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The TIAA Graded Payment Method and the CPI

This issue of Research Dialogues *examines the benefit payment experience of the TIAA graded annuity payment method. The graded method was introduced as a TIAA option in 1982. It enables an inflation-adjusting factor to be incorporated into the traditional TIAA annuity payments.*

Introduction

A major challenge for retirees is to keep up with cost-of-living increases as measured by the CPI (Consumer Price Index) after retirement income starts. Since the introduction of the CREF variable annuity in 1952, the preferred defense against loss of income purchasing power for most TIAA-CREF participants has been a combination of TIAA traditional and CREF variable annuities. Given the historically higher average long-term rates of return for equities, CREF annuities — normally more volatile and less predictable than the traditional TIAA annuities — can offer potential value in fortifying an annuitant's longer-term inflationary defenses. Concurrently, the traditional TIAA annuity under the standard payment option can provide a more conservative and stable basic income, although it is likely to be less responsive to inflation.

TIAA Graded Benefit Payment Method

A new method of receiving TIAA traditional annuity benefits was introduced in 1982 — the TIAA Graded Payment Method. An alternative to the Standard Payment Method, the graded option — when selected by the TIAA annuitant — introduces an inflation-fighting factor into the TIAA part of combined TIAA-CREF income.

When it was first offered, only a few TIAA annuitants selected the graded method — about 2 percent. But by 1994, 14 percent were selecting the graded method in preference to the standard method. For participants with total TIAA-CREF accumulations of $200,000 or more, 20.2 percent selected the graded method for their TIAA benefits in 1994.

A previous issue of *Research Dialogues* (no. 8, April 1986) described the basic mathematical formulas on which the graded method is based. Booklets in the TIAA-CREF Library Series for plan participants provide basic information on the graded method for retirement planning. This issue of *Research Dialogues* focuses on the hypothetical and actual income purchasing-power experience of the graded method, illustrating annuitant experience based on five different annuity starting years.

The graded method was created with inflation in mind. The key is in its treatment of TIAA traditional annuity dividend earnings: Under the graded method, in contrast to the standard method, a part of current annuity dividend income is withheld each year in order to increase the annuity income for the following year. As a result, the starting income under the graded method is lower than under the standard method, but the graded method has a superior capacity for real growth and a built-in mechanism to help maintain purchasing power. In effect, therefore, the "price" paid for an annually increasing graded TIAA annuity — a hedge against inflation — is the initial difference in annuity income between the graded and the standard methods. Beginning March 31, 1996, annuitants who initially selected the graded method for their TIAA annuity can switch to the standard method, but not the other way around.

How It Works

Under the standard method, the full TIAA annuity dividend that is declared each year is paid out to retirees as part of their total benefit. Under the graded method, the annuity dividend based on interest in excess of 4 percent (the initial assumed interest rate, or AIR) is added to the annuity reserve to purchase future additional annuity income. The remainder, including guaranteed income, is paid as current income. The selected 4 percent threshold is at a level that is currently considerably lower than the total effective TIAA life annuity interest rates (guaranteed plus dividends). In recent years the total interest rates for payout annuities have ranged from 6 percent to over 9 percent (depending on the time premiums and dividends were applied, or transfers to TIAA made).

As long as a given year's total effective TIAA interest rates for payout annuities are higher than the 4 percent AIR, the

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next year's graded benefit will increase. The percent of the increase will be very close to the difference between the 4 percent AIR and the total interest rate.

With part of the graded dividend plowed back into the annuity reserve each year — something like a dividend reinvestment plan, the graded benefit method is positioned to increase basic TIAA income each year throughout retirement. The actual increase each year will depend on the TIAA dividend declared. Dividends are declared a year in advance and are not guaranteed for more than a one-year period; they will vary according to the investment experience of the fund and other factors as determined by the TIAA Board of Trustees. Purchasing power will be partially maintained if the total effective TIAA interest rate above the 4 percent AIR is less than the CPI increase and generally maintained if it is about the same as the percentage increase in the CPI. It will be increased if it is greater than the CPI increase rate. If the total interest rate is equal to or less than the 4 percent AIR, the actual dollar amount of income will go down and purchasing power will certainly be reduced.

