

Over-the-Counter Derivatives Markets in Ireland – An Overview

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ABSTRACT

The CBFSAI participated in the most recent survey of turnover in global over-the-counter (OTC) derivatives markets, which is co-ordinated by the Bank for International Settlements every three years. The survey results for Ireland show robust growth in OTC derivatives trading in the past few years. Interest rate swaps recorded the strongest growth and now account for over 83 per cent of total OTC derivatives turnover. The strong growth in the Irish market is attributable to a number of factors including increased proprietary trading by financial institutions, greater use of hedging techniques by market participants, the transfer of business functions by foreign banks to affiliates based in the IFSC and, finally strong loan growth which has boosted the use of derivatives products by credit institutions. Ireland was ranked 15th out of 52 reporting countries in terms of the size of its turnover in the OTC derivatives market in 2004. The outlook for further growth in turnover in the Irish market in the coming years is very favourable. Continued strong growth in on-balance-sheet activities should underpin strong demand for derivatives by credit institutions while new product and process innovations will present additional trading opportunities for customers. The growing involvement of exchanges providing clearing services in OTC derivatives markets should encourage risk-averse institutions into the market. Finally, any negative impact on trading volumes associated with the implementation of the financial accounting standard IAS 39 are likely to be short-lived.

1. Introduction

Every three years, the Bank for International Settlements (BIS) co-ordinates a global survey of foreign exchange and over-the-counter (OTC) derivatives markets. In the most recent survey, 52 central banks and monetary authorities (including the Central Bank and Financial Services Authority of Ireland – CBFSAI) monitored market activity in April 2004. With the BIS recently publishing the final results of this survey, it is timely to consider how OTC derivatives markets have evolved in Ireland in recent years.

This article is structured as follows: Section 2 provides background information on the nature and purpose of derivatives contracts. This section also contains (in Box 1) the survey's main methodological details as well as definitions of key financial instruments. Trading in OTC derivatives has grown rapidly in the past three years. Section 3 includes some measures of the size of global markets and provides some international comparisons against which the Irish data can be assessed. The

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focus of the analysis in Section 4 is on turnover² in the market for OTC derivatives in Ireland, which comprises the following instruments: forward rate agreements (FRAs), interest rate swaps, interest rate options, currency swaps and currency options. Section 5 considers the factors that are likely to affect activity levels in the OTC derivatives markets in the coming years. Finally, conclusions are presented in Section 6.

2. Background

Derivatives are financial instruments whose value is based on, or derived from, the prices of securities, commodities, money or other external variables. Derivatives contracts can be classified into two main types:

- *Outright contracts*: These are instruments with a linear payoff profile, i.e., they provide symmetric payoffs to upward and downward movements in the price of the underlying contract.
- *Options*: These are instruments with a non-linear payoff profile, i.e., they provide payoffs that depend asymmetrically on changes in the price of the underlying contract.

While many derivatives are either pure outright contracts (e.g., FRAs, interest rate swaps) or pure options contracts, more complex derivatives instruments are also available that are a combination of both.

Although there is a great variety of derivatives instruments, they share one common property: they provide a means to hedge financial risk. They do this by transferring (for a price) the cost of bearing the risk from one party to another; the former wishes to reduce exposure to risk, whereas the latter is willing to assume that exposure in the expectation of making a profit. Governments, financial institutions and corporates can use derivatives to protect themselves from losses due to fluctuations in prices during periods of foreign exchange and interest rate volatility. Credit institutions may use interest rate derivatives to hedge against the risk associated with a maturity mismatch between their assets and liabilities: e.g., banks that fund fixed-rate mortgages from variable rate deposits are faced with potential losses if the variable deposit rate that they pay on their funding rises above the fixed mortgage rate that they receive. The use of interest rate swaps allows banks to exchange a stream of fixed for floating payments. Interest rate options provide an alternative means of hedging against interest rate risk. By buying

² Gross turnover (measured in nominal value) was defined as the absolute value of all deals contracted during April 2004; netting arrangements and offsets were ignored.

interest rate caps³ with a strike rate related to the fixed mortgage rate offered to customers, these institutions can cap the interest cost of their floating-rate liabilities at a maximum rate related to the fixed rate that they receive from their mortgage customers. Finally, some market participants may engage in the buying and selling of derivatives contracts in an attempt to make profits through taking positions or speculating on the likely changes in foreign exchange and interest rates.

