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401(k) Participant Investment Behaviors (So Far) During the COVID-19 Crisis

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David Blanchett, PhD, CFA, CFP®
Head of Retirement Research
Morningstar Investment Management LLC
david.blanchett@morningstar.com

Executive Summary

- Equity markets declined 20% in the first quarter of 2020 and, at one point, were down more than 30%.
- Median 401(k) balances declined 11.2% during the period, where participants with more-aggressive portfolios and larger balances saw the largest declines.
- This paper explores the allocation decisions of 401(k) participants during the first quarter of 2020, looking at potential allocation changes for 635,116 participants and the enrollment decisions of 15,985 participants.
- While only 5.6% of participants enrolled in a 401(k) plan as of December 31, 2019, changed their portfolio allocations during the quarter, there is significant variation based on how those participants were invested. Of participants self-directing their accounts, 10.8% made a change, compared with 2.4% of participants using a target-date fund, 1.8% of participants who opted into managed accounts, and 1.3% of participants who were defaulted into managed accounts.
- Participants who adjusted their portfolios changed equity levels by 18.9%, on average, with an aggregate decline of 9.4%. Most portfolio changes were relatively small, though, with roughly half of participants changing equity levels by less than 10%.
- The percentage of participants who selected the default investment declined throughout the first quarter, primarily among older participants.
- This analysis demonstrates that professionally managed solutions (for example, target-date funds and managed accounts) have been relatively "sticky" during the recent downturn, especially when compared with the decisions of participants self-directing their accounts.

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401(k) Participant Investment Behaviors (So Far) During the COVID-19 Crisis

The first quarter of 2020 was not kind to equity investors. U.S. large-cap equities were down about 20%, U.S. small-cap equities were down more than 30%, and international equities typically fared somewhere in between. One of the few bright spots during the period was long-term government bonds, which were up more than 20%. However, more broad fixed-income indexes, such as the Bloomberg Barclays Aggregate Bond Index, were up only about 3%.

Most participant 401(k) accounts declined in value during the quarter, with a median change of negative 11.2%, which is not surprising given equity returns and the fact that most 401(k) participants are invested relatively aggressively.[1] Participants with more-aggressive portfolios and larger balances saw the largest declines, while many participants with smaller balances and conservative allocations actually saw increases. Losses were somewhat mitigated by contributions over the period (that is, employee deferrals and employer contributions). If we limit our sample to participants not saving for retirement, the median return becomes negative 17.4%.

The recent market volatility, and its subsequent impact on balances, has left many investors wondering what they should be doing with their portfolios. For most people, the likely answer is, "Not too much." Assuming you're in a risk-appropriate, well-diversified portfolio, the best approach is probably to hang tight. While the rise of prepackaged multi-asset solutions, such as target-funds, and in-plan professional advice, such as managed accounts, has made it easier for investors to get an appropriate portfolio, many participants still choose to go their own path and build their own portfolios.

This paper explores the allocation decisions of 635,116 401(k) participants and the enrollment decisions of 15,985 participants during the first quarter of 2020. We find that of participants enrolled in a 401(k) plan as of December 31, 2019, 5.7% changed their portfolio allocations during the first quarter, although the rate of change varied significantly based on how the participant was invested. For example, 10.8% of participants who were self-directing their portfolios changed their allocations, compared with only 2.4% of participants using a target-date fund, 1.8% of participants who had opted into managed accounts, and 1.3% of participants who were defaulted into managed accounts. These findings strongly suggest professionally managed solutions (for example, target-date funds and managed accounts) have been relatively "sticky" during the recent downturn, and that managed accounts were slightly stickier than target-date funds.

1. As December 31, 2019, the average participant equity allocation was approximately 75% and the median participant equity allocation was 81.0%.

Participants in professionally managed portfolio options (for example, target-date funds or managed accounts) who made a change to their portfolio had relatively similar attributes and tended to be older, with longer plan tenures, higher deferral rates, higher salaries, higher balances, and more-conservative equity allocations (demographics typically associated with more-sophisticated investors). This contrasts with the attributes for participants self-directing their accounts who made a change, who tended to be younger with lower salaries and lower balances (demographics typically associated with less-sophisticated investors).

Participants who adjusted their portfolios made an average equity allocation change of 18.9%. Changes tended to result in more-conservative allocations, where the average equity allocation declined by 9.4%. Most changes were relatively small, though, with approximately half of participants changing equity levels by only 10% or less. Older participants who changed allocations made more-extreme changes than younger participants, especially those invested in more-aggressive portfolios.

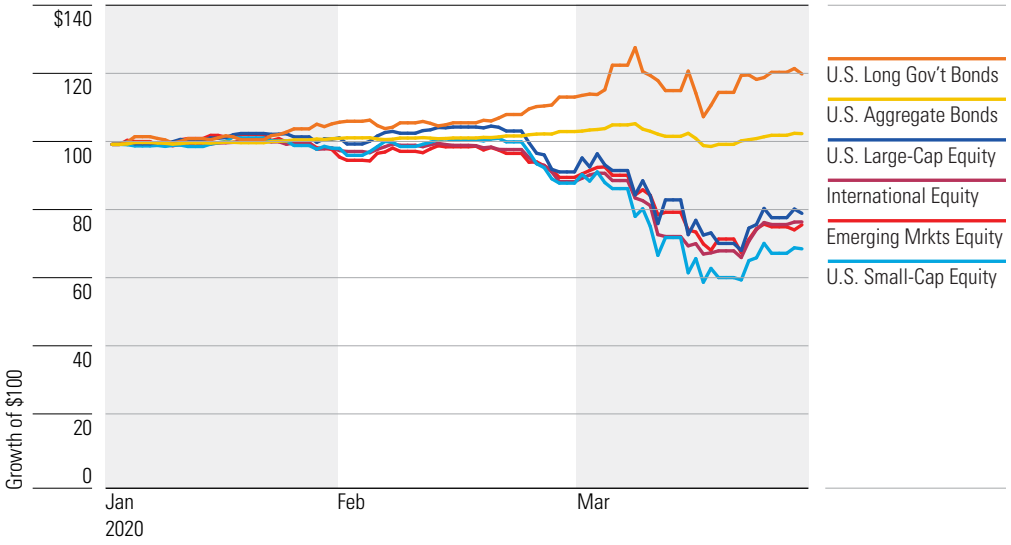
Default investment acceptance declined during the quarter, especially for older investors. The sample used for the analysis was relatively small (15,985 participants) and we will revisit this analysis in the future to see if the trend persists.

It is not clear how much longer the recently experienced volatility will continue and what future markets have in store; however, this research strongly suggests that giving participants access to professionally managed investment options, such as target-date funds or managed accounts, and getting participants to use them, is a vital approach to weathering future market storms.

First-Quarter Performance

The equity markets performed relatively poorly in the first quarter of 2020, with most of the action coming during the second half of the quarter. We see this effect in Exhibit 1, which shows the growth of $100 from Dec. 31, 2019, to March 31, 2020, for six broad market indexes: U.S. aggregate bonds (proxied by the Bloomberg Barclays U.S. Aggregate Bond Index), U.S. long government bonds (proxied by the Bloomberg Barclays U.S. Government Long Index), U.S. large-cap equity (proxied by the Russell 1000), U.S. Small-Cap Equity (proxied by the Russell 2000), international equity (proxied by the MSCI EAFE Index), and emerging-markets equity (proxied by the MSCI Emerging Markets Index).

Exhibit 1 Market Returns in the First Quarter of 2020



Source: Morningstar Direct.

While U.S. aggregate bonds were up slightly over the quarter and U.S. long government bonds were up significantly, U.S. large-cap equities were down around 20%, U.S. small-cap equities were down over 30%, and international equity indexes were down somewhere in between. U.S. large-cap equities declined by more than 10% during a single day; at one point in the quarter, they were down over 30% and U.S. small-cap equities were down over 40%. In other words, it was a terrible quarter for equity investors.

The negative returns had a negative impact on 401(k) participant balances, which is not surprising since most 401(k) participants are invested relatively aggressively. For example, the average equity allocation among the participants in our dataset was approximately 75% as of December 31, 2019, and the median equity allocation was 81.0%.

