

THE \$10,000 HURDLE

The Olympic hurdles race is a thrilling event to watch. Many of us probably attempted hurdles for fun back in our school days. The first hurdle seemed insurmountable; but if you were able to clear it, you felt energized into a rhythmic pace to keep going. The same jitter-thrill dynamic exists in numerous activities, such as rock climbing or roller coasters, which many of us ended up loving after getting through that first time.

While perhaps hard to assimilate the feeling of thrill with retirement plans, participants can likely relate to the jitter dynamic much easier. When looking at the retirement marketplace, we recognize a number of financial hurdles that participants face. But there's one mental hurdle in particular we continue to advocate for: that participants in defined contribution (DC) plans strive to cross the \$10,000 balance mark as early as possible.

And just as it usually took a nudge from a friend to quell that first jitter, employers may help in the same way by utilizing plan features, rewarding the effort, and driving strong commitment among participants.

WHY \$10,000?

Academic and industry analyses have captured an empirical pattern of participants dropping out of their plans – a reverse correlation with their account values. The peril of having as low as \$1,000, for instance, is that it is likely perceived as “play money,” with a 60-84% cash-out rate (see statistics by account values in Appendix). Such leakage risk is reduced when the participants have gathered \$5,000+, but still remains elevated (i.e. participants could go either way). The leap to \$10,000+ makes a more noticeable difference, slashing the drop-out rate by half (compared to the \$1,000 trap), therefore making it a meaningful milestone.¹

The other side of the coin is the propensity to stay in a retirement plan. A simple regression fits the data very well (Figure 1 with $R^2 = 0.81$). The curvature shows remarkable sensitivity of investor action at the initial stage of asset accumulation: a small gain may strongly encourage participants to stay, while conversely a small loss may disproportionately touch the nerve and trigger abandonment.

The significance of crossing the \$10,000 hurdle is that mentally, it triggers a stronger sense of accomplishment and thus incentivizes commitment. And economically, it forms a more solid basis to garner the tax deferral benefit. There seems to be a self-reinforcing virtuous cycle that could lead to better participant

¹ Plan sponsors were allowed to automatically cash out benefits below a certain threshold, a mandatory cash-out, which is becoming less prevalent. Effective in 2005, accounts valued between \$1,000 and \$5,000 must be given the option to roll over to an Individual Retirement Account (IRA). Careful studies, as cited here, count voluntary cash-out separately from mandatory cash-out and rollovers.

Retirement Discoveries

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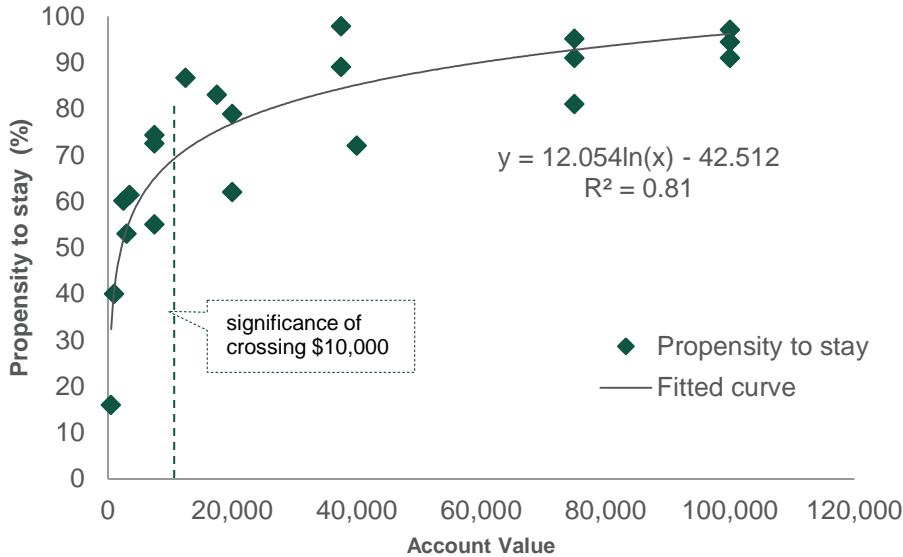
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outcomes. Look at those with \$100,000+. Their likelihood to stay is up to 97%. Consistent participation in 401(k) plans generates greater value, as empirical evidence has shown.²

The much shortened time to cross \$10,000 means fewer impulse opportunities for the participant to cash out.