Derivatives contracts may be traded on organised exchanges or in OTC markets. Due to their flexibility and non-standardised format, OTC derivatives can be tailored to a user's specific requirements. A consequence of this flexibility, however, is that the market for some OTC derivatives contracts may not be very liquid, giving rise to difficulties in trading these contracts. Furthermore, all OTC derivatives contracts leave the holders exposed to counterparty credit risk. If one of the two parties to an OTC derivatives contract defaults before its maturity, the other could incur a massive shortfall depending on how prices have shifted in the interim. Exchange-traded derivatives, by contrast, benefit from various safeguards against credit risk, including multilateral netting with central clearing, margin requirements which provide a buffer against default, a reserve fund which the clearing house can draw upon when needed, minimum capital requirements and other prudential rules (Coleman, 1999). None of these safeguards exist for OTC derivatives. In addition, the measurement of market risk is more difficult for OTC derivatives contracts where the lack of centralised markets makes it difficult to assess prices.

Since derivatives are used to hedge risk, it might be assumed that their use will increase when markets become more volatile. A number of early studies supported this view, including Martell and Wolf (1987) who showed that volatility was the most significant explanatory variable of monthly turnover in futures markets. Cornell (1981) associated volatility with uncertainty and argued that an increase in uncertainty should lead to an increase in both hedging and speculative trading in derivatives. In contrast, more recent research points to a more tenuous relationship between volatility and derivatives turnover if monthly data are used in the analyses instead of daily or intra-day data (Jeanneau and Micu, 2003). Daily data will tend to show a positive link since trading volumes are generally substantially higher on a day in which key macroeconomic data are published than on days with no data releases. Monthly data will probably show less of a relationship because the main macroeconomic

³ A cap is an option that sets a ceiling on the rate paid on an underlying item. In this example, the purchase of a cap option protects the buyer from increases in interest rates. If the agreed contract (strike) rate is exceeded on the settlement date, the writer (i.e., the seller of the option) pays the purchaser the difference between the market and contract prices, times the notional principal.

announcements are repeated each month. In addition, this study found that a negative relationship may exist between volatility and monthly activity as “mechanically determined hedging transactions are offset by a retrenchment of speculative trading in periods of heightened market turbulence and reduced liquidity” (Jeanneau and Micu, 2003, p.65).

The increased use of derivatives by financial institutions and corporate entities is of direct relevance to central banks from monetary policy, financial stability and regulatory perspectives. Derivatives may impact on monetary policy through the informational content of the market. The same processes that are used for calculating derivatives prices, such as forward interest and exchange rates, can be used to extract information from market prices. For instance, a central bank may calculate implied forward rates to judge whether the market expects interest rates to increase or whether market expectations of the timing of interest rate changes has altered. The use of derivatives may also impact on the monetary policy transmission mechanism. If banks are fully hedged against interest rate changes, they should be able to adjust their deposit and lending rates promptly after a change in official interest rates. However, as interest rate derivatives reduce banks’ sensitivity to interest rate changes, they permit banks to respond with a lag to policy actions by monetary authorities, if they so desire (Doran, 2004). A study by the BIS of the effect of derivatives use on the transmission mechanism concluded that there was no significant impact in the markets studied (Hanoun Committee, 1994). A similar conclusion was reached in an IMF study (1997), which stated “theoretically, derivatives trading speeds up transmission to financial asset prices, but changes in transmission to the real economy are ambiguous”.

The effective hedging of risk is extremely important, both to a credit institution and to the financial system as a whole. The use of derivatives can protect a bank from an adverse shock, thereby safeguarding its profits and reducing the risk of insolvency. This in turn limits the potential impact to the stability of the financial system from contagion effects associated with a bank collapse.

While derivatives provide an important tool for insulating banks, and as a result the financial system, from the effects of adverse shocks, regulators still need to ensure the adequacy of internal risk management and controls, as well as capital adequacy. Derivatives instruments give rise to few completely new risks in themselves. However, they enable institutions to take on large exposures to market risks for relatively small initial cash outlays. Risk identification as well as timely and independent measurement of exposures is crucial to effective risk management. Both the EU and the BIS have established capital requirements for market and credit risks for on- and off-balance-sheet items, including derivatives.

