

NOTES ON THE *FINANCIAL TIMES*- ACTUARIES BRITISH GOVERNMENT SECURITIES INDICES IN 1980

by

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and

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1. *Introduction*

1.1 This note continues the series started in 1976, of which the last previous was "F.T.-Actuaries British Government Securities Indices 1979" (*J. I. A.*, 107, 315 and *T. F. A.* 37, 77).

1.2 Throughout 1980 partly paid new issues have been excluded from the indices until fully paid. It is intended that eventually partly paid new issues be included as if fully paid from date of issue, but no retrospective adjustments to the published indices will be made. The only difficulty in 1980 deserving comment arose on 16th/17th December. The *xd* adjustments for 17th December published in the *Financial Times* should have been shown for the 16th, in addition to the actual *xd* adjustments published for the 16th. Subsequent data were unaffected by this error.

2. *Yield Indices*

2.1 Appendix B of the 1979 note lists the constituents of the yield indices at 31st December 1979. Changes in the constituents during 1980 are listed in Appendix A of the present note. There were 11 new stocks entering (excluding further tranches of existing stocks); 7 stocks came within one year of maturity; and 15 stocks were moved from one coupon band to another to maintain roughly equal numbers in each band. The grouping of coupons in bands was changed on three occasions.

2.2 At 31st December 1980 there were 25 stocks in the Low Coupon band which then contained coupons from 3%–9%; 25 in the Mediums (9½%–12¼%); and 24 in the Highs (12½%–15½%). A complete list of these is given in Appendix B.

2.3 Appendix C shows the values of the gross redemption yields, convertible half-yearly, for the ten indices for 31st December 1979 and for the last working day of each month in 1980, together with the highest and lowest values recorded for each index during the year. The yield lows occurred on or about 21st July, and the highest yields on 4th March, except that the Irredeemables yield registered its high on 21st March.

3. *Portfolio Indices*

3.1 Appendix E of the 1979 note listed the constituents of the portfolio indices at 31st December 1979. Changes in the constituents during 1980

are listed in Appendix D of the present note. Of a total of 17 new entries 4 were included from fully paid issue (of these 2 were A stocks) and 13 from payment of the final call (of these 4 were A stocks); the nominal amount of three stocks was increased on special further issues to the Bank of England for resale in the market; 4 new tranches were amalgamated; 6 stocks neared redemption; and 6 stocks moved between sectors as the time to redemption shortened.

3.2 At 31st December 1980 there were 27 stocks in the "up to 5 years" sector; 29 stocks in the "5 to 15 years" sector; 28 stocks in the "over 15 years" sector; and 6 stocks in the irredeemables sector; making a total of 90 stocks. These are listed in Appendix E.

3.3 In 5.1 to 5.6 of the 1976 note it was shown how one could use the published values of the indices and the "xd adj" figure to calculate cumulative rates of return on the sectors for the year on two different assumptions about when dividends are reinvested and at two different tax rates. The values of the index at the end of each month and the cumulative interest received for 1980 to the end of each month, for each sector, are shown in Appendix F.

3.4 The cumulative rates of return for 1980, expressed as percentages, were :

	<i>First Assumption</i>		<i>Second Assumption</i>	
	<i>Gross</i>	<i>Net of tax at 37½%</i>	<i>Gross</i>	<i>Net of tax at 37½%</i>
Up to 5 years	17.87%	13.59%	17.73%	13.51%
5 to 15 years	19.20%	13.99%	19.10%	13.95%
Over 15 years	21.26%	15.52%	20.96%	15.36%
Irredeemables	17.79%	12.97%	17.64%	12.88%
All stocks	19.46%	14.39%	19.28%	14.30%

First Assumption: Interest is reinvested at the end of the month during which it has gone "ex div".

Second Assumption: Interest is held as a credit until the end of the month following that in which it has gone "ex div".