Figure 1: Propensity to Stay in a Retirement Plan



Source: The scattered plot is based on the data in the Appendix, but shown as the propensity to stay as opposed to drop out. Mid-points are used to represent their account value ranges. Regression is in logarithmic form.

HOW TO CROSS \$10,000 QUICKLY

So while in theory we know the \$10,000 mark is a logical hurdle to shoot for, let's explore some illustrations on how participants may actually get there. To set the stage, let's look at a worker making \$45,000 at age 25 that expects a 2% pay raise each year until retirement at age 65 and we'll assume a constant 5% investment return for simplicity.

U.S. plans often set a 3% savings rate at a starting point but many participants, however, are anchored here as they misperceive the default as an implicit endorsement of sufficiency. In this case, it would take 6.1 years for the worker to reach \$10,000 and the terminal balance is quite low (case 0 in Figure 2 below). In the early "battle years" of a young worker's career, six years to hit this important hurdle rate could be detrimental. If the worker drops out of the plan or switches jobs, but even manages to start over later on, the gap in contribution may result in 23% less assets upon retirement.

Here's where employer "nudges" may potentially help. Providing a 50¢ match for each \$1 saved by the employee (up to 6% of pay) substantially boosts the ending balance at retirement by 50% (case 1), compared to the base case 0. Also, auto-escalation of savings at a gentle pace of 0.5% per year until 10% of salary shrinks the battle time to 3.6 years and boosts the account value by an enormous 141% (case 2). Going beyond that, setting the default employee contribution rate at 6% maximizes the employer match from the beginning, which adds 13% to the account (case 3). If the employer provides greater benefit of 1% non-matching contribution throughout the career (or equivalently, if the encouraged employee makes a stronger commitment), the account value grows bigger by another 8% (case 4). The boosts are significant in dollar terms but appear to be declining in percentage terms simply because they are calculated on increasingly larger bases as the effects of plan features add up.

² See VanDerhei, et al. (2016) for discussions.

Cumulatively, these plan features enable the participant to cross the \$10,000 hurdle in slightly over two years and the account balance has the potential to grow to nearly \$1 million at retirement (case 4), about five times as large as case 0. That is, contributions increase with pay at a faster pace than they otherwise would and they benefit from the power of return compounding over a longer time horizon. The shortened time to cross \$10,000 means fewer impulse opportunities for the participant to cash out. And the more participants remain committed, the more likely a positive peer effect will emerge in the workplace, which in turn will likely lure those drop-outs to come back.

Figure 2: Accelerating the asset accumulation for a young worker

Case	Savings Patterns or Plan Features	Battle Years to Reach \$10,000	No Cash Out During Battle Years		Cash Out During Battle Years	
			Value at Retirement	Boost	Value at Retirement	Shortfall
0	Anchored at 3% default savings rate	6.1	\$220,156	--	\$168,950	-23%
1	50¢ match for \$1 savings	4.3	\$330,234	50%	\$277,558	-16%
2	Auto-escalation of savings by 0.5%/year	3.6	\$796,589	141%	\$738,531	-7%
3	6% default savings rate for max match	2.2	\$902,534	13%	\$846,848	-6%
4	1% higher savings rate*	2.1	\$975,919	8%	\$920,233	-6%
5	Upfront load \$5,000 match, 3-year vesting	1.4	\$978,052	0%	--	--

*Greater benefit (employer non-matching contribution) or, equivalently, stronger commitment by the encouraged employee.
Source: Calculations based on a representative worker, assumed plan features, and a 5% rate of return for simplicity.

Case 5 is a plan design idea: an employer could consider depositing \$5,000 upfront to the new hire's DC account. This upfront load is largely equal to the sum of scheduled matches within three years. Thus there would be no additional cost for the employer, and the same vesting requirement could apply, that is, the employer could recouse part or the entire upfront load if the participant failed to fulfill their duty (e.g., reaching 6% contribution rate in each year) for a certain period of time, similar in spirit to a clawback clause when the employer provides relocation subsidies, sign-on bonus, or sponsorship of continued education.

It is hard to imagine that the participant would immediately drop out and forgo \$5,000. In fact, behavioral finance suggests the opposite effect: the participant would have a stronger incentive to contribute so as to retain the money. The pain of losing the \$5,000 match is twice as intense as the joy of getting the same amount, a "loss aversion" phenomenon termed by Amos Tversky and Nobel laureate Daniel Kahneman.