In the 1980s, when interest rates rose to relatively high levels, the initial benefit difference between the TIAA standard and graded methods was quite large, reflecting the wider spread between the 4 percent AIR and the total effective TIAA interest rate. With a large difference, only few participants were attracted by the graded choice, despite its inflation-adjustment potential. But as total interest rates have declined from around 12 percent to current levels, the initial benefit difference between the two methods has decreased, and more TIAA annuitants are selecting the graded method.

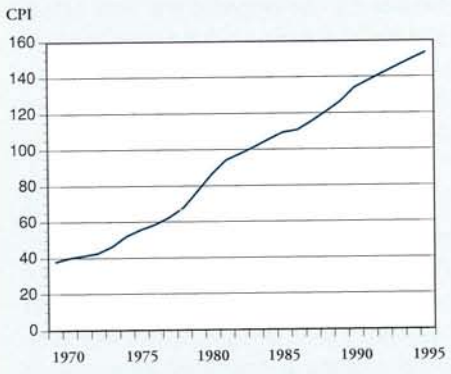
A graded TIAA income offers a lower income volatility than an income based on equity investments; this may appeal to risk-averse annuitants who nonetheless value a degree of inflation protection. Comparisons of the initial benefits of the graded method with annuity income from CREF are appropriate, since benefits from both are based on a 4 percent AIR. For a given TIAA traditional annuity accumulation, the initial year's income under the TIAA graded method and from a CREF account would be virtually the same, with only slight differences based on applicable mortality rates.

Table 1 — Consumer Price Index
CPI-U — All Urban Consumers
All Items: 1982-84 = 100

Year	December CPI	Percent Increase from Previous December
1969	37.7	—
1970	39.8	5.6%
1971	41.1	3.3%
1972	42.5	3.4%
1973	46.2	8.7%
1974	51.9	12.3%
1975	55.5	6.9%
1976	58.2	4.9%
1977	62.1	6.7%
1978	67.7	9.0%
1979	76.7	13.3%
1980	86.3	12.5%
1981	94.0	8.9%
1982	97.6	3.8%
1983	101.3	3.8%
1984	105.3	3.9%
1985	109.3	3.8%
1986	110.5	1.1%
1987	115.4	4.4%
1988	120.5	4.4%
1989	126.1	4.6%
1990	133.8	6.1%
1991	137.9	3.1%
1992	141.9	2.9%
1993	145.8	2.7%
1994	149.7	2.7%
1995	153.2*	—

* September 1995
Source: Bureau of Labor Statistics

Chart 1 — Consumer Price Index
CPI-U — All Urban Consumers
All Items: 1982-84 = 100
December Value Each Year



The Graded Experience

Participants who consider the graded method usually want to know what the graded purchasing-power experience has been in the past. They may also want to know when the purchasing power of the graded benefits might be expected to equal or exceed that of benefits they would receive if they chose the standard method.

Past performance is not necessarily a predictor of future results, but it can serve as a general guide. To illustrate the past purchasing-power experience of the two methods, we start in 1970 (to illustrate a typically long retirement period) and show retirements at five-year intervals to 1990. We use the December value each year of the CPI (Table 1) to measure prior-year changes, hypothetical graded payments for the periods before the 1982 introduction of the graded method, and the actual TIAA dividend and mortality rates in effect in the periods shown.

The illustrations show the nominal (actual dollar payments) and the inflation-adjusted (real) monthly benefits for retirements starting at the beginning of each period. The benefits are based on retirement at age 65, an accumulation of $100,000, and selection of a one-life annuity with 10 years of payments guaranteed whether the annuitant lives or dies.

For each benefit method — standard and graded — Tables 2 through 6 show three columns: nominal payments, real (inflation-adjusted) payments, and a purchasing-power index. The nominal payments are the actual amounts of the benefit check. The real payments show the dollar benefits adjusted for inflation (purchasing power) of the benefit check relative to the initial year's monthly benefit. Each year's dollar purchasing power is determined by the combination of any changes in nominal benefits and changes in the CPI.

