Vanguard

How America Saves 2021

20TH EDITION

In-depth research on the investing behavior of real retirement plan participants so you can explore what's possible.

June 2021

In-plan advice continues to play a critical role in aiding many retirement plan participants. It's such an effective way to achieve financial well-being because it focuses on both the economic aspects of retirement and the human side. Advice joins the ranks of automatic enrollment, target-date funds (TDFs), and other elements of smart plan design as key strategies plan sponsors can use to improve participant outcomes.

The growing use of these strategies is detailed in *How America Saves 2021*—an examination of retirement plan data from 4.7 million defined contribution (DC) plan participants across our recordkeeping business. Celebrating its 20th edition, *How America Saves* has become a trusted resource for plan sponsors and the financial services industry at large. This year's issue captures how plan participants and sponsors reacted to the COVID-19 pandemic. It shows many of the positive trends documented over the past 20 years in *How America Saves*—trends that fostered a beneficial long-term participant focus—continued throughout a volatile and uncertain 2020.

The growth of advice is particularly encouraging. During the past five years, the percentage of plans offering managed account advice has grown by 44%, and, in turn, the percentage of participants offered the service has grown by 34%. The reason: Plan sponsors see the value of advice in supporting participants in their full retirement journey. It's an approach that can provide the portfolio, financial, and emotional value necessary to support the complete scope of a participant's financial well-being.

Of course, it's impossible to achieve financial well-being without first turning employees not just into plan participants, but active participants who save enough to meet their retirement goals. Here, too, the data is encouraging.

Despite the pandemic, median account balances increased last year by 30%—a result of market dynamics and a steady rate of contributions. Participants did change (increase and decrease) their deferral amounts, although the trend remained largely positive. The proportion of participants in professionally managed allocations remained at 62%, and 76% of participants maintained a balanced strategy. And while 9 of 10 participants stayed the course and did not trade in 2020, participants were more active in trading because of the additional market volatility.

Such results are a testament to the power of thoughtful retirement plan design. It's also a preview of what can happen when plan design serves as the cornerstone of a broader financial well-being program. Our experience tells us that, as the retirement plan industry continues to evolve, plans will increasingly be designed to produce positive outcomes that are both financial and emotional. This is accomplished by giving participants access to personalized advice and guidance; reliable, high-quality investments; and a human-centered experience.

Data from *How America Saves* suggests we're moving in the right direction. We intend to keep that momentum going by focusing on an inclusive range of products, cutting-edge research, and advice provided through an intuitive wealth planning experience that supports the complete scope of financial well-being for participants. Concurrently, we'll continue building upon *How America Saves* with actionable wisdom, such as that in *Insights to Action*. Now in its second edition, it includes actions plan sponsors can take to optimize their plan design—our recommendations based on *How America Saves* data. It's all part of our ongoing efforts to provide plan sponsors and consultants with the tools they need to implement plan design that encourages financial well-being.

Sincerely,

John

John James
Managing Director
Institutional Investor Group

Contents

Executive summary

Over the past decade, retirement plan sponsors have increasingly turned to plan design to influence employee retirement saving behavior. As a result, plan participation rates have increased, and automatic enrollment designs have become stronger. Participant portfolio construction also continues to improve with more age-appropriate asset mixes and less extreme equity allocations.

These trends continued largely unabated in 2020, when the COVID-19 pandemic sent shock waves through the global economy, increasing market volatility and causing unprecedented financial and nonfinancial uncertainty and concern. Fortunately, participants remained largely resilient. Not only did most resist dipping into their accounts, but participant saving rates remained stable. It's a testament to plan sponsors' growing use of automatic solutions, which leverage inertia for the benefit of the participant. Of course, the idea of investor inertia is not a new learning, but it has now been battle-tested in a very unusual environment. That's good news for plan sponsors, who are increasingly working to improve financial wellness on two fronts: Helping participants save for retirement and then spend in retirement.

Saving and investing attention is shifting to how best to provide participants with a holistic financial wellness platform, via advice, which also helps meet another challenge—offering guidance for the income needs of retirees who stay in their employers' plans. Meeting these needs, along with continually encouraging strong saving rates with appropriate investment diversification, are the primary drivers in creating successful retirement outcomes for employees.

Growth of automatic savings features

The adoption of automatic enrollment has more than tripled since year-end 2007, the first year after the Pension Protection Act (PPA) of 2006 took effect. At year-end 2020, 54% of Vanguard plans had adopted automatic enrollment, including 74% of plans with at least 1,000 participants. In 2020, because larger plans were more likely to offer it, 69% of participants were in plans with an automatic enrollment option.

Two-thirds of automatic enrollment plans have implemented automatic annual deferral rate increases. Additionally, automatic enrollment defaults have increased over the past decade. Fifty-seven percent of plans now default employees at a deferral rate of 4% or higher, compared with 30% of plans in 2011.

Ninety-nine percent of all plans with automatic enrollment defaulted participants into a balanced investment strategy in 2020—with 98% choosing a target-date fund as the default.

