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4   401(k) Plans and Tax-Deferred Saving

James M. Poterba, Steven F. Venti, and David A. Wise

Tax-deferred 401(k) saving plans were the fastest-growing employee benefit during the 1980s. Since there are penalties for early withdrawal of assets in 401(k) accounts, the contributions to these plans are likely to remain invested until workers retire. The growth of 401(k) plans therefore has the potential to significantly affect the financial status of future elderly households.

Tax-deferred saving accounts, including 401(k)s, have become an increasingly significant channel for personal saving in the United States. This trend began with the Economic Recovery Tax Act of 1981, which dramatically expanded eligibility for Individual Retirement Accounts (IRAs) and allowed individuals who were also covered by employer pension plans to contribute to these accounts. By 1985, more than 15 percent of all taxpayers made IRA contributions totaling more than $38 billion, or nearly one-third of personal saving in the United States. More than 25 percent of all families had IRAs, even though not all of them made contributions in 1985. The 1986 Tax Reform Act limited the scope for tax-deductible IRA contributions. These changes prompted a sharp decline in the number of IRA contributors, from 15.5 million in 1986 to 7.3 million (6.8 percent of tax returns) in 1987. Total IRA contributions declined from $38 to $14 billion.

Like IRAs, 401(k) plans are deferred compensation plans for wage earners,

but unlike IRAs, they are provided by employers. The plans were formally established by the Revenue Act of 1978, but were rarely used until the Treasury Department issued clarifying rules in 1981. If provided by the employer, the 401(k) plan permits the employee to contribute before-tax dollars to a retirement account. Taxes are deferred on the part of income that is contributed to the plan. The participant also benefits from tax-free accumulation of the 401(k) investment, just as with IRAs, and may obtain additional benefits if the employer matches part of the employee contribution. Taxes are paid when funds are withdrawn from the account. The Tax Reform Act of 1986 reduced the annual limit on 401(k) contributions from $30,000 to $7,000 and added nondiscrimination provisions to prevent plans from providing benefits exclusively to high-income employees. The $7,000 contribution limit has been indexed since 1988 and is $8,475 for the 1991 tax year.

The availability of 401(k)s and participation in them expanded rapidly after the 1981 clarifying rules. In 1983, total employment at firms with 401(k) plans totaled 7.1 million; by 1988, the number of workers eligible to participate had increased to 27.5 million. The number of participants increased as well, from 2.7 million in 1983 to 15.7 million in 1988. Almost $40 billion was contributed to 401(k) plans in 1988, with an average employee contribution of about $2,500. Most large firms now have 401(k) plans. A Hewitt Associates (1990) survey of 902 major U.S. employers found plans at 92 percent of the firms in 1989. The recent adoption of 401(k)s has been fastest, however, at small firms: a Massachusetts Mutual Life Insurance Company (1988) survey shows that the number of small firms offering these plans increased from 8 percent in 1984 to 36 percent in 1988.

This chapter provides a systematic analysis of the nature and significance of 401(k) plans. It is divided into five sections. Section 4.1 describes the structure of 401(k) plans, their eligibility rules, contribution limits, and typical balances. It presents summary information on 401(k) eligibility and participation decisions, with particular attention to participation patterns for those with and without IRA accounts. Section 4.2 considers the characteristics of 401(k) plans in more detail and includes preliminary evidence on employer matching rates and withdrawal provisions. Section 4.3 focuses on the overlap between IRA and 401(k) eligibility, directly addressing the extent of substitution between 401(k) and IRA saving and the correspondence between actual saving patterns and "rational" patterns. Section 4.4 examines the extent to which 401(k) contributions represent new saving. The analysis is based on changes over time in total assets of 401(k) participants, and on differences between the net worth of households eligible for and ineligible for 401(k) plans. The results suggest that 401(k) plan contributions represent a net addition to saving, rather than transfers from other stores of wealth or displacement of other forms of saving. Section 4.5 is a brief conclusion.

4.1   401(k) Plan Eligibility and Participation

The probability that an individual contributes a given amount to a 401(k) plan can be factored into the product of three probabilities: the probability of contributing that amount conditional on participating in a 401(k) plan, the probability of participating given that a plan is available, and the probability of being eligible to participate. We analyze each of these probabilities in turn.

The basic data are from the 1984, 1985, and 1986 panels of the Survey of Income and Program Participation (SIPP). Each panel comprises eight interview waves administered over two and one-half years. Data from wave 4 of the 1984 panel cover September–December 1984. Wave 7 of the 1985 panel and wave 4 of the 1986 panel cover the period January–April 1987. The same set of questions about income, assets, and personal retirement saving programs were asked of each panel, with one exception: the 1984 panel did not ask for the balance held in 401(k) accounts. We present nominal values from each of these surveys below. The consumer price index rose 5.9 percent during the twenty-eight-month period separating these surveys.

Five categories of financial assets are distinguished in our analysis: 401(k)s, IRAs, all other financial assets (excluding 401(k)s and IRAs), total financial assets, and debt. Other financial assets include all liquid assets such as bank saving accounts as well as stocks and bonds, although in some cases, we present results excluding stocks and bonds. Total financial assets equal the sum of IRAs, 401(k)s (when available), and other financial assets.

The unit of observation is the household reference person and the reference person's spouse, if present. For a family to be included in our sample, the household reference person had to be between 25 and 65 years of age, at least one member of the family had to be employed, and no member of the family could report self-employment income. The last restriction is necessary because in most cases neither IRAs nor 401(k)s are feasible options for the self-employed.

The SIPP data are supplemented with data from two additional sources. The May 1983 and 1988 Current Population Surveys (CPS) provide data on 401(k) eligibility and participation and on IRA contributions. The 1989 Survey of Consumer Finances (SCF) provides information on the characteristics of 401(k) plans at the end of the 1980s. In addition, we have used IRA contribution data from the Internal Revenue Service.

4.1.1   Eligibility and Participation in 401(k) Plans

At the beginning of the 1980s, 401(k) plans were virtually nonexistent. By 1987, however, one in eight families participated in a 401(k) plan, and one in five families were eligible for a plan through an employer. The top panel of table 4.1 reports the age and income characteristics of persons eligible for and participating in 401(k) plans in 1984 and 1987. The proportion of families contributing to a 401(k) plan increased by 62 percent between 1984 and 1987, from 7.7 to 12.5 percent. The percentage whose employers offered such plans

Table 4.1   401(k) Eligibility and Participation by Age and Income, 1984 and 1987 (%)

	401(k) Eligibility	401 (k) Participation Given Eligibility	401(k) Participation	IRA Participation
Total population				
1984	13.3	58.1	7.7	25.4
1987	20.0	62.6	12.5	28.8
1987 Income categories (thousand $)				
<10	3.9	49.3	1.9	8.3
10–20	10.3	49.8	5.1	12.3
20–30	16.7	54.9	9.2	22.7
30–40	24.1	61.8	14.9	31.9
40–50	31.9	64.6	20.6	41.1
50–75	35.8	68.0	24.3	56.1
>75	33.2	83.9	27.8	66.6
1987 Age categories				
25–34	18.3	53.3	9.7	16.3
35–44	22.2	63.3	14.1	25.1
45–54	21.3	66.9	14.3	37.4
55–64	17.6	72.0	12.7	48.1

Source: Authors' tabulations from the SIPP, as described in the text.

and who were thus eligible to contribute increased from 13.3 to 20.0 percent. Perhaps the most striking feature of these plans is the high participation rate of those who are eligible, 58.1 percent in 1984 and 62.6 percent in 1987.[1]

The 401(k) participation rate of eligible families is more than twice as high as the participation rate in the IRA program, for which virtually all wage earners were eligible through the 1986 tax year.[2] For example, 25.4 percent of families had IRA accounts in 1984, and 28.8 percent had these accounts in 1987. In fact, the difference in participation rates is greater than these data suggest; the "rates" are not precisely comparable. A family is counted as "participating" in a 401(k) if it contributed to a plan in the year of the survey. But a family need only *have* an IRA account to be classified as participating in the IRA program. Thus the IRA rate overestimates the proportion of families currently contributing to an IRA. This difference is especially important after the 1986 restrictions on IRA eligibility.

Several factors may account for the higher 401(k) participation rate, includ-

1. Throughout this paper we view 401(k) participation as a voluntary employee choice. Some employers make contributions to their employees' 401(k) accounts even if the employees choose not to make contributions. Only 24 percent of all 401(k) plans, and 5 percent of the plans at large employers, have this feature (see U.S. General Accounting Office [GAO] 1988a).

2. The 1987 data are for the months January–April. IRA contributions made during this period are generally for the 1986 tax year. Thus 1987 IRA data from the SIPP typically reflect the tax rules in effect through 1986.

ing attractive employer matching, some degree of encouragement for worker participation from employers, or the presence in some plans of "hardship withdrawal" provisions that make 401(k)s somewhat more liquid than IRAs. In addition, 401(k) contributions are usually made through payroll deductions, which may serve as a form of self-control and ensure that a saving plan is adhered to. Once the payroll deduction form has been signed, saving is further removed from day-to-day competition with consumption; salary reductions never appear as spendable earnings.

The two lower panels of table 4.1 report the income and age characteristics of families eligible for and participating in 401(k)s in 1987. The third column of the middle panel reveals that 401(k) participation is closely related to income. Among families with incomes less than $10,000, about 2 percent participate in a 401(k). For higher income families, the participation rate exceeds 25 percent.

The relationship between income and 401(k) participation that is graphed in figure 4.1 reflects both the relationship between income and 401(k) eligibility and the correlation between income and contributions conditional on eligibility. While only about 4 percent of families with annual income less than $10,000 work for employers who offer 401(k) plans, almost 35 percent of those with incomes above $50,000 are eligible for such plans.[3] The 401(k) participation rate conditional on eligibility also rises as income rises, from about 50
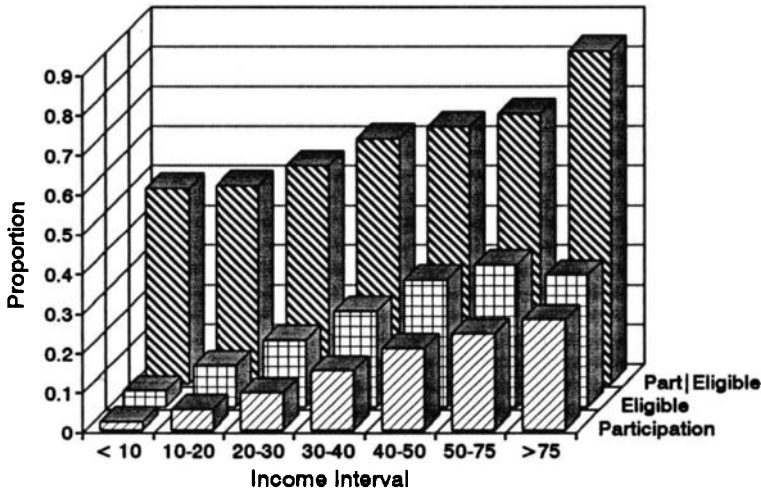

Fig. 4.1   401(k) rates of participation, eligibility, and participation given eligibility, 1987 (by income)

3. Eligibility shows only a weak relationship to age, however. Given eligibility, more than 50 percent of families in almost every age-income group participate in 401(k) plans.

percent for families with income less than $10,000 to 84 percent for families with income over $75,000.