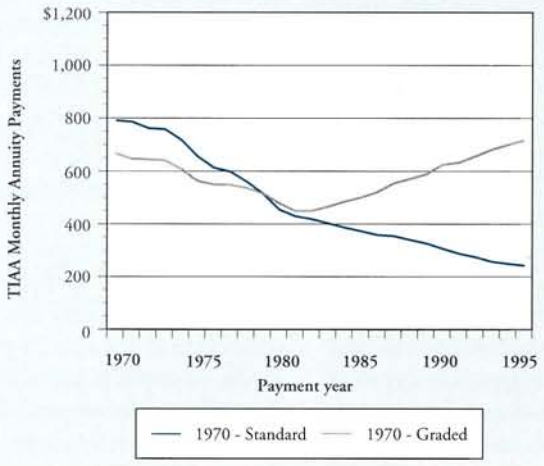
The index columns of Tables 2 through 6 show the purchasing-power changes of

Table 2 — Retirement in 1970
Standard and Graded TIAA Monthly Annuity Payments
Nominal (Actual) and Inflation-Adjusted (Real)

	Standard			Graded			
Year of Payment	Nominal Payment	Real Payment	Purchasing-Power Index 1970=100	Nominal Payment	Real Payment	Purchasing-Power Index 1970=100	Graded/ Standard Ratio
1970	$ 793	$793	100	$ 668	$668	100	0.84
1971	832	788	99	682	646	97	0.82
1972	832	763	96	702	644	96	0.84
1973	857	760	96	722	641	96	0.84
1974	881	719	91	747	609	91	0.85
1975	904	657	83	775	563	84	0.86
1976	904	614	77	809	549	82	0.89
1977	926	600	76	844	547	82	0.91
1978	926	562	71	884	537	80	0.96
1979	926	516	65	927	516	77	1.00
1980	926	455	57	976	480	72	1.05
1981	985	430	54	1,028	449	67	1.04
1982	1,044	419	53	1,119	449	67	1.07
1983	1,044	403	51	1,205	465	70	1.15
1984	1,044	388	49	1,297	483	72	1.24
1985	1,044	374	47	1,397	500	75	1.34
1986	1,044	360	45	1,505	519	78	1.44
1987	1,044	356	45	1,620	553	83	1.55
1988	1,044	341	43	1,745	570	85	1.67
1989	1,044	327	41	1,879	588	88	1.80
1990	1,027	307	39	2,089	624	93	2.03
1991	1,027	289	36	2,239	631	94	2.18
1992	1,011	276	35	2,401	656	98	2.38
1993	972	258	33	2,562	681	102	2.64
1994	965	250	32	2,704	699	105	2.80
1995	965	243	31	2,847	717	107	2.95

Source: TIAA Actuarial
Illustrations are hypothetical for retirements prior to the introduction of the Graded Payment Method.

Chart 2 — Retirement in 1970
Inflation-Adjusted — Real Payment Amounts



the standard and graded benefits, based on an index of 100 for the first year's benefit amount. The index columns help put a sharp focus on the purchasing-power experience of each of the illustrations.

The column at the far right in each table relates the purchasing power of the two benefit choices — standard and graded — to each other. This column shows the ratio of the inflation-adjusted graded benefit to the inflation-adjusted standard benefit for each year of payment (Gr/Std — the real payment ratio). The ratio column allows the reader to trace the *relative* purchasing power of the graded method — lower at first, higher later — compared with the standard method.

It is important to emphasize that the purchasing-power figures in the tables result from the interaction of two major factors: the CPI and the total interest rates of TIAA annuities. The two factors may trend in the same or opposite directions at different times.

The graded method aims to compensate for inflation, but it can do so only within limits. As noted, inflation at rates higher than the difference between the total effective TIAA interest rates and the 4 percent AIR will be partially compensated for, but not fully. Periods of high inflation and lagging interest rates will affect the purchasing power of both the standard and the graded methods, although with varying impact, as the illustrations show.

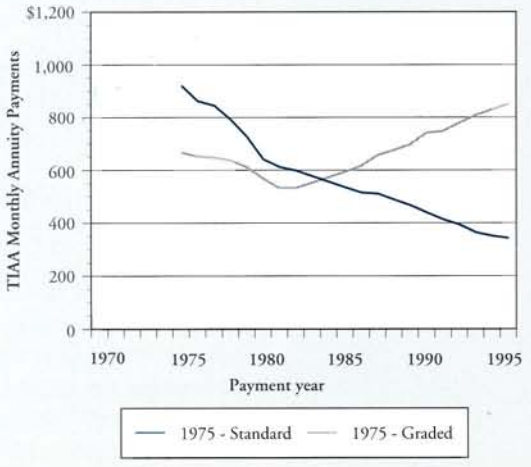
Even if a cost-of-living increase and the TIAA interest rates in excess of 4 percent are exactly the same, it should be noted that as a result of the graded-benefit calculation method there will be a very slight mismatch between the benefit increase and the CPI increase. For example, let us assume an inflation rate of 3 percent and a total effective TIAA interest rate of 7 percent. There will be a 3 percent difference between the 4 percent AIR and the total 7 percent interest rate. To calculate the benefit increase in this example, the graded benefit is increased by the formula (1.07/1.04) – 1 = .029, or by 2.9 percent. Thus, the graded benefit increase will be close to but will not exactly match the 3 percent inflation rate.