Exhibit 2 provides some context around the median changes in participant balances from December 31, 2019, to March 31, 2020, by equity allocation and balance as of December 31, 2019.

Exhibit 2 Median Change in Participant Balances

	Equity Allocation (%)						
Balance	<10	10-25	25-45	45-55	55-75	75-90	>=90
<$5k	15.08	20.62	–0.35	10.54	13.66	8.38	12.61
$5k–$25k	4.58	2.39	–4.54	–5.43	–7.27	–11	–10.09
$25k–$50k	2.83	0.14	–5.29	–7.98	–10.33	–13.9	–14.18
$50k–$100k	2.24	0.1	–5.83	–8.57	–11.6	–15.05	–15.98
$100k–$250k	1.59	–1.67	–6.74	–9.82	–12.9	–16.08	–17.64
$250k-$1m	0.63	–2.71	–7.31	–10.56	–13.76	–16.80	–18.84
>=$1m	–3.59	–3.68	–7.80	–10.77	–14.04	–17.14	–18.91

Groups formed on Dec. 31, 2019. Note: Positive values represent increases in balances and vice versa.

Most participants experienced a loss over the period. Participants who experienced the greatest losses had more-aggressive portfolios and higher balances. Smaller balances fared better, holding everything else constant, since contributions to a 401(k) account (for example, participant deferrals and employer contributions) have a relatively larger impact when balances are smaller (and can help offset negative market returns).

While many participants likely already have some sense of how their 401(k) fared during the quarter, given the media coverage of recent market returns, they may be in for a bit of shock when they see their quarterly statements. Therefore, it's worth exploring how participants responded to the recent volatility, to see what insights we can glean from such events and potentially prepare for future market shocks.

Dataset

Data for the analysis was provided by a recordkeeper of U.S. defined contribution plans. There are two separate primary datasets, as of December 31, 2019, and March 31, 2020. All plans included in the analysis were 401(k) plans. The base dataset is assumed to be as of December 31, 2019.

To be included in the allocation test dataset, the participant needed to appear in both datasets (that is, enrolled on or before December 31, 2019, and still in the plan as of March 31, 2020). Only plans that had the exact same funds on December 31, 2019, and March 31, 2020, were included. This ensures any observed changes in participant allocations were active decisions made by the participant and not a result of decisions made by the plan sponsors, such as a fund replacement. Additionally, we had to be able to identify 100% of a participant's holdings in both periods. These filters reduce the allocation test dataset to 635,116 participants across 509 401(k) plans. An additional analysis looked at participant enrollment decisions during the quarter and is discussed in a future section.

Equity risk level is based on the Morningstar Category or similar style proxy if the category is not available. Classifications for all funds are based on their classifications as of December 31, 2019, (that is, even if the category changed between the two periods it would be assumed to be the same for this analysis). The assumed equity risk levels for each category are included in Appendix 1.

The same equity level is assumed for all funds that have the same category (that is, investment style). In other words, equity risk is not assumed to vary by funds within a given category. In reality, each fund is likely to have a slightly different equity level, given things such as cash holdings; however, we use category-level proxies to ensure any changes in portfolio risk (equity) level would be driven entirely by changes in the allocations, not owing to changes made by the underlying funds.

Participants are categorized into four broad groups based on whether the participant is self-directing his or her account, is using a target-date fund, was defaulted to managed accounts, or opted into managed accounts. Target-date fund users are defined as those who have 100% of their allocation to an investment categorized as a target-date fund. Managed accounts users are noted by a flag provided by the recordkeeper. Managed accounts users are broken out into those who were coded as being defaulted into the solution, versus those who opted into the service. This is an important distinction because how a participant came to invest in the account product may affect how likely they are to stick with it.

We do not have a reliable indicator of whether a participant was defaulted into the target-date fund, and it is likely that some participants using target-date funds actively selected to be in them. We also do not attempt to confirm whether the respective vintage reflects a reasonable retirement age for the participant. Participants are categorized as self-directing their accounts if they do not fit into any of the other three groups.

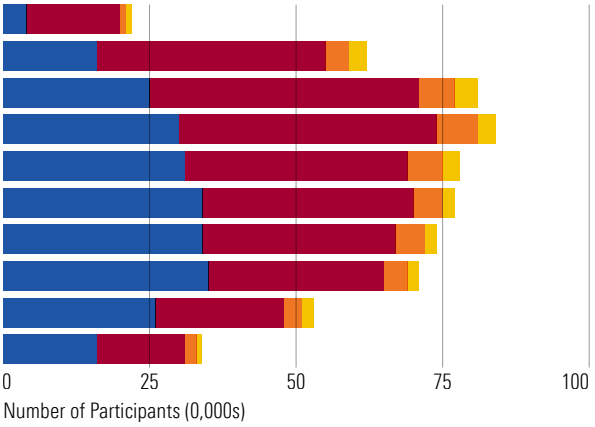
Of the 635,116 total test participants, as of December 31, 2019, 250,507 (39.4%) participants were self-directing; 318,556 (50.2%) participants were using a target-date fund; 43,821 (6.9%) participants were defaulted into managed accounts; and 22,232 (3.5%) participants opted into managed accounts.

Exhibit 3 includes information on the distribution of investment type by age. Panel A includes the total number of participants and Panel B includes the distribution within each age group.

Exhibit 3 Investment Type by Age

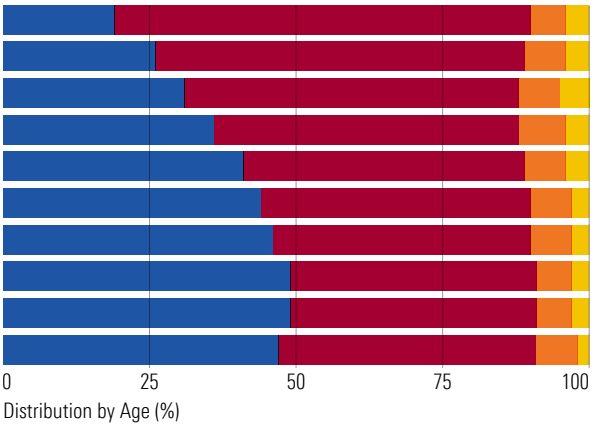
Panel A: Number of Participants (0,000s)

Age Group	Self-Direct	Target Date Fund	MA Default	MA Opt In
< 25	4	16	1	1
25–29	16	39	4	3
30–34	25	46	6	4
35–39	30	44	7	3
40–44	31	38	6	3
45–49	34	36	5	2
50–54	34	33	5	2
55–59	35	30	4	2
60–64	26	22	3	2
>= 65	16	15	2	1



Panel B: Distribution by Age (%)

Age Group	Self-Direct	Target Date Fund	MA Default	MA Opt In
< 25	18	72	6	3
25–29	26	63	7	4
30–34	31	57	7	4
35–39	36	52	8	4
40–44	40	49	8	4
45–49	44	47	7	3
50–54	46	44	7	3
55–59	49	42	6	3
60–64	49	42	6	3
>= 65	47	44	7	2



Groups formed on Dec. 31, 2019.

Self-direction becomes more popular at older ages. Only 18.9% of participants under the age of 25 were self-directing their accounts, versus 49.5% of those between the ages of 60 and 64.

Several demographic variables are available for each participant, including age, date of participation in the plan, deferral rate, salary, plan balance, and gender, and are explored in the analysis. Descriptive statistics for these variables are included in Exhibit 4 by investment type.

