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Morgan Stanley Pension Surplus Index

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With the advent of FASB 87 and asset/liability management strategies, plan sponsors need to be able to compare total pension plan results (i.e., assets and liabilities) to a standard measure. While the consulting and brokerage communities have inundated the pension world with indices, benchmarks, and tools for measuring asset performance, an important benchmark of pension performance—pension surplus—has largely gone unmeasured.

Background

Much has been written about the size, source, growth, decline and/or disposition of "surplus" pension assets. By some accounts surplus has risen dramatically in the 1980s as pension assets have soared. By other accounts surplus has actually declined due to sharp increases in liabilities.

Much of the noise and amazement seems to stem from the choice of interest rates used to value liabilities, and some of the remaining noise comes from the choice of a liability definition.

Nonetheless, liabilities and assets are being assigned market values and these values are being disclosed on a relatively current basis as a result of FASB 87 which must be adopted by most corporations no later than the first accounting year commencing after December 15, 1986.

The most complex studies of the surplus measurement and disclosure issue devote considerable effort to the development and analysis of one simple idea: **Surpluses increase when assets go up faster than liabilities and decline when liabilities go up faster than assets.**

Surpluses may be defined in dollar terms as assets minus liabilities or in funded ratio terms as assets divided by liabilities. Asset/liability ratios exceeding 100% indicate a surplus; ratios below 100% identify a plan deficit. When we focus on ratios we find that funded ratios increase when assets increase by a larger percentage than liabilities and decline otherwise.

We have recognized several general principles that make it possible to estimate readily how pension funding ratios are changing for the "typical" plan. These principles include:

- The major factor affecting liability values in the short run is interest rates.
- The interest sensitivity of the Accumulated Benefit Obligation (ABO) of many plans falls in a fairly narrow range (i.e., a duration of ten to twelve years is quite common).
- Plan assets will exhibit price behavior different from the liabilities for two primary reasons:
  - — the plan's fixed income holdings are of different duration (almost invariably shorter) than the liabilities, and

— equity returns differ from the returns on a liability-matching (i.e., immunized) portfolio.

- A nominal asset mix of 60% equity, 30% bonds, 10% cash will roughly represent a great number of plans' actual mixes.

Morgan Stanley Pension Surplus Index

Based on the above we have developed the Morgan Stanley Pension Surplus Index (MSPSI) which we compute monthly based on changing capital market conditions (we have made some simplifying assumptions with respect to plan demographics so that the index may be computed with respect to capital market effects alone). The initial index value was set at 125% (1.25—a ratio of $125 in assets to $100 in liabilities) at January 1, 1980. Table 1 shows the progression of the MSPSI from January 1980 through July 1987.

Figure 1 tracks the asset performance of the typical pension plan from January 1980 through July 1987. It was assumed that the typical plan had an asset mix of