The increase in participation as income rises is much less pronounced than the corresponding pattern for IRAs. IRA participation is only about 8 percent for families with income less than $10,000 but increases to 67 percent for those with income above $75,000.

4.1.2   401(k) Balances

Table 4.2 shows that in 1987, the *mean* balance in 401(k) accounts was $1,237 for all households. The mean IRA balance was $2,836. Among those who had 401(k) accounts, the mean 401(k) balance was $9,862 in 1987, almost the same as the mean IRA balance of families who had IRAs, $9,841. Among

Table 4.2   **Mean and Median Balances in 401(k) and IRA Accounts, 1987**

Income (thousand $)	Participants[a]		All Households	
	Median	Mean	Median	Mean
401(k) Balances				
All	4,000	9,862	0	1,237
<10	1,000	1,628	0	31
10–20	1,000	4,328	0	222
20–30	2,000	4,510	0	413
30–40	4,000	7,856	0	1,168
40–50	4,000	9,021	0	1,861
50–75	6,300	13,584	0	3,304
>75	11,560	20,350	0	5,660
IRA Balances				
All	8,000	9,841	0	2,836
<10	6,000	7,538	0	628
10–20	4,500	6,955	0	859
20–30	5,024	7,247	0	1,645
30–40	7,000	9,016	0	2,876
40–50	7,550	9,112	0	3,748
50–75	10,000	11,690	2,200	6,555
>75	13,600	15,175	7,500	10,107
IRA + 401(k) Balances				
All	18,000	24,208	0	4,073
<10	12,500	10,530	0	659
10–20	7,045	11,453	0	1,081
20–30	11,000	14,777	0	2,058
30–40	14,856	17,666	0	4,044
40–50	13,000	19,535	400	5,609
50–75	22,000	26,893	4,200	9,859
>75	31,518	37,295	10,000	15,767

Source: Authors' tabulations from the SIPP.

[a]Participation in a 401(k) or IRA defined as a balance greater than zero in that plan. Participation in IRA + 401(k) defined as balances greater than zero in *both* plans.

participants, however, the *median* 401(k) balance is half the median IRA balance. There are fewer very large IRA account balances than there are very large 401(k) balances because of the lower legal contribution limit for IRAs. Table 4.2 also reports the distribution of 401(k) and IRA balances by income. For low income groups, the mean 401(k) balance was about 20 percent of the IRA mean, and for high income groups, about half of the IRA mean. Conditional on participating in a 401(k), however, the mean 401(k) balance for high income households actually exceeds that in IRAs.

That the relationship of 401(k) assets to income is stronger than that of IRA assets, given participation, is probably the result of two effects. First, contributions to 401(k) plans, unlike IRA contributions, are typically specified as a percentage of salary. This applies to both employer and employee contributions. Thus high-income employees tend to contribute more than their low-income counterparts. Second, the contribution limits to the two plans are different. The IRA limit is typically $2,000. The 401(k) limit was $45,475 before 1982, $30,000 before the 1986 Tax Reform Act, and $7,000 thereafter. Thus there is much more latitude for 401(k) contributions to increase with income.

A large fraction of the financial assets of most families was in the form of IRAs or 401(k)s. Table 4.3 reports median financial total and other assets, 401(k) account balances, and IRA balances, for families in 1987 classified by 401(k) and IRA participation. Even families that had only 401(k)s had a large fraction of their assets in this form—$2,800 versus $2,149 in other financial assets. Families with both 401(k)s and IRAs typically had more in these accounts than in other financial assets—$18,000 versus $14,350. Families with both 401(k)s and IRAs had much larger balances in both accounts together than families with only IRAs had. The large share of assets held in 401(k) accounts will in all likelihood rise over time, as households continue to contribute to these accounts. It is particularly striking in light of the relatively short time that these plans have been available.

4.2   Characteristics of 401(k) Plans: Preliminary Evidence

This section presents descriptive evidence on characteristics of 401(k) plans that may affect the degree to which they are viewed as substitutes for other tax-deferred saving vehicles. These plan characteristics should also feature prominently in future work on 401(k) participation decisions.

4.2.1   Employer Matching Rates

A 1988 U.S. General Accounting Office (U.S. GAO 1988b) survey of 401(k) plans suggested that participation rates are much higher in plans with some employer matching of worker contributions. Table 4.4 presents summary tabulations from the GAO survey. While the employee participation rate in plans without any matching was less than 50 percent, the rate exceeded 75 percent in plans with employer matching. The increase in participation rates

Table 4.3   Median and Mean Asset Balances by 401(k) and IRA Participation, 1987

Asset	Households with IRA	Households with 401(k)	IRA-*Only* Households	401(k)-*Only* Households	Households with Both	All Households
			Median			
Total financial assets	22,300	17,100	19,300	7,299	38,276	2,849
Total financial assets excluding stocks and bonds	18,600	14,300	16,000	6,061	32,499	2,250
Non–IRA-401(k) assets	10,025	5,600	9,483	2,149	14,350	1,750
Non–IRA-401(k) assets excluding stocks and bonds	6,699	3,500	6,100	1,500	8,188	1,250
IRA	8,000	0	7,359	0	9,000	0
401(k)	0	4,000	0	2,800	6,000	0
IRA and 401(k)	8,997	7,500	7,359	2,800	18,000	0
Debt	500	1,000	500	1,200	700	650
			Mean			
Total financial assets	40,456	36,693	35,605	16,567	59,224	16,299
Total financial assets excluding stocks and bonds	29,856	26,614	26,413	11,819	43,177	11,845
Non–IRA-401(k) assets	27,901	21,645	26,062	9,702	35,016	12,227
Non–IRA-401(k) assets excluding stocks and bonds	17,300	11,566	16,869	4,954	18,969	7,772
IRA	9,841	5,186	9,544	0	–	2,836
401(k)	2,714	9,862	0	6,865	–	1,237
IRA and 401(k)	12,555	15,048	9,544	6,865	24,208	4,073
Debt	3,575	3,298	3,581	3,071	3,552	3,041

Source: Authors' tabulations based on the SIPP.

Table 4.4   401(k) Participation Rates by Employer Match Rate, 1986

Match Rate (%)	Participation Rate (%)	Average Contribution/Salary (%)
0	49.5	3.5
0–25	75.3	3.8
25–50	75.6	3.8
50–75	81.0	3.8
75–100	64.5	4.2
100	98.6	7.0
>100	88.1	8.6

Source: U.S. GAO (1988b).

as the firm match rate rises is less clear, but the nearly 90 percent participation rate for plans with more than dollar-for-dollar matching suggests there may be some incremental effects.

The data in table 4.4 also suggest that employees tend to contribute a higher fraction of their salary when employer match rates are more generous. Conditional on participating, employees at firms with no matching provisions contribute 3.5 percent of their salary. Those with plans matching more than dollar-for-dollar, however, contribute an average of 8.6 percent of salary.

We also investigated the importance of matching using the 1989 SCF, which includes information on both the employer match rate and the amount of employee contribution. Table 4.5 shows that nearly 40 percent of 401(k) participants in the SCF face match rates less than 10 percent, while one-quarter are matched more than dollar-for-dollar by their employers. For these employees, 401(k)s are clearly superior to IRAs, even when the IRA contribution is tax-deductible. The U.S. GAO (1988a) tabulations show that 51 percent of the firms sponsoring 401(k) plans matched employee contributions. As in the SCF, the GAO found that the majority of plans with matching provisions involved dollar-for-dollar matching. The similarity between the GAO and SCF results is encouraging, because the underlying sampling rules are different. The GAO results weight each *plan* equally, while our SCF tabulations average across households and therefore weight plans in proportion to their number of contributors.

Table 4.6 displays the distribution of *employee* contribution rates, as a share of salary, for those who reported 401(k) participation in the 1988 CPS. Most employees contribute 3–9 percent of their salary to the 401(k) plan. These results are similar to those from the 1989 SCF, although many more SCF participants (10.3 percent) indicated zero employee contributions to the plan.

4.2.2   Other Plan Provisions

Employer matching rates are probably the most important dimension along which 401(k) plans differ, but there are many other features of these plans that

Table 4.5   **Employer Match Rate for 401(k) Plan Contributions, 1989**

Match Rate (%)	Percentage of All 401(k) Plan Participants (%)
0–10	39.3
10–20	1.6
20–30	3.2
30–40	6.9
40–50	13.3
50–100	9.8
>100	25.7

Source: Authors' tabulations from the 1989 SCF.

Table 4.6   Share of Employee Salary Contributed to 401(k) Plan, 1988

Share of Salary (%)	Percentage of All 401(k) Participants (%)	
	Percentage	Cumulative
0	1.0	1.6
1	4.2	5.8
2	7.5	13.3
3	9.0	22.3
4	7.7	30.0
5	19.6	49.6
6	16.1	65.7
7	4.6	70.3
8	5.8	76.1
9	1.6	77.7
10	11.8	89.5
>10	9.4	100.0

Source: Authors' tabulations from the 1988 CPS.

can affect their attractiveness as saving vehicles. Table 4.7 presents descriptive information on the plans surveyed by the GAO in 1987. The table describes four plan provisions and yields no strong evidence on the link between these provisions and participation rates.

Participation rates are slightly higher in plans that preclude employees from borrowing against their accumulated balances, making their own investment choices, or making hardship withdrawals of their own contributions. While the differential participation rates are relatively small in all three cases, the pattern is surprising, since employees appear more likely to participate in plans that reduce their financial flexibility. These data are an invitation to further work, since the bivariate tabulations do not control for match rates or characteristics of the firm or workers covered by these plans.

