



SOCIETY OF ACTUARIES

Article from:

# International Section News

June 1998 – Issue No. 16

# Survey of FAS 87 Assumptions

by F. Roger Atkins

This article presents a brief summary of Watson Wyatt's Survey of FAS 87 assumptions for non-U.S.-defined benefit plans as of December 31, 1996 and also includes some historical comparisons for selected countries. This is the eighth annual survey of assumptions used by major U.S. (and a few non-U.S.) corporations for their defined-benefit plans outside of the U.S.

Survey responses were received from more than 130 companies that had adopted FAS 87 for their foreign plans and the following 20 countries were covered: Australia, Germany, Mexico, South Africa\*, Austria, Hong Kong, Netherlands, Spain, Belgium, Ireland\*, New Zealand\*, Switzerland, Canada, Italy\*, Philippines\*, Taiwan, France, Japan, Portugal, United Kingdom.

This list includes the major foreign countries where companies have defined-benefit plans and also covers usage of a fairly wide spectrum of different local funding and actuarial approaches. In addition, the results from the U.S. survey have been included for reference.

## Measurement Dates

The majority of the reported measurement dates are December 31, 1996 or within a few months of this date.

## Background Economic Data

### Europe

The European recovery in the 1990s has been hampered by consistently high unemployment rates. In 1996, however, growth in the core European economies started to strongly increase, and there was gradual improvement across the EU as a whole. Generally this expansion is being achieved without significant inflationary pressures, and there is evidence that the high levels of unemployment will result in continued capacity for growth without inflation. Interest rates, while rising slightly, remain at relatively low levels.

In Germany, interest rates remained stable during 1996. At the end of the

\*New to this year's survey.

year, yields on government long-term bonds (with maturity dates more than 10 years) were running at 6.8%, effectively unchanged from the previous year. The same picture prevails for shorter dated bonds, where yields at the end of 1996 were 5.8%, compared with 6.0% a year earlier. Inflation in 1996 eased further to 1.5% and is expected to remain at a similar level for 1997, although in the medium term cyclical pressures are likely to cause inflation to gradually increase.

Unemployment in France is a major problem, rising to 12.7% by the end of 1996 and showing no sign of decreasing in the near future. This has caused considerable strain on the French economy generally and on the social welfare system in particular. It remains to be seen how the newly elected socialist government will address the economy's structural problems. Inflation, however, has been contained and is stable at about 1.8%.

Long-term interest rates at the end of 1996 were 5.85%.

The U.K. economy continued to grow in 1996, with a corresponding fall in unemployment and with concerns over capacity constraints leading to action to head off the threat of inflation. Sterling strongly appreciated in value against the major trading partners during the course of the year. In 1996, long-bond yields on government stock closed at 7.6%. Interest rates fell during the first half of the year, but had begun to rise by year-end when base rates stood at 6.0%; in the first half of 1997, there were further increases to 6.5%. Inflation fell during 1996 to a low point of 2.1% in September before creeping back up to 2.5% at the year-end. Since then there has been little change.

### Asia/Pacific

In 1996, the Hong Kong market exceeded its 1995 comeback, posting a 35% return for the year (FTA-Hong Kong Index). This reflects the positive investor sentiment towards the 1997 handover of sovereignty.

In 1996, following the slump in 1995 real estate prices, the property sector strongly rebounded. This sparked a rise in bank mortgages, which boosted the

financial sector. Investors who avoided utilities did especially well. Consumer price inflation dropped 3% to 6.6%, its lowest level in 10 years.

Japanese equities lost further ground in 1996 as Japan continued to be forced to manage its struggling economy and the dollar continued its assault on the yen. After the economy enjoyed a brief period of growth in the first quarter of 1996, the Japanese market ended the year down 16% in U.S.-dollar terms. The slowdown was caused by the further contraction in corporate-sector cash flow, which added to the deteriorating structural problems. Bond yields have plummeted in anticipation of falling interest rates, which have further weakened the yen. However, this could provide some economic stimulus for at least the export side of the economy in 1997.