Box 1: BIS Survey Methodology and Definitions

The Irish component of the 2004 survey was completed by 19 credit institutions. This contrasts with previous surveys when all resident credit institutions were invited to participate. However, all credit institutions active in the inter-dealer market and/or in business with large customers participated in the survey so that coverage amounted to over 80 per cent of the total market. Survey participants provided details of their gross turnover for the 20 business days in April 2004, broken down by instrument, currency and counterparty type. Turnover data provide a measure of market activity, and can also provide a rough proxy of market liquidity. Gross turnover (measured in nominal value) was defined as the absolute total value of all deals contracted during the period; netting arrangements and offsets were ignored. The basis for reporting was the location of the sales desk, even if deals entered into in different locations were booked in a central location. All transactions were reported to the BIS in US dollar equivalents.

The survey collected data on the following transaction types:

Foreign Exchange Transactions

Spot transaction: Single outright transaction involving the exchange of two currencies at a rate agreed on the date of the contract for value or delivery (cash settlement) within two business days. The spot legs of swaps were not included among spot transactions but were treated as swap transactions, even when they were for settlement within two days.

Outright forward: Transaction involving the exchange of two currencies at a rate agreed on the date of the contract for value or delivery (cash settlement) at some time in the future (more than two business days later).

Foreign exchange swap: Transaction which involves the actual exchange of two currencies (principal amounts only) on a specific date at a rate agreed at the time of the conclusion of the contract (the short leg), and a reverse exchange of the same two currencies at a date further in the future and at a rate (generally different from the rate applied to the short leg) agreed at the time of the contract (the long leg). Short-term swaps carried out as 'tomorrow/next day' transactions are included in this category.

OTC Currency Derivatives

Currency swap: Contract which commits two counterparties to exchange two streams of interest payments in different currencies for an agreed period of time and to exchange principal amounts in different currencies at a pre-agreed exchange rate at maturity. Counterparties will enter into a currency swap because it allows them to exploit their comparative advantage in different markets and hence both can reduce their cost of borrowing.

Currency option: Option contract that gives the right to buy or sell a currency with another currency at a specified exchange rate during a specified period.

Single-Currency OTC Interest Rate Derivatives

Forward rate agreement (FRA): Interest rate forward contract in which the rate to be paid or received on a specific obligation for a set period of time, beginning at some time in the future, is determined at contract initiation.

Interest rate swap: Agreement to exchange periodic payments related to interest rates on a single currency; can be fixed for floating, or floating for floating based on different indices. This group includes those swaps whose notional principal is amortised according to a fixed schedule independent of interest rates. Interest rate swaps developed so that parties to the swap could exploit their comparative advantage in accessing different markets.

Interest rate option: Option contract that gives the right to pay or receive a specific interest rate on predetermined principal for a set period of time. Included in this category are interest rate caps, floors, collars, corridors, swaptions and warrants.

Reporting institutions were requested to provide a breakdown of contracts by counterparty (i.e., reporting dealers, other financial institutions and non-financial customers) for each instrument. Reporters were also asked to provide separate information on local and cross-border transactions (determined according to the location, rather than the nationality, of the counterparty) to permit adjustment for double-counting.

The BIS published an analysis of the global results in March 2005. National central banks also conducted a survey of outstanding positions in derivatives markets (based on end-June 2004 data); the aggregated results are available on the BIS website at www.bis.org/publ/rpfx04.htm.

3. International Comparisons

The global OTC derivatives market recorded very robust trading volumes in the April 2004 survey. Average daily turnover climbed from US\$575 billion in April 2001 to US\$1,220 billion, an increase of 112 per cent at current exchange rates. Keeping the exchange rates fixed at their April 2004 values brings the increase in average daily turnover down by one third, to 77 per cent. A number of reasons have been advanced to explain this marked increase in activity including increased use of risk management, more position-taking, increased use of derivatives by other financial institutions and greater use of more complex products such as options.