Exhibit 4 Descriptive Statistics

Panel A: Median Values

Participant Group	Age	Tenure (Years)	Def %	Male	Active	Salary $	Balance $	Equity %
All Participants	44	5.22	5	0	1	68,004	30,852	81.00
Self-Directors	47	8.00	6	0	1	88,484	80,182	82.50
Target-Date Fund Users	41	4.07	5	0	1	55,120	16,072	85.00
Default Managed Accounts Users	43	4.95	3	0	1	60,258	20,258	76.00
Opt-In Managed Accounts Users	41	2.74	6	0	1	74,214	19,191	81.00

Panel B: Average Values

Participant Group	Age	Tenure (Years)	Def %	Male	Active	Salary $	Balance $	Equity %
All Participants	45	7.75	7.34	0.48	0.83	98,220	118,068	74.36
Self-Directors	47	10.18	9.58	0.50	0.83	124,933	203,553	74.00
Target-Date Fund Users	43	6.08	5.91	0.47	0.83	77,454	60,023	75.10
Default Managed Accounts Users	44	7.26	4.64	0.46	0.74	94,102	74,350	70.27
Opt-In Managed Accounts Users	43	5.22	7.94	0.43	0.88	102,909	72,716	75.91

Groups formed on Dec. 31, 2019.

The average plan balance is similar to other recordkeepers. For example, as of December 31, 2019, Fidelity noted an average defined contribution participant balance of $112,300[2], which is slightly lower than our average for all participants ($118,068).

There are notable differences in the participant demographics across investment groups. For example, self-directors tended to be older, with longer tenures, higher deferral rates, higher salaries, and higher balances compared with other participants. These attributes are typically associated with more-sophisticated investors. Participants using a default investment, which could be either managed accounts or target-date funds, tended to be younger and have lower salaries and balances (that is, they would generally be characterized as less-sophisticated investors).

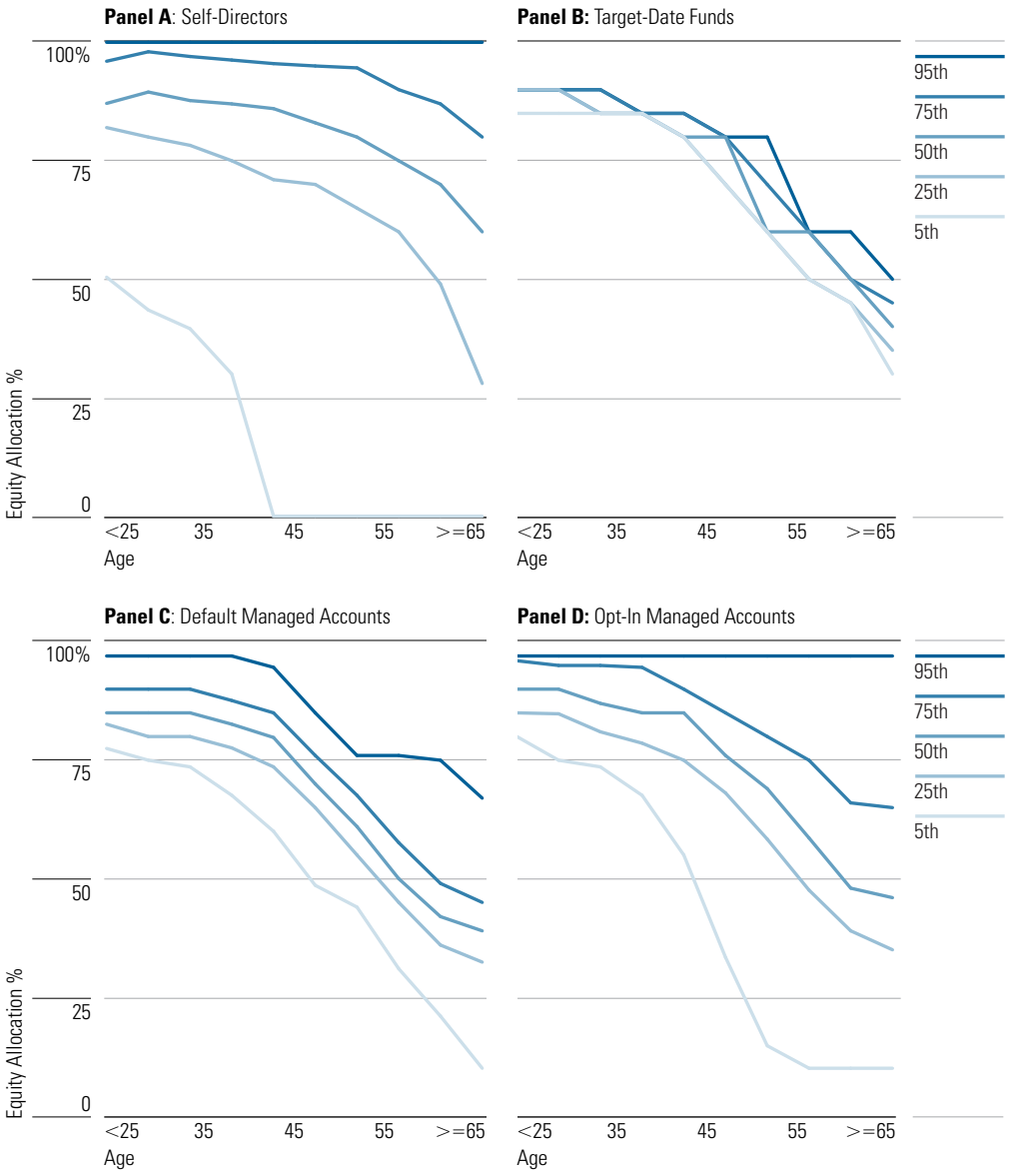
It is important to remember that the average 401(k) participant is different than the average American, since participants tend to have significantly higher wages[3], for example. So while this

2. https://www.fidelity.com/bin-public/060_www_fidelity_com/documents/press-release/quarterly-retirement-trends-021320.pdf
3. https://www.census.gov/data/tables/time-series/demo/income-poverty/cps-pinc/pinc-01.html

analysis should be relatively representative of decisions made by 401(k) investors in the U.S., it is not necessarily representative of the decisions made by all investors or all Americans.

Equity risk levels varied among investment types. This effect is demonstrated in Exhibit 5, which shows the distribution of equity allocations by investment type as of December 31, 2019, for self-directors (Panel A), target-date fund investors (Panel B), default managed account users (Panel C), and opt-in managed account users (Panel D).

Exhibit 5 Equity Allocation by Age and Investment-Type



Groups formed on Dec. 31, 2019.

Participants self-directing their accounts had the widest dispersion of equity allocations (Panel A), while target-date fund investors had the tightest distribution of equity allocations (Panel B). The lack of dispersion for target-date fund investors by age is consistent with their design, where the equity allocations declines as the participant approaches retirement but doesn't vary by age. As a reminder, the actual equity allocations of target-date funds can vary considerably by provider, but our equity levels are determined at the Morningstar Category (i.e., style) level, not the individual fund level, and therefore have significantly less variation.

The distribution of equity allocations for opt-in managed accounts participants (Panel D) is wider than those who were defaulted into the service (Panel C). This can likely be attributed to the fact participants who opt into managed accounts are more likely to provide additional information about their situation, resulting in a more personalized portfolio recommendation. There is a still a reasonable amount of dispersion among participants who were defaulted into managed accounts, though, with equity allocation differences at some age groups exceeding 30%. While some of the dispersion in equity allocations for defaulted managed accounts participants can be attributed to participant engagement, a decent amount of the variation is simply due to using participant-specific data, such as age, income, balance, and savings rate, among other factors, to personalize the equity recommendation.

We intentionally choose not to focus on the performance differences for the different investment-types for this analysis, for a few reasons. First, it is too early to tell whether a more aggressive or conservative portfolios will better serve investors during 2020. Second, a significant degree of the actual participant-level experiecend performance is going to be driven by decisions made by the plan sponsor, around things like menu of funds available, which is not necessarily something the participant can control. Third, risk appropriateness (and suitability) is the most important consideration when it comes to determining risk levels. While stocks have outperformed bonds over the long-term, if a conservative portfolio is the one deemed the most suitable for an investor, that's the one he or she should be invested in, even if performance is subsequently lower (e.g., if stocks outperform bonds).

Which Participants Change Their Portfolios?