The smaller Asian markets had a

---

*"The European recovery in the 1990s has been hampered by consistently high unemployment rates."*

---

very mixed year. Despite leading indicators predicting a boom in Korea in 1996, Korean companies suffered the effects of an increasingly difficult export environment. Blue-chip stocks took a beating, and negative investor sentiment filled the market. Thailand struggled with uncertain developments in the government and weaknesses in the financial sector. The Thai stock market ended the year down 40%. The region's success story was found in Malaysia, which rallied in the first and fourth quarters of 1996, ending the year up 26% in U.S.-dollar terms. The foreign-exchange markets received assistance from the Malaysian central bank during the fourth quarter, as the Ringgit increased in strength.

*continued on page 4, column 1*

### Survey of FAS 87 Assumptions continued from page 3

#### Latin America

Mexico's economy experienced a 5% GDP growth during fiscal year 1996 along with a 23% real-terms peso appreciation. Recent forecasts have estimated that GDP will grow at least 6% during fiscal year 1997. After three years of very low returns (below inflation), the Mexican stock market rose more than 40% during the first semester of 1997. Such increment is mainly the result of a 6.5 billion foreign investment. Finally, it is important to note that during half of fiscal year 1997, salaries are expected to have an average growth of 6% to 7% above inflation to partially compensate for the loss of purchasing power experienced

during fiscal year 1995.

#### U.S. and Canada

In the U.S., equity markets had another outstanding year with large-capitalization stocks once again leading the way. The DJIA neared 6500 at year-end, reflecting a 29.1% increase (including dividend income) from the end of 1995. The S&P 500 and Russell 1000 returned 23.1% and 22.5%, respectively. When taken with the 35% returns for 1995, the equity markets have increased more than 50% for the past two years. Clearly, performance of this level has not been seen since the mid-1950s. Growth stocks outpaced value for the year as the Russell

1000 Growth Index returned 23.1% versus the 21.6% return for the Russell 1000 Value. Capital goods, consumer staples, financial services, and technology were the top-performing industries.

The Russell 2000 small capitalization index ended the year up 16.5%, or

continued on page 5, column 1

TABLE 1  
Bond Yields and CPI in the 20 Countries Included in the Survey

Country	Bond Yields				CPI	
	Government		Corporate			
	12/31/95 Percentage	12/31/96 Percentage	12/31/95 Percentage	12/31/96 Percentage	12/31/95 Percentage	12/31/96 Percentage
Australia	8.12%	7.36%	8.25%	7.68%	5.10%	1.50%
Austria	5.74	5.44	—	—	1.80	2.30
Belgium	6.64	5.91	7.25	6.32	1.50	2.50
Canada	7.10	6.40	8.30	7.35	1.70	2.20
France	6.51	5.76	6.81	5.80	2.10	1.70
Germany	5.88	5.69	5.24	5.60	1.80	1.40
Hong Kong	5.77	5.59	—	—	6.60	6.70
Ireland	—	6.80	—	7.55	—	1.90
Italy	—	7.48	—	6.41	—	2.60
Japan	3.06	2.75	2.76	2.51	-0.30	0.60
Mexico	44.70	27.37	—	—	52.00	27.70
Netherlands	6.32	5.70	6.47	6.09	1.90	2.50
New Zealand	—	7.14	—	8.12	—	2.55
Philippines	—	10.25	—	—	—	5.10
Portugal	8.93	5.40	8.90	6.10	3.40	3.30
South Africa	—	16.86	—	—	—	9.40
Spain	9.35	6.69	9.91	7.14	4.30	3.20
Switzerland	3.79	3.72	4.10	3.85	1.90	0.80
Taiwan	6.50	5.65	—	—	4.60	2.50
U.K.	7.45	7.51	8.37	8.23	3.20	2.50
15 years	7.79	7.65	—	—	—	—
U.K.	5.59	6.41	6.86	7.36	2.50	3.30
30 years	5.97	6.65	—	—	—	—

Sources:

**Bond Yields:** Hong Kong, Philippines, Taiwan, Mexico, Portugal (Government) and South Africa—*Economist*—Emerging-Market Indicators—Short-Term Interest Rates, Ireland, New Zealand and Portugal (Corporate)—Local Watson Wyatt Office, All others—*Economist*—Financial Indicators.