It is clear from Table 1 that London is the main business centre for the OTC derivatives industry accounting for a commanding 42.7 per cent of global turnover in April 2004, following a 134 per cent increase in turnover over the preceding three years. The euro area's global market share fell from 34.6 per cent in April 2001 to 22.7 per cent in April 2004, largely as a result of a considerable decline in turnover in Germany. Over the past few years, much of the business previously conducted in Germany has been relocated to affiliates abroad, principally in London. According to the survey's methodology, the turnover of German banks' subsidiaries and branches abroad is attributed not to Germany but to the country where the business is conducted. The decline in German turnover is largely concentrated in single-currency interest rate derivatives, the daily turnover of which amounted to US\$43 billion in April 2004, down from US\$94 billion three years earlier. There was also a sharp contraction in activity levels in the Spanish market. Despite a strong increase in turnover volumes between 2001 and 2004, Japan's global market share continued the downward decline that has been evident in recent surveys, falling from 12.2 per cent in 1995 to just 2.6 per cent in 2004. This fall in market share is not particularly surprising given the weakness in economic activity in Japan. Ireland's share of the global derivatives market stood at 0.9 per cent in April 2004, marginally up from the previous

survey, and is similar in size to that of countries like Austria, Denmark and Spain.

Table 1: OTC Derivatives ('Net-Gross') Turnover — International Comparisons

Daily Averages in US\$ Million	April 2001	% Share of Global Market	April 2004	% Share of Global Market	% Change 2001-2004
UK	275,032	36.0	643,399	42.7	134
US	134,595	17.6	354,789	23.5	164
France	66,774	8.7	153,842	10.2	130
Germany	97,016	12.7	45,690	3.0	-53
Japan	21,683	2.8	39,371	2.6	82
Austria	4,685	0.6	14,848	1.0	217
Ireland*	6,230	0.8	12,823	0.9	106
Spain	21,020	2.7	12,300	0.8	-42
Denmark	6,306	0.8	12,002	0.8	90
<i>Euro Area**</i>	<i>264,875</i>	<i>34.6</i>	<i>342,226</i>	<i>22.7</i>	<i>29</i>
Global total	764,504		1,508,353		97

Notes: OTC derivatives include FRAs, interest rate swaps, interest rate options, currency swaps and currency options. The data are adjusted for local dealer double-counting – termed 'net-gross'.

*Data for Ireland differ from those presented in Section 4 due to the aggregation method employed by the BIS when compiling global figures.

**Euro area includes turnover data for Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal and Spain.

4. OTC Derivatives: Survey Results for Ireland

Average daily turnover for OTC currency and interest rate derivatives in Ireland almost doubled between 2001 and 2004, rising from US\$6.5 billion to US\$12.6 billion.⁴ Turnover in single-currency interest rate derivatives⁵ accounted for most of the expansion in the current survey, increasing from an average turnover of US\$6.1 billion per day in 2001 to US\$12.1 billion per day in 2004. Turnover in currency derivatives contracts⁶ grew at a considerably slower pace, rising from a daily average of US\$419 million in 2001 to US\$451 million in the most recent survey. The measured growth of OTC derivatives was inflated by the depreciation of the US dollar in the three years to April 2004.⁷ Nonetheless, it is clear that activity in the OTC interest rate derivatives market has been very buoyant since the time of the last survey.

A number of factors have contributed to the surge in activity in OTC derivatives markets in Ireland in the last three years. First, there has been an increase in proprietary trading by financial institutions looking for greater profitability in a low interest rate environment. Secondly, corporate treasurers are more aware of the necessity to hedge financial risk, as well as being more

4 Data have been adjusted for local double-counting. Turnover was defined as the absolute gross value of all deals contracted during the month, and was measured in terms of the nominal or notional amounts of the contracts.

5 i.e., FRAs, interest rate swaps and interest rate options.

6 i.e., currency swaps and currency options.

7 The data collected for the survey are expressed in US dollars. The dollar depreciated by 26 per cent against the euro between April 2001 and April 2004. Hence, a given amount of euro would translate into a higher amount of dollars in 2004.

knowledgeable about the available products. Thirdly, the increased globalisation of the world economy has made it easier, and more necessary, for businesses to use derivatives to hedge their financial risks. Prior to the introduction of the euro, the Irish pound market was too small and illiquid to support an FX options market.⁸ Fourthly, IFSC banks are active users of derivatives for balance sheet growth and risk management purposes which, coupled with the transfer of some business functions by foreign banks to their affiliates in Dublin, has had a major impact on volume levels in the Irish market for OTC derivatives. Finally, strong loan growth in the past few years has further contributed to the growing use of derivatives by Irish credit institutions as they seek to hedge against interest rate risk.