OPPORTUNITY COST OF CROSSING \$10,000 LATER

Many U.S. workers have saved very little early in their careers for various reasons. In this case, the task for the older workers to save adequately for retirement is more pressing because they have a shorter time horizon to accumulate assets in comparison to the younger workers. Specifically, as shown by the account values in Figure 3 vs. Figure 2 across all the scenarios, saving early while the worker was young enables them to increase the account value at retirement by more than 100%, in contrast to starting significantly later.³

³ Two-thirds (65%) of the survey respondents wish they had contributed a higher proportion of their salary to their 401(k) plans, five years ago, according to Northern Trust (2016).

These illustrations reveal the two-fold significance of employer “nudges” to potentially help employees cross \$10,000 as early as possible: it doubles the likelihood of employees being committed to retirement savings (as discussed above), which in-turn, also increases their chance to double asset values upon retirement.

Significance of crossing \$10,000 as early as possible: it largely doubles the likelihood of employees being committed to retirement savings, and as such it also increases their chance to double their asset value upon retirement.

Figure 3: Accelerating the asset accumulation for an age-40 worker

Case	Savings Patterns or Plan Features	Battle Years to Reach \$10,000	No Cash Out During Battle Years		Cash Out During Battle Years	
			Value at Retirement	Boost	Value at Retirement	Shortfall
0	Anchored at 3% default savings rate	4.8	\$107,051	--	\$84,317	-21%
1	50¢ match for \$1 savings	3.3	\$160,577	50%	\$134,634	-16%
2	Auto-escalation of savings by 0.5%/year	2.9	\$361,978	125%	\$331,795	-8%
3	6% default savings rate for max match	1.7	\$430,565	19%	\$399,923	-7%
4	1% higher savings rate*	1.6	\$466,249	8%	\$448,450	-4%
5	Upfront load \$5,000 match, 3-year vesting	1.1	\$466,942	0%	--	--

Notes: The worker makes \$60,500 at age 40, after the pay raises in earlier years.
 *Greater benefit (employer non-matching contribution) or, equivalently, stronger commitment by the encouraged employee.
 Source: Calculations based on a representative worker, assumed plan features, and a 5% rate of return for simplicity.

HOW INVESTMENTS MAY POTENTIALLY HELP

To get ready for retirement, contributions on a persistent basis are the prerequisite and high quality investments may help accelerate the accumulation. Quality lies in broad risk diversifications and a steady pace to reach a certain asset level. For many, professionally crafted target date funds (TDFs) are an excellent start. TDFs have their hallmark improvement of automatic asset (re)allocation over time. Empirically, TDF investors are less sensitive or panicky to market volatility, which is an encouraging sign of the mitigated risk of dropping out.⁴

Despite their key benefits, TDFs may be further improved. In particular, the growth orientation in the glidepath may be fine-tuned in terms of timing and shape. As discussed above, the first hurdle in DC plans is to build confidence and establish commitment among participants, so a rush to highly aggressive portfolios may scare investors when the market drops. Such large swings in account value early in their career may induce participants to view the \$10,000 mental hurdle as out of reach. A more conservative TDF at the front end of the glidepath helps them stay calm and carry on. This doesn’t mean much sacrifice of growth or missed opportunity because the account balance is typically small at this point of time, compared with the forthcoming contributions in later years.

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It is worth noting that this isn’t just the engineering of investment products, it aims to tackle savings leakage and help participants stay on track through a holistic approach. Wealth accumulation over the life cycle hinges on the foremost role of persistent savings and, on this foundation, may be accelerated by the power of long-term investing.⁵

⁴ See Pang (2016b) for empirical analysis.

⁵ See Pang (2016a) for a breakdown of asset accumulations to savings, investing, and fees.

APPENDIX

Propensity of Participants to Cash Out in Association with Account Value

Account balance	Aon Hewitt	Willis Towers Watson	Poterba, et al.	Average
<\$1,000	84%	--%	60%	72%
\$1,000-\$4,999	47	40	39	42
\$5,000-\$9,999	45	26	28	33
\$10,000-\$29,999	38	17	18	24
\$30,000-\$49,999	28	11	2	14
\$50,000-\$99,999	19	9	5	11
\$100,000+	9	6	3	6

Source: Consolidated data about percent or probability of participants to cash out their DC accounts, if allowed, upon job separation from Aon Hewitt (2015), Willis Towers Watson (2007), and Poterba, et al. (2001). See References.

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⁶ *Pensions & Investments* 2016 Special Report on Money Managers, May 30, 2016.