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Premium Allocations and Accumulations in TIAA-CREF— Trends in Participant Choices among Asset Classes and Investment Accounts

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This issue of Research Dialogues *traces the choices that TIAA-CREF participants have been making in their allocation of premiums and of accumulations under regular employer-sponsored pension plans. We start with the allocation choices made in 1986 and follow changes through 1996, a period during which six new CREF accounts and one new TIAA account were added to participants' investment portfolio options. We then examine the accumulation account patterns from 1992 through 1996. Generally, the participant allocation and accumulation patterns reflect considerable change over time, a diversity of personal and investment objectives, and an increasing reliance on equity investments as components of a total pension portfolio.*

Introduction

Participants in TIAA-CREF currently can choose to allocate their annuity premiums among a variety of funding vehicles, each representing specific investment characteristics. In our analysis of the trends in participant choices, we classify the TIAA-CREF funding vehicles according to four basic asset classes: (1) guaranteed, (2) equity, (3) fixed income, and (4) real estate. These classifications have been developed at TIAA-CREF to provide a framework in financial education and retirement planning programs. The box on page 2 lists the TIAA and CREF accounts within their asset classes. (The information on premium and asset allocations in this study covers the period 1986 through 1996, and therefore does not include the CREF Inflation-Linked Bond Account, which was made available to participants May 1, 1997.)

TIAA-CREF asset class choices. Before 1952, all premiums were paid to one asset class, the TIAA traditional guaranteed annuity, which provides a guarantee of principal, a basic interest guarantee, and additional credited interest dividends as declared. With TIAA's invention of the variable equity annuity in 1952 and the introduction of CREF, a new asset class of equities was opened for participant allocations. Later, CREF offered a new "fixed income" asset class, first in 1988 with the introduction of the Money Market Account, and then in 1990 with the Bond Market Account. In addition, the CREF Social Choice Account, also introduced in 1990, offered participants a "balanced account" of equity and fixed-income investments, giving special consideration to certain social criteria. Three additional CREF equity accounts were added between 1990 and 1994, and in 1995 TIAA established a Real Estate Account as a TIAA separate account. With these changes over an eight-year period, participant allocation patterns can now best be described by their asset class destination rather than by type of account or TIAA or CREF label.

Overall Trends in Premium Allocation Patterns

What choices have TIAA-CREF participants been making in their premium allocations over the period 1986 to 1996? Tables 1 and 2 show the major clusters of allocation choices in each year over this eleven-year period. The period was chosen in order to include data covering two years before CREF introduced its first account in the fixed-income asset class—the CREF Money Market Account—a period that also includes the October 1987 decline in the stock market. The allocation choices shown in the tables are those in effect December 31 of each year. They cover the Retirement Annuity (RA) and Group Retirement Annuity (GRA) contracts held by TIAA-CREF participants under regular employer-sponsored retirement plans.

Asset Classes of TIAA and CREF Accounts

Asset Class	Date of Inception
Guaranteed	
TIAA traditional annuity	April 23, 1918
Equity	
CREF Stock	July 1, 1952
CREF Social Choice*	March 1, 1990
CREF Global Equities	May 1, 1992
CREF Growth	April 29, 1994
CREF Equity Index	April 29, 1994
Fixed Income	
CREF Money Market	April 1, 1988
CREF Bond Market	March 1, 1990
Real Estate	
TIAA Real Estate	October 2, 1995

* The CREF Social Choice Account is a balanced account. As of year-end 1996, its portfolio consisted of 62 percent equity investments and 38 percent fixed-income investments.

Table 1 shows the percentages of *participants* allocating annuity contributions to each of the asset class groups. Table 2 shows the percentages of *premiums* represented by the participant choices. Because participants can allocate in any combination of percentages to any asset class and account (subject to employer restrictions in some institutions), and many possible combinations can result, for simplicity of illustration the tables are consolidated into major asset allocation groups. The information in Table 1 is shown graphically in Chart 1, with some of the allocation categories combined.

We note from Tables 1 and 2 that a majority of participants, but by no means all, generally favor diversification among asset classes. In 1986, when just the guaranteed and equity asset classes were available, close to half, or 46.2 percent of participants, chose a 50/50 allocation to equity and guaranteed investments. About a quarter (26.9 percent) chose some other combination of equity and guaranteed funds. But there was also a fairly large group in 1986—26.8 percent of participants—who chose to make a 100 percent allocation to just one asset class: 23.5 percent of participants to the guaranteed fund, and 3.3 percent to the equity fund.

If we look at the premiums involved in the 1986 participant allocations (Table 2), we see that 44.9 percent of total premiums were allocated 50/50 to equity and guaranteed investments. Under the choice of a combination of equity and guaranteed classes (in any other proportion), 31.7 percent of premiums were paid in 1986. Under allocations of 100 percent of premiums to the guaranteed class in 1986, 19.9 percent of total premiums were paid by 23.5 percent of participants. And under allocations of 100 percent of premiums to the equity class in 1986, 3.6 percent of premiums were paid by 3.3 percent of participants.

Turning to 1996 data, we see that 24.6 percent of premiums (Table 2) were being allocated on a 50/50 equity/guaranteed basis by 20.9 percent of participants

Table 1

Allocation of Premiums to TIAA and CREF Accounts
Percent of Premium-Paying RA/GRA Participants, by Asset Class, 1986-96

Allocation Pattern	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
100% guaranteed	23.5%	21.7%	22.4%	21.8%	21.0%	20.0%	18.1%	16.1%	14.2%	13.0%	11.2%
100% equity	3.3	4.5	3.7	4.0	5.0	6.3	8.4	11.5	15.0	17.7	22.2
100% fixed income	-	-	1.5	3.2	3.3	3.8	3.8	3.8	3.5	3.9	4.1
50% equity, 50% guaranteed	46.2	46.3	42.7	36.7	32.9	30.8	28.9	27.0	24.9	23.2	20.9
Mostly guaranteed											
75.1% - 99.9% guaranteed	0.9	0.9	1.4	1.6	2.0	2.0	1.9	1.9	1.6	1.4	1.2
50.1% - 75% guaranteed	15.9	15.2	15.1	14.4	13.9	13.0	12.0	10.8	9.6	8.5	7.3
Mostly equity											
75.1% - 99.9% equity	0.3	0.4	0.4	0.4	0.6	0.9	1.4	2.1	3.2	4.0	5.1
50.1% - 75% equity	9.8	11.0	9.7	8.5	8.5	9.1	11.1	13.0	15.2	16.3	17.2
Mostly fixed income											
75.1% - 99.9% fixed income	-	-	0.1	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
50% - 75% fixed income	-	-	0.7	2.4	3.4	4.1	4.1	4.0	3.7	3.6	3.3
Other combinations	-	-	2.1	6.8	9.2	9.9	10.2	9.7	9.0	8.3	7.4
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Any real estate										0.1%	0.6%

Source: TIAA-CREF Actuarial Technical
Percentages may not add to 100 because of rounding.