Chart 1: Average Daily OTC Derivatives Turnover by Instrument

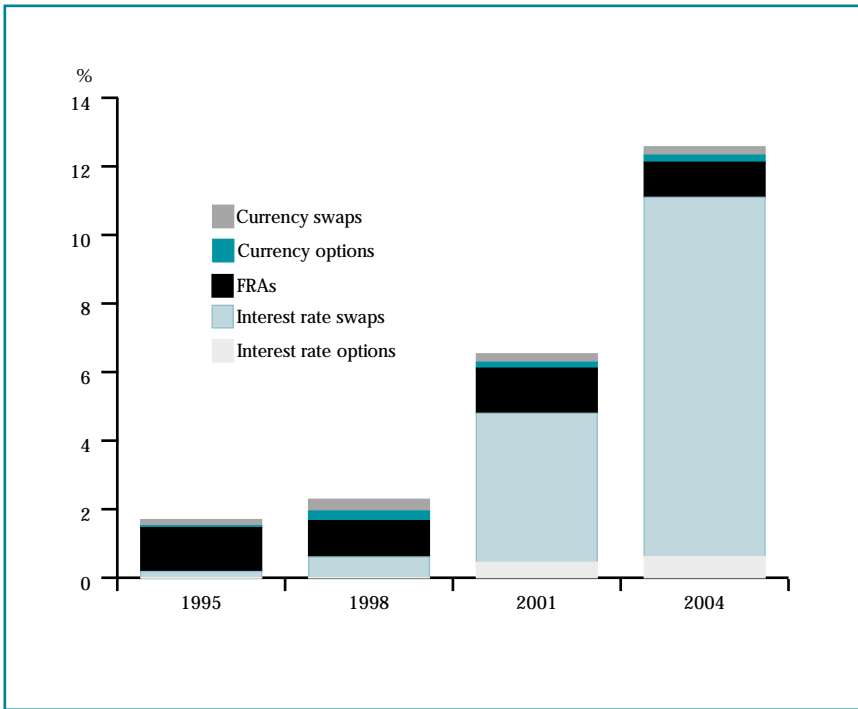


Chart 1 shows that trading in interest rate swaps dominates activity in the Irish OTC derivatives market, accounting for over 83 per cent of total turnover in April 2004. This share has risen strongly in each survey, climbing from 10.5 per cent of total turnover in 1995 to 66 per cent in the 2001 survey. The dominance of interest rate swaps in the Irish OTC derivatives market is high by international standards. Trading in interest rate swaps accounted for 55 per cent of global turnover in OTC derivatives in the 2004 survey, with the share attributable to interest rate swaps in the UK market amounting to only 47 per cent. Average daily turnover in FRAs has remained largely unchanged in each of the last four surveys. As a consequence, the relative importance of this instrument has diminished considerably, accounting for only 8 per cent of average daily

⁸ The Irish Futures and Options Exchange (IFOX), which was set up in 1989 ceased trading in 1996.