4.3   Are 401(k)s and IRAs Substitutes?

A central issue in evaluating the net saving effects of tax-advantaged saving plans is the extent to which these plans serve as substitutes for other forms of saving. The net saving effect of 401(k) plans depends both on the extent to which individuals treat them as substitutes for traditional saving vehicles, and on the extent to which 401(k) plans substitute for other tax-advantaged saving plans such as IRAs.

Focusing on household behavior with respect to only one saving incentive program may yield misleading inferences about the consequences of changing the provisions of that program. For example, an increase in the IRA contribution limit is typically viewed as affecting the opportunity set of an individual

Table 4.7   **401(k) Participation Rates by Various Plan Characteristics, 1986**

Plan Characteristic	Participation Rate (%)	Average Contribution/Salary (%)
Loan provision?		
Yes	69.3	4.6
No	81.7	4.9
Hardship withdrawals for employee contributions?		
Yes	71.3	4.5
No	75.6	6.8
Hardship withdrawals for employer contributions?		
Yes	86.9	5.3
No	50.1	3.5
Self-directed investments?		
Yes	69.9	5.4
No	73.1	4.0

Source: U.S. GAO (1988b).

who is making the maximum possible IRA contribution. However, this may be incorrect if the IRA contributor is also participating in a 401(k) plan but not contributing up to the 401(k) limit, since this person's *total* tax-deferred saving is not constrained. If 401(k) and IRA accounts are treated as perfect substitutes, then changing the IRA limit should not affect the saving of such a household.

In contrast, a high-income worker who is not eligible to make a tax-deductible IRA contribution might change her saving if an employer 401(k) plan became available to her. If she contributed the 401(k) maximum, then changes in this limit would directly affect her saving. A "rational" saver should *never* contribute less than the maximum to a 401(k) and also make a non-deductible IRA contribution, since raising the former and reducing the latter would reduce her current tax liability with no change in net worth.

A few high-income households make limit contributions to both a 401(k) plan and an IRA.[4] If these households do no further saving through taxable channels, then changes in the IRA contribution limit or the 401(k) limit will almost surely affect their total saving. If these households save through taxable channels, then all tax-deferred saving might be thought of as inframarginal. If individuals treat all forms of saving as perfect substitutes, then changing either contribution limit would not affect net saving. A central issue in evaluating the net saving effects of IRAs is the degree to which IRAs and other forms of

4. Two-thirds to three-quarters of all IRA contributions are at the contribution limit. Only about 3 percent of all 401(k) contributions are at the post-1986 legal contribution limit. However, about 40 percent of firm 401(k) plans place additional limits on the contributions of some highly paid employees to comply with "nondiscrimination" tests for pension plans. See U.S. GAO (1988a) and Hewitt Associates (1988).

saving are treated as substitutes.[5] To illuminate the pattern of substitution be-
tween IRA and 401(k) saving and the correspondence between actual saving
patterns and "rational" patterns, this section presents data on the interaction
between IRA and 401(k) saving.

4.3.1 The Overlap between 401(k) and IRA Saving

Table 4.8 presents evidence on the overlap between IRA and 401(k) saving.
The data show the percentage of persons who make 401(k) contributions who
also participate in IRAs. The SIPP, the source for these tabulations, indicates
whether a family has an IRA account in each year but does not report whether
a contribution was made in that year. Even in the early years of the IRA pro-
gram, the percentage of families contributing in a given year was less than the
percentage with an account. In later years, particularly following the Tax Re-
form Act of 1986, the two percentages diverged as families that were once
regular participants stopped contributing. In 1987, for instance, more than
twice as many families had accounts as contributed.

To provide information on IRA contributions as well as accounts, therefore,
we present data from the CPS, which reports the percentage of persons making
an IRA contribution in the 1982 and 1987 tax years. Because the 1987 CPS
data pertain to the 1987 tax year, they reflect the eligibility restrictions imposed
by the Tax Reform Act of 1986. In 1987, 47 percent of 401(k) *contributors*
also had IRA accounts. The CPS data for 1987 reveal that only 17 percent of
401(k) contributors also made an IRA contribution, a substantial decline from
37 percent in 1982.

4.3.2 401(k)s and the Post-1986 Fall in IRA Contributions

It is tempting to conclude that, as 401(k)s became more widely available,
they displaced IRAs because employer matching made them more attractive.
A large fraction of 401(k) contributors became ineligible for the full tax advan-
tages of the IRA after 1986, however, and this may have induced a decline in
IRA contributions even *without* any 401(k) substitution. This view is supported
by the similarity between the decline in IRA participation among households

Table 4.8   **Overlap of 401(k)s and IRAs, 1982–87**

	1982 CPS	1984 SIPP	1987 SIPP	1987 CPS
Percentage of 401(k) contributors who:				
Have an IRA	–	41.1	47.1	–
Contribute to an IRA	37.0	–	–	17.4

Source: Authors' tabulations using surveys as indicated.

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5. This is the focus of empirical work by Feenberg and Skinner (1989), Gale and Scholz (1994),
and Venti and Wise (1986, 1990a, 1990b, 1992).

that are eligible, and those that are ineligible, for 401(k)s. The proportion of *all* tax filers making IRA contributions rose from 12.6 to 15.9 percent between 1982 and 1986, and then fell to 6.8 percent in 1987. The decline in IRA participation for 401(k) participants thus mirrors the population reduction, suggesting that tax reform and not the diffusion of 401(k)s explains the IRA decline.

The sharp decline in IRA contributions after 1986 was common to all income groups. Table 4.9 shows the percentage of persons who contributed to an IRA, by 401(k) eligibility status and by income interval, in 1982 and 1987. The data suggest several important conclusions that are made clear with the aid of figure 4.2. First, controlling for income, the percentage of 401(k) eligibles who contributed to an IRA in 1982 was very close to the percentage of ineligibles who contributed. The contribution rates are significantly different only for the less than $10,000 and greater than $75,000 income groups, for which the percentage of 401(k) eligibles contributing to IRAs is *higher* than the percentage of ineligibles.[6] If IRAs and 401(k)s were viewed as close substitutes, then IRA accounts would be less prevalent among those eligible for a 401(k). These data consequently cast doubt on either standard assumptions about saving behavior or the assumption that IRAs and 401(k)s are perfect substitutes.

Second, the decline in IRA contributions after 1986 is not consistent with a high degree of substitution between IRAs and 401(k)s. The Tax Reform Act of 1986 phased out the tax deduction for IRA contributions for higher-income taxpayers—married filing units with incomes above $40,000 and single filers with incomes above $30,000—provided they were also covered by an employer-sponsored pension plan. Approximately 73 percent of all tax filers

Table 4.9   **Percentage Contributing to an IRA by 401(k) Eligibility and Income**

Income (thousand $)	1982		1987	
	Not Eligible for 401(k)	Eligible for 401(k)	Not Eligible for 401(k)	Eligible for 401(k)
<10	11.9	20.9	7.2	12.8
10–20	16.1	18.5	9.6	12.2
20–30	24.3	22.9	15.8	14.0
30–40	36.8	39.2	18.3	17.5
40–50	50.5	46.3	24.2	15.3
50–75	59.2	55.2	26.5	19.6
>75	64.5	85.4	37.2	28.7
All	19.9	26.0	12.9	15.3

Source: Authors' tabulations based on 1983 and 1988 CPS.

6. App. A presents estimates of standard errors for the levels and differences in participation rates for various income groups.
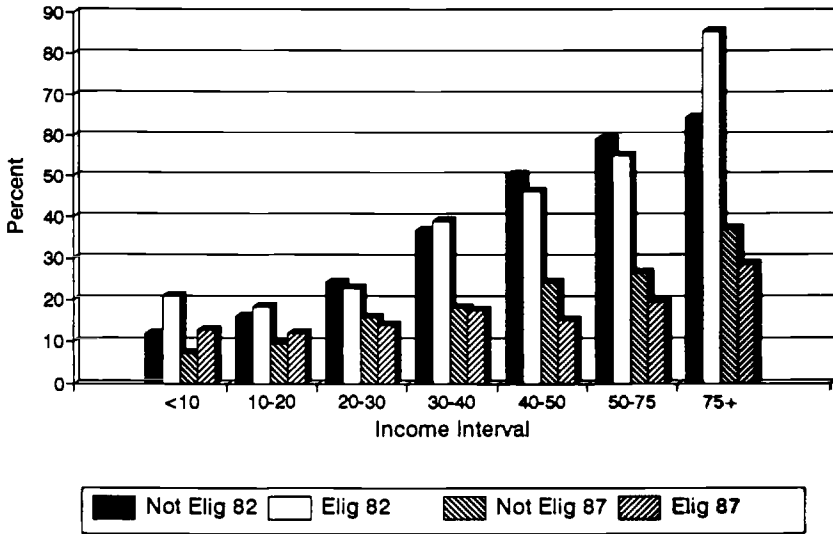
Fig. 4.2   IRA contribution percentage by 401(k) eligibility, 1982 and 1987

were unaffected by the changes. Given these changes, one would have expected little change in IRA contribution behavior at low income levels and the greatest response among high-income households that were eligible for a 401(k) plan.[7] In fact, the percentage contributing to IRAs fell dramatically for all income groups after 1986, and it was largely independent of 401(k) eligibility. Only for the greater than $75,000 income group was the *fall* in the contribution rate for 401(k) eligibles significantly greater than the fall in the contribution rate for the 401(k) ineligibles. Thus the availability of the 401(k) option cannot explain the drop in IRA contributions.

