counterparty potential exposures. Another possible way is to observe abnormal sharp growth of a derivatives market. Of course, there is more work need to be done before any early warning signal can be identified at a reasonable confidence level.

Exhibit 1

Risk dimensions and indicators of derivatives

Risk	Counterparty credit risk	Market risk	Operational risk	Systemic risk
Definition	The risk that a counterparty of a contract fails to fulfil the contract terms	The risk that the value of a contract fluctuates due to market factor movements	The risk associated with executing a contract	The risk that financial system soundness is in danger
Indicators	Notional, maturity, underlying, product type, exchange or OTC based, Potential exposure, netting, collateral, etc.	Notional, maturity, underlying, product type, etc.	Notional, product type, etc.	Notional, clearing mechanism, custodian arrangement, etc.

Regulatory data requirements and challenges

To effectively regulate and supervise derivatives activities in an economy, regulators need to impose some fundamental requirements in the process of data collection. This section presents a set of requirements that can be conveniently summarized as “ACTRiG” (the acronym of Accuracy, Comprehensiveness, Timeliness, Risk-sensitiveness and Granularity; also alluding to the eventual purpose of data collection which is to TRiGger supervisory ACTion if needed).

Accuracy. This requirement is the most fundamental one. In the context of derivatives activities, it has at least two aspects. The first one is the data consistency between front-office (FO) system and back-office (BO) system. The issue here is how to ensure derivatives position data flow automatically from FO to BO and in the calculation of some risks, e.g. counterparty credit risk exposures, how to accurately link non-positional but related information such as netting and collateral with derivatives positions. The data consistency is not only essential for an institution’s own management oversight but also crucial for regulators and supervisors should they require such information, for example, in an examination. Many factors may affect the degree of data consistency here, such as whether an institution grows through organic expansion or through aggressive merger, the degree of complexity of transactions, and internal resource availability, etc. The second aspect of data accuracy relates to an institution’s regulatory report filing. Regulatory report is main source

where regulators and supervisors get hold of data. Hence institutions have an obligation to ensure data accuracy in regulatory report filing.

Comprehensiveness. Data collected must cover all derivatives products transacted. Derivatives products can be either classified by underlyings or by types. Usual underlyings include interest rate, foreign exchange rate, equities, commodities and credit. Usual types include futures, options, swaps and forwards. At times, there are derivatives complex enough that cannot be readily classified as any of the above. They usually can be decomposed to relatively plain vanilla parts but in practice it's not guaranteed this is done correctly in data filing. Comprehensiveness also refers to the coverage of institutions in an economy. Data collection may not cover all institutions that transact derivatives due to the limitation of a regulator or supervisor's mandate. For instance, if a supervisor is only mandated to supervise banks, then it may not have data on transactions conducted by non-bank financial institutions (NBFIs) such as hedge funds and insurance companies, etc. This poses great challenges in supervising derivatives activities, as NBFIs can be a significant participant that exposes to derivatives risks. To certain extent, booking arrangement of an institution (e.g. a global bank) can also affect comprehensiveness of data collection for regulatory and supervisory purpose. This is because many derivatives positions may be booked outside of a jurisdiction hence no data filed to the jurisdiction's regulator, yet traders may be locally deployed. These derivatives activities will have profit and loss (PnL) and reputational risk implications to the local branch. As a result, more comprehensive data (covering not only local branches but ideally groups) would enhance regulatory and supervisory effectiveness.

Timeliness. Usually regulatory reports need to be filed quarterly or semi-annually and there is a lag of the report submission date and position cut-off date. In normal times, such a lag wouldn't make a big difference. But in a crisis, it could be a matter of life and death for an institution how timely data on its positions can be gathered and reported. Given the lessons of GFC, at least major institutions (e.g. systemically important financial institutions or SIFIs) are increasingly expected to be able to report positions within a relatively short period of time. Management of these institutions should invest resources to make sure derivatives positions are accurate and timely reported both internally (e.g. in MIS reports) and externally (e.g. in data returns filed to supervisors).

Risk-sensitiveness. The data reported should reflect the riskiness of derivatives positions as far as possible yet simple enough for reporting. For example, market risk is one of the main risks derivatives positions possess. Market risk measures may include value-at-risk (VaR) and its back-testing results (i.e. VaR exceptions), the latter of which may have direct impact on regulatory capital charge. For credit risk measures, relevant data include notional, current credit exposure (CCE), potential future exposure (PFE), and associated collateral, etc. Clearly not every measure shows equal risk-sensitiveness. Notional is widely used as a summary statistics of derivatives positions. Yet institutions may not rely on it in their internal MIS reports in monitoring risks. Still notional of overall derivatives positions contains information on leverage hence risks of a market. Another example is the measure of counterparty exposures arising from OTC derivatives. Due to the uncertainty of cash flows associated with a derivatives contract, PFE needs to be estimated. There are several methods in estimating PFEs such as original exposure method (roughly using notional), current exposure method (CCE + add-on) and simulation method (e.g. Monte-Carlo simulation). The risk-sensitiveness varies across different measures and across different estimation methods. All these make the aggregation of data a difficult task.