(Table 1). This shows a decline by about one-half in the 50/50 choice from 1986. Allocation combinations in 1996 of guaranteed, fixed-income, and equity classes increased since 1986, representing 42.2 percent of premiums paid by 41.7 percent of participants. In 1996, allocations to just one asset class were also higher than in 1986: They totaled 33.2 percent of premiums (compared with 23.5 percent in 1986), representing 37.5 percent of participants. These premium allocations in 1996 were distributed as follows: 22.1 percent exclusively to the equity class; 9.0 percent exclusively to the guaranteed class; and 2.1 percent exclusively to the fixed-income class (primarily to the CREF Money Market Account).

Taking the eleven-year period as a whole, we see that with more asset classes available in 1996 than in 1986, and with an increased number of equity accounts, allocation choices have become more diversified. The changes may also reflect modifications in some participants' basic investment objectives over the period. For example, between 1986 and 1996, we see a substantial decline in 50/50 allocations between equity and guaranteed investments, a decline in 100 percent allocations to the guaranteed class, and increases in allocations to the equity asset group—both through increases in 100 percent allocations to the equity class and in asset combinations that include equity assets and other asset classes as well.

Somewhat surprising is the increasing percentage of participants who allocate 100 percent of premiums to the fixed-income asset class—4.1 percent in 1996, up from 1.5 percent in 1988. (The fixed-income class includes both money market and bond portfolios, but virtually all of the 100 percent fixed-income allocations shown in Tables 1 and 2 are to the Money Market Account.) While a money market account may not be viewed as an appropriate vehicle for retirement investment for the long term, at times it can serve as an instrument for participants who have not yet decided on other allocation choices but in the meantime want flexibility and low volatility. Some participants may also believe, rightly or wrongly, that they can "time the market"—benefiting from changes in equity market values by holding money market funds for advantageous transfer to other accounts in the future.

Chart 1 shows a slight dip between 1987 and 1988 in the bars that trace allocations to equity assets of greater than 50 percent. It does seem possible that these changes reflect some reaction to the October stock market decline, although with some lag, since the allocation choices shown are those in effect at year-end. It may also be that the allocation changes in 1988 reflect a response to the CREF Money Market Account, which became available in April of that year. But the changes are moderate in both magnitude and duration. This may suggest that retirement plan participants tend to be fairly consistent in pursuing their longer-term investment goals and, for the most part, are not especially likely to respond to shorter-term equity market events with undue concern.

Allocation Patterns by Age

Table 3 indicates that between 1986 and 1996 there have been some major changes in allocation patterns by age of participants. For example, we see considerable differences in the ages of participants allocating 100 percent of premiums to the guaranteed asset class. In 1986, the highest percent of participants by age with 100 percent allocations to the guaranteed class was represented by those age 55 and over, 29.5 percent. But in 1996,

Table 2

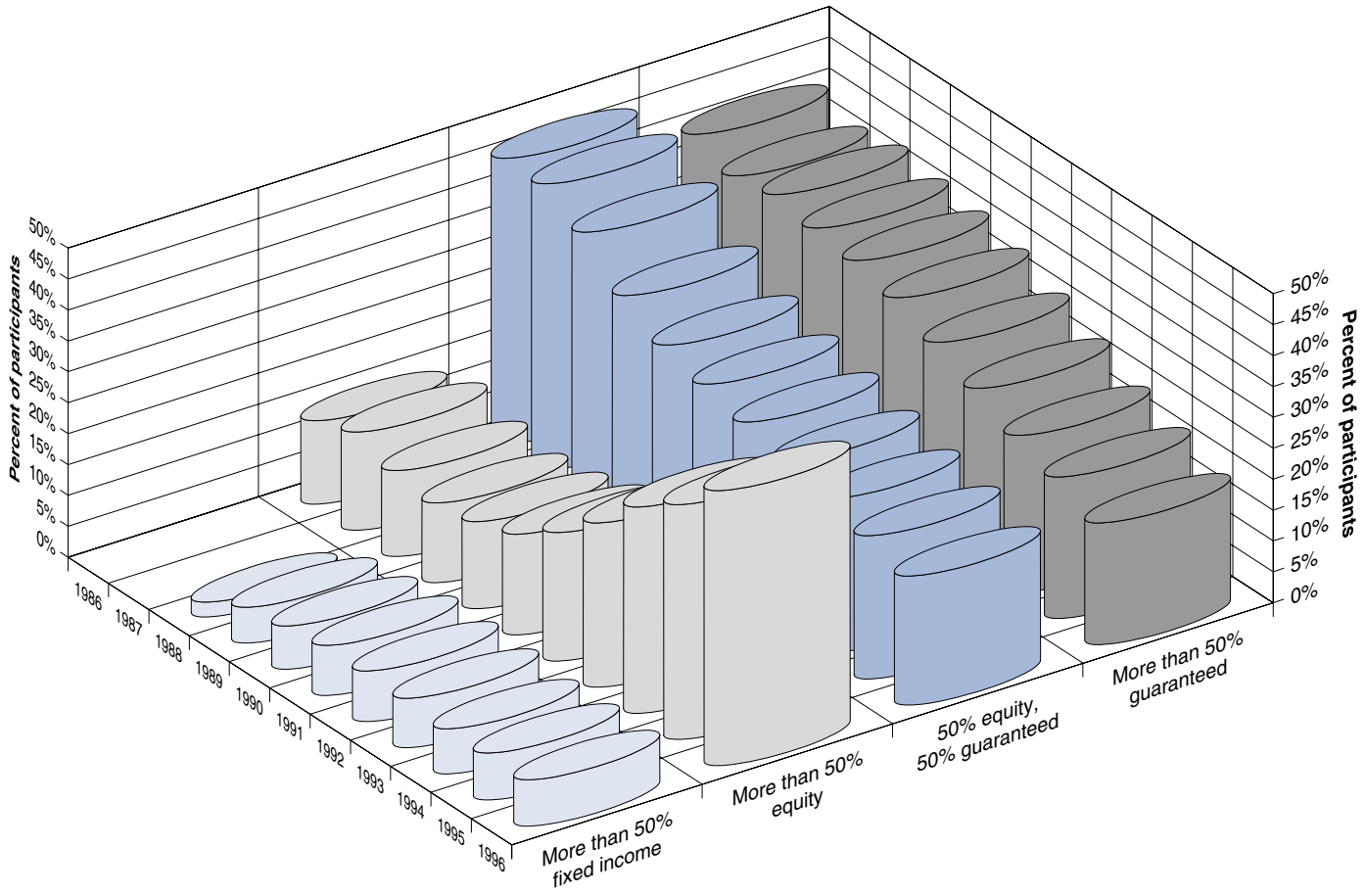
Allocation of Premiums to TIAA and CREF Accounts
Percent of Premiums Paid by Premium-Paying RA/GRA Participants, by Asset Class, 1986-96

