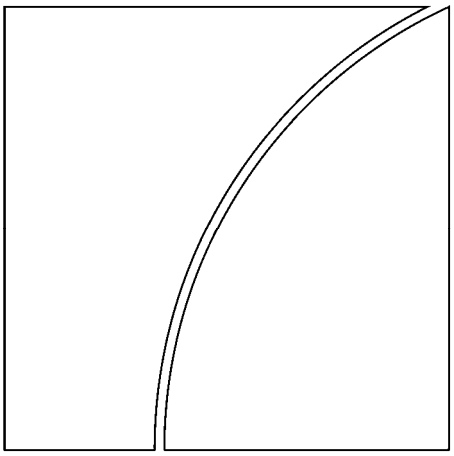
Irving Fisher Committee on Central Bank Statistics



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Data requirements for monitoring derivative transactions

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Foreword

This volume is a collection of the presentations and papers from the workshop on "Data requirements for monitoring derivative transactions", which was co-hosted by the People's Bank of China (PBoC) and the Irving Fisher Committee on Central Bank Statistics (IFC). The event was held at the PBoC training centre in Zhengzhou, China, from 27–29 September 2010.

The objectives of the workshop were threefold:

- to present an overview of key issues related to data requirements for monitoring derivative transactions, including: an overview of derivative instruments, markets and users; a review of existing international frameworks with respect to derivatives data; and challenges in gathering and using derivatives data from various policy perspectives.
- to share experiences with respect to the monitoring of derivative transactions and other financial innovations between experts from IFC member institutions and participants from China.
- to allow the PBoC and other Chinese institutions represented at the workshop to identify best practices and next steps to improve data for monitoring derivative transactions.

Some 150 persons took part in the workshop. They included officials from the headquarters and branches of the PBoC, various supervisory agencies in China and the Ministry of Finance, as well as representatives of financial institutions and other market participants.

The workshop was very successful. It will contribute to the development of a strategy to capture relevant information on derivative transactions in the People's Republic of China. The publication of the proceedings of the workshop should allow other experts, inside and outside the IFC, interested in data requirements for monitoring derivative transactions to familiarise themselves with the topics and issues involved.

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Derivatives markets, products and participants: an overview

Michael Chui[1]

1. Introduction

Derivatives have been associated with a number of high-profile corporate events that roiled the global financial markets over the past two decades. To some critics, derivatives have played an important role in the near collapses or bankruptcies of Barings Bank in 1995, Long-term Capital Management in 1998, Enron in 2001, Lehman Brothers in and American International Group (AIG) in 2008. Warren Buffet even viewed derivatives as time bombs for the economic system and called them financial weapons of mass destruction (Berkshire Hathaway Inc (2002)).

But derivatives, if "properly" handled, can bring substantial economic benefits. These instruments help economic agents to improve their management of market and credit risks. They also foster financial innovation and market developments, increasing the market resilience to shocks. The main challenge to policymakers is to ensure that derivatives transactions being properly traded and prudently supervised. This entails designing regulations and rules that aim to prevent the excessive risk-taking of market participants while not slowing the financial innovation aspect. And it also calls for improved data quantity and quality to enhance the understanding of derivatives markets.

This chapter provides an overview of derivatives, covering three main aspects of these securities: instruments, markets and participants. It begins with a quick review of some key concepts, including what derivatives are; why they exist; who use these instruments and for what purpose. It also discusses the factors that have contributed to the rapid growth of the markets over the past few decades. In section 3, the main types of derivative contracts will be discussed. Section 4 examines how specific derivatives contracts are written on various underlying asset classes. Section 5 discusses two main types of markets: exchange-traded and over-the-counter. The key differences of these markets will be highlighted. Section 6 reviews some recent credit events and to what extent counterparty risk has played a role. Finally, section 7 concludes.

2. Derivative securities: some basic concepts

The Oxford dictionary defines a derivative as something derived or obtained from another, coming from a source; not original. In the field of financial economics, a derivative security is generally referred to a financial contract whose value is derived from the value of an underlying asset or simply *underlying*. There are a wide range of financial assets that have been used as underlying, including equities or equity index, fixed-income instruments, foreign currencies, commodities, credit events and even other derivative securities. Depending on the types of underlying, the values of the derivative contracts can be derived from the corresponding equity prices, interest rates, exchange rates, commodity prices and the probabilities of certain credit events.

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What is the main function of derivatives? They allow users to meet the demand for cost-effective protection against risks associated with movements in the prices of the underlying. In other words, users of derivatives can hedge against fluctuations in exchange and interest rates, equity and commodity prices, as well as credit worthiness. Specifically, derivative transactions involve transferring those risks from entities less willing or able to manage them to those more willing or able to do so. Derivatives transactions are now common among a wide range of entities, including commercial banks, investment banks, central banks, fund mangers, insurance companies and other non-financial corporations.

Participants in derivatives markets are often classified as either "hedgers" or "speculators". Hedgers enter a derivative contract to protect against adverse changes in the values of their assets or liabilities. Specifically, hedgers enter a derivative transaction such that a fall in the value of their assets will be compensated by an increase in the value of the derivative contract. By contrast, speculators attempts to profit from anticipating changes in market prices or rates or credit events by entering a derivative contract. According to this definition, activities of speculators are inherently more risky and should warrant close monitoring by financial regulators. However, it is difficult to differentiate the two in practice. As pointed out by Jarrow and Turnbull (20), "Hedging – risk reduction – speculation – risk augmentation are flip sides of the same coin."

Hedging and speculating are not the only motivations for trading derivatives. Some firms use derivatives to obtain better financing terms. For example, banks often offer more favourable financing terms to those firms that have reduced their market risks through hedging activities than to those without. Fund managers sometimes use derivatives to achieve specific asset allocation of their portfolios. For example, passive fund managers of specific index-tracking funds may need to use derivatives to replicate exposures to some not so liquid financial assets.

Derivatives have a long history and early trading can be traced back to Venice in the 12th century.[2] Credit derivative deals at that period took the form of loans to fund a ship expedition with some insurance on the ship not returning. Later in the 16th century, derivatives contracts on commodities emerged. During that time, the slow speed in communication and high transportation costs presented key problems for traders. Merchants thus used derivatives contracts to allow farmers to lock in the price of a standardised grade of their produces at a later delivery date.

A number of fundamental changes in global financial markets have contributed to the strong growth in derivative markets since the 1970s. First, the collapse of the Bretton Woods system of fixed exchange rates in 1971 increased the demand for hedging against exchange rate risk. The Chicago Mercantile Exchange allowed trading in currency futures in the following year.

Second, the changing of its monetary policy target instrument by the US Federal Reserve (FED) promoted various derivatives markets. The adoption of a target for money growth by the FED in 1979 has led to increased interest-rate volatility of Treasury bonds. That in turn raised the demand for derivatives to hedge against adverse movements in interest rates. Later in 1994 when the US Federal Open Market Committee moved to explicitly state its target level for the federal funds rate, that policy has spurred the growth of derivatives on the federal funds rates. Third, the many emerging market financial crises in the 1990s, which were often accompanied by a sharp rise in corporate bankruptcy, greatly increased the demand of global investors for hedging against credit risk.

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[2] See Swan (2000).

Fourth, innovation in financial theory was another contributing factor. The advancements in options pricing research, most notably the Nobel-prize winning Black-Scholes options pricing model, provided a new framework for portfolio managers to manage risks. More importantly, the rapid improvements in computer technology in the 1990s allowed these asset managers to design and develop increasingly sophisticated derivatives as part of their risk management tools.

3. Major types of derivatives

There are four main types of derivatives contracts: forwards; futures, options and swaps. This section discusses the basics of these four types of derivatives with the help of some specific examples of these instruments.

3.1 Forwards and futures contracts

Forward and futures contracts are usually discussed together as they share a similar feature: a forward or futures contract is an agreement to buy or sell a specified quantity of an asset at a specified price with delivery at a specified date in the future.

But there are important differences in the ways these contracts are transacted. First, participants trading futures can realise gains and losses on a daily basis while forwards transaction requires cash settlement at delivery. Second, futures contracts are standardised while forwards are customised to meet the special needs of the two parties involved (counterparties). Third, unlike futures contracts which are settled through established clearing house, forwards are settled between the counterparties. Fourth, because of being exchange-traded, futures are regulated whereas forwards, which are mostly over-the-counter (OTC) contracts, and loosely regulated (at least in the run up to the global financial crisis). This importance of exchange-traded versus OTC instruments will be discussed further in later section.

3.2 Options contracts

Options contracts can be either standardised or customised. There are two types of option: *call* and *put* options. Call option contracts give the purchaser the right to buy a specified quantity of a commodity or financial asset at a particular price (*the exercise price*) on or before a certain future date (*the expiration date*). Similarly, put option contracts give the buyer the right to sell a specified quantity of an asset at a particular price on a before a certain future date. These definitions are based on the so-called American-style option. And for a European style option, the contract can only be exercised on the expiration date.

In options transaction, the purchaser pays the seller – the writer of the options – an amount for the right to buy or sell. This amount is known as the *option premium*. Note that an important difference between options contracts and futures and forwards contracts is that options do not require the purchaser to buy or sell the underlying asset under all circumstances. In the event that options are not exercised at expiration, the purchaser simply loses the premium paid. If the options are exercised, however, the option writer will be liable for covering the costs of any changes in the value of the underlying that benefit the purchasers.

3.3 Swaps

Swaps are agreements between two counterparties to exchange a series of cash payments for a stated period of time. The periodic payments can be charged on fixed or floating interest rates, depending on contract terms. The calculation of these payments is based on an agreed-upon amount, called the notional principal amount or simply the *notional*.

4. Underlying assets and derivative products

While forwards, futures, options and swaps can be viewed as the mechanics of derivation, the value of these contracts are based on the prices of the underlying assets. In this section, we discuss a range of derivatives products that derive their values from the performance of five underlying asset classes: equity, fixed-income instrument, commodity, foreign currency and credit event. However, given the speed of financial innovation over the past two decades, the variety of derivatives products have grown substantially. Thus a few key examples will be discussed below. For a more detailed discussion of other major financial innovations in recent years, see Anderson and McKay (2008).

4.1 Equity derivatives

Equity futures and options on broad equity indices are perhaps the most commonly cited equity derivatives securities. Way back in 1982, trading of futures based on S&P's composite index of 500 stocks began on the Chicago Mercantile Exchange (CME). Options on the S&P 500 futures began trading on the CME in the following year. Today, investors can buy futures based on benchmark stock indices in most international financial centres (Table 1). In 2010, the authorities approved trading of futures on the China Securities Index 300.

Table 1

International exchange with stock index futures or options

Americas	Asia Pacific	Europe, Africa, Middle East
BM&F BOVESPA	Australian Securities Exchange	Athens Derivatives Exchange
Chicago Board Options Exchange	Bombay Stock Exchange	Borsa Italiana
CME Group	Hong Kong Exchange	Budapest SE
ICE Futures US	Korea Exchange	Eurex
International Securities Exchange	National Stock Exchange India	Johannesburg SE
MexDer	Osaka Securities Exchange	MEFF
Montréal Exchange	Singapore Exchange	NASDAQ OMX Nordic
NASDAQ OMX PHLX	TAIFEX	NYSE Liffe (European)
NYSE Amex	Thailand Futures Exchange	Oslo Børs
	Tokyo Stock Exchange Group	Tel Aviv Stock Exchange
		Warsaw Stock Exchange
		Wiener Börse

Source: World Federation of Exchanges.

Index futures contract enable an investor to buy a stock index at a specified date for a certain price. It can be an extremely useful hedging tool. For example, an investor with a stock portfolio that broadly matches the composition of the Hang Seng index (HSI), he will suffer losses should the HSI record a fall in market value in the near future. Since he means to hold the portfolio as a long term strategy, he is unwilling to liquidate the portfolio. Under such circumstances, he can protect his portfolio by selling HSI index futures contracts so as to profit from any fall in price. Of course, if his expectations turned out to be wrong and the HSI rose instead, the loss on the hedge would have been compensated by the profit made on the portfolio.

Some investors prefer to purchase options on futures (or "futures options") instead of straight futures contracts. The option strike price is the specified futures price at which the future is traded if the option is exercised. For some market participants, the pricing of an option reveal valuable information about the likely future volatility of the returns of the underlying asset.[3] One commonly cited example is the Chicago Board Options Exchange Market Volatility Index (VIX index), which is calculated based on a range of options on the S&P 500 index. When investors are concerned about a potential drop in the US stock market, they buy the VIX index as an insurance against losses in the value of their portfolio. The more investors demand, the higher the price of the VIX. As such, the VIX can be viewed as an "investor fear gauge" (Whaley (2008)).

Other commonly traded equity derivatives are equity swaps. Under an equity swap contract, an investor pays the total return on a stock to his counterparty and receives in return a floating rate of interest. With this equity swap, the investor can hedge his equity position without giving up ownership of his share. At the same time, the party receiving equity return enjoys exposure without actually taking ownerships of shares.

4.2 Interest rate derivatives

One of the most popular interest rate derivatives is interest rate swap. In one form, it involves a bank agreeing to make payments to a counterparty based on a floating rate in exchange for receiving fixed interest rate payments. It provides an extremely useful tool for banks to manage interest rate risk. Given that banks' floating rate loans are usually tied closely to the market interest rates while their interest payments to depositors are adjusted less frequently, a decline in market interest rates would reduce their interest income but not their interest payments on deposits. By entering an interest rate swap contract and receiving fixed rate receipts from a counterparty, banks would be less exposed to the interest rate risk.

Meanwhile, interest rate futures contract allows a buyer to lock in a future investment rate. For example, the Chicago Board of Trade offers federal funds futures contracts ranging from the current month to 24 months out. A by-product of these futures is that they provide useful information on the market expectations of future monetary policy decisions in the United States (Carlson, Craig, Higgins and Melick (2006)).

4.3 Commodity derivatives

As mentioned in section 1, the earliest derivatives markets have been associated with commodities, driven by the problems about storage, delivery and seasonal patterns. But modern day commodity derivatives markets only began to develop rapidly in the 1970s. During that time, the breakup of the market dominance of a few large commodity producers allowed price movements to better reflect the market supply and demand conditions. The resulting price volatility in the spot markets gave rise to demand of commodity traders for derivatives trading to hedge the associated price risks. For example, forwards contracts on Brent and other grades of crude became popular in the 1970s following the emergence of the Organisation of Petroleum Exporting Countries. Deregulations of the energy sector in the United States since the 1980s also stimulated the trading of natural gas and electrical power futures on the New York Mercantile Exchange (NYMEX) in the 1990s.

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[3] However, empirical evidence for informed traders preferring to trade options instead of the underlying stocks is mixed. See Ansi and Ben Ouda (2009) for an up-to-date survey of the empirical literature.

4.4 Foreign exchange derivatives

The increasing financial and trade integration across countries have led to a strong rise in demand for protection against exchange rate movements over the past few decades. A very popular hedging tool is forward exchange contract. It is a binding obligation to buy or sell a certain amount of foreign currency at a pre-agreed rate of exchange on a certain future date. Consider a Korean shipbuilder who expects to receive a $1 million payment from a US cruise company for a boat in 12 months. Suppose the spot exchange rate is 1,200 won per dollar today. Should the won appreciate by 10 per cent against the dollar over the next year, the Korean shipbuilder will receive only 1,090 million of won (some 109 million of won less than he would have received today). But if the shipbuilder can hedge against the exchange risk by locking in buying dollars forwards at the rate of say 1,100 won per dollar.

For thinly trade currencies or currencies of those countries with restrictions on capital account transactions, the profit or loss resulting from the forwards transaction can be settled in an international currency. This is the so-called *non-deliverable forwards* contract, and very often they are traded offshore.

Another type of foreign exchange derivatives are cross-currency swaps. This involves two parties exchanging payments of principal (based on the spot rate at inception) and interest in different currencies. According to many market participants, having a liquid cross-currency swap market is an important for local currency bond market developments. This is because such instruments allow foreign borrowers in local bond markets to swap back their proceeds to their own currencies while hedging against the interest rate risk.

4.5 Credit derivatives

A credit derivative is a contract in which a party (the credit protection *seller*) promises a payment to another (the credit protection *buyer*) contingent upon the occurrence of a *credit event* with respect to a particular entity (the *reference entity*). A credit event in general refers to an incident that affects the cash flows of a financial instrument (the *reference obligation*). There is no precise definition, but in practice, it could be filing for bankruptcy, failing to pay, debt repudiation or moratorium.

The fastest growing type of credit derivatives over the past decade is credit default swap (CDS). In essence, it is an insurance policy that protects the buyer against the loss of principal on a bond in case of a default by the issuer. The buyer of CDS pays a periodic premium to the seller over the life of the contract. The premium reflects the buyer's assessment of the probability of default and the expected loss given default.[4] In the event of a credit incident, the buyer has a right to demand compensation from the seller.

In its simplest form, the CDS is written with respect to one single reference entity, the so-called single-name CDS. Some data providers compile indices of a basket of single-name CDSs of similar ratings (eg, the S&P US Investment Grade CDS Index consists of 100 equally weighted investment grade US corporate credits). These index tranches give investors the opportunity to take on exposures to specific segments of the CDS index default loss distribution (see Amato and Gyntelberg (2005)).

[4] Duffie and Singleton (2003) discusses the basic principles of pricing CDSs.

5. Derivatives markets

Derivatives are traded either on organised exchanges or in OTC markets. The differences between the exchange-traded and OTC derivatives are not confined to where they are traded but also how.

In exchange-traded markets, derivatives contracts are standardised with specific delivery or settlement terms. Negotiation between traders traditionally was conducted by shouting on the trading floor (open outcry). But electronic trading system has become increasingly popular in many major exchanges. Exchange-traded derivative trades are publicly reported and cleared in a clearing house. The clearing house will be obliged to honour the trade if the seller defaults. The solvency of the clearing house was protected by marking all positions to market daily through a system of margins.

By contrast, derivative trades in OTC markets are bilateral in nature. All contract terms such as delivery quality, quantity, location, date and prices are negotiable between the two parties. Transactions can be arranged by telephone or other communication means. Prices are not reported publicly.

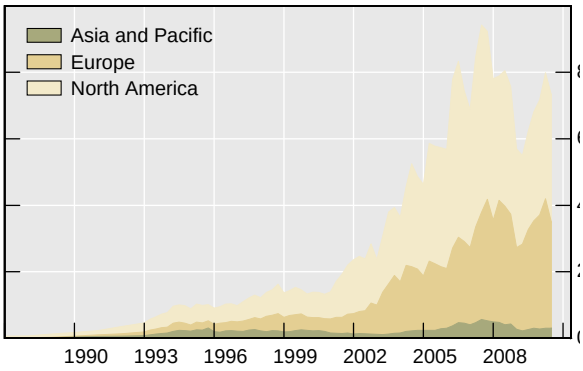
The different characteristics of the two types of markets mean that they complement each other in providing a trading platform to suit various business needs (see Nystedt (2004)). On the one hand, exchange traded derivative markets have better price transparency than OTC markets. Counterparty risks are also smaller in exchange-traded markets with all trades on exchanges being settled daily with the clearing house. On the other hand, the flexibility of OTC markets means that they suit better for trades that do not have high order flow and or with special requirements. In this context, OTC markets perform the role as an incubator for new financial products.

Graph 1

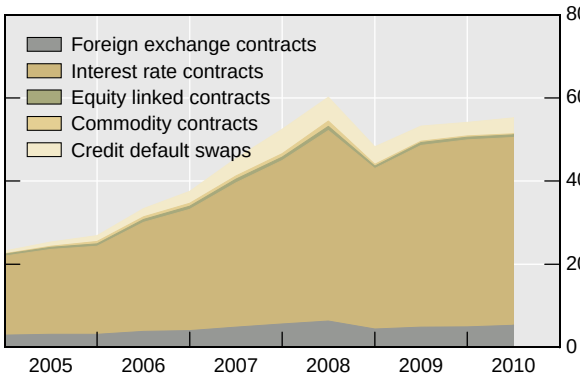
Growth of derivatives markets

Notional amounts outstanding, in trillions of US dollars

Exchange-traded derivative markets[1]



OTC derivative markets[2]



[1] In trillions of US dollars. [2] In billions

Source: BIS.

The size of both exchange-traded and OTC derivative markets have grown sharply since the 2000s. The trend was briefly interrupted by the global financial crisis. But the notional amounts outstanding in both markets have since returned to almost pre-crisis levels (Graph 1). Exchanges in North America and Europe remain dominant, accounting for 90% of total market share. Interest rate futures and options are by far the most popular instruments traded on organised exchanges. Total notional amounts outstanding of derivatives traded in

OTC markets are much larger than those on exchanges. Like on organised exchanges, interest rate contracts are also the most commonly traded instruments in OTC markets.

It should be noted that notional amount is only an imperfect measure of the size of derivative markets (see ISDA (2008)). Notional amount is the total principal of the underlying security around which the transaction is structured. It is easy to collect and understand. However, it does not represent the actual amount exchanged in derivatives transaction as the actual amount exchanged is uncertain at the initiation of many derivative contracts. Furthermore, in OTC markets, contracts are negotiated bilaterally and can only be closed before maturity by entering into another derivative contract that offset the payoff stream of the initial contract. This means that notional amount overstate the level of market activity.

6. Role of derivatives in recent credit events and regulatory issues

Financial derivatives have been associated with a number of high-profile credit events over the past two decades. In the early 1990s, Procter and Gamble Corporation lost over $100 million in transactions in equity swaps. On December 6 1994, Orange County declared bankruptcy after suffering losses of around $1.6 billion from a wrong-way bet on interest rates (the so-called “inverse floaters”) in one of its principal investment pools. In 1995, Barings collapsed when one of its traders lost $1.4 billion (more than twice its available capital) in trading equity index derivatives.

The amounts involved with derivatives-related corporate distress in the 2000s have increased substantially. Two such events were the bankruptcy of Enron Corporation in 2001 and the near collapse of AIG in 2008. One common feature of these events was that OTC derivative tradings were thought to have played some role.

Enron’s filing for bankruptcy in December 2001 took many commentators by surprise. At that time, the company was estimated to have a shareholder value of $70 billion. The core of Enron’s business was dealing in derivative contracts based on the prices of oil, gas, electricity and other variables in OTC markets. Enron’s derivatives transactions in these markets were largely unregulated with no reporting requirements. There was little information is available about the profitability of these derivatives activities. Some thought that speculative losses in derivatives, perhaps masked by “creative” accounting, was one of the main contributing factor to the collapse of the company.

In 2008, the US government introduced a $150 billion financial package to prevent AIG, once the world’s largest insurer by market value, from filing for bankruptcy. Being an AAA-rated company, AIG was being exempted from posting collateral on most of its derivatives trading at that time. In addition, AIG was unique among CDS market participants in that it acted almost exclusively as credit protection seller. As the global financial crisis reached its peak in late 2008, AIG’s CDS portfolios recorded substantial mark-to-market losses. Consequently, the company was asked to post $40 billion of collateral, partly contributed to the near collapse.

These credit events raised some important questions concerning the regulations of derivatives trading and financial stability.[5] The focus appears to centre on improvements in counterparty risk management and in favour of promoting exchange-traded derivative markets. Very often, the lack of knowledge of a counterparty’s financial health can lead to fears about its solvency and contagion risk. Under such an environment, OTC contracts are particularly exposed to risks of inadequate collateral and capitalisation. In this context,

[5] For a detailed exposition of a large number of regulatory issues related to OTC derivative markets, see Banque de France (2010).

central clearing of derivatives transactions and more robust collateralisation are important for mitigating counterparty risk in OTC markets. In addition, financial regulators are designing new rules to improve post-trade price transparency. There are also proposals in some jurisdictions to encourage the migration of trading in some actively OTC traded products to exchanges.

7. Conclusions

The chapter provides an overview of derivatives markets, products and participants. Derivatives are invented in response to some fundamental changes in the global financial system. They, if properly handled, should help improve the resilience of the system and bring economic benefits to the users. In this context, they are expected to grow further with financial globalisation. However, past credit events exposed many weaknesses in the organisation of derivatives trading. The aim is to minimise the risks associated with such trades while enjoying the benefits they bring to the financial system. An important challenge is to design new rules and regulations to mitigate the risks and to promote transparency by improving the quality and quantity of statistics on derivatives markets.

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Derivative market: the experience of Chile

Luis A Opazo R[1]

1. Introduction

The derivatives market has shown a significant development in recent years. According to ISDA, the industry has grown around 340% in the period 2002-2009. Chile is not the exception; the domestic market has also registered a significant growth, which has been focused mainly on currency derivatives. Indeed, the current composition of the derivatives market is explained in almost 74% for currency derivatives, 22% for interest rate derivatives, and only 4% for commodity derivatives[2]. For this reason, and considering the availability of information (see below), the analysis reported in this paper is based on FX derivatives.

According to Fernandez (2003), until early this decade the FX derivatives market in Chile was restricted because of two main reasons: the presence of portfolio management regulations to institutional investors – Pension Funds (PF) – and low market liquidity. Such constraints, however, have been relaxed through the time and also a floating exchange rate regime was implemented. Ahumada and Selaive (2007) point out that these elements, among others, have led to a higher level of activity at the FX derivatives market, which has tended to converge to levels consistent with its fundamentals in recent years.

The development of this market has significant benefits. In general terms, these benefits are associated as a step towards more complete markets and, therefore, agents can achieve a better risk diversification. Additionally, the dynamics of trade quantities and transaction prices in these markets provide useful information to the authorities to monitor the financial markets. In effect, both the monitoring and analysis of information on derivatives is a useful tool for financial stability purposes. Moreover, the significant restrictions on the availability type of information in other countries – given the predominance of OTC transactions – are not present in Chile. In fact, as described below, the Central Bank of Chile compiles updated and thorough information on currency derivatives contracts.

In this context, the goal of this document is to provide a description of foreign exchange derivatives market in Chile, to explain how the information on foreign exchange derivatives is collected, and to discuss the application of such information for financial stability analysis.

2. Characterization of foreign exchange derivatives market in Chile

Chilean market has expanded rapidly in recent years. Indeed, foreign exchange derivatives market has grown about four times in the last twelve years (Figure 1). As explained above, this growth would be associated both with the existence of a floating exchange rate regime and with the increasing demand for foreign exchange derivatives of Pension Funds (Figure 2). In this regards, it is worth mentioning that PF are restricted simultaneously to maximum foreign investment limits and to maximum non-hedged of their foreign investment,

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[1] Financial Policy Division, Central Bank of Chile.

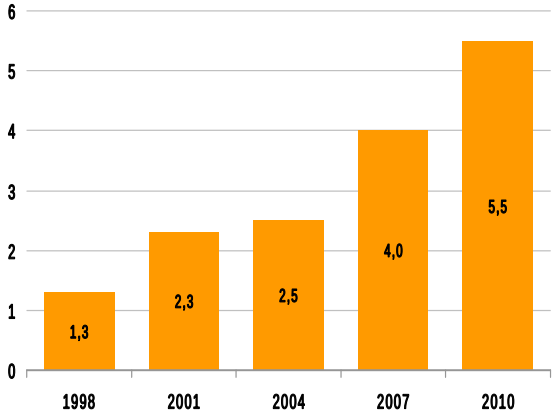
[2] Market share is based on turnover.

and additionally, until last year PF, were only allowed to conduct the hedging activity in the Chilean formal exchange market, mainly domestic banks[3].

Figure 1

FX Derivative Market Turnover

(Turnover/GDP)

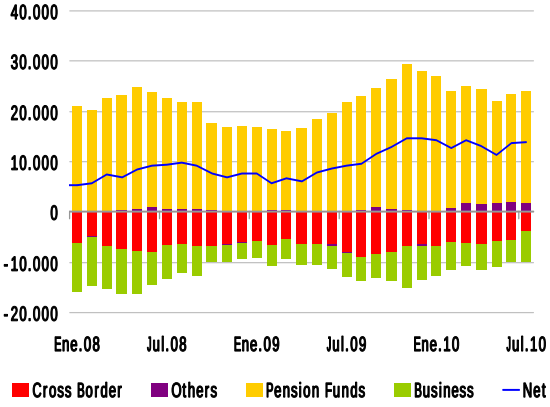


Source: Bank for International Settlements.

Figure 2

Forward Position at Domestic Banks

(millions of US$ dollars)



Source: Central Bank of Chile

Despite of the important role of PF in the development of the derivatives market, it has also been accompanied by increased corporate activity in this market. Specifically, the use of FX derivatives by firms has grown across the spectrum of firms – small, medium and large. In 2009, approximately 50% of large firms used these instruments − a larger percentage compared with the figure of ten years before (lower than 20%) – while in the smallest firms, the utilization rate increased by about 10 percentage points during the same period (Figure 3).

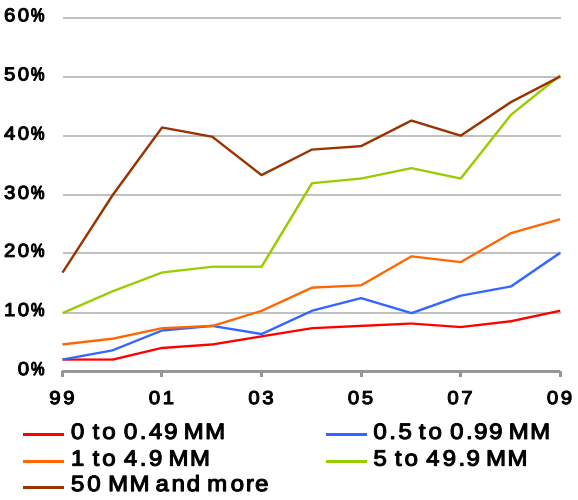
Based on Selaive and Ahumada (2007), this fast growth would be linked to the convergence of hedging activity to its equilibrium values. The authors estimate that the predicted turnover in 1998 was approximately 50% higher than the level consistent with factors such as exchange rate volatility and trade integration, among others. However, this difference was substantially reduced to levels of around 20% during the period 2001-2004 (Figure 4).