Figure 4.3 presents IRA contribution rates for 1985 and 1988, by income interval, without accounting for 401(k) eligibility. The data used to construct these figures are from the IRS Statistics of Income series. Actual rates are shown in figure 4.3*A*, and the percentage decline between 1985 and 1988 is presented in figure 4.3*B*. Families that lost the up-front tax deduction virtually quit contributing after the 1986 legislation. Close to 70 percent of families with incomes greater that $50,000 made IRA contributions before 1986. But after the legislation, the proportion fell by almost 90 percent, to less than 10 percent. Families with incomes between $40,000 and $50,000—the interval over which the up-front deduction was phased out—reduced their contribution

7. An alternative view is that the Tax Reform Act of 1986 lowered marginal tax rates and thus made the IRA tax deduction less attractive. But IRA contributions fell even for low-income families that experienced little change in marginal tax rates because of the 1986 legislation (see Hausman and Poterba 1987).
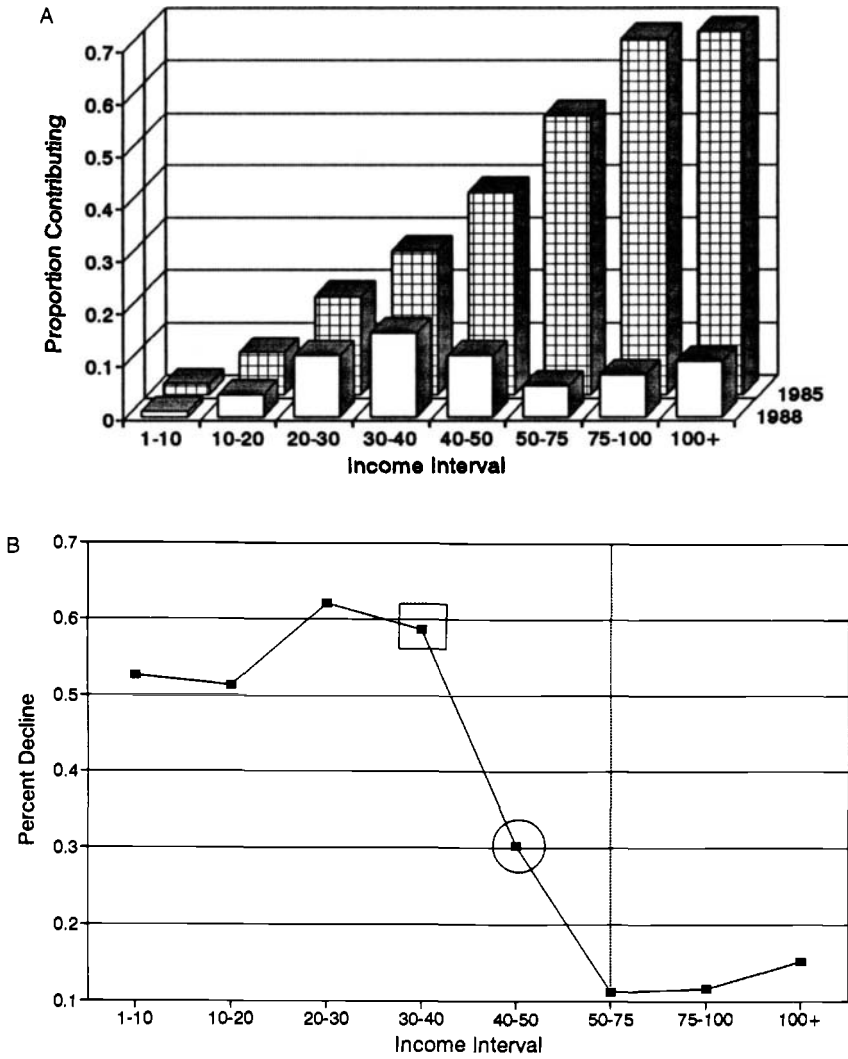
Fig. 4.3 *A*, **IRA contribution rate by income interval, 1985 and 1988. *B*, Decline in IRA contribution rate by income interval, 1985–88.**

rate by 70 percent. Even lower-income families unaffected by the legislation reduced their contributions by between 40 and 50 percent.

The across-the-board reduction in the IRA contribution rate was undoubtedly due in part to a misperception of the 1986 legislation, especially among lower-income families. Higher-income families may also have misunderstood the legislation, thinking that both the up-front deduction and the tax-free accumulation of returns had been eliminated. The systematic decline in IRA contri-

butions also suggests that the promotion of these accounts may have been an important determinant of their widespread use.

Third, the pattern of IRA contribution rates in 1987 suggests only a modest relationship between IRA contributions and 401(k) eligibility. The rates for 401(k) eligibles are significantly lower than the rates for ineligibles in income categories above $40,000. At lower income levels, however, there is little relationship between IRA participation and the availability of a 401(k) plan. Indeed, the rate for eligibles is significantly higher than the rate for ineligibles in the two lowest income intervals. This suggests that, for households that remained eligible for tax-deductible IRAs after the 1986 tax reform, 401(k) saving did not displace IRA saving. Taken together, the results suggest that IRA contributions were curtailed as a result of the 1986 tax reform but were not displaced by 401(k)s.

4.3.3   IRA and 401(k) Saving by 401(k) Eligibles

Table 4.10 provides information on the saving behavior of all families *eligible* for 401(k)s in 1987. The first column, based on SIPP data, pertains to *families* and indicates whether the family has an IRA *account* in 1987. The second column, based on CPS data, pertains to *individuals* and indicates whether the individual *contributed* to an IRA in 1987. Only about one-third of 401(k) eligibles saved in neither a 401(k) nor an IRA. Among those eligible for a 401(k), 40 percent have an IRA account and 10.4 percent have only an IRA; 15.5 percent contribute to an IRA and 5.1 percent contribute only to an IRA. The IRA contribution rate for those eligible to make 401(k) contributions exceeded the IRA contribution rate for all tax filers in 1987, but this is because of the higher income of 401(k) eligibles. Controlling for income, there is little difference between the two groups except at higher income intervals, as shown in table 4.9.

4.3.4   IRA Limit Contributors and 401(k) Saving

The overlap between 401(k) and IRA saving for families making maximum possible IRA contributions in 1984 is shown in table 4.11. It might be pre-

Table 4.10   **Retirement Plan Use by Families Eligible for 401(k)s (%)**

	1987 SIPP	1987 CPS
Neither a 401(k) nor an IRA	27.1	35.5
Only an IRA	10.4	5.1
Only a 401(k)	33.1	49.0
Both a 401(k) and an IRA	29.5	10.4

Source: Authors' tabulations from the CPS and the SIPP.

Note: The 1987 SIPP data pertain to families and to IRA accounts. The 1987 CPS data pertain to individuals and to IRA contributions.

Table 4.11   **IRA Limit Status versus 401(k) Participation**

	IRA Participants	IRA Limit Contributors	All Households
Probability of 401(k) participation (%)	16.2	17.2	11.5
Probability of 401(k) participation if eligible (%)	65.8	66.1	56.0

	401(k) Eligibles	401(k) Participants	All Households
Probability of IRA limit contribution (%)	20.6	24.3	16.3
Probability of IRA contribution (%)	26.2	30.8	21.9

Source: Authors' tabulations based on merging waves 4 and 7 of the 1984 SIPP Panel. A household is defined to be an IRA contributor in a year if the change in the IRA balance over the one-year interval exceeded $500. A household is defined to be a limit contributor if the change in the balance exceeded $2,000.

sumed that persons at the IRA limit are constrained by the limit and thus would like more tax-deferred saving. Indeed, 66 percent of families at the IRA maximum make additional contributions to a 401(k) plan if they are eligible for such a plan. The significant fraction that does not take advantage of the 401(k) is striking, because employer matching typically makes a 401(k) plan more attractive than an IRA. Perhaps some families are only motivated to make an IRA contribution to shelter income at the time of tax filing and do not consider the role of IRAs in an ongoing saving plan. This is consistent with the finding that one-third to one-half of all IRA contributions are made between the end of the tax year and the April 15 filing deadline (Summers 1986; Skinner 1992).

Among families who were eligible to participate in a 401(k), 26.2 percent made an IRA contribution. Of those who made a 401(k) contribution, 31 percent also contributed to an IRA. Although the data do not indicate whether the 401(k) contributors who made IRA contributions were at the 401(k) limit, it is likely that most were not. This pattern is also surprising, since for many households 401(k)s probably yield higher returns, inclusive of employer matching, than IRAs.

The results in this section cast doubt on the assumption that all forms of saving, and particularly saving in 401(k)s and IRAs, are treated as perfect substitutes. They also raise doubts about the extent to which all households are "rational" savers, basing saving decisions on economic return criteria only. The relationship between 401(k) eligibility and IRA saving is weak, and a substantial proportion of families save in IRAs even though they could make additional 401(k) contributions. Understanding why some households save through dominated saving instruments is an important issue for future work.

4.4   The Saving Effects of 401(k) Plans

To investigate whether 401(k) contributions represent "new saving," one could compare the total non-401(k) saving of 401(k) contributors to the total non-401(k) saving of noncontributors. Contributors save more in non-401(k) forms than do noncontributors, even after controlling for differences in income, and thus the total saving of 401(k) contributors exceeds the total saving of noncontributors. This does not necessarily mean that 401(k)s increased total saving, because the comparison of contributors to noncontributors ignores individual-specific saving effects. Some families are "savers" and some families are "nonsavers," and the former are likely to save more in all available forms. Convincing evidence on the net saving effect of 401(k)s therefore requires a more subtle test.

We use two simple approaches to consider the saving effect of 401(k)s, both intended to control for individual-specific saving effects. The first considers two demographically similar random cross sections of "like families" that have been "exposed" to 401(k) plans and IRAs for different periods of time. Since age, income, and other characteristics of the two cross sections are similar, one would expect saving balances also to be similar. However, the 1984 sample has had only about two years (1982–84) to accumulate 401(k) and IRA balances, but the more recent sample has had about five years. The central question is whether longer "exposure" to these plans results in higher levels of saving.[8] Our second approach relies on the natural experiment that is provided by the largely exogenous determination of 401(k) eligibility. It considers whether eligibility is associated with higher levels of total saving, holding income constant. This approach views 401(k) eligibility as the "treatment" in a "natural experiment" to evaluate the effect of tax incentives on saving.

4.4.1   Changes in Assets of "Like Families": 1984 versus 1987

In this subsection we compare two independent samples of households that contribute to 401(k)s. The samples are randomly chosen and thus are similar with respect to age, income, and other economic and demographic characteristics. One sample is from 1984, and the other is from 1987. In principle, we are comparing a typical person aged, say, 40 in 1984 to another person aged 40 in 1987. Both persons are at the same point in the life cycle and would presumably have accumulated similar levels of assets, abstracting from possible aggregate effects due to asset appreciation rates between 1984 and 1987.

8. An issue that cannot be controlled for with this approach is the possibility that the persons who took up the 401(k) option were those who were about to *change* their saving behavior, that the 401(k) just happened to be available at the opportune time, and that it was used as the saving vehicle for the reborn saver who would have increased saving in another form, had it not been for the 401(k) option. The second approach (below) tends to minimize the potential confounding of effect of this possible coincidence. This issue is discussed in more detail, with respect to IRAs, in Venti and Wise (1992).

There is one important difference, however. The 401(k) contributor in 1984 had roughly two years over which contributions could be made; the 401(k) contributor in 1987 had roughly five years. If 401(k) contributions represent asset transfers, then the total asset balances of the 1984 and 1987 contributors should be roughly the same—additional 401(k) contributions made by the 1987 contributor would replace saving that would have been done in other forms. If 401(k) contributions represent new saving, however, then the total financial assets—including 401(k)s—of the 1987 contributor should exceed the total assets of the 1984 contributor by the amount contributed to 401(k)s between 1984 and 1987.