It can be seen that the first assumption gives results somewhat higher than those under the second assumption, with the differences ranging from 0.04% more for "5 to 15 years" (Net) to 0.30% more for "over 15 years" (Gross.)

APPENDIX A

Yield Indices: Changes in Constituents during 1980

Numbers in parentheses indicate the numbers of stocks in the low, medium and high coupon bands respectively, after each change. At 31 December 1979 they were (21 : 23 : 26): 3% to 8½%; 8½% to 11½%; 12% to 15½%.

9 Jan.	Entry of 14% Treasury 1998/2001 (high) (21 : 23 : 27)
10 Jan.	Issue of 14% Exchequer 1984 (high) (21 : 23 : 28)
15 Jan.	One year from maturity of 11½% Treasury 1981 (medium) (21 : 22 : 28)
15 Feb.	One year from maturity of 3½% Treasury 1979/81 (low)
	Transfer from medium to low of:
	8½% Treasury 1980/82
	8½% Treasury 1984/86
	8½% Exchequer 1983
	8½% Exchequer 1997
	Transfer from high to medium of:
	12% Treasury 1983
	12% Treasury 1984
	12% Treasury 1995
	12% Exchequer 1998
	12% Exchequer 1999/2002
	12% Exchequer 2013/17
	Bands now 3% to 8½%; 9% to 12%; 12½% to 15% (24 : 24 : 22)
29 Feb.	Entry of 13½% Exchequer 1983 (high) (24 : 24 : 23)
1 Apr.	One year from maturity of 9½% Treasury 1981 (medium) (24 : 23 : 23)
11 Apr.	Entry of 14% Treasury 1996 (high) (24 : 23 : 24)
29 May	Issue of 3% Treasury 1985 (low) (25 : 23 : 24)
6 June	Entry of 13½% Treasury 2004/08 (high) (25 : 23 : 25)
12 June	One year from maturity of 8½% Exchequer 1981 (low) (24 : 23 : 25)
11 July	Entry of 13½% Exchequer 1992 (high) (24 : 23 : 26)
25 July	Transfer from medium of low of:
	9% Treasury 1994
	9% Treasury 1992/96
25 July	Transfer from high to medium of:
	12½% Exchequer 1985
	12½% Exchequer 1992
	12½% Exchequer 1999
	Bands now 3% to 9%; 9½% to 12½%; 12½% to 15½% (26 : 24 : 23)
28 July	(should have been 25 July) Entry of 13½% Exchequer 1994 (high) (26 : 24 : 24)
4 Aug.	One year from maturity of 9½% Exchequer 1981 (medium) (26 : 23 : 24)
21 Aug.	One year from maturity of 3% Exchequer 1981 (low) (25 : 23 : 24)
29 Aug.	Entry of 13% Treasury 2000 (high) (25 : 23 : 25)
12 Sep.	Entry of 12% Treasury 1987 (medium) (25 : 24 : 25)
14 Nov.	Entry of 11½% Exchequer 1986 (medium) (25 : 25 : 25)
24 Nov.	One year from maturity of 12½% Exchequer 1981 (high) (25 : 25 : 24)

APPENDIX B

*Yield Indices: Stocks at 31st December 1980**Low Coupons (3% to 9%)*
(25 stocks)

3%	Treasury 1982
3%	Exchequer 1983
3%	Exchequer 1984
3%	Treasury 1985
3%	British Transport 1978/88
3%	British Gas 1990/95
3½%	Funding 1999/2004
5%	Treasury 1986/89
5½%	Funding 1982/84
5½%	Treasury 2008/12
5½%	Funding 1987/91
6%	Funding 1993
6½%	Funding 1985/87
6½%	Treasury 1995/98
7½%	Treasury 1985/88
7½%	Treasury 2012/15
8%	Treasury 2002/06
8½%	Treasury 1982
8½%	Treasury 1987/90
8½%	Treasury 1980/82
8½%	Treasury 1984/86
8½%	Treasury 1983
8½%	Treasury 1997
9%	Treasury 1994
9%	Treasury 1992/96