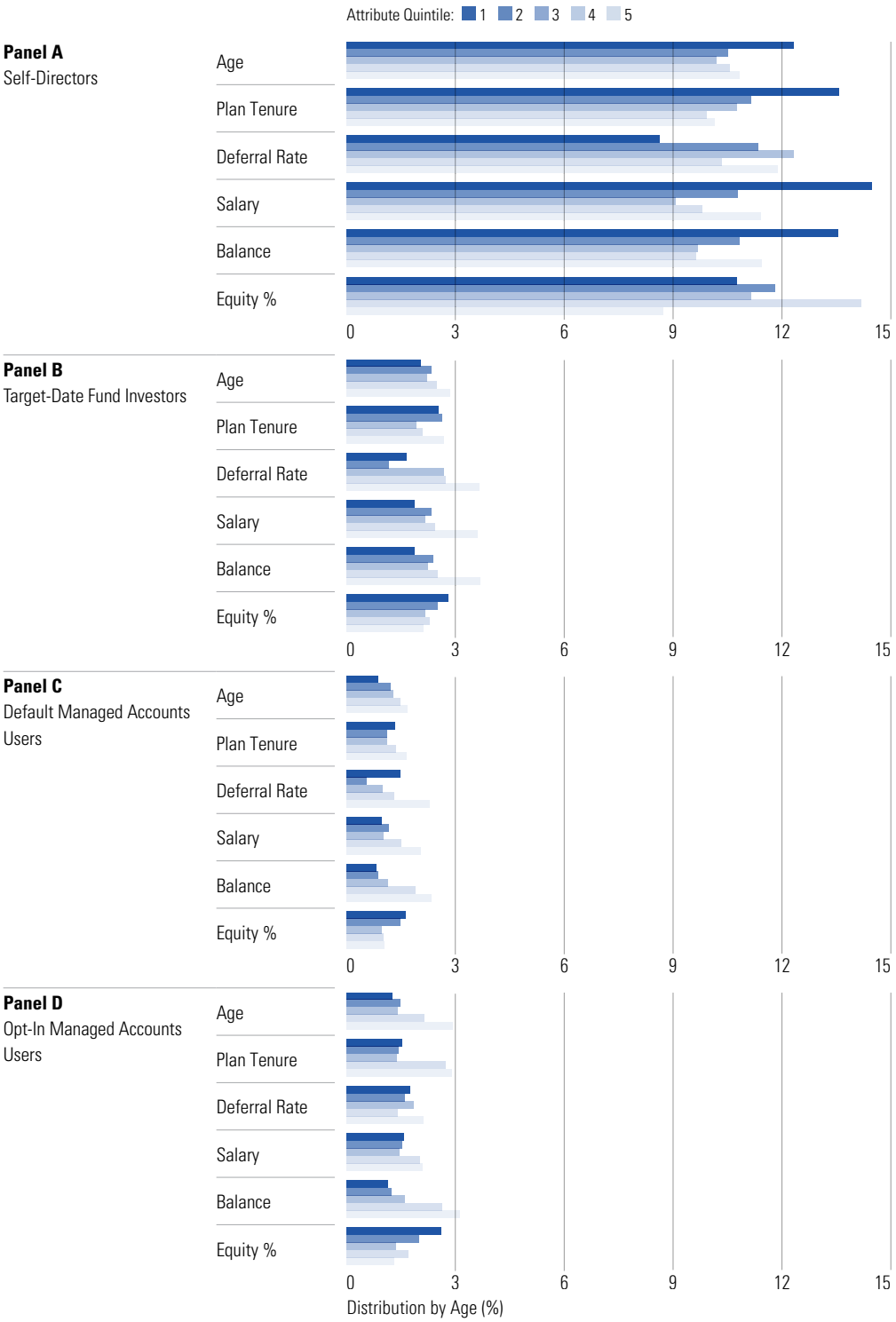
Understanding how participants responded to recent market volatility is important when trying to assess the value of the respective approaches. There is a significant amount of research noting that 401(k) participants, and investors in general, are not very good at building their own portfolios or timing the stock market. Therefore, the extent to which a given investment strategy (or advisor) is better at keeping someone invested in times of market turmoil creates a different type of "alpha," since it has the potential to increase the investor's long-term returns.

Exhibit 6 includes information about what percentage of participants changed their allocations during the first quarter of 2020 for self-directors (Panel A), target-date fund users (Panel B), default managed account users (Panel C), and opt-in managed account users (Panel D). Portfolio changes are determined by comparing allocation weights as of December 31, 2019, and March 31, 2020. Theoretically, it is possible that a participant could change his or her allocation between these two periods and change it back at the end of the quarter, so that there would appear to be no change in the allocation. Such behavior would not be captured in this analysis and the participant would not appear to have made a change.

The analysis focuses on the allocation weights for the two periods, instead of balances, since balances are constantly evolving based on underlying fund performance, contributions, and so on, and allocations are much easier to compare (the sum of the weights must equal 100 and all weights are integers). One problem with this approach of comparing allocations is that it would not capture a participant who changed the weights to the balances but did not change allocations.

Six different participant attributes are reviewed in Exhibit 6: age, plan tenure (years the participant has been in the plan), deferral rate, income, plan balance, and equity allocation. All attributes are as of December 31, 2019. Quintile breakpoints are based on the entire participant population and therefore held constant across the four investment options.

Exhibit 6 Percentage of Participants Who Changed Their Portfolio Allocation by Attribute and Investment Type



Groups formed on Dec. 31, 2019.

The percentage of participants who made a change to their portfolio allocation is significantly higher among those who were self-directing their accounts (Panel A) versus those using a professionally managed investment option (Panels B, C, and D). Of participants who were self-directing their portfolios, 10.9% changed their allocations, versus 2.4% of participants using a target-date fund, 1.8% of opt-in managed accounts users, and 1.3% of default managed accounts users. With respect to managed accounts, a "change" would be defined as the participant opting out of the service.

The changes across quintiles within the self-directing group are not that monotonic (that is, constantly increasing or decreasing); although the largest changes are typically for those with attributes with the lowest quintile values (for example, the youngest participants, and those with the lowest salaries and lowest balances, tended to be the ones who most often made a change). These attributes would typically be associated with less-sophisticated investors.

When focusing on the professionally managed investment solutions, participants in managed accounts changed their allocations less frequently than those in a target-date fund. One variable we are not able to capture with target-date funds is the portion that opted to use this option, which could explain part of this effect (that is, the participant actively selected the target-date fund, so they are self-directing monies to target-date funds in a sense).

While we do not know why more participants who opted into managed accounts left the service compared with those who were defaulted into it, we can speculate that participants who had opted into managed accounts are more "active" since they had to actively select the managed accounts option. At the same time, though, we might expect participants who had actively selected the solution to be more informed about the choice and therefore more likely to stick with it than those who passively enrolled in the service (that is, those who were defaulted). This difference likely warrants further investigation.

The attributes associated with higher or lower portfolio change rates were quite similar among each of the professionally managed investment solutions, where participants who made a change tended to be older, with longer tenure, higher deferral rates, higher salaries, and higher balances, and tended to have more-conservative equity allocations. These demographic attributes would typically be associated with more-sophisticated investors.

To better understand how demographics are potentially related to change rates, we also conducted a series of logistic regressions. For each logistic regression the dependent variable is whether the participant changed his or her portfolio allocation (that is, set to 1 if there was a change, else 0). We ran the regressions that included all participants as well as the four investment types separately to see if any differences exist among the options. The results of the logistic regressions are included in Appendix 2.

An interesting effect noted in these regressions, but not necessarily clear in Exhibit 6, is that those participants with the largest balances were the least likely to make a change among self-directors, but the most likely to make a change among those using professionally managed solutions. There is also an interesting effect among self-directors where those investors who were in balanced portfolios (that is, not at either equity extreme) were more likely to make to a change to their portfolios.

Overall, though, Exhibit 6 provides powerful evidence that getting participants in a professionally managed investment solution, such as target-date funds or managed accounts, is a great way to keep them from changing their portfolio during times of market turmoil.

Changes in Equity Levels

Next, we explore the extent of the equity adjustments made by participants during the first quarter of 2020. Participants who changed their allocations are a minority of all participants (5.7% of the total), but it's useful to understand how participants changed their allocations when they decided to make a change, especially by investment type.

