Table 4: ProQuest database system search results

Periodical/ Newspaper	Date	U.S. trade deficit	U.S. trade protection	VER
Periodical	Jan 86-Dec 89	248	102	8
Periodical	Jan 90-Dec 91	57	45	9
Periodical	Jan 92-Aug 93	58	27	7
Periodical	Sept 93-Sept 94	57	11	5
Newspaper	Jan 85-Dec 86	411	27	2
Newspaper	Jan 87-Dec 88	590	111	0

SYSTEMIC RISK IN THE DERIVATIVES MARKET

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SYSTEMIC RISK IN THE DERIVATIVES MARKET*

In order to reduce the risk that is associated with everyday market volatility, participants in the market buy and sell financial derivatives. Derivatives allow actors that are risk averse to guard against changes or fluctuations in commodity price, exchange rates and interest rates. Financial derivatives are defined as, "a financial contract the value of which is derived from the value of another underlying asset, such as an equity, bond, or commodity."[1] While by some estimates there are over 1,000 types of derivatives, the most common derivatives are Futures (Forwards) contracts, Options (both call and put options) and Equity swaps.

The growth of financial derivatives has occurred concurrently with globalization of the financial markets and the subsequent increase in the interdependence of markets *(See Figures 1 and 2)*. As such, the ability for one market to influence another is heightened, especially in the face of an external shock or crisis precipitated by large losses. Recently, a number of end-users have incurred substantial losses while using derivative instruments. These losses have raised questions about the possibility that substantial losses in one secondary market may influence a tertiary market and to what extent this volatility may influence the market in general. Many regulators argue that financial derivatives not only pose a greater degree of bank-specific risk, but also increase the risk incurred by the entire system. In order to avert this systemic risk, regulators have called for a number of reforms. Using price data during the recent derivatives losses I propose a method of quantifying systemic risk.

DERIVATIVES AND FINANCIAL INNOVATION

In a prescient article in 1991, University of Chicago Nobel Laureate Merton Miller described derivatives as the "the instrument of the next twenty years."[2] Miller argues that the financial markets have a remarkable capacity for innovation to allow for risk averse parties to transfer risk to those more willing to

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bear the risk. According to one estimate, since 1980 alone there have been 158 innovative products introduced into the financial markets.[3]

In addition, market participants are attempting to hedge against all types of risk, including macroeconomic fluctuations. In 1985, the Chicago Board of Trade set up an inflation futures market which later failed. In a futuristic book, Yale Economics Professor Robert Shiller argues that there ought to be markets that allow the direct hedging of macroeconomic variables such as inflation or growth in GDP.[4] Other examples of innovative hedging include the Chicago Board of Trade which sells "hurricane futures" and many firms are now offering "Act-of-God" bonds.

Miller argues that derivatives are an efficient way to reduce risk in the system. The end user, *i.e.*, the party purchasing the derivative, is able to decrease the risk associated with price and interest rate fluctuations. In addition, University of Chicago Economists Christopher L. Culp and Robert J. Mackay argue that the use of derivatives allows users to borrow in the cheapest capital market, to lower financing costs, to enhance asset yields, and to provide an effective means for investors to manage their portfolios of assets and liabilities. In sum, derivatives are designed to minimize exposure to asset value fluctuations in interest rates, commodity prices, and currency prices by transferring the price risks associated with such changes to those willing to bear them.

As the *Columbia Law Review* states, "by adjusting the shape of the portfolio's potential distribution of returns, derivatives allow investors to alter their portfolio's risk at a minimum cost without changing the underlying securities. Thus investors can use derivatives to rid their portfolios of more downside risk while gaining much of the upside."[5] Not only does use of derivatives benefit end-users, but they also benefit the dealer in that "dealing has increased both the average credit quality and diversity of credit risk to which dealers are exposed."[6] Another possible benefit to the dealers identified by Culp and Mackay is the possibility that the experience dealers get with risk management while dealing derivatives will spill over into other risk management activities, and thus will allow the dealers to better manage other risks. In addition, economists assert that the growth of the derivatives market has given the United States greater access to international capital markets. Culp and Mackay also argue that because US firms are less exposed to risk due to interest rate or price fluctuation, employment will be more stable. In addition, by spreading the risk to multiple actors in the economy, capital formation is easier. Perhaps most importantly, a study done by Hans Stoll and Roger Huang (1991) found that derivatives to not add to the volatility of the underlying cash markets.