Table 3 — Retirement in 1975
Standard and Graded TIAA Monthly Annuity Payments
Nominal (Actual) and Inflation-Adjusted (Real)

	Standard			Graded			
Year of Payment	Nominal Payment	Real Payment	Purchasing-Power Index 1975=100	Nominal Payment	Real Payment	Purchasing-Power Index 1975=100	Graded/ Standard Ratio
1975	$ 922	$922	100	$ 668	$668	100	0.72
1976	922	863	94	697	652	98	0.76
1977	949	846	92	727	648	97	0.77
1978	949	793	86	762	637	95	0.80
1979	949	727	79	799	612	92	0.84
1980	949	642	70	841	569	85	0.89
1981	1,020	613	66	885	532	80	0.87
1982	1,087	600	65	964	532	80	0.89
1983	1,087	578	63	1,038	552	83	0.96
1984	1,087	557	60	1,118	573	86	1.03
1985	1,087	536	58	1,204	593	89	1.11
1986	1,087	516	56	1,296	616	92	1.19
1987	1,087	511	55	1,396	656	98	1.28
1988	1,087	489	53	1,503	676	101	1.38
1989	1,087	468	51	1,619	697	104	1.49
1990	1,066	439	48	1,799	741	111	1.69
1991	1,066	414	45	1,929	748	112	1.81
1992	1,046	394	43	2,068	778	116	1.97
1993	997	365	40	2,207	807	121	2.21
1994	988	352	38	2,329	829	124	2.36
1995	988	343	37	2,453	850	127	2.48

Source: TIAA Actuarial
Illustrations are hypothetical for retirements prior to the introduction of the Graded Payment Method.

Chart 3 — Retirement in 1975
Inflation-Adjusted — Real Payment Amounts



The slight calculation difference will have a small cumulative effect over time. The main source of potential purchasing-power loss over time, however, will result from periods in which inflation rates are greater by, say, a percentage point or more than the difference between the 4 percent AIR and the total effective interest rate. Conversely, there may be other periods when the inflation rate is lower than that interest rate difference, which will produce increases in purchasing power under the graded method.

Illustrations

Each of the illustration tables is accompanied by a chart showing the course of the inflation-adjusted standard and graded benefit payments for each retirement period.

Table 2, the first of the five illustrations, starts benefits in 1970 (hypothetical, as noted, since the actual graded method was introduced much later), with payments through 1995. For the initial year 1970, the graded benefit (both nominal and real) is $668 per month, or 84 percent of the standard method's starting benefit of $793. Table 2 covers periods of considerable inflation, as the index columns show in numbers below 100; but despite the economic conditions, overall the graded method's purchasing-power potential is evident. And beginning in 1983, the graded purchasing-power index turns around, rising to 102 in 1993 and to 107 in 1995, a full purchasing-power recovery and more. Concurrently, the standard benefit's purchasing-power index, which also started at 100, declined by 1995 to 31.

We noted that dividend changes, as well as changes in the CPI, affect nominal and real benefits under both the graded and the standard methods. An example of the effect is shown from 1970 to 1971 in Table 2. The TIAA dividend increased the total effective interest rate from 6.25 percent for 1970 to 7 percent for 1971. Under the standard method, the increase was immediately applied to 1971 benefits. As a result, the TIAA standard method's payments (in nominal dollars) increased from $793 to $832, or 4.9 percent. Under the graded benefit, the 1971 benefit is based on the interest above 4 percent in the prior year, so that the graded benefit for 1971 represents an increase based on the one-year excess of the 1970 total interest rate of 6.25 percent over the 4 percent assumed interest rate, resulting in a 2.1 percent nominal benefit increase in the graded benefit from $668 to $682.

Taking into account that the inflation that occurred over the year 1970 increased the cost of living by 5.6 percent, the standard method's purchasing power shown in Table 2 for the second year of payments shows an index of 99 compared with the graded method's index of 97.