[3] Based on BIS (2007), IMF estimates show that the share of foreign dealers in the currency trading activity for 2007 was low respect to international levels. For instance, the average share in advanced and emerging economies was 56.6 and 42.4%, respectively, whereas in Chile this share was only 22.8%.

Figure 3

Use of Derivatives by Size of Exports

(percentage of companies)

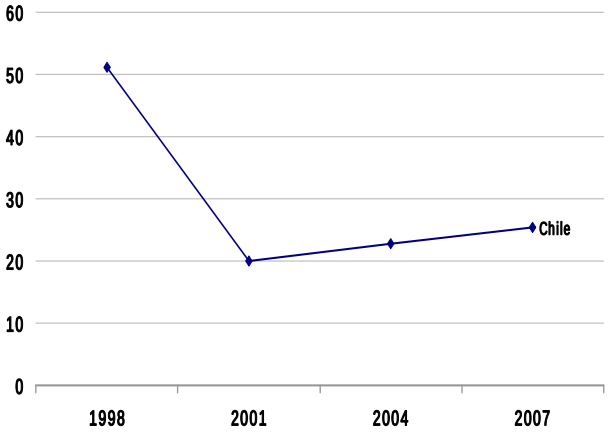


Source: Central Bank of Chile.

Figure 4

Predicted Turnover – Observed Turnover

(percentage)



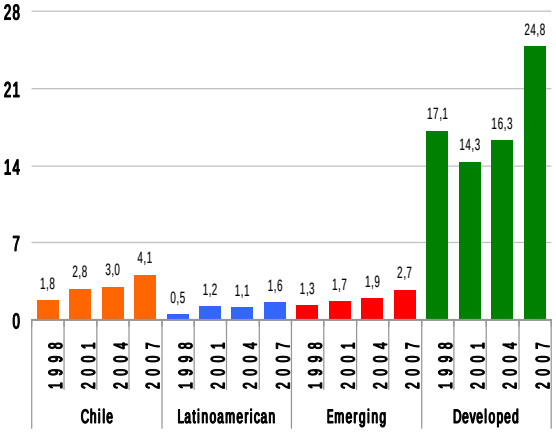
Source: Own calculations based on Ahumada and Selaive (2007).

Moreover, this growth has allowed the Chilean market size to be considered relatively high compared to other emerging economies. In 2007, the Chilean market turnover was 4.1 times the GDP, whereas the average figures for Latin America and emerging economies were 1.6 and 2.7, respectively (Figure 5). Nonetheless, the domestic derivatives market is still smaller than other developed economies. If spot transactions are considered, the relative size of the Chilean market is bigger, but the previous comparisons remain (Figure 6).

Figure 5

Turnover in the derivatives market

(times GDP)

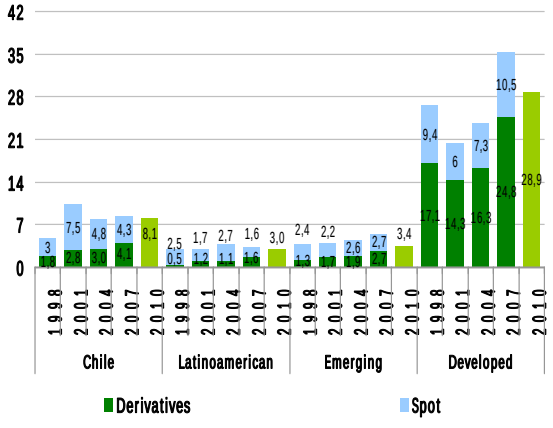


Source: Rodriguez and Villena (2009).

Figure 6

Turnover in the derivatives and spot market

(times GDP)



Note: 2010 data includes spot and derivatives.

Source: Rodriguez and Villena (2009) and BIS (2010).

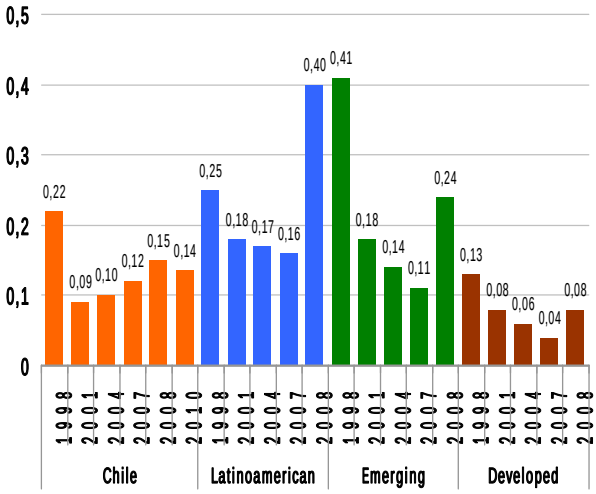
Finally, another interesting comparison is related to the spread of foreign exchange derivatives transactions, this is the difference between bid and ask prices. The spread is a measure that includes transaction costs; liquidity costs and the costs of maintain open

positions. Based on this metric, the Chilean market also compares favorably with the average of emerging economies. In fact, using the spread of forward transactions to 30 days, the indicator for Chile is lesser than the average for Latin American and emerging economies (Figure 7).

Figure 7

Average Spread Forward 30 days

(Percentage)



Note: difference between bid and ask divided by the average between these prices.

Source: Bloomberg.

3. Data collecting process[4]

The Central Bank collects virtually all FX derivatives transactions in Chile. This is possible because the Basic Constitutional Act of the Central Bank permits to request statistical data from agents that participate in the spot and FX derivates market. Concretely, the Central Bank request information from all transactions conducted through the formal market – it mainly includes domestic banks and other financial institutions – and also those transactions of residents with a non-resident counterparty. Transactions reported through these procedures represent approximately 96% of total FX derivatives transactions in Chile[5]. Therefore, the information collected covers roughly the total market transactions.

Figure 8 exhibits a diagram showing all potential market transactions and identifying those reported to the Central Bank. The solid lines represent the reported transactions, while the dotted lines reflect those operations that are not informed. Among the latter, it is possible to distinguish direct transactions between non-financial firms without a formal market intermediary – for example, transactions between an exporter and an importer –, transactions between participants in the informal market – for example, the sale between securities brokers non-registered in the formal market –, transactions between nonresidents

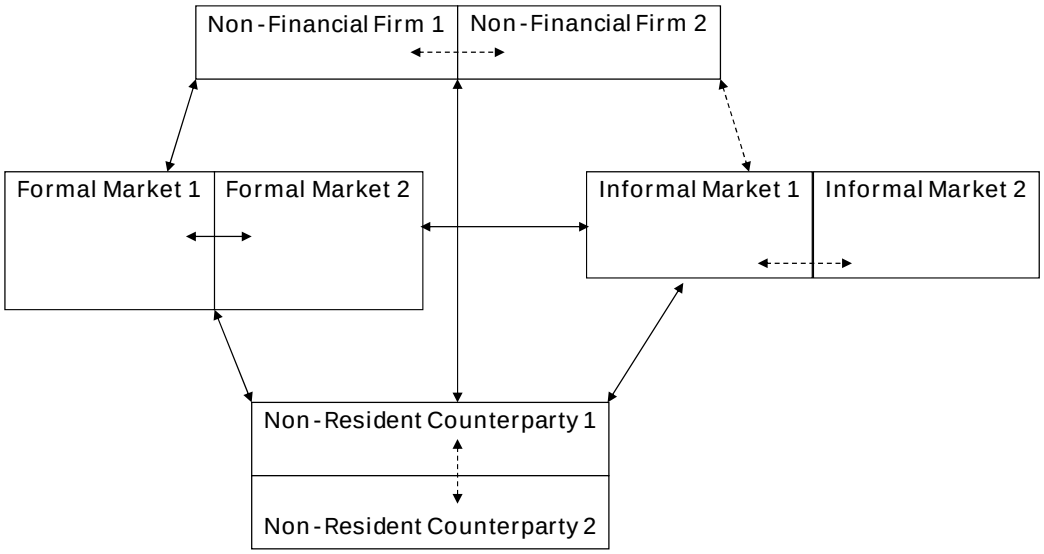
[4] This section is mainly based on Orellana and Rodriguez (2008).

[5] Figure based on the annual survey conducted by the Division of Statistics, Central Bank of Chile.

and, finally, transactions between non-financial firms and financial intermediaries who are not registered in the formal market.

Figure 8

FX Transactions and Data Collected by the Central Bank



- - - - = non-reported data to the Central Bank

___ = reported data to the Central Bank

Source: Alarcón et al (2004)

The information required for each transaction covers virtually every single detail of FX derivative contracts. This information includes the transaction date, the forward rate, the transaction amount, the buyer and seller identification, and the settlement currency, among others. This information is contained in the terms of the contract, and therefore it is easy to report. In this sense, the practice suggests that ask for information which is not included in the contracts is not effective. For instance, some years ago, the Central Bank requested information related to the economic sector of the buyer and seller – which is not included in standard contracts – and, therefore, it had to be filled out specifically for reporting purposes to the Bank; however, subsequent validations suggested that this information was not properly reported.

The number of reporting agents is relatively limited. In the case of the formal market transactions, there are 29 reporting institutions which are composed of 22 banks and 7 securities brokers. They must report daily all contracts of the previous day at 11:00 AM[6]. The current daily volume of reported contracts is around 500 operations – for instance, transactions reported on 16th January were 440. On the other hand, transactions of residents with non-residents should be reported by the resident agent not later than the 10th of the following month. On February, 6 resident agents reported transactions, adding up to 1,162 transactions in January, 2011.

Although the number of reporting agents is relatively limited, it has systematically grown. In fact, as mentioned above, the number of non-financial companies using FX derivatives has grown steadily over time, from 353 to 2,239 in the period 1998-2009. While other categories

6 Information is reported to the Central Bank in an Internet based platform.

of agents have increased to a lesser extent; in particular, the number of banks being counterparty of FX derivatives contracts has remained constant (Table 1).

Finally, it should be noted that the availability of information on foreign exchange derivatives is highly abundant respect to other derivatives. In particular, information on interest rate derivatives reported to the Central Bank is quite limited and corresponds to the price of interest rate swaps obtained through a daily survey to two traders[7]. Currently, the Central Bank is working with the Superintendence of Banks and Financial Institutions in order to collect more information on this subject.

Table 1

Number of Counterparties in FX Derivatives Contracts

Year	Local				Cross-Border
	Institutional Sector *	Financial Sector excluding banks	Non Financial Sector	Banks	
1998	14	40	353	22	24
1999	16	39	323	25	23
2000	21	38	402	24	28
2001	34	41	704	25	30
2002	33	42	809	24	26
2003	35	42	995	24	34
2004	36	42	1.356	24	36
2005	43	48	1.709	24	39
2006	46	49	1.811	24	40
2007	43	53	2.150	23	40
2008	44	44	2.924	23	43
2009	37	37	2.239	22	41

Note: * = includes PF´s, mutual funds and insurance companies.

Source: Central Bank of Chile.

4. An Application: On-Shore Rate

The on-shore rate is defined as the implicit cost in dollars derived from the Covered Interest Parity, which is made using the bid-ask information of the derivatives[8]. Under perfect arbitrage conditions, this rate can not be greater than the cost of borrowing at the international markets – i.e., Libor + risk premium + taxes + others –, and it can not be lower than the return from investing abroad – i.e., Libor – transaction costs[9]. These limits form a so-called non-arbitrage area. If the on-shore rate exceeds or falls below the upper and lower limits of the band, this would be an indication of potential sources of tension in the foreign currency money market – i.e., the arbitrage of the interest rate is not possible to achieve. Figure 8 shows the evolution of the on-shore rate and the arbitrage band.

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[7] These traders represent a significant share of the interest rate derivatives market in Chile. The reported information contains the average bid-ask spread of transactions on the previous day. This report is made at mid- and closing-day (12:00 and 14:30 hrs, respectively).

[8] Additionally, the on-shore rate calculation requires information on the domestic interest rate and the foreign exchange spot rate.

[9] For further details see Opazo and Ulloa (2009).

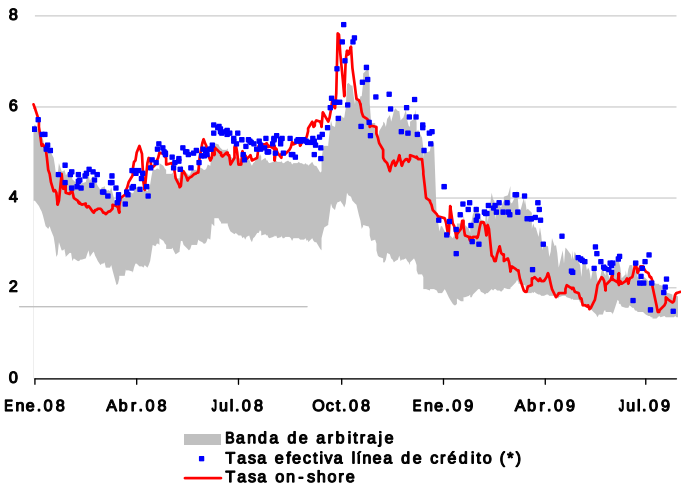
This indicator was monitored by the Central Bank on a daily basis during the onset of the subprime crisis. As shown in Figure 8, the on-shore rate increased significantly in early October-2008[10]. This indicator, along with other information, led to a series of measures in order to mitigate the effects that global money market turmoil could cause in Chile. In 29 September 2008, the international reserve accumulation program, initiated earlier this year, was canceled. The Central Bank implemented a 28-days dollar swap program for a period of one month for a total amount of U.S. $ 2,000 million. Subsequently, on 10 October the Bank extended the program to six months and the swaps to 60 and 90 days. Lastly, on December 2009, the swaps were further extended to 180 days.

As shown in Figure 9, after the measures were implemented by the Central Bank, the on-shore rate began to fall to levels consistent with the absence of restrictions on the arbitrage. In other words, the on-shore rate achieved levels consistent with the absence of liquidity constraints. In this sense, the on-shore spread was a useful monitoring tool in two aspects: to assess tensions in the market – ie, sudden increase at the beginning of October – and to evaluate the result on the measures before described. In any case, it is necessary to emphasize that the monitoring by the Central Bank considers a larger set of instruments and mechanisms, and the role of the on-shore rate is specially highlighted given the goal of this paper.

Figure 9

Dollar Funding Rate: Actual and Theoretical (1)

(percentage)



(1) One year maturity

(2) Dots indicate actual rates of banks using external funding credit lines.

Source: Central Bank of Chile.

5. Conclusions

The Central Bank has abundant information on FX derivatives market. The information covers virtually all aspects involved in FX derivative contracts and is collected with a

[10] At that time, the 90-days on-shore rate reached a historic maximum of 9.56%.

minimum lag of time. Therefore, and considering the depth that the market has reached, this information is a useful tool for monitoring the evolution of the money markets.

In practice, the information on FX derivatives contracts has allowed to include the on-shore rate as part of the set of indicators whose performance is evaluated regularly. The on-shore rate analysis played an important role in the evaluation and formulation of measures to mitigate the effects of subprime crisis on the domestic market. This is just one of the possible dimensions that can be analyzed with the information on FX derivatives. As an example, the analysis of purchases and sales of FX derivatives by some specific agents may help to get information about the expected trend in the foreign exchange rate.

Finally, it is important to note that the information contained in the derivatives must be evaluated with caution and complementarily with other data. Although the literature argues that derivatives contain better information than other financial instruments, it has raised that the valuation of these instruments is not perfect, specially in times of financial turbulences, aspect that emerges with particular force in the context of the subprime crisis – for example, the CDS tend to be traded more actively than the underlying bonds in times of crisis.

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Development and utilisation of financial derivatives in China

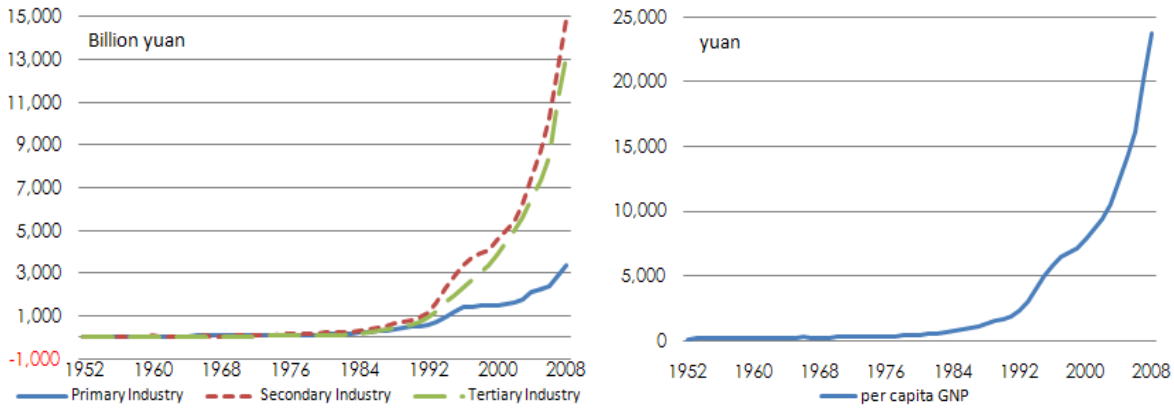
Jinan Yan[1]

1. Development of the financial derivatives market in China

China has made tremendous strides after three decades of reforms and a progressive opening of its markets. By mid-2010, the country's GDP reached CNY 17 trillion, more than USD 2.5 trillion, and its high economic growth rate has made a significant contribution to the global economy. GDP per capita, however, is still low.

GDP and GDP per capita

1952–2009, CNY billions



Source: National Bureau of Statistics of China.

Finance is the core of a modern economy. China's financial system has made great progress, in line with rapid economic growth, and has converged on international best practice. As an important part of the modern financial system, financial derivatives have been the focus of much attention in China. A number of RMB derivative types are in use, and the RMB derivatives market has already reached a mature stage in China.

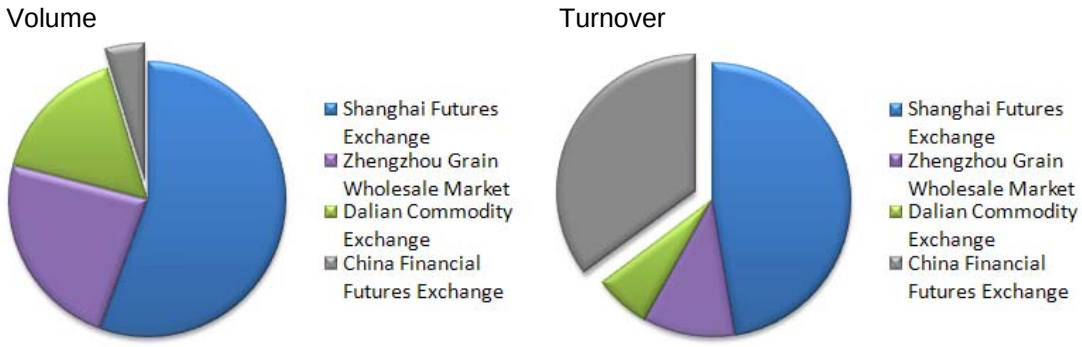
1.1 Commodity-based financial derivatives

Commodity futures are the oldest form of derivative. The first commodities futures market in China, the China Zhengzhou Grain Wholesale Market, opened on 12 October 1990. Subsequently, the Shanghai Futures Exchange and Dalian Commodity Exchange have also started operations.

[1] Deputy Director-General, Management Information Center, Bank of China

Futures market transactions in China

June 2010; CNY billions



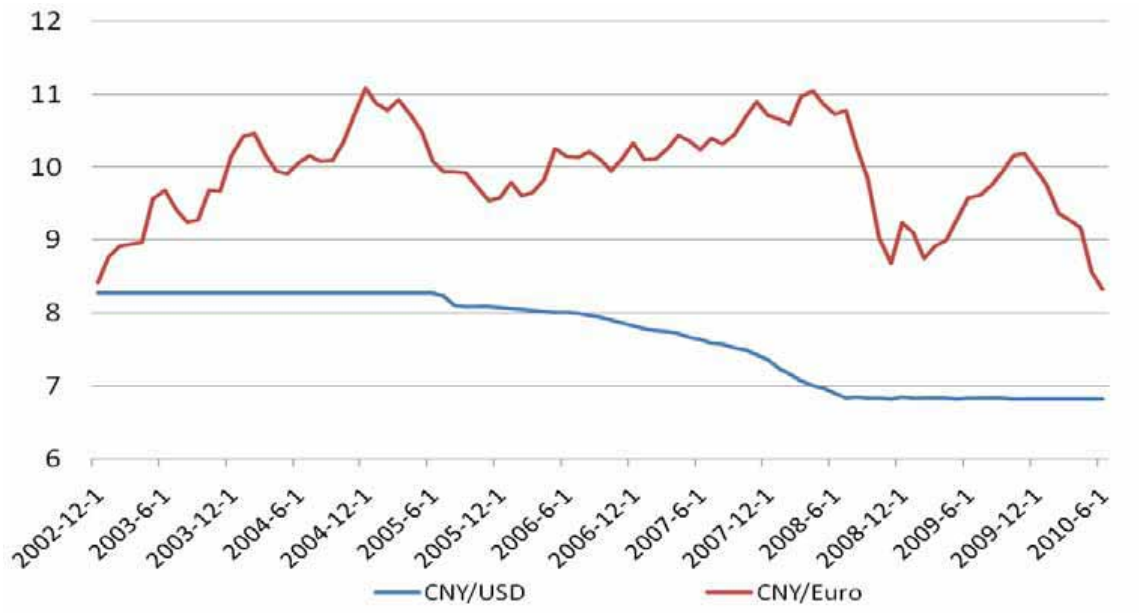
Source: China Futures Association.

1.2 Exchange rate derivatives

Because of China's growing contribution to the global economy, the RMB exchange rate has attracted an increasing amount of attention worldwide. Meanwhile, demand for derivatives, especially those related to risk management, has increased steadily from financial institutions and even from non-financial companies and individual investors.

RMB exchange rate vis-à-vis US dollar and euro

December 2002–June 2010; CNY/USD, CNY/EUR



Source: State Administration of Foreign Exchange of China.

(a) RMB forwards

In 1994, the China Foreign Exchange Trade System introduced a spot foreign exchange trading system for financial institutions. Preparatory studies for RMB forward transactions started one year later and, in January 1997, the People's Bank of China (PBC) formally established its "Interim Management Rules for RMB Forward Exchange Settlement and Sales" as a framework for the development of this business. In April 1997, the Bank of China

started up its RMB forward exchange settlement and sales business, as the first bank authorised to do so, marking an important milestone in the development of the Chinese derivatives market.

(b) RMB foreign exchange swaps

RMB exchange swap transactions were introduced in April 2006. The National Import and Export Bank of China and the Bank of China were the first to execute a deal in the nascent Chinese interbank foreign exchange market.

(c) RMB futures

In August 2006, the Chicago Mercantile Exchange (CME) launched futures and option contracts on the CNY against the US dollar, euro and Japanese yen. This brought into being the first RMB derivative market outside China.

CNY-USD futures contract

January 2010–September 2010, USD/CNY

Sources: CME for futures contracts data; SAFE for middle price data.

(d) RMB non-deliverable forwards and options

The two most commonly used OTC and off-shore exchange rate derivatives are non-deliverable forwards (NDF) and options (NDO).

1.3 Interest rate derivatives

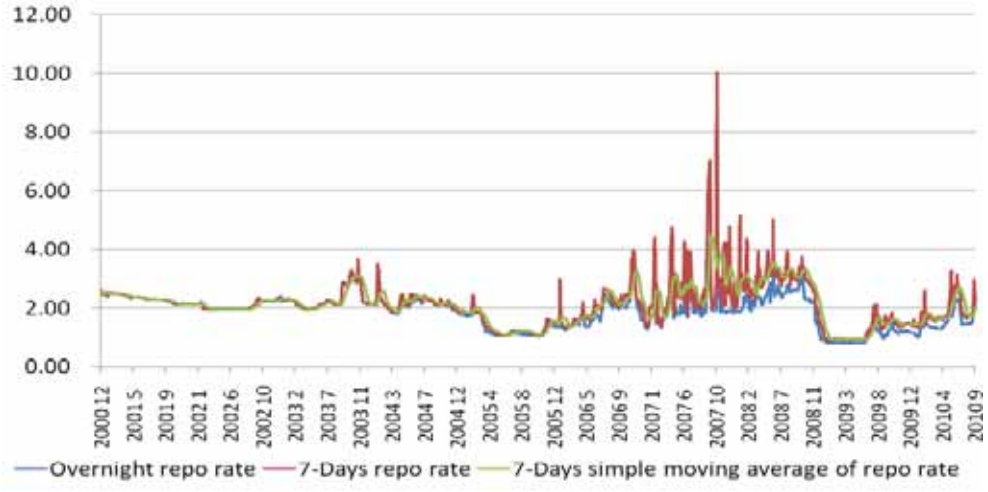
RMB interest rate derivatives can help financial institutions to smooth out fluctuations in these key economic indicators.

(a) RMB bond futures

A pilot scheme for government bond futures was introduced in December 1992 but was later suspended. Futures trading was restarted in June 2005 in the interbank lending market.

Interbank repo rate in China

2001–10, %



Source: China Foreign Exchange Trading System.

(b) RMB interest rate swaps

In February 2006, the PBC announced a pilot scheme for RMB interest rate swap transactions, which greatly promoted the development of this instrument in China.

(c) RMB exchange rate swaps

In August 2007, the PBC announced guidelines for foreign exchange swaps, which opened the way for the Chinese yuan to be swapped against the US dollar, the euro, the Japanese yen, the Hong Kong dollar and sterling in the Chinese interbank foreign exchange market. Such exchange rate swaps are widely used in the interbank market.

(d) RMB forward rate agreements

In October 2007, the PBC further authorised SHIBOR-based RMB forward rate agreements.

1.4 Equity derivatives

In February 2010, the China Securities Regulatory Commission officially approved the HuShen300 stock index futures contracts and business rules on the China Financial Futures Exchange, and HuShen300 stock index futures contracts were first traded on 16 April.

Closing price and difference of the stock index and stock index future

16 April 2010–3 September 2010

Source: China Foreign Exchange Trading System.

2. Utilisation of financial derivatives by China's commercial banks

China's banking sector has made great progress in line with the vigorous development of the financial markets and the economy.

- China's commercial banks have generally adopted modern capital structures. Some 16 institutions have completed IPOs.
- As of June 2010, the total assets of banking institutions in China stood at CNY 87 trillion, an 18.3% increase over the previous year.
- As of July 2010, deposits at national financial institutions amounted to CNY 69 trillion CNY, and loans to CNY 48 trillion.

Financial derivatives: share of Chinese bank balance sheets

June 2010; %

Source: People's Bank of China.

I believe that we can make two observations about the use of financial derivatives in China's commercial banks:

1. They are widely used:

(a) Financial derivatives are widely used in the day-to-day operations of large banks.

(b) A broad range of financial derivatives is available.

(c) Financial derivatives are used for several purposes:

i. Not only for arbitrage.

ii. More banks are hedging risk exposures:

- eg by managing the term of exposure to a specific bond; or
- by adjusting the terms and currency of the balance sheet structure.

iii. In addition to own-account use, China's commercial banks are also providing widely used financial derivatives as financial products to meet the various needs of their customers.

2. But represent a small share of the overall business:

Financial derivatives transactions in China's commercial banks still represent only a small proportion of the overall business.

(a) First, consider the total volume of global financial derivatives transactions.

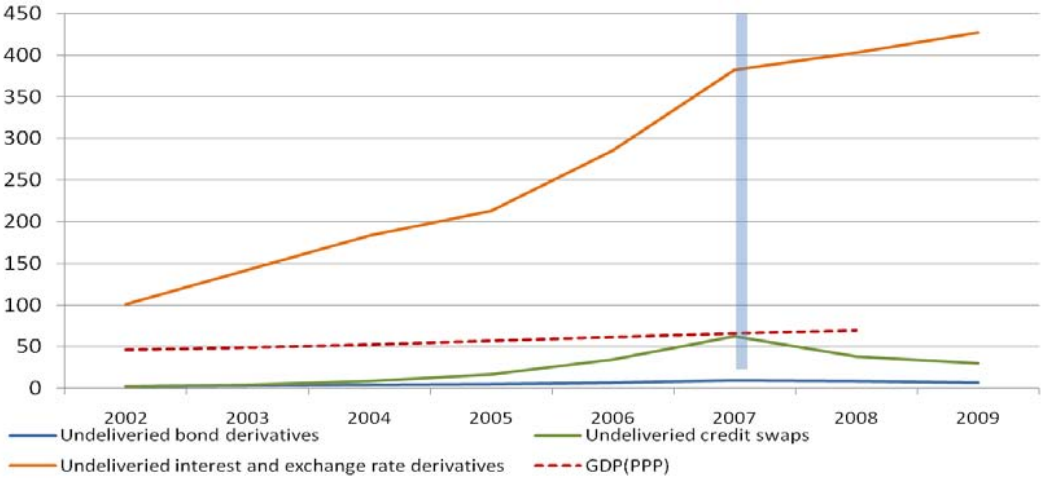
i. According to ISDA statistics for OTC derivatives transactions, traditional interest rate and exchange rate derivative products have shown the most rapid growth, with the global total face value of the transactions increasing to USD 427 trillion in 2009 from USD 865.6 billion in 1987, representing an almost fiftyfold expansion over 22 years.

ii. By the end of 2009, the volume of CDS had increased to USD 30 trillion, up from USD 918.9 billion eight years earlier, representing a thirty-threefold expansion.

iii. The development of emerging equity derivatives trading is relatively slow, expanding less than threefold over seven years, from USD 2.5 trillion at end-2002 to USD 6.8 trillion in 2009.