The assets of families that had only 401(k) plans are shown in the first panel of table 4.12. The financial assets of these families in 1987 data are shown in the second and fourth columns. The median of total financial assets was about $6,100 excluding, and $7,300 including, stocks and bonds. We would like to know how much financial wealth families like these had in 1984. Was it about

Table 4.12   Median IRA and 401(k) versus Other Financial Asset Balances by Type of Asset Held, 1984 and 1987

Group	Excluding Stocks and Bonds		Including Stocks and Bonds	
	1984	1987	1984	1987
Families with 401(k) only				
Total assets	–	6,061	–	7,299
Other than 401(k)	1,800	1,500	3,000	2,149
401(k)	–	2,800	–	2,800
Debt	1,000	1,200	1,000	1,200
Families without 401(k)				
Total assets	1,500	1,500	1,949	2,000
Families with IRA only				
Total assets	13,000	16,000	16,170	19,300
Other than IRA	6,550	6,100	9,400	9,483
IRA	4,500	7,400	4,500	7,400
Debt	500	500	500	500
Families without IRA				
Total assets	650	754	800	960
Families with IRA and 401(k)				
Total assets	–	32,499	–	38,276
Other than IRA or 401(k)	8,499	8,188	13,000	14,350
IRA	5,000	9,000	5,000	9,000
401(k)	–	6,000	–	6,000
IRA and 401(k)	–	18,000	–	18,000
Debt	500	700	500	700
Families with neither IRA nor 401(k)				
Total assets	600	550	750	700

Note: Entries are in nominal dollars for 1984 and 1987.

the same as in 1987, suggesting no net saving effect, or did it increase, suggesting a net addition to saving? We assume that the families that participated in 401(k) plans in 1987 are like those that participated in such plans in 1984, except that the 1987 families were able to make plan contributions for two or three more years. The data for 1984 are not complete, however, because the SIPP did not obtain 401(k) asset balances in that year. Thus both 401(k) and total financial asset balances are missing.

It is nonetheless possible to make rough judgements about the net saving effect of the 401(k) contributions. No change in non-401(k) asset balances would suggest no substitution of 401(k) for other forms of saving, and thus that 401(k) balances represented net new saving, no matter what the magnitude of the 401(k) saving. The data, however, show a small decline in the median of other—non-401(k)—assets between 1984 and 1987, about $850 including stocks and bonds and about $300 excluding stocks and bonds. Median debt increased by about $200. Thus, we would like to compare this decline with the increase in 401(k) assets.

The increase in the median 401(k) balance was undoubtedly substantial, but we can provide only a rough approximation of the amount of the increase. About 40 percent of the families that had plans in 1987 did not have them in 1984. The typical 401(k) contribution is well above $2,000 (actually about $2,500). Thus, as a rough approximation, assume that the 401(k) balances of employees who had accounts in 1984 increased about $5,000 between 1984 and 1987. Again as a rough approximation, assume that the increase for those who began to contribute after 1984 was about $2,500 on average. The average increase would then be about $4,000 (0.4 × $2,500 + 0.6 × $5,000). If these 401(k) contributions replaced saving that would otherwise have occurred in other forms, the non-401(k) assets of the contributors should have fallen by about the same amount as the increase in 401(k) assets. But the decline in other assets was much smaller than the probable increase in 401(k) assets. This suggests that, in large part, the 401(k) contributions represented net new saving.[9] In contrast to the substantial increase in the financial assets of families with 401(k)s, families without 401(k)s had about the same median wealth in both years—exactly the same excluding stocks and bonds, and $1,949 in 1984 versus $2,000 in 1987 if stocks and bonds are included.

A similar comparison can be made between families that had only IRA accounts in 1987 and families that had only IRA accounts in 1984. These data are shown in the second panel of table 4.12. This comparison is more complete and probably more accurate than the comparison for 401(k) participants, however, because total assets are known in both years and because the sample size is much larger than the sample of families with 401(k)s only. Consider families

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9. The approximations used in this paragraph relate more directly to means than to medians. Table 4.12 is reproduced in App. table 4B.1, but means rather than medians are reported. The basic conclusions are the same.

that had IRA accounts in 1987. Again, we assume that the families that had IRA accounts in 1987 are like those that had such accounts in 1984, except that the 1987 families were able to make IRA contributions for two or three more years. Indeed, the 1987 families had $2,859 more in IRA accounts than the 1984 families. If additional IRA contributions replaced saving that would otherwise have occurred in other forms, however, total assets of the 1987 sample should have been about the same as the total for the 1984 sample. But the median total financial assets of the 1987 families were in fact $3,130 larger than the total financial assets of the 1984 families. There was essentially no change in the nominal value of other financial asset balances ($9,400 in 1984 vs. $9,483 in 1987). In addition, there was no change in median debt. This suggests that the IRA contributions did not replace other saving. The basic pattern is the same whether stocks and bonds are included or excluded from the measure of other financial assets. These results are similar to those in earlier studies of IRA contributors (see, e.g., Venti and Wise 1990a, 1990b, 1992) and are directly comparable to the results in Venti and Wise (1992), based on Consumer Expenditure Survey data.

Comparable data for families that had both IRA and 401(k) accounts in 1987 and families that had both accounts in 1984 are shown in the bottom panel of table 4.12. By 1987, families with both accounts had a median balance of $18,000 in the two together, approximately half the median balance in total financial assets. Like the data for the 401(k)-only group, the data for this group are incomplete, because 401(k) balances were not obtained in the 1984 survey, but the basic inference is the same. IRA and 401(k) contributions were not offset by reduced saving in other financial asset forms. If they had been, the 1987 families would have accumulated fewer assets in other forms, because when they started to contribute to IRAs and 401(k)s they would have saved less in other forms.

The data show that the 1987 respondents had somewhat larger balances in non-401(k)-IRA financial assets than the 1984 respondents had, and their median debt was only slightly larger ($700 in 1987 vs. $500 in 1984). These data also suggest little substitution between IRA and 401(k) saving. The IRA balance for this group increased by $4,000—$1,000 more than the increase in the IRA balance for those with IRAs only.

4.4.2   Asset Balances by 401(k) Eligibility

This section relies on the natural experiment that is provided by the essentially exogenous determination of 401(k) eligibility to explore the effect of 401(k) contributions on total saving. Eligibility is determined by employers. If household saving behavior is independent of individual characteristics related to the probability of working at firms with 401(k) plans, an assumption which is unlikely to be completely accurate, then comparison of the net worth of families with and without 401(k) eligibility can be used to infer the saving effect of these plans. If there are no net saving effects of 401(k)s, then families

who have the 401(k) option should have similar net worth, but less non-401(k) assets, than those families without 401(k) eligibility.

Median financial asset balances by 401(k) eligibility and by income interval are shown in table 4.13 for 1987 and 1984. We stratify by income because 401(k) eligibility increases with income. If, given income, eligibility is determined exogenously, then the data allow strong inferences about the saving effect of 401(k) plans. Figure 4.4 presents information from this table in graphical form. Figure 4.4A shows that families whose employers offered 401(k) plans had substantially greater total financial assets in 1987 than did families whose employers did not provide such plans. For example, the median level of financial assets of families with incomes between $50,000 and $75,000 who were eligible for a 401(k) was $25,343, whereas the median for families who were not eligible was only $14,650. If when families became eligible for 401(k) plans they reduced saving in other forms, the typical family eligible for a 401(k) in 1987 should have less accumulated wealth in other financial assets than the typical family who had not been eligible for a 401(k). Figure 4.4B shows that this was not the case. There was little difference in the other financial assets between families who were and those who were not eligible for a 401(k). Indeed, the eligible families had somewhat higher levels of other financial assets.

Table 4.13   **Median Asset Balances by 401(k) Eligibility and Income, 1984 and 1987**

Group	<10	10–20	20–30	30–40	40–50	50–75	>75	All
				Income (thousand $)				
				1987				
Not eligible for a 401(k)								
All financial assets	22	400	1,366	4,000	6,630	14,650	30,900	1,870
Other assets	20	350	1,052	2,800	4,245	8,737	21,200	1,300
IRA	0	0	0	0	0	2,000	6,000	0
Eligible for a 401(k)								
All financial assets	1,090	1,190	4,000	9,205	12,650	25,343	58,119	10,330
Other assets	361	305	1,250	3,250	5,800	11,200	25,500	4,000
IRA	0	0	0	0	0	2,500	11,204	0
401(k)	0	0	150	1,000	1,000	1,500	8,500	1,000
				1984				
Not eligible for a 401(k)								
All financial assets	34	458	1,768	3,950	7,150	15,870	19,000	1,850
Other assets	30	400	1,400	3,000	5,138	11,000	21,950	1,400
IRA	0	0	0	0	0	2,000	4,000	0
Eligible for a 401(k)								
All financial assets[a]	–	–	–	–	–	–	–	–
Other assets	25	509	1,749	3,740	5,049	11,500	30,400	3,740
IRA	0	0	0	0	0	0	0	0
401(k)[a]	–	–	–	–	–	–	–	–