High Coupons (12½% to 15½%)
(24 stocks)

12½%	Treasury 1993
12½%	Exchequer 1994
12½%	Treasury 2003/05
12½%	Treasury 1992
12½%	Treasury 1995
13%	Treasury 1990
13%	Treasury 2000
13½%	Exchequer 1987
13½%	Exchequer 1996
13½%	Treasury 1997
13½%	Exchequer 1983
13½%	Exchequer 1992
13½%	Exchequer 1994
13½%	Treasury 2004/08
13½%	Treasury 1993
13½%	Treasury 2000/03
14%	Treasury 1982
14%	Exchequer 1984
14%	Treasury 1996
14%	Treasury 1998/01
14½%	Treasury 1994
15%	Treasury 1985
15½%	Treasury 1996
15½%	Treasury 1998

Medium Coupons (9½% to 12½%)
(25 stocks)

9½%	Exchequer 1982
9½%	Treasury 1983
9½%	Treasury 1999
10%	Exchequer 1983
10%	Treasury 1992
10½%	Exchequer 1995
10½%	Exchequer 1997
10½%	Treasury 1999
11%	Exchequer 1991
11½%	Exchequer 1984
11½%	Treasury 1989
11½%	Treasury 2001/04
11½%	Exchequer 1986
11½%	Treasury 1991
11½%	Treasury 2003/07
12%	Treasury 1983
12%	Treasury 1984
12%	Treasury 1987
12%	Treasury 1995
12%	Exchequer 1998
12%	Exchequer 1999/02
12%	Exchequer 2013/17
12½%	Exchequer 1985
12½%	Exchequer 1992
12½%	Exchequer 1999

Irredeemables (6 stocks)

2½%	Treasury
2½%	Consols
3%	Treasury
3½%	War Loan
3½%	Conversion
4%	Consols

APPENDIX C

Yield Indices: Gross Redemption Yield (Convertible Half-Yearly) Per Cent

	Low Coupons				Medium Coupons				High Coupons				Irredeemables
	5 yrs	15 yrs	25 yrs		5 yrs	15 yrs	25 yrs		5 yrs	15 yrs	25 yrs		
31 Dec. 1979	12.49	12.56	12.72		14.78	14.45	14.17		14.96	14.87	14.60		12.23
31 Jan. 1980	12.18	12.18	12.18		14.40	13.81	13.72		14.87	14.30	14.00		11.22
29 Feb.	13.10	12.90	12.90		15.09	14.48	14.26		15.17	14.80	14.69		11.86
31 Mar.	13.17	12.89	12.89		14.98	14.54	14.33		15.03	14.84	14.73		12.39
30 Apr.	12.41	12.31	12.31		14.12	13.91	13.79		14.22	14.22	14.22		11.64
30 May	12.21	12.15	12.15		14.04	14.83	13.69		14.16	14.17	14.07		11.36
30 June	11.94	11.94	11.94		13.42	13.46	13.43		13.49	13.80	13.83		11.27
31 July	11.67	11.62	11.62		13.06	12.94	12.84		13.19	13.30	13.09		11.13
29 Aug.	12.27	12.27	12.27		13.89	13.76	13.64		14.10	13.89	13.89		11.80
30 Sep.	11.71	11.71	11.71		13.09	13.80	13.06		13.26	13.54	13.30		11.30
31 Oct.	11.60	11.57	11.57		13.19	13.19	12.92		13.28	13.44	13.08		11.07
28 Nov.	11.64	11.62	11.62		13.17	13.36	13.08		13.16	13.58	13.25		11.23
31 Dec.	11.96	11.96	11.96		13.53	13.84	13.51		13.53	14.06	13.74		11.61
1980 High (on)	13.32	13.12	13.12		15.37	14.71	14.50		15.44	15.06	14.92		12.53
	4/3	4/3	4/3		4/3	4/3	4/3		4/3	4/3	4/3		21/3
1980 Low (on)	11.17	11.11	11.11		12.45	12.40	12.35		12.71	12.81	12.63		10.80
	21/7	21/7	21/7		21/7	21/7	23/7		17/7	21/7	23/7		21/7