INTERDEPENDENCE OF MARKETS

Yale Law Professor Henry T.C. Wu points out that markets are becoming increasingly interdependent. For example, he notes that while banks used to hedge against market risks on interest rate swaps, they would rely on the cash market for US Treasury bonds. Later, they began to use futures markets first with Treasury Bond futures and then with swap futures. Now, the swap market is directly linked to the Treasury bond-market as many capital markets have been linked. Now instead of entering into a directly offsetting derivative transaction of the same type, banks can hedge the market "synthetically."

Other interdependencies exist as well. For instance, Wu points out that payments received on one derivative transaction may be used by the market participant as payments on another derivative transaction. Wu observes, "fragile networks--often with a leading money center bank at the center --may thus be created."[7] In a recent study, Economists Alastair Craig, Ajay Dravid and Matthew Richardson found that information is incorporated rationally into prices across international financial markets, particularly through the use of derivative securities, arguing that derivatives are a tool of stability and not volatility.

RECENT DERIVATIVES LOSSES

Despite the fact that derivative use has grown in the past decade, there have been a plethora of losses, failings and bankruptcies due to losses in derivatives. For example, in January 1994, Codelco lost $207 million in a copper futures deal and in April 1994 Kashima Oil lost $1.5 billion on dollar derivatives. In April 1994, Proctor and Gamble lost $102 million in equity swaps after interest rates increased in the fall. In early 1994, Gibson Greetings lost $19.7 million on interest rate derivative transactions. In July 1994, Glaxo lost $180 million on derivatives and asset-backed bonds. Most recently, on February 26, 1995, Barings Bank of England went bankrupt, losing an estimated $1.4 billion. In addition, Investors Equity Life Insurance Co. in Hawaii lost $80 million in 3 days. Other banks such as Drexel-Burnham and the Bank of England have also incurred losses. Perhaps most disturbing to Congress was the $2 million lost in structured notes by the Municipality of Orange County in California. By the end of 1994, derivatives losses were estimated to be more than $10 billion.

The sheer magnitude and frequency of the losses has precipitated a closer look at the derivatives market. Some view the losses as indicative of a market failure, requiring an increased role for regulation. For example, economists such as Michael Darby and Alan Greenspan argue that the market provides an incentive for excessive levels of risk. Levels of risk are defined as excessive to the extent that the probability of bank failure resulting from the private, unregulated decisions of bank managers exceeds the level of failure that maximizes social welfare, creating a situation in which individual banks to not guard against systemic risk.[9] Others view the losses as confined to specific institutions that rightly bear the brunt of their own risk taking.

CAUSES OF SYSTEMIC RISK

The extent to which the failure of an individual institution may affect the entire financial market is a function of the systemic risk in that market. Systemic risk is the risk that the failure of one firm will lead to the failure of a large number of other firms which could potentially lead to the failure of the entire international financial system. This contagion effect or systemic risk has been attributed to (1) size and complexity of the market (2) increased concentration of the market (3) disclosure and accounting practices (4) illiquidity (5) settlement Risk (6) credit risk and (7) unregulated entities, particularly the over-the-counter market.

SIZE AND COMPLEXITY OF THE MARKET

With the recent increase in fluctuations in the market (*Figure 3* shows the increased volatility of interest rates in recent years), wholesale banks and financial institutions have increasingly become involved in trading derivatives. Measured in terms of notional principal amount, over-the-counter (OTC) derivatives [10] outstanding in 1995 are near $10 trillion.[11] The growth rate of OTC and exchange traded derivatives was 100 percent for insurance firms and 77 percent for securities firms, compared to 41 percent for banks. *Figures 1 and 2* display the increase in derivative use over the past decade. While some economists have pointed to the increase in derivative use, others have argued that it is only normal that derivative use has increase, since the total trade volume has increased dramatically also. As evidenced by *Figure 1*, however, derivative use as a percentage of total trade volume has also increased. In addition, derivatives are increasingly used by commercial banks.