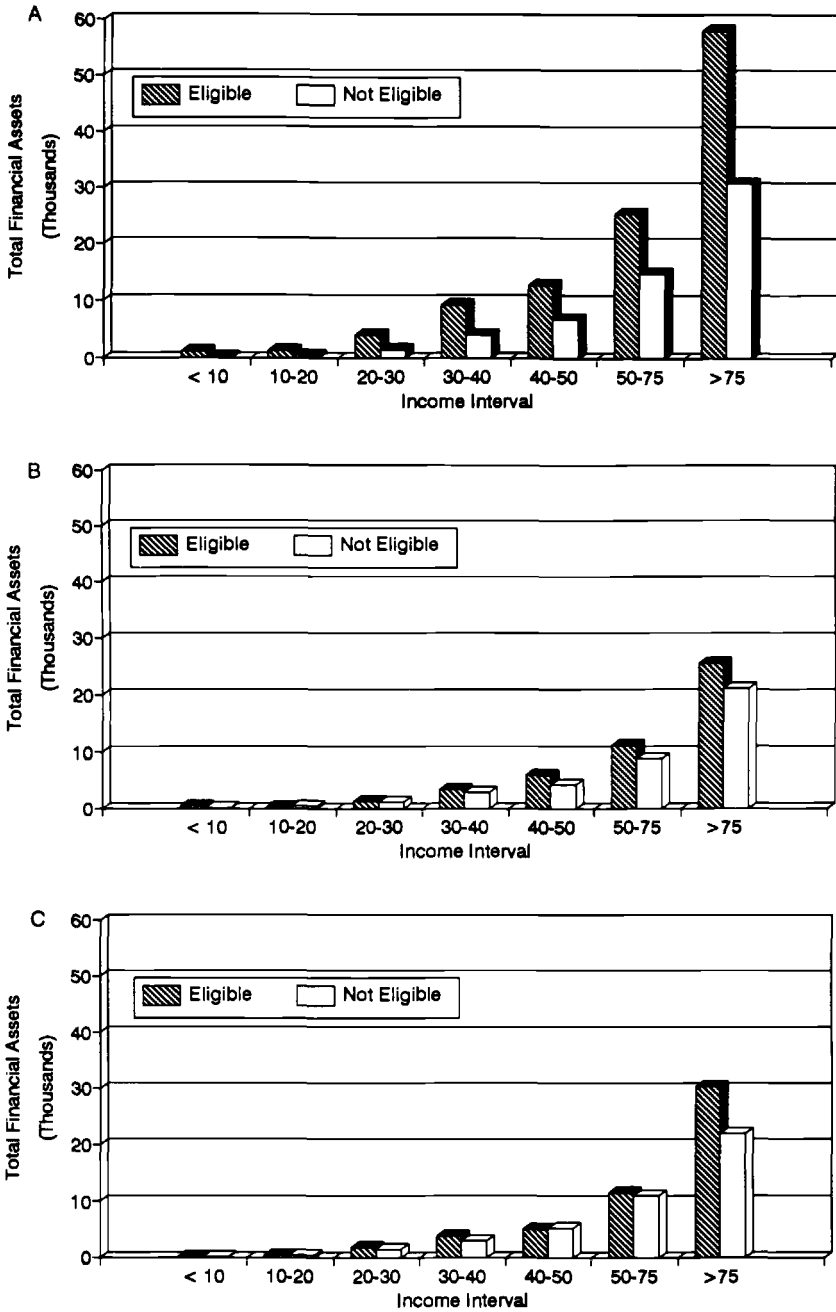[a]401(k) assets are not available for 1984. Entries are in nominal 1984 and 1987 dollars.

Fig. 4.4   Assets by 401(k) eligibility. *A*, Total financial assets of all families, 1987. *B*, Other financial assets of all families, 1987. *C*, Other financial assets of all families, 1984. *D*, Other financial assets of 401(k) eligibles, 1984 and 1987.
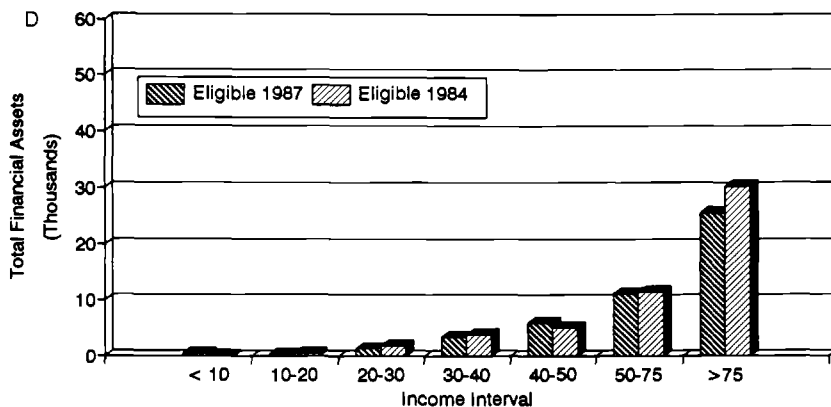
Fig. 4.4   (continued)

The data also show that, in 1984, eligible and ineligible families had virtually the same levels of other financial assets. Figure 4.4C suggests that 401(k) contributions did not substitute for other financial asset saving.[10] Moreover, other financial assets of eligible families in 1984 were about the same as the other financial assets of eligible families in 1987, as shown in figure 4.4D, again suggesting that 401(k) assets did not substitute for other financial assets.

Table 4.14 also distinguishes families on the basis of 401(k) eligibility, but the data pertain to families—eligible or ineligible for a 401(k)—that had IRA accounts. The conclusions are the same as those suggested by table 4.13 and figure 4.4. Eligible families have greater total financial wealth, but other financial assets of eligibles are virtually the same as those of ineligibles, in both 1987 and 1984. There was virtually no difference between the nominal holdings of other financial assets by eligibles in 1984 and 1987.

Our analysis relies on the exogenous determination of 401(k) eligibility status, given income. It could be that the eligible group is composed disproportionately of savers, who save more than the typical person, in all forms. There is little evidence, however, for this type of heterogeneity in saving behavior. As shown above, eligible and ineligible families had about the same level of other financial assets in 1987 and 1984. Thus the eligible group had not been saving more than the ineligible group, in other assets, as they would have if they were disproportionately high savers, saving more in all forms. Moreover, those who were eligible for a 401(k) in 1984 had about the same level of other assets as those who were eligible in 1987. In addition, among IRA savers, other assets do not differ by 401(k) eligibility status. Whereas 401(k) eligibility

10. The 1984 data do not show 401(k) asset balances, however, so that total assets of eligible and ineligible families can not be compared in that year.

Table 4.14   **Median Asset Balances for Families with IRAs by 401(k) Eligibility and Income, 1984 and 1987**

Group	<10	10–20	20–30	30–40	40–50	50–75	>75	All
				1987				
Not eligible for a 401(k)								
All financial assets	13,249	10,800	12,487	18,748	19,000	28,050	48,550	19,646
Other assets	5,000	4,000	5,900	9,630	10,000	16,200	30,990	9,700
IRA	6,000	4,500	5,000	7,320	8,000	10,000	12,500	7,500
Eligible for a 401(k)								
All financial assets	5,820	9,400	15,228	21,000	24,700	36,400	68,500	30,600
Other assets	2,100	2,300	4,500	8,400	9,000	15,500	29,292	12,000
IRA	2,000	6,000	5,900	6,700	6,500	10,000	15,000	8,000
401(k)	0	300	1,000	2,000	2,316	4,000	10,000	2,900
				1984				
Not eligible for a 401(k)								
All financial assets	7,200	9,749	10,500	16,230	17,401	25,600	43,529	16,250
Other assets	2,525	5,000	5,700	9,300	10,600	17,400	33,529	9,450
IRA	3,000	3,800	4,000	4,500	4,700	6,000	7,500	4,500
Eligible for a 401(k)								
All financial assets[a]	–	–	–	–	–	–	–	–
Other assets	3,100	2,249	6,500	10,605	6,950	17,500	38,200	11,500
IRA	4,000	3,000	3,400	4,000	4,224	6,530	8,250	4,500
401(k)[a]	–	–	–	–	–	–	–	–

Income (thousand $) spans the columns <10 through >75.

[a]401(k) assets are not available for 1984. Dollar magnitudes are measured in current-year dollars for 1984 and 1987.

status may be determined exogenously, IRA status is chosen by individuals. Within either eligibility status, families with an IRA have substantially greater total financial assets than those without an IRA. This may reflect, in part, an individual-specific saving effect. Like other assets, however, IRA assets do not differ much by 401(k) eligibility status, as shown in figure 4.5.[11] Thus these data suggest that 401(k) status is indeed largely independent of overall saving propensity, given income.

An additional source of information on the extent of substitutability between 401(k), IRA, and other forms of financial saving is the *change* between 1984 and 1987 in median asset balances, *not* controlling for income interval. The idea is to consider whether the non-401(k)-IRA assets—"other assets"—of families with 401(k)s and/or IRAs declined between 1984 and 1987, as they would if the tax-advantaged saving substituted for other saving. The data are summarized in table 4.15. The main point of the data is that there was no change in the other assets of 401(k)-eligible families—whether or not they contributed to an IRA. For example, the amount of total financial assets of all

11. This seems to suggest little substitution between 401(k) and IRA saving, consistent with the data in the previous sections that were graphed in fig. 4.2.
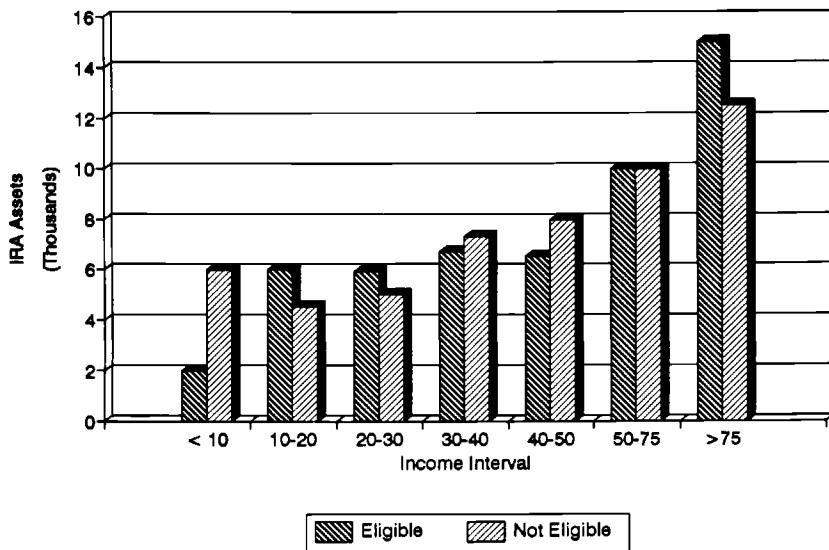
Fig. 4.5   IRA assets by 401(k) eligibility for families with an IRA, 1987

families eligible for a 401(k) in 1984 was $5,000 (excluding 401(k) assets); families eligible in 1987 had $10,330.[12] But there was almost no change in other financial assets of eligible families—a slight increase from $3,740 to $4,000. In contrast, the total (and other) financial assets of families not eligible for a 401(k) remained essentially unchanged over this period.

The message is the same for 401(k)-eligible families with an IRA and for those without an IRA: although total financial assets increased, other financial assets were essentially the same in 1984 and in 1987. The data reveal no hint of substitution. Among those not eligible for a 401(k), only those with an IRA experienced an increase in total assets—from $16,250 to $19,646—and for this group there was virtually no change in other assets. There was essentially no change in the assets of those without an IRA.

Finally, the increase in IRA assets—for families with these accounts—did not depend on 401(k) eligibility status. The increase for those not eligible for a 401(k) was from $4,500 to $7,500. For those who were eligible, the increase was from $4,500 to $8,000. Both the fact that both eligibility groups had the same level of IRA assets in 1984 and the almost identical increases suggest little substitution between 401(k) and IRA assets.