**CPI:** Hong Kong, Philippines, Taiwan, Mexico, and South Africa—*Economist*—Emerging Market Indicators, Ireland and New Zealand—Local Watson Wyatt Office, All others—*Economist*—Financial Indicators.

## Survey of FAS 87 Assumptions continued from page 4

over 5% behind the large stock indices. Small-value outperformed small-growth as the Russell 2000 Value Index returned 21.4% versus an 11.3% return for the Russell 2000 Growth. Energy, capital goods, and financial services paced the small sector of the market.

Canadian stocks, as represented by the TSE 300, delivered a 28.4% return. The TSE Consumer Products Stock Index returned 19.6%, while the TSE Real Estate Stock Index gained 41.7%. The Canadian bond market had another good year, posting returns of 13.3% for long bonds (SM long-term), 12.5% for intermediate bonds (SM mid-term), and 10.7% for short bonds (SM short-term).

In the U.S. bond market, Treasury yields rose by approximately 70 basis points across the curve. As a result, the shorter duration mortgage and asset-backed sectors were the best performers of the year posting returns of 5.4% and 5.1%, respectively. The long end of the U.S. Treasury market fared relatively poorly with the 30-year issue losing 3.5%. Overall, small capital losses partially offset yields, providing a 3.6% return for the broad market as represented by the Lehman Brothers Aggregate Index over the year.

Table 1 on page 4 gives useful information on bond yields and CPI in the 20 countries included in the survey.

### Discount Rates

Discount rates eased almost across the board following reductions in long-term interest rates in most of the world's economies. It is clear from the survey that companies are taking different approaches to recognizing the higher inflation in Mexico, thereby making the "average rate" somewhat misleading. The range of rates in Hong Kong looks rather extreme. Table 2 shows the distribution of rates and the average for last year.

Figure 1 on page 6 explores how closely the discount rate has been following long-term corporate bond rates, as the latter has become a benchmark for establishing the discount rate. Figure 1 shows the average discount rate less the long-term corporate bond rate for 1995 and 1996. I have excluded Mexico because of the special situation there. In those countries where no corporate bond data were available, I used government bond data as shown earlier, which in

TABLE 2  
Discount Rate Distribution

	Average		Lowest 1996	Highest 1996
	1996	1995		
Australia	7.78%	8.26%	6.50%	9.00%
Austria	6.40	6.80	5.50	7.00
Belgium	6.89	7.36	6.00	7.50
Canada	7.88	8.41	7.00	9.00
France	6.89	7.56	6.00	8.00
Germany	6.57	6.86	6.00	7.50
Hong Kong	8.82	8.38	7.50	11.00
Ireland	7.31	—	7.00	7.50
Italy	8.88	—	7.50	9.50
Japan	4.25	4.36	3.00	5.75
Mexico	15.13	13.49	5.00	25.40
Netherlands	6.33	6.73	6.00	7.00
New Zealand	5.83	—	5.50	6.00
Philippines	12.29	—	11.00	15.00
Portugal	7.16	7.90	6.00	8.00
South Africa	14.86	—	14.00	15.00
Spain	7.54	8.56	6.00	9.50
Switzerland	4.53	4.80	4.00	5.00
Taiwan	7.30	7.83	7.00	8.00
U.K.	8.21	8.56	6.75	9.00
U.S.	7.55	7.28	5.75	8.50

some instances means short-term interest rates.

It is interesting to note that in 1995 there were six countries, and in 1996 nine countries, in which the measured difference was greater than  $\pm 1\%$ . Also there were two countries in 1995 and four countries in 1996 in which the measured difference was negative (that is, the average discount rate was lower than the bond rate).

### Rate of Return

The survey disclosed the following percentages of funded plans in those countries in which both funded- and book-reserved plans occur: Austria, 30%; Japan, 86%; France, 56%; Mexico, 89%; Germany, 55%; Spain, 25%; Italy, 75%.

As expected, in most cases the rate of return changed very little, but there are some wide ranges, which need further explanation. Mexico is a special case. Table 3 shows the distribution of rates and the average for last year, and Table 4 shows the range of results of "real returns."