Still others argue that the total number of derivatives transactions is misleading. Rather, it is exposure to risk that matters. Economist Michael Darby argues that, "the actual exposure is normally only 2 or 3 percent of the notional principal amount--say $200 or $300 billion on $10 trillion worth of derivatives" *(See Figures 4 and 5).*

INCREASED CONCENTRATION OF THE MARKET

Another concern of regulators is that OTC derivative dealing is done by a small concentration of dealers *(See Figure 6).* For example, OTC derivative activity in the US is concentrated among 15 major US dealers that are extensively linked to one another, to end-users, and the exchange traded markets. For example, as of December 1992, the top seven domestic bank OTC derivatives dealers accounted for more than 90 percent of the total US bank derivatives activity. Similarly, securities' regulatory data indicate that the top five US securities firms dealing in OTC derivatives accounted for 87 percent of total derivatives activity for all US securities firms. Substantial linkages also exist between these major US

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derivatives dealers and foreign derivative dealers. For example, 14 US OTC derivative dealers reported to us that their transactions with foreign dealers represented an average of about 24 percent of their combined derivatives notional amounts.

While regulators point to the high concentration rate as increasing systemic risk, others argue that these wholesale financial markets are truly global and thus a measure of industry concentration would have to include foreign banks as well. Moreover, they argue that no single firm has more than 10% of the dealer activity. The globalization of the market as well as the celerity with which information spreads among markets lends credence to the broadened definition of the market. On the other hand, considerable risk has been shifted to these firms from other financial and non-financial corporations, and this concentration of risk could have the potential to lead to the disruption of funding of the other dealers' hedging activities in the hours of a major price break as lenders hold back to investigate rumors about individual dealers' creditworthiness.

DISCLOSURE AND ACCOUNTING PRACTICES

All parties admit that the accounting and disclosure practices associated with derivatives are lacking. As a result in 1994, the major dealers have been working with the Financial Accounting Standards Board to develop FASB "interpretation 39" which would require dealers to report current credit exposures from derivative transactions on dealer balance sheets. Some regulators feel that disclosure should go further in order to require dealers to report in their financial statements on the hedges or speculative positions taken through derivative instruments.

ILLIQUIDITY

Fear of illiquidity stems from two possible occurrences. First, the possibility of illiquidity arises when a payment system collapses, say due to a natural disaster (such as the Kobe earthquake). As The *Economist* points out, most large financial transactions are made electronically through some type of clearing house, usually run by a central bank. Since these transactions clear only with a lag, financial institutions face a risk that they will find themselves caught in the middle of a transaction with a bank that collapses, and not get paid. If such a crisis causes people to avoid the payments system altogether, then this "Herstatt" risk (named after a German bank which failed in 1974) can "dry up liquidity", generating system-wide problems. This risk is especially high for international transactions, since the clearing houses of the central banks involved may not be open at the same times. By improving the system's capacity for real-time transactions, governments can greatly reduce one of the biggest threats to financial market's soundness.

The second potential source of illiquidity that could magnify systemic risk are "runs" on banks by nervous depositors. The *Economist* points out that, "since banks rarely maintain a large proportion of their assets in liquid form, a sudden surge of withdrawals could easily cause several other banks to fail as well,

thus dramatically exaggerating the costs of the first bank's mistake."[12] The safeguard against such runs is deposit insurance, which the US instituted in the 1930s in response to the Great Depression. But internationally, not all banks have such deposit insurance. For example, in March of 1995, Greece just instituted deposit insurance for very small deposits.

COUNTERPARTY RISK

Counterparty risk is the risk associated with the financial stability of the party entered into contract with. Any doubt about the ability of two parties to settle would constitute counterparty risk. This risk is not a factor for the exchange traded derivatives since the exchanges require traders to have a post-margin. However, in the over-the-counter market, many have called for higher cash margins so that neither of the parties is undercapitalized.

CREDIT RISK

Overall systemic risk is thought to have reduced systemic risk in this area by the growth of OTC derivatives, since bank dealers have increased the average quality and diversity of credit risk to which they are exposed." From *Figure 6* we see that among the seven largest US bank dealers only Bankers Trust had larger credit exposure from derivatives than loans, and for five of the others the loan exposure was three or more times as large as the derivatives exposure.

UNREGULATED ENTITIES

Central bankers and securities regulators sometimes express concern about the unrelated status of several OTC derivatives dealers such as insurance company affiliates. However, Darby argues, "given the high credit standards required to compete as a dealer, this concern does not appear to have much substance."