Allocation Pattern	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
100% guaranteed	19.9%	18.8%	19.3%	18.6%	17.7%	16.6%	14.7%	13.1%	11.5%	10.5%	9.0%
100% equity	3.6	5.3	4.1	4.5	5.5	7.0	9.1	12.1	15.4	17.8	22.1
100% fixed income	-	-	0.6	1.5	1.9	2.1	2.7	2.2	1.9	2.1	2.1
50% equity, 50% guaranteed	44.9	45.6	44.6	40.7	37.3	35.3	33.3	31.2	29.0	27.2	24.6
Mostly guaranteed											
75.1% - 99.9% guaranteed	2.1	1.0	1.5	1.6	1.8	1.8	1.7	1.7	1.4	1.3	1.1
50.1% - 75% guaranteed	16.2	14.9	15.1	14.8	14.4	13.6	12.4	11.3	10.1	9.0	7.7
Mostly equity											
75.1% - 99.9% equity	0.6	0.6	0.6	0.6	0.8	1.0	1.5	2.2	3.3	4.1	5.3
50.1% - 75% equity	12.8	13.9	12.9	11.6	11.6	11.9	13.5	15.4	17.3	18.3	19.3
Mostly fixed income											
75.1% - 99.9% fixed income	-	-	0.1	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.1
50% - 75% fixed income	-	-	0.2	1.5	2.3	3.0	3.1	2.9	2.7	2.6	2.4
Other combinations	-	-	1.0	4.3	6.6	7.4	7.8	7.7	7.3	7.0	6.3
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Any real estate										0.0%	0.1%

Source: TIAA-CREF Actuarial Technical
Percentages may not add to 100 because of rounding.

Chart 1

Allocation of Premiums to TIAA and CREF Accounts
Percent of Premium-Paying RA/GRA Participants, by Asset Class, 1986-96



Source: TIAA-CREF Actuarial Technical

although the highest percentage by age for this allocation class was still in the age 55-and-over group, the percentage was substantially less, at 16.1 percent. Comparable but even more striking differences are observed in the same period among participants in the group under age 35 who allocate 100 percent of premiums to the guaranteed class. In 1986, 24.8 percent of participants under age 35 were allocating 100 percent of premiums to the guaranteed class; in 1996, 8.3 percent were in the group, or about two-thirds less. Chart 2 presents information summarizing Table 3 data on allocations by age group.

The 50/50 equity/guaranteed allocation choice was made much less often at all ages in 1996 than in 1986. But there was a substantial difference by age among participants in 1996 who were allocating premiums on the 50/50 equity/guaranteed basis. Among participants under age 35, 9.6 percent allocated on the 50/50 basis, in contrast to the 29.4 percent of participants age 55 and over.

For 100 percent allocations to equity investments, we note that in 1986 there were only slight differences by age in the relatively small percentages in this allocation class, ranging from 3.3 percent to 3.8 percent, ascending by age group. In 1996, the percentages of participants making 100 percent allocations to equity investments were many times higher than in 1986. There were also greater differences among the age groups for this allocation choice in 1996. In 1996, over a quarter (26.5 percent) of participants under age 35 allocated 100 percent of premiums to an equity class, in contrast with slightly less than a fifth (19.4 percent) of participants age 55 and over who made the same 100 percent equity allocation.

Table 3 also shows the percentages of participants by age who were allocating 100 percent of premiums to fixed-income assets in 1996. Among younger participants (under age 35), 9.3 percent allocated 100 percent of their premiums to the fixed-income class. The proportion making this selection was much higher than in the older age groups—3.5 percent of participants aged 35 to 44, and 2.7 per-

Table 3

Premium Allocation Patterns for TIAA and CREF Accounts
Percent of Premium-Paying RA/GRA Participants, by Asset Class and Age, 1986 and 1996

	1986				1996			
Allocation Pattern	**Under 35**	**35-44**	**45-54**	**55+**	**Under 35**	**35-44**	**45-54**	**55+**
100% guaranteed	24.8%	20.9%	19.9%	29.5%	8.3%	10.2%	11.1%	16.1%
100% equity	3.3	3.4	3.6	3.8	26.5	22.3	21.2	19.4
100% fixed income	-	-	-	-	9.3	3.5	2.7	2.7
50% equity, 50% guaranteed	45.5	48.3	47.0	40.8	9.6	17.3	25.2	29.4
Mostly guaranteed								
75.1% - 99.9% guaranteed	1.2	1.0	0.7	0.9	1.2	1.3	1.2	1.1
50.1% - 75% guaranteed	18.4	17.4	14.1	11.9	4.3	7.1	8.4	8.8
Mostly equity								
75.1% - 99.9% equity	0.4	0.4	0.3	0.3	8.4	6.3	4.0	2.1
50.1% - 75% equity	6.5	8.6	14.4	13.0	19.1	18.5	16.5	14.6
Mostly fixed income								
75.1% - 99.9% fixed income	-	-	-	-	0.3	0.2	0.1	0.1
50% - 75% fixed income	-	-	-	-	4.4	3.8	2.9	2.2
Other combinations	-	-	-	-	8.9	9.6	6.8	3.7
Total	100%	100%	100%	100%	100%	100%	100%	100%
Any real estate					1.0%	0.7%	0.5%	0.4%

Source: TIAA-CREF Actuarial Technical
Percentages may not add to 100 because of rounding.

cent of participants 45 and older. Table 3 indicates that the TIAA Real Estate Account also plays a somewhat stronger role in the allocations of those who are under age 35 compared with those of older participants.