While it would be desirable to use the best possible estimate of a long-term CPI to develop these data, for simplicity and

convenience I have used the reported current CPI rates that appear earlier. Therefore, when interpreting these results, it is important to take into account that they are benchmarked against a current CPI as opposed to a long-term CPI.

### Salary Increase

Table 5 shows the distribution of the salary increases, together with the average for last year.

The salary increase is very much company- and plan-specific, once the underlying country level of inflation is taken into account and there appears to be a modest reduction from last year.

Table 6 shows the range of results for "real salary increases."

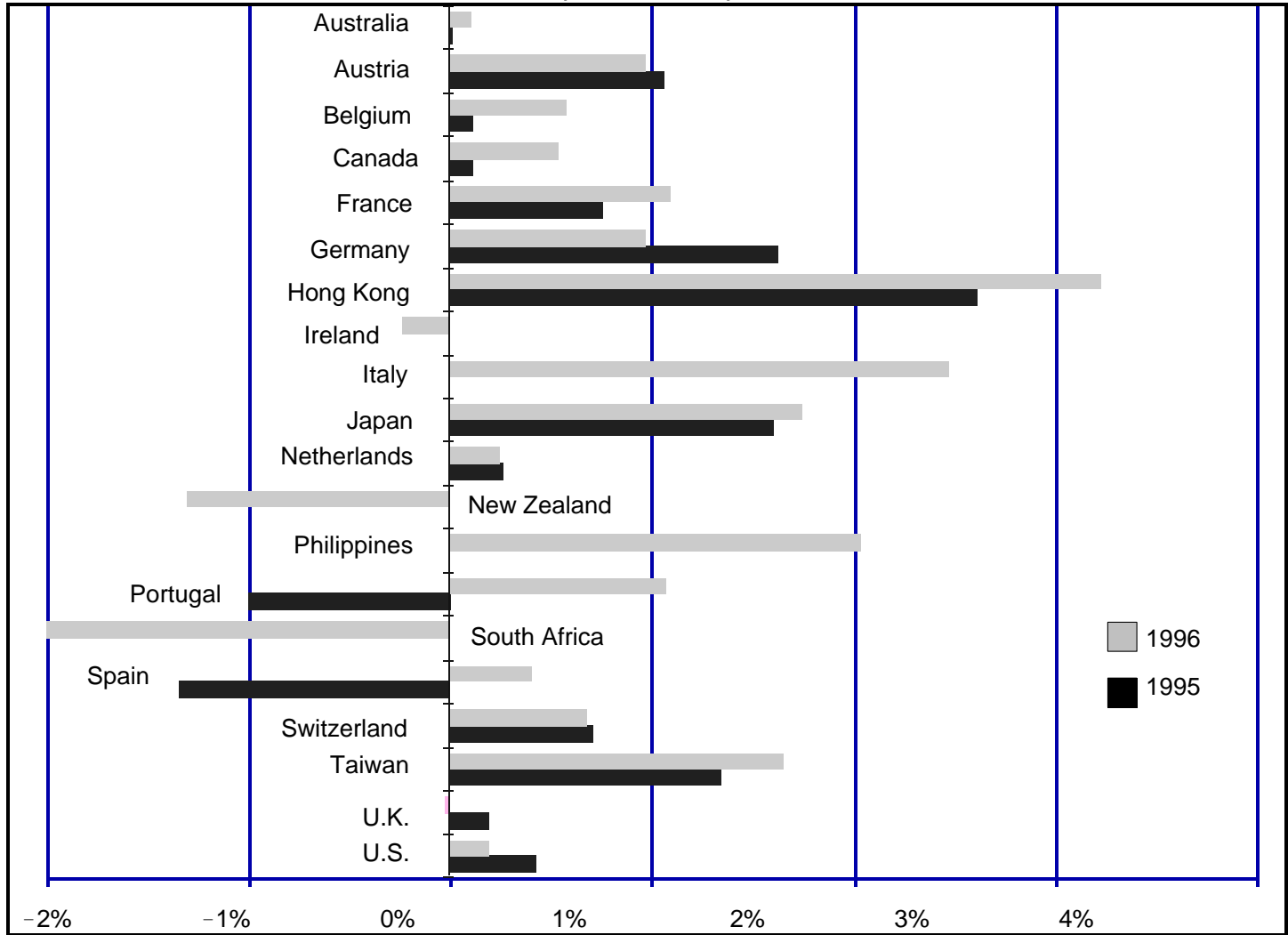
### Historical Data

Figures 2-7 provide historical information on the discount rate and government bond rate for six important countries: Australia, Canada, Germany, Japan, Netherlands, and the U.K. over the period 1989 to 1996.