CASE STUDY: BARINGS BANK

The aftermath of the bankruptcy of Barings Bank provides an excellent case study of systemic risk. Representative James Leach (R-MO) has argued that the Barings Bank case is the paragon example of market failure or as an exemplum of the market's ability to sustain itself in the face of a crisis. Those who cite Barings as an example of derivatives causing market failures point to the fact that the authorities in Shanghai temporarily closed its bond-futures market and told investors to wind down positions in an attempt to limit damage from a trading scandal. In addition, they argue that "if anything, the Barings name may have contributed to its undoing, if it turns out to have been the bank's familiarity that blinded the authorities at Singapore's futures exchange to the enormous wrong-way bet its trader made on the future direction of Japan's Nikkei average." A closer look

at the reaction of market participants and volatility after the fall may provide insight into the magnitude of the contagion effect.

Barings' young trader Nicholas Leeson was supposed to be "arbitraging", seeking to profit from differences in the prices of Nikkei-225 futures contracts listed on the Osaka Securities Exchange (OSE) in Japan and Singapore Monetary Exchange (SIMEX). Such arbitrage involves buying futures contracts on one market and selling them on another. Since the margins on this are small, the volumes traded by arbitrageurs tend to be large. However, this strategy is not very risky: a long position in one market (betting on a rise) is offset by a short position (betting on a fall) in the other). However, in addition to arbitraging the Osaka Exchange and the SIMEX, as far back as September 1994, Leeson began to simultaneously sell put options and call options on Nikkei-225 futures. This type of deal is known as a "straddle." If the market is less volatile than the options prices predict, the seller makes a profit. However, as a result of the Kobe earthquake, the Nikkei-225 fluctuated and Leeson began to exponentially increase the size of his open positions. By trading on a fraudulent account, numbered 88888, Leeson began to buy futures on a large scale in an attempt to almost single-handedly push up the Nikkei-225. This proved unsuccessful and eventually Leeson's losses were so large the bank eventually collapsed. A lifeboat by the Bank of England was not feasible due to the fact that many of the derivatives were impossible to wind down immediately, as the options did not expire for months.

While this case has been widely cited as providing evidence of a market failure, others argue that the systemic risk from the loss was minimal. *The Economist* stated, "by the end of the week, a few hints of other losses-- at funds managed by Gartmore and Perpetual and among Japanese life insurers--were emerging." Others argue that in the event of a viable threat of systemic risk, the Bank of England would have bailed out Barings Bank, but the precise magnitude of the systemic risk is not known. Reports in the *Wall Street Journal* immediately following the collapse of Barings express that the markets were "shaken" but provide no quantifiable estimate of the effect of the collapse.

DECREASING SYSTEMIC RISK

CAPITAL REQUIREMENTS

The report issued by the US General Accounting Office in May 1994 advocates an increased regulatory role. First, it recommends that a consistent set of capital standards be adopted for derivatives dealers. This recommendation is geared towards preventing dealers who are undercapitalized from engaging in excessive transactions. However, many economists (*i.e.*, Darby, Culp) argue that most of the derivatives transactions are settled at fixed dates making large cash flows unnecessary. In addition to these risk-based capital requirements, banks are also currently required to maintain a minimum leverage ratio. Culp and Mackay assert that dealers are usually well capitalized, and the practices of the trade are such that undercapitalization does not occur. In addition, many argue that since these capital requirements reflect an assessment of credit risk, that the requirements will penalize those firms that have invested in internal risk management systems.

A 1994 study by Levonian explains that the minimum adequate level of bank capital is computed as a ratio of capital to risk exposure, with exposure

measured as a weighted sum of gross and net positions from a hypothetical composite portfolio for each bank. The conceptual model suggests that this approach can produce capital standards tat are reasonably accurate. While Levonian's system of weighting of gross and net exposures can be viewed as an affine approximation (the equivalent of linear in several dimensions) to the true portfolio variance and hence can link capital standards fairly tightly to portfolio risk in order to prevent failure probabilities from reaching excessive levels. However, Levonian admits himself that "a system based on a weighted root sum of squares of gross and net would be more precise." *Figure 7* shows that the capital ratios of the ten largest banks in the US, Britain, Italy, Germany, Japan, and France all exceed the Basle II requirement of an 8% capital ratio.