Allocation Patterns by Sex

There were some differences between the allocation patterns of men and women to TIAA and CREF asset classes. Table 4 shows the allocation choices by sex for 1986 and 1996.

In addition to reflecting the previously noted trends toward increasing proportions of equity asset class investments over the eleven-year period, Table 4 indicates that in both 1986 and 1996, women tended to favor the guaranteed asset class more than men, the equity asset class somewhat less than men, and the 50/50 equity/guaranteed choice about the same as men. We also note that although the percentages are small, in 1996 women participants favored 100 percent fixed-income or mostly fixed-income allocations at rates greater than did men.

Allocation Patterns by Accumulation Quintile

Finally, we look at premium allocation patterns by asset class according to the size of participants' total annuity accumulation measured (Table 5). We look at two years, 1986 and 1996, according to quintiles of participant asset ownership (all RA/GRA accounts combined) at the end of each year shown.

Looking at Table 5, we see in 1986 considerable differences by accumulation quintile in the percentages of participants allocating all premiums to the guaranteed asset class. Thus, while 26.9 percent of those in the lowest quintile allocated 100 percent of premiums to the guaranteed class, only 14.5 percent of those in the highest quintile made the same allocation. In contrast, there were no significant differences by accumulation quintile in the proportions of participants who chose a 50/50 equity/guaranteed allocation. This allocation group represented 46.8 percent of participants in the lowest quintile and 47.3 percent in the highest.

Participant allocations of 100 percent of premiums in 1986 to equity assets were not large within any accumulation quintile: They ranged from 3.9 percent at the lowest quintile, slightly downward in the next three quintiles, to 3.7 percent at the highest quintile. However, there were significant differences by quintile among the proportion of participants in the "mostly equity" allocation category. Here, 6.4 percent of participants in the lowest accumulation quintile allocated more than 50 percent but less than all of their premiums to equity investments, compared with 21.6 percent of those in the highest quintile.

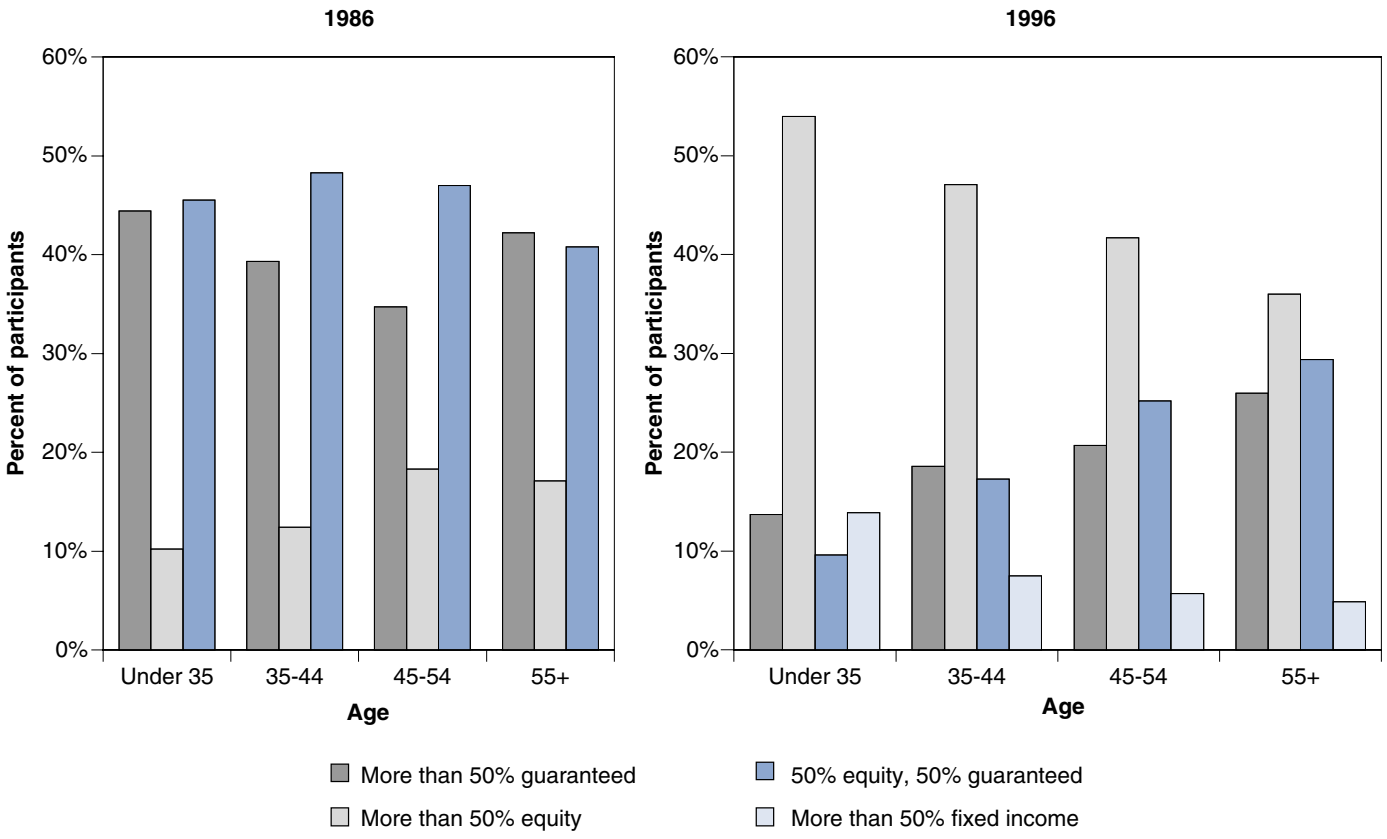
In 1996, allocation patterns by asset class and by size of participants' accumulations greatly differed from those in 1986. As percentages of participants in 1996 in each of the accumulation quintiles, allocations of 100 percent of premiums to the guaranteed asset class were much lower than in 1986. Within accumulation quintile, 100 percent premium allocations to the guaranteed class in 1996 were higher in the lowest quintile (10.8 percent) than in the highest (7.2 percent), but the differences between quintiles low to high were not nearly as great as in 1986.