Professionally managed allocations

The rising prominence of professionally managed allocations has been essential to improvements in portfolio construction. Participants with professionally managed allocations have their entire account balance invested in a single target-date or balanced fund or in a managed account advisory service.

At year-end 2020, 62% of all Vanguard participants were solely invested in an automatic investment program—compared with 7% at the end of 2004 and 33% at year-end 2011. Fifty-four percent of all participants were invested in a single target-date fund; another 1% held one other balanced fund; and 7% used a managed account program. These diversified, professionally managed investment portfolios dramatically improve diversification compared with the portfolios of participants who make their own choices.

Increased use of target-date funds

Ninety-five percent of plans offered target-date funds at year-end 2020, up from 82% in 2011. Nearly all Vanguard participants (99%) were in plans offering target-date funds. Eighty percent of all participants used target-date funds. Two-thirds of participants owning target-date funds had their entire account invested in a single target-date fund.

An important factor driving the use of target-date funds is their role as an automatic or default investment strategy. The qualified default investment alternative (QDIA) regulations promulgated under the PPA continue to influence adoption of target-date funds.
That said, voluntary choice is still important, with about 4 in 10 single target-date investors choosing the funds on their own, not through default.

Note: Investments in target-date funds are subject to the risks of their underlying funds. The year in the fund name refers to the approximate year (the target date) when an investor in the fund would retire and leave the workforce. The fund will gradually shift its emphasis from more aggressive investments to more conservative ones based on its target date. An investment in the target-date fund is not guaranteed at any time, including on or after the target date.

High-level savings metrics

High-level metrics of participant saving behavior were steady in 2020. The estimated plan-weighted participation rate was 84%, up from 77% in 2011 (see Methodology on page 117). The participant-weighted participation rate was 78% in 2020, up from 74% in 2011. Plans with automatic enrollment had a 92% participation rate, compared with a participation rate of 62% for plans with voluntary enrollment. Between 2011 and 2020, plans with automatic enrollment have had strong participation rates. However, as more plans adopt automatic enrollment, the remaining pool of plans with voluntary enrollment has seen participation rates deteriorate.

The average deferral rate was 7.2% in 2020, up modestly from 6.9% in 2011. The median deferral rate was 6.0% in 2020—unchanged for as long as we have been tracking this metric.

These statistics reflect the level of employee-elective deferrals. Most Vanguard plans also make employer contributions. Including both employee and employer contributions, the average total participant contribution rate in 2020 was 11.1%, and the median was 10.2%. These rates have remained fairly stable for the past 15 years.

When including nonparticipants, employees hired under automatic enrollment plans saved an average of 10.7%, considering both employee and employer contributions. Employees hired under a voluntary enrollment design saved an average of 6.8%, due to significantly lower participation.

Roth 401(k) adoption

At year-end 2020, the Roth feature was adopted by 74% of Vanguard plans, and 14% of participants within these plans had elected the option. We anticipate steady growth in Roth adoption rates, given the feature's tax diversification benefits. However, all plan sponsors with automatic enrollment defaulted to traditional pre-tax savings.

Account balances

In 2020, the average account balance for Vanguard participants was $129,157; the median balance was $33,472. Vanguard participants' average account balances increased by 21% since 2019, driven primarily by the 18% increase in U.S. equity markets over the year.

Participant portfolio construction

Participant portfolio construction has improved dramatically over the past 15 years, with 76% of participants having a balanced strategy in 2020, compared with 39% in 2005. Three percent of participants held no equities and 3% of participants had more than 20% allocated toward company stock in 2020. In 2005, 13% of participants had no equities and 18% of participants held a concentration in company stock.

Participant trading muted

During 2020, as market volatility increased, 10% of DC plan participants traded within their accounts, while 90% did not initiate any exchanges. On a net basis, there was a shift of 3% of assets to fixed income during the year, with most traders making small changes to their portfolios.

Over the past decade, we have observed a decline in participant trading. The decline in participant trading is partially attributable to participants' increased adoption of target-date funds. Only 4% of participants holding a single target-date fund traded in 2020.

Drop in company stock exposure

A shift away from company stock holdings first observed in 2006 continued in 2020. Among plans offering company stock, the percentage of participants holding a concentrated position of more than 20% of their account balance continued its fall from 30% in 2011 to 12% in 2020. In addition, the number of plans actively offering company stock to participants continued its decline from 10% in 2011 to 8% in 2020. As a result, 3% of all Vanguard participants held concentrated company stock positions in 2020, compared with 9% at year-end 2011.

Loan activity decreased

During 2020, loan use declined by more than 20%. Thirteen percent of participants had a loan outstanding in 2020, compared with 16% in 2015. The average loan balance was about $10,400. Only about 1% of aggregate plan assets were borrowed by participants.