SUITABILITY REQUIREMENTS

In response to the huge losses incurred by more than a few institutions in the derivatives market, many legislators are calling for restrictions on the parties eligible to trade in the market. Basically, this provision is intended to protect end users from making investments for which they are "unsuitable." A party would be deemed "unsuitable" if they had inadequate information about the risks associated with certain products. As a case in point, in December 1994, Bankers Trust Company paid $10 million to settle SEC and CFTC charges that the bank had not made clear the risks of an ill-fated derivatives transaction with one of its clients. Pending legislation (H.R. 4503 "Capital Markets Safety and Soundness Act of 1994") would attempt to require information disclosure in the following form: each customer would be furnished with a basic, single page risk disclosure statement, and a separate risk disclosure statement for exchange-traded commodity options before an account can be opened for a customer.

However, those against suitability requirements, such as Federal Reserve Bank Chairman Alan Greenspan argue that suitability requirements would be counterproductive because they would increase the dealer's liability to customers and this would be detrimental because they would in effect lead to higher transaction costs to compensate for dealers' increased legal risk.

NETTING AGREEMENTS

In 1991, the International Swap Dealers Association (ISDA) encourages the international acceptance of netting agreements. Netting agreements are agreements between two parties that have entered into multiple derivative transactions with each other aggregate all such transactions in the case of bankruptcy, thereby reducing credit risk.

END-USERS

Many argue that individual firms should bear the consequences of their own managerial decisions. However, when the end user is a state or local municipality such as was the case in the Orange County bankruptcy, notions of suitability are challenged. The GAO report included a study done of state and local entities in California, and the percentage of governments using derivatives for

which purposes. *Figure 8* shows the percentage of respondents who used derivatives in the year 1992. What is most interesting about this exhibit is the large percentage of pension plans that are the end users of derivatives. Of the 288 (out of 3727 respondents) who reportedly used derivatives, 72% of those who used derivatives used them as a speculative device.

A survey taken of non-financial corporations conducted by the Wharton School and Chase Manhattan Bank reported that of 530 corporations, 35% used derivatives. 75% of these firms used derivatives to hedge while 40% admitted to using derivatives as a speculative tool.

MEASURING SYSTEMIC RISK

There are many problems posed by measuring systemic risk. For one, disaggregated information as to the volume and sources of derivative activity is currently unavailable. Also, Yale Law Professor Henry Wu points out that there is no mechanism by which new derivative products may be identified. However, the collapse of Barings Bank offers a case study by which the short-run impact of systemic risk could be measured. By using the Capital-Asset-Pricing Model (CAP-M), an analysis of excess returns immediately following the news of Barings collapse would indicate Barings' relative impact on stock prices.

CONCLUSIONS

The use of derivatives allows parties that are risk averse to transfer risk to those more willing to bear the risk. The question that arises however, is whether the individual firms are able to incorporate the costs of systemic risk into their calculations. The case study of Barings Bank offers an excellent opportunity to test both the magnitude and the source of systemic risk. Intra-day price data from the London, New York and Tokyo Stock Exchanges would indicate the magnitude of the external shock.

FOOTNOTES

1 Molvar, Roger H. D. and James F. Green, "The Question of Derivatives," Journal of Accountancy, March 1995, pp. 55-61.

2 Miller, Merton H., "Financial Innovation: Achievements and Prospects," Journal of Applied Corporate Finance, Winter 1992, pp. 4-11.

3 Merton Miller, "Financial Innovation: The Last Twenty Years and the Next," Journal of Financial and Quantitative Analysis, 1986, Vol. 21, p. 459-71.

4 Shiller, Robert, Macromarkets, London, Oxford University Press, 1993.

5 Goldman, Geoffrey B., "Note: Crafting a Suitability Requirement For the Sale of Over-the-Counter Derivatives: Should Regulators 'Punish the Wall Street Hounds of Greed'?" 95 Columbia Law Review 1112, June 1995.

6 Ibid. 5, 1114.

7 Wu, Henry T.C., "Misunderstood Derivatives: The Causes of Informational Failure and the Promise of Regulatory Incrementalism," Yale Law Journal, April 1993, Volume 102, No. 6, pp. 1457-1513.