In keeping with the overall trends during the period, allocations of 100 percent of premiums to the equity asset class were much greater overall in 1996 than in 1986. By accumulation quintile in 1996, the highest proportion of participants making a 100 percent equity allocation, 28.1 percent, was in the lowest quintile. The next highest was in the second quintile; then it dipped to slightly below 20 percent for the next two quintiles, and was 21.1 percent in the top quintile.

In allocations of 100 percent of premiums to the fixed-income class in 1996, it is notable that in the top three accumula-

Chart 2

Premium Allocation Patterns for TIAA and CREF Accounts
Percent of Premium-Paying RA/GRA Participants by Asset Class and Age, 1986 and 1996



Source: TIAA-CREF Actuarial Technical

tion quintiles, the percentages of participants were relatively small—under 2 percent. But the percentages were much larger in the lower quintiles, with 12.6 percent of participants in the lowest quintile and 3.7 percent in the second quintile. The slope of these figures may suggest that to some extent new retirement plan entrants, younger participants, or others who have not yet built up substantial retirement annuity assets express in this allocation choice a preference for current flexibility and are willing to defer longer-term commitment to other asset class options.

We can also note that among diversified allocations to asset classes, participants in the "mostly guaranteed" group in 1996 were a lower percentage of those in the lowest quintile of accumulations (4.2 percent) than in the highest (9.1 percent). For participants in the "mostly equity" group, the differences of ownership among quintiles were not as great, ranging from 22.3 percent in the lowest quintile to 23.7 percent in the highest.

Patterns in the Allocation of Accumulations

We now turn from investigating TIAA-CREF premium-paying participants' patterns of premium allocation among asset classes to studying the allocation of accumulations among the asset classes and the TIAA and CREF accounts.[1] One might think that there is little essential difference between measuring premium allocations and measuring the distribution of accumulation amounts. However, there are at least three reasons why this is not so.

First, a participant can change premium allocations at any time (subject to an employer's plan provisions) among the TIAA and CREF accounts and can move accumulation amounts among the CREF accounts and the TIAA Real Estate Account and from CREF and the TIAA Real Estate Account to the TIAA traditional annuity.[2] In RA/GRA contracts, however, a participant can't immediately move accumulations from the TIAA traditional annuity to the other accounts. This is because the TIAA traditional annuity guarantees principal and invests in loans entailing long-term commitments. TIAA can make these investments knowing that retirement funds will remain in TIAA for the long term. As a result, the investments are relatively illiquid and can't be sold quickly at an established price, so that transfers from the TIAA traditional annuity accumulations to the other accounts, if elected, must be made gradually over a ten-year period. Hence, everything else being equal, any movement by participants away from the TIAA traditional an-

nuity will appear in premium allocations before it appears in accumulations.

Second, it is uncertain whether participants will be more likely to change their premium allocations, or to move their accumulations, in response to a change in personal situation or in their views of the likely future performance of the various asset classes and accounts. It may be that if a participant is at all uncertain about the need to alter asset allocation patterns, he or she will be reluctant to move large accumulations precipitously because a wrong choice might seriously reduce the levels of future accumulations and retirement income. Since a change in premium allocations has a more gradual impact, a participant may feel more comfortable in pursuing that strategy.

On the other hand, it may be that a participant will feel confident of the need for change, moving accumulations but leaving current premium allocations unchanged because they are of lesser financial consequence, at least in the short run. It is unclear which type of behavior will dominate or, indeed, whether the decision making will differ systematically according to participant characteristics such as age or level of accumulation. Hence, considering only these behaviors, it is uncertain whether a participant's desire to alter

Table 4

Premium Allocation Patterns for TIAA and CREF Accounts
Percent of Premium-Paying RA/GRA Participants, by Asset Class and Sex, 1986 and 1996

	1986		1996	
Allocation Pattern	Women	Men	Women	Men
100% guaranteed	26.8%	20.2%	12.6%	9.9%
100% equity	2.7	4.0	20.6	24.2
100% fixed income	-	-	3.9	3.1
50% equity, 50% guaranteed	45.3	46.5	20.0	22.0
Mostly guaranteed				
75.1% - 99.9% guaranteed	1.0	0.9	1.5	0.9
50.1% - 75% guaranteed	17.0	14.5	8.0	6.8
Mostly equity				
75.1% - 99.9% equity	0.3	0.4	4.9	5.5
50.1% - 75% equity	7.0	13.5	16.6	18.1
Mostly fixed income				
75.1% - 99.9% fixed income	-	-	0.2	0.1
50% - 75% fixed income	-	-	3.7	2.8
Other combinations	-	-	8.2	6.7
Total	100%	100%	100%	100%
Any real estate			0.5%	0.8%

Source: TIAA-CREF Actuarial Technical
Percentages may not add to 100 because of rounding.