Global derivatives market compared with GDP

2002–09; trillions of US dollars



Source: Derivatives data from ISDA Operations Survey 2010; GDP data from China Economic Net.

(b) Let us look at the total volume of financial derivatives transactions in China's banking sector.

i. Notional amount:

- Interest and exchange rate derivatives posted a volume of almost CNY 6.8 trillion in 2008 and 2009, and increased significantly this year. By the end of June, the total of interest rates and exchange rates derivatives had reached CNY 9.7 trillion.
- The USD 1.42 trillion derivatives market in China accounts for only 0.33% of the global market, which is worth about USD 427 trillion. Compared with China's share of global GDP, China's banking sector is obviously very cautious in its use of derivatives, and there is still much work to do.

ii. Fair value:

Because of the financial crisis, by June 2008, the net value of derivatives was CNY 104.7 billion, which fell by half by the end of 2008, and dropped to zero by the end of 2009.

3. The use of financial derivatives by the Bank of China

The Bank of China (BOC) was founded in 1912, almost a century ago. In 2006, BOC successfully listed on the Hong Kong Stock Exchange and the Shanghai Stock Exchange, as the first Chinese commercial bank to complete an IPO both in mainland China and in Hong Kong. By the end of June 2010, the Bank's total assets and equity attributable to shareholders amounted to CNY 9.7 trillion and CNY 567 billion, representing an increase of

11% and 4% from the prior year-end respectively. The Bank achieved a profit after tax of CNY 54.4 billion, an increase of 26%. Return on average total assets (ROA) and return on average equity (ROE) were 1.18% and 19.79% respectively, an increase of 0.04 and 2.40 percentage points. As an international bank, BOC has pioneered the use of derivatives in China's banking sector. According to BOC's 2010 interim report, the notional amount of its derivatives exposure is as follows:

- As of end-June, the total is CNY 2.68 trillion, about one fourth of the total for all financial institutions in China.
- The derivatives are mainly exchange rate-based, with interest rate derivatives as the runner-up.

Bank of China has a comprehensive and rigorous risk management policy that complies with the New Basel Capital Accord and the "Guidelines on the Risk Management of Commercial Banks" issued by the China Banking Regulatory Commission.

Specifically, for the trading account:

- BOC monitors overall risk exposures and limits, as well as carrying out stress testing and t trade tracking daily.
- Uses VaR (value-at-risk) to estimate the maximum potential loss in a specific holding period on a group-wide basis.
- Backtests on a daily basis with a view to improving the accuracy and reliability of its models.
- Stress testing is used to supplement the VaR based on scenarios that subject the group's trading profile to extreme market conditions.

Derivative financial instruments

CNY millions

	As at 30 June 2010			As at 31 December 2009		
	Contractual/ notional amount	Fair value		Contractual/ notional amount	Fair value	
		Assets	Liabilities		Assets	Liabilities
Exchange rate derivatives						
Currency forwards and swaps, and cross-currency interest rate swaps (1)	2,094,011	25,501	(17,361)	1,629,325	20,810	(12,353)
Currency options	7,011	60	(20)	4,331	16	(14)
Subtotal	2,101,022	25,561	(17,381)	1,633,656	20,826	(12,367)
Interest rate derivatives						
Interest rate swaps	531,339	7,919	(10,859)	459,885	6,213	(9,404)
Interest rate options	2,532	–	(105)	839	–	(4)
Interest rate futures	8,253	9	(7)	1,958	6	(3)
Subtotal	542,124	7,928	(10,971)	462,682	6,219	(9,411)
Equity derivatives	8,151	165	(137)	4,548	102	(106)
Commodity derivatives	31,609	1,656	(1,434)	20,611	1,224	(915)
Credit derivatives	543	3	–	3,482	143	(424)
Total	2,683,449	35,313	(29,923)	2,124,979	28,514	(23,223)

Trading book VaR by risk category

USD millions

	For the six month period ended 30 June					
	2010			2009		
	Average	High	Low	Average	High	Low
Bank trading VaR						
Interest rate risk	5,00	9,88	2,19	5,18	9,22	1,59
Foreign exchange risk	1,09	2,78	0,23	0,81	5,27	0,20
Volatility risk	0,12	0,61	0,01	0,45	2,82	0,03
Total Bank trading VaR	4,74	10,29	1,87	5,28	9,51	1,68

Source: Bank of China 2010 interim report.

4. Some views on financial derivatives

Generally speaking, criticism about derivatives in the financial crisis has focused on the following aspects:

1. Derivative transactions are too far divorced from the real economy, and the transaction chain is too long and complicated.
2. Highly leveraged, which has resulted in the explosive expansion of trading.
3. Fair value accounting has also attracted criticism, to the effect that FVA fuelled the crisis.

(a) Difficulties in measurement:

i. Measurement of “fair value” depends on market quotations, ie the “mark to market”. However, in the financial crisis and other exceptional circumstances, this may give a misleading view of the intrinsic value of financial assets.

ii. Lack of active market prices: when no actual market value can be referenced, the measurement of fair value is forced to rely on “mark to model”.

- However, the more complex the mathematical model, the more severely the valuation depends on parameters, and estimates of such parameters are always very subjective.
- In addition, mathematical models are always based on a hypothesis that simplifies reality. Ultimately, the hypothesis undermines the validity of the model. The efficient market hypothesis and the investor rationality hypothesis are just two examples.

(b) Procyclicality

During boom times, FVA reinforces the effects of greed to create asset bubbles, adding fuel to an already overheated economy. In a recession, FVA accentuates the downturn in the economy, creating a black hole for assets and fomenting investor panic.

In response, the International Accounting Standards Board has issued IFRS 9 to replace IAS 39, with the aim of improving the classification and measurement of financial instruments. Looking ahead, I think that problems remain to be solved and further development is required.

In conclusion, my thoughts about financial derivatives are as follows:

1. Derivatives are inevitable, and will certainly see much greater development in the future.

2. As fear is bred by the unknown and risks from uncertainty, financial practitioners, especially regulators, should adapt their strategy to the challenges outlined above.

   (a) On the one hand, the speed of innovation in exotic derivatives must be restricted to a safe pace. More attention needs to be paid to product pricing, risk measurement, disclosure, and the way products are used. On the other hand, the design and use of financial derivative products needs to relate closely to the real economy, so that derivatives transactions don't become an end in themselves.

   b) Stronger disclosure is important, so that investors are fully informed about the transactions they enter into.

3. Financial derivatives have been widely used in China in line with the reforms and economic growth of recent years, but much work remains to be done in the areas of how derivatives are actually used and the related institution building. If the financial crisis has exposed the development of financial derivatives in western financial markets as somewhat too rapid, the situation in China is quite different.

Session 2

Review of existing international frameworks with respect to derivatives data

Papers:

The treatment of financial derivatives in *BPM6*
Eduardo Valdivia-Velarde, International Monetary Fund

The BIS framework for monitoring financial derivatives
Karsten Von Kleist, Bank for International Settlements

Cross-border derivatives statistics in France: the use of accounting data
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The treatment of financial derivatives in *BPM6*

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The Treatment of Financial Derivatives in *BPM6*

The main objective of this paper is to present the international standards for the statistical treatment of financial derivatives, based on the sixth edition of the *Balance of Payments and International Investment Position Manual (BPM6). BPM6* provides clear and detailed guidance for the presentation of financial derivatives in the international accounts.

I. Introduction

1. In the last 25 years, financial derivatives have become increasingly important in world finance. Financial derivatives are now traded actively on many exchanges throughout the world. Financial derivatives are also regularly traded outside exchanges by financial institutions, fund managers, and corporate treasurers in the over-the-counter (OTC) market.[2] Financial derivatives are also sometimes added to new issues of debt and equity securities, and may be embedded in these securities.

2. The significant increase in the volume and importance of financial derivatives in many economies since the mid-1990s led to the need to update the international statistical standards in order to present these financial instruments appropriately in the international accounts. The fifth edition of the *Balance of Payments Manual* (*BPM5*), published in 1993, provided standards for the statistical treatment of exchange traded financial derivatives, including them in portfolio investment or in reserve assets. The *Supplement to BPM5*, published in 2000, identified financial derivatives as a financial instrument in its own right, separately recorded from portfolio investment.

3. The sixth edition of the *Balance of Payments and International Investment Position Manual* (*BPM6*), published in December 2009 is the current international statistical standard for external sector statistics (http://www.imf.org/external/pubs/ft/bop/2007/bopman6.htm). *BPM6* provides a separate functional category "Financial Derivatives (other than Reserves) and Employee Stock Options (ESOs)", with complete coverage of financial derivatives other than reserves. *BPM6* also provides clear and more detailed guidance for the presentation of financial derivatives in the international accounts.

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The views expressed herein are those of the author and should not be attributed to the IMF, its Executive Board, or its management.

[2] A derivatives exchange is a market where individuals trade standardized contracts that have been defined by the exchange. The OTC market is an important alternative to exchanges, and measured in terms of the total volume of trading, has become much larger than the exchange-traded market.

II. Definition and main features

Definition

4. A financial derivative contract is a financial instrument that is linked to another specific financial instrument or indicator or commodity and through which specific financial risks (such as interest rate risk, foreign exchange risk, equity and commodity price risks, credit risk, and so on) can be traded in their own right in financial markets (*BPM6*, paragraph. 5.80).[3] The value of a financial derivative contract derives from the price of the underlying instrument, but transactions and positions in financial derivatives are treated separately from the values of the underlying instruments to which they are linked.

5. Financial derivatives contracts are used for risk management, hedging, speculation, and arbitrage. Hedgers use financial derivatives to reduce the risk associated with the potential future price of an asset. Speculators use them to bet on the future movements in the price of an asset. Arbitrageurs take offsetting positions in two or more instruments to lock-in a profit due to a discrepancy between prices in two different markets.

6. Financial derivatives are not debt instruments. In general, no principal amount is advanced that is required to be repaid, and no investment income accrues on any financial derivative instrument. Nevertheless, an overdue obligation on a financial derivative contract is classified as an account receivable/payable (as the claim becomes a debt instrument).

Risk Transfer

7. Financial derivatives enable parties to trade specific financial risks (such as interest risk, currency, equity and commodity price, and credit risk) to other entities more willing or better suited, to take or manage these risks. The risk embodied in a financial derivative contract can be traded either by trading the contract itself or by creating a new ("reverse") contract offsetting the risks of the existing contract. Offsetability means that it is often possible to eliminate the risk associated with a financial derivative by creating a new but reverse contract having characteristics that countervail the risk underlying the first derivative.

Valuation

8. The value of a financial derivative contract derives from the price of an underlying item (reference price). Because the future reference price is not known with certainty, the value of a financial derivative at maturity can only be estimated/anticipated. The reference price may relate to a commodity, financial instrument, interest rate, exchange rate, another derivative, an index, basket of prices, spread between two prices, etc. To calculate the value of a financial derivative, it is important that a prevailing market price for the underlying item be observable or estimated. Exchange traded derivatives have an observable price. The value of OTC derivatives is often established in markets with the use of models.

9. *BPM6* recommends that financial derivatives be valued at market prices in the balance of payments and International Investment Position (IIP) accounts. If market price data are unavailable, other fair value methods (such as option models or present values) may be used to value them (*BPM6*, paragraph 7.33).

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[3] The same definition is included in the System of National Accounts 2008 (2008 SNA), paragraph 11.111. The 2008 SNA is available at http://unstats.un.org/unsd/nationalaccount/sna2008.asp.

Settlement

10. Typically, but not always, a financial derivative instrument allows counterparties to change their risk exposure without trading in a primary asset or commodity. Consequently, financial derivatives contracts are usually settled by net payments of cash, often before maturity, rather than by the delivery of the underlying item.

Aggregation and Netting

11. In some cases, a clear distinction between assets and liabilities may not be feasible, such as for financial derivatives in the form of forward contacts, which could change between assets and liabilities. In such cases, it may not be possible to apply the net recording principle, which requires separate presentation of transactions in assets and transactions in liabilities. For such financial derivatives, net transactions in assets and liabilities combined may have to be recorded in the balance of payments accounts.

III. Types of financial derivatives

12. There are two main types of financial derivative contracts – forward-type contracts and options. Both types of contracts are mainly related to market risk resulting from changes in market prices of securities, commodities, interest, and exchange rates.

Forward-Type Contracts

13. A forward-type contract is an unconditional contract by which two parties agree to exchange a specified quantity of an underlying item (real or financial) at an agreed price (strike price) on a specified date (*BPM6*, paragraph 5.88).[4] Forward-type contracts include futures and swaps.[5] The organized exchange facilitates trading by determining the standardized terms and conditions of the contract and requiring a margin to be deposited to mitigate against risk.

14. At the inception of a forward-type contract, risk exposures of equal market value are exchanged, so the contract typically has zero value at that time, and no transactions are recorded. As the price of the underlying item changes, the market value of the derivative will change. Therefore, the classification of a forward-type contract may change between asset and liability positions. Many forward-type contracts involve net cash settlement payments, based on the difference between the agreed contract price and the prevailing market price of the spread between two reference prices, times quantity, for the underlying item. In general, a cash payment is recorded as a transaction that reduces the derivatives liabilities, and a cash receipt is recorded as a transaction that reduces the derivatives assets.

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[4] The term “forward” is often used more narrowly in financial markets, only referring to futures (forward-type contracts traded on organized exchanges) and not including swaps.

[5] A swap contract involves counterparties exchanging, in accordance with prearranged terms, cash flows based on the reference prices of the underlying items. Swap contracts classified as forward-type contacts include currency swaps, interest rates swaps, and cross-currency interest rate swaps.

Options

15. An option is a derivatives contract in which the purchaser acquires from the seller (writer) the right to buy or sell – depending on whether the option is a call (buy) or a put (sell) – a specified underlying item (real or financial) at a specific price (strike price) on or before a specified date, in return for a premium paid to the writer of the option (*BPM6*, paragraph 5.85).

16. As the creation of an option involves the payment of a premium by the buyer to the writer, a transaction is recorded and a position established. Therefore, the buyer is always the creditor (and has the asset), and the seller/writer is the debtor (and has the liability) – in return for the option premium (often a percent of the nominal amount). The direction never changes from asset to liability and vice versa. Option contracts may expire worthless or are extinguished by a cash payment equal to their market value. Nevertheless, some option-type contracts are settled by the purchase of the underlying asset (e.g., purchase of the underlying asset, such as a stock or bond, at the strike price specified in the contract).

Forward-Type Contract	Options
• No up-front payment (premium). • Contract has zero value at inception.	• Up-front payment (premium). • Contract has value at inception.
• During life of the contract, either party can be creditor/debtor (and it may change), • Forwards can switch between assets and liabilities for both counterparties.	• The buyer is always the creditor, and the writer is always the debtor. • Along the contract, only asset for one counterparty and liability for the other.
• Obligation for transaction at maturity.	• Exercise at discretion of the buyer (holder).

Credit Derivatives

17. Credit derivatives are financial derivatives whose primary purpose is to trade credit risk. They are designed for trading in loans and security default risk (*BPM6*, paragraph 5.93). Like many other financial derivative contract, credit derivatives are frequently drawn up under standard master legal agreements and involve collateral and margin procedures, which allow for a means to make a market valuation. Credit derivatives may take the form of forward-type or option contracts. For example, total return swaps exchange cash flows and capital gains/losses, which transfer both the credit risk and the market risk of the underlying asset. Under a credit default swap, premiums are paid in return for a cash payment in the event of a default by a debtor of the underlying instrument.

IV. Other financial arrangements and recording issues

18. There are a number of financial arrangements that are not financial derivatives, although they share some of their features or purposes.

Employee Stock Options

19. Employee stock options (ESOs) are not financial derivatives. Although ESOs have similar features to financial derivatives (such as a similar pricing behavior), they are financial assets and liabilities with very different purposes. ESOs are options to buy the equity of a company offered to employees as a form of remuneration. The purpose of the ESOs is to

motivate employees to contribute to increasing the value of the company rather than to trade risk (*BPM6*, paragraph 5.96).

20. *BPM6* includes financial derivative instruments and ESOs in the same functional category. Only in few cases, the entity that issues the ESOs is a resident of a different economy from the employee, in which case, ESOs would imply international transactions and positions to be recorded in the international accounts.

Insurance Contracts

21. Insurance contracts are not financial derivatives. Insurance involves the collection of funds from policyholders to meet future claims arising from the occurrence of events specified in insurance policies. Therefore, insurance is used to manage event risk primarily by the pooling rather than the trading of risk.

Contingencies

22. Contingent assets and liabilities are not financial derivatives. The main characteristic of contingencies is that one or more events must be fulfilled before a transaction takes place. Information on contingences is important for policy and analysis. To this end, *BPM6* recommends the collection and dissemination of supplementary data on contingencies.

Embedded Derivatives

23. Instruments with embedded derivatives are not financial derivatives. An embedded derivative arises when a derivative feature is inserted in a standard financial instrument and is inseparable from the instrument. Instruments with embedded derivatives include bonds convertible into shares, securities with options for repayment in currencies other than those in which the securities were issued, etc.

Margins

24. Margins are payments of cash or deposits of collateral that cover actual or potential obligations incurred in financial derivative and some other contracts. The mandatory provision of margin is standard in financial derivative markets and reflects market concerns over counterparty risks.

25. The classification of margins as financial derivatives depends on whether they are repayable or nonrepayable. Repayable margins are not classified as financial derivatives while nonrepayable margins are recorded as transactions in financial derivatives.

- Repayable margin consist of cash or other collateral deposited to protect the counterparty against default risk. Ownership of the margin remains with the unit that deposited it. Repayable margin payments in cash are classified as deposits (if the debtor's liabilities are included in broad money) or in other accounts receivable and/or payable.[6]

[6] Nevertheless, when a repayable margin deposit is made in a noncash asset (such as securities), no transaction is recorded because no change in economic ownership has occurred.

- Nonrepayable margin payments reduce the liability created through a financial derivative. The entity that pays nonrepayable margin no longer retains the ownership of the margin nor has the right to the risks and rewards of ownership.

Fixed-Price Contracts

26. Fixed-price contracts are not financial derivatives, unless the contract is standardized in such a way that the risk embodied in the contract can be traded separately. Many traded contracts are fixed-price contacts.

V. Presentations of financial derivatives in *BPM6*

27. The international accounts for an economy summarize the economic relations between residents of that economy and nonresidents. They comprise three statements:

- Balance of payments (summarizes economic transactions during a specific period),
- Other changes in financial assets and liabilities account (shows changes due to economic events other than transactions), and
- IIP (shows at a point in time the value of financial assets, or gold bullion held as reserve assets, and of liabilities).

28. Transactions in financial derivatives are recorded in the financial account of the balance of payments, holding gains/losses (which may be large) in the other changes in financial assets and liabilities account, and positions in the IIP. Likewise, financial derivatives (both transactions and positions) are classified, to the extent possible, according to the resident institutional sector.[7]

29. Financial derivatives are mostly covered in a separate functional category "Financial derivatives (other than reserves) and employee stock options". However, financial derivatives that qualify as reserves are included in the "Reserve assets" functional category instead.[8]

Standard Components

30. Standard components are items that are fully part of the framework and contribute to the totals and balancing items. The presentation of the standard components for financial derivatives in the balance of payments (financial account) and the IIP merge derivatives and ESOs. When the latter are significant, separate identification is encouraged. Preferably, assets and liabilities are reported separately, but a net figure may be reported by sector.

31. In addition to the standard components, *BPM6* seeks considerable additional data on financial derivatives, particularly concerning notional values of positions involving foreign currency contracts with nonresidents.[9] The notional values are useful for analysis, because

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[7] The institutional sector classification comprises (1) central bank, (2) deposit-taking corporations, except the central bank, (3) general government, and (4) other sectors, further classified into (a) other financial corporations and (b) nonfinancial corporations, households, and nonprofit institutions serving households (NPISH). Supplementary information on Monetary authorities should be provided for economies in which extensive reserve assets are held outside the central bank.

[8] *BPM6* distinguishes five functional categories: (1) direct investment, (2) portfolio investment, (3) financial derivatives (other than reserves) and employee stock options, (4) other investment, and (5) reserve assets.

[9] The notional value is the amount underlying a financial derivative contract that is necessary for calculating payments or receipts on the contract. This amount may or may not be exchanged (BPM6, paragraph 7.37).

they provide information about the risk exposure and assist in understanding the link between financial derivatives and the underlying item to which they relate.

Standard Components for Financial Derivatives in *BPM6*

Assets[1/]
- Central Bank / *Monetary authorities (where relevant)*
- Deposit-taking corporations, except the central bank
- General Government
- Other sectors
  - Other financial corporations
  - Nonfinancial corporations, households and NPISHs

Liabilities[1/]
- Central Bank / *Monetary authorities (where relevant)*
- Deposit-taking corporations, except the central bank
- General Government
- Other sectors
  - Other financial corporations
  - Nonfinancial corporations, households and NPISHs

1/ Preferably, assets and liabilities are reported separately, but a net figure may be reported.

Memorandum Items

32. Memorandum items are part of the standard presentation, but are not used in deriving totals and balancing items. Like in the case of standard components, memorandum items are to be reported to the IMF as completely and accurate as possible.

Table A9-1. Currency Composition of Assets and Liabilities (at a reference date)[1]

Table A9-1-1b. Financial Derivative Positions with Nonresidents
Foreign Currency Derivatives: Notional Value of Contracts with Nonresidents[2]

	Central bank	General government	Deposit-taking corporations, except the central bank	Other sectors[3]			Inter-company lending	Total
				Total	OFC	Other		
Receive foreign currency							n.a.	
U.S. dollar							n.a.	
Euro							n.a.	
Yen							n.a.	
Other currencies							n.a.	

[1]Table A9-1 is a memorandum item.

Table A9-1-2b. Financial Derivative Positions with Nonresidents
Foreign Currency Derivatives: Notional Value of Contracts with Nonresidents

	Central bank	General government	Deposit-taking corporations, except the central bank	Other sectors[2]			Inter-company lending	Total
				Total	OFC	Other		
Pay foreign currency							n.a.	
U.S. dollar							n.a.	
Euro							n.a.	
Yen							n.a.	
Other currencies							n.a.	

[1]Original maturity.
[2]OFC = other financial corporations, Other = nonfinancial corporations (except intercompany lending), households, and NPISHs.

33. Table A9-I identifies the memorandum items for financial derivatives in *BPM6*. The table presents the notional value of foreign currency derivatives contracts with nonresidents broken down by currency (rows) and cross-classified by institutional sector (columns). Data on financial derivatives in the table should include those foreign derivatives that swap foreign currency liabilities into domestic currency. These items correspond to the currency composition of the notional value of foreign-currency derivatives positions with nonresidents

related to contracts to receive foreign currency (Table A9-I-1b) and to contracts to pay foreign currency (Table A9-I-2b).

34. A financial derivatives contract to buy foreign currency with domestic currency at a future date is classified as a contract to receive foreign currency. A financial derivatives contract to buy domestic currency with foreign currency at a future date is classified as a contract to pay foreign currency. The decisive factor in determining whether the financial derivative is to be classified as to receive or to pay foreign currency is the exposure to currency movements. Therefore, if payment of a financial derivatives contract is linked to a foreign currency, even though payment is required in domestic currency, the financial derivatives is to be classified as a contract to pay foreign currency, and vice versa. If a single financial derivatives contract both pays and receives foreign currency, the notional amount should be included under both categories; i.e., to pay and to receive foreign currency (*BPM6*, paragraph 5.108).

Supplementary Items

35. Supplementary items are outside the standard presentation of the balance of payments and the IIP, but are they compiled depending on circumstances in the particular economy, taking into account the interests of policymakers and analysts as well as resource costs. The IMF encourages economies to report supplementary items where relevant.

36. Four supplementary presentations of financial derivative contracts with nonresidents are recommended in *BPM6*: (1) currency composition of foreign-currency derivative contracts, (2) currency composition of foreign-currency derivative contracts by institutional sector and type of instrument, (3) financial derivatives (other than reserves) and ESOs by type of instrument, and (4) financial derivatives contracts by risk categories.

Currency Composition of Foreign-Currency Derivative Contracts

37. Table A9-II presents the currency composition of the notional value of foreign-currency derivatives positions with nonresidents related to contracts to receive foreign currency (Table A9-II-1b) and to contracts to pay foreign currency (Table A9-II-2b). This table covers time series data (does not cover projections).

Table A9-II. Currency Composition of Assets and Liabilities (time series data)[1]

Table A9-II-1b. Financial Derivative Positions with Nonresidents
Financial Derivatives: Notional Value of Foreign Currency Contracts with Nonresidents

All Sectors	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Receive foreign currency								
U.S. dollar								
Euro								
Yen								
Other currencies								

[1]Table A9-II is supplementary and covers time series data, not projections.

Table A9-II-2b. Financial Derivative Positions with Nonresidents
Financial Derivatives: Notional Value of Foreign Currency Contracts with Nonresidents

All Sectors	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Pay foreign currency								
U.S. dollar								
Euro								
Yen								
Other currencies								

Foreign-Currency Derivative Contracts by Institutional Sector and Type of Derivative

38. Table A9-III presents the notional value of foreign-currency and foreign-currency linked financial derivatives contracts with nonresidents classified by institutional sector and further broken down between positions in options and positions in forwards. Table A9-III-1b relates to contracts to receive foreign currency, and table A9-III-2b to contracts to pay foreign currency.

39. A further breakdown of other sectors into (1) other financial corporations and (2) nonfinancial corporations (except intercompany lending), households, and NPISHs is encouraged in Table A9-III.

Table A9-III. Currency Composition by Sector and Instrument (at a reference date)[1]

Table A9-III-1b. Financial Derivative Positions with Nonresidents

Financial Derivatives: Notional Value of Foreign-Currency and Foreign Currency-Linked Contracts with Nonresidents

To Receive Foreign Currency
Central bank
Forwards
Options
General government
Forwards
Options
Deposit-taking corporations, except the central bank
Forwards
Options
Other sectors[1]
Forwards
Options
Total
Forwards
Options

Table A9-III-2b. Financial Derivative Positions with Nonresidents

Financial Derivatives: Notional Value of Foreign-Currency and Foreign Currency-Linked Contracts with Nonresidents

To pay foreign currency
Central bank
Forwards
Options
General government
Forwards
Options
Deposit-taking corporations, except the central bank
Forwards
Options
Other sectors[1]
Forwards
Options
Total
Forwards
Options

[1]A further breakdown for (i) Other financial corporations, and (ii) Nonfinancial corporations (except intercompany lending), households, and NPISHs is encouraged.

Financial derivatives (other than reserves) and ESOs by type of instrument

40. *BPM6* recommends the separate identification of financial derivatives (broken down into forwards and options) and ESOs as supplementary items (*BPM6*, paragraph 5.95).

Financial derivatives transactions and positions are to be recorded at market value in the financial account of the balance of payments and the IIP, respectively.

41. As mentioned in the previous section, financial derivatives that qualify as reserves are included in the "Reserve assets" functional category.

Financial Derivatives and Employee Stock Options, by Type of Instrument

Assets
- Financial Derivatives (Other than Reserves)
- Options
- Forward Type Contracts
- Employee Stock Options
Liabilities
- Financial Derivatives (Other than Reserves)
- Options
- Forward Type Contracts
- Employee Stock Options

Financial Derivatives by Risk Categories

42. Additional supplementary breakdowns of financial derivatives also are by main market risk categories (see table below).

43. If more than one risk category is involved, the financial derivatives may be reported separately according to individual components or, if not possible, in a single category based on the most significant underlying risk component. The allocation of such products with multiple exposures should be determined by the underlying risk component that is most significant. If there is doubt about the correct classification of multiexposure derivatives, the allocation by risk component should be made according to the order of precedence adopted by the Bank for International Settlements (BIS): commodities, equities, foreign exchange, and single-currency interest rate. (*BPM6* paragraph 5.95).

Financial Derivatives by Risk Categories

Assets
- Foreign exchange
- Single-currency interest rate
- Equity
- Commodity
- Credit
- Other
Liabilities
- Foreign exchange
- Single-currency interest rate
- Equity
- Commodity
- Credit
- Other

VI. Financial derivatives data reported to STA

44. The IMF Statistics Department (STA) collects financial derivatives data from member countries, which are published in the International Finance Statistics (IFS) and the Balance of Payments Statistics Yearbook (BOPSY). Fifty-five economies have reported financial derivatives data over the 2007–2009 period.