8 Hans Stoll and Robert Whaley, "Stock Market Structure and Volatility," Review of Financial Studies, Volume 3, 1990, pp. 37-71.

9 Interestingly, Levonian views the socially optimal level of failure as indicated by the capital standards. The acceptable capital level depends on regulators' tolerance for risk, which may in turn reflect judgments regarding the potential welfare costs of insolvency balanced against the costs imposed by the regulations. The probability a bank will become insolvent depends on the level of capital and the variance or standard deviation of changes in that capital. With risky positions both long and short, the variance of changes in capital requirements requires a matrix presentation.

10 Over-the-counter derivatives are derivatives that are not traded on an exchange.

11 Even after deduction of double counting for intra-dealer transactions.

12 "A New Nightmare in the Boardroom," The Economist, February 10, 1996, pp. 3-5.

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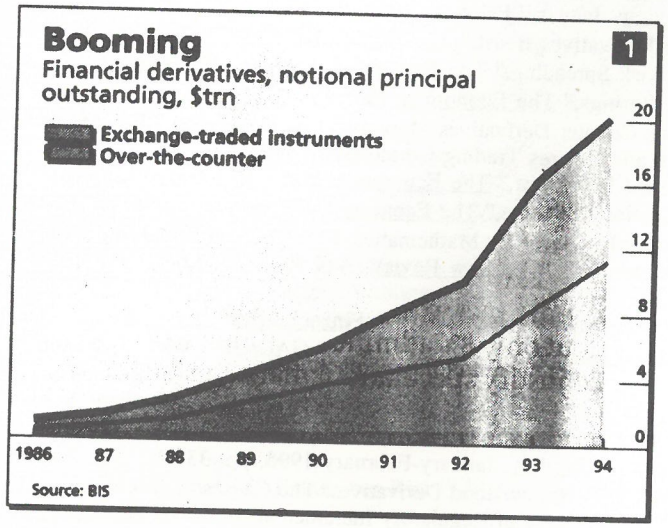
APPENDIX

FIGURE 1 (a)



Source: "The Collapse of Barings: A Fallen Star" The Economist, March 4, 1995, p. 21.

FIGURE 1 (b)

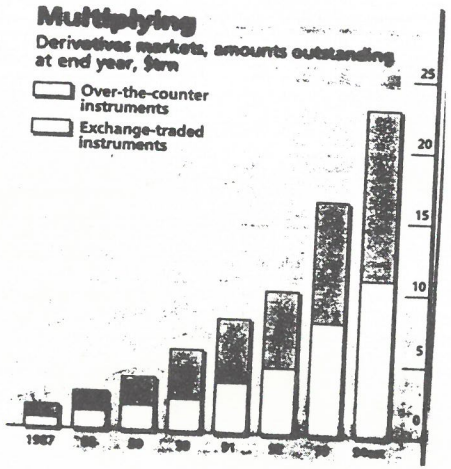
DERIVATIVE CONTRACTS

OTC Forwards	OTC Options	Exchange Traded Futures	Exchange Traded Options
Forwards Commodity Contracts	Commodity Options	Eurodollar (CME)	S&P Futures Options (MERC)
Forward Foreign Exchange Contracts	Currency Options	US Treasury Bond (CBT)	Bond Futures Options (LIFFE)
Forward Rate Agreements (FRAs)	Equity Options	9% British Gilt (LIFFE)	Corn Futures Options (CBT)
Currency Swaps	FRA Options	CAC-40 (MATIF)	Yen/$Futures Options (IMM)
Interest Rate Swaps	Caps, Floors, Collars	DM/$ (IMM)	
Commodity Swaps	Swap Options	German Bund (DTB)	
Equity Swaps	Bond Options	Gold (COMEX)	