In the next three years — 1972-1974 — the purchasing-power indexes of the graded and standard methods reflect similar experience. A further dividend increase for 1973 benefited the purchasing power of the standard method; at the same time, the graded method's formula-based increases plus the effect of dividend increases helped maintain purchasing power relative to that of the standard method. By 1974, standard and graded both retained 91 percent of their purchasing power. One notes that for the twenty-six-year period as a whole, the ratio of graded to standard purchasing power rises considerably, from 0.84 to 2.95.

The first half of the 1970-1995 period witnessed steeply rising inflation rates; between 1974 and 1981 there were three years of double-digit inflation and five years of inflation ranging from 6.7 percent to 8.9 percent. By 1979, the purchasing power of the graded method had risen to equal that of the standard method; that is, the ratio of the purchasing power of the graded benefit to that of the standard benefit reached 1.00 in 1979. Thus, the purchasing-power crossover point occurred after nine years of payments; thereafter the graded method reflects a higher purchasing power than the standard method, despite the fact that the monthly benefit of the standard method started at the higher nominal level of $793 versus the graded benefit's nominal $668.

Chart 2 shows graphically the purchasing-power experience of the two 1970-1995 benefit streams.

Each of the next tables and charts can be examined in similar detail to reveal the experience of different annuity payout periods.

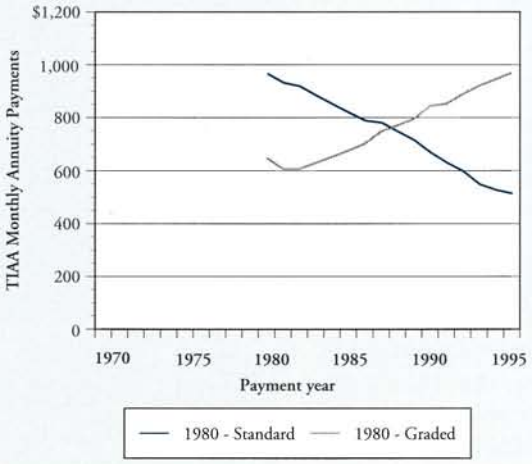
In Table 3, which illustrates retirement in 1975, the graded benefit starts out at 72 percent of the standard benefit.

Table 4 — Retirement in 1980
Standard and Graded TIAA Monthly Annuity Payments
Nominal (Actual) and Inflation-Adjusted (Real)

	Standard			Graded			
Year of Payment	Nominal Payment	Real Payment	Purchasing-Power Index 1980=100	Nominal Payment	Real Payment	Purchasing-Power Index 1980=100	Graded/ Standard Ratio
1980	$ 966	$966	100	$ 648	$648	100	0.67
1981	1,049	932	96	682	606	94	0.65
1982	1,125	918	95	743	606	94	0.66
1983	1,125	884	92	800	629	97	0.71
1984	1,125	852	88	861	652	101	0.77
1985	1,125	819	85	928	676	104	0.83
1986	1,125	789	82	999	701	108	0.89
1987	1,125	781	81	1,076	747	115	0.96
1988	1,125	747	77	1,159	770	119	1.03
1989	1,125	716	74	1,248	794	123	1.11
1990	1,099	669	69	1,387	843	130	1.26
1991	1,099	630	65	1,487	852	131	1.35
1992	1,075	598	62	1,594	887	137	1.48
1993	1,016	549	57	1,701	920	142	1.68
1994	1,004	528	55	1,795	944	146	1.79
1995	1,004	514	53	1,890	969	150	1.89

Source: TIAA Actuarial
Illustrations are hypothetical for retirements prior to the introduction of the Graded Payment Method.

Chart 4 — Retirement in 1980
Inflation-Adjusted — Real Payment Amounts



Again, both of the inflation-adjusted columns reflect the high inflation of the seventies and early eighties. By the end of the 1975-1995 period, the purchasing-power index of the standard method has declined from 100 at the start to 37, while the purchasing-power index for the graded method gives annuitants 27 percent more purchasing power than they started out with.

