NUMBERS

but do they add up?

Statistics on the outstanding in financial derivatives — $US16 trillion worldwide is a favoured number — have dramatic scare-value but little merit. Real exposures are a minuscule fraction of that amount. But regulators are still worried. John McMurtrie puts the concerns in perspective.

The equity and debt market gyrations of recent months have once again focused attention on derivatives. The US House of Representatives Banking Committee has held discussions with the high-profile derivatives player George Soros and others involved in hedge funds. A widespread study of derivatives has also been released by the US General Accounting Office, urging greater regulation. Earlier, in August 1992, the Group of Thirty, comprising industry practitioners, academics, lawyers and accountants, established a study group in an attempt to shed some light on the perceived complexity and obscurity of derivatives.

All this interest is hardly surprising. Concerns regarding derivatives were first raised by Mr Gerald Corrigan, president of the New York Federal Reserve, in January 1992, with the now-familiar words: "You had all better take a very, very hard look at off-balance-sheet activities. I hope this sounds like a warning, because it is."

A few facts might help to put the issue of derivatives into perspective:

- Derivatives are here to stay; they help to provide hedging mechanisms consistent with more, not less, stability in the system.
- Derivatives are a part of a much larger financial system and are swamped by physical markets in bonds and equities.
- All players have developed much tighter systems of control in all trading activities including derivatives. They are well able to deal with each other free of the active intervention of regulators.

What are they?
The generally accepted definition of a derivative is "a financial instrument whose value is derived from another underlying instrument, such as bonds, shares, currencies, interest rates, precious metals, commodities or indices".

While the array of derivatives may appear complex (see Table 1), it should be remembered that every derivative transaction can be built up from the two fundamental building blocks of forwards and options.

Growth in derivatives
Exchange-traded derivative markets, in particular futures markets, have been operating for many decades. Starting with agricultural commodities, they now cover the full gamut of commodities and financial instruments. The trading in currencies and financial instruments on futures markets (the Sydney Futures Exchange is no exception) now swamps trading in commodities.

The 1970s and 1980s have seen rapid growth in over-the-counter (OTC) derivatives, starting with forward foreign exchange after the general

John McMurtrie is managing director of UBS Australia Limited and chairman of the International Banks and Securities Association. This article is adapted from his address to an AIC conference on risk management and derivatives in July 1994.
Table 1: Types of Derivative Contract

<table>
<thead>
<tr>
<th>Privately negotiated (OTC) forwards</th>
<th>Privately negotiated (OTC) forwards</th>
<th>Exchange-traded futures</th>
<th>Exchange-traded options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commodity options</td>
<td>Eurodollar (CME)</td>
<td>S&amp;P futures options (Merc)</td>
<td></td>
</tr>
<tr>
<td>Currency options</td>
<td>US treasury bond (CBT)</td>
<td>Bond futures options</td>
<td></td>
</tr>
<tr>
<td>Equity options</td>
<td>9% British gilt (LIFFE)</td>
<td>Corn futures options (CBT)</td>
<td></td>
</tr>
<tr>
<td>Caps, floors, collars</td>
<td>CAC-40 (MATIF)</td>
<td>Yen/$ futures options (IMM)</td>
<td></td>
</tr>
<tr>
<td>Swap options</td>
<td>German bund (DTB)</td>
<td></td>
<td></td>
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<tr>
<td>Bond options</td>
<td>Gold (COMEX)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Share price index (SFE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90-Day bank bill (SFE)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-Year bond government (SFE)</td>
<td></td>
<td></td>
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<tr>
<td>10-Year government bond (SFE)</td>
<td></td>
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</tr>
</tbody>
</table>

Source: Group of Thirty Report, July 1993

Table 2: Total Interest-Rate and Currency Swaps Notional Outstandings ($US Billion), 1987-92

<table>
<thead>
<tr>
<th>Year</th>
<th>Outstandings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>866</td>
</tr>
<tr>
<td>1988</td>
<td>1,327</td>
</tr>
<tr>
<td>1989</td>
<td>1,974</td>
</tr>
<tr>
<td>1990</td>
<td>2,889</td>
</tr>
<tr>
<td>1991</td>
<td>3,872</td>
</tr>
<tr>
<td>1992</td>
<td>4,712</td>
</tr>
</tbody>
</table>

Source: ISDA

The growth in derivatives could be attributed to:
- increased demand for risk-management products due to the volatility of exchange rates, interest rates, commodity and share prices;
- growth in the number of players offering derivative products to clients;
- breakthroughs in the development of financial software and valuation models;
- substantial reduction in transaction costs through advances in communication and information-processing technologies.