Exhibit 7 provides an overview of some of the portfolio changes, where participants are categorized by their investment type and the equity allocations as of December 31, 2019. Panel A includes the percentage of participants making a change, Panel B includes the average absolute equity change within each equity bin (that is, total change), Panel C includes the average equity change within each equity bin (to provide a sense of the overall directional changes), and Panel D includes information about the distribution of participants across equity. There are no participants with allocations in the two most-conservative equity bins (<10% and 10%-25%) for target-date funds because target-date fund portfolios are not assumed to get that conservative (the minimum assumed risk level is 30% equities for the retirement vintage). There are also few participants in the most-conservative bins for participants defaulted into managed accounts, but we include the results nonetheless for thoroughness.

Exhibit 7 Overview of Equity Allocation Changes

		Equity Allocation (%)							
		< 10	10-25	25-45	45-55	55-75	75-90	>= 90	Average
Panel A % of Participants Changing Allocation by Initial Equity Level	Self-Directors	6.8	15.5	12.5	11.2	12.9	12.3	8.7	10.8
	Target-Date Fund	n/a	n/a	2.8	2.8	2.5	2.2	2.1	2.4
	Default Managed Accounts	1.1	0.7	1.5	1.9	1.6	1.0	1.0	1.3
	Opt-In Managed Accounts	2.7	3.4	2.1	2.5	2.0	1.7	1.3	1.8
Panel B Average Absolute Change in Equity Allocation by Initial Equity Level	Self-Directors	50.1	21.2	19.6	19.5	13.8	12.8	23.7	18.6
	Target-Date Fund	n/a	n/a	22.4	24.5	21.4	18.8	10.9	18.8
	Default Managed Accounts	33.0	11.2	20.2	27.6	27.4	24.8	24.6	25.3
	Opt-In Managed Accounts	39.3	32.6	27.1	22.4	33.1	23.9	30.7	28.3
Panel C Average Change in Equity Allocation by Equity Bin	Self-Directors	50.1	21.2	19.6	19.5	13.8	12.8	23.7	-8.6
	Target-Date Fund	n/a	n/a	22.4	24.5	21.4	18.8	10.9	-11.1
	Default Managed Accounts	33.0	11.2	20.2	27.6	27.4	24.8	24.6	-17.2
	Opt-In Managed Accounts	39.3	32.6	27.1	22.4	33.1	23.9	30.7	-17.4
Panel D Distribution of Equity Allocations by Initial Equity Level	Self-Directors	4.7	1.7	4.5	3.9	26.1	31.0	28.1	100.0
	Target-Date Fund	0.0	0.0	3.7	14.3	22.0	40.9	19.1	100.0
	Default Managed Accounts	0.4	0.9	11.3	14.3	29.0	33.6	10.6	100.0
	Opt-In Managed Accounts	2.3	4.3	6.1	8.2	22.0	33.5	23.5	100.0

Groups formed on Dec. 31, 2019.

As noted previously, participants who were self-directing their accounts in balanced allocations tended to change their portfolios more than those at the extreme equity levels (for example, less than 10% equities or more than 90% equities). Among target-date investors, changes tended to take place more often for more-conservative portfolios, which is effectively a proxy for age, an effect we see in Panel B of Exhibit 6.

There is not a consistent relationship between those who made changes to their portfolios and equity allocations as of December 31, 2019, versus for those who were defaulted into managed accounts, although there is a clear effect where participants who were in more-conservative portfolios were more likely to make a change if they opted into managed accounts.

The average absolute change in the equity allocation for participants who made a change over the quarter was 18.9%. There is not necessarily an intuitive relationship between the overall levels of changes across the four investment types.

The average changes in equity allocations were negative for all four groups, with an equity reduction

of 9.4% across all investors. This suggests the aggregate shift in risk levels over the quarter was to become more conservative, consistent with expectations. Some participants who were invested in the most-conservative portfolio actually increased risk during the quarter, an effect we explore in greater detail next.

To provide some additional context as to how equity allocations changed, we put each participant who changed their equity allocation over the quarter in one of seven equity risk-level bins: < 10%, 10%-25%, 25%-45%, 45%-55%, 55%-75%, 75%-90%, and >= 90%, as of both December 31, 2019, and March 30, 2020. Exhibit 8 provides the distribution of equity allocations among participants who changed their allocations during the quarter for each of the four investment types.

Exhibit 8 Equity Allocation Movements Among Participants Who Changed Allocations

		Equity Allocation (%)							
	Equity Allocation (%)	< 10	10-25	25-45	45-55	55-75	75-90	>= 90	**Total**
Panel A Self-Directors	< 10	36	4	5	5	7	10	33	**100**
	10-25	31	35	10	4	9	5	7	**100**
	25-45	23	7	44	6	8	6	7	**100**
	45-55	16	4	8	42	12	7	10	**100**
	55-75	11	2	5	4	65	7	6	**100**
	75-95	8	1	3	2	8	67	11	**100**
	>= 90	17	2	2	2	4	8	64	**100**
	Total	**141**	**55**	**77**	**64**	**114**	**112**	**137**	
Panel B Target-Date Fund Investors	< 10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	10-25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	25-45	32	2	34	19	4	3	7	**100**
	45-55	37	2	4	38	10	4	6	**100**
	55-75	21	1	4	4	49	10	11	**100**
	75-95	16	1	2	1	4	52	24	**100**
	>= 90	7	1	1	2	2	16	72	**100**
	Total	**113**	**7**	**44**	**63**	**68**	**86**	**119**	
Panel C Default Managed Accounts Users	< 10	50	0	0	0	0	50	0	**100**
	10-25	20	40	40	0	0	0	0	**100**
	25-45	34	6	47	2	2	3	6	**100**
	45-55	41	2	9	31	6	2	9	**100**
	55-75	32	1	1	5	42	5	15	**100**
	75-95	24	3	2	1	7	49	16	**100**
	>= 90	18	2	3	0	7	8	62	**100**
	Total	**219**	**54**	**101**	**38**	**64**	**118**	**107**	
Panel D Opt-In Managed Accounts Users	< 10	33	11	0	11	11	11	22	**100**
	10-25	24	18	12	18	0	18	12	**100**
	25-45	33	4	33	0	8	13	8	**100**
	45-55	25	0	13	28	19	6	9	**100**
	55-75	43	1	1	2	38	3	10	**100**
	75-95	24	1	2	2	7	50	16	**100**
	>= 90	26	0	2	3	3	9	57	**100**
	Total	**208**	**35**	**62**	**64**	**87**	**109**	**135**	

Groups formed on Dec. 31, 2019.

We see that most participants who changed their allocations typically made relatively small changes. Approximately 50% of participants ended up in the same equity risk bin across the two periods (that is, had an equity allocation shift of approximately 10% or less).

There is clearly a movement toward the extremes, though, where participants primarily ended up in the most-conservative equity bin (>10% equities) while some ended up in the most-aggressive bin (>=90% equities). For example, 33% of participants who were self-directing their accounts and invested in conservative portfolios (>10% equities) moved to a very aggressive portfolio (>90% equities).

We performed a series of ordinary least squared regressions, where the dependent variable was the change in the equity allocation, where only those participants who made a change in their portfolios were included. We did this separately for all participants and each of the four investment types, and include the results in Appendix 3. The statistical significance of these regressions is much lower than the logistic regressions (which explored the attributes related to who changes their allocations).

There are two notable relationships that become apparent in Appendix 3 that are worth further discussion. First, there is a strong negative monotonic relation between age and equity changes, whereby older participants who made a change were increasingly likely to move to a more-conservative portfolio. Reducing equity allocations after a market decline is effectively the opposite of rebalancing.

Second, there are notable changes by the equity allocation of the portfolio allocations as of December 31, 209, where participants who were invested conservatively tended to increase their risk level, and vice versa. This effect is not necessarily all that surprising, to some extent, because participants in conservative portfolios who want to change their allocations can't really do much but become more aggressive and vice versa. However, when we combine these age- and risk-level effects, it provides an interesting perspective on the types of changes being made.