Throughout this section, we have focused on *median* asset levels, rather than on means, because the very large financial assets of a few families lead to mean

12. The median 401(k) balance in 1987 was $1,000, and the median 1984 balance was probably less than this.

Table 4.15   **Median Asset Balances for All Income Groups by 401(k) Eligibility and IRA Status, 1984 and 1987**

Group	1984	1987
All families		
Not eligible for a 401(k)		
All financial assets	1,850	1,870
Other assets	1,400	1,300
IRA	0	0
Eligible for a 401(k)		
All financial assets[a]	5,000	10,330
Other assets	3,740	4,000
IRA	0	0
401(k)	–	1,000
Families with an IRA		
Not eligible for a 401(k)		
All financial assets	16,250	19,646
Other assets	9,450	9,700
IRA	4,500	7,500
Eligible for a 401(k)		
All financial assets[a]	19,200	30,600
Other assets	11,500	12,000
IRA	4,500	8,000
401(k)	–	2,900
Families without an IRA		
Not eligible for a 401(k)		
All financial assets	700	623
Other assets	700	623
Eligible for a 401(k)		
All financial assets[a]	2,072	3,900
Other assets	1,774	1,923
401(k)	–	225

[a]Does not include 401(k) assets in 1984. Entries are measured in current dollars in 1984 and 1987.

asset levels that are much greater than the asset levels of the typical family. For example, the median of total financial assets of families not eligible for a 401(k) is $1,870, whereas the mean is $13,480. The median has the disadvantage, however, that medians of individual assets do not sum to the median of total assets, as means do. For example, the medians of the individual assets of all 401(k)-eligible families with incomes over $75,000 sum to $45,204, but the median of the total is $58,119. Mean values analogous to the medians in table 4.13 are presented in Appendix table 4B.2. The basic conclusions do not differ from the conclusions drawn from the median values. In fact, the difference in the means between the two groups is close to the difference in the medians.

4.5   Conclusions

Our results suggest that 401(k) plans are a significant and increasingly important component of retirement saving in the United States. Unlike IRA contributions, which fell by over 70 percent after the Tax Reform Act of 1986, 401(k) contribution levels have risen throughout the last decade. For many households, assets held through 401(k)s represent more than half of their financial wealth. The high participation rate of those eligible for 401(k)s, coupled with the tendency for most households to reach retirement age with few financial assets other than Social Security and employer-provided pension benefits, suggests that these accounts will play a very important part in the economic security of retirees in coming decades.

Our findings suggest several important conclusions. First, the high 401(k) participation rate of families whose employers offer 401(k) plans suggests that payroll deduction and emulation of other employees may be important determinants of saving decisions. While only about 16 percent of all tax filers made IRA contributions at the height of their popularity, over 60 percent of persons eligible for a 401(k) contribute to the plan. Even in the lowest income groups, the participation rate is close to 50 percent.

Second, the data reveal little substitution of 401(k) saving for either IRA saving or saving through traditional saving vehicles. The data actually show substantial IRA saving even when 401(k) saving would appear to offer a higher rate of return. This casts doubt on the usual assumptions that all forms of saving are treated as perfect substitutes and that all savers make "rational" saving decisions.

Third, the virtual cessation of IRA contributions by persons who lost the upfront tax deduction after the Tax Reform Act of 1986 suggests that such "attention getters" have an effect on saving that goes beyond the strict economic value of the deduction. The importance of promoting saving is suggested by the finding that, after the 1986 legislation, even unaffected persons reduced their contributions by almost 50 percent.

Fourth, the results suggest that 401(k) saving largely represents net new saving. This conclusion rests on the comparison of the financial assets of 401(k)-eligible and 401(k)-ineligible families and on the comparison of the assets of a random sample of 401(k) households in one year with the assets of a random sample of such households in a later year.

This paper sets the stage for further, more formal analysis of 401(k) saving. A behavioral model of household contributions to 401(k)s can in principle be used to simulate the effects of changes in the tax rules governing these plans or of changes in employer match rates. In some circumstances, for example at the firm analyzed in Kusko, Poterba, and Wilcox (1994), employer match rates change substantially from one year to the next. Economic conditions and other factors that affect these rates may therefore have an important influence on household saving as 401(k) plans become a more significant saving channel.

Another important question regarding the rapid rise of 401(k) plans concerns the extent to which these plans have replaced *previous* retirement saving plans. The 1988 GAO survey found that more than half of all firms with 401(k) plans also offer other saving vehicles, such as profit-sharing plans. At 61 percent of the firms in the GAO survey, the 401(k) plan was introduced as a new plan. For 29 percent of the firms, however, the 401(k) replaced a previous profit-sharing plan, and in the remaining cases, it replaced other pre-existing saving arrangements (see U.S. GAO 1988b). In 1987, the 401(k) was the primary plan of only 26 percent of participants (see Andrews 1992). Unfortunately, the published survey results provide no guidance on the number of workers who experienced plan replacements or on the extent to which 401(k) saving is simply a relabeling of saving that previously was channeled to other types of retirement plans.

Appendix A
IRA Contribution Rates by 401(k) Eligibility

We estimate two ANOVA specifications, one to provide estimates of the change in the IRA participation rates between 1982 and 1987 and the other to provide estimates of the difference in the rates for 401(k) eligibles versus ineligibles in 1982 and 1987. The first specification, for the change in participation rates, is of the form

(A1) $C = y_i + y(87)_i + e_i + e(87)_i + \varepsilon.$

This equation is estimated using data for individual persons, with $C = 1$ if the person contributes to an IRA and 0 otherwise. We denote different income intervals with subscript i, corresponding to the income groups in table 4.9. For each group, y is the base rate for ineligibles in 1982, $y(87)$ is the 1987 effect, e is the eligibility effect, and $e(87)$ is the eligibility effect in 1987. For each income group, the IRA contribution rates by year and 401(k) eligibility status—shown in table 4.9—are then given by

	1982	1987
Ineligible	y	$y + y(87)$
Eligible	$y + e$	$y + e + y(87) + e(87)$

The results are shown in table 4A.1. The $e(87)$ estimate of -0.2950 for the highest income interval indicates that the fall in the IRA contribution rates for the eligibles was 0.2950 larger than the fall for the ineligible group, and the *t*-statistic of -2.8 indicates that this difference is statistically significant at standard levels of significance.

The second specification, for the difference in contribution rates between 401(k) eligibles and ineligibles, is of the form

Table 4A.1   **IRA Contribution Rates by 401(k) Eligibility Status (estimates of eq. [A1])**

Variable	Parameter Estimate	Standard Error	t-Statistic
y_1	0.1186	0.0048	24.5
y_2	0.1607	0.0049	33.0
y_3	0.2427	0.0064	38.2
y_4	0.3679	0.0102	36.2
y_5	0.5046	0.0177	28.5
y_6	0.5924	0.0211	28.0
y_7	0.6446	0.0292	22.0
e_1	0.0904	0.0232	3.9
e_2	0.0238	0.0165	1.4
e_3	−0.0133	0.0173	−0.8
e_4	0.0239	0.0268	0.9
e_5	−0.0420	0.0436	−1.0
e_6	−0.0402	0.0554	−0.7
e_7	0.2092	0.0958	2.2
$y(87)_1$	−0.0464	0.0079	−5.9
$y(87)_2$	−0.0644	0.0073	−8.9
$y(87)_3$	−0.0849	0.0091	−9.3
$y(87)_4$	−0.1848	0.0136	−13.6
$y(87)_5$	−0.2625	0.0228	−11.5
$y(87)_6$	−0.3269	0.0269	−12.1
$y(87)_7$	−0.2721	0.0412	−6.6
$e(87)_1$	−0.0345	0.0298	−1.2
$e(87)_2$	0.0021	0.0199	0.1
$e(87)_3$	−0.0044	0.0205	−0.2
$e(87)_4$	−0.0321	0.0299	−1.1
$e(87)_5$	−0.0472	0.0479	−1.0
$e(87)_6$	−0.0297	0.0602	−0.5
$e(87)_7$	−0.2950	0.1036	−2.8

Source: Authors' estimates using the 1983 and 1988 CPS. See text for further description.

$$(A2) \qquad C = y(82)_i + y(87)_i + e(82)_i + e(87)_i + \varepsilon,$$

where $y(82)$ is the rate for ineligibles in 1982, $y(87)$ is the rate for ineligibles in 1987, $e(82)$ is the addition to the rate for eligibles in 1982, and $e(87)$ is the addition for eligibles in 1987. In this case the IRA contribution rates by year and 401(k) eligibility status are given by

	1982	1987
Ineligible	$y(82)$	$y(82) + e(82)$
Eligible	$y(87)$	$y(87) + e(87)$

The estimates are shown in table 4A.2.

Table 4A.2   **IRA Contribution Rates by 401(k) Eligibility Status (estimates of eq. [A2])**

Variable	Parameter Estimate	Standard Error	t-Statistic
y_1	0.1186	0.0048	24.5
y_2	0.1607	0.0049	33.0
y_3	0.2427	0.0064	38.2
y_4	0.3679	0.0102	36.2
y_5	0.5046	0.0177	28.5
y_6	0.5924	0.0211	28.0
y_7	0.6446	0.0292	22.0
e_1	0.0904	0.0232	3.9
e_2	0.0238	0.0165	1.4
e_3	−0.0133	0.0173	−0.8
e_4	0.0239	0.0268	0.9
e_5	−0.0420	0.0436	−1.0
e_6	−0.0402	0.0554	−0.7
e_7	0.2092	0.0958	2.2
$y(87)_1$	0.0722	0.0062	11.6
$y(87)_2$	0.0963	0.0054	17.9
$y(87)_3$	0.1578	0.0066	24.0
$y(87)_4$	0.1831	0.0091	20.2
$y(87)_5$	0.2421	0.0144	16.8
$y(87)_6$	0.2655	0.0167	15.9
$y(87)_7$	0.3725	0.0291	12.8
$e(87)_1$	0.0558	0.0187	3.0
$e(87)_2$	0.0259	0.0112	2.3
$e(87)_3$	−0.0177	0.0109	−1.6
$e(87)_4$	−0.0082	0.0133	−0.6
$e(87)_5$	−0.0892	0.0198	−4.5
$e(87)_6$	−0.0700	0.0237	−2.9
$e(87)_7$	−0.0858	0.0394	−2.2

Source: Authors' estimates using the 1983 and 1988 CPS. See text for further description.