Table 1

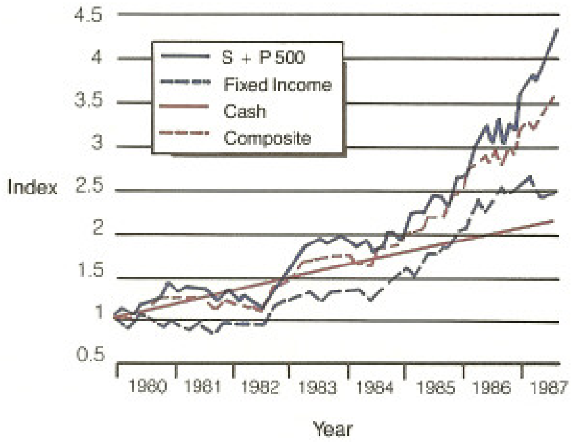
Morgan Stanley Pension Surplus Index

1980–1987

Date	MSPSI	Date	MSPSI	Date	MSPSI	Date	MSPSI
1/31/80	139.93%	1/31/82	160.43%	1/31/84	158.34%	1/31/86	141.04%
2/29/80	149.55	2/28/82	153.10	2/29/84	158.31	2/28/86	134.64
3/31/80	141.48	3/31/82	150.35	3/31/84	163.21	3/31/86	128.62
4/30/80	129.17	4/30/82	150.46	4/30/84	166.33	4/30/86	130.91
5/31/80	128.88	5/31/82	146.74	5/31/84	169.43	5/31/86	141.31
6/30/80	128.27	6/30/82	148.82	6/30/84	170.81	6/30/86	134.04
7/31/80	141.78	7/31/82	143.12	7/31/84	158.57	7/31/86	132.56
8/31/80	145.38	8/31/82	145.20	8/31/84	165.09	8/31/86	132.67
9/30/80	151.79	9/30/82	138.34	9/30/84	159.86	8/31/86	131.23
10/31/80	157.75	10/31/82	138.98	10/31/84	152.73	10/31/86	134.33
11/30/80	165.85	11/30/82	143.56	11/30/84	149.44	11/30/86	133.94
12/31/80	157.22	12/31/82	142.32	12/31/84	149.99	12/31/86	132.96
1/31/81	155.64	1/31/83	150.57	1/31/85	153.78	1/31/87	140.96
2/28/81	164.63	2/28/83	147.06	2/28/85	162.00	2/28/87	141.00
3/31/81	164.60	3/31/83	149.97	3/31/85	157.60	3/31/87	144.87
4/30/81	172.84	4/30/83	150.35	4/30/85	156.52	4/30/87	149.71
5/31/81	164.79	5/31/83	158.22	5/31/85	149.04	5/31/87	152.34
6/30/81	165.58	6/30/83	158.08	6/30/85	149.15	6/30/87	157.16
7/31/81	171.87	7/31/83	164.94	7/31/85	151.54	7/31/87	163.27
8/31/81	173.11	8/31/83	163.36	8/31/85	148.08		
9/30/81	171.91	9/30/83	159.41	9/30/85	145.20		
10/31/81	168.73	10/31/83	160.55	10/31/85	144.45		
11/30/81	155.91	11/30/83	160.41	11/30/85	145.09		
12/31/81	160.24	12/31/83	161.03	12/31/85	141.58		

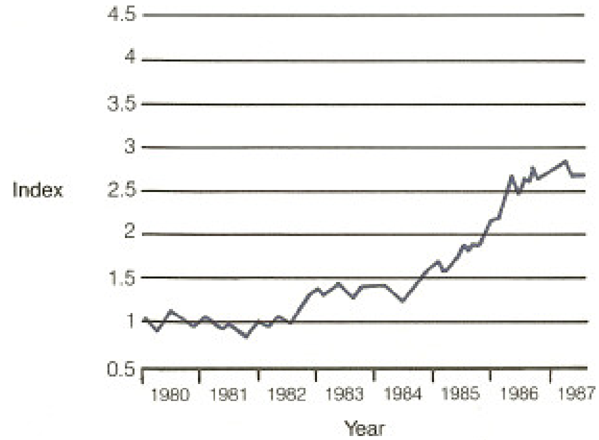
Source: Morgan Stanley Pensions

Figure 1
Asset Performance
1980–1987



Source: Morgan Stanley Pensions

Figure 2
Liability Values
1980–1987



Source: Morgan Stanley Pensions

60% equities, 30% intermediate government bonds and 10% cash. The annualized rates of return over this time period were:

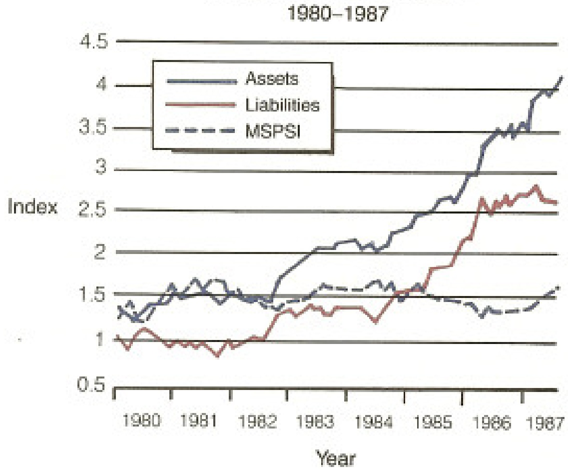
Equities	20.7%
Fixed Income	12.1
Cash	10.4
Total	17.3%

Figure 2 displays the pension fund's ABO liabilities over the same time period. In developing the liabilities, we used a representative corporate pension benefit schedule with a duration of approximately 11 years at current interest rates. As shown in the figure, liabilities have fluctuated greatly with changes in long-term interest rates. Over the time period, the annualized liability return was 13.3%.