45. Most economies reporting financial derivatives provide both transactions data in their balance of payments and positions data in their IIP (about 90 percent of the reporting economies in 2007–2009). However, the reported detail of the data varies considerably. Some economies reported quarterly data and others annual data. About two-thirds of the reporting economies presented transactions data disaggregated into assets and liabilities, the rest only reported a net figure (assets minus liabilities). All major reporting economies presented position data separated into assets and liabilities. A number of economies classify financial derivatives data by institutional sector as recommended by *BPM6* (see table below).

Financial Derivatives

Standard Components	BOP (transactions)			IIP (positions)		
	Period 1	Period 2	Period 3	Period 1	Period 2	Period 3
Financial Derivatives (Net) [1/]						
Assets						
Central Bank / *Monetary authorities*						
Deposit-taking corporations, except the Central Bank						
General Government						
Other sectors						
Liabilities						
Central Bank / *Monetary authorities*						
Deposit-taking corporations, except the Central Bank						
General Government						
Other sectors						

1/ Assets minus liabilities.

Sector classification according to *BPM6*, Appendix 9

Ten Largest Reporting Economies

46. The table below presents financial derivatives position data for the ten largest reporters of financial derivatives included in their IIP during 2007–2009. The largest ten economies represent about 95 percent of the total financial derivatives position data reported to STA for the period 2007–2009. Among them, the United Kingdom and the United States have by far the largest financial derivatives positions.

47. Financial derivatives data show a distinctive trend for 2007–2009. For both assets and liabilities, the levels more than doubled from 2007 to 2008 and then dropped by about 40 percent back to approximately $8 trillion in 2009. This mainly reflects the trends observed in the financial derivative data of the top two reporting economies (United Kingdom and United States).

48. According to the U.S. Bureau of Economic Analysis (Survey of Current Business, July 2010 issue), U.S. holdings of financial derivatives (both assets and liabilities) decreased in 2009 after even larger rises in 2008. The large declines in 2009 were mainly due to decreases in U.S. assets and liabilities from interest-rate and credit-default swap contracts. In late 2008, the values of interest-rate, exchange-rate, and credit contracts hit a peak as interest rates plunged, the dollar appreciated rapidly, and credit spreads increased sharply. The value of contracts fell in 2009 as the markets adjusted to lower short-term interest rates and long-term interest rates rose, the dollar depreciated, and credit spreads were reduced.

Financial Derivatives--Position data at end-year [1/]

Top Ten Economies Reporting Data to STA [2/]

Billions of US Dollars

		Assets			Liabilities		
		2007	2008	2009	2007	2008	2009
1	United Kingdom	2,761	5,890	3,565	2,789	5,708	3,436
2	United States	2,559	6,127	3,512	2,488	5,968	3,384
3	France	355	326	343	460	403	419
4	Switzerland	123	209	165	67	194	128
5	Netherlands	120	248	159	123	242	185
6	Spain	66	151	112	93	159	113
7	Australia	65	78	n.a.	62	75	n.a.
8	Finland	53	130	117	51	129	114
9	China, P.R.: Hong Kong	48	87	49	33	74	39
10	Japan	39	77	46	44	86	57
	Top 10 total	**6,189**	**13,323**	**8,067**	**6,210**	**13,037**	**7,874**
	Total Reported to STA [3/]	**6,390**	**13,829**	**8,489**	**6,460**	**13,590**	**8,334**

n.a. = not available.

1/ According to *BPM5* and *BPM6* , IIP data are to be recorded at market value.

2/ By largest financial derivatives asset positions included in the IIP for 2007.

3/ Fifty five economies reported data to STA during 2007-2009.

Source: IMF, Balance of Payments Statistics Yearbook (BOPSY) 2010, Position data included in IIP statistics.

VII. Concluding remarks

49. For many economies, financial derivatives are important to measure. Financial derivatives can be volatile, and capital gains and losses on holdings may be sizable for some economies in some periods. Financial derivatives may have an important financial impact on an economy's foreign currency positions.

50. It may be challenging to obtain comprehensive data on derivatives. Notional values may be relatively easy to obtain, data on market values of investment positions may also be somewhat easy to obtain, whereas comprehensive data on transactions are usually very difficult to obtain. Aggregate notional values do not necessarily provide a good measure of risk exposure. Risk exposures differ by type of derivative, and maximum risk exposure may be greater than, less than, or equal to notional values.

The BIS framework for monitoring financial derivatives

Karsten von Kleist[1]

1. Overview

The BIS compilation of statistics on global financial derivatives follows market practice in distinguishing two broad functional categories: the statistics provide quarterly data on exchange-traded derivatives and semiannual data on over-the-counter (OTC) derivatives activity. The data on exchange-traded derivatives are obtained from market sources, while those on OTC derivatives are based on a BIS survey of central banks in major financial centres, which in turn collect the data from reporting dealers. The statistics measure the size and structure of global derivatives markets and help to monitor their development over time.

The remainder of this article is organised as follows. The second section looks at the size, structure and growth of exchange-traded derivatives data at an aggregate level. The third section focuses on OTC derivatives, comparing the triennial and semiannual BIS surveys. The fourth section discusses the reporting of derivatives positions in the BIS banking statistics. The final section provides a comparison of BIS OTC survey data with newly available market data.

2. Exchange-traded derivatives

Exchange-traded derivatives are standardised contracts, defined by the specialised exchanges on which they are traded. Since the exchange acts as an intermediary to all transactions, these derivative markets are relatively straightforward to track; most of the exchanges publish "open interest", ie the number of contracts outstanding and not effectively unwound (liquidated) by an offsetting trade, as well as contract turnover. The BIS collects these data from specialised market data providers, which cover more than 80 derivatives exchanges worldwide.

The instruments and risks covered by the BIS are futures and options on interest rates, currencies, equities and commodities, with a geographical breakdown by location of exchange between North America, Europe, Asia-Pacific and "other" regions. Following market practice, the BIS publishes the number of contracts outstanding and traded in each market risk category. Because turnover in terms of number of contracts is not affected by valuation effects such as movements in exchange rates, this is a good measure of activity on a single exchange over time.

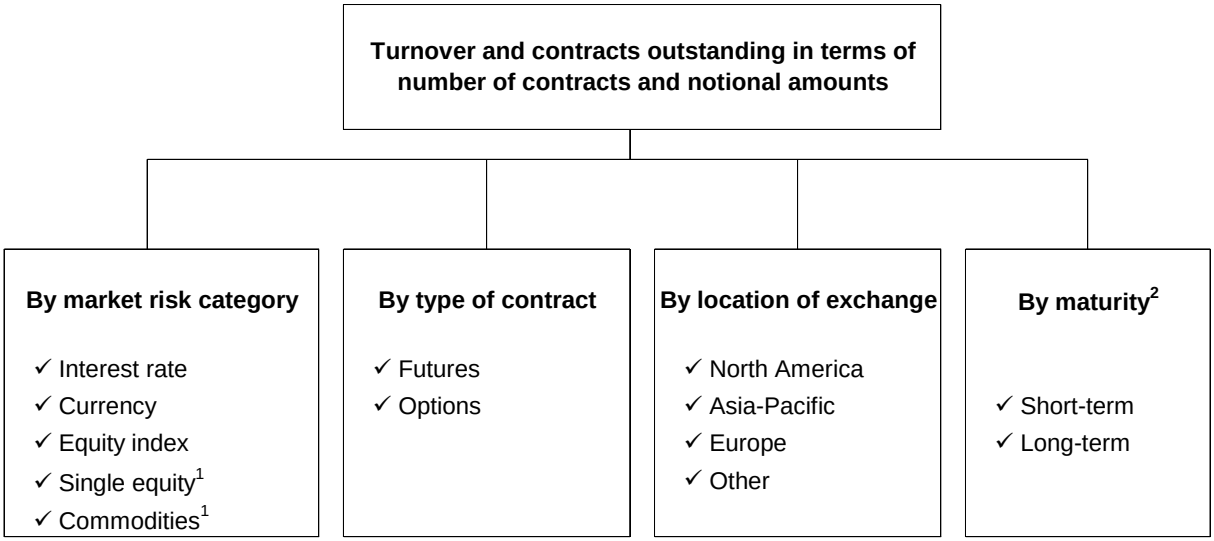
For global and regional aggregates, however, since contract sizes differ between exchanges, this measure is supplemented by notional principal amounts calculated by the BIS. For each contract type on each exchange, the notional principal is calculated as the number of contracts multiplied by the face value of the derivative instrument. These amounts are then converted to US dollars to facilitate aggregation and comparison across all exchanges worldwide. In the case of equity index derivatives, the face value is calculated as the product

[1] I thank Tristan Broderick, Iva Cecchin, Sally Davies, Carlos Mallo, Philippe Mesny, Vichett Oung, Winfried Rudek and Nick Vause for helpful comments. The views expressed are those of the author and do not necessarily reflect those of the BIS.

of the contract multiplier (a defined money amount) and the underlying index value in index points. This requires tracking and maintaining a growing list of stock indices.[2]

Figure 1

Disaggregation of exchange-traded derivatives statistics



[1] Number of contracts only. [2] Interest rate contracts only.

3. Over-the-counter (OTC) derivatives

3.1 Overview

Over-the-counter derivatives are traded privately between two counterparties, without intermediation through an exchange. The contracts are not necessarily standardised and can be tailored to fit the exact economic needs of the counterparties entering into the transaction in terms of shedding or taking on risk. Trading information on these individual contracts is collected from major derivatives traders by central banks, which transmit the data to the BIS for aggregation and publication. The central banks and the BIS conduct two OTC surveys: the Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity and a regular semiannual survey of positions in the global OTC derivatives market. Both surveys share the same format and cover the notional amounts outstanding and gross market values of foreign exchange, interest rate, equity, commodity and credit derivatives traded in OTC markets, and both refer to the worldwide consolidated positions of reporting dealers.

All published BIS figures are adjusted to remove double-counting of trades between reporting institutions, since by definition these positions are reported twice in the raw data. While notional amounts outstanding are adjusted by halving positions vis-à-vis other reporting dealers, adjusted gross market values are obtained by adding the total gross positive market value of all dealer contracts to the absolute value of the gross negative market value of their

[2] Notional amounts are not provided for single equity and commodity contracts. The exchange-traded derivatives are published at www.bis.org/statistics/extderiv.htm.

contracts with non-reporting counterparties. Data are reported to the BIS in US dollars, with positions in other currencies being converted into US dollars at the exchange rate prevailing at the end of each reporting period.

3.2 Comparing the triennial and semiannual surveys

3.2.1 Amounts outstanding[3]

The triennial survey is the more comprehensive, covering more than 400 market participants (head offices) in a total of 47 jurisdictions. It thus serves as benchmark for the semiannual survey, which is currently based on data from 59 major dealers in the G10 countries and Switzerland.[4] Amounts outstanding are reported on a consolidated global basis by reporting dealers' head offices.

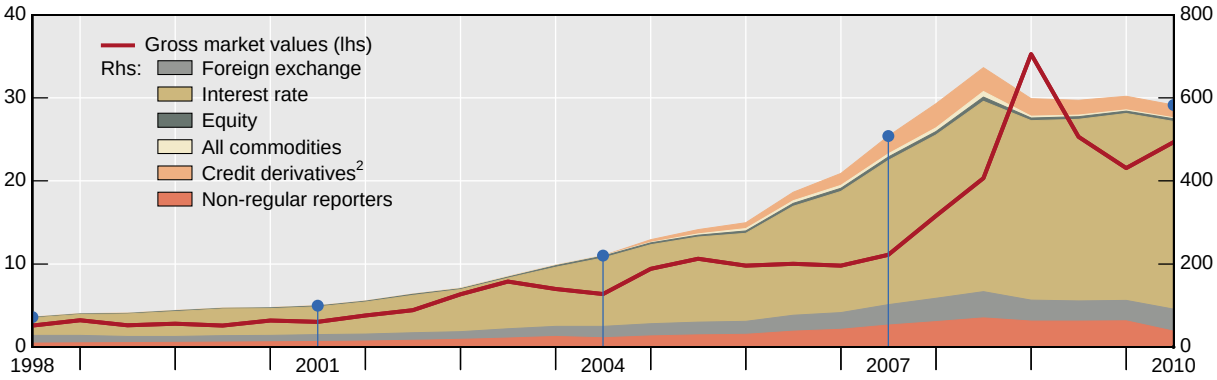
The triennial survey is also more comprehensive in covering some instruments not included in the semiannual survey, in particular credit derivatives other than credit default swaps (CDS), other FX and interest rate products and derivatives on other underlying market risk categories.

Graph 1 combines amounts outstanding reported in the triennial end-June survey data (blue dots on vertical lines) with the more frequent semiannual survey data. The data from the non-regular reporters, ie the reporting centres that participate only every three years (36 in 2010), and the data from smaller non-regular reporters in the G10 countries and Switzerland are shown as "non-regular reporters". Their contribution to total semiannual amounts outstanding between the major survey dates is extrapolated based on their contribution to the most recent triennial survey total, as measured every three years.

Graph 1

Global OTC derivatives market

Triennial and semiannual surveys, notional amounts outstanding,[1] in trillions of US dollars



[1] Dots mark Triennial Survey dates and data. [2] Data available from end-December 2004.

Source: BIS.

[3] See BIS (2010).

[4] Australia and Spain will contribute from end-2011. The concentration of derivatives trading in G-10 countries is confirmed by Davies (2009), who notes a recent slight trend to increase exposures to emerging market countries and financial centres.

The "non-regular reporters" contributed about 7% to the global OTC derivatives market in terms of notional amounts outstanding in June 2010. This is quite a marked decline from their 12% share in the 2007 survey and is caused mainly by two factors: first, a number of non-regular reporters moved to regular reporting status, due to mergers and changes in ownership, and second, other non-regular reporters dropped out of the reporting due to reduced business volume.

Notional amounts outstanding provide useful information on the structure of the OTC derivatives market but should not be interpreted as a measure of the counterparty credit exposure (CCE) of these positions. While no single comprehensive measure of this type of risk exists, a useful concept is the cost of replacing all outstanding contracts at the prevailing market prices, ie their gross market value. The market value of a derivative records the cost of replacing the contract with an equivalent new contract at current market prices.

Because derivatives contracts are zero-sum in nature, for every contract one counterparty will be in the money and the other will be out of the money. The gross market value measures, for every contract, the positive replacement cost from the perspective of the in-the-money counterparty. As such, it provides an indication of current counterparty exposure. Market values are typically much smaller than notional amounts. In the case of CDS, for example, this is because they reflect the difference between the present values of anticipated future premiums and default-linked payments. Default probabilities may be estimated to be small or expected flows conditional to default may be expected to be low.[5]

Counterparty risk is reduced by bilateral netting and collateral arrangements. While comprehensive data on the collateral held against positions in OTC derivatives are not available[6], the semiannual BIS survey does ask reporting dealers to state, in addition, the market value of their positions after taking into account enforceable bilateral netting arrangements. For the major dealers reporting semiannually, this figure increased by 34% to $3.6 trillion (15% of the gross market value of outstanding positions) in 2010, compared with $2.7 trillion or 24% of gross market values in 2007. Reasons for the smaller growth in gross credit exposures than in gross market values include the increased use of central counterparties and wider use of legally enforceable netting clauses in standard contract documentation. These changes are probably the result of heightened concern about counterparty credit exposures in the wake of the financial crisis.

3.2.2 Additional data on counterparty breakdown of CDS positions[7]

The latest semiannual survey introduces additional information on the importance of central counterparties (CCPs) in the CDS market. At end-June 2010, about 11% of CDS positions were vis-à-vis a CCP. This relatively low share reflects the large amount of non-standard CDS contracts covered in the BIS survey, which are not easily traded with CCPs. In terms of market value, contracts with CCPs account for only 4% of the total value of CDS. The discrepancy between their shares of notional amounts and market values could reflect the fact that CDS indices, which are popular products cleared by CCPs, are often less volatile than other CDS, such as single-name CDS, because of the diversification benefits of the former. Approximately twice as many multi-name as single-name contracts are traded with CCPs.

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5 See Vause (2010) for an in-depth discussion of counterparty risk and contract volumes in the credit default swap market.

6 Some data on collateral are available from http://www2.isda.org/functional-areas/research/surveys/margin-surveys/.

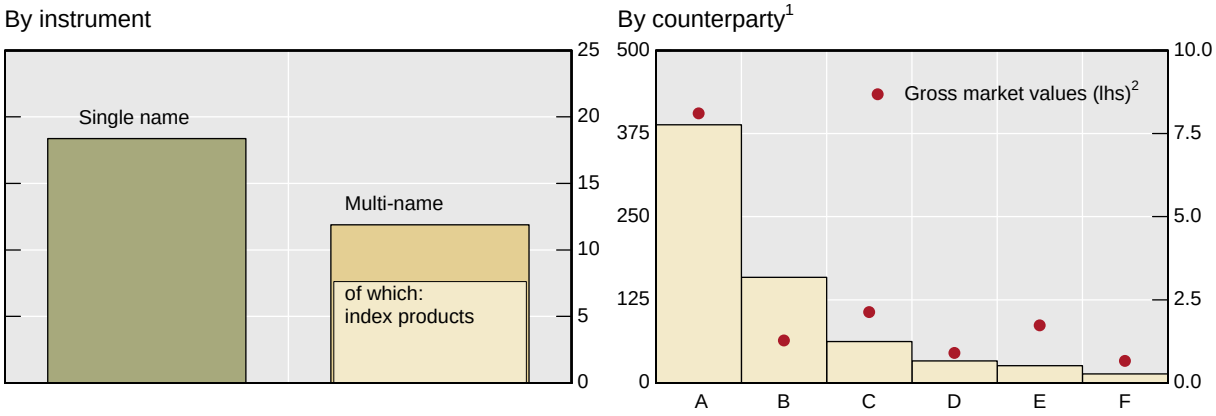
7 As recommended by the Committee on the Global Financial System (2009).

Index products as a subset of multi-name CDS instruments are now also reported separately (Graph 2, left-hand panel).

Graph 2

Credit default swaps, newly introduced categories

Notional amounts outstanding at end-June 2010, in trillions of US dollars



[1] Detailed breakdown of other financial institutions: A = banks and securities firms; B = central counterparties; C = other residual financial customers; D = hedge funds; E = special purpose vehicles (SPVs), corporations (SPCs) or entities (SPEs); F = insurance and financial guaranty firms. [2] In billions of US dollars.

Source: BIS.

Figure 2

Disaggregation of semiannual central bank OTC derivatives statistics

Notional amounts and gross market values outstanding

By market risk category

- ✓ FX
- ✓ Interest rate
- ✓ Equity-linked
- ✓ Commodities
- ✓ Credit[1]

By type of contract

- ✓ Forwards
- ✓ Swaps
- ✓ Options

By type of counterparty

- ✓ Reporting dealers
- ✓ Other financial institutions
  - *CCPs*[1]
  - *Banks and securities firms*[1]
  - *Insurance firms and pension funds*[1]
  - *SPVs, SPCs or SPEs*[1]
  - *Hedge funds*[1]
  - *Other*[1]
- ✓ Non-financial customers

By risk factor

- ✓ Currencies:[2] USD, EUR, JPY, GBP, CHF, CAD, SEK
- ✓ Regions:[3] US, Japan, Europe, Latam, other Asia
- ✓ Ratings:[1] AAA/AA, A/BBB, BB and below, non-rated
- ✓ Sectors:[1] Sovereigns, non-Sovereigns (financial firms, non-financial firms, securitised products, multiple products)

By remaining maturity

- ✓ Up to one year
- ✓ Over one year and up to 5 years
- ✓ Over 5 years

[1] Credit defaults swaps only. [2] Foreign exchange and interest rate derivatives only. [3] Equity-linked derivatives only.

The CDS counterparty breakdown for contracts with other financial institutions has also been expanded. In particular, special purpose vehicles (SPVs) and hedge funds are broken out for the first time. In the past, this breakdown had been used only by a subset of reporters, so that data for these sub-categories in June 2010 are not directly comparable with those of previous periods. In the current period, CDS contracts with hedge funds and SPVs account for about 5% and 4% respectively of total notional amounts outstanding with other financial institutions.

3.3 Comparing exchange-traded and OTC data

3.3.1 Amounts outstanding

The amounts outstanding reported in the triennial and semiannual surveys are not directly comparable with those in the exchange-traded data in terms of exposure. The data for exchange-traded products refer to open interest, equivalent to the sum of positive net positions in each contract across traders. That is, for each trader, any negative position in a given contract is netted against his positive position, and positive net positions are then summed across traders. For exchange-traded contracts, it is perfectly reasonable to net in this way because, unlike OTC contracts, exchange-traded contracts have standardised size and settlement dates and the same counterparty, ie the exchange.

By contrast, the triennial and semiannual survey data refer to gross positions. For example, a trader wishing to close a position in an outright forward would not usually terminate the existing contract, but enter into a new and offsetting contract. The gross amount outstanding would double, even though the net exposure is now zero. On an exchange, the open interest would fall to zero in this case, while the amount outstanding in the BIS survey would double.[8] Thus, while one might encounter an aggregation of exchange-traded and OTC derivatives outstanding, simply adding up amounts outstanding in the two sectors would be misleading with respect to the relative significance of the two markets.

The gross reporting of amounts outstanding is informative, however. A significant aspect of counterparty risk concerns during the recent crisis was that the major dealers are important counterparties to one another. Although inter-dealer exposures are often small on a net basis, they can be large in gross terms, and there were concerns that agreements to net obligations across contracts might not be enforceable in the event of default, although such concerns were not realised in the case of the Lehman bankruptcy.[9]

3.3.2 Turnover

In contrast to amounts outstanding, turnover on exchange-traded products is comparable to OTC turnover reported in the triennial survey. Turnover on exchange-traded products does not count contracts bought or sold on the exchange separately, but only one transaction between the buy and sell side. By definition, there is no inter-dealer double-counting and thus exchange-traded turnover is comparable to the netted[10] OTC survey turnover.

OTC derivatives are relatively more important in emerging market economies (EMEs) than in advanced economies. In EMEs, derivatives are traded in almost equal proportions over the counter and on exchanges (Graph 3, centre and right-hand panels). By comparison, in advanced economies almost two thirds of derivatives are traded on exchanges (right-hand panel) and 38% over the counter (centre panel). The relative size of the exchange-traded

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[8] See King and Mallo (2010) for a detailed guide to the triennial survey.

[9] See Vause (2010).

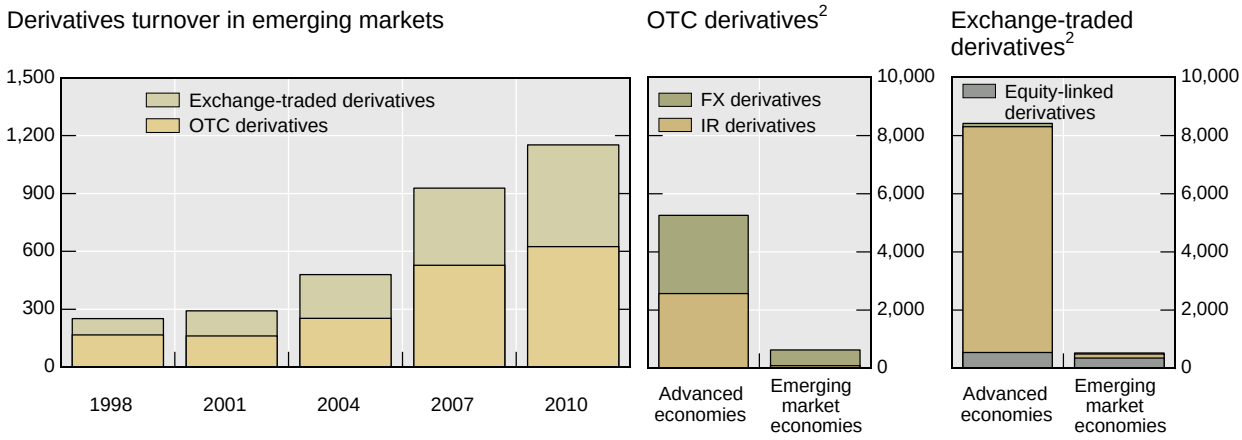
[10] Netted for inter-dealer double-counting.

derivatives market in emerging markets is dominated by the derivatives exchanges in Brazil and Korea, which together account for nearly 90% of all emerging market turnover of exchange-traded derivatives. Trading of OTC derivatives is highly concentrated in Hong Kong and Singapore. The two financial centres together accounted for 69% of all OTC foreign exchange and 59% of all interest rate OTC derivatives turnover in EMEs in April 2010.[11]

Graph 3

Derivatives turnover in advanced and emerging markets[1]

Daily average turnover in April, in billions of US dollars



[1] OTC derivatives aggregates are adjusted for local inter-dealer double-counting, ie trades between reporting dealers located in the same countries were halved, and not corrected for intraregional double-counting, ie trades between reporting dealers located in different countries of the same region were not halved. OTC derivatives comprise FX and interest rate derivatives; exchange-traded derivatives comprise FX, interest rate and equity-linked derivatives. [2] In April 2010.

Source: Triennial Central Bank Survey, Mihaljek and Packer (2010).

4. Derivatives in the BIS banking statistics

The BIS consolidated banking statistics collect data on credit exposures to foreign residents and include data on direct credit exposures arising from *all* derivatives contracts.[12] Direct exposures from derivatives contracts are the counterparty credit exposures (CCE) to foreign residents that arise from *all* derivatives contracts (ie in the banking or the trading book) that reporting banks have outstanding.

Specifically, counterparty credit exposures are the positive fair value, as of the report date, of all derivatives contracts with foreign residents. Net positive fair values – ie positive fair values less negative fair values (or zero, whichever is greater) – can be reported only for those contracts that are both with the same counterparty and covered under a legally enforceable netting agreement. This item measures the total exposures to foreign counterparties that a bank would have, were its derivatives contracts all to settle on the report date.

[11] This section draws on Mihaljek and Packer (2010), who discuss derivatives in emerging markets on the basis of the BIS survey data.

[12] In the consolidated statistics, "foreign" is defined relative to the country of the headquarters of the reporting bank (ie the lender). The consolidated statistics do not collect data on liabilities arising from derivatives contracts.

The consolidated statistics also collect data that reflect credit protection bought and sold using *credit* derivatives. A form of contingent credit exposure, credit protection on a foreign reference entity (ie borrower) that is *sold* using credit derivatives – is included in a separate item in the consolidated statistics called "**guarantees**."[13] This item also includes, indistinguishably, contingent credit exposures to foreign residents that arise from the provision of other types of credit guarantees, such as financial and performance standby letters of credit for foreign borrowers.

In addition, the consolidated statistics collect data that reflect the effects – on the ultimate obligor or guarantor of a claim – of credit protection purchased via *credit* derivatives. Specifically, the consolidated statistics distinguish between the residency and sector of the immediate debtor counterparty of reporting banks and the residency and sector of the ultimate obligor. The latter is the counterparty ultimately responsible for servicing any outstanding obligations in the event of a default by the immediate borrower. The country of ultimate risk is generally defined as the country in which the guarantor of a financial claim resides or the head office of a legally dependent branch is located.[14]

If a reporting bank *purchases* protection against default in the credit derivatives market, then the country of ultimate risk is defined as the country in which the counterparty to the contract resides. The consolidated statistics collect this effect as an "**inward risk transfer**" into the country of the protection seller and an "**outward risk transfer**" from the country of the borrower. However, like "guarantees", credit protection purchased via credit derivatives is combined, indistinguishably, with credit protection obtained through some other form of credit guarantee, such as a financial or performance standby letter of credit.

The country allocation of CCE is affected by (liquid) collateral held in the same way that the country allocation of loans would be affected. For example, CCE collateralised by US collateral would disappear from the statistics reported by US banks. CCE collateralised by foreign collateral would be reallocated to the country of the collateral, if that country differs from that of the counterparty.

Table 1

Reported item	Instrument	Risk mitigation	Valuation	Book	Ultimate risk country
1. Derivatives	All financial derivatives not included in 2. or 3.		Positive market value only	Banking and trading	Counterparty
2. Guarantees extended	Guarantees, including CDS	Credit protection sold by reporting bank	Notional	Banking and trading	Reference entity
3. Inward and outward risk transfers	Credit derivatives and other risk mitigants	Credit protection bought by reporting bank	Notional	Banking	Guarantor

[13] The bulk of such exposures would typically reside in a bank's trading book, since one would expect the banking book to contain only credit derivatives that are *hedges*, ie those that *purchase* credit protection, rather than sell it.

[14] McGuire and Wooldridge (2005) discuss credit risk transfers in the BIS consolidated banking statistics.

Thus the derivative positions in the consolidated statistics on an ultimate risk basis provide an approximation of banks' derivative exposures to counterparties worldwide, excluding CCE in their home countries.

5. BIS derivatives data compared with new data sources

5.1 Depository Trust & Clearing Corporation (DTCC) data for CDS[15]

Recent developments in CDS markets have led to the availability of additional financial derivatives data sources. In conjunction with the well known ISDA market survey and the BIS semiannual central bank survey on OTC derivatives markets, these new sources can be used to monitor global market trends more closely. One source that has attracted much attention is the Depository Trust & Clearing Corporation (DTCC) data on CDS. DTCC stores OTC credit derivatives data in a global repository called the Trade Information Warehouse (TIW). It then performs post-trade processing functions such as automated calculation, netting and central settlement of payment obligations, as well as settlement of credit events such as bankruptcies. We examine the DTCC data and briefly compare them with the data from the BIS semiannual central bank survey on outstanding CDS.