DERIVATIVE SECURITIES

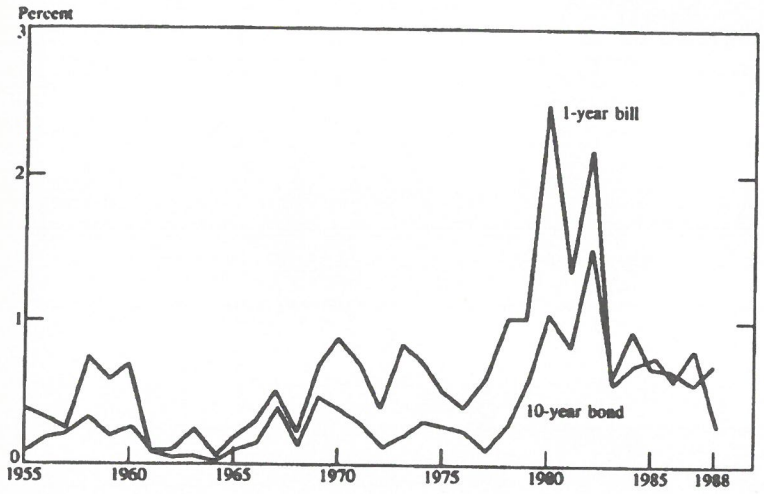
Structured Securities and Deposits	Stripped Securities	Securities with Option Characteristics
Dual Currency Bonds	Treasury Strips	Callable Bonds
Commodity-Linked Bonds	Interest-Only Strip (IO)	Putable Bonds
Yield Curve Notes	Principle-Only Strip (PO)	Convertible Securities
Equity-Linked Bank Deposits		Warrants

FIGURE 2



Source: "A Brief History of Derivatives" The Economist, February 10, 1996, p. 10.

FIGURE 3



Source: Charles S. Morris, "Managing Interest Rate Risk With Interest Rate Futures," Economic Review, March 1989, p. 5.

FIGURE 4

NOTIONAL AMOUNT OF DERIVATIVES OUTSTANDING BY TYPE OF DERIVATIVE PRODUCT
1989-1992

Derivative Product	1989	1990	1991	1992	% Growth
Forwards	3,034	4,437	6,061	7,515	148
Futures	1,259	1,540	2,254	3,154	151
Options	953	1,305	1,841	2,263	137
Swaps	1,952	2,890	3,872	4,711	141
Total Outstanding	**7,198**	**10,172**	**14,028**	**17,643**	**145**

Source: United States General Accounting Office, Financial Derivatives: Actions Needed To Protect the Financial System, Report GAO/GGD-94-133, Washington: General Accounting Office, 1994, p. 36.

FIGURE 5

NOTIONAL AMOUNT OF DERIVATIVES OUTSTANDING BY NATURE OF THE UNDERLYING RISK
1989-1992

Underlying	1989	1990	1991	1992	% Growth
Interest Rates	4,311	6,087	8,404	10,923	153
Exchange Rates	2,779	3,927	5,415	6,475	133
Equity/Commodity	108	158	209	245	127
Total Outstandings	**7,198**	**10,172**	**14,028**	**17,643**	**145**

Source: United States General Accounting Office, Financial Derivatives: Actions Needed To Protect the Financial System, Report GAO/GGD-94-133, Washington: General Accounting Office, 1994, p. 36.