continued on page 6, column 1

**Survey of FAS 87 Assumptions**  
*continued from page 5*

**FIGURE 1**  
**Average Discount Rate Less the Long-Term Corporate Bond Rate**  
**(1995 and 1996)**



It is curious that even since 1993, when the SEC set out its approach to selecting the discount rate, the survey shows that some companies are using discount rates below the government bond rate. This might arise from issues of materiality and a less than strict application of FAS 87, but we have not explored the matter. It might also arise

from a continuing practice, in some cases, of using local funding assumptions for FAS 87 purposes.

The December 31, 1997 survey is about to be started. I would be happy to answer any questions that readers may have.

My thanks to colleagues Angela Tamburino for managing the survey

process and Mani Sundaresan for his review and preparation of the figures.

*F. Roger Atkins, ASA, is a consulting actuary at Watson Wyatt Worldwide in Washington, D.C.*

*continued on page 7*

Survey of FAS 87 Assumptions

**TABLE 3**  
Rates of Return Distribution

	Average		Lowest 1996	Highest 1996
	1996	1995		
Australia	8.52%	8.94%	8.00%	10.00%
Austria	7.42	7.08	6.75	8.00
Belgium	7.49	7.60	4.75	8.75
Canada	8.95	9.09	7.00	11.00
France	7.25	7.93	6.00	8.50
Germany	7.10	6.98	6.50	8.00
Hong Kong	9.86	9.50	9.00	12.00
Ireland	8.00	—	7.50	8.50
Italy	7.67	—	4.50	9.50
Japan	4.94	5.64	3.00	7.50
Mexico	16.19	16.00	6.00	26.00
Netherlands	7.47	7.43	6.00	8.50
New Zealand	6.46	—	5.75	7.00
Philippines	12.75	—	11.00	15.00
Portugal	7.28	7.90	6.00	8.00
South Africa	15.93	—	14.00	16.50
Spain	7.00	8.20	6.00	8.50
Switzerland	5.48	5.79	4.00	6.50
Taiwan	7.30	7.86	7.00	8.00
U.K.	9.20	9.36	7.75	11.00
U.S.	9.09	9.09	8.00	10.50

**TABLE 4**  
Real Returns

Real Rate	1995	1996
Less than 3%	1	0
3%–4%	4	4
4%–5%	1	5
5%–6%	5	5
More than 6%	4	6

**TABLE 6**  
Real Salary Increases

Real Rate	1995	1996
Less than 1%	2	0
1.0%–1.5%	0	1
1.5%–2.0%	3	7
2.0%–2.5%	4	3
2.5%–3.0%	3	3
More than 3.0%	3	6

*continued on page 8*

**TABLE 5**  
Salary Increase Distribution

	Average		Lowest 1996	Highest 1996
	1996	1995		
Australia	5.17%	5.63%	4.00%	6.50%
Austria	4.10	3.97	3.00	5.00
Belgium	4.36	4.75	3.00	6.00
Canada	4.90	5.32	3.50	7.90
France	3.40	3.97	2.00	5.50
Germany	3.76	3.85	2.50	6.50
Hong Kong	8.23	7.58	7.50	10.50
Ireland	4.88	—	4.00	6.00
Italy	5.81	—	5.00	7.00
Japan	3.53	3.71	2.30	5.30
Mexico	13.84	10.45	2.00	25.00
Netherlands	4.28	4.21	2.50	6.50
New Zealand	4.25	—	3.00	5.00
Philippines	10.25	—	9.50	12.00
Portugal	4.91	6.00	3.50	7.00
South Africa	12.43	—	10.00	13.50
Spain	5.33	6.21	3.75	7.00
Switzerland	3.28	3.56	2.50	4.50
Taiwan	7.10	7.43	6.50	8.50
U.K.	5.70	6.05	4.00	7.50
U.S.	4.73	4.78	2.50	8.40