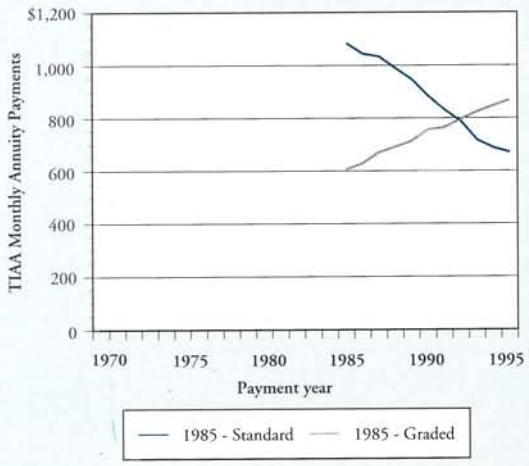
Table 4 illustrates retirement in 1980. Here, as in Table 2, there was a dividend increase for the second year, increasing the nominal dollar benefit in 1981 under the standard method from $966 to $1,049. A 12.5 percent inflation rate for the year 1980 countered the gain, however, reducing the purchasing-power index of the standard method from 100 to 96. The decline was greater (to 94) for

Table 5 — Retirement in 1985
Standard and Graded TIAA Monthly Annuity Payments
Nominal (Actual) and Inflation-Adjusted (Real)

	Standard			Graded			
Year of Payment	Nominal Payment	Real Payment	Purchasing-Power Index 1985=100	Nominal Payment	Real Payment	Purchasing-Power Index 1985=100	Graded/ Standard Ratio
1985	$1,085	$1,085	100	$ 605	$605	100	0.56
1986	1,085	1,045	96	652	628	104	0.60
1987	1,085	1,034	95	702	669	111	0.65
1988	1,085	990	91	756	690	114	0.70
1989	1,085	948	87	814	711	118	0.75
1990	1,058	883	81	905	755	125	0.86
1991	1,058	832	77	970	763	126	0.92
1992	1,031	787	73	1,040	794	131	1.01
1993	966	717	66	1,110	824	136	1.15
1994	953	688	63	1,171	846	140	1.23
1995	953	670	62	1,233	867	143	1.29

Source: TIAA Actuarial

Chart 5 — Retirement in 1985
Inflation-Adjusted — Real Payment Amounts



the graded method, since the 1981 graded increase is based on the lower 1980 dividend above the 4 percent AIR. By 1984, the graded purchasing power had risen to slightly above its starting level (to index 101), while the standard method had by 1984 declined to index 88. By 1988, the crossover point, the ratio of the purchasing power of the graded method to that of the standard method had reached 1.03. By 1995, the purchasing power of the standard method had dropped from the initial index 100 to 53, while the index for the graded method had risen to 150.

Tables 5 and 6 show retirements in 1985 and 1990, shorter payment periods than the previous tables. Over the eleven-year experience of Table 5, the nominal dollar benefits of the standard method reflect four dividend decreases, due to falling interest rates. The standard method's purchasing-power index declines from 100 to 62 over the period. Over the same period, the graded method's purchasing-power index rose from 100 to 143. By 1992, the ratio of the graded benefit's purchasing power to that of the standard method reached 1.01, and by 1995 it is 1.29. Note that because of the higher dividend interest rates prevailing at the start of the period, the initial real ratio of the graded benefit to the standard benefit in Table 5 is the lowest (0.56) for all of the annuity starting points shown in the tables.

Table 6 shows retirement in 1990. The starting ratio of the graded benefit to the standard method is .70. The nominal dollar payments for the standard method show two small dividend increases. Inflation at 6.1 percent in 1990 lowered the graded benefit's purchasing power in the second year. After five years of payments, the purchasing-power index of the standard method fell to 85 from 100, while that of the graded method rose to 105.

Considering all five of the retirement starting periods, several observations can be made: No periods have identical purchasing-power experience. The initial differences between the graded and the standard methods vary, primarily as a function of the current level of the TIAA dividend interest rate. The standard method loses purchasing power after its initial year in every year shown in all five tables. The graded method shows some losses of initial purchasing power in some years (except for the illustration in Table 5), but the losses are less than under the standard method, the number of such years is far fewer, and in all the tables the purchasing power of the initial graded benefit is later regained and then exceeded.

The Graded Method and Retirement Planning

One of the most important objectives in retirement planning is to retain income purchasing power. For participants considering a purchasing-power goal for TIAA income, we suggest two major questions:

(1) Can an annuitant accept the initial year's difference in nominal dollar amounts between the graded and the standard benefits as the price to be paid for the graded method's purchasing-power potential?