Appendix B

Table 4B.1   **Mean IRA and 401(k) versus Other Financial Asset Balances by Type of Asset Held, 1984 and 1987**

Group	Excluding Stocks and Bonds		Including Stocks and Bonds	
	1984	1987	1984	1987
Families with 401(k) only				
Total assets	–	11,819	–	16,567
Other than 401(k)	5,851	4,354	8,259	9,702
401(k)	–	6,865	–	6,865
Debt	3,014	3,071	3,014	3,071
Families without 401(k)				
Total assets	8,942	9,729	12,239	13,375
Families with IRA only				
Total assets	23,725	26,427	32,954	35,617
Other than IRA	17,695	16,886	26,925	26,076
IRA	6,030	9,542	6,030	9,542
Debt	3,938	3,580	3,938	3,580
Families without IRA				
Total assets	4,343	4,553	5,815	6,519
Families with IRA and 401(k)				
Total assets	–	43,177	–	59,224
Other than IRA or 401(k)	19,063	18,969	33,606	35,016
IRA	6,305	10,992	6,305	10,992
401(k)	–	13,216	–	13,216
IRA and 401(k)	–	24,208	–	24,208
Debt	3,551	3,552	3,551	3,552
Families with neither IRA nor 401(k)				
Total assets	4,245	3,808	5,656	5,488

Note: Entries are measured in nominal 1984 and 1987 dollars.

Table 4B.2   Mean Asset Balances by 401(k) Eligibility and Income, 1984 and 1987

Group	<10	10–20	20–30	30–40	40–50	50–75	>75	All
					Income (thousand $)			
					1987			
Not eligible for a 401(k)								
All financial assets	3,334	5,022	8,492	13,923	19,590	31,961	61,077	13,480
Other assets	2,714	4,149	6,843	11,087	15,800	25,410	51,947	10,960
IRA	620	874	1,649	2,836	3,790	6,551	9,130	2,520
Eligible for a 401(k)								
All financial assets	5,369	5,696	12,652	18,435	22,021	44,472	85,116	27,550
Other assets	3,748	2,811	8,548	10,578	12,532	28,672	55,972	17,285
IRA	819	730	1,626	3,003	3,660	6,562	12,077	4,092
401(k)	802	2,155	2,477	4,854	5,830	9,239	17,066	6,172
					1984			
Not eligible for a 401(k)								
All financial assets	2,799	5,109	7,545	13,443	20,174	31,304	72,398	12,310
Other assets	2,517	4,477	6,469	11,602	17,598	27,268	67,175	10,844
IRA	282	632	1,076	1,841	2,576	4,036	5,222	1,466
Eligible for a 401(k)								
All financial assets[a]	—	—	—	—	—	—	—	—
Other assets	2,813	4,984	5,588	10,356	14,302	24,755	73,081	14,989
IRA	459	598	791	1,469	2,215	4,482	5,864	2,037
401(k)[a]	—	—	—	—	—	—	—	—

[a]401(k) assets are not available for 1984. Dollar magnitudes are measured in nominal 1984 and 1987 dollars.

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Comment   Jonathan Skinner

The paper by Poterba, Venti, and Wise has two parallel goals. The first is to present heretofore unknown facts about 401(k) programs. Given the growing importance of 401(k) programs for retirement saving, such facts are highly useful and sometimes quite surprising. I would have never expected that half

of lower-income employees eligible for 401(k) would contribute. By contrast, enrollment rates among lower-income families for Individual Retirement Accounts (IRAs) were less than 10 percent (Venti and Wise 1990). These simple tabulations are key pieces of evidence in thinking about the equitable design or expansion of tax-preferred saving programs.

Another goal of this paper is to compare wealth accumulation among 401(k) contributors, IRA contributors, and the large fraction of the population who avail themselves of neither program. Such comparisons are important in judging the effect of 401(k)s on overall saving. Finding, for example, that contributors to 401(k) programs have less in taxable assets (holding income constant) might suggest "shuffling," in which the taxable assets are shifted into the 401(k)s with no effect on overall wealth accumulation. While the authors are careful not to make claims that 401(k)s "cause" saving, the tabulations clearly show that 401(k) participants are avid savers in other assets as well.

In my comments, I will stress two points. First, the authors seek to measure the interactive effects of both the IRA and the 401(k) programs. This interactive effect is important for the design of policy if, for example, 401(k) plans substitute for IRA programs. As the authors stress, expanding IRA limits or eligibility could have minimal effects if the target population of savers are non-limit contributors to 401(k) plans. However, I am not convinced that the data are strong enough to measure this type of "crowding out." That is, contributors to *either* a 401(k) or an IRA are a relatively select group of enthusiastic savers. Trying to distinguish between substitution effects of IRAs versus 401(k)s, and differences in individual tastes for saving, is likely to strain the data.

My second point is to suggest some additional tests from the authors' data that might shed light on the question of whether 401(k)s have any effect on saving behavior. The authors demonstrate that those who contribute to 401(k)s save more in other assets relative to those who do not. While such evidence is consistent with the view that 401(k)s encourage saving, it is by no means conclusive, since it may be the case that contributors are simply active savers among the employees that would have saved anyway in the absence of the tax-preferred saving plan. In this view, 401(k)s, like IRAs, do nothing for personal saving.

The advantage of studying 401(k)s relative to studying IRAs is that some firms offer 401(k)s to their employers and others do not. Hence one can potentially compare the saving behavior of those *eligible* to contribute to 401(k)s with those who are ineligible, as Poterba, Venti, and Wise do. The question I address in more detail is, Are average saving rates of those who are eligible higher or lower than saving rates of those who are ineligible?

This proposed test of whether 401(k)s stimulate saving can also be viewed as an instrumental variables (IV) estimator.[1] Suppose that total wealth holding

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1. A good explanation of the IV approach is in Permutt and Hebel (1989). For a similar application, see McClellan and Newhouse (1992).

for family i, W_i, is a linear function of exogenous variables X_i, such as age, earnings, family size, the availability of a 401(k) program, and individual tastes toward saving v_i, then

$$W_i = X_i\beta + Z_iQ_i\delta + v_i,$$

where β is a vector of coefficients, Z_i is an indicator variable equal to 1 if the firm offers a 401(k) program, Q_i is equal to 1 if the individual contributes to a 401(k), and δ is the net effect of the 401(k) saving program on wealth accumulation.[2]

What does a comparison of contributors versus (eligible) noncontributors tell us? The average difference in wealth across groups can be written as

$$W_c - W_{nc} = (X_c - X_{nc})\beta + \delta + (v_c - v_{nc}),$$

where c and nc denote average for contributors and noncontributors, respectively. Ignoring observable differences in wealth owing to $(X_c - X_{nc})\beta$, the difference in average wealth can be attributed to $\delta + v_c - v_{nc}$, the sum of the true effect of 401(k)s on saving plus the difference in tastes. The sum of these terms is large and positive, as the authors show. But there are a priori grounds for believing that 401(k) contributors have a strong taste for saving, so one cannot separately determine the value of δ.

A different test separates the data into those who are eligible to contribute and those who are not;

$$W_e - W_{ne} = (X_e - X_{ne})\beta + p\delta + (v_e - v_{ne}),$$

where e and ne denote those eligible and not eligible for the 401(k) plans, respectively, and p is the average fraction of those eligible who contribute. Once again, the difference in wealth is the sum of the true effect of the 401(k) plan (times the percentage of people who enroll) plus the difference in average tastes toward saving. It is easier to argue that this latter difference should be zero, on average, unless there is strong self-selection among firms in choosing to institute a 401(k) plan. I will return to this issue below.

The Poterba, Venti, and Wise paper contains the basic numbers necessary to make this instrumental variables calculation, although I cannot control for differences in observable characteristics $(X_e - X_{ne})\beta$. Table 4C.1 shows median financial wealth by income (between $10,000 and $75,000) for those eligible and those not eligible for 401(k)s, taken from Poterba, Venti, and Wise's table 4.13. The difference in 1987 financial wealth between those eligible and those not eligible, shown in row 3, is equivalent to $p\delta + v_e - v_{ne}$. If there is no self-selection of employees with a strong preference for saving into firms that offer 401(k)s, so that $E\{v_e - v_{ne}\} = 0$, then the number reported in the third row of

2. In this simple example, δ is assumed constant. It might be expected to have a larger impact on wealth, the larger income and the more years of participation in the 401(k).

Table 4C.1   **Median Financial Wealth by 401(k) Status and Income, 1984 and 1987**

401(k) Status	Income (thousand $)				
	10–20	20–30	30–40	40–50	50–75
			1987		
Eligible	1,190	4,000	9,205	12,650	25,343
Not eligible	400	1,366	4,000	6,630	14,650
Difference	790	2,634	5,205	6,020	10,693
			1984		
Eligible	550	2,075	4,450	6,850	16,268
Not eligible	458	1,768	3,950	7,150	15,870
Difference	92	307	500	−300	398

Source: Poterba, Venti, and Wise (chap. 4 in this volume, table 4.13; unpublished data).
Note: Financial assets in 1984 do not include 401(k) assets.

table 4C.1 is an estimate of $p\delta$. For example, employees with income between $30,000 and $40,000 in firms that offered 401(k)s held $5,205 more in financial wealth than those in firms without 401(k)s. Dividing through by p, which for this group is equal to .618, yields an estimate of $\delta = 8422$. This simple calculation certainly suggests strong saving effects associated with 401(k)s.

One objection to this inference, as noted above, is that there could be systematic differences between employees of firms that go to the trouble of instituting 401(k)s and employees of those that do not. One way to test for this heterogeneity is to compare wealth of those eligible and those not eligible during 1984, a period when 401(k)s were still quite new and presumably had had little impact on overall wealth holdings. Median financial wealth comparisons, which unfortunately do not include 401(k) balances in 1984, are shown in table 4C.1, rows 4–6, and are taken from unpublished data kindly provided by Poterba, Venti, and Wise. There is little difference in median financial wealth between those eligible and those not eligible during 1984, providing at least some support for the notion that, at least in 1984, there were no systematic differences in tastes for saving across the two groups. On the whole, then, these preliminary calculations provide some evidence that 401(k)s exert a real influence over saving decisions of households.

This paper is the first of what I hope is a continued research program by the authors on the saving effects of 401(k)s. These retirement programs ultimately hold greater promise, I think, for two reasons. First, 401(k)s provide an excellent natural experiment to test the hypothesis that tax-sheltered saving incentives affect saving. And second, based on the statistics presented in the Poterba, Venti, and Wise paper, 401(k) programs hold out at least a promise for encouraging saving across a wide range of income groups.

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