Plan withdrawals

During 2020, the Coronavirus Aid, Relief, and Economic Security (CARES) Act was passed in response to the COVID-19 pandemic. This wide-ranging law included a provision for retirement savers to withdraw up to $100,000 from their retirement plan penalty-free until December 30, 2020. Overall, 5.7% of participants who had the option withdrew retirement assets through coronavirus-related distributions (CRDs). Hardship withdrawal activity was down 29%, and other nonhardship withdrawal activity was down 16%, compared with 2019.

Most assets preserved for retirement

Participants separating from service largely preserved their assets for retirement. During 2020, about one-quarter of all participants could have taken a distribution because they had separated from service in the current year or prior years. Most of these participants (83%) continued to preserve their plan assets for retirement by either remaining in their employer's plan or rolling over their savings to an IRA or new employer plan. In terms of assets, 98% of all plan assets available for distribution were preserved and only 2% were taken in cash.

Plan sponsors are continually looking for ways to help retirees within the plan. In 2020, 63% of plans allowed retirees to take installments, and 35% of plans allowed for partial withdrawals.

Estimated data

Some charts in this edition contain "2020 estimated" data. For an explanation, please see the Methodology section on page 117.

Defined contribution (DC) retirement plans are the centerpiece of the private-sector retirement system in the United States. More than 100 million Americans are covered by DC plan accounts, with assets now in excess of $9.6 trillion.

Source: U.S. Department of Labor, Private Pension Plan Bulletin Historical Tables and Graphs, January 2021; and Investment Company Institute, Quarterly Retirement Market Data, Fourth Quarter 2020, March 2021.

DC retirement plans

DC plans are the dominant type of retirement plan sponsored by private-sector employers in the United States, covering nearly half of all private-sector workers. Although there is still a significant minority of individuals eligible for such plans who fail to participate in them, DC plans have nonetheless enabled millions of American workers to accumulate savings for retirement.

The performance of DC plans can be measured in several ways:

Accumulating plan assets

Plan contributions are essential to retirement savings adequacy. Employee participation rates, participant deferral rates, and the value of employer contributions all affect plan contributions. Participant deferral behavior is increasingly influenced by employers' automatic enrollment and automatic escalation default designations. Overall, retirement plan design varies substantially across employers—and variation in the level of employer contributions does impact the employee contributions needed to accumulate sufficient retirement savings.

Managing participant accounts

After participants decide to contribute to a retirement savings plan, their most important decision is how to allocate their holdings among the major asset classes.

As with deferral decisions, many investment decisions are increasingly influenced by employer-established defaults. The growing use of all-in-one portfolio strategies such as target-date funds and managed account programs also plays a role. These investment decisions—including the types of investment options offered by the plan and the choices participants or employers make from among those options—have a direct impact on account performance over time. Thus, investment choices, in conjunction with the level of plan contributions, ultimately influence participants' level of retirement readiness.

Accessing plan assets

Participants may be able to take a loan or in-service withdrawal to access their savings while working. When changing jobs or retiring, they typically have the option of remaining in the plan, rolling over to another plan or IRA, or taking a cash lump sum.

Our analysis shows that most Vanguard DC plan participants have seen their retirement savings grow over one- and five-year periods.

Figure 1. Highlights at a glance

Vanguard recordkeeping statistics	*How America Saves* 2021 reference	2016	2017	2018	2019	2020
Number of participant accounts (millions)		4.4	4.6	5.0	5.0	4.7
Number of plans (thousands)		1.9	1.9	1.9	1.8	1.7
Median participant age		45	45	44	44	44
Median participant tenure		6	6	7	6	7
Percentage male		58%	58%	57%	57%	56%
Median eligible employee income (thousands)		$58	$62	$61	$64	$64*
Median participant income (thousands)		$69	$73	$70	$72	$73*
Median nonparticipant income (thousands)		$34	$33	$34	$34	$34*