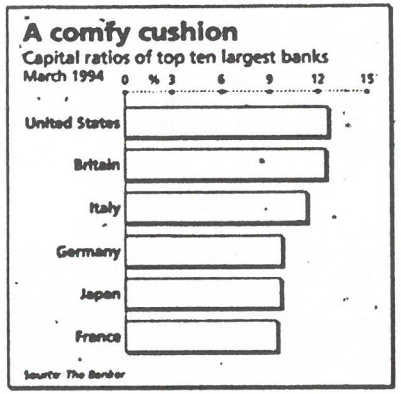
FIGURE 6

TEN HOLDING COMPANIES WITH THE MOST DERIVATIVE CONTRACTS
1993

Rank	Holding Company	Assets	Total Derivatives	Total Futures	Total Swaps	Total Options
1	Chemical Banking Corporation	145,522	2,117,385	1,245,500	544,257	317,628
2	Bankers Trust New York Corp.	83,987	1,769,947	816,740	355,597	597,610
3	Citicorp	216,285	1,762,478	1,207,132	264,811	290,535
4	JP Morgan & Co., Inc.	132,532	1,550,680	572,897	579,219	398,563
5	Chase Manhattan Corporation	99,085	1,125,075	666,150	258,086	200,839
6	Bankamerica Corporation	185,466	899,783	581,034	229,926	88,823
7	First Chicago Corporation	49,936	452,780	276,790	100,666	75,324
8	Continental Bank Corporation	22,352	170,052	61,058	52,953	56,041
9	Republic New Corporation	36,205	164,979	81,707	45,504	37,768
10	Bank of New York Company, Inc.	41,045	91,434	65,128	12,200	14,106
	Top Ten Holding Companies		10,104,592	5,574,136	2,453,219	2,077,236
	Other 205 Holding Companies		617,374	247,461	227,278	142,574
	Total Amount For All Holding Companies		10,721,965	5,821,597	2,680,497	2,219,811
	Top Ten Percentage of Total Holding Companies:		**94.24%**	**95.74%**	**91.52%**	**93.57%**

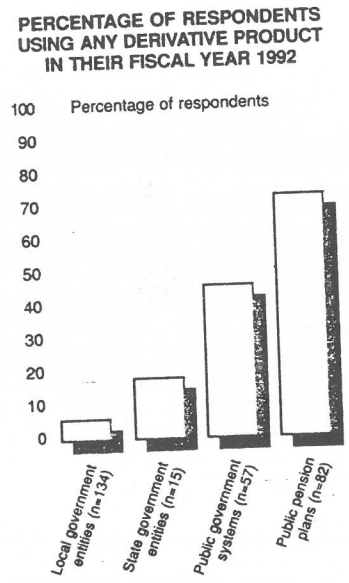
Source: Peter A. Abken, "Over-the-Counter Financial Derivatives: Risky Business?" *Economic Review*, March/April 1994, p. 5.

FIGURE 7



Source: "The Collapse of Barings: A Fallen Star" The Economist, March 4, 1995, p. 21.

FIGURE 8



Source: betsy Dotson, "Financial Derivatives: Government As End Users," Government Finance Review, August 1994, p. 13.

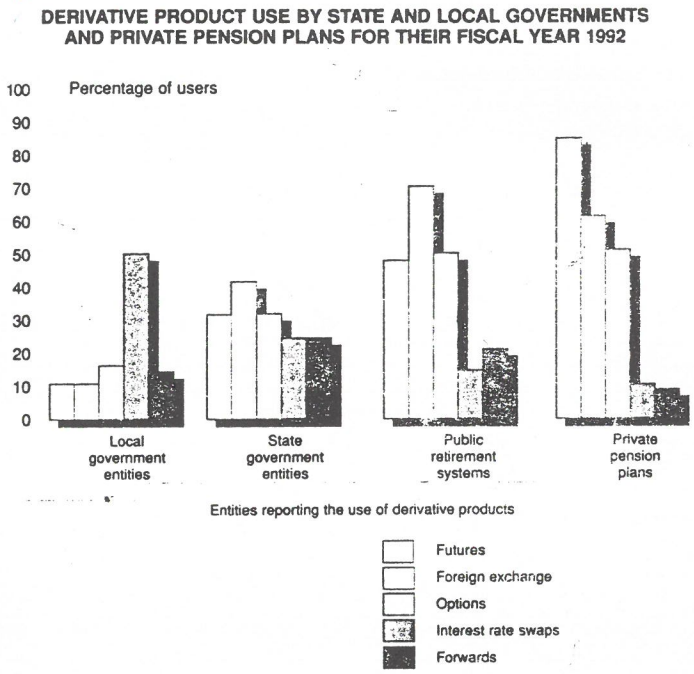


FIGURE 10

PERCENTAGE AND NUMBER OF USERS CITING REASONS FOR USING A DERIVATIVE PRODUCT

	To Reduce Cost of Raising Capital		To Increase Rate of Return		To Hedge		All Other	
	Number	%	Number	%	Number	%	Number	%
Derivative Product								
Interest Rate Swap	12	44	20	71	24	73	6	55
Foreign Exchange	4	8	33	55	62	94	10	67
Forward	6	50	7	50	9	69	1	50
Future	6	11	56	81	56	82	30	88
Option	6	14	46	81	39	72	8	73
Other	7	28	19	70	24	86	5	71

From Betsy Dotson, "Financial Derivatives: Governments as End Users," *Government Finance Review*, August 1994, p.13.

THE AFDC DILEMMA: A PROBLEM OF INCENTIVES AND TRADEOFFS

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