This is illustrated in Exhibit 9, which includes information about the percentage of self-directed participants who made a change to their portfolio (Panel A) and the average change in the equity allocation among those self-directors who made a change (Panel B). We include only self-directed participants in Exhibit 9 because participants in professionally managed solutions do not tend to have such extreme asset-allocation levels (for example, >90% to equities at age 65 or >10% equities at age 30) and had significantly lower levels of changes.

Exhibit 9 Equity Allocation Movements Among Self-Directors

		Equity Allocation (%)						
	Age Group	< 10	10-25	25-45	45-55	55-75	75-90	>= 90
Panel A Self-Directing Participants, % Making Change	< 25	5.6	24.0	19.0	11.9	13.9	28.6	7.4
	25-29	9.6	18.2	10.9	9.3	13.4	17.3	8.5
	30-34	9.8	15.9	13.7	6.9	12.4	13.1	8.6
	35-39	9.3	15.6	12.0	12.5	10.8	11.8	9.0
	40-44	9.4	20.1	12.0	10.5	11.0	11.2	8.7
	45-49	9.0	19.4	13.2	9.8	10.7	12.0	8.3
	50-54	6.6	16.8	13.0	10.0	13.8	10.5	8.7
	55-59	6.2	17.1	13.1	9.8	15.2	9.9	8.9
	60-64	5.3	14.1	14.3	14.4	14.2	11.0	9.8
	65-69	3.9	10.2	12.7	14.9	12.1	9.2	9.7
	>= 70	4.3	6.6	5.2	8.3	11.0	8.3	7.0
Panel B Self-Directing Participants, Average Change if Made	< 25	92.4	30.7	-2.3	17.5	0.7	0.3	-3.9
	25-29	74.3	16.1	8.0	25.7	0.2	-1.0	-9.8
	30-34	71.6	13.9	4.3	-0.5	-1.2	-1.6	-13.7
	35-39	51.5	27.5	9.4	3.9	-4.1	-5.9	-16.9
	40-44	57.5	19.9	9.7	8.5	-3.5	-7.5	-22.6
	45-49	56.1	17.3	7.2	3.2	-5.4	-9.0	-22.6
	50-54	54.6	16.7	3.1	-0.2	-7.6	-13.3	-27.0
	55-59	47.8	4.5	-0.3	-5.1	-8.3	-20.7	-33.5
	60-64	35.7	-0.6	-4.4	-5.6	-15.4	-26.9	-42.8
	65-69	23.0	-1.1	-9.1	-10.8	-18.1	-28.6	-41.8
	>= 70	21.3	11.6	-7.9	-8.9	-13.1	-36.4	-41.3

Groups formed on Dec. 31, 2019.

As a reminder, 10.9% of self-directors made a change in their portfolios between December 31, 2019 to March 31, 2020 (this is relevant for Panel A of Exhibit 9). Some age groups clearly had a higher change rate than others; the information in Exhibit 6 (Panel A) and the logistic regressions in Appendix 1 provide additional perspective on these relations.

Panel B of Exhibit 9 clearly demonstrates how the response to recent market events varied significantly based on the investor's age and portfolio risk level. Younger participants were much more likely to increase risk if they were invested conservatively and only had relatively minor reductions in equity allocations if they invested aggressively. In contrast, the oldest participants who were invested conservatively only had relatively modest increases in risk, while those who were invested aggressively had significant reductions in risk, with an average decline of approximately 40%.

These results strongly suggest age is an important driver of how investors respond to market turmoil. In theory, older individuals should be "better" investors since they have more experience investing (they've been doing it for longer); however, these results suggest that among participants who made a change to their portfolios, the changes tended to be the most extreme among older investors. This suggests older participants are likely to benefit the most from being invested in a professionally managed solution (for example, target-date funds or managed accounts) since these types of investments proved to be significantly stickier during the first quarter. Unfortunately, older investors appear to be relatively less interested in delegating investment-management responsibilities (see Exhibit 3).

Default Investment Acceptance During the Quarter

We conduct a secondary analysis to assess how default investment acceptance behavior has changed for newly enrolled participants during the first quarter of 2020. These participants would not be included in the original analysis because we would not have allocation data for them as of December 31, 2019 (to compare with the March 31, 2020 allocations), since they enrolled during the quarter.

To be included in the analysis a plan had to have at least five new participants enroll during the quarter and the plan must have had an overall default investment acceptance rate of at least 50%. We want to ensure the plan has participants consistently using the default investment, which is why we set this threshold.

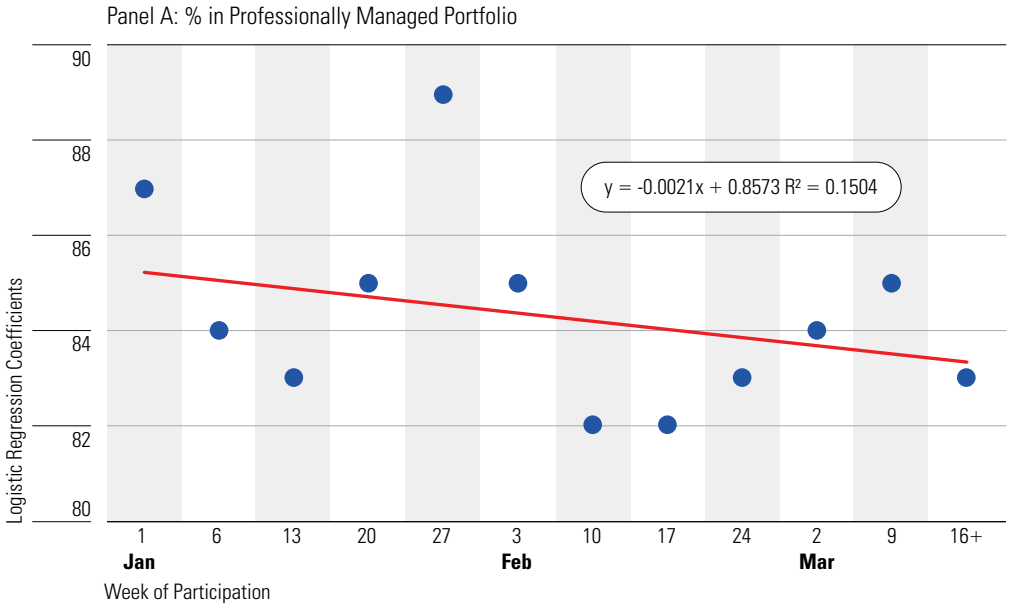
We must be able to identify whether the plan is using a target-date fund or managed accounts as the default investment. We include participants who enroll up to April 1, 2020, in the analysis, since we have some data on some participants as of this date. We include these participants to increase the size of the population enrolling near the end of the quarter (which trails off significantly). We only have 15,985 participants who meet our criteria. This is a relatively small test dataset, but still worth exploring to see if any trends emerge.

Participants are coded as being in a professionally managed portfolio if they are invested 100% in a target-date fund or in managed accounts at the end of the quarter, regardless of the plan default investment. The recordkeeper coded 86.7% of participants as selecting a professionally managed portfolio during the quarter. This is higher than we would normally expect given some of the filters used to include participants in the analysis (where the total acceptance of professionally managed investment solutions for all participants enrolling during the quarter exceeded 50%). While we refer to participants as accepting the default investment for this analysis, they have only technically selected a professionally managed portfolio (for example, a participant could have been defaulted into a target-date fund and then enrolled in managed accounts), although we expect the vast

majority of participants using a professionally managed portfolio to be in whatever the default investment was for the respective plan.