1. Accumulating

Plan design—page 17						
Plans offering immediate eligibility for employee contributions	Figure 3	68%	68%	69%	69%	70%*
Plans requiring one year of service for matching contributions	Figure 3	24%	24%	23%	22%	20%*
Plans providing an employer contribution	Figure 6	96%	95%	96%	96%	96%*
Plans with automatic enrollment	Figure 16	45%	46%	48%	50%	54%
Plans with automatic enrollment with automatic annual increases	Figure 19	67%	66%	66%	68%	69%
Plans offering catch-up contributions	Figure 40	98%	98%	98%	98%	97%
Plans offering Roth contributions	Figure 41	65%	68%	71%	74%	74%
Plans offering after-tax contributions	Figure 42	18%	17%	18%	19%	19%
Participation rates—page 31						
Plan-weighted participation rate	Figure 23	81%	81%	82%	84%	84%*
Participant-weighted participation rate	Figure 23	71%	72%	77%	78%	78%*
Voluntary enrollment participant-weighted participation rate	Figure 30	56%	60%	60%	60%	62%*
Automatic enrollment participant-weighted participation rate	Figure 30	92%	91%	92%	92%	92%*
Participants using catch-up contributions (when offered)	Figure 40	14%	16%	14%	15%	15%*
Participants using Roth contributions (when offered)	Figure 41	13%	11%	11%	12%	14%*
Participants using after-tax contributions (when offered)	Figure 42	8%	8%	8%	8%	10%*
Employee deferrals—page 36						
Average participant deferral rate	Figure 31	6.8%	7.0%	7.0%	7.1%	7.2%*
Median participant deferral rate	Figure 31	6.0%	6.0%	6.0%	6.0%	6.0%*
Percentage of participants deferring more than 10%	Figure 32	20%	21%	21%	21%	22%*
Voluntary enrollment plan average participant deferral rate	Figure 38	6.8%	7.2%	7.1%	7.0%	7.2%*
Automatic enrollment plan average participant deferral rate	Figure 38	6.8%	6.9%	6.9%	7.1%	7.2%*
Participants reaching 402(g) limit ($19,500 in 2020)	Figure 39	13%	15%	12%	12%	12%*
Average total contribution rate (participant and employer)	Figure 43	10.4%	10.8%	10.7%	11.3%	11.1%*
Median total contribution rate (participant and employer)	Figure 43	9.7%	10.0%	9.9%	10.5%	10.2%*
Account balances—page 48						
Average balance	Figure 48	$96,495	$103,866	$92,148	$106,478	$129,157
Median balance	Figure 48	$24,713	$26,331	$22,217	$25,775	$33,472

* These figures are estimated for 2020 as the data required to compute them will not be available until December 2021.

(Continued)

Figure 1. Highlights at a glance

2. Managing

	How America Saves 2021 reference	2016	2017	2018	2019	2020
Asset and contribution allocations—page 57						
Average plan asset allocation to equities	Figure 55	71%	73%	71%	73%	72%
Average plan contribution allocation to equities	Figure 56	74%	75%	76%	77%	77%
Average plan asset allocation to target-date funds	Figure 55	28%	33%	35%	37%	37%
Average plan contribution allocation to target-date funds	Figure 56	49%	54%	57%	59%	60%
Participants with balanced strategies	Figure 85	71%	74%	75%	76%	76%
Extreme participant asset allocations (100% fixed income or equity)	Figure 83	10%	8%	9%	8%	8%
Plan investment options—page 62						
Average number of funds offered	Figure 60	17.9	18.0	17.7	17.4	17.5
Average number of funds used	Figure 60	2.7	2.5	2.5	2.4	2.5
Plans offering an index core	Figure 64	57%	61%	63%	64%	67%
Participants offered an index core	Figure 64	70%	72%	73%	70%	71%
Percentage of plans designating a QDIA	Figure 67	80%	79%	84%	86%	87%
Among plans designating a QDIA, percentage target-date fund	Figure 67	96%	96%	97%	97%	97%
Plans offering target-date funds	Figure 75	92%	92%	93%	94%	95%
Participants using target-date funds (when offered)	Figure 78	74%	75%	79%	80%	80%
Plans offering managed account program	Figure 87	27%	30%	32%	37%	39%
Participants offered managed account program	Figure 87	53%	55%	57%	63%	71%
Participants with professionally managed allocations	Figure 73	53%	58%	59%	62%	62%
Participants using a single target-date fund	Figure 74	46%	51%	52%	54%	54%
Participants using a single risk-based balanced fund	Figure 74	3%	3%	3%	3%	1%
Participants using a managed account program	Figure 74	4%	4%	4%	5%	7%
Plans offering company stock	Figure 71	9%	9%	8%	8%	8%
Participants using company stock	Figure 71	12%	10%	9%	9%	9%
Participants with >20% company stock	Page 86	6%	5%	4%	4%	3%
Investment returns—page 88						
Average 1-year participant total return rate	Figure 91	8.3%	18.0%	(5.3%)	22.4%	15.1%
Average 1-year participant personal return rate	Figure 91	8.2%	17.4%	(7.0%)	21.2%	16.5%
Trading activity—page 92						
Participant-directed trading	Figure 95	8%	8%	8%	7%	10%
Recordkeeping assets exchanged to equities (fixed income)	Figure 95	(1.5%)	(0.3%)	(1.1%)	(1.3%)	(3.0%)

Figure 1. Highlights at a glance

3. Accessing

	How America Saves 2021 reference	2016	2017	2018	2019	2020
Plan loans—page 100						
Plans offering loans	Figure 101	79%	80%	78%	78%	79%
Participants with an outstanding loan (when offered)	Figure 103	16%	15%	13%	13%	13%
Recordkeeping assets borrowed	Page 101	1%	1%	1%	1%	1%
Plan withdrawals—page 105						
Plans offering hardship withdrawals	Figure 107	84%	85%	85%	88%	95%
Recordkeeping assets withdrawn	Page 106	1%	1%	1%	1%	2%
Participant account balance withdrawn	Figure 109	32%	30%	34%	35%	40%
Plan distributions and rollovers—page 107						
Terminated participants preserving assets	Figure 118	82%	84%	81%	80%	83%
Assets preserved that were available for distribution	Figure 118	97%	98%	96%	96%	98%
Participant access methods—page 113						
Participants not contacting Vanguard during the year	Figure 119	36%	36%	36%	34%	31%
Participants registered for website account access	Figure 123	70%	73%	73%	76%	79%
Participant account transactions processed via the web	Figure 124	88%	88%	90%	91%	91%

Source: Vanguard 2021.