APPENDIX D

Portfolio Indices: Changes in Constituents during 1980

- 9 Jan. Entry fully paid of 14% Treasury 1998/2001 (Issued £20 paid on 28 November 1979, Call £40 on 14 December 1979, Final call £35·50) (+£957·5m. to “over 15”)
- 10 Jan. New issue of 14% Exchequer 1984 (+£1,061·9m. to “up to 5”)
- 25 Jan. Shortening of 12% Treasury 1995 (£873·8m. from “over 15” to “5 to 15”)
- 4 Feb. Redemption of 9% Treasury 1980 (—£987·8m. from “up to 5”)
- 22 Feb. Shortening of 15% Treasury 1985 (£998·7m. from “5 to 15” to “up to 5”)
- 29 Feb. Entry fully paid of 13½% Exchequer 1983 (Issued £60 paid on 23 January 1980, Final call £36·75) (+£772·8m. to “up to 5”)
- 14 Mar. Entry fully paid of 12½% Treasury A 2003/05 (Issued £25 paid on 23 January 1980, Call £45 on 15 February 1980, Final call £21·50) (+£870·0m. to “over 15”)
- 11 Apr. Entry fully paid of 14% Treasury 1996 (Issued £20 paid on 27 February 1980, Call £30 on 18 March 1980, Final call £45·50) (+£779·0m. to “over 15”)
- 14 Apr. Redemption of 9½% Treasury 1980 (—£1,085·6 from “up to 5”)
Amalgamation of 12½% Treasury A 2003/05 with main stock
- 1 May Shortening of 3% British Gas 1990/95 (£97·4m. from “over 15” to “5 to 15”)
- 29 May Redemption of 3½% Treasury 1977/80 (—£258·8m. from “up to 5”)
Redemption of 5½% Funding 1978/80 (—£395·5m. from “up to 5”)
New issue of 3% Treasury 1985 (+£414·0m. to “up to 5”)
- 6 June Entry fully paid of 13½% Treasury 2004/08 (Issued £20 paid on 17 April 1980, Call £30 on 16 May 1980, Final call £45) (+£977·5m. to “over 15”)
- 18 June Amalgamation of 13½% Treasury A 2000/03 with main stock
- 11 July Entry fully paid of 13½% Exchequer 1992 (Issued £20 paid on 8 May 1980, Call £30 on 13 June 1980, Final call £46) (+£1,010m. to “5 to 15”)
- 17 July New issue of 3% Exchequer A 1983 (+£330·0m. to “up to 5”)
- 21 July Shortening of 10½% Exchequer 1995 (£679·0m. from “over 15” to “5 to 15”)
- 28 July (Should have been 25 July) Entry fully paid of 13½% Exchequer 1994 (Issued £40 paid on 4 June 1980, Call £30 on 4 July 1980, Final call £26 on 25 July 1980) (+£1,036·2m. to “5 to 15”)
- 1 Aug. Entry fully paid of 12½% Exchequer A 1985 (Issued £40 paid on 25 June 1980, Final call £58·25) (+£586·5m. to “5 to 15”)
- 29 Aug. Entry fully paid of 13% Treasury 2000 (Issued £30 paid on 25 June 1980, Call £45 on 8 August 1980, Final call £21) (+£997·5m. to “over 15”)
- 12 Sept. Entry fully paid of 12% Treasury 1987 (Issued £20 paid on 9 July 1980, Call £30 on 15 August 1980, Final call £46) (+£955·0m. to “5 to 15”)
- 26 Sep. Entry fully paid of 11½% Treasury A 1991 (Issued £20 paid on 23 July 1980, Call £30 on 22 August 1980, Final call £44) (+£1,089·0m. to “5 to 15”)
- 16 Oct. Amalgamation of 12½% Exchequer A 1985 with main stock
- 24 Oct. Entry fully paid of 12% Exchequer A 1998 (Issued £50 paid on 18 September 1980, Final call £42·50) (+£1,212·2m. to “over 15”)
- 29 Oct. New issue of 3% Treasury A 1985 (+£290·0m. to “up to 5”)
- 6 Nov. Redemption of 13% Exchequer 1980 (—£793·6m. from “up to 5”)
- 14 Nov. Entry fully paid of 11½% Exchequer 1986 (Issued £30 paid on 16 October 1980, Final call £65·75) (+£1,011·1m. to “5 to 15”)
- 17 Nov. Shortening of 12½% Treasury 1995 (+£876·4m. from “over 15” to “5 to 15”)