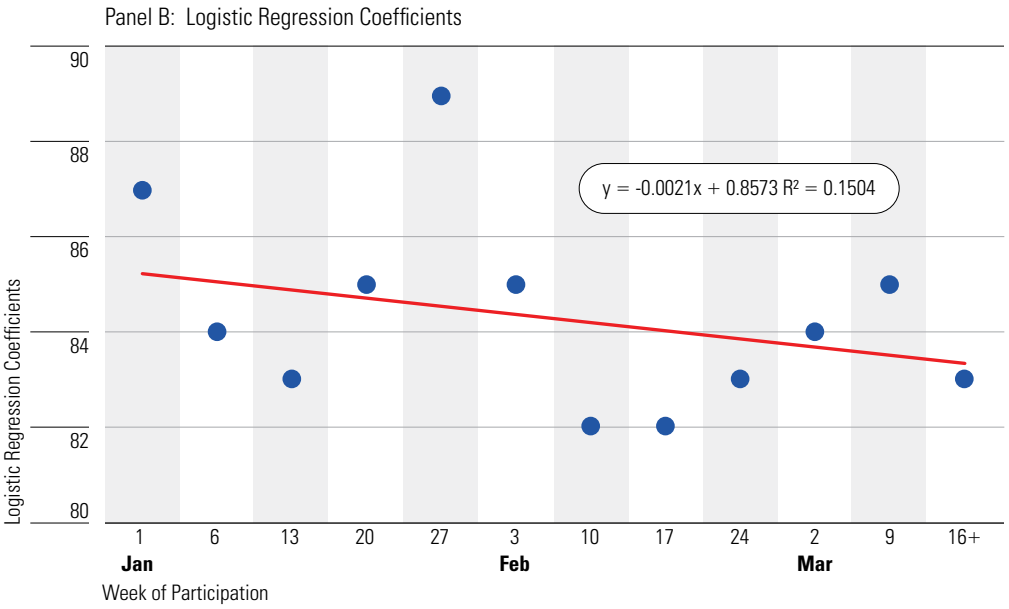
Exhibit 10 provides information about how default investment acceptance varies over the quarter, where we segment participants by week. Panel A shows the raw percentages by week and Panel B shows the results of a logistic regression where the dependent variable is set to 1 if the participant accepted the default investment, else 0. We include the logistic regression coefficients as a robustness check to ensure the relations noted in Panel A are not simply related to a variation in participant attributes during the quarter (for example, if participants who enrolled later in the quarter tended to have higher incomes, balances, and so on, which could explain part of the effect). The results of the logistic regression are detailed in Appendix 4 and the overall statistical significance of most of the coefficients is weak, so this is definitely worth revisiting when more data is available.

Exhibit 10 Percentage of Participants Accepting the Default Investment



Determined on March 31, 2020.

Exhibit 10 Percentage of Participants Accepting the Default Investment (Continued)

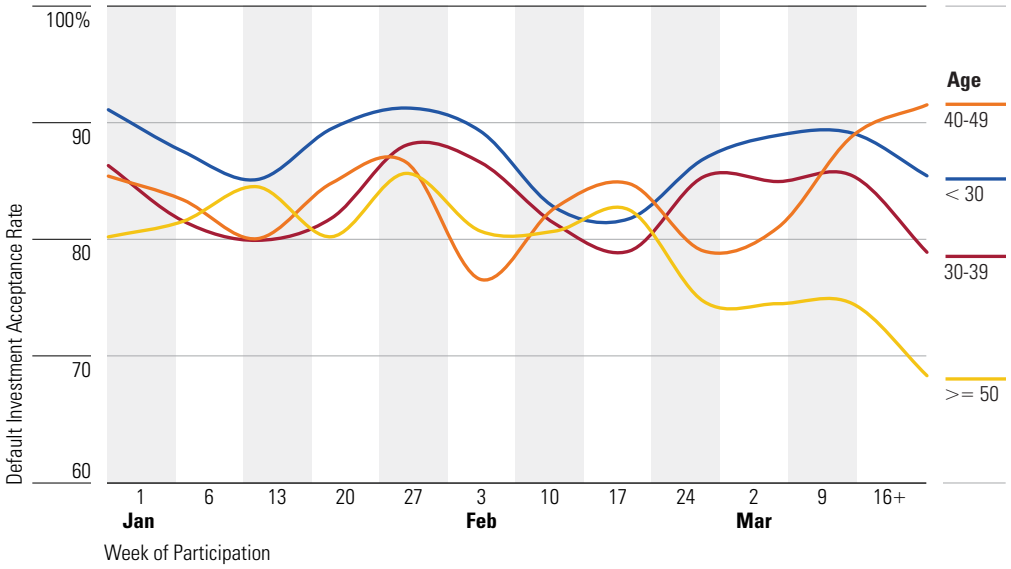


Determined on March 31, 2020.

Both panels in Exhibit 10 suggest default investment acceptance declined during the first quarter by approximately 4% (from 86% to 82%). In other words, recent market volatility appears to have negatively affected demand for professionally managed investment solutions.

Next, we tried to understand how default investment acceptance varied over the quarter by age. We segmented participants by age given the notable relation between age and default investment acceptance in Exhibit 3. Because of sample-size issues, we combined all participants age 50 and over into a single group (versus previously segmenting participants between the ages of 50 and 59 and over 60 into separate groups). The results are shown in Exhibit 11.

Exhibit 11 Default Investment Acceptance by Age and Week of Enrollment



Determined on March 31, 2020.

The only age group where default investment acceptance notably changed (or declined) over the quarter was for participants age 50 and over, declining from approximately 80% at the beginning of the quarter to less than 70% by the end of the quarter. This suggests older participants are now even less likely to accept the default today than at the beginning of the quarter.

The sample of participants who have opted out during the first quarter is not large enough to investigate in terms of changes in equity allocation across different dimensions (for example, age), especially given the relatively small sample size of participants at the end of the quarter (there are only 28 participants we can investigate with equity allocations after March 16, 2020). However, the equity allocation is relatively static over the entire period. This topic will be explored in future research.

Conclusions

While participants in 401(k) plans are increasingly moving toward professionally managed solutions such as target-date funds and managed accounts, self-direction is still relatively popular, especially among older participants. After an extensive review of 635,838 participants, we find that both target-date funds and managed accounts resulted in a significantly lower likelihood of a participant changing his or her portfolio allocation during the recent period of market turmoil (the first quarter of 2020). An additional review of 15,985 participants who enrolled in a 401(k) plan during the first quarter of 2020 suggests usage of default investment is declining, especially among older participants.

This research strongly suggests that there is an additional value associated with professionally managed investment solutions for 401(k) participants because participants using these options were less likely to make changes during the period of recent market volatility. Participants need help, and it's essential that plan sponsors make professionally managed investment solutions, such as target-date funds and managed accounts, available to help keep participants on the road to a successful retirement.

Appendices

Appendix 1 Assumed Equity Level by Morningstar Category

Category	Equity %
Allocation—15% to 30% Equity	15
Allocation—30% to 50% Equity	35
Allocation—50% to 70% Equity	60
Allocation—70% to 85% Equity	75
Allocation—85%+ Equity	95
Bank Loan	0
Commodities Broad Basket	20
Commodities Precious Metals	0
Communications	100
Consumer Cyclical	100
Consumer Defensive	100
Corporate Bond	0
Diversified Emerging Mkts	100
Diversified Pacific/Asia	100
Emerging Markets Bond	0
Emerging-Markets Local-Currency Bond	0
Energy Limited Partnership	100
Equity Energy	100
Equity Precious Metals	100
Europe Stock	100
Financial	100
Foreign Large Blend	100
Foreign Large Growth	100
Foreign Large Value	100
Foreign Small/Mid Blend	100
Foreign Small/Mid Growth	100
Foreign Small/Mid Value	100
Global Real Estate	100
Health	100
High Yield Bond	0
Industrials	100
Inflation-Protected Bond	0
Infrastructure	100
Intermediate Core Bond	0
Intermediate Core-Plus Bond	0
Intermediate Government	0
Japan Stock	100
Large Blend	100
Large Growth	100
Large Value	100
Long Government	0
Long-Short Equity	60
Long-Term Bond	0
Managed Futures	50
Market Neutral	50
Mid-Cap Blend	100
Mid-Cap Growth	100
Mid-Cap Value	100
Miscellaneous Region	100
Money Market - Taxable	0
Multi-alternative	50
Multicurrency	0
Multisector Bond	0
Natural Resources	100
Nontraditional Bond	0
Options-based	90
Pacific/Asia ex-Japan Stock	100
Preferred Stock	0
Prime Money Market	0
Real Estate	100
Short Government	0
Short-Term Bond	0
Small Blend	100
Small Growth	100
Small Value	100
Stable Value	0
Tactical Allocation	50
Target-Date 2000-2010	35
Target-Date 2015	40
Target-Date 2020	45
Target-Date 2025	50
Target-Date 2030	60
Target-Date 2035	70
Target-Date 2040	80
Target-Date 2045	85
Target-Date 2050	85
Target-Date 2055	90
Target-Date 2060+	90
Target-Date Retirement	30
Technology	100
Ultrashort Bond	0
Utilities	100
World Allocation	50
World Bond	0
World Bond-USD Hedged	0
World Large Stock	100
World Small/Mid Stock	100

Groups formed on Dec. 31, 2019.