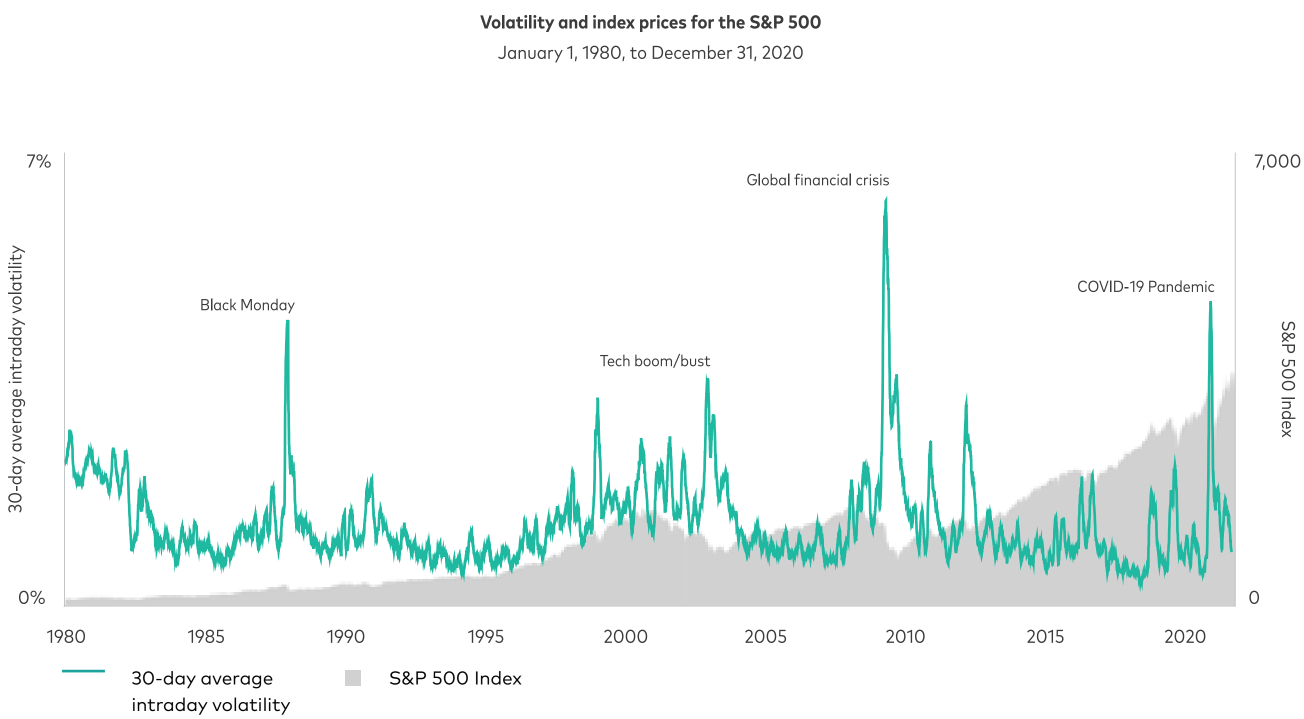
Market overview

In 2020, amid the COVID-19 pandemic and economic uncertainty, market volatility reached its highest level since the 2008 global financial crisis **(Figure 2)**. More than 40% of trading days had a change in stock prices of +/–1%. Furthermore, 11% of trading days had a change in stock prices of +/–3%. In comparison, during the 2008 global financial crisis, nearly 17% of trading days had a change in stock prices greater than +/–3%.

During the past 10 years, four years had no trading days with a change in stock prices of greater than +/–3% (2012, 2013, 2014, and 2017) and two more years (2016 and 2019) had less than 1% of trading days with high levels of volatility. In 2011, the market was relatively volatile, with nearly 5% of days with changes in stock prices of greater than +/–3%.

Overall, stock prices increased by 16% in 2020.

Figure 2. S&P 500 daily volatility and close



Source: Vanguard calculations, using data from Bloomberg.

Past performance is no guarantee of future results.
The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

01
Accumulating plan assets

Historically, employees have had to decide whether to participate in the plan and at what rate to save. Employers are now increasingly making these decisions for employees through automatic enrollment.

Plan design

Nine in 10 Vanguard-administered DC plans permit pre-tax elective deferrals by eligible employees. Employee deferral decisions are shaped by the design of their employer-sponsored DC plan.