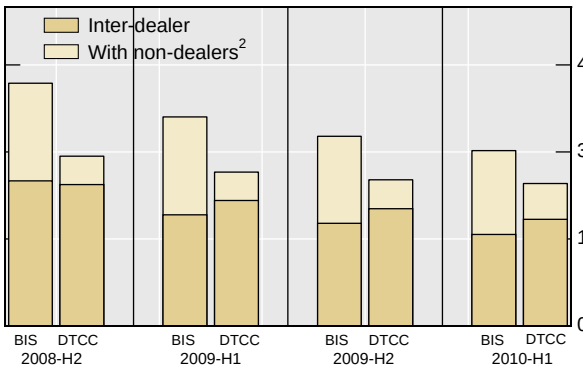
In early November 2008, DTCC started weekly publication of aggregated data as part of efforts to address market concerns about the lack of transparency in CDS markets. The DTCC data are based on CDS records registered in the warehouse, while the BIS data rely on dealers' reports to national central banks.

Graph 4

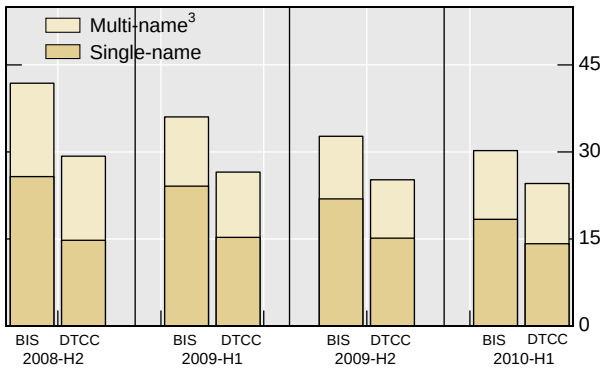
Comparison of BIS and DTCC CDS data[1]

Notional amounts outstanding, in trillions of US dollars

By counterparty



By instrument



[1] The BIS sample includes reporting banks whose head office is located in a G10 country. [2] The DTCC non-dealers category includes some inter-customer contracts. [3] Multi-name contracts include credit default tranches.

Sources: DTCC; BIS.

[15] See Gyntelberg et al (2009).

One indicator of the size of global CDS markets is the gross notional amounts outstanding, available in both the BIS and DTCC datasets. By counterparty, the BIS data distinguish between reporting dealers, other financial institutions and non-financial customers. By contrast, the DTCC data identify as counterparties only dealers and non-dealers (customers). To facilitate comparison, we combine the two non-reporting counterparty groups in the BIS survey in a single aggregate non-dealer category (Graph 4, left-hand panel). In addition, for the DTCC data we include direct trades between non-dealers, which amount to only 0.1% of the total.

Initially, the DTCC and BIS data for the total gross amounts outstanding between dealers as of end-2008 matched almost perfectly. Since then, CDS amounts reported by DTCC have risen slowly and at end-June 2010 amounted to 117% of outstanding inter-dealer contracts in the BIS data (Graph 4, left-hand panel). The likely explanation for this difference is that DTCC covers somewhat more dealers.

The combined pattern across counterparties and instrument types suggests that a main reason for the differences between the two datasets may be that outstanding single-name contracts used in the more customised transactions between dealers and non-dealers (including other financial institutions) are covered more comprehensively by the BIS, but are increasingly also entering the DTCC database.

5.2 TriOptima Interest Rate Swaps[16]

The OTC Derivatives Interest Rate Trade Reporting Repository (IR TRR) launched by TriOptima in early 2010 is an important step towards improving transparency in the global OTC derivatives markets. The IR TRR collects data on all transactions in OTC interest rate derivatives from a group of 14 major dealers.

In April 2010, the IR TRR published its first monthly report summarising outstanding notional volumes at end-March 2010. The report provides a detailed breakdown of outstanding volumes by currency, maturity and type of contract. In contrast to the BIS data, the IR TRR does not publish information on market values or counterparty exposures.

The total amount outstanding of interest rate derivatives of the 14 participants in the new trade repository (13 of which are included in the sample of 59 dealers reporting to the BIS OTC derivatives statistics) at the end of June 2010 is very close to the market totals reported by the BIS statistics (Table 2).[17] This suggests that market concentration is high and that the coverage of the IR TRR data is near comprehensive.

[16] See Gyntelberg and von Kleist (2010).

[17] The figures adjust inter-dealer positions to account for double-reporting and exclude cross-currency swaps.

Table 2

OTC interest rate derivatives data comparison

IR TRR			BIS		
	End-June 2010			End-June 2010	
Counterparty type	Notional amounts outstanding (USD billions)	% of total	Counterparty type	Notional amounts outstanding (USD billions)	% of total
Dealers	86,684	20	Dealers	132,128	29
CCPs	212,080	48	Other financial	282,027	62
Other counterparties	140,671	32	Non-financial	37,677	8
Total	439,435	100	Total	451,831	100

The trade repository data include $9,836 billion of cross-currency swaps, which are classified as FX instruments in the BIS data. They are thus excluded from the IR TRR data column in this table.

Source: The detailed data are available on: http://www.trioptima.com/repository.html.

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Cross-border derivatives statistics in France: the use of accounting data

Alain Christophory[1]

1. Introduction

Banque de France has recently built a new reporting system ("Compte-rendu de transaction des intermediaires financiers") in order to prepare the transposition of the international standards of the IMF's Sixth edition of the Balance of Payments Manual (BPM6) and international investment position (IIP).The new reporting system specifically addresses the transactions by financial intermediaries which have a major role in the continuing expansion of financial derivatives markets and their globalization.

The focus of the new reporting is put on the financial intermediaries, defined as Monetary and Financial Institutions, securities firms and financial auxiliaries which are to report either on a monthly or on an annual basis depending on the importance of their business activity. Although non financial firms may hold financial derivatives in their balance sheet for hedging purposes, they are less likely to enter significantly into the international derivatives markets. Therefore and order to limit the reporting burden, financial intermediaries are, up to now, the sole resident sector to report.

This paper discusses the French reporting system with a special focus on the use of accounting data as a primary source of information.

2. The widespread use of financial derivatives

According to BIS Semiannual Over the counter derivatives statistics, notional amounts of OTC derivatives reached USD 582,655 billions in June 2010. Their gross market value amounted to USD 24,673 billions. A decade earlier, figures were respectively six and ten times lower.

BIS statistics also show that interest rates derivatives represent the bulk of outstanding in OTC derivatives (78 % of notional amounts) followed by foreign exchange derivatives (9 %) and credit derivatives (5 %).

Banks are the primary dealers and end-users of financial derivatives. Typically, financial derivatives, which are fully recognized under IFRS, account for 10–20 % of the consolidated balance sheet of large banking groups. Banks are involved in OTC derivatives but also heavily trade derivatives on organized markets.

The vast majority of financial derivatives are recognized in the trading book but some derivatives in this category are in fact contracted for hedging purposes but do not formally

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The opinions expressed in this working paper are the sole responsibility of the author and do not necessarily reflect those of the Banque de France.

qualify for hedge accounting under IFRS. The bulk of the derivative market value consists in OTC interest rate derivatives, mainly plain vanilla interest rate swaps which are, for instance, used for Asset and Liabilitiy Management (ALM) purposes.

Banking groups trade derivatives for their own needs and for their client needs for financing, hedging, indexation, leveraged borrowing. Consequently, financial derivatives booked in banking groups balance sheet also reflect the interest of non-financial end users.

Financial derivatives are a growing business and are internationally traded. They represent a challenge for statisticians since they are expected to account for a significant share of BOP Financial account flows and the International investment position (IIP). Moreover, as solo accounts cannot be used as not being systematically marked to market, a specific reporting with identification of cross border intra group transactions is needed.

3. IMF's Balance of Payments and International Investment Position Manual guidelines in a nutshell

The Sixth Edition of the IMF's Balance of Payments and International Investment Position Manual (BPM6) now incorporates financial derivatives. It promotes an integrated view of transactions, other changes, and positions which allows consistency between stocks and flows

Integrated International Investment Position Statement

	Beginning of period IIP	Financial account - Transactions	Other changes in financial assets and libilities due to			End of of period IIP
			Other changes in volumes	Exchange rate changes	Other prices changes	
Assets						
...						
Financial derivatives (other than reserves) and ESOs						
...						
Total assets						
Liabilities						
...						
Financial derivatives (other than reserves) and ESOs						
...						
Total liabilities						
Net IIP						

Source: BPM6 Table 7.1 (extract from)

The main guidelines on financial derivatives statistics are in the following chapters:

Chapter 3 – Accounting Principles

- The notion of net flows is defined in article 3.114. *"Net recording always refers to aggregations for which all debit entries of a particular asset or a particular liability are netted against all credit entries in the same asset type or in the same liability type."*

Chapter 5 – Classifications of financial assets and liabilities

- *A financial derivative contract is a financial instrument that is linked to another specific financial instrument or indicator* (underlying asset). *It can be traded in its own right* (cf. article 5.80).
- Financial instruments that are not financial derivatives are listed in article 5.83.
- Two broad types of financial derivatives are defined by BMP6: options and forward-type contracts, including in particular interest rate swaps (cf. article 5.84), such as listed in articles 5.85 to 5.93.
- Only non repayable margins – ie that reduce financial liabilities – are classified as financial derivatives (cf. article 5.94). Repayable margins which consist in cash deposit are not financial derivatives transactions.

Chapter 6 – Functional Categories

- Financial derivatives are recorded separately for assets and liabilities and preferably for both positions and transactions (cf. article 6.60).

Chapter 7– International Investment Position

- Financial derivatives are valued at market prices (cf. articles 7.33 to 7.36).
- Gross asset and gross liability data be compiled by summing, respectively, the values of all individual contracts in asset positions and the values of all individual contracts in liability positions. *"Financial derivatives should, by preference, be reported separately for both assets and liabilities"* (cf. article 7.37).

Chapter 8 – Financial account

- *"Transactions may arise at inception, on secondary markets, with ongoing servicing (such as for margin payments), and at settlement. Financial account entries for derivatives should preferably be shown separately for each of assets and liabilities"* (cf. article 8.34).
- At inception, Forward-type contracts do not usually require the recording of financial transactions because, at that time, the market value should be nil and in any case is not triggering cash in or cash out. On contrary, the purchase of a conditional instrument leads to the recording of a financial transaction equivalent of the premium paid (cf. article 8.35).
- *Margins are payments* (or receipts) *of cash or deposits of collateral that cover actual or potential obligations incurred through financial derivatives – especially futures or exchange traded options.* (cf. article 8.39).
- When a financial derivative is settled several transactions are registered if the underlying asset is delivered (cf. article 8.40).

Chapter 9 – Other changes in financial assets and liabilities account

- *"Changes in the value of derivatives due to change in the underlying item are recorded as revaluation"* (article 9.30).

4. The merits of Financial Statement information

Using accounting data which by definition is the main input of financial statements is thought to be an efficient way to obtain high-quality data to the maximum extent possible since financial statements are certified by Independent external auditors. The data directly stem from the accounting interpreter. Reporters may use additional referential database to qualify the counterparty residency.

All financial derivatives are recognized in the balance sheet at fair value and transactions are market valued at the trade date since there is a single valuation measure for financial derivatives: the fair value which promotes market prices.

Aligning the statistical definition of financial derivatives on International accounting standards (IFRS/IAS) also allows large – however not necessarily complete since US Gaaps can be different – international comparability.

5. The limits of Financial Statement information on a solo basis

In France, the recording of financial derivatives at market value in the balance sheet is not fully recognized in unconsolidated individual financial statements, while consolidated accounts comply with IFRS. Indeed, accounting principles applied for solo accounts only recognize financial derivatives at their market value when held for trading purposes ("Catégorie D – Gestion spécialisée").

Consequently, financial intermediaries IFRS accounting inputs are used, but the concerned financial intermediaries have to restate intra group transactions with foreign subsidiaries or branches which are eliminated during the consolidation process.

6. IAS 39: Accounting of financial derivatives

International Financial Reporting Standards (IFRS) are the applicable accounting standards for consolidated financial statements. IAS 39 ("Financial instruments: Recognition and measurement") establishes requirements for all aspects of accounting for financial instruments to all types of financial instruments including financial derivatives (options, rights, warrants, futures contracts, forward contracts, and swaps).

Fair value in the consolidated balance sheet is determined on the basis of quoted prices in an active market or using valuation techniques. In practical terms, the bulk of financial derivatives are traded in active markets. Consequently, quoted prices for derivatives traded on organized markets (futures and options) and quoted prices and generally accepted models for plain vanilla OTC derivatives are available and are fully suited for valuing stocks and flows. Financial derivatives traded in inactive markets are valued using model based on (un) observable parameters.

6.a Derivative instruments held for trading purposes

They are recognized in the balance sheet in "Financial assets at fair value through profit or loss". Realized and unrealized gains and losses are taken to the profit and loss account on the line "Net gain/loss on financial instruments at fair value through profit or loss".

6.b Derivatives under the hedge accounting

Hedging refers to the process of mitigating risks of the hedged item using derivatives. Under IAS 39,[2] three purposes of the hedge are identified:

1. Fair value hedge,
2. Cash flow hedge,
3. Net foreign currency investments in affiliates hedge.

Derivatives used for hedging purposes are recognized at fair value in the balance sheet. Changes in fair value are taken differently in the P&L account depending on the purpose of the hedging strategy.

Since financial derivatives are always recognized at fair value in the balance sheet, accounting information used to build stocks of derivatives in the consolidated balance sheet can also be processed into financial derivatives IIP reporting. The individual accounting transaction hence constitutes the mutual input for both consolidated balance sheet (after elimination of positions with foreign affiliates) and the international investment position (individual reporter).

BOP transactions also rely on accounting information which tracks buy and sell of options, future's margin call and swaps servicing.

7. Compilation of cross-border derivatives statistics in France

Building a new reporting scheme (BOP/IIP) was the Banque de France's answer to implement BPM6 guidelines and to design an integrated view of transactions, other changes, and positions of financial derivatives.

Only the most significant financial intermediaries report flows of cross-border derivatives activities on a monthly basis (i.e. 29 Credit institutions and 7 Securities firms). Others financial intermediaries report on an annual basis.

Market value

According to BPM6, positions of financial assets and liabilities (cf. article 3.84) and flows should be priced at market value. Fair value is a market-equivalent value (cf. 3.88 a).

Definition of financial derivatives

Since financial intermediaries rely on their accounting system to produce stocks and flows of financial derivatives, they follow the definition of derivatives provided by IAS 39. The noticeable exception is the embedded derivatives. Indeed according to BPM6 (Art 5.83), embedded derivatives are not financial derivatives but IAS 39 states that derivatives embedded in hybrid financial instruments are, under certain circumstances, extracted from the value of the host contract and accounted for separately as a derivative. Considering that it is not a major statistical inconsistency, all cross-border derivative products that are recognized in the balance sheet are subject to BOP/IIP reporting.

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[2] The IASB aims to replace all of the requirements of IAS 39 by the second quarter of 2011. The new standard will be IFRS 9 *Financial Instruments*.

Definitions of financial derivatives

Under BPM6 (Art 5.80)

"A financial derivative contract is a financial instrument that is linked to another specific financial instrument or indicator or commodity and through which specific financial risks (such as interest rate risk, foreign exchange risk, equity and commodity price risks, credit risk, etc.) can be traded in their own right in financial markets. Transactions and positions in financial derivatives are treated separately from the values of any underlying items to which they are linked."

Under IAS 39 (paragraph 9)

A derivative is a financial instrument or other contract with all three of the following characteristics:

a) its value changes in response to the change in a specified interest rate, financial instrument price, commodity price, foreign exchange rate, index of prices or rates, credit rating or credit index, or other variable, provided in the case of a non-financial variable that the variable is not specific to a party to the contract (sometimes called the "underlying");

b) it requires no initial net investment or an initial net investment that is smaller than would be required for other types of contracts that would be expected to have a similar response to changes in market factors; and

c) it is settled at a future date.

Initial reporting of stocks of financial derivatives

Financial intermediaries are first asked to report the market value of their stocks[3] (asset and liability positions) of financial derivatives as of the end of 2010. This piece of information once aggregated forms the intial IIP. Breakdowns for stocks and flows are provided by instruments (swaps, forwards, futures, option, FRA), markets (organized markets, OTC), countries and currencies.

Reporting of flows of financial derivatives

Resident financial intermediaries report, on a parent basis, financial derivatives transactions with non resident institutions which can be foreign subsidiaries (Identified in the scope of consolidation) or non affiliated foreign counterparties (Non financial Corporations, Financial Institutions – including Central Counterparty Clearing Houses or CCP, Retail customers). In both cases, the residency of the counterparty is properly identified at the transaction level in order to fit into the right category.

Financial intermediaries also report other flows – ie mainly reevaluations – which allow Banque de France to increment the final IIP.

[3] For more details see: www.banque-france.fr/fr/statistiques/telechar/economie_balance/F10-156_CRT_Borne_ouverture_PFD.xls

Swaps switching from an asset to a liability position (and vice versa)

Tracking financial transactions arising from swaps has to take into account changes in market prices. Indeed, in the reporting, transactions are tagged as stemming from assets (for instance SA110) or from liabilities (SP110). Consequently, reporters are required to identify swaps and other forwards that have switched in market value and assign an asset (liability) transaction (ie SA110 or SP110) for net receipts (payments) even though the derivative has turned a liability (asset).

Since other flows are globally deducted from aggregated positions (initial and final IIP) and transactions (ie country/currency/products/asset or liabilities), the tree datasets (position/transactions/other flows) remain consistent over time.

IIP & Flows of financial derivatives on country A

INITIAL IIP			FLOWS - Month XX				FINAL IIP	
ASSET	LIABILITIES		ASSET		LIABILITIES		ASSET	LIABILITIES
ON COUNTRY A		Products	Transactions	Other flows	Transactions	Other flows	Market value	Market value
		Options traded on organized exchanges	OA210	OA211	OP210	OP211		
		OTC Options	OA110	OA111	OP110	OP111		
		Cleared Swaps	SA110*	SA111	SP110	SP111		
		Swaps	SA210	SA211	SP210	SP211		
		Futures	FA120	FA121		FP121		
		Forwards	FA210	FA211	FP210	FP211		
		of which flows with foreign affiliates					of which IIP with foreign affiliates	
		All products	DA210	DA211	DP210	DP211		

Individual reportings are then compared with financial statements and are cross-checked with peers. Temporal inconsistencies are tracked when building a new international investment position in financial derivatives.

8. Conclusion

The use accounting data allows reporters to rely on existing information systems and existing audit trails which are devised for financial statements. Fair value accounting (IFRS/IAS 39) almost perfectly fits with the BPM6 definition of financial derivatives allowing the direct use of established definitions (fair value, financial derivatives).

The integration of flows and positions, since financial intermediaries are only asked to report flows (transactions and other flows) but have keep track of the market valued stocks of financial derivatives, is deemed to limit errors.

Some issues remain difficult to address such as the way to take into account transactions with home CCPs that have also relationships with foreign financial counterparties.

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Session 3

Challenges in gathering and using derivatives data from various policy perspectives

Papers:

The regulation and supervision of banks' derivatives activities: existing practices, challenges, and preliminary proposals from data perspective
Yuanfeng Hou, Hong Kong Monetary Authority

The role of oversight in collecting derivatives data
Marc Hollanders, Bank for International Settlements

Development of derivative statistics: challenges for the Bank of Japan
Satoru Hagino, Bank of Japan

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

Yuanfeng Hou[1]

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

[1] Hong Kong Monetary Authority.

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, NBFI, 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 SIFIs. 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.

The role of oversight in collecting derivatives data

Marc Hollanders[1]

1. Overview

Derivatives transactions are an important part of the financial markets. For this reason, the market infrastructures supporting the trading, clearing and settling of derivatives transactions, in particular trade repositories and central counterparties, play an important role in contributing to the transparency, the safety and the efficiency of derivatives markets. This, in turn, enhances the stability of the financial system.

This article, after a brief look at derivatives transactions and the market structure of the derivatives markets, will first discuss the risks in clearing and settling derivatives transactions, then look at the market infrastructure supporting derivatives markets, mention the new international standards for financial market infrastructure and discuss the role of oversight. It will then focus on the collection of data on derivatives markets, including the derivatives statistics published by the Bank for International Settlements (BIS).

2. Derivatives transactions

A derivatives transaction is a financial contract whose value depends on the values of one or more underlying reference assets, interest or exchange rates, or indices. In a schematic way, all derivatives can be divided into components of forward contracts, options or combinations of these. In a forward contract, one counterparty agrees to buy, and the other counterparty agrees to sell, a specific amount of an underlying asset at a specific price on a specific date in the future. In an option contract, the buyer pays a premium to the seller in return for the right, but not the obligation, to buy or sell a specific amount of the underlying asset at a specific price during a specific period or on a specific date.

Derivatives transactions can be settled in two ways: either through delivery of the reference asset or through cash settlement, ie a payment from one counterparty to the other that equals the loss (and gain to the other) from the change in the value of the contract between the transaction date and the settlement date. Certain contracts (such as interest rate swaps and credit default swaps) may also obligate counterparties to make periodic cash payments prior to the maturity (or expiration) date of the contract.

3. Market structure

Derivatives transactions can be traded over the counter and on exchanges. Over-the-counter (or OTC) derivatives are privately negotiated transactions that typically are executed electronically or by telephone. These contracts are offered internationally by dealers to end-users and other dealers. Brokers may be used to find counterparties, but the brokers are not themselves counterparties to the transactions. The dealers are primarily large international

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financial institutions – mostly banks but also some securities firms and insurance companies. End-users include, for example, banks, insurance companies, pension funds, hedge funds and non-financial corporations. Counterparty risk management and settlement occur on a bilateral basis.

Exchange-traded derivatives are transacted on a central trading floor or (in most cases) through an electronic trading system. They are then cleared and settled centrally through the exchange's clearing house, which acts as central counterparty (or CCP) to all the contracts. The economic terms of exchange-traded contracts – the underlying assets, amounts, delivery or expiration dates and the prices at which options can be exercised – are standardised. Counterparty risk management also has standardised features: clearing members are subject to common membership requirements and to margin (or collateral) requirements. The standardisation of the terms of the contracts tends to make exchange-traded contracts more liquid than OTC derivatives transactions.

4. Risks in clearing and settling derivative transactions

There are significant differences in the risk profiles of derivatives traded bilaterally and those traded on an exchange. We will look first at OTC derivatives and then at derivatives traded and settled in a centralised market with a CCP.

OTC derivatives

Counterparties to OTC derivatives transactions are subject to the same basic types of risk as counterparties to any other financial transactions: credit risk, liquidity risk, market risk, legal risk, operational risk and custody risk. Losses to OTC counterparties from these sources can, as seen in the recent financial crisis, be so severe as to pose systemic risks to financial markets and, more generally, the financial system.

Credit risk

Credit risk, or counterparty credit risk, is the risk of loss from default by the counterparty, typically as a consequence of its insolvency. Two types of credit risk can be distinguished: (i) replacement cost (sometimes called pre-settlement risk) – the loss from replacing open contracts with the defaulting counterparty; and (ii) settlement risk (also called principal risk) – the risk of loss on payments or deliveries from the defaulting counterparty.

Replacement cost risk

In the event that an OTC derivatives counterparty defaults before settlement, the non-defaulting counterparty would typically seek to close out each of its contracts with the defaulting counterparty and replace them with contracts on the same terms with another counterparty. The replacement cost risk is the risk that the non-defaulting counterparty will incur a loss in replacing the contract. Such a loss will occur only if, at the time of default, the OTC derivatives contract has a positive market value to the non-defaulting counterparty.

Settlement risk

Settlement risk is a concern only for those OTC derivatives contracts that provide for an exchange of payments (for example, most foreign exchange contracts) or for delivery of the reference asset in exchange for payment (for example, commodity forward contracts). Even for these types of contract, settlement risk can be mitigated if there is a payment-versus-payment or delivery-versus-payment mechanism for the currencies or reference asset in question. Thus, in practice, settlement risk is an issue primarily for certain physically settled

contracts. Where settlement risk exists, the potential loss in the event of a default of the counterparty equals the full principal value of the contract.

Liquidity risk

Liquidity risk is the risk that a counterparty will experience demands for funds (or collateral) that it cannot meet when due. In most respects, liquidity risks associated with OTC derivatives are in nature no different from liquidity risks associated with other obligations. In some circumstances OTC derivatives could give rise to significant liquidity pressures. For example, the fact that many OTC transactions are collateralised can be a potential source of liquidity demands: a significant decline in the value of an OTC derivatives portfolio could result in substantial demands for collateral and thus substantial liquidity pressures.

Market risk

Market risk is the risk of loss from adverse movements in the level or volatility of market prices of assets. Market risk can only be analysed in a meaningful way on a portfolio basis, taking into account offsetting positions in specific underlying risk factors (eg interest rates, exchange rates or commodity prices) and correlations among those risk factors.

Legal risk

Legal risk is the risk of loss because of the unexpected application of a law or regulation or because a contract cannot be enforced. A contract may be invalid or unenforceable for various reasons. For example, the counterparty or the counterparty's signatory lacks the capacity or authority to enter into the contract; or the documentation supporting a transaction could contain invalid terms or fails to meet local legal standards and may therefore be unenforceable in whole or in part.

Operational risk

Operational risk is the risk that deficiencies in information systems or internal controls could result in unexpected losses. Operational risk is inherent in any financial activity, but is especially significant in the case of OTC derivatives. Timely and accurate information is critical to the management of credit risks and market risks associated with OTC derivatives. However, the capture of data on OTC derivatives is often a manual process and therefore subject to error and delays.

Custody risk

Custody risk is the risk of loss of securities held with a custodian as a result of insolvency, negligence or fraudulent action by the custodian. In OTC derivatives transactions, custody risk arises principally under collateral agreements in which collateral taken is held by the counterparty receiving the collateral or by a third-party custodian.

Systemic risk

Systemic risk is the risk that the failure of a counterparty to meet its obligations when due will cause other counterparties to fail to meet their obligations when due. Of particular concern is the possibility that the resulting liquidity and credit problems could be so severe that the liquidity of key financial markets could be impaired or payment and settlement systems could be disrupted. Because OTC derivatives transactions are a major source of credit exposures between the largest global institutions, financial difficulties in one of these institutions could lead to shocks to the entire financial system.

Exchange-traded derivatives

Derivatives that are traded on an exchange are typically cleared through a CCP: a CCP interposes itself between two counterparties to a trade, becoming the buyer to every seller and the seller to every buyer. The exact risks that a CCP must manage depend on the specific terms of its contracts with its participants. Nevertheless, many CCPs face a common set of risks that must be managed effectively. There is the risk that participants will not settle obligations either when due or at any time thereafter (counterparty credit risk) or that participants will settle obligations late (liquidity risk).

If a commercial bank is used for money settlements between a CCP and its participants, failure of the bank could create credit and liquidity risks for the CCP (settlement bank risk). Other risks potentially arise from the taking of collateral (custody risk), the investment of clearing house funds or cash posted to meet margin requirements (investment risk), and deficiencies in systems and controls (operational risk). A CCP also faces the risk that the legal system will not support its rules and procedures, particularly in the event of a participant's default (legal risk). Though many of these risks apply equally to OTC derivatives, there are a few important differences, as explained below. Since market, legal and operational risk are similar in both cases, they are not mentioned again.

Credit risk

A CCP is exposed to the risk of loss from default by a participant. As before, credit risk has two dimensions: replacement cost risk and settlement risk.

If a participant were to default, a CCP typically would terminate the defaulter's contracts. To do so a CCP would enter the market and purchase or sell contracts identical to those held by the defaulting participant. The size of the loss (or gain) will depend on the volatility of the contract prices, the amount of time that has passed between trade dates and default, and the size of the positions being replaced. However, margin requirements (ie the posting of collateral to cover exposures) and the contributions to the default fund will usually limit losses in the event that a participant defaults. A CCP also faces settlement risk: potentially it could incur large credit exposures on settlement days when the full principal value of transactions is at risk.

Liquidity risk

Depending upon the terms of its contracts with its participants, a CCP may have an obligation to make a wide variety of payments. Since a CCP must continue operating and fulfil its payment obligations to non-defaulting participants on schedule, even if it faces one or more participant defaults or operational difficulties, a CCP is exposed to liquidity risk. A CCP has a range of resources it can use to fulfil its payment obligations. These include assets of the defaulting participant posted with the CCP as well as the CCP's own capital and possibly the assets of non-defaulting participants. But often these resources are non-cash assets. Such assets must be liquidated in order for a CCP to meet its obligations, and this process may be difficult or costly to complete in the time required.

Custody risk

Typically a CCP will manage its credit risk by requiring that participants post margin to cover their exposures. This generates custody risk. Similarly, if a CCP invests its capital in securities that are held at a custodian, custody risk will arise. The custodian may act negligently, commit fraud or become insolvent, resulting in the loss of the collateral.

Settlement bank risk

In addition to the risk associated with a counterparty's default, a CCP runs the risk that the bank providing cash accounts for money settlements with its participants may fail. This would create credit and liquidity pressures for a CCP, the size of which will be dependent upon the amounts flowing through the failed bank, the timing of the bank's failure, and the terms of the settlement agreement between a CCP and a settlement bank.

Investment risk

A CCP has resources such as equity and reserves that are typically invested in order to generate revenues. These funds are usually placed in very short-term bank deposits or securities. A CCP therefore faces credit and liquidity risks with respect to the banks or issuers of these securities. If a CCP has a programme to invest cash deposited as margin, a similar investment risk would arise.