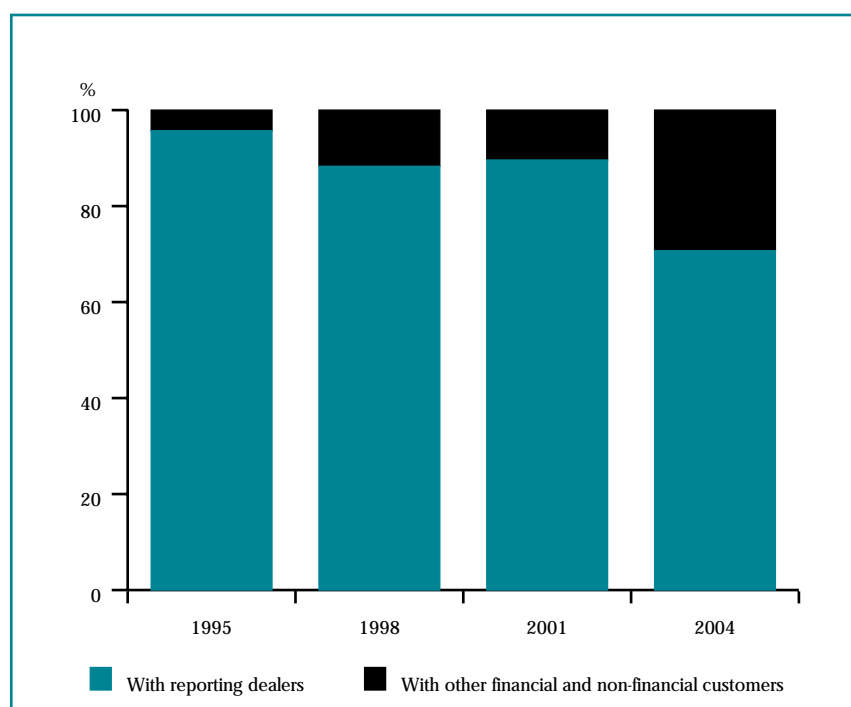
turnover compared with 20 per cent in the 2001 survey. FRAs became less popular with Irish banks after the start of monetary union as the FRA market was mainly in euro legacy currencies (i.e., the pre-euro currencies of the euro area member states). The decline in the use of FRAs is probably also related to the success of the euro interest rate swap market. Overnight interest rate swaps have become the main trading instrument for speculating on and hedging against interest rate movements (Euro Money Market Survey 2004, ECB). While turnover in interest rate options increased by 37 per cent since the last survey, its share of total OTC derivatives turnover fell from a high of 7 per cent in 2001 to 5 per cent in 2004.

Table 2: OTC Interest Rate Derivatives Turnover by Currency in Ireland

Per Cent	2001	2004
US Dollar	18.3	15.4
Euro	51.9	62.3
Japanese Yen	4.7	2.0
Sterling	16.8	10.7
Other Currencies	8.3	9.6
	100.0	100.0

As might be expected, the most traded currency in the Irish OTC interest rate derivatives market in 2004 was the euro, accounting for 62 per cent of total turnover, up from 52 per cent in the 2001 survey. Turnover in the US dollar, sterling and the Japanese yen all declined since the last survey. The increase in turnover in 'other currencies' was largely accounted for by trading in the Canadian dollar.

Chart 2: OTC Interest Rate Derivatives by Counterparty in Ireland



Just over 70 per cent of trading in OTC interest rate derivatives in 2004 was between reporting dealers⁹ (adjusted for local double-counting). This represents a considerable fall from previous years. The share of trades involving other customers (i.e., with other financial and non-financial institutions) almost trebled from the last survey, climbing from 10 per cent to 30 per cent. This trend is evident in the global survey results also and reflects the activities of mutual funds, hedge funds and insurance companies in the OTC derivatives market.

In conclusion, the Irish survey results demonstrate a surge in activity in the OTC derivatives market, with interest rate swaps in particular showing very robust turnover figures. The euro has increased its dominance in the market with over 60 per cent of turnover in OTC interest rate derivatives denominated in euro in April 2004. The share of the market accounted for by the other major currencies, (i.e., US dollar, sterling and the Japanese yen), fell since the previous survey. Other financial institutions now play a more active role in the market, participating in 29 per cent of trades involving OTC interest rate derivatives, while the share attributable to non-financial customers fell from 0.9 per cent in 2001 to 0.4 per cent in 2004.

5. Outlook for Irish OTC Derivatives Market

The results of the 2004 survey demonstrate that global OTC derivatives markets have adjusted successfully after the dramatic reduction in the size of the overall market in 2001 that followed the introduction of the euro and a wave of consolidation in the banking industry. The outlook for the next three years, for both the Irish and the international markets, is positive for a number of key reasons. Continued strong growth in on-balance-sheet activities should promote greater demand for derivative instruments. The generally favourable outlook for the Irish economy should support robust lending growth by financial institutions and, in turn, boost demand for derivatives products. In addition, the market is expected to keep offering new opportunities/products for clients which, coupled with growing sophistication and confidence among market participants, should further boost demand for derivatives products. This increased demand can be expected to emanate not just from multinationals but also from small- and medium-sized enterprises that have large exposures to currency movements and wish to limit their risks.