DC plans with employee-elective deferrals can be grouped into four categories based on the type of employer contributions made to the plan: (1) plans with matching contributions; (2) plans with nonmatching employer contributions; (3) plans with both matching and nonmatching contributions; and (4) plans with no employer contributions. Nonmatching contributions are typically structured as a variable or fixed profit-sharing contribution, or less frequently as an employee stock ownership plan (ESOP) contribution.

In employee-contributory DC plans, employer contributions are typically a secondary source of plan funding. Both the type and size of employer contributions vary substantially across plans.

Eligibility

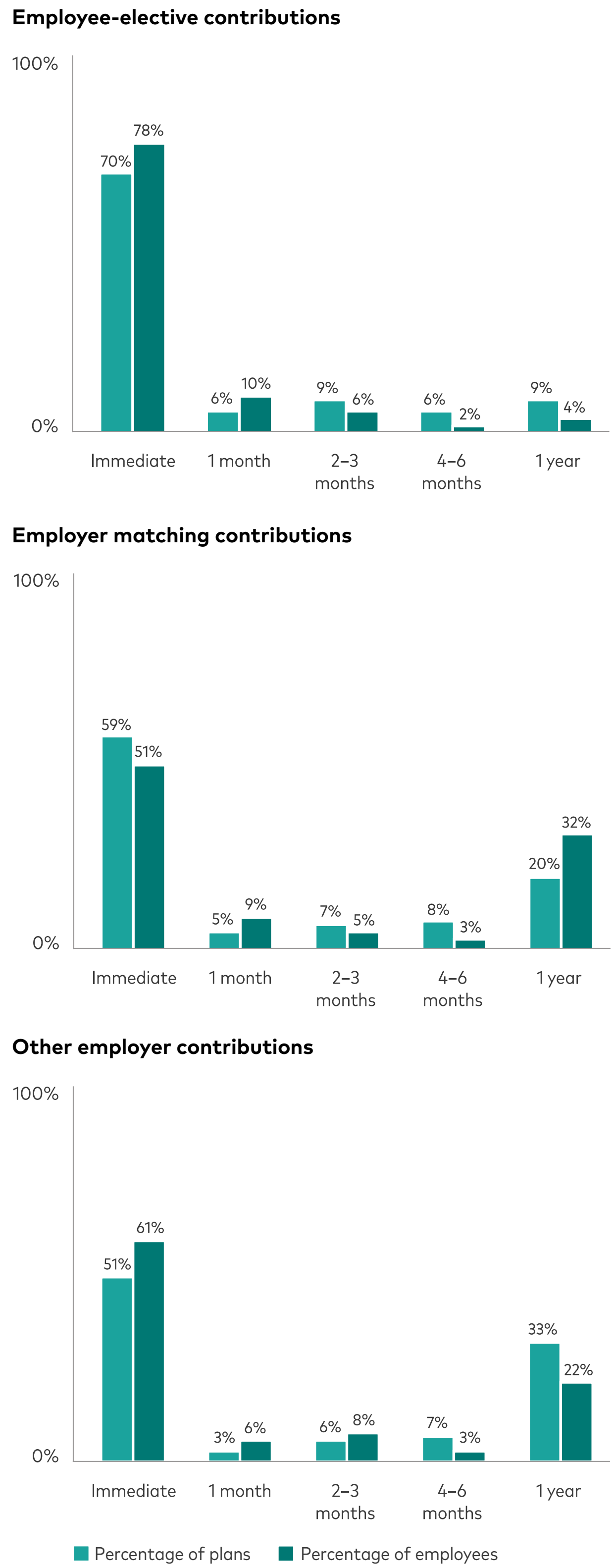
In 2020, 7 in 10 Vanguard plans allowed employees to make voluntary contributions immediately after they joined their employer **(Figure 3)**. Larger plans were more likely than smaller plans to offer immediate eligibility. As a result, nearly 8 in 10 employees qualified for immediate eligibility in 2020 (estimated; see the Methodology section on page 117).

At the other extreme, 9% of plan sponsors required one year of service from eligible employees before allowing employee-elective contributions to the plan. Smaller plans were more likely to impose the one-year wait. As a result, only 4% of total eligible employees were subject to this restriction.

Eligibility rules are more restrictive for employer contributions, including matching and other contribution types such as profit-sharing or ESOPs. A one-year eligibility rule is more common for employer contributions, presumably because employers want to minimize compensation costs for short-tenured employees.

Figure 3. Eligibility, 2020 estimated

Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2021.

The proportion of plans permitting immediate eligibility for employee-elective contributions has risen over the past ten years **(Figure 4)**.