5. Market infrastructure supporting derivatives markets

Trade repositories (TRs) and central counterparties (CCPs) are the main elements of the infrastructure underpinning both the exchange-traded and the OTC derivatives markets. They therefore play an important role in strengthening the core financial infrastructure for derivatives transactions. In addition to enhancing the safety, TRs and CCPs make important contributions to the transparency and the efficiency of derivatives markets.

Trade repositories

The role of trade repositories

A TR is a centralised registry that maintains an electronic database of the records of transaction data. They are a fairly new type of market infrastructure and have recently grown in importance, particularly in the OTC derivatives markets. By centralising information on outstanding transactions, they help to improve the transparency of the derivatives markets. A well designed TR provides an effective mechanism to collect and distribute market data to both the relevant authorities and the public. A TR could also engage in the management of trade life-cycle events and, provided that the records are standardised, could facilitate downstream trade processing services based on the records it maintains.

For exchange-traded derivatives, the transaction data is kept by the exchange. For OTC derivatives, however, the individual counterparties to a trade keep the records of the transaction themselves, often in proprietary systems. Unless, of course, both counterparties make use of a TR to maintain transaction data. Moreover, other entities providing services to market participants, such as prime brokers, trading platforms, custodians and CCPs, might also maintain transaction records.

Risk management

TRs play a key role in the post-trade infrastructure supporting the derivatives markets. Given this importance, the need for international standards applicable to TRs became clear a few years ago, when the Committee on Payment and Settlement Systems (CPSS) and the Technical Committee of the International Organization of Securities Commissions (IOSCO) decided to develop policy guidance for TRs. Their findings were published in May 2010 as a consultative report titled *Considerations for trade repositories in OTC derivatives markets*.

This report analyses the most important risks associated with TRs and gives a list of factors that should be considered by TRs in designing and operating their services. These factors are aimed at the function of keeping centralised records, whether this function is performed by a TR or by another service provider. The factors outlined in the report should also be considered by the relevant authorities, in particular central banks and market regulators, in overseeing and regulating TRs.

Central counterparties

The role of central counterparties

A CCP is a legal entity that interposes itself between the buyer and the seller. Trading is not affected by the presence of the CCP. When both sides of a trade are matched, the information is sent to the CCP for registration and the counterparties receive a notification. The trades are then entered into the CCP through a legally binding arrangement (such as novation), whereby one contract between two initial counterparties is replaced with two new contracts, one between each counterparty and the CCP. This process allows the CCP to perform multilateral netting of both exposures and payments.

Historically, CCP arrangements – most of them supporting exchange-traded products – have performed well: CCPs have made an important contribution to a reduction in risk. Thus, the idea of extending the use of CCPs to OTC derivatives markets has gained ground in recent years.

Risk management

A CCP's risk mitigation capacity is determined by two key elements. First, the parties using the CCP for their transactions have put capital into the CCP. Second, a CCP typically requires the posting of initial collateral to cover the potential future exposure of open contracts with each of its participants. More collateral will be needed for positions whose market value is more volatile. In addition, positions are marked to market at least daily and variation margin is paid and received by participants each day in the currency of the position.

A well designed CCP with appropriate risk management arrangements reduces the risks run by its participants. At the same time, however, there is a concentration of risks and responsibilities for risk management at the level of the CCP. This means that the effectiveness of the CCP's risk control and the adequacy of its financial resources are crucial for the safety of the financial market the infrastructure serves. For this reason, central banks and securities regulators have a strong interest in the risk management of CCPs. That is why the CPSS and the IOSCO Technical Committee published *Recommendations for central counterparties* in 2004. This report sets out 15 comprehensive and detailed standards for the risk management of a CCP. These recommendations, it should be mentioned, were essentially conceived for CCPs clearing exchange-traded derivatives.

Because of the nature of the OTC markets, ensuring that CCPs for OTC instruments are safe presents unique challenges in comparison with the existing CCPs for exchange-traded products. That is why the application of the 2004 Recommendations to CCPs for OTC derivatives involved a significant degree of interpretation and judgment. For this reason the CPSS and IOSCO published a consultative report, *Guidance on the application of the 2004 CPSS-IOSCO recommendations for central counterparties to OTC derivatives CCPs*, which was published in May 2010. The report analyses key issues that arise when CCPs clear OTC derivatives and it develops new guidance on how these CCPs should implement the 2004 recommendations.

6. New international standards for FMIs

In the beginning of 2010 the CPSS and IOSCO's Technical Committee launched a general review of the international standards for financial market infrastructures (FMIs). Though FMIs performed well during the recent financial crisis, events surrounding the crisis highlighted important lessons for effective risk management. These lessons, along with the experience gained by implementing the existing international standards, led to an update of the standards for FMIs. The resulting report, *Principles for financial market infrastructures*, was issued for public consultation in March 2011.

The standards in this new report harmonise and, where appropriate, strengthen the existing international standards for payment systems that are systemically important, central securities depositories, securities settlement systems, and central counterparties. The revised standards also incorporate the additional guidance for OTC derivatives CCPs and trade repositories that was released in 2010.

7. The role of oversight

Because TRs and CCPs are critical components of the financial markets, their soundness is crucial to maintaining financial stability, especially in times of high market stress. In order to ensure the safety of these systems, TRs and CCPs are subject to regulation, supervision and oversight by national authorities such as the central bank, the securities (or market) regulator and other relevant bodies. The division of responsibilities amongst these authorities depends to a large extent on the legal and institutional framework applicable in the country where the market infrastructure is based.

Oversight of FMIs is a central bank function that has the objective of promoting safety and efficiency. This is achieved by monitoring planned and existing systems, by assessing these systems against international standards (such as the above-mentioned Principles for FMIs) and by inducing change if the systems do not comply with those standards. For FMIs supporting securities markets (such as TRs and CCPs) this responsibility is shared with securities regulators.

8. Collecting data on derivatives markets

In order to effectively carry out their responsibilities to regulate, supervise and oversee, central banks and market regulators should have specific powers, in particular the ability to obtain information. Authorities should have appropriate powers to access information that enables them to understand and assess the FMI's activities, its risk management policy and its adherence to the relevant regulations and standards. Key sources of information include publicly available information, official system documentation, regular or ad hoc reporting on system activity, internal reports from board meetings and internal auditors, bilateral meetings and on-site inspections. Regular or ad hoc reporting is a particular useful source of information: it refers to reports on the daily volume and value of transactions, reports on the performance of the daily operations, results from stress tests and the scenarios and methodology used in estimating exposures.

It is worth mentioning that the recently published CPSS-IOSCO *Principles for financial market infrastructures* contain one principle on the disclosure of market data. Principle 24 states that a TR should provide timely and accurate data to relevant authorities and the public in line with their respective needs. The data should be comprehensive and sufficiently detailed in order to enhance market transparency and to support other public policy

objectives. Furthermore, a TR should have effective processes and procedures to provide data to relevant authorities to enable them to meet their respective regulatory mandates and legal responsibilities. Finally, the data should be provided in a format that permits it to be easily analysed.

In addition to this general overview concerning the collection of market data from FMIs, the sections below give some specific information on data gathering with respect to derivatives transactions. It focuses on FMIs that serve the derivatives markets and provides a few examples of TRs and CCPs. Finally, the role of the BIS in compiling and publishing derivatives statistics is mentioned.

Trade repositories

Today, the most important TR for OTC credit derivatives is the Trade Information Warehouse established by the Depository Trust & Clearing Corporation (DTCC). It provides almost complete coverage of outstanding standardised single- and multi-name credit default swaps (CDS) contracts worldwide. Less standardised CDS contracts are not covered. The Warehouse facilitates the processing of various lifecycle events, such as, for example, the quarterly payments that occur over the contractual lifetime of a CDS. DTCC publishes weekly information on notional amounts outstanding, by counterparty type, on both a gross (before netting) and net (after netting) basis for individual reference entities. This increases market transparency and provides useful data to the regulatory authorities on the markets and the positions of major traders.

There are also trade repositories for interest rate and equities derivatives: the OTC Derivatives Interest Rate Trade Reporting Repository (IR TRR) collects transaction data on interest rate derivatives from market participants and provides regulators with monthly reports summarising outstanding trade volumes and gross notionals as well as currency breakdowns and maturity profiles by product type.

Regarding equities derivatives, the Equity Derivatives Reporting Repository (EDRR) holds key position data, including product types, notional value, open trade positions, maturity and currency denomination for participants' transactions, as well as counterparty type. The service supports OTC equity derivatives products such as options; equity, dividend, variance and portfolio swaps; and contracts for difference. By aggregating and maintaining the data, EDRR prepares reports that keep market participants and regulators informed on the notional values of outstanding contracts and positions as well as other position-related information.

Central counterparties

There are many well established CCPs for exchange-traded derivatives. On their websites these CCPs, which are often called clearing houses, provide information to the general public on the clearing and settlement activity taking place through their infrastructure. In addition, they also provide detailed data to the regulatory authorities. It should be noted that the exchanges themselves also provide information on the trading activity taking place in the many products they offer, including derivatives.

The number of CCPs that clear OTC derivatives is limited. With one exception – SwapClear – all such CCPs were launched fairly recently. SwapClear, a CCP for interest rate swaps, was established in 1999 to reduce counterparty and operational risk and to economise on the use of collateral for the major inter-dealer swap traders. It initially provided clearing for plain vanilla interest rate swaps in a few major currencies. Since then, the range of products, currencies and maturities cleared has been expanded to include 14 currencies and 22 indices. The other CCPs of this type offer clearing services for interest rate swaps and credit default swaps.

BIS derivatives statistics

Semiannual OTC derivatives statistics

In June 1998 central banks of major financial centres started reporting to the BIS semiannual OTC derivatives statistics on forwards, swaps and options of foreign exchange, interest rate, equity and commodity derivatives. As of end-June 2004, the BIS also releases statistics on concentration measures, going back to June 1998. The data include concentration measures for foreign exchange, interest rate and equity-linked derivatives. Finally, as of end-December 2004, the BIS releases semiannual data on credit default swaps including notional amounts outstanding and gross market values for single- and multi-name instruments. Additional information on CDS by counterparty, sector and rating has been made available as of December 2005. As of end-June 2010 more granular information is published on CDS counterparties (eg CCPs and hedge funds) as well as on index products in the multi-name CDS instruments.

The objective of the semiannual OTC derivatives markets statistics is to obtain comprehensive and internationally consistent information on the size and structure of derivatives markets in the major industrialised countries. They provide data on notional amounts outstanding and gross market values and permit the evolution of particular market segments to be monitored. The data are updated and published every six months and are available in electronic form on the BIS website (www.bis.org).

Statistics on exchange traded derivatives

The statistics on exchange-traded derivatives, compiled since 1986 and derived from various market sources, mainly cover turnover and open interest in both number of contracts and notional amounts. The value added by the BIS consists of aggregating highly detailed contract-level information according to specific standard criteria such as market risk categories, instrument types and location of trade. In addition, the BIS also calculates the notional amounts of the contracts which, in the case of the equity instruments, require tracking and maintaining a growing list of stock indexes.

The main purpose of the exchange traded derivatives statistics is to obtain extensive information of the size, structure and development of futures and options markets so as to complement and reinforce other more traditional sets of financial statistics compiled by the BIS. The data are updated and published every quarter and are available in electronic form on the BIS website. Further information on the BIS framework for monitoring financial derivatives can be found in von Kleist (2011).

9. Conclusion

This article presents an overview of the infrastructure supporting derivatives markets, with special emphasis on TRs and CCPs, and the risks occurring in the clearing and settlement of derivatives transactions. It discusses the international standards for financial market infrastructures that have been developed recently and the role these infrastructures play in collecting statistical data on derivatives markets.

In collecting derivatives data as part of their oversight and regulatory responsibilities, central banks and securities regulators can obtain a more complete picture of the derivatives market, and in particular with respect to the size and the nature of the risk exposures of the major market participants. This allows the authorities to monitor the risks and, when necessary, to take preventive measures to mitigate the risks run by the financial sector. In gathering and using statistical data, authorities can therefore make a significant contribution to maintaining and enhancing the stability of the financial markets, and more widely, the financial system.

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Development of derivatives statistics: challenges for the Bank of Japan

Satoru Hagino[1]

1. Introduction

Since the activities of the Bank of Japan have been diversified, different departments have engaged in the development of derivatives statistics at the Bank. Specifically, the following departments have played key roles: Financial Markets, Financial System and Bank Examination, International, and Research and Statistics.

The directions in the development of derivatives statistics have varied. The Financial Markets and Financial System and Bank Examination departments have been interested in derivatives data on a consolidated basis for monitoring the financial market and financial institutions. The International and Research and Statistics departments have focused on derivatives data on a residency basis for the compilation of sectoral accounts statistics.

The Financial Markets Department has compiled BIS derivatives statistics semiannually and every three years for market monitoring and macroprudential purposes. The department has strengthened the data for credit default swaps (CDS).

The Financial System and Bank Examination Department collects derivatives data as a way of monitoring the financial system and individual banks. For microprudential purposes, it collects data on exposures of derivatives transactions by major counterparties.

The International Department compiles settlements data of financial derivatives for the balance of payments statistics (BOP) and their market value data for the annual International Investment Position (IIP). These statistics represent flows and positions of resident entities vis-à-vis nonresidents and classify residents into public, banks, and other sectors.

The Research and Statistics Department compiles flow, stock, and revaluation data of financial derivatives for the flow of funds accounts (FFA). In the FFA, residents are classified into financial institutions, nonfinancial corporations, general government, households, and nonprofit institutions serving household sectors. Nonresidents are represented as the overseas sector.

2. Regular Derivatives Market Statistics in Japan

The Regular Derivatives Market Statistics consist of data on consolidated outstanding derivatives positions, measured in notional amounts as well as on gross positive and negative market values, compiled based on data from reporting institutions.

2-A. History of statistics development

The central banks of the Group of Ten countries[2] and the Bank for International Settlements (BIS) worked together to introduce a new statistical survey on the global derivatives markets

[1] The views expressed herein are those of the author, and should not be attributed to the Bank of Japan.

based on the *Proposals for Improving Global Derivatives Market Statistics* (Yoshikuni Report) published by the BIS in July 1996.

The BIS has implemented the survey on the global derivatives markets through two reporting frameworks: (1) the Regular Derivatives Market Statistics, a set of semiannual derivatives statistics on the amounts outstanding of derivatives transactions covering only major dealers, first conducted at the end of June 1998, and (2) the Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity, a survey on the amounts of foreign exchange and derivatives turnover and outstanding, which covers a wider range of dealers.

For the Regular Derivatives Market Statistics, 59 financial institutions worldwide take part voluntarily and report semiannually their derivatives positions to the central banks of their respective countries. Of those, 18 institutions[3] are based in Japan and report to the Bank of Japan.

The Regular Derivatives Market Statistics show the breakdown of the aggregated derivatives positions classified into four risk categories: foreign exchange, interest rates, equity prices, and commodity prices (on a U.S. dollar basis). With regard to each of these risk categories, the statistics give further details by type of instrument, currency, counterparty, and maturity. Since the release of the end-December 2004 statistics, a breakdown of credit default swaps has been included. In addition, the Bank of Japan has been making public data on credit derivatives based on data from reporting institutions in Japan since the release of the end-June 1999 statistics.

The Financial Markets Department has cooperated with the BIS and other central banks on developing further the Regular Derivatives Market Statistics. Specifically, it strengthened CDS data in June 2010 by creating an item for index CDS. It is considering adding the central counterparty sector in addition to the current sectors of reporting dealers, other financial institutions (banks and securities firms, insurance firms, SPVs, other), nonfinancial customers, trust accounts, and others.

2-B. Recent development of Japan's derivatives market

According to the Regular Derivatives Market Statistics, the notional amounts outstanding of derivatives transactions by major Japanese financial institutions at end-June 2010 were equivalent to 38.0 trillion U.S. dollars for over-the-counter (OTC) contracts[4] and 3.8 trillion U.S. dollars for exchange-traded contracts, an increase of 10.4 percent and a decrease of 4.6 percent, respectively, from the previous survey as of end-December 2009.

A breakdown by risk category shows that the amount outstanding of single currency interest rate (IR) contracts was 33.1 trillion U.S. dollars for OTC contracts, representing an increase of 9.5 percent. That of foreign exchange (FX) contracts was 4.7 trillion U.S. dollars, an increase of 16.6 percent. Equity contracts increased by 19.1 percent to 180.5 billion U.S. dollars. Commodity contracts decreased by 0.1 percent to 39.1 billion U.S. dollars.

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[2] Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom, and the United States.

[3] They are Aozora Bank, Ltd., The Bank of Tokyo-Mitsubishi UFJ, Ltd., The Chuo Mitsui Trust and Banking Co., Ltd., Daiwa Securities Capital Markets Co. Ltd., Japan Post Bank Co., Ltd., Mitsubishi UFJ Securities Co., Ltd., Mitsubishi UFJ Trust and Banking Corporation, Mizuho Bank, Ltd., Mizuho Corporate Bank, Ltd., Mizuho Securities.

[4] The figures of total OTC contracts do not include CDS and other credit derivatives.

A breakdown by instrument type shows that IR swaps continued to represent the largest share of OTC contracts, accounting for 72.8 percent. In terms of exchange-traded contracts, IR futures accounted for a dominant share of 81.4 percent.

From end-December 2009 to end-June 2010, the gross positive and negative market values of OTC derivatives contracts increased by 29.6 percent to 698.2 billion U.S. dollars, and by 29.3 percent to 653.8 billion U.S. dollars, respectively.

After taking account of bilateral netting agreements, the positive market value was 198.4 billion U.S. dollars (up 15.6 percent), and the negative market value was 154.0 billion U.S. dollars (up 11.4 percent). The ratio of the net positive market value to the notional amount outstanding was 0.5 percent.

With regard to IR contracts of OTC derivatives, the U.S. dollar and the Japanese yen taken together continue to be dominant, with a market share of 79.2 percent of notional amounts, as compared with 79.6 percent at end-December 2009. The Japanese yen accounted for 56.9 percent, decreasing from 58.8 percent at end-December 2009. As for FX contracts of OTC derivatives, the U.S. dollar and the Japanese yen taken together accounted for 81.9, decreasing from 83.9, percent.

Transactions between reporting dealers[5] accounted for 79.9 percent and 64.2 percent of notional amounts outstanding in OTC IR and FX contracts, respectively.

Among OTC contracts, IR derivatives with remaining maturities of over one year and up to five years continued to occupy the largest share, at 45.5 percent. With respect to FX derivatives, contracts with remaining maturities of over one year and up to five years continued to be dominant, accounting for 47.3 percent.

The notional amount outstanding of CDS was 1,110.4 billion U.S. dollars. By counterparty, transactions between reporting dealers continued to be dominant, accounting for 89.0 percent of CDS contracts. By remaining maturity, contracts with remaining maturities of over one year and up to five years were dominant at 64.9 percent, followed by those with remaining maturities of over five years, accounting for 25.0 percent of notional amounts outstanding.

3. Japan's BOP, IIP AND FFA

Information on financial derivative flows and positions of domestic financial institutions and nonfinancial sectors is important for financial stability as well as sectoral analysis. Recently, some local governments such as municipalities, and some NPIs such as universities have suffered significant losses on financial derivatives. Source data for their derivatives positions are not yet fully available.

The central government's derivatives position became available and was incorporated into the FFA in 2010. Meanwhile, the BOP has recorded flow data for the public sector, and the IIP has recorded position data for the public sector. This typically represents the differences in the source data of the FFA, BOP, and IIP. Although these sectoral accounts have a common presentation framework – based on the 1993 System of National Accounts (SNA) – they complement one another other in practice due to the differences in the source data.

[5] Transactions between major Japanese institutions and institutions that participated in the statistics released by the BIS.

3-A. BOP and IIP

Japan's BOP currently represents financial derivatives transactions, covering realized profits or loss on options, futures and forward agreements, warrants, and currency swaps. Interest accruing on interest-rate swaps is also recorded under this component. Source data are based on reports on payments/receipts, and on reports concerning derivatives transactions and securities transactions. Japan's IIP represents financial derivatives positions (market value), except for swaps. Interest-rate swaps were classified as property income rather than financial instruments under the original version of the 1993 SNA, which was then revised so that interest-rate swaps could be treated as financial instruments.

The sources of derivatives data in the BOP and IIP are based on reports on derivatives transactions from financial corporations as well as payments and receipts from nonfinancial corporations, individuals, and other entities (991 is the specific code for financial derivatives). The report on derivatives transactions contains items for monthly flows and annual positions data for options as well as for futures and forward transactions, while it only contains an item for monthly flows for swap transactions. Thus, in future updates, an item for positions of swap transactions needs to be added and position data need to be collected on a quarterly basis so that the quarterly IIP can include derivatives data.

3-B. FFA

The FFA represents flows and positions of all types of financial derivatives except for positions of exchange-traded derivatives in Japan, which are measured and settled on a daily basis. In the FFA, flows are further disaggregated into transactions and revaluations. Although settlement payments of derivatives' market value and initial payments of option premia of the option-type instruments are recorded as transactions, these are posted as reconciliation amounts together with the change in market price, due to the limitations of source data. While payments for derivatives between residents and nonresidents are available from the BOP, they are not posted as transactions in the FFA so that the treatment of transactions among residents and that between residents and nonresidents could be consistent with each other.

The FFA uses a variety of methods to estimate derivatives flows and positions, drawing on various source data and many assumptions. Specifically, the estimation is conducted in such a manner that amounts outstanding of domestically licensed banks are allocated proportionally to insurance and pension funds, securities investment trusts, nonbanks, securities companies, private nonfinancial corporations, and overseas (to specify the holders of assets/liabilities in banks), assuming that OTC derivatives transactions are carried out mainly via domestically licensed banks.

Holding amounts of domestically licensed banks are based on the financial statements and the results of the Regular Derivatives Market Statistics in Japan, while the holding amounts of insurance companies, nonbanks, securities companies, and the central government are based on the financial statements of individual institutions. Holding amounts of other financial institutions and overseas are estimated using the outstanding ratio by counterparties acquired from the Central Bank Survey of Foreign Exchange and Derivatives Market Activity. Residuals are regarded as the portion held by private nonfinancial institutions. The amount outstanding of foreign exchange margin transactions is estimated using the financial statements of major foreign exchange margin trading firms, etc., and is allocated to households and private nonfinancial corporations.

Exchange-traded derivatives are based on the financial statements of the institutions stated above and on exchange market data.[6] The amount outstanding in this category is evaluated at the market price. Settlements of market value that cause changes in cash should be posted as transaction flows, but due to the limitations of the source data, they are not posted for forward and option types, and all term-on-term differences in amounts outstanding are posted as reconciliation amounts. However, until the second quarter of 2000, only the term-on-term difference in the acquisition cost of the option premium (the outstanding amount not reflected in the fluctuation of the market price) is posted as a transaction flow.

One shortcoming of the source data is related to its scope. For OTC derivatives, data organized on a residency basis (in which the transaction parties are classified as residents/nonresidents) are unavailable, while the only available source data are those on a consolidated basis (in which overseas sectors are consolidated into the sectors in Japan, where transaction parties are not classified as residents or nonresidents). Accordingly, the resident/nonresident ratio from the Central Bank Survey of Foreign Exchange and Derivatives Market Activity is used as a benchmark.

Another shortcoming relates to the frequency of the source data. Financial statement data are used to estimate the amounts outstanding of forward- and option-type instruments. In many cases, however, only half-yearly data (end of March and September) are available. For the unavailable quarters (end of June and December), data are estimated based on changes in the total amount at market value and changes in contractual obligations related to financial derivatives transactions.

4. Concluding remarks

We would like to present some concluding remarks. The compiling experience of the Bank of Japan suggests three efficient ways for introducing new statistics on derivatives transactions.

First, the latest Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity, conducted in 2010, shows that the aggregated share of both the top 10 and the top 20 institutions in terms of amounts of derivatives transactions had continued to rise since the previous survey to reach more than 90 percent in Japan. This implies that for collecting derivatives data, central bankers should have close contact with major financial institutions in their countries.

Second, when preparing reporting forms from financial institutions, it should be noted that transactions of financial derivatives in statistical terms always accompany cash movements, and thus differ from holding gains/losses in accounting terms. Also, counterparties need to be classified according to analytical needs. In recognition of these caveats, central bankers should communicate well with their respondents.

Third, the most efficient way of developing derivatives and other statistics is to learn about the practices of other central banks. As a neighboring central bank, the Bank of Japan is always willing to cooperate with the People's Bank of China.

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Session 4

Other types of financial innovations and data requirements for monitoring them

Papers:

Statistics on securities issuance and holdings
Branimir Gruić and Paul Van den Bergh, Bank for International Settlements

Developing database on securities holders information: the case of Japan
Yoshiko Sato, Bank of Japan

Statistics on securities issuance and holdings

Branimir Gruić and Paul Van den Bergh[1, 2]

Introduction

Financial intermediaries play a significant role in the financial markets. Direct financing through securities markets is trying to catch up. The aim of this paper is to briefly present recent initiatives in the field of internationally comparable securities statistics and illustrate one possible way for central banks to set up a compilation system for securities statistics.

The paper is organised as follows: first, we describe financial intermediation and the importance of financial markets and direct financing. FSB-IMF Recommendation #7 will be discussed in the following sections, followed by the framework for securities statistics defined in the BIS-ECB-IMF Handbook on Securities Statistics. Both securities issues and holdings statistics will be addressed. Next, we will illustrate the importance of financial innovations and the impact they have on securities statistics. Finally, the compilation of securities statistics is briefly outlined, as well as recent developments in the field of BIS securities statistics.

The basics

Financial intermediation can be defined as the process of managing liquidity in the economy, in such a way that savings from surplus institutions are allocated to those with a deficit. Depending on whether this process involves other specialised institutions called financial intermediaries (ie banks), two major types of financial intermediation are defined: indirect and direct.

Financial intermediaries are major players in the financial markets. They raise funds in the form of deposits or by issuing securities[3] and lend not only to large, well known corporations, but also to small companies. The latter have difficulty in individually accessing financial markets and raising money simply because, in these markets, they do not have a borrowing history (that would enable other market players to assess their risks).

To meet the needs of small companies, banks must rely on information. In effect, financial intermediaries are institutions that can overcome information problems by focusing on the performance history of their clients that is available in their banking books. As long as this information is unavailable to other market players, financial markets cannot be perfect because, without good information, it is hard to make screening decisions about the most profitable, least risky companies. Thus, information asymmetry clearly supports the existence of financial intermediaries, although it is not the only reason for their existence.

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[3] Beside banks, which are the most important players in the financial markets, other financial intermediaries (such as investment companies, insurance companies, and investment or pension funds) can provide similar support to businesses and meet their need for financing.

Payments transmission is a crucial service provided by financial intermediaries. This relies on transaction technology that speeds the processing of payments and the transfer of funds to or from clients' accounts,[4] ultimately contributing to liquidity in the economy. The technology also provides economies of scale as it can be assumed that the existence of financial intermediaries helps to lower the costs of individual transactions.[5]

In essence, banks are responsible not only for providing liquidity to the economy but also for transforming one type of risk or financial instrument (ie short-term deposits) into another (ie long-term loans). This process can and will lead to serious problems if banks are not able to meet their liabilities, which in turn means that state authorities (ie the central bank) must regulate and supervise the business of institutions whose performance can affect the economy's overall health.

Theories of financial intermediation,[6] as briefly presented above, justify the existence of financial intermediaries on the grounds of imperfect markets (information asymmetries), transaction costs (ie for payments) and the need to enable smooth operation of financial markets (regulatory and supervisory authorities). Although indirect financing costs more than direct financing, it is possible to conclude that the modern world still counts on financial intermediation[7] although direct financing is catching up (Graph 1).

In direct financing, surplus and deficit economic units negotiate and provide finance directly, without the involvement of classic financial intermediaries.[8] This also means that, in line with classical theory, markets are able to assess risks of the issuers,[9] and that the costs of financing such operations should be relatively lower than for loans.

In this environment, banks not only receive deposits and extend loans but also arrange securities issues for others or for their own needs. Other intermediaries, such as institutional investors (ie investment funds), are positioned on the other (lender) side of the market, and raise funds (like any other borrower) by issuing units or other forms of obligations; any surplus of the funds thus raised and invested in different financial market products will end up in bank deposits. In that sense, even participants in a mature, well developed financial market will still make use of the classic products offered by financial intermediaries.

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4 A very good example of complexity and efficiency of these systems is the real-time gross settlement (RTGS) system for large-value interbank funds transfers. CPSS (1997) notes that RTGS systems can offer a powerful mechanism for limiting settlement and systemic risks in the interbank settlement process, because they can effect final settlement of individual funds transfers on a continuous basis during the processing day.

5 It is worth noting that the same principle can be applied to other services offered by financial intermediaries, ie the cost of valuation of assets that could be used as collateral.

6 This relates to classical theories. Other theories focus on different factors, eg Hakenes (2002) on risk transformation.

7 Scholtens (2000) argues that as developments in information technology, deregulation, deepening of financial markets etc tend to reduce transaction costs and informational asymmetries, financial intermediation theory should come to the conclusion that intermediation becomes useless.

