A look at the interplay of 401(k) plan decisions concerning when to start contributions, the level of contributions and how the assets will be invested.

The Impact of 401(k) Plan Decisions On Accumulated Retirement Wealth

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Many corporations offer 401(k) plans for their employees as a benefit and actively encourage their use. These plans, of course, can provide significant opportunities to save for retirement in a tax-deferred setting.

Unfortunately, many individuals do not fully recognize the importance of active control of their retirement funding through the use of 401(k) plans.

The 401(k) Plan

A key feature of a 401(k) plan is that plan participants control many of the important decisions that will control the growth of retirement assets. Of course, a participant does not control all of the factors—a participant does not determine any company matching contribution policies, nor does the participant have any control over the maximum limits on contribution amounts, which is decided by Congress.

However, an individual participant can control, and should carefully consider, the time at which he starts contributing to the 401(k) plan, the percentage of pay contributed (up to the allowable limit), and the asset allocation decision(s) he can make (limited by the choices provided by the employer).

To maximize the chances of achieving desired and reasonable goals for retirement accumulations, a participant needs to understand the link between the decisions he can make—timing, contribution levels, and allocation of funds—and the amount of retirement assets that are likely to accumulate, employing reasonable assumptions concerning likely rates of return on alternative investment opportunities. Exactly how does the decision to delay participation in a 401(k) plan affect retirement accumulations, and how does changing the level of contributions alter the outcome? To what extent can larger *later* contributions make up for smaller or non-existent *earlier* contributions?

Given the set of retirement wealth–determining choice variables under the control of an employee, and employing reasonable assumptions regarding those factors not under the immediate control of the employee, we can calculate retirement accumulations and demonstrate the effects on wealth accumulation of different critical choices.

Consider, then, the performance of a plan for a young worker who, at age 27, is employed in a job paying $40,000 yearly, and whose planned retirement age is 67, corresponding to a 40-year time horizon. We will set the company's "matching" contribution at 25 cents per dollar invested, up to a maximum employee contribution of $5,000 (a maximum employer contribution of $1,250). Assume, further, that the worker's pay will grow at a conservative 4% annual rate, allowing both the employee's and the employer's contribution to grow at the same yearly rate (limited to the maximum employer and employee caps, which exist throughout the time horizon).

Table 1 shows the results of our plan participant investing in his 401(k) plan. The table illustrates the effects of alternative choices in the factors he can control:

- The age at which plan contributions begin (the table permits a range of starting dates, from immediate contributions (contributions over the full 40 years) to a 15-year delay in participation (contributions start at age 42 and last 25 years),
- The percentage of salary contributed to the plan (ranging in the table from 4% to 8%), and
- The rate of return earned on invested funds reflecting asset allocation choices made by the plan participant. Among asset allocation choices, plan participants usually have access to accounts in equities and fixed-income instruments. The widely known and cited Ibbotson Associates data indicate, for the time span from 1926 through 1993, annual compound rates of return of 5.6% on corporate bonds and 10.3% on common stocks. Corresponding to the likely portfolio performances represented by these measures, our analysis accommodates yearly compound rates of return ranging

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from 5% (an all-bond portfolio) to 10% (an all-equity portfolio).

The Effects of Time

The results summarized in Table 1 are striking. A clearly critical terminal wealth–determining factor revealed in the table is time, reflecting the power of compounding over lengthy time horizons. Illustratively, with a 6% contribution rate and a 10% historical rate of return (which would be consistent with an all-equity portfolio) a five-year delay in starting a 401(k) plan results in a retirement funding reduction of more than $550,000 ($1,989,256 versus $1,435,934). With a 10-year delay, the cost to the retirement fund is over $970,000 and, with a 15-year delay, $1,287,328.

For an immediate starting date and 40-year investment period, a plan participant with a return of 8% compounded annually at any contribution rate ends up with a substantially larger terminal wealth total than a participant with a return of 10% yearly and a 10-year delayed starting day resulting in a 30-year investment period. Likewise, an investor whose assets return just 5% annually but who starts contributions immediately ends up with nearly as large a terminal wealth accumulation as an investor who delays contributions for 15 years but whose assets return 10% annually; a return of 6% for the participant who starts contributions immediately results in wealth accumulations that are considerably larger. Starting a plan early is, quite apparently, critically important in generating retirement funding.

Table 1 also clearly illustrates the power of higher rates of return in enhancing retirement funding. For a given starting date, the differences between terminal wealth from the historical all-equity performance (10%) and a yield-focused portfolio performance (5%) are also striking. For instance, over 40-year horizons at any contribution rate, terminal wealth with the all-equity portfolio is triple that of the yield-based portfolio, albeit with higher risk exposure.

In the absence of any restriction on contributions, terminal wealth measures would vary in direct proportion to the contribution rate. In our example projection, the current $9,240 maximum contribution cap constrains contributions only for employee contribution rates of 6% or more (the constraint is in effect for the last five years of the career of our example retirement planner if the contribution rate is 6%, for the last nine years at a contribution rate of 7%, and for the last 13 years with a contribution rate of 8%). As values in Table 1 reveal, limitations that result from a maximum contribution cap are more costly for shorter investment intervals and lower growth rates, a combination of factors that places more importance on the amount of contributions and less on the accumulated earnings on funds.

Table 1.
Ending Wealth for Various Starting Dates, Contribution Rates, and Investment Returns

(Assumptions: Current salary is $40,000 with 4% annual growth; employer match is 25% of employee contribution; maximum of $9,240 for employee and $1,250 for employer)

Annual Rate of Return (%)	Contribution Rates: 4%	5%	6%	7%	8%
	Invest today for 40 years				
10	$1,344,453	$1,672,553	$1,989,256	$2,289,712	$2,572,859
9	1,060,309	1,317,913	1,564,941	1,797,174	2,014,203
8	842,271	1,045,885	1,239,606	1,419,819	1,586,629
7	674,443	836,542	989,426	1,129,892	1,258,499
6	594,798	676,878	796,373	906,394	1,005,886
5	444,231	549,596	646,809	733,442	810,696
	Delay 5 years, invest for 35 years				
10	975,508	1,211,372	1,435,934	1,644,059	1,834,969
9	797,401	969,178	1,170,658	1,337,084	1,488,386
8	655,476	812,372	959,480	1,092,929	1,213,040
7	542,126	671,145	791,004	896,336	993,864
6	451,356	558,109	656,258	742,671	819,003
5	378,448	467,368	548,173	618,322	679,131
	Delay 10 years, invest 30 years				
10	696,790	862,975	1,017,857	1,156,302	1,277,534
9	589,508	729,413	858,019	973,273	1,072,602
8	500,804	619,032	727,472	822,253	903,696
7	427,346	527,670	618,834	697,472	764,304
6	366,403	451,917	526,826	594,203	649,097
5	315,739	388,982	454,109	508,581	553,713
	Delay 15 years, invest 25 years				
10	486,234	599,779	701,928	787,829	859,270
9	425,119	523,926	612,157	685,592	746,078
8	372,731	458,940	535,296	598,124	649,329
7	327,779	403,212	469,430	523,230	566,574
6	289,167	355,373	412,928	459,041	495,729
5	255,960	314,258	364,403	403,967	435,019

Conclusions

Plan participants need a clear understanding of the likely importance to their retirement well-being of largely self-funded savings plans and, in particular, 401(k) plans. They also need to understand the linkages between the plan decisions made while working and the results in retirement funding. While supporting the commonsense conclusions that one should "start early, fund well, and invest in equities" for the long haul, this article provides realistic quantification of the trade-offs among choice variables that plan participants must control.