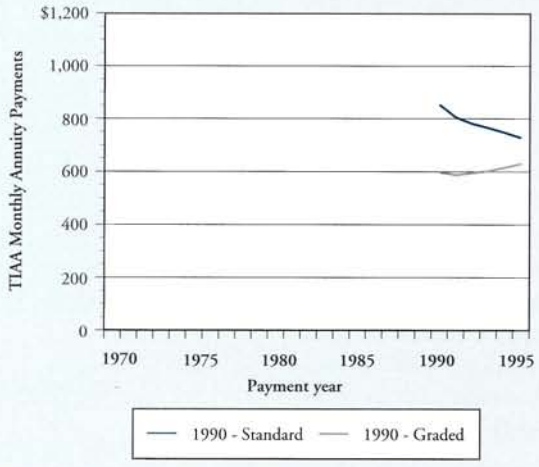
(2) Is the time required to reach the "crossover" point (the point at which the purchasing power of the graded method

Table 6 — Retirement in 1990
Standard and Graded TIAA Monthly Annuity Payments
Nominal (Actual) and Inflation-Adjusted (Real)

	Standard			Graded			
Year of Payment	Nominal Payment	Real Payment	Purchasing-Power Index 1990=100	Nominal Payment	Real Payment	Purchasing-Power Index 1990=100	Graded/ Standard Ratio
1990	$852	$852	100	$597	$597	100	0.70
1991	852	803	94	623	587	98	0.73
1992	852	779	91	650	594	100	0.76
1993	858	763	90	678	602	101	0.79
1994	862	746	88	712	616	103	0.83
1995	862	726	85	746	629	105	0.87

Source: TIAA Actuarial

Chart 6 — Retirement in 1990
Inflation-Adjusted — Real Payment Amounts



begins to equal or exceed that of the standard method) considered reasonable?

Longevity is a factor to consider in retirement planning. Although no one can predict the exact length of his or her remaining life, retirement planning can sometimes benefit from reasonable estimates based on personal circumstances. If for health reasons, for example, relatively few years of life might be expected after the eight to ten years it takes to reach the graded method's crossover point, there may be a somewhat lesser value to accepting the graded annuity income compared with the standard. But in this connection, pension researchers warn that many retirees seriously *underestimate* their potential future life span and often fail to take into account the longer joint life expectancies of couples.

Average retired lifetimes are longer than most people realize. For example, for people retiring at age 65 under TIAA-CREF plans, the average life expectancy is about twenty-one years for men and twenty-four for women, i.e., to age 86 for men and 89 for women. Some people will live beyond the averages, and no one can know who they will be. In light of the statistics, Table 2 in our illustrations, with twenty-six years of payments, is not unrealistic in its long time span.

Some retirement planners advise selecting the standard TIAA method and then setting aside part of income for reinvestment, so that in the future the reinvested funds can be used to supplement income to compensate for lost purchasing power. Such options should be considered. But in doing so, it should be noted that a large part (and, in many cases, all) of pension income is subject to federal, state, and perhaps local income tax, so that investable funds may be reduced by as much as 30 percent or so after taxes but before reinvestment. Under the graded approach, in contrast, the portion of dividends used to increase the annuity reserve for future benefit increases is not currently taxable as income to the annuitant and can therefore help produce higher income benefits.

Summary

The TIAA graded payment method is an alternative to the standard payment method. It permits an annual adjustment of annuity payments that is very close to the difference between a 4 percent assumed interest rate and the current TIAA total effective interest rate (guaranteed interest rate plus dividends). If the Consumer Price Index goes up 3 percent during the year and the total TIAA interest rate (guaranteed plus dividends) is 7 percent, the next year's benefit goes up 2.9 percent and thus comes close to recovering the lost purchasing power.

Of course, CPI increases may be more or less than the difference between the 4 percent AIR and the current total TIAA interest rate, and the dividend rates themselves will change from year to year. Over the long term, hypothetical and actual illustrations show the graded method to be a valuable mechanism for purchasing-power retention while remaining under the traditional annuity umbrella.

Choosing the graded method involves taking a lower initial benefit than under the standard method, as illustrated. In essence, the lower benefit is the price paid for the potential of annual benefit increases. After a certain number of graded-payment years, there is a crossover point. This is the point at which the purchasing power of the graded annuity can be expected to equal and then considerably exceed that of a standard annuity that was started at the same time. ❑

(This report was prepared for Research Dialogues *by Francis P. King, Senior Research Officer, TIAA-CREF.)*