Figure 3 exhibits pension assets, liabilities, and the Morgan Stanley Pension Surplus Index (MSPSI) over the time period. Figure 4 shows the MSPSI alone.

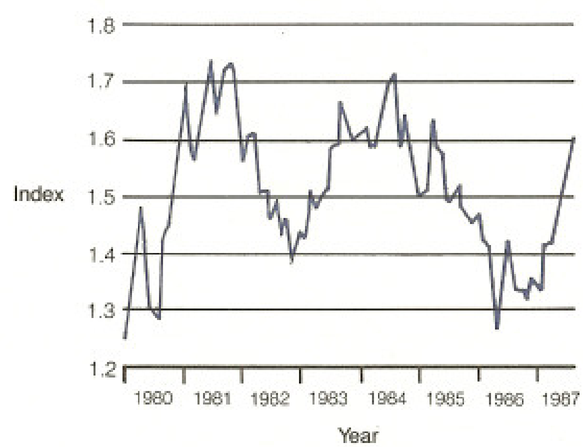
Until recently, liability disclosures have been based on discount rates which were lower than rates generally available in the capital markets. The resulting overstatement of liabilities was most prominent when market

Figure 3
Assets, Liabilities and Morgan Stanley Pension Surplus Index
1980–1987



Source: Morgan Stanley Pensions

Figure 4
Morgan Stanley
Pension Surplus Index



Source: Morgan Stanley Pensions

interest rates were at their highest. As market rates declined and disclosure rates rose, reported surpluses marched steadily upwards. This gives the impression that surpluses increased throughout the bull market which began in 1982. The MSPSI shows that the most dramatic growth in pension ratios occurred between early 1980 and late 1981. During most of the subsequent bull market, surplus ratios actually declined! A new surplus surge began in late 1986 as the equity market leaped ahead in marked contrast to declining bond prices.

Table 2 displays the overall and asset-class-specific MSPSIs. The MSPSI of a portfolio with any mix of these asset classes may be calculated by weighting the growth rate of the MSPSI of each individual asset class by the proportion of the asset in the portfolio. For instance, Table 2 shows that from June 30, 1987 to July 31, 1987, the all-equity MSPSI went up by 5.50% (191.67 to 202.22), the all-bond MSPSI by 1.16% (114.35 to 115.68), and the all-cash MSPSI by 2.32% (100.44 to 102.77). Combining 60% of 5.50%, 30% of 1.16% and 10% of 2.32% results in a 3.89% increase for the overall MSPSI (157.16 to 163.27).

Conclusion

The Morgan Stanley Pension Surplus Index represents a step forward in measuring pension fund performance in an asset/liability framework. While each plan's asset/liability ratio will rise and fall as a result of many factors (e.g., demographics, plan design), those capital market forces which affect plan ratios are now identifiable. Further, by using the asset-class-specific MSPSIs, these forces may be measured for plans which mix stocks, bonds and cash in any proportions. Those sponsors whose investment focus is asset/liability oriented have a new tool at their disposal.

Table 2

Overall and Asset-class-specific MSPSIs
1980–1987

Date	Overall MSPSI	All-Equity MSPSI	All-Bond MSPSI	All-Cash MSPSI	Immunized Bond MSPSI
1/01/80	125.00%	125.00%	125.00%	125.00%	125.00%
6/30/80	128.27	130.43	122.94	127.64	125.00
12/31/80	157.22	174.37	127.66	148.39	125.00
6/30/81	165.58	183.24	130.95	170.16	125.00
12/31/81	160.24	172.42	129.82	179.51	125.00
6/30/82	148.82	153.25	126.81	184.80	125.00
12/31/82	142.32	150.59	122.01	144.42	125.00
6/30/83	158.08	177.22	124.15	146.51	125.00
12/31/83	161.03	179.36	126.83	153.51	125.00
6/30/84	170.81	187.17	134.81	177.43	125.00
12/31/84	149.99	161.06	125.36	145.16	125.00
6/30/85	149.15	163.23	123.78	130.25	125.00
12/31/85	141.58	155.19	119.96	114.24	125.00
6/30/86	134.04	151.52	110.88	95.60	125.00
12/31/86	132.96	146.34	115.02	95.64	125.00
6/30/87	157.16	191.67	114.35	100.44	125.00
7/31/87	163.27	202.22	115.68	102.77	125.00

Source: Morgan Stanley Pensions