Survey of FAS 87 Assumptions

FIGURE 2  
Australian Discount Rates

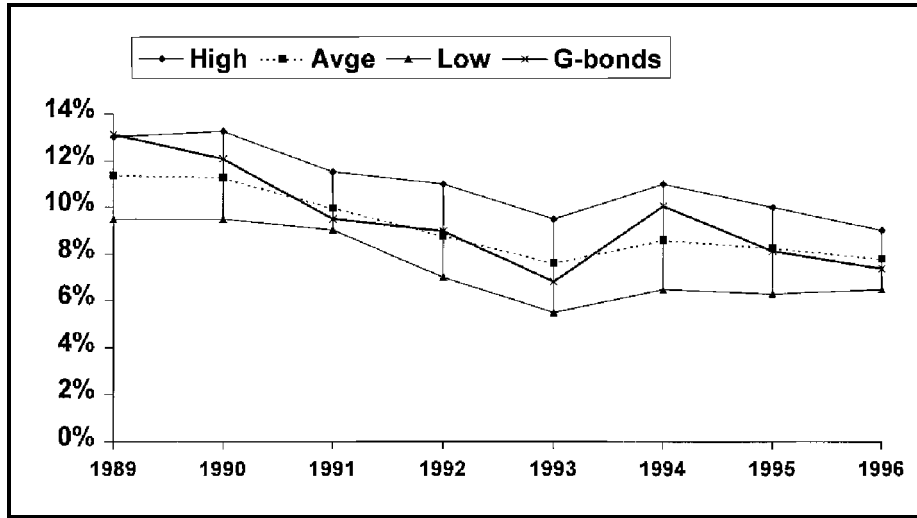


FIGURE 3  
Japanese Discount Rates

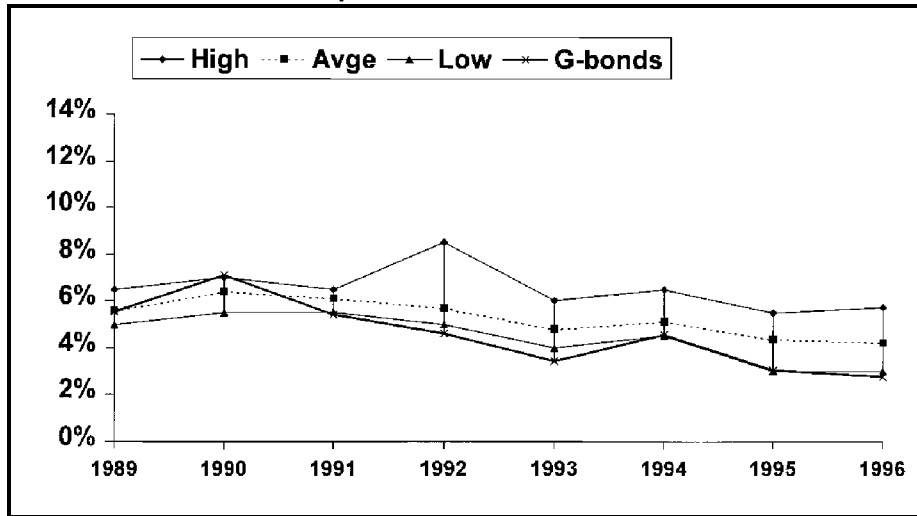
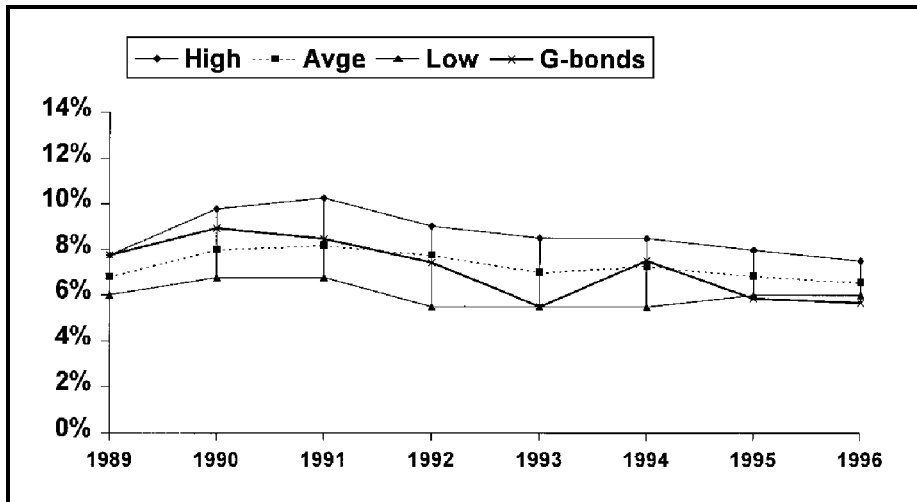