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- 24 Nov. Shortening of 12½% Exchequer 1985 (£1,275·3m. from "5 to 15" +
"up to 5")
- 4 Dec. Amalgamation of 11½% Treasury A 1991 with main stock
- 16 Dec. Redemption of 11½% Treasury 1981 (—£593·4 from "up to 5")
- 22 Dec. Addition of £100m. nominal to 12½% Exchequer 1992 (+£94·1m. +
"5 to 15")
- Addition of £100m. nominal to 12½% Exchequer 1994 (+£95·5m. +
"5 to 15")
- Addition of £100m. nominal to 10½% Exchequer 1997 (+£94·0m. +
"over 15")

APPENDIX E

Portfolio Indices: Stocks as at 31st December 1980

<i>Up to 5 Years (27 stocks)</i>		<i>Market Value (£m)</i>
3½%	Treasury 1979/81	484·2
3½%	Treasury 1991	810·9
8½%	Exchequer 1981	882·3
9½%	Exchequer 1981	775·1
3%	Exchequer 1981	569·1
12½%	Exchequer 1981	607·6
8½%	Treasury 1980/82	822·3
3%	Treasury 1992	372·1
14%	Treasury 1982	630·1
8½%	Treasury 1982	750·0
9½%	Exchequer 1982	1,542·4
8½%	Exchequer 1983	740·4
3%	Exchequer 1983	515·9
3%	Exchequer A 1983	344·6
12%	Treasury 1983	1,562·8
9½%	Treasury 1983	734·8
13½%	Exchequer 1983	816·6
10%	Exchequer 1983	836·0
5½%	Funding 1982/84	421·6
11½%	Exchequer 1984	1,088·7
14%	Exchequer 1984	1,141·4
3%	Exchequer 1984	787·4
12%	Treasury 1984	1,050·4
15%	Treasury 1985	1,110·3
3%	Treasury 1985	442·3
3%	Treasury A 1985	292·6
12½%	Exchequer 1985	1,278·1
Sector Total		21,411·0

<i>5 to 15 Years (29 stocks)</i>		<i>Market Value (£m)</i>
11½%	Exchequer 1986	1,111·2
8½%	Treasury 1984/86	508·5
13½%	Exchequer 1987	491·9
6½%	Funding 1985/87	438·3
12%	Treasury 1987	941·2
7½%	Treasury 1985/88	383·8
3%	British Transport 1978/88	648·4
11½%	Treasury 1989	551·2
5%	Treasury 1986/89	382·9

APPENDIX E (*continued*)

13%	Treasury 1990	573.0
8½%	Treasury 1987/90	456.0
11½%	Treasury 1991	1,742.5
5½%	Funding 1987/91	256.0
11%	Exchequer 1991	681.0
12½%	Treasury 1992	555.8
10%	Treasury 1992	492.7
12½%	Exchequer 1992	843.7
13½%	Exchequer 1992	995.0
12½%	Treasury 1993	1,002.4
6%	Funding 1993	374.2
13½%	Treasury 1993	1,239.1
14½%	Treasury 1994	639.8
13½%	Exchequer 1994	983.8
12½%	Exchequer 1994	1,046.4
9%	Treasury 1994	676.1
12%	Treasury 1995	877.5
3%	British Gas 1990/95	103.8
10½%	Exchequer 1995	625.0
12½%	Treasury 1995	850.5