Table 5

Premium Allocation Patterns for TIAA and CREF Accounts
Percent of Premium-Paying RA/GRA Participants, by Asset Class and Accumulation Quintile, 1986 and 1996

	1986					1996				
Allocation Pattern	Lowest Quintile	2nd Quintile	3rd Quintile	4th Quintile	Highest Quintile	Lowest Quintile	2nd Quintile	3rd Quintile	4th Quintile	Highest Quintile
100% guaranteed	26.9%	28.5%	26.8%	20.3%	14.5%	10.8%	13.6%	13.1%	11.3%	7.2%
100% equity	3.9	2.8	2.9	3.1	3.7	28.1	22.1	19.7	19.8	21.1
100% fixed income	-	-	-	-	-	12.6	3.7	1.9	1.1	1.1
50% equity, 50% guaranteed	46.8	45.2	45.0	48.1	47.3	9.6	13.2	18.1	28.2	35.3
Mostly guaranteed										
75.1% - 99.9% guaranteed	0.9	1.1	1.0	0.9	0.7	0.8	1.6	1.7	1.2	0.7
50.1% - 75% guaranteed	15.2	16.9	17.7	17.4	12.3	3.4	6.4	8.6	9.8	8.4
Mostly equity										
75.1% - 99.9% equity	0.3	0.3	0.3	0.3	0.4	6.1	5.9	5.3	4.9	3.4
50.1% - 75% equity	6.1	5.3	6.3	9.9	21.2	16.2	17.0	16.0	16.5	20.3
Mostly fixed income										
75.1% - 99.9% fixed income	-	-	-	-	-	0.3	0.2	0.1	0.1	0.1
50% - 75% fixed income	-	-	-	-	-	5.3	5.1	3.7	1.6	0.8
Other combinations	-	-	-	-	-	6.9	11.1	11.7	5.6	1.8
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Any real estate						1.6%	0.4%	0.4%	0.4%	0.5%

Source: TIAA-CREF Actuarial Technical
Percentages may not add to 100 because of rounding.

asset balances will appear in changes in premium allocations before it appears in accumulation transfers.

Third, there are participants who make an initial choice in premium allocation and don't ever alter that choice. There are also participants who never move their accumulations. If there are systematic differences in returns among asset classes over time, accumulations in the higher return class will grow faster than in the lower return class. Hence, observed changes in the distribution of accumulations may, at least in part, be the result of the influence of relative return performance rather than of asset redistribution. In particular, because of the last two years of exceptional performance of the equity markets, changes in accumulations in the equity asset class and accounts may appear robust without any corresponding change in premium allocations. Of course, some participants will rebalance their accumulations in response to the unexpectedly high return performance of an asset class or account, while leaving their premium allocations unchanged; this rebalancing, however, may not be widespread.

It is difficult to know which of the considerations listed above is more important in explaining observed accumulation patterns and any differences between premium allocations and accumulation patterns. Because future accumulations are what ultimately matter for retirement income levels in a defined contribution plan, we investigate accumulation patterns across asset classes and TIAA and CREF accounts in addition to our study of premium allocations in the preceding section.

Table 6

Percent of Premium-Paying RA/GRA Participants with Accumulations in TIAA and CREF Accounts by Asset Class and Account, 1992-96

	1992	1993	1994	1995	1996
Asset class					
Guaranteed	91.3%	88.7%	85.9%	83.0%	79.2%
Equity	78.0	80.0	82.2	83.3	84.9
Fixed income	26.9	27.4	27.4	27.8	27.7
Real estate	-	-	-	0.1	0.9
Investment account					
TIAA traditional annuity	91.3	88.7	85.9	83.0	79.2
CREF Stock	75.6	75.5	75.5	75.1	74.8
CREF Money Market	23.6	22.1	20.9	20.7	20.0
CREF Bond Market	6.8	9.3	10.8	11.7	12.2
CREF Social Choice	6.8	11.3	12.7	13.6	14.6
CREF Global Equities	1.3	7.4	18.9	21.5	24.2
CREF Equity Index	-	-	0.7	3.9	8.2
CREF Growth	-	-	2.4	9.4	17.1
TIAA Real Estate	-	-	-	0.1	0.9

Source: TIAA-CREF Corporate Research

Table 7

Percentage Distribution of Accumulations of Premium-Paying RA/GRA Participants by Asset Class and TIAA and CREF Accounts, 1992-96

	1992	1993	1994	1995	1996
Asset class					
Guaranteed	48.9%	47.2%	48.2%	43.2%	40.1%
Equity	47.5	49.6	48.5	53.6	56.4
Fixed income	3.5	3.2	3.2	3.2	3.3
Real estate	-	-	-	0.0	0.2
Total	100%	100%	100%	100%	100%
Investment account					
TIAA traditional annuity	48.9%	47.2%	48.2%	43.2%	40.1%
CREF Stock	47.0	47.7	45.2	49.2	50.4
CREF Money Market	3.0	2.6	2.7	2.5	2.6
CREF Bond Market	0.5	0.6	0.5	0.7	0.7
CREF Social Choice	0.4	0.7	0.7	1.0	1.1
CREF Global Equities	0.2	1.2	2.3	2.3	2.7
CREF Equity Index	-	-	0.0	0.3	0.6
CREF Growth	-	-	0.3	0.9	1.6
TIAA Real Estate	-	-	-	0.0	0.2
Total	100%	100%	100%	100%	100%

Source: TIAA-CREF Corporate Research
Percentages may not add to 100 because of rounding.

Distribution of Participants According to Asset Class and Account

Table 6 shows the percent of premium-paying RA/GRA participants with accumulations of any size in the four asset classes and in the various component TIAA and CREF accounts as of the year-end 1992 through 1996. The percent of participants with accumulations in the guaranteed asset class fell over the period from 91.3 to 79.2 percent, while the percent with any equity accumulations rose from 78.0 to 84.9 percent. Although the percent with any fixed-income accumulations was fairly steady over the period, we note that the percent of those with accumulations in the Bond Market Account nearly doubled, while the percent in the Money Market Account dropped somewhat. Among the equity accounts, the percent of participants with accumulations in the Stock Account held steady, while the percent in the Social Choice, Global Equities, Equity Index, and Growth Accounts grew significantly following the introduction of each account. Although the TIAA Real Estate Account has only re-