FIGURE 4  
German Discount Rates



Survey of FAS 87 Assumptions

FIGURE 5  
Netherlands Discount Rates

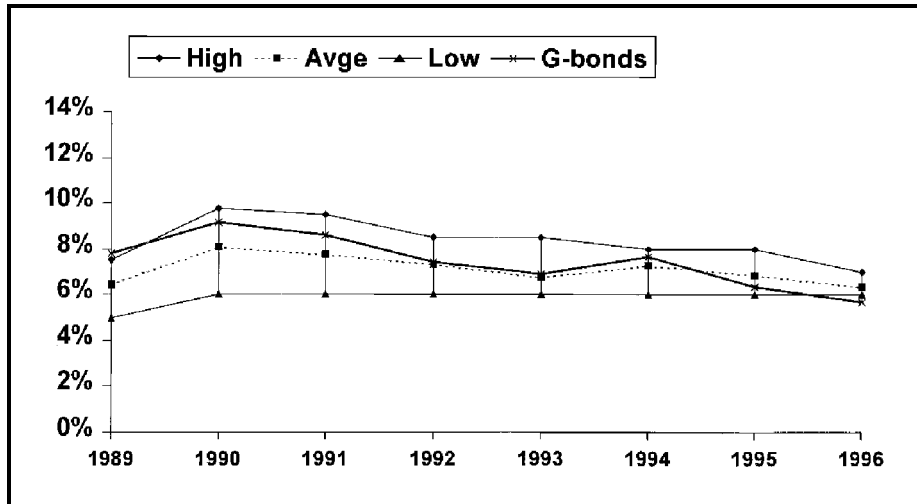


FIGURE 6  
U.K. Discount Rates

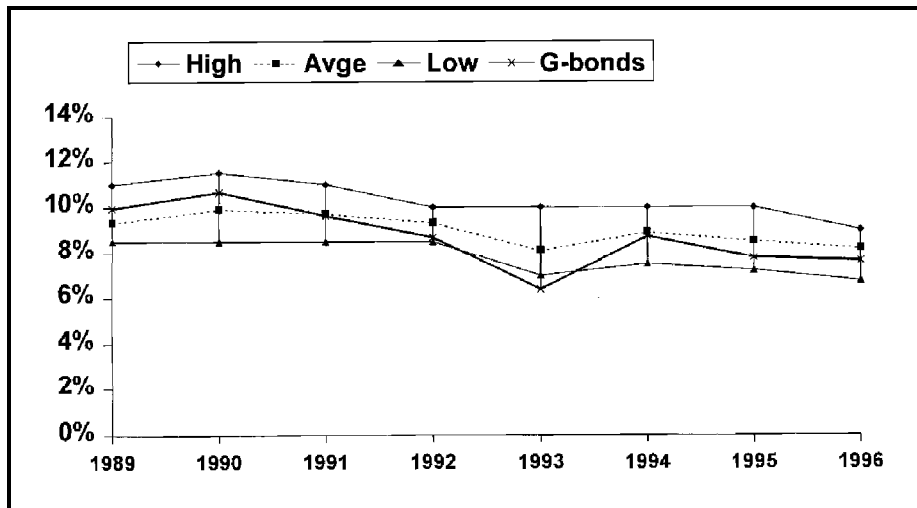


FIGURE 7  
Canada Discount Rates