Appendix 2 Logistic Regression Results, Dependent Variable = Participants Who Changed Their Allocations, Includes All Participants

Category		All Participants	Self Directing	Target-Date Fund	Default Managed Accounts	Opt-In Managed Accounts
Intercept		-2.648***	-2.935***	-4.075	-4.411***	-4.482***
Age	< 30	0.218***	0.215***	-0.134***	-0.190	0.023
	30-39	0.110***	0.093***	0.079*	0.098	0.002
	50-59	0.021	0.018	0.083*	0.118	0.324*
	>= 60	0.046*	0.006	0.192	0.228	0.674***
Tenure	< 2	0.256***	0.155***	0.475**	0.793***	0.295
	2-4	0.088***	-0.013	0.361***	0.115	-0.059
	8-15	-0.225***	-0.259***	-0.143***	-0.148	0.180
	>= 15	-0.135***	-0.179***	0.067***	0.066	0.134
Default	= 0	-0.004	0.097***	-0.251	-0.066	-0.144
	1-4	-0.289***	0.022	-0.773***	-0.629***	0.177
	8-12	0.094***	0.094***	0.156***	0.012	0.045
	>= 12	0.142***	0.152***	0.235***	0.525***	0.034
Salary	< $40k	0.408***	0.622***	0.046***	0.276	0.383*
	$40k-$60k	0.165***	0.157***	0.165	0.291	0.153
	$80k-$120k	0.031	0.035	0.016***	0.248	0.261
	>= $120k	0.193***	0.176***	0.332	0.358*	0.069
Balance	< $5k	-0.087***	0.075*	-0.203***	-0.434*	-0.458*
	$5k-$20k	-0.014	-0.024	0.019***	-0.226	-0.279
	$50k-$150k	0.094***	0.082***	0.100	0.509***	0.490**
	>= $150k	0.299***	0.297***	0.420*	0.658***	0.539**
Equity	< 10%	-0.626***	-0.533***	NA***	-0.618	0.240
	10%-25%	0.276***	0.413***	NA	-0.917*	0.319
	25%-45%	0.045	0.119**	0.178	-0.276	-0.238
	55%-75%	0.031	0.153***	-0.035*	-0.067	0.036
	75%-95%	-0.087***	0.057	-0.065	-0.226	0.178
	90%	-0.464***	-0.350***	0.047	-0.303	-0.040
Active		0.403***	0.503***	0.265	-0.442**	-0.286
Male		0.094***	0.214***	-0.323***	0.038	0.293**
Target-Date Fund		-1.681***	—	—	—	—
Defaulted Managed Accounts		-2.028***	—	—	—	—
Opt-In Managed Accounts		-2.261***	—	—	—	—
Number of Observations		**635,116**	**250,507**	**318,556**	**43,821**	**22,232**

Groups formed on Dec. 31, 2019. Statistical Significance: *** < 0.001, ** < 0.01, * < 0.05

Appendix 3 Ordinary Least Squared Regression Results, Dependent Variable = Change in Equity Allocation from 12/31/19 to 03/31/20, Only Includes Participants Who Made a Change in Their Allocation

Category		All Participants	Self Directing	Target-Date Fund	Default Managed Accounts	Opt-In Managed Accounts
Intercept		3.733**	5.251***	-4.049	-5.161	19.428
Age	< 30	7.714***	6.195***	8.383***	8.579	5.369
	30-39	3.700***	3.562***	3.890***	8.346*	-0.480
	50-59	-5.429***	-5.889***	-4.284**	-5.469	-2.875
	>= 60	-14.430***	-15.359***	-9.979***	-17.023**	-16.361*
Tenure	< 2	0.413	0.250	1.276	10.000	-13.370*
	2-4	-0.204	-1.248*	1.868	4.820	-7.584
	8-15	-2.716***	-2.543***	-3.722**	-0.830	-12.349
	>= 15	-3.235***	-2.899***	-6.154***	-1.410	-3.686
Default	= 0	-0.191	0.757	-0.350	-7.736	5.864
	1-4	0.361	1.296	-1.839	9.452	-0.171
	8-12	1.674***	1.710**	2.273*	4.721	4.607
	>= 12	1.397**	2.013***	-0.645	5.157	5.401
Salary	< $40k	2.117***	2.010**	1.781	1.735	-11.931
	$40k-$60k	-0.140	0.097	0.500	-7.388	-17.523*
	$80k-$120k	-0.348	-0.363	-0.982	6.696	-9.583
	>= $120k	1.941***	1.295*	4.092***	4.600	0.357
Balance	< $5k	6.931***	3.344***	11.074***	14.007*	18.764*
	$5k-$20k	3.381***	2.511***	4.623***	-1.661	-1.535
	$50k-$150k	-2.013***	-1.477*	-4.695***	1.944	-9.484
	>= $150k	-0.924	-1.268	-0.511	5.413	-13.606
Equity	< 10%	51.746***	49.588***	—	55.868*	33.472*
	10%-25%	14.729***	11.422***	—	18.166	33.384**
	25%-45%	5.236***	1.971	10.404***	13.425*	7.781
	55%-75%	-6.828***	-8.631***	-3.527*	-8.580	-21.321**
	75%-95%	-14.547***	-15.289***	-13.115***	-20.124***	-23.379**
	90%	-24.123***	-27.282***	-16.559***	-25.005***	-34.237***
Active		-1.574*	-1.052	-0.871	-8.343*	-0.338
Male		0.847**	2.186***	-3.159***	-5.593	-1.173
Target-Date Fund		-3.749***	—	—	—	—
Defaulted Managed Accounts		-11.080***	—	—	—	—
Opt-In Managed Accounts		-10.008***	—	—	—	—
Observations		35,417	26,963	7,495	568	391
R^2		21.12%	25.19%	7.38%	16.29%	24.50%
Adjusted R^2		21.05%	25.11%	7.06%	11.94%	18.66%

Groups formed on Dec. 31, 2019. Statistical Significance: *** < 0.001, ** < 0.01, * < 0.05

Appendix 4 Logistic Regression Results, Dependent Variable = Participants Who Were Invested in a Professionally Managed Portfolio as of 03/31/19, Includes All Participants

Category		All Participants
Intercept		1.998
Age	< 30	0.045
	30-39	-0.015
	50-59	-0.092
	>= 60	-0.232*
Default	= 0	0.281**
	1-4	1.073***
	8-12	-1.022***
	>= 12	-1.332***
Salary	< $40k	0.664
	$40k-$60k	0.083
	$80k-$120k	-0.429
	>= $120k	-0.621
Enroll Week	Jan 6	0.015
	Jan 13	-0.113
	Jan 20	0.029
	Jan 27	0.049
	Feb 3	-0.001
	Feb 10	-0.196
	Feb 17	-0.256.
	Feb 24	-0.206*
	Mar 2	0.015
	Mar 9	-0.131
	Mar 16+	-0.274
Male		-0.167***
Defaulted Managed Accounts		0.025
Observations		15,985

Determined on March 31, 2020. Statistical Significance: *** < 0.001, ** < 0.01, * < 0.05

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For More Information

Michael Laske
Product Manager, Manager Research
+1 312 696-6394
michael.laske@morningstar.com

22 West Washington Street
Chicago, IL 60602 USA