Statistics on derivatives are difficult to obtain. Disclosure is minimal in US bank annual reports and almost non-existent in most European and Japanese bank reports. Estimates of global derivatives (all products) outstandings at 31 December 1993, vary widely with notional values quoted as high as $US16 trillion. Annual growth rates have been estimated at between 25 and 40 per cent since 1987.

The notional value of Australian banks' derivatives outstanding at 31 December 1993 is around $US1.4 trillion, with an average rate of increase of 30 per cent over the past seven years (reported in the Australian Financial Review, 15 April 1993).

The International Swaps and Derivatives Association (ISDA) provides data which is arguably the most comprehensive and consistent on derivative activity. However, the data is formulated from the responses of about 155 ISDA members and does not capture all derivative products. Table 3 gives an indication of the size of derivative activity.

To put the size of derivative markets into context, the following statistics are worth reviewing:
Major players
The major players in the derivatives markets are:
- major international banks;
- US investment banks, generally through special-purpose vehicles;
- insurance companies;
- major corporations; and
- hedge funds and other speculators.

Fortune in March 1994 claimed to be the first to compile statistics on total notional derivative risk (all products) and subsequently ranked the major derivative players. However, its research may include some double counting and may not be comprehensive, given that many European banks and most Japanese banks do not disclose data on derivatives.

Nevertheless, Fortune claimed that Chemical Bank had the greatest notional outstandings with $US2.4 trillion. Bankers Trust, Citicorp and J.P. Morgan all had notional outstandings greater than $US1.6 trillion. The top 11 players (all banks) have notional outstandings greater than $US1 trillion.

In comparison, Westpac, Australia’s largest derivatives player among the big four trading banks, is reported to have notional outstandings of $US461 billion (see Table 4).

Hedge funds
Hedge funds, such as those managed by the Soros Group (more than $US11 billion under management) invest on a leveraged basis in equity and debt securities and trade in a variety of currency, interest-rate and commodity products.

Hedge funds speculate in the financial markets by using derivative products. They can leverage their positions because of the nature of such low-entry-cost activities, the effect of price movements on a particular position being magnified. The greatest risk in dealing with such funds is the possibility of trading losses if the exposure rapidly erodes the fund’s net asset base.

However, the recently reported $US600 million loss made by one of the Soros hedge funds involved repurchase agreements, not a derivative structure. Note that a leveraged position of up to 30 times is available on repurchase agreements, much higher than anything usually found in the derivatives market.

Note that there are reportedly more than 700 hedge funds operating in America, compared with 100 in 1987. Estimates have them commanding more than $US70 billion of resources — but mutual funds of $US2.5 trillion dwarf the hedge funds in size.

Earning power
How important are derivatives to the revenues and earnings of banks and investment banks? The degree of transparency on this question is generally poor. Some US banks may disclose the revenues and earnings of trading activities but it is not usually possible to arrive at figures for derivatives alone.

A study by the Wall Street firm Keefe, Bruyette and Woods, quoted in Fortune, concluded that trading revenues of the seven biggest US banks “grew more than five times as fast over the past five years as all other revenues”. It is likely that this growth is primarily attributable to derivatives.