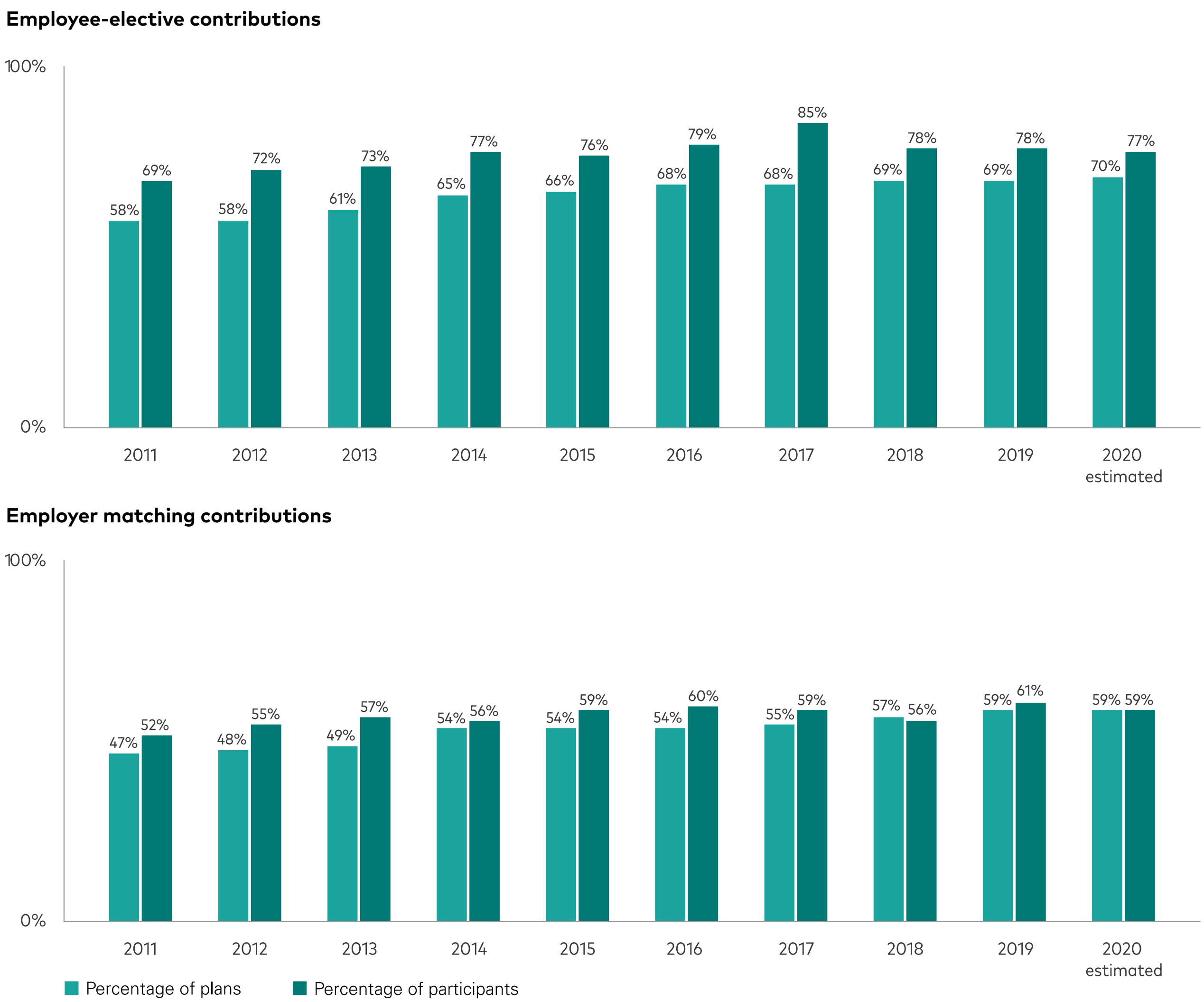
Fifty-eight percent of plans offered immediate eligibility in 2011; in 2020, 70% did. Because larger plans are more likely to offer immediate eligibility for employee-elective contributions, 77% of participants in 2020 were in plans offering immediate eligibility. Similar trends are observed for both employer matching contributions and other employer contributions.

Vesting

In 2020, nearly half of plans immediately vested participants in employer matching contributions, and 47% of participants were enrolled in these plans **(Figure 5)**. One in 4 plans with employer matching contributions used a 5- or 6-year graded vesting schedule, and 1 in 6 participants with employer matching contributions were in such a plan.