Other factors that will influence the levels of activity in the derivatives market over the coming three-year period include concerns about commodity risk and the impact of IAS 39. Commodity risk became a key feature in derivatives markets in

⁹ Reporting dealers are defined as financial institutions that are actively involved in buying and selling OTC derivatives both for their own account and/or in meeting customer demand.

2004 following the substantial rise in oil prices. The increased awareness of this category of risk should support demand for commodity hedging strategies. Data on turnover in commodity derivatives were not collected in the 2004 survey.

The introduction of IAS 39, the new financial instrument accounting standard, in January 2005 has changed how companies account for their hedging transactions. IAS 39 requires publicly-listed companies to record financial derivatives on-balance sheet at fair value rather than at historical cost. The fair value of derivatives can alter dramatically as markets move, giving rise to considerable volatility in balance sheet data. While the stringent standards imposed by IAS 39 are likely to impact on trading activity, experience from other countries suggests that there may not be a significant long-term effect on trading volumes. A survey in the US by the Association of Financial Professionals (Sept. 2002) revealed that up to 80 per cent of respondents claimed that their use of derivatives had either not changed or had increased following the introduction of FAS 133, the US equivalent of IAS 39 (Finance Guide to Corporate Treasury 2005).

A final factor, which should impact positively on trading volumes in derivatives, both in Ireland and globally, is the announcement by most of the major exchanges of their intention to enter, or to become more active in, OTC derivatives markets. For example, Liffe¹⁰ and the London Stock Exchange (through its EDX¹¹ subsidiary) have both entered into the OTC equity derivatives markets; the Chicago Mercantile Exchange has formed a joint venture with broker Tullett-Liberty in the short-term interest rate market; while the New York Mercantile Exchange (Nymex) has ventured into the OTC energy markets.¹² The expansion of these exchanges into OTC clearing services should encourage risk-averse banks to become involved in OTC markets and enable banks generally to use their risk capital more efficiently. The provision of clearing services by exchanges means that there is a central counterparty eliminating inter-dealer risk. As outlined in Section 2, probably the main disadvantage of OTC derivatives compared with exchange-traded contracts is that holders traditionally had no safeguards against credit risk. This development therefore represents a considerable advancement in enhancing the attractiveness of OTC derivatives *vis-à-vis* exchange-traded products.

10 London International Financial Futures Exchange.

11 Equity Derivatives Exchange.

12 Data on turnover in equity and commodity derivatives were not collected in the 2004 survey.

6. Conclusions

The CBFSAI has participated in the last four of the BIS surveys of turnover in global OTC derivatives markets, which are conducted every three years. The results of the 2004 survey show that a dynamic and fast-growing OTC derivatives market exists in Ireland with average daily turnover of US\$12.6 billion in April 2004 compared with US\$6.5 billion in 2001, US\$2.3 billion in 1998 and US\$1.7 billion in 1995. Interest rate swaps recorded the strongest growth and now account for over 83 per cent of total OTC derivatives turnover. As in the 2001 survey, the majority of trading in OTC interest rate derivatives was denominated in euro. Trading in euro accounted for 62 per cent of total turnover in OTC interest rate derivatives in 2004, up from 52 per cent in the previous survey. While most deals were conducted between reporting dealers, other financial institutions are playing a growing role in the OTC interest rate derivatives market, having increased their share of total turnover from 10 per cent in 2001 to close to 30 per cent in 2004. The strong growth in the Irish market can be attributed to a number of factors including increased proprietary trading by financial institutions, more sophistication among market participants, the transfer of business functions by foreign banks to affiliates based in the IFSC and finally, strong loan growth which has boosted the use of derivatives products by credit institutions. Consequently, Ireland was ranked 15th out of 52 reporting countries in terms of the size of its turnover in the OTC derivatives market. This compares with a ranking of 13th in 2001 and 17th in 1998.

The outlook for the next three years is favourable for the Irish market. Continued strong growth in on-balance-sheet activities should underpin robust demand for derivatives instruments by credit institutions. New product and process innovations will present additional opportunities for customers and make trading more cost-efficient. While the implementation of the financial accounting standard IAS 39 is expected to have an impact on trading volumes initially, experience elsewhere suggests that any negative effects may be short-lived. Finally, the growing involvement of exchanges providing clearing services in OTC derivatives markets should encourage risk-averse institutions into the market.

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