Table 8

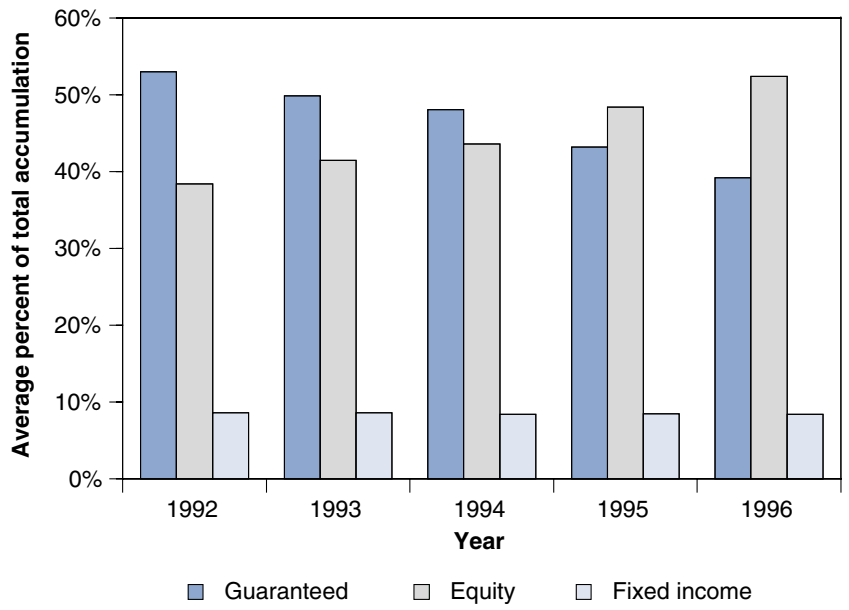
Average Percent of Accumulations Held by Premium-Paying RA/GRA Participants by Asset Class and TIAA and CREF Accounts, 1992-96

	1992	1993	1994	1995	1996
Asset class					
Guaranteed	53.0%	49.9%	48.1%	43.2%	39.2%
Equity	38.4	41.5	43.6	48.4	52.4
Fixed income	8.6	8.6	8.4	8.5	8.4
Real estate	-	-	-	0.0	0.2
Total	100%	100%	100%	100%	100%
Investment account					
TIAA traditional annuity	53.0%	49.9%	48.1%	43.2%	39.2%
CREF Stock	36.1	36.4	34.6	36.2	36.3
CREF Money Market	7.1	6.6	6.2	6.2	6.1
CREF Bond Market	1.5	2.0	2.1	2.3	2.2
CREF Social Choice	2.1	3.5	3.7	4.1	4.3
CREF Global Equities	0.2	1.6	4.8	5.2	5.7
CREF Equity Index	-	-	0.1	0.7	1.6
CREF Growth	-	-	0.4	2.2	4.4
TIAA Real Estate	-	-	-	0.0	0.2
Total	100%	100%	100%	100%	100%

Source: TIAA-CREF Corporate Research
Percentages may not add to 100 because of rounding.

Chart 3

Average Percent of Accumulations Held by Premium-Paying RA/GRA Participants by Asset Class, 1992-96



Source: TIAA-CREF Corporate Research

cently been introduced, nearly 1 percent of participants now have an accumulation in the account.

Distribution of Average Accumulation Amounts Held by Participants

Table 7 shows the distribution of premium-paying participants' accumulations by asset class and TIAA and CREF accounts; these figures indicate the distribution of aggregate accumulations across all premium-paying participants, and hence give greater weight to the choices of participants with large accumulations. In 1992, accumulations in the guaranteed and equity classes were nearly equal at 48.9 and 47.5 percent of aggregate accumulations, respectively. By 1996, however, accumulations in the equity class, at 56.4 percent, dominated those in the guaranteed class (40.1 percent). The influence of asset returns is noticeable here, as the distribution to equities declined slightly in 1994, a year of relatively poor performance in the equity market, and increased substantially in 1995 and 1996, years of excellent returns from the stock market. As seen in Table 6, although holdings in the new accounts that were introduced in 1988 and later are becoming more widespread among participants, aggregate accumulations in these accounts are still relatively modest compared with those in the TIAA traditional annuity and the CREF Stock Account.

Table 8 and Chart 3, instead of focusing on aggregate accumulations, look at participants. These data show the average percent of accumulations across asset classes and accounts held by participants in their RA/GRA contracts; these figures give equal weight to participants with small and large accumulations. (The data in Chart 3 do not include the real estate asset class.) The average participant's portfolio was invested 53 percent in guaranteed and 38 percent in equities in 1992; by 1996, these percentages had nearly reversed. Comparing the 1996 figures in Tables 7 and 8 for the fixed-income class, a higher percent of the average portfolio is held in the fixed-income class (8.4 percent) than of the aggregate accumulation (3.3 percent). This implies, of course, that

Table 9

Average Percent of Accumulations Held by Premium-Paying RA/GRA Participants by Asset Class and TIAA and CREF Accounts, by Age, 1996

	Under 35	35-44	45-54	55+
Asset class				
Guaranteed	28.3%	37.8%	42.2%	45.4%
Equity	58.5	52.6	51.0	49.1
Fixed income	13.0	9.5	6.7	5.3
Real estate	0.2	0.1	0.1	0.2
Total	100%	100%	100%	100%
Investment account				
TIAA traditional annuity	28.3%	37.8%	42.2%	45.4%
CREF Stock	29.5	34.2	38.7	41.2
CREF Money Market	9.1	6.8	5.0	4.3
CREF Bond Market	3.8	2.7	1.7	1.1
CREF Social Choice	6.8	5.6	3.5	1.7
CREF Global Equities	9.7	6.4	4.6	3.4
CREF Equity Index	3.3	1.7	1.2	0.8
CREF Growth	9.3	4.7	3.1	2.0
TIAA Real Estate	0.2	0.1	0.1	0.2
Total	100%	100%	100%	100%

Source: TIAA-CREF Corporate Research
Percentages may not add to 100 because of rounding.

Table 10

Average Percent of Accumulations Held by Premium-Paying RA/GRA Participants by Asset Class and TIAA and CREF Accounts, by Sex, 1996

	Women	Men
Asset class		
Guaranteed	40.5%	37.6%
Equity	50.2	54.7
Fixed income	9.1	7.5
Real estate	0.1	0.2
Total	100%	100%
Investment account		
TIAA traditional annuity	40.5%	37.6%
CREF Stock	33.6	39.2
CREF Money Market	6.7	5.4
CREF Bond Market	2.4	2.1
CREF Social Choice	5.0	3.6
CREF Global Equities	5.7	5.8
CREF Equity Index	1.7	1.6
CREF Growth	4.3	4.5
TIAA Real Estate	0.1	0.2
Total	100%	100%

Source: TIAA-CREF Corporate Research
Percentages may not add to 100 because of rounding.

participants with small accumulations are more likely to hold larger percentages in the fixed-income class than participants with large accumulations.