The following examples offer some indication:
- In its 1993 accounts, J.P. Morgan revealed that about 39 per cent of trading revenue was from derivatives;
- Chemical Bank, for the first nine months of 1993, reported that about

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Table 3: Global financing activities — notional turnover in $US trillions (1992)

<table>
<thead>
<tr>
<th>Selected markets</th>
<th>Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest rate and currency swaps</td>
<td>3.12</td>
</tr>
<tr>
<td>Futures and options (exchange-traded)</td>
<td>140</td>
</tr>
<tr>
<td>Foreign exchange (estimated)</td>
<td>220</td>
</tr>
</tbody>
</table>

Table 4: Notional outstandings in $US trillions (year end 1991)

<table>
<thead>
<tr>
<th>Selected markets</th>
<th>Outstanding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest rate and currency swaps</td>
<td>3.87 (4.71 in 1992)</td>
</tr>
<tr>
<td>Bonds (domestic and cross-border)</td>
<td>14.4</td>
</tr>
<tr>
<td>Equities (domestic and cross-border)</td>
<td>10.1</td>
</tr>
</tbody>
</table>

Source: Adapted from Group of Thirty Report
30 per cent of its total trading revenues were from derivatives. Derivative revenues increased from $US154 million in 1992 to $US236 million for the first nine months of 1993.

Analysts estimate that on average, the leading investment banks earn approximately 20 per cent of their earnings from derivatives. Proprietary trading houses, such as Bankers Trust and Salomon Brothers, are believed to make even more from derivatives, perhaps as much as 25 per cent of their annual earnings.

The first-quarter 1994 results of the major US derivatives players put into perspective the impact of the early-1994 equity and debt market gyrations.

While it is not possible to determine the exact impact derivative trading had on results, what can be deduced is that although trading revenues deteriorated, the effects on net income were by no means a calamity. Compare this to the amounts lost in recent years from corporate and property loan exposures!

**What are the risks?**

**Market risk**

This refers to the potential losses in value that could arise on transactions from fluctuations in the market.

Even if complex customer transactions are broken down into their individual risk components and hedged, some risks remain which need to be continuously managed. That is, prices may move in a direction that leaves a derivative player losing on unhedged positions (as in the case of Metallgesellschaft).

A subsidiary of Metallgesellschaft, a German metals, mining and industrial company, reportedly suffered losses of between $US500 million and $US800 million from derivative trading. *Fortune*, March 1994, explained:

MG took a couple of years to dig its hole. In Part 1 of this affair, it entered into long-term, fixed-price contracts (which are not derivatives) to supply oil products to gasoline stations and other users. In Part 2, it negotiated other long-term contracts to buy oil, so that it would have product to deliver against Part 1’s contracts. But for whatever reason it did not line up 100 per cent of its requirements.

**The leading investment banks earn approximately 20 per cent of their earnings from derivatives.**

**Credit risk**

Unlike a traditional loan, the credit risk is not constant throughout the duration of the contract, but depends on the market value, which in turn corresponds to the replacement value. This changes continuously in response to market fluctuations during the life of the contract.

A bank is exposed to an actual risk of loss only if the transaction develops in favour of the bank or to the disadvantage of the counterparty and, at the same time, the probability of a default arising from a deterioration in the counterparty’s borrower quality increases.

Although losses from counterparty default have been rare, one should not forget that the derivative business is a fairly recent business. According to *The American Banker* (“A Primer on Off-Balance Sheet Risk”, 31 July 1991), three counterparties which turned insolvent — Development Finance Corporation of New Zealand, Drexel Burnham Lambert and British and Commonwealth Merchant Bank — all threatened to default on swap contracts. In none of these cases did counterparty losses materialise.

In early 1990, Bank of New England (BNE) was heading toward insolvency with asset quality problems and was forced to unwind about $US30 billion in derivatives. BNE successfully disposed of the majority of its book and earned a small profit arising from favourable market movements.

Compare these experiences with the amounts lost in recent years from corporate and property loan exposures!

**Legal risk**

Legal risk concerns are focusing on the issue of netting. The BIS guidelines require banks to base capital allocation on gross rather than on net exposure, a requirement which is presently causing considerable debate.

Laws validating netting have yet to be passed in the countries where the major derivative players reside. Even then, a derivatives contract of a US branch of a German bank be subject to the bankruptcy code of Germany? The legal question is not yet solved and to allow netting on uncertain legal grounds would indeed be risky.
Personnel risk
Less obvious, but just as important, is personnel risk. If a dealing team has a monopoly on software and information, then the institution runs a very real risk if these key people depart. The continuing development of new and complex products represents challenges for management at all levels, as well as for the supervisory bodies. The reliance on sophisticated black-box software creates three real issues:
- make sure accounting staff have as good an understanding of the software as the dealers;
- revaluation rates should be chosen by non-dealers with a strict separation of dealing from accounting staff;
- senior management should become familiar with all risks involved.