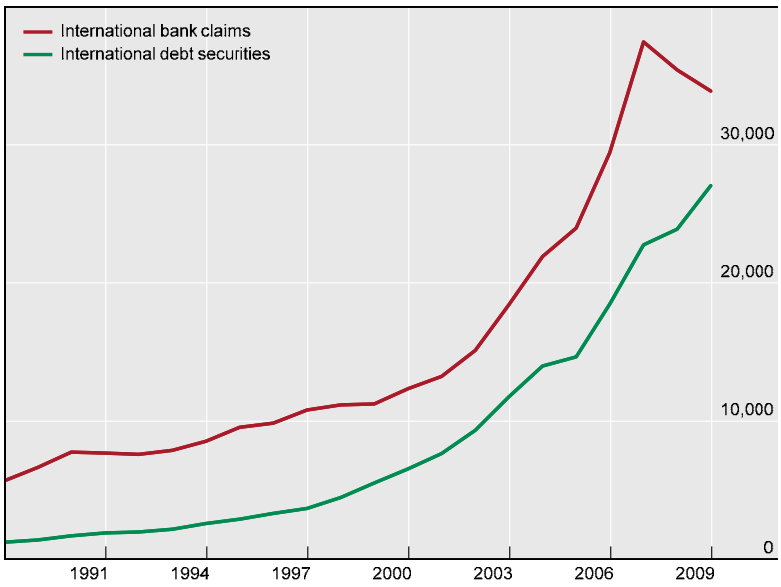
8 There is still a need for specific intermediaries that provide infrastructure, such as stock exchanges and central depository agencies.

9 Although development of the internet and the amount of freely available information can certainly contribute to the development of different financial products, the recent crisis confirmed that the quality of risk management is not highly correlated with the amount of available information.

Graph 1

Evolution of international bank claims and international debt securities

Amounts outstanding, in billions of US dollars



Source: BIS.

Sound data are needed to understand financial markets The BIS international banking statistics[10] provide data on outstanding amounts of cross-border or foreign currencies assets and liabilities of the reporting banks. Another set of statistics compiled by the BIS covers outstanding amounts of securities issued on international markets.[11] The importance of securities issued on international markets as compared to cross-border financing provided by internationally active banks is illustrated in Graph 1.

The information

The central bank regularly monitors developments in banks' balance sheets and accordingly uses monetary instruments to influence or fine-tune the economy. The background information needed for these decisions can be found in statistical data, provided that a sound statistical information system exists. Part of that system must deal with securities statistics.

Securities[12] comprise part of the balance sheets of both issuers (liabilities) and investors (assets). A national numbering agency allocates an International Securities Identification

[10] Available at http://www.bis.org/statistics/bankstats.htm.

[11] Available at http://www.bis.org/statistics/secstats.htm.

[12] According to the BIS-ECB-IMF *Handbook on Securities Statistics*, securities are negotiable financial instruments. Negotiability means they can be traded on an organised exchanges or over the counter. Debt securities are those for which issuer is obliged to pay a specified amount of principal and interest to the owner. Shares and investment funds units are not debt securities because they represent either claims on the residual value of a corporation after the claims of all creditors have been met or represent a share in an investment portfolio.

Number[13] (ISIN) to each security. The security is also registered with the Central Securities Depository (CSD) and rated by rating agencies. Investors can choose to keep their securities with custodians. All in all, data on securities issued can be found in books and registers of various market players, meaning that the reporting system for securities statistics can grow complex. If it includes different groups of market players, overlaps can result that need to be resolved during the final compilation of sound aggregates. Compilation of statistics is cost-intensive, not least because most data sources are not designed to feed into statistical systems.[14]

Different countries have different regulations for listing, trading and settlement. As local markets have varying degrees of sophistication, international comparisons are far from straightforward. Only a common framework for presenting statistics in a standardised way can improve data comparability. Such a framework must include meaningful breakdowns of data to encourage users to analyse national, regional or global markets, and it must also present in a clear and simple way different financial products, the issuing activity of national sectors and the relative importance of issuance in foreign currencies on local markets.

Recent global financial crises have confirmed the existence of information gaps. The G20 Governors and Ministers of Finance have requested the International Monetary Fund (IMF) and Financial Stability Board (FSB) to make recommendations to address these gaps. This has resulted in 20 recommendations that require either the development of conceptual/statistical frameworks or improvements in the current collection process. Recommendation #7 defined the need for improvement in securities statistics[15] and the further development of the *Handbook for Securities Statistics* (Handbook).[16]

Statistics on issuance and holdings of debt securities

The Handbook is divided into two parts. The first part covers issuance of debt securities,[17] while the second part deals with holdings of securities.[18]

Debt securities issue statistics are classified primarily by issuing sector and market of issue. Standard sectors, such as non-financial corporations, financial corporations, general government, and households,[19] are defined in the system of national accounts (SNA) and additional subsectors can be introduced. The activity of resident issuers is covered in different markets so that the importance of international markets for a given country can be

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13 The ISO 6166 standard defines the structure of an ISIN. This 12-character alpha-numeric code uniquely identifies a security for trading and settlement.

14 The best way to obtain securities statistics is to develop a security-by-security system (SBS) that will retain data granularity (issuer, investor, issue currency, nominal amount, market price, discount, coupon rate etc) at the level of each individual security. Such a system should not suffer from the overlaps that are common to aggregated data sources. We will return to the topic of SBS later in this article.

15 Recommendation #7: Central banks and, where relevant, statistical offices, particularly those of the G20 economies, to participate in the BIS data collection on securities and contribute to the further development of the BIS-ECB-IMF *Handbook on Securities Statistics (Handbook)*. The Working Group on Securities Databases to develop and implement a communications strategy for the *Handbook*.

16 Developed by the Working Group on Securities Statistics and sponsored by the BIS, ECB and IMF with contributions from central banks.

17 This part was sponsored by the BIS. It was released in June 2009.

18 This part was sponsored by the ECB. It was released in May 2010.

19 The households sector also includes non-profit institutions serving households.

assessed. The same approach exists when it comes to non-resident issuers and their activity on local markets: by extending the sectoral breakdown to the rest of the world, it is possible to arrive at the size of the local market for each country or region.

Further classifications provide additional information that is especially relevant to the analysis of the level of development of national markets. It could be argued that more mature markets provide a greater variety of instruments, or that the same type of instrument could have different properties with respect to eg currency of denomination or type of interest rate. Special consideration can be given to financial innovations, so that users of statistics can track how markets differ in the significance of securitisation. In addition, the classification of securities according to their ratings could potentially also reveal how markets value issuers from one region to another.

The Handbook covers all of these characteristics and sets out a stylised presentation table which is the basis for the compilation of internationally comparable securities issuance statistics (Figure 1).

Figure 1

Standard conceptual framework for debt securities issues

Location of issue	Market, currency, maturity and interest rate		Sectors: Non-financial corporations	Financial corporations	General government	Households and NPISH	Residents	Non-residents	All issuers
Location of issue	Domestic market	Currency							
		Maturity							
		Interest rate							
	International market	Currency							
		Maturity							
		Interest rate							
	All markets	Currency							
		Maturity							
		Interest rate							
			Residence of issuer						

Source: Handbook, Part 1.

Stocks of outstanding amounts change over time. As it is possible simultaneously to issue securities and to repay existing ones, transaction statistics[20] can contribute significantly to understanding developments on securities markets. Exchange rate changes also affect outstanding amounts when reported in a numeraire currency and should be distinguished from real transaction values. Similar considerations apply to the effect of price changes[21] or other changes in stocks.[22]

[20] Transactions are just one type of flow. Generally, it is possible to define the transaction as a change in the ownership of the underlying assets. This approach is common in the field of macroeconomic statistics and is further discussed in the SNA and other guidelines (such as the Balance of Payments Manual).

[21] As securities issues statistics are based on the liabilities of issuers, it makes sense to use face values. It is also possible to think in terms of the overall debt of certain sectors, which means that accrued interest should

The above list of security properties is not exhaustive but it can provide a detailed background for better understanding of national markets, their weight in regional or global markets, or the size and importance of the global securities market. In additional to stocks, available flows data can clearly show how the position of a country is changing over time and why. Such data can show whether there is a change in activity on the primary financial market (gross and net issues), or how good was the choice of issue currency (with respect to exchange rate revaluations). Comparison of market and nominal values of outstanding amounts can indicate how investors see the riskiness of a certain country and its economic sectors. Finally, data on accrued interest can help to define the pressure put on issuers by the servicing of issued debt securities.

The second part of the Handbook covers holders of securities, ie investors or lenders. Here too there is an important distinction between residents and non-residents. It also shows how securities statistics can provide a complete picture of a country (or region) by combining issuance and holdings of debt securities. Ultimately, such a framework enables the creation of a "from who to whom" matrix (Figure 2).

Concepts, definitions and classifications in holdings statistics must be identical to those applied to securities issues statistics.[23] While concepts such as residence (of the holder and of the issuer) together with breakdowns by currency of issue, maturity or type of interest rate could be applied, it is not analytically useful to include the market of issue in securities holdings statistics .

Figure 2

Residence of holder approach in debt securities statistics

Issuer \ Holder		Residents					Non-residents	All holders
		Non-financial corporations	Financial corporations	General government	Households and NPISH	All residents		
Residents	Currency							
	Maturity							
	Interest rate							
Non-residents	Currency							
	Maturity							
	Interest rate							
All issuers	Currency							
	Maturity							
	Interest rate							

Source: Handbook, Part 2.

be added (nominal value). Finally, the SNA (and IIP) could make use of securities issue statistics if the latter are also compiled using market values.

[22] Other changes (in volume) cover changes in outstanding amounts that can not be explained as transactions or revaluations. Examples include a change in reporting population (ie the addition of a new reporter that has issued previously should not be treated as an increase in real economic activity, ie in the same way as net issues) or a re-sectorisation of issuers.

[23] Flows in holdings statistics will cover the same types of changes (transactions, revaluations, other changes in volume) and should always be based on market valuation.

Special attention in holdings statistics should be given to consolidation and valuation principles. Consolidation can be performed on different levels, but the one that could be applied at sectoral level can blur comparability between securities issues and securities holdings statistics because assets and liabilities of institutional units of the same sector would cancel out and the two sets of statistics would no longer be comparable. That is why the comparability of two statistics can be achieved only by providing the statistics on an unconsolidated basis.

Valuation principles are also a challenge to consistent measurement. Investors can hold their securities in different portfolios: if securities are held to maturity, they will be valued differently (at nominal value) to those bought for trading (at market value). As a result, the aggregate of outstanding securities on the investors' assets side of the balance sheet (which is a data source for holdings statistics) will be a combination of different valuation principles,[24] meaning that it can not be easily compared with the aggregate value in securities issues statistics, even when the latter are marked to market.[25] The only solution to this problem is that the statistician should apply the specific valuation principles that are needed for the production of specific statistics, ie market valuation for securities holdings statistics and nominal for issues.[26] This is closely linked to the SBS reporting systems.

Finally, securities can be bought and sold outright. They will end up on market participants' balance sheets, so that the identification of all market participants and the information on the revaluation of balance sheet positions could ultimately provide comprehensive securities statistics. The following section shows that the production of statistics from such a system could be challenging unless one has a precise knowledge of financial innovations.

Financial innovations and securities statistics

The report by the US government's Financial Crisis and Inquiry Commission[27] states that the total value of mortgage-backed securities issued in the US market between 2001 and 2006 was $13.4 trillion. These securities are based on a pool of mortgage loans usually issued by specialised corporations in a process called securitisation.[28]

The Handbook establishes that securitisation results in the creation of debt securities for which coupon or principal payments (or both) are backed by specified financial or non-financial assets or future income streams. In other words, a company (or its affiliate) groups financial assets (such as housing loans from a bank), issues securities backed by those assets, and sells them to investors who receive returns funded by the original assets (principal and interest payments from the housing loans).[29]

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[24] The Handbook, Part 2, states that market values should be used for holdings statistics.

[25] Ideally, both sets of statistics would be compiled using exactly the same valuation principle with complete coverage of the markets (financial instruments and market players). This implies that both issues and holdings should be revalued to market values, which is extremely difficult if the reporting system is based on aggregate (balance sheet) data.

[26] The Handbook recommends that debt securities should be presented on a market value and nominal-value basis.

[27] Final Report of the National Commission on the Causes of the Financial and Economic Crisis in the United States.

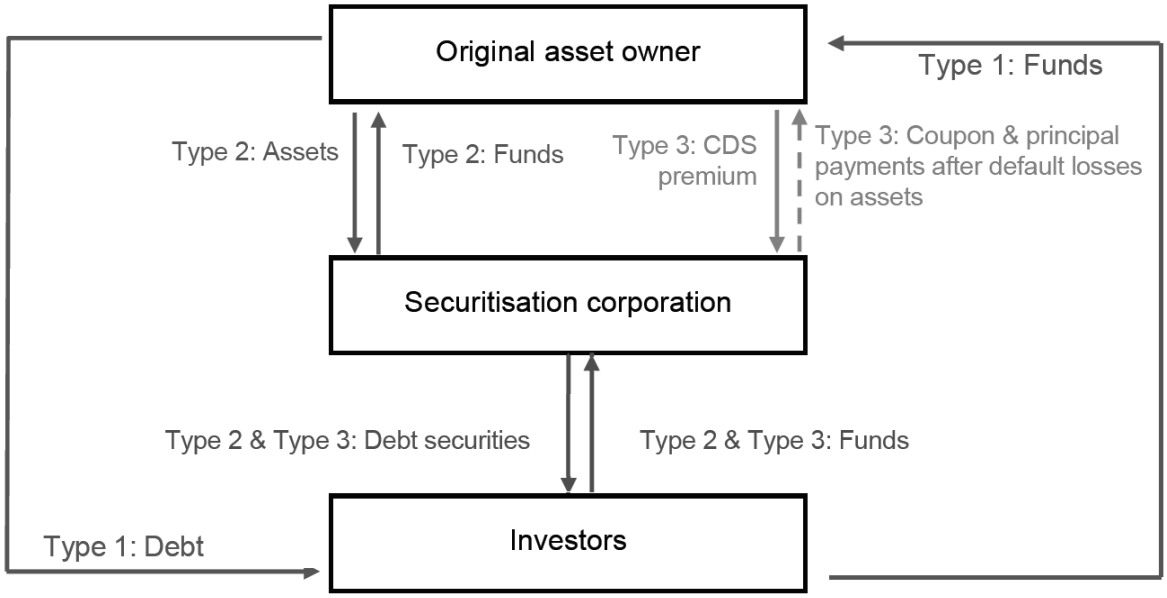
[28] Woodford (2010) argues that non-bank financial intermediaries have become increasingly important as sources of credit, particularly as a result of the growing popularity of securitisation.

[29] There are more players in the whole process. Rating agencies rate securities. Investors rely on these ratings when assessing the riskiness of different securities meaning that the rating companies can substantially

It is important that in this process, the original assets may (i) stay on the issuer's balance sheet, (ii) be transferred to a securitisation corporation, or (iii) are only affected by the transfer of the credit risk of the original assets, either through a securitisation corporation (also known as a special purpose vehicle or SPV) or through the direct issuance of debt securities by the original asset owner (Figure 3).[30]

Figure 3

Securitisation process



Source: Handbook, Part 1.

The main problem in securities issues statistics is to correctly allocate securities to the issuing sectors. The first two types of securitisation do not pose problems in that sense, while the third type requires more attention.

Transfer of credit risk can be achieved by buying protection against possible default losses. Financial derivatives or, more precisely, credit default swaps (CDS)[31] provide such insurance[32] and are not classified as securities.

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influence investors' decisions. In the case of securitisation, understanding of the process and the quality of the underlying assets are crucial in determining the riskiness of the new security. Finally, information technologies are necessary to access and analyse large amounts of data (especially when securitisation is based on large pool of loans whose borrowers differ significantly in quality).

The FCIC summarises that in the mid-2000s "with these pieces in place – banks that wanted to shed assets and transfer risk, investors ready to put their money to work, securities firms poised to earn fees, rating agencies ready to expand, and information technology capable of handling the job – the [US] securitization market exploded".

30 Depending on the technique, securitisation is defined as (i) on-balance sheet, (ii) true-sale or (iii) synthetic securitisation.

31 SNA (2008) defines a CDS as a financial derivative whose primary purpose is to trade credit default risk.

32 Albertazzi (2011) notes that securitisation involves a transfer of credit risk and is therefore similar to an insurance contract.

SPVs issue securities based on assets that stay on the original owner's balance sheet. The original owner pays a premium to the corporation to protect against the default of the original debtor(s). This premium is combined with the interest on proceeds from the securities issued to provide coupon payments to investors. In case of the insured event (default of the original asset), investors suffer losses and the protection buyer (original asset owner) is compensated by the protection seller (SPV).

Securities statistics will only recognise the creation of securities issued either by the original owner or by the securitisation corporation. Depending on the arrangement, the Handbook mentions that securitisation results in different types of securities, ie asset-backed securities (ABS), asset-backed commercial papers (ABCP), covered bonds, credit-linked notes, or collateralized debt obligations (CDO).[33]

Reverse transactions are another example of financial innovation that need to be taken into account. They involve the sale (the change of legal ownership) of securities with a commitment to repurchase them (or other similar securities) on a specified date at a pre-agreed price. Apart from plain repos, securities lending and sell/buy-backs are also considered to be reverse transactions.[34]

A problematical case is mentioned in the Handbook: the securities provided under reverse transactions are treated as not having changed economic ownership because the lender still receives the income yielded by the security (since coupon payments and dividends are passed on in the form of a "manufactured dividend") and remains subject to the risks or benefits of any change in the price of the security. The exchange of funds under reverse transactions does not involve the issuance of any new debt securities. Holding statistics, however, can suffer from double reporting if an indirect or mixed system of collecting the data is applied by national authorities because (eg) custodian accounts, based on legal changes of ownership, will record "new" securities on the client's account while, at the same time, the same securities will stay in the books of the original owner.

Solutions to the various problems mentioned in the previous sections depend mainly on the choice of securities statistics compilation system.

Compilation of securities statistics

The quality of data sources ultimately determines the quality of statistical reports. At the same time, even if individual data sources are of high quality, a deficient compilation process can result in final statistical output of lower quality.

As already noted, data on securities are part of the balance sheets of issuers and holders/investors. It is therefore possible to create a direct reporting system in which data on securities issues and holdings are provided directly by the respective entities. Financial intermediaries play a crucial role in this, since they are typically large issuers of securities as well as holders. The latter they do on their own behalf or as custodians for clients[35]. Normally, issuers value their liabilities on a nominal basis, while investors use market values. The direct reporting system for securities statistics will probably rely on both sources, meaning that there is a high probability of overlaps in the data when only aggregate amounts

[33] This list is not exhaustive. Further information can be found in the Handbook, Part 1 (p 17).

[34] Further information on these instruments can be found in the Handbook, Part 2 (p 21).

[35] In securities statistics, these investments should be attributed to the ultimate investors' institutional sector, not to custodians.

are reported. Introduction of breakdowns (the need for more granular data) in such systems will usually require cooperation with specialised financial intermediaries.

An alternative reporting system relies on Central Securities Depositories (CSDs) and custodians which keep records of securities (issued and held in the case of CSD, held only in case of custodians) and can provide reports on the current ownership of issued securities. Their records can be used if the authorities request them to identify investors (not necessarily as individuals, but rather as resident/non-resident or by some other basic sectoral breakdown) or if the issuers are to report their liabilities using market values. However, in most cases, CSD and custodian accounts mask the real, ultimate, investors in their records, meaning that the statistical breakdowns needed by authorities can only be partially provided. Custodians can also contribute their data (without disclosing individual investors), but again there will be a problem of double reporting (this time for both CSD and custodians) unless detailed information is provided. The advantage of indirect reporting systems is that they reduce the overall reporting burden due to a much lower number of reporters than in direct systems.

Some features of securities (eg coupons) require up-to-date records in the CSD in order to distribute returns to investors.[36] Also, since the main feature of securities is negotiability, this needs to be supported by the market infrastructure. That is why statisticians see intermediaries as a reliable, if not the best, solution when it comes to data sources.[37]

Direct reporting by issuers and investors, indirect reporting by intermediaries, or a mixed system of direct and indirect reporting could be organised on an aggregate level or on an individual security level (SBS). Both approaches (aggregate and micro level data) have benefits and costs.

Compilers (and analysts) would probably benefit more from a SBS system because they can fully control classifications (of securities and issuers), have enough flexibility to organise the data in the best way to meet users' needs, can compile both stocks and flows using the valuation principle needed, or complement issuance statistics with data on holdings and thus provide the full set of securities statistics. On the other side, a SBS system is costly (requiring skilled staff, IT support, paid access to private data sources) and complex to manage. Databases can grow significantly, implying a need for a data warehouse, and as a minimum a register of resident companies has to be available.[38] In order to reduce the direct financial cost of acquiring data and instead of buying market databases covering individual securities,[39] authorities can develop their own system by relying on SBS data from CSD and

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[36] Trading, or change of ownership, need not be carried out only on exchanges. In some cases, especially when natural persons are considered (ie a resident sells securities to a nonresident), the change of ownership will simply be registered with a public notary and the transaction will not be reflected in exchange records. On the other hand, if the new investors are interested in receiving coupons, the proof of change of ownership will be provided to the CSD meaning that the CSD still has full market coverage.

[37] This is only applicable to securities issued on local markets and holdings of resident securities by resident investors because a resident CSD can only cover the domestic market.

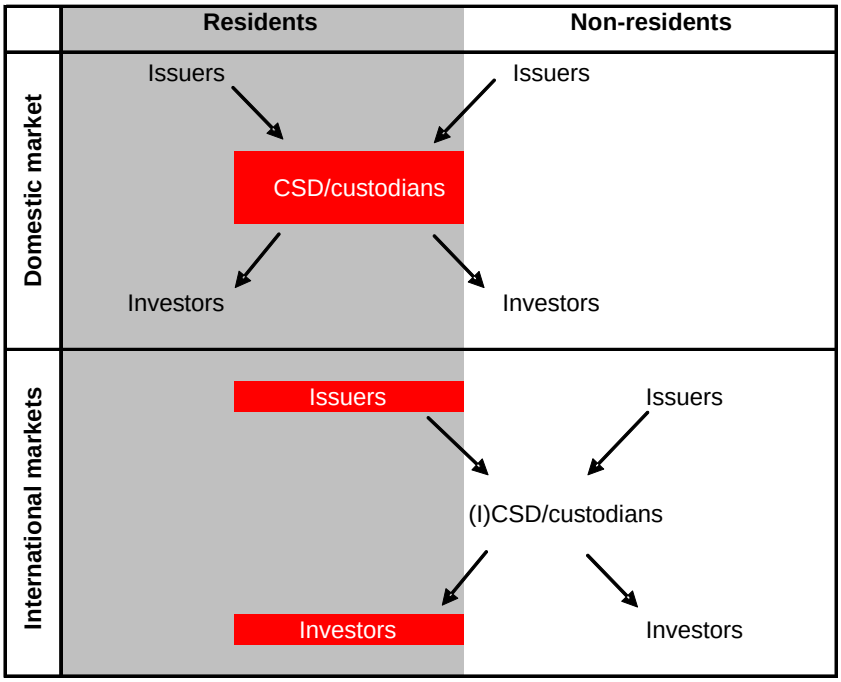
[38] A register of institutional units includes basic data on all companies and related jurisdictional aspects (such as ownership, main activities, or address), together with sector identification.

[39] Such data sources can be extremely useful for securities issues statistics because providers such as Thomson Reuters, or Dealogic can provide a large number of properties of individual securities (issuer, market price, nominal value, outstanding amount, currency, coupons etc). On the other hand, individual data providers cannot cover the whole universe of securities, which implies a need to combine several data providers (the ECB's Central Securities Database is a good example of this type of solution). Finally, not all securities are covered perfectly and in most cases data cleaning will be a major task for statisticians.

custodian records. These can be combined with the data on issues and investments in foreign markets. Figure 4 illustrates such a hybrid reporting system.

Figure 4

Example of hybrid reporting system for securities statistics



Arrows indicate the flows of securities and data reporters are marked in red. Individual securities issued on the domestic market, either by residents or non-residents, as well as investment in those securities by resident or non-resident investors, are registered and reported by resident CSD (indirect reporting). Resident issues on international markets will be directly reported by resident issuers, while investments in securities traded in international markets (which also include securities issued by residents on foreign markets) will be reported by resident investors (direct reporting). The authorities will thus be able to identify securities, issuers and investors in individual securities all together.[40] The final step in compilation of securities statistics is the production of global aggregates. International organisations provide global and country-comparable statistics in the field of their expertise. The BIS statistics covers securities issues.[41]

BIS (2009) notes that the origins of its activities in the field of international financial statistics go back to the mid-1960s and the emergence of the Eurocurrency markets. As a result of the

[40] Identification of individual non-resident issuers on foreign markets is not needed for statistics: an allocation between domestic and foreign portfolio investments is all that is needed.

[41] Data on holdings, in particular cross-border holdings, are part of the Coordinated Portfolio Investment Survey coordinated and compiled by the IMF. Since the CPIS is quite comprehensive in terms of geographical coverage and includes a breakdown by country, it can provide both a creditor and debtor view of cross-border portfolio holdings. Indeed, holdings by a country's residents of debt securities issued by resident sectors of other countries (creditor) can provide a mirror view of holdings by residents of other countries of debt securities issued by resident sectors (debtor). CPIS data are available at http://cpis.imf.org/.

increasing role of the international securities markets in global financial intermediation,[42] the BIS was mandated in 1986 to collect and publish statistics on international debt securities.[43]

In 2007 the Committee on the Global Financial System (CGFS) issued a report on financial stability and local currency bond markets. The report was illustrated with additional data on bond markets collected through an ad hoc survey with the assistance of central banks. It was recognised that the lack of detailed, internationally comparable and timely data was a matter of concern. To remedy this, it was suggested that:

- central banks covered by the BIS domestic debt securities (DDS) statistics should work with the BIS to regularly update part of the information collected for the preparation of the report;
- the BIS should explore how the collection of data in its DDS database could be improved and expanded on the basis of the existing collection framework (ie from available national sources);
- the Working Group on Securities Databases (WGSD), a joint undertaking of the BIS, IMF and ECB, should reconvene to promote the collection of timely data on debt securities issues in support of financial stability monitoring (it was noted that the segregation of domestic and international bond data had outlived its usefulness and that a number of other proposed breakdowns would be more relevant).

As a follow-up to G20 recommendations (Recommendation #7 is concerned with securities statistics), the BIS took the lead in the WGSD to sponsor the first part of the Handbook covering debt securities issues. A number of concrete reporting templates have been proposed as a follow-up to the recommendations, which cover all the breakdowns suggested by the CGFS. All central banks currently included in the BIS DDS have been contacted to report their national data on the basis of the G20-approved tables in an automated way through the BIS Data Bank. Contacts have been nominated by all central banks and G20 central banks are close to reporting the initial high-level data[44] that are needed in order to improve the data published on the BIS website. The new statistics will thus focus on providing national aggregates for securities issued on all markets, as well as those issued on international markets.[45]

Conclusion

Banks and other financial intermediaries play a crucial role in financial markets directly or on behalf of their customers. While banks' own activities are well covered in statistics compiled by local authorities and international organisations (such as the BIS international banking statistics), statistics on direct access to financing by non-banks is less well covered, especially when it comes to internationally comparable statistics.

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[42] CGFS, Recent innovations in international banking (Cross Report), 1986, http://www.bis.org/publ/ecsc01.htm.

[43] Originally based on official sources (such as the OECD and the Bank of England data), this database is today based on commercial databases. Statistics on announced international equity issues (by nationality of issuer) and statistics on domestic debt securities (by residence of issuer) are also part of the current BIS securities statistics (these are based on commercial databases and publicly available information from central banks, respectively).

[44] For the euro area countries the BIS is collaborating with the ECB which has already introduced consistent reporting on debt securities issues for individual euro area countries and for the euro area as a whole.

[45] Users can calculate securities issued on domestic market as residual category.

Recent financial crises have confirmed the existence of information gaps. G20 IMF/FSB recommendations call for the improvement in various fields of financial statistics, including the one on securities. As a result, the BIS, IMF and ECB took the lead in the WGSD to produce the Handbook on Securities Statistics in which the common framework has been defined so that internationally comparable securities statistics, based on national data sources, can be produced.

Although the identification of market participants is key in designing a proper statistical information system, special attention should be given to the choice of aggregate or micro-level data sources, treatment of financial innovations and data collection methods. We showed that a combined indirect (based on central securities depository and custodians) and direct (needed for international issues and investments abroad) reporting system could give a solid foundation for various statistical breakdowns, based on the Handbook recommendations.

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Developing database on securities holders information: the case of Japan

Yoshiko Sato[1]

1. Introduction

Identifying the exact holder or the holding sector of securities is always one of the most challenging tasks for statistical compilers.

In macroeconomic statistics such as the flow of funds accounts, a balance sheet provides useful information on the holding amount of securities, but aggregating balance sheets does not always provide a full picture of the economy. Balance sheets of non-financial corporations and some of other financial institutions, for example, are not always available, and households do not make balance sheets.

Under such constraints, some central banks and statistical authorities have started projects to build up securities databases to store information on securities holders. The ECB (2009) explains its intention to establish a single authoritative data source—the centralized securities database—to meet the needs of the ECB itself. The BIS, ECB, and IMF (2010) argue the holding side of securities statistics. This kind of movement is gaining ground especially after the recent financial crisis where securitized products incurred a considerable amount of financial losses to their holders, whereby risks are transmitted in the financial system. The Financial Stability Board (2009) advocates the importance of knowing where risks actually lie across institutions.