Distribution of Average Accumulation Amounts by Age

Like Table 8, the remainder of the tables in this issue report on the average percent of accumulations across asset classes and accounts held by participants. They focus, however, on year-end 1996 and note differences by three major characteristics of participants—age, sex, and size of accumulation. In Table 9, we see that there are significant differences by age in the participants' average accumulation distribution. Younger participants (under age 35) hold more equities (58.5 percent of accumulations) in their RA/GRA contracts than older (age 55 and over) participants (49.1 percent of accumulations). Younger participants also prefer the fixed-income asset class (13.0 percent) compared with older participants (5.3 percent). This may be because younger participants are more interested in flexibility than in the higher returns generally available through the TIAA traditional annuity. Younger participants also have larger shares of accumulations in the new CREF accounts than older participants; so far, however, there is no noticeable difference by age in the share of accumulations devoted to the TIAA Real Estate Account.

Differences in Average Accumulation Amounts by Sex

Table 10 focuses on differences in the composition of accumulations according to participants' sex. Women have somewhat larger shares of their accumulations in the guaranteed and fixed-income classes than do men. Among equity accounts, however, women have a higher percent of their accumulations in the Social Choice Account (5.0 percent) than do men (3.6 percent). The gender difference in portfolio composition seems to be a general result; for example, similar results were found in studies of the asset allocation choices of participants in the thrift plan for federal government employees and in a 401(k) plan for workers at a large private corporation.[3]

Table 11

Average Percent of Accumulations Held by Premium-Paying RA/GRA Participants by Asset Class and TIAA and CREF Accounts, by Accumulation Quintile, 1996

	Lowest Quintile	2nd Quintile	3rd Quintile	4th Quintile	Highest Quintile
Asset class					
Guaranteed	26.1%	37.3%	43.4%	46.6%	41.7%
Equity	55.9	51.4	48.2	49.6	55.8
Fixed income	17.7	11.2	8.3	3.8	2.4
Real estate	0.4	0.1	0.1	0.1	0.2
Total	100%	100%	100%	100%	100%
Investment account					
TIAA traditional annuity	26.1%	37.3%	43.4%	46.6%	41.7%
CREF Stock	23.2	29.0	35.2	42.3	51.1
CREF Money Market	13.7	7.6	6.0	2.9	1.9
CREF Bond Market	4.0	3.6	2.2	0.8	0.4
CREF Social Choice	7.2	7.0	4.8	1.8	0.6
CREF Global Equities	9.5	8.9	4.9	3.1	2.3
CREF Equity Index	4.5	1.7	0.9	0.6	0.5
CREF Growth Account	11.5	4.8	2.5	1.8	1.4
TIAA Real Estate	0.4	0.1	0.1	0.1	0.2
Total	100%	100%	100%	100%	100%

Source: TIAA-CREF Corporate Research
Percentages may not add to 100 because of rounding.

Differences in Average Accumulation Distribution by Accumulation Quintile

Finally, differences by accumulation quintiles in average accumulation distribution across classes and accounts are shown in Table 11. Somewhat surprisingly, participants in the lowest and highest quintiles have nearly the same percent of their accumulation in equities—approximately 56 percent. Participants in the lowest quintile, however, have significantly higher portions of their accumulation in the CREF Growth Account than participants in the highest quintile (11.5 percent compared with 1.4 percent). Participants in the third quintile—the middle one—have the lowest percent in equities—48.2 percent. Looking across quintiles, participants differ most in the share of their accumulations held in the fixed-income class—17.7 percent for the lowest quintile falling monotonically to 2.4 percent for the highest quintile.

There are certain similarities in the results shown in Tables 9 and 11, particularly in the large holdings of the fixed-income asset class and the popularity of the new equity accounts among young participants and participants in the lowest accumulation quintile. This is not surprising because there is a positive correlation between age and size of accumulation. Nevertheless there are also significant differences between figures shown in Tables 9 and 11; for example, although the oldest participants have the lowest percent among age groups of their accumulation invested in equities, participants in the highest accumulation quintile have the second-to-highest percent of their accumulation invested in equities among participants grouped by size of accumulation.

Conclusion

This analysis of premium allocation patterns and the distribution of accumulations of TIAA and CREF participants covered periods beginning with 1986 and continuing through 1996. During the 1986-96 period, two new annuity asset classes became available for premium allocation and accumulation, along with seven new accounts. Looking over the period studied, a number of general observations can be made. On the whole, participants continue to favor a considerable diversification of premium allocations and accumulations among asset classes. At the same time, there has been a movement among participants toward greater emphasis on allocation choices and accumulation growth in the equity asset class. Part of the growth in equity accumulations, of course, is related to recent favorable rates of return among equity investments. And it seems evident that the changes in premium allocation patterns taking place over the 1986-96 period represent both a response to nearer-term equity asset experience and an increasing awareness of favorable long-term historical experience of equity investments by many participants, particularly among younger participants. Along with this trend, however, are ample indications that participants have not lost sight of the value of diversification among asset classes, evidenced by an increased variety in asset choice combinations in the later years of the period studied. ❑

(This report was prepared for Research Dialogues *by John Ameriks, Francis P. King, and Mark Warshawsky, Corporate Research, with the assistance of Shaya Stern, Actuarial Technical, TIAA-CREF.)*

Endnotes

[1] Accumulations are defined as total balances across all RA/GRA contracts, including paid-up contracts, of participants who are paying premiums on at least one RA/GRA contract. The total accumulations shown in Tables 6 to 11 do not include non-RA/GRA contracts.

[2] Effective May 1, 1997, transfers out of the Real Estate Account are limited to one per month per participant. However, there are no restrictions on transferring funds into the account.

[3] See Richard Hinz, David McCarthy, and John Turner, "Are Women Conservative Investors?: Gender Differences in Participant-Directed Pension Investments," and Vickie Bajtelsmit and Jack VanDerhei, "Risk Aversion and Retirement Income Adequacy," both forthcoming in *Positioning Pensions for the Twenty-First Century,* ed. Olivia Mitchell (Philadelphia, Pennsylvania: Pension Research Council and the University of Pennsylvania Press, 1997).

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