Granularity. Due to the multi-faceted nature of derivatives, granular data is needed to effectively monitor derivatives positions. Ideally data should at least reflect the following information:

- Long or short position
- Transaction types: swap, forward, option, futures, etc.
- Notional (but this can be tricky for exotic derivatives)

- Maturity or first call date
- Underlying: equity or equity index, rate index, investment or speculative-grade, home or foreign name, etc.
- Currency
- Counterparty: corporate, bank, NBF, connected entity, etc.
- Mark-to-market

This requires institutions to implement MIS system capable to catch the above information.

Sources of derivatives data

Data on derivatives positions can be gleaned through several ways. One common source is regulatory reports (e.g. returns or surveys). The basic requirement is institutions periodically submit reports in which data satisfies the ACTRiG criteria. In addition, regulatory reports ideally should cover both revenue or PnL information and risks of derivatives activities in order to give a balanced view of an institution and of the overall industry. Another main source is supervisory off-site reviews and on-site examinations of derivatives activities. Compared to regulatory reports, this can be more targeted and up-to-date but may not be cost effective. Through the targeted examination or review, some regulatory concerns on data can be mitigated such as inconsistency between FO and BO or between internal and external reports. The third source is exchanges and trade repositories, from which information on exchange traded derivatives and over-the-counter (OTC) traded ones can be obtained respectively. A common question relating to trade repositories is – how granular of data can a prudential supervisor access? There is a balance between the effectiveness of supervision and the privacy of data. It is not difficult to appreciate however that in many cases aggregate data is not enough, hence more granular data such as bought and sold position information is needed. The last but not least source is the information shared among regulators and supervisors. This has been increasingly important given the interconnectedness of global derivatives markets and the existence of SIFs. Information sharing may involve home and host regulators, and regulators and supervisors across different industries (e.g. insurance firms, securities firms, and banks).

A case study – exchange traded fund (ETF)

ETF has become increasingly popular as a stand-alone asset class. For example, the average trading volume in Hong Kong reached roughly HKD 2 billion per day in 2009, up more than eightfold from 2006. The market capitalisation of these 50 ETFs have reached over HKD 160 billion in January 2010. ETF is normally perceived as transparent and of relatively low risk (e.g. comparable to stocks). However, there are significant risks arising from ETF constructed using derivatives, which represented over 60% of ETF traded in Hong Kong.

There are mainly two ways to form an ETF: physical replication and synthetic replication. The former one tracks the performance of the target index by holding all (i.e. full replication) or a representative sample (i.e. partial replication) of the underlying constituent assets of the target index. The latter one uses swaps or other derivatives to replicate the target indexes. Apart from being cost effective, this strategy is necessary when there are limitations to the access of a market. For those swap or derivatives based ETFs, collecting data for supervisory and regulatory purpose has many potential problems. First, not all ETF issuers provide detailed information on counterparties of the swaps and other derivatives used.

Second, even if these counterparties are known, the same authority of the institutions that actively take part in ETFs may not regulate them. Again this may hinder the data collection process. Third, some ETFs may be subject to other regulatory risks where data is not easily available to identify. For example, many ETFs target China indices but cannot do the physical replication due to limited access to China's on-shore market. In synthetically replicating an index, these ETFs are subject to the risk that some derivatives counterparties may not have enough QFII (qualified foreign institutional investor) quota to fully back up the market value of the ETFs. Yet without the relevant data, a regulator may not be able to gauge the scale of the risks associated with the fast growing ETF market. To address the challenges of prudential supervision on ETF markets, supervisors should collect data on counterparty concentration and on collaterals that back up the derivatives used in synthetic replication. Co-operation between different authorities (e.g. bank authority and securities authority) is also needed to share information in order to effectively monitor the complex product.

Concluding remarks

This paper highlights that data collection and analysis is key in effectively regulating and supervising derivatives activities. Some fundamental principles of derivatives data, i.e. ACTRiG, need to be complied with. Given the complex nature of derivatives, many challenges exist which requires continuing efforts being made by institutions, data vendors, and regulators and supervisors alike.