This paper introduces the Bank of Japan's recent exploration of the central securities depository (CSD) data as a statistical source of securities holders' information. This paper is organized as follows. Section 2 explains the features of the CSD in Japan. Section 3 introduces the recent achievement as a result of applying the CSD data to the flow of funds accounts statistics. Section 4 argues general challenges pertaining to CSD data as a statistical source to identify final holders of securities, sometimes referring to the result of the survey the Bank of Japan conducted for seven OECD countries in April and May 2010. Section 5 concludes.

2. Features of the CSD in Japan

CSD data in general are considered to have at least two advantages in data collection. One is the centralization of information, which is elaborated in this section, and the other is a wider universe than that of the administratively collected data. Administratively collected data are correct, powerful, and quick in order to see the conditions of a specific sector, but they are apparently weak in the sense that a data gap may exist outside the scope of authorities.

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The views expressed here are those of the author and do not necessarily represent the views of the Bank of Japan. The author is responsible for any errors and omissions.

2.A The one and only platform of book-entry transfers except for central government bonds

The book-entry transfer services of securities except for central government bonds are provided by one CSD in Japan, which is the Japan Securities Depository Center, Inc. (JASDEC). The book-entry transfer services of central government bonds are provided by the Bank of Japan. This paper discusses the former.

The JASDEC is a privately owned stock company licensed under the Act on Transfer of Bonds, Shares, etc ("the Law" hereafter). It operates the book-entry transfer system for general securities such as corporate bonds, stocks, commercial paper, investment trusts. Since the JASDEC is the one and only platform of book-entry transfers for those securities, the information is centralized to this system on a security-by-security basis, whereby it has the potential for collective gathering of securities holdings information.

The Law stipulates its book-entry transfer business but does not require data supply for statistics. So far there is no data exchange contract between the JASDEC and the central bank or statistical authorities.

The book-entry transfer system has been in operation since 2002. The rate of use of the system in CP transaction is almost 100%. That of other securities transactions is thought to be close to 100%.

2.B Chain of accounts

The JASDEC system takes a cascade structure of accounts. As illustrated in the attached Chart, an investor who wants to make a transaction opens a customer account at either a direct account management institution (DAMI) or at an indirect account management institution (IAMI). When there is a deal, the transactional information is transferred from the institution at which the investor holds an account to the institution keeping an account of the investor's transactional counterparty. If the investor indicated as "Participant (i)" in the Chart sells securities to the investor indicated as "Participant G," the information on the deal goes through institutions E, A, the JASDEC, and finally to C where sold securities are entered into the book at the customer account of G (Case 1). Similarly, if "Participant (i)" sells securities to "Participant (ii), the transactional information is processed within E. IAMI E transfers the transactional amount from Participant (i)'s account to Participant (ii)'s account, and the transaction is completed within E (Case 2).

The DAMI or IAMI—usually banks or securities companies—can also hold their own accounts. Those accounts are called self accounts which are separated from customer accounts in this system. As of May 2010, there are 89 DAMI and 407 IAMI in the book-entry transfer system for corporate bonds.

2.C Finality of ownership (direct system vs. indirect system)

One of the features which is different from the CSDs of some other countries is the finality of the ownership of securities. In the JASDEC system, neither DAMI nor IAMI takes over the ownership of transacted securities at customer accounts, even though the process itself occurs in chains of accounts held by such intermediate institutions. Kanda (2009) describes the system as the "direct system." An account management institution just keeps an investor account and provides book-entry transfer services. The legal ownership of securities remains with the investor and does not move to any other institution.

As opposed to the direct system, there are some countries in which an account management institution legally holds assets and an investor keeps equitable interest to these assets, or a securities entitlement is moved from an investor to an account management institution. In this indirect system, it might be difficult to detect the final holder of securities.

2.D Security by security

All data are handled on an individual issue basis in the book-entry transfer system. Information available for each issue includes the name of issue, name of issuer, face value, maturity, etc. The current outstanding amount is also available. For example, with regard to corporate bonds whose data are required to be open to the public, one can obtain detailed information by searching the JASDEC website by using the name of the issue or the ISIN code as an identifier. This security by security nature will enable compilers to sort data in accordance with the System of National Accounts and it also has the potential to be used for multi-purpose securities databases.

3. Application of CSD data to flow of funds accounts

The Bank of Japan started discussing the possible use of data as a statistical source with the JASDEC in late 2009. This was primarily motivated by the need to secure a more accurate source data for the flow of funds accounts statistics. Some statistical improvements have been made to the data revision of the statistics in March 2010 thanks to efforts by the JASDEC to respond to the Bank of Japan's inquiry on data definition. Some of these improvements are summarized as follows.

3.A ABCP

Asset-backed commercial papers (ABCP), a part of structured-financing instruments, had no reliable data source before the revision. Figures for the ABCP used to be estimated by assuming that they were part of other structured-financing instruments (Sato [2009]). Through the aforementioned process of discussions on the data, we confirmed that some data released by the JASDEC were consistent with our ABCP definition and decided to use them as new source data. As a result, the market size of the ABCP was more accurately reflected in the flow of funds accounts statistics.

3.B Local government bonds

The information on the outstanding amount of local government bonds had not been centralized. Before the dematerialization started in 2006, the total outstanding amount had been estimated based on registered bonds. There were problems in the frequency of the data, which was once a year, and in the existence of non-registered bonds (held in certificate) of which the amount had not been deemed negligible.

As the dematerialization proceeded, a majority of local government bonds shifted from registered bonds to those in the book-entry transfer system. Since the system is open on the web everyday and the data are stored security by security, we are able to confirm whether each issue is within the definition of our statistics at any date. Further, we successfully found out that the amount of non-registered bonds still exists but not as significant as to make estimation impossible. By conducting a series of examinations, we then concluded that the CSD's aggregate data were the most centralized and reliable primary data source at present to describe the total market size of local government bonds.

3.C Privately placed asset-backed securities

Although we have improved the quality of the ABCP, the remaining part of structured-financing instruments such as privately placed asset-backed securities are still under examination. Classification of these issues by type of collateral (e.g. financial assets or real

estates) is required to decide the transaction item, either securitized products or another kind of corporate bonds.

We expect further improvement of the flow of funds accounts statistics by incorporating information about privately placed asset-backed securities from CSD in March 2011.

4. Challenges for statistical development of CSD data

While CSD data have a distinct advantage in data collection because of its electronically processed centralized system, there are things to overcome for the development of the data as a source of final holders.

In this section, we argue the general challenges pertaining to CSD data as a statistical source to identify final holders of securities. We sometimes refer to the result of the survey that the Bank of Japan conducted in April and May 2010 to ask central banks and statistical authorities whether they use CSD data for compiling financial statistics. Seven countries (the U.S., the U.K., Australia, Germany, Spain, Chile, and Canada) responded to the survey. The result of the survey is summarized in the Table.

4.A Cascade structure of accounts

The most important reason why it is difficult to identify final holders from CSD data is a practical one that exists in a cascade structure of accounts. The transactional information is transferred from one institution to another as explained in 2-B. However, detailed information on an investor such as the sector in which it is statistically classified is held only by the account management institution at which the investor holds the account. In other words, detailed information on the investors is decentralized among account management institutions in the book-entry transfer system. Participants of the system know the name, characteristics and the amount of individual securities in the accounts they offer, but they do not have information about the ultimate owners of securities in case the account is a customer account. For instance, the CSD and DAMI, which are located upstream in the chain structure, do not know the change of ownership of the securities when a transaction is completed within the IAMI, as seen in Case 2 in section 2-B. Therefore, for statistical purposes, compilers should take another measure to obtain the entire market information.

Most countries have access to supplementary source data other than CSD in order to overcome the cascade account structure problem. In countries that appear to have an indirect system and it is deemed to be difficult to detect final holders, CSD data is either selectively used or not used for compilation at all. In the U.S., CSD data are used along with private vendor data for bonds and stocks issued by non-financial corporate businesses. The amount of asset-backed securities issued is measured as the assets removed from the balance sheet of originators. CSD data are used selectively for ABCP because they cover 100 percent of the market. Then the amount of ABCP is used to calculate the amount of asset-backed corporate bonds by deducting it from the total amount of asset-backed securities. In the UK, the CSD data are used as part of a quality assurance process but not for data compilation. Instead, data collected from London based issuing and paying agents are used for published securities issues statistics.

According to the results of the BOJ survey, which are shown in the table of CSD data usage in financial statistics, even in the countries that appear to have a direct system, data given by intermediate institutions are also used for financial statistics. In Spain, for Balance of Payments and International Investment Position, the CSD data are used for debt securities issued by residents and held by non-residents. The data incorporates the country of residency of the first-known counterpart but not the final holder. If there is a resident custodian between non-resident and CSD, it is the resident custodian who has the

information and CSD data do not cover the transaction. The information provided by the resident custodians is also used, on an aggregated basis, to identify the holdings of securities by non-financial corporations and by households. In Germany, the CSD is one of about 2,000 reporting agents.

In Chile, Banco Central de Chile does not currently use information given by CSD for the compilation of yearly financial accounts statistics. Nevertheless, it is working on a project related to quarterly financial accounts, where CSD data will be used intensively, including the securities holders' information.

In Japan, one of the challenges in using CSD data is to obtain supplementary information about customer accounts in the DAMI. At present, accounts of which the JASDEC manages the outstanding amount are basically limited to those set up within the JASDEC itself, as accounts for A, B, and C illustrated in the Chart. Ideally, the data should cover all the participants of the book-entry transfer system including both the DAMI and the IAMI. Most major financial institutions participate in the system as DAMIs. If the owners' information on securities in DAMIs' customer account becomes available with the cooperation of JASDEC and DAMIs, the information can be applied to the composition of customer accounts in the IAMI to estimate the amount of each type of securities held by each sector. The estimation could be conducted with certain accuracy because all DAMIs and IAMIs are registered at JASDEC and it is known that the chain structure does not extend to more than a few layers.

4.B Confidentiality of customer accounts

The other reason why it is difficult to get accurate information is the confidentiality of customer accounts. Even if the cascade account structure problem is technically solved, the confidentiality problem remains. There are self accounts and customer accounts as explained in 2-B. We can identify, in our direct system, relatively easily whether an account held by an account management institution is a customer account or a self account. But detailed information on a customer, which is necessary for compiling statistics, is usually hard to obtain. It is partly because custodians or account management institutions are commonly required to keep the accounts confidential under contracts with customers, which makes them reluctant to provide customer information.

In order to overcome the confidentiality problem, central banks or statistical authorities will need a contract with CSD or with custodians that states they will receive just aggregate data and will not share individual data. In the U.S., the Federal Reserve receives data from the CSD based on a contract with a confidentially clause that says it cannot share data of individual firms. From a statistical point of view, compilers do not need firm level information. They just need aggregate data classified according to institutional categories of holders of securities. Such data will not need to be security by security as long as they are correctly reported.

4.C Cooperation with CSD and with securities-related industry

The third factor is the cooperation with CSD and with securities-related industry. According to our survey, all of the three countries using CSD data (the U.S., Australia, and Chile) are confirmed to have a contract or an agreement with CSD in obtaining data, implying that the securities-related industry agrees to using CSD data in principle. Germany and Spain go further; they have official central bank regulations that stipulate a mandatory data collection scheme. Therefore, it seems that there is a general understanding toward the statistical value of CSD data in the economy.

Also in Japan, it is understood that the development of financial and securities statistics is an important issue and will contribute to the growth of the securities market. Based on such an understanding, a conference was held in late 2009—the Japan Securities Dealers

Association was the organizer—with participants such as the members of securities-related industry; the Bank of Japan also participated as an observer. Participants argued that the availability of additional CSD data could increase the understanding on securities market.

5. Concluding remark

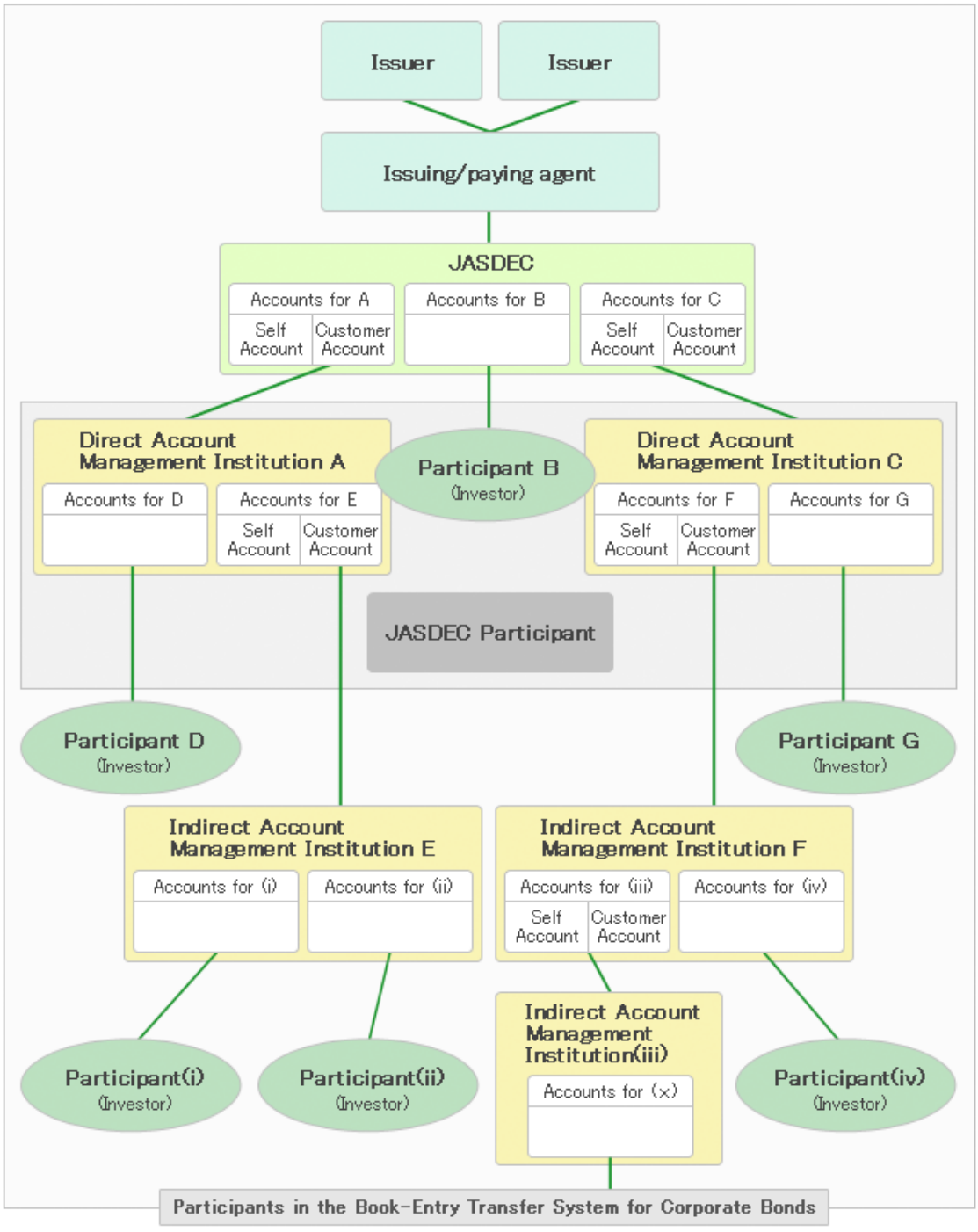
This paper has introduced the Bank of Japan's recent exploration of the CSD data as a statistical source of securities holders' information. The CSD in Japan has several features suitable for data collection: the one and only platform for book-entry; finality of ownership; and the security by security nature. Through communication with the CSD, we have achieved statistical improvement in our flow of funds accounts statistics mainly for the market size—the ABCP and local government bonds—and we can expect further improvement by incorporating privately placed asset-backed securities to the CSD data next year.

While CSD data has a distinct advantage in data collection because of its electronically processed centralized system, there are things to overcome for the development of the data as a source of final holders. General challenges are: the cascade structure of accounts; confidentiality of customer accounts; cooperation with CSD and securities-related industry.

Approaches to data gaps considered upon the recent financial crisis should relate closely to the possibility of developing a wider and more reliable source of information. Although there are many challenges, CSD data will continue to be a strong candidate in shedding light on sectors such as households, non-financial corporations, or some other financial institutions.

Chart

Accounts structure of the JASDEC



Source: JASDEC

http://www.jasdec.com/en/system/sb/outline/image/index.html

Table. CSD data usage in financial statistics

	Respondent	CSD Data usage	Holders' information	Coverage	Contract/agreement	Data used other than CSD (i.e. custodians)
U.S.	Federal Reserve	○ 1)	×	Low (ABS) High (ABCP)	○	
U.K.	Bank of England	×	-	-	-	○ (London based issuing and paying agents)
Australia	Australian Bureau of Statistics	○	×	Low (voluntary registration)	○	○
Canada	Statistics Canada	×	-	-	-	○
Germany	Deutsche Bundesbank	○	△ (Not in all cases final holders)	Low	○	○
Spain	Banco de España	○	△ (debt securities issued by residents and held by non-residents)	Low (If between the non-resident and the CSD there is a resident custodian, it is the latter who declares.)	○	○ (custodians, used to identify the holdings of securities by Non-financial corporations and by Households.)
Chile	Banco Central de Chile	× → ○ 2)	- → ○	—	- → ○	
Japan	Bank of Japan	○	× → ○ (e.g. Local government bonds held by non-residents) 3)	High	×	×

Notes: 1) CSD data is used for bonds and stocks issued by non-financial corporate businesses along with other private vendor data. CSD data gives inadequate coverage for asset-backed bonds (probably less than 20 percent of the market), while CSD data on asset-backed CP is 100 percent of the market.

2) Currently, the Banco Central de Chile does not use the information given from the CSD for the compilation of yearly financial accounts statistics. Nevertheless, it is working in a project of quarterly financial accounts, where CSD data will be used intensively, including the securities holders' information.

3) It is identifiable by aggregating the amount of the tax exempt accounts which are specially allowed for non-residents.

Source: OECD Working Party on Financial Statistics - Workshop on Securitisation, 27-28 May 2010, Madrid Spain, updated by the author based on additional information obtained at the workshop

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Closing ceremony

PBC-IFC workshop on "Data requirements for monitoring derivatives transactions"

Papers:

Observations on the PBC seminar on data requirements for monitoring derivatives transactions
Guanglei Song, Industrial and Commercial Bank of China (ICBC)

Comments on joint PBC-IFC workshop on "Data requirements for monitoring derivatives transactions"
Hong Hu, Safe - State Administration of Foreign Exchange

Comments on joint PBC-IFC workshop on "Data requirements for monitoring derivatives transactions"
Zhu Jiang, PBoC - Chengdu Branch of People's Bank of China

Observations on the PBC seminar on data requirements for monitoring derivatives transactions

Guanglei Song[1]

It is my great honor to stand here today to share my experience at this conference with all of you, our leaders from the People's Bank of China and relevant ministries, my colleagues from the Zhengzhou training school and financial institutions. Derivatives transactions, generally known as the blasting fuse of this crisis, have become one of the hottest topics in the post-financial crisis era. And regulators and financial institutions also pay special attention to derivatives transactions in risk management. So this international seminar held by the PBC is very necessary, and it has benefited us a lot, especially for domestic financial institutions.

I want to demonstrate 3 points based on the content of this seminar:

First of all, the experts explicitly explained what derivatives transactions are. Compared with other seminars or training events, this time the experts were more concentrated on the conceptual framework, from its basic definition, classification, and counterparties to securities issuance. For example, three experts explained the definition of derivatives from different angles, including its essence and key risk points, which helped us understand it better than before. Meanwhile, the professional attitude and dedication of the experts were quite impressive to us, and please allow me to say thanks to them all. Derivatives are among the most complicated financial instruments, but with the help of the experts, we have increased our understanding of them.

Secondly, this seminar has widened our horizon about derivatives, and we have all gained a deeper understanding of derivatives transactions; for example, how this kind of transaction functions, whether there are globally defined criteria or not, and how such criteria work. This seminar has provided us with perfect answers to the questions above. The recent financial crisis provided enough proof of the existence of global financial integration. It is very wise that the experts accurately captured this trend and emphasized the importance of building international standards for derivatives transactions. The specialists from the IMF introduced the latest revised version of BPM6 and showed us the methods and rules through a case study, which really impressed me; the experts of the Bank for International Settlements explicitly demonstrated the BIS's monitoring function with respect to derivatives transaction data; Mr. Kleist also especially compared the BIS data framework to BPM6, which helped us clearly understand the differences between them; the expert from the French central bank, despite his tiring journey, gave us an excellent speech on derivatives transaction information based on accounting systems, and through his speech we not only learned how to collect data from accounting systems, but also gained a deep understanding of IAS 39, which was considered the cornerstone of financial accounting. In short, all the speeches were well prepared, so that we obtained authoritative and valuable information.

Thirdly, this seminar has given us the opportunity to share experiences with derivatives transaction statistics with others. The Chilean and Japanese experts introduced their derivatives transaction data collection systems and provided us with a lot of useful methods, which illuminated us greatly. These experiences will help domestic commercial banks improve their capacity to collect information on derivatives transaction and are also of great

[1] Industrial and Commercial Bank of China (ICBC)

value in risk management. The expert from the HKMA analyzed the system of derivatives transactions very closely, including the future, risk points, and procedure of derivatives transactions.

During this seminar, everything was well organized, and we were enlightened a lot, which is a feeling shared by all the participants; in addition to the results about derivatives, I still have some personal perspectives to share with you.

Firstly, digestion is more important than eating; how to digest the knowledge we learned from this seminar is very important. With the help of the PBC, we got the precious opportunity to attend such a high-quality seminar with many top-level experts, and we all benefited a lot. The next thing we should do is to carry it out. One Chinese proverb goes, “Gear one’s study to practical use”. My next job is to put the new ideas learned through this seminar into practice, in accordance with the requirements of derivatives transaction data at the ICBC, where I work; in addition, I will prepare the fundamentals of derivatives statistics and automatic data collection; above all, to pick up the data sources out of thousands of business systems is a matter of great urgency.

Secondly, statistics is a language, and we should popularize “mandarin” instead of various “dialects”. The topic of this seminar is derivatives transaction data, and whatever we do is to popularize a worldwide data standard as a kind of “mandarin” instead of various “dialects”. Nowadays, derivatives transaction in China are still under development and there is a long way to go, which makes China’s derivatives transaction data not as popular as other countries’, just like a kind of “dialect”. The trend of global financial integration has created an efficient worldwide market, and it’s inevitable that China should follow the trend of the development of derivatives as soon as possible. By then, everything will change, including the competitors, marketing environment, etc. For this reason, our “language” of derivatives data has to be more normative and international, which is the very aim of this seminar. As practitioners in China’s financial industry, we should not only know our local practices, but also keep abreast of international rules. And we ought to take an active part in international financial statistics and offer various proposals and suggestions for the development of China’s derivatives transaction statistics reform.

Last but not least, I would like to share my personal understanding of data statistics: data are life. Every datasheet is not as simple as it looks. It requires successive operations, including data searching, data sorting, data inputting, etc. On the one hand, no one should try to damage the data, which is very hard to collect, and we must cherish it; on the other hand, we should try our best to improve the data quality and ensure the accuracy and authenticity of the data. This also reminds me of our daily work. The statistics department of the PBC takes on heavy responsibilities for processing data from thousands upon thousands of banks all over the country, and the number of data they deal with daily is unbelievably huge, and thousands of times larger than ICBC, which has the largest stock value in the world. So there is no excuse for us to make mistakes in financial statistics and data delivery. Statistics is full of boring and hard work; however, personally I think this job is also full of glory and pride, because it is based on accurate data that enable the country to make the correct decision, which I take deep pride in and am willing to dedicate my life to. Smiles, dedication, insistence… I have the courage to provide more valuable data on derivatives and other financial instruments, with no complaints.

To sum up my words about this seminar, this conference has given me a deeper understanding of the significance and a powerful sense of the mission of my job. This seminar has been great, and on behalf of all the participants I have the honor to thank the organizer, the Statistics Department of the PBC, whose wonderful work enabled this helpful meeting; to the experts, whose excellent speeches have benefited us a lot; and to the Zhengzhou training school, which provided us with such a beautiful and comfortable living environment.

Finally, please accept my congratulations with all my heart on the success of this seminar.

Comments on joint PBC-IFC workshop on "Data requirements for monitoring derivatives transactions"

Hong Hu[1]

Experts from the IMF, the BIS, Chile, France, Hong Kong SAR and Japan have made wonderful speeches on how to collect and monitor derivatives transactions under both conceptual and practical frameworks. As a BOP statistician, I would like to comment on their speeches respectively.

Eduardo Valdivia-Velarde demonstrated how financial derivatives are recorded in BPM6. As some of the participants from commercial banks are also BOP reporters, the speech provided a good opportunity to acquaint them with the conceptual framework on financial derivatives statistics. In my view, this is critical because a good grasp of the concepts, the principles and the methodology contributes to the future construction of BOP reporting systems in China.

Michael Chui, Karsten von Kleist and Paul Van den Bergh also gave excellent speeches, covering the general information on derivatives, the monitoring framework and potential data sources. They demonstrated not only the key elements in the BIS's triennial and semi-annual central bank surveys, but also the ability to collect data through payment systems. Moreover, the comparison of data from dealers and Central Counterparties (CCP) was very interesting, especially when I read the gross notional value of CDS bought (or sold) by China from the DTCC. There is obviously still more to do to fill the data gaps.

Moreover, my special thanks to the representatives of Chile, France, Hong Kong SAR and Japan, because their wonderful speeches gave practical insight into the topic. During the seminar, I kept wondering how different legal frameworks and resource constraints shape an economy's practice. And my foreign colleagues offered the answer. For example, Chile applies a security-by-security approach, while France uses accounting data to compile financial derivatives. These two approaches are of great interest to the SAFE as we are considering designing a new financial derivatives reporting system. Also, I can see similar challenges and concerns in data collection process across countries/regions, as Yuanfeng Hou's ACTRiG requirements from Hong Kong SAR indicate. As many countries do, we ask lots of questions before implementing new BOP reporting plans. To name a few, which data can be collected; accounting; security-by-security or transaction-by-transaction data? How do the banks view front-office and back-office data? What is the benefit? What is the cost? This process helps to identify the statistical requirements and workload of the data reporters. Moreover, thanks to Satoru Hagino's background in both BOP and FFA statistics, he made an informative speech on how the Bank of Japan collects and estimates derivatives data. Also, thanks to Yoshiko Sato for sharing with us the recent development of the database on securities holders in Japan.

Last but not least, I would like to thank the People's Bank of China and Irving Fisher Committee for holding the seminar. This seminar offers not only the opportunity to meet old friends, but also the chance to make new friends. I sincerely hope that the cooperation between the SAFE, the PBC and other government agencies will continue. Also, I look forward to talking to more BOP reporters in the future.

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[1] State Administration of Foreign Exchange.

Comments on joint PBC-IFC workshop on "Data requirements for monitoring derivatives transactions"

Zhu Jiang[1]

It has been my great honor to attend this seminar. First, please allow me on behalf of my colleagues to thank the Head Office of the PBC and the IFC for providing this opportunity, and also all the experts for their excellent speeches and answers.

Financial derivatives transactions have been developing very rapidly in recent years. Although they started late in China, derivatives transactions have grown fast and have continuously expanded in size. The 2008 financial crisis showed that financial derivatives can bring great potential risk to the overall financial system due to their high uncertainties and leverage, while also making the financial market prosperous. Maintaining financial stability is one of the most important responsibilities of the PBC. And we need to strengthen the regulation and research of financial derivatives transactions. So I cherished this opportunity. During the past two days, experts have shared the results of their research with us, and we have learned a lot.

First, the seminar was rich in content, including basic theories and concepts relating to derivatives transactions; the demand, collection, process and usage of derivatives data; the regulation framework of derivatives transactions and practices in Japan and Hong Kong; and the development and challenges of derivatives transactions in China, Chile, France and Japan. There were theory frameworks and empirical analysis, references to international experience and domestic practices. In addition to excellent speeches, during the question and answer session, there was professional communication among the experts and serious questions from the audience. This abundant content and active participation guaranteed the success of the seminar.

Second, the experts were professional and considerate. During the past two days, 11 experts have given us excellent speeches about different aspects of derivatives transactions. What impressed me most was their personal way of communication. In the summary yesterday and speech today, Mr. Paul explained the meanings of various professional terms and abbreviations in the speeches, which helped us to understand the contents. Thanks to Mr. Paul.

Third, the participants took part in the seminar actively. Besides the experts who gave speeches, the participants of the seminar come from many different departments, including the head office and sub-branches of the PBC, Ministry of Finance, CBRC, CIBC, CSBC and commercial financial institutions. Due to different educational backgrounds and work experience, we learned about the theories and practices of derivatives transactions to different extents. However, all the participants displayed an active and serious attitude.

The excellent arrangements for the seminar, the professionalism of the experts, and the active participation and communication of all attendees made the seminar successful. Although the seminar didn't last long, we have learned a lot due to its abundant content. Thanks again to the Head Office of the PBC and the IFC, and to Mr. Paul and the other experts.

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[1] Chengdu Branch of the People's Bank of China.