Systemic risk
The risk that the default of a major market participant could trigger a chain reaction in the financial system can be defined as “systemic risk”.

Some imaginative commentators have created the scenario of a dramatic crisis at a major derivatives house causing it to default on its contracts and instigating a chain reaction, bringing down other institutions and sending shock waves throughout global financial markets.

The threat of systemic risk is relatively remote. Although some major derivatives players have recently suffered losses, all market-makers, unlike insurance markets in London, have access to substantial capital bases. In addition, most of the major players achieved record earnings in 1993.

Transparency, liquidity and valuation
Exchanges publish information about trading activities. Price changes can be followed, trading volumes are disclosed and levels of open interest are reported. This information is not available for the OTC markets.

There are substantial market-makers in derivatives in most products up to tenors of 12 months. Liquidity of derivatives reduces for complex long-term and custom-made derivatives. Derivative exposure in markets which are illiquid at the best of times — such as LDC stocks — may experience a liquidity drought following an abrupt market move.

I would caution against the notion that traded markets offer a complete solution to transparency and liquidity. There have been many traded markets which have experienced “air pocket” moves where prices have changed by as much as 10-20 per cent in a very short time — for example, the equity market in October 1987.

Regulatory issues
Given that dealing in OTC derivatives is an essentially borderless activity, potential problems could arise should each regulator devise its own regulatory regime. Regulators are focusing on different aspects, with some imposing highly formulated capital rules.

It is against this background that the International Council of Securities Associations (ICSA), comprising the world’s leading securities industry associations, and the various bankers’ associations have been working on recommendations to be put to supervisors worldwide. Even at this stage, however, it is clear that the industry bodies do not regard regulators’ concerns as being unfounded.

I would caution against the notion that traded markets offer a complete solution to transparency and liquidity.

The fact that derivatives are used by financial institutions to hedge the risks they take in other products is acknowledged by regulators and then often forgotten when they devise regulatory solutions. Accordingly, ICSA and others are likely to repeat the messages about the need to recognise netting across products for capital-adequacy purposes and to give credit for hedged positions.

In December 1992, the Australian Securities Commission (ASC) launched a debate about regulation of derivatives. The reason was not, I believe, a conviction that derivatives needed to be regulated. On the contrary, the ASC seemed to be more concerned about obtaining an understanding of the nature and scope of OTC activity.

The ‘interim safe harbour’
In the six months after release of its discussion paper in December 1992, the ASC learned a lot about OTC derivatives activities.

To a large extent, it listened receptively to financial institutions and their representative bodies. The ASC started to appreciate the size of the markets that it was dealing with and the enormity of the political risks which it would be incurring if its response had the effect of driving derivatives activity offshore.

This sensitivity was reflected in what has become known as the “interim safe harbour” solution. Under that solution, the ASC announced in July 1993 that it intended to recommend to the attorney-general that OTC derivatives activities should be permitted to continue in their unregulated fashion provided that one party to an agreement was a regulated financial institution and the other party was an “appropriate person”.

The ASC took the view that if neither party to an OTC derivatives contract was subject to external regulation, then the agreement would be illegal even if, for example, one of the parties was AAA-rated. This view effectively denies sophisticated financial institutions and other corporations the opportunity to form their own judgments about potential counterparties. If every market participant took the view that establishing that one’s counterparty is regulated is a more effective form of protection than the type of credit assessments currently undertaken, then we really would have some systemic risks to worry about.

Conclusion
Since Gerald Corrigan flagged his concerns in 1992, there has been a determined effort by financial intermediaries to increase their internal risk management controls. To a large extent, they have heeded the advice of the Group of Thirty.

The rampant rumours regarding blood in the streets following the events of early 1994 have been put into perspective by the first quarter results of the major US players in derivatives.

I would caution against over-reaction. Derivatives are here to stay. Recent events, however, are a timely reminder to all derivative players to look carefully at their risk-management controls.