Sector Total 20,471.7

(11½% Treasury A 1989 (£30 paid) omitted £356.1m)

<i>Over 15 Years (28 stocks)</i>	<i>Market Value</i> (£m)
14% Treasury 1996	790.0
9% Treasury 1992/96	455.2
15½% Treasury 1996	1,466.4
13½% Exchequer 1996	779.0
3% Redemption 1986/96	19.6
13½% Treasury 1997	1,428.8
10½% Exchequer 1997	835.0
8½% Treasury 1997	595.0
6½% Treasury 1995/98	613.8
15½% Treasury 1998	1,233.4
12% Exchequer 1998	716.0
12% Exchequer A 1998	1,179.8
9½% Treasury 1999	451.5
12½% Exchequer 1999	1,669.5
10½% Treasury 1999	649.0
13% Treasury 2000	988.3
14% Treasury 1998/01	1,016.2
12% Exchequer 1999/2002	1,140.8
13½% Treasury 2000/03	1,770.8
11½% Treasury 2001/04	712.0
3½% Funding 1999/2004	172.3
12½% Treasury 2003/05	1,685.2
8% Treasury 2002/06	406.5
11½% Treasury 2003/07	1,306.9
13½% Treasury 2004/08	1,021.2
5½% Treasury 2008/12	499.0
7½% Treasury 2012/15	379.5
12% Exchequer 2013,17	928.7
Sector Total	24,909.4

Sector Total 24,909.4

(11½% Treasury A 2003/07 (£40 paid) omitted £361.2m)

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APPENDIX E (continued)

<i>Irredeemables (6 stocks)</i>		<i>Market Value</i> (£m)
2½%	Consols 1923-	56.9
3½%	War Loan 1952-	584.7
4%	Consols 1957-	115.4
3½%	Conversion 1961-	110.9
3%	Treasury 1966-	14.3
2½%	Treasury 1975-	98.7
Sector Total		980.9
Total Market Value of all included stocks		<u>£67,773.0</u>

APPENDIX F

Portfolio Indices: Values of index (P) and cumulative interest received 1980 to date (C)

	Up to 5 years		5 to 15 years		Over 15 years		Irredeemables		All Stocks	
	P	C	P	C	P	C	P	C	P	C
31 Dec. 1979	100.33	0.00	103.31	0.00	106.82	0.00	119.85	0.00	103.18	0.00
31 Jan. 1980	101.00	0.68	105.16	1.88	111.75	0.42	131.69	0.00	105.85	0.86
29 Feb.	99.76	2.30	103.35	2.00	107.57	1.99	124.54	1.45	103.34	2.06
31 Mar.	101.17	2.30	103.66	2.68	107.58	2.82	120.10	1.78	103.94	2.53
30 Apr.	103.00	3.45	107.50	3.97	111.34	4.51	125.69	6.08	106.95	3.95
30 May	104.00	4.02	109.05	4.27	112.97	4.81	129.05	6.08	108.35	4.34
30 June	105.28	5.18	110.38	6.77	113.82	7.39	129.88	7.24	109.45	6.37
31 July	106.11	6.05	112.52	8.31	119.82	7.78	132.70	7.24	112.60	7.21
29 Aug.	104.15	7.62	108.45	8.64	113.00	9.45	125.10	8.69	108.24	8.46
30 Sep.	106.90	7.62	112.29	9.59	118.04	10.19	131.36	9.02	112.16	9.00
31 Oct.	106.60	8.78	113.07	10.68	118.93	11.97	131.18	13.32	112.61	10.39
28 Nov.	107.45	9.26	113.13	10.90	118.52	12.24	130.32	13.32	112.76	10.71
31 Dec.	107.10	10.38	109.25	13.18	113.75	14.84	126.18	14.48	109.75	12.70