Figure 4. Immediate plan eligibility trend

Vanguard defined contribution plans permitting employee-elective deferrals

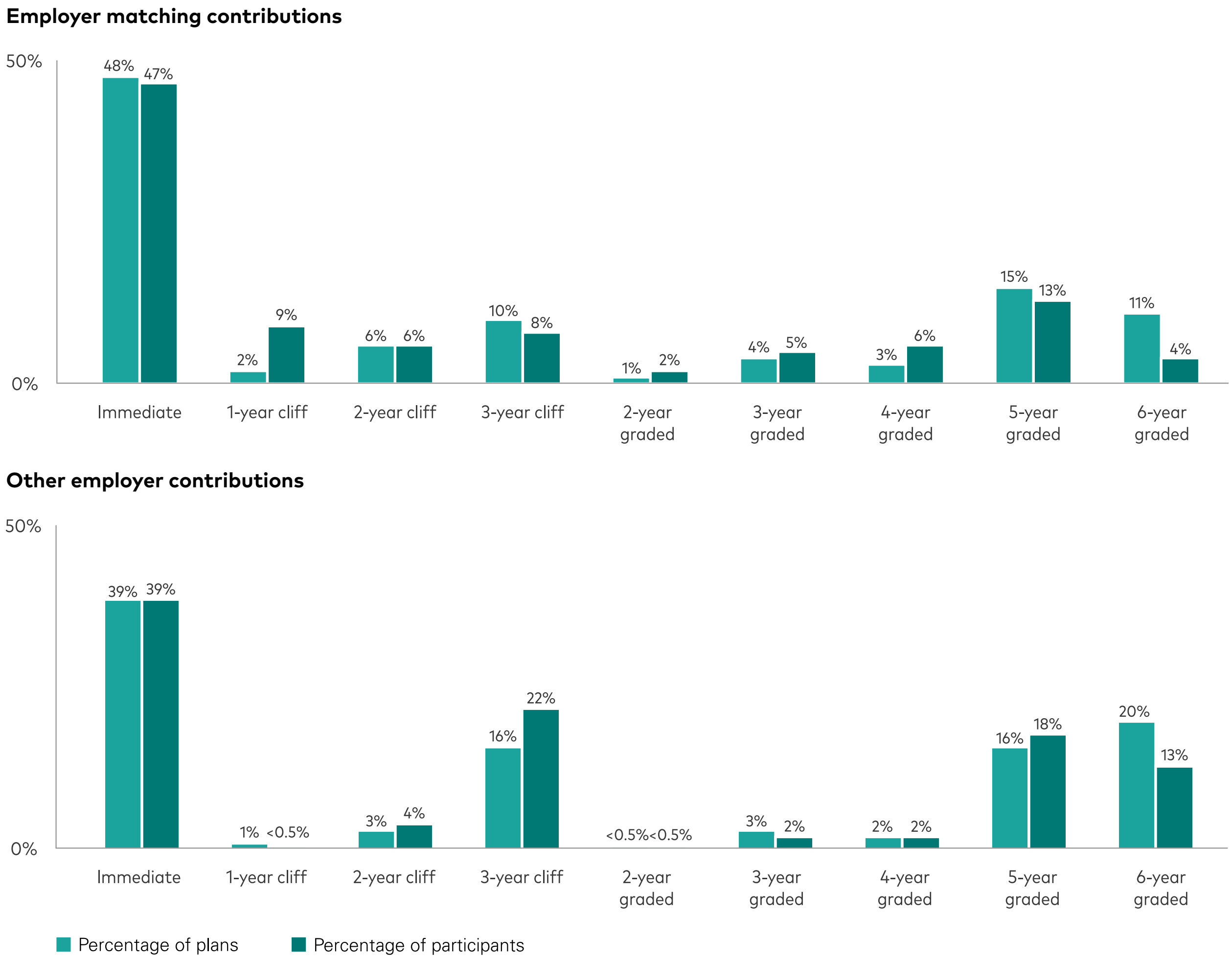


Source: Vanguard 2021.

Four in 10 plans immediately vested participants for other employer contributions, such as profit-sharing or ESOPs. On the other hand, 36% of plans with other employer contributions were using a 5- or 6-year graded vesting schedule, and 3 in 10 participants receiving other employer contributions were in plans with these longer vesting schedules.

Figure 5. Vesting, 2020

Vanguard defined contribution plans with employer contributions



Source: Vanguard 2021.

Employer contributions

Half of Vanguard plans provided only a matching contribution in 2020, and 55% of participants were in such a plan **(Figure 6)**.

One-third of plans, covering 4 in 10 participants, provided both a matching and a nonmatching employer contribution. Ten percent of plans provided only a nonmatching employer contribution, and 3% of participants were in this type of design. Finally, 4% of plans made no employer contributions of any kind in 2020, and 1% of participants were in such a plan.

This data summarizes the incidence of employer contributions to a DC plan that accepts employee deferrals. It does not necessarily reflect the entire retirement benefits program funded by certain employers. Some employers may offer a companion employer-funded plan—such as a defined benefit (DB) plan, a stand-alone profit-sharing plan, an ESOP, or a money-purchase DC plan—in addition to an employee-contributory DC plan.

Matching contributions

The wide variation in employer contributions is most evident in the design of employer matching formulas. In 2020, Vanguard administered more than 180 distinct match formulas for plans offering an employer match. Among plans offering a matching contribution, 72% (covering 62% of participants) provided a single-tier match formula, such as $0.50 on the dollar on the first 6% of pay **(Figure 7)**. Less common, used by 21% of plans (covering 27% of participants), were multi-tier match formulas, such as $1.00 per dollar on the first 3% of pay and $0.50 per dollar on the next 2% of pay.

Another 5% of plans (covering 9% of participants) had a single- or multi-tier formula but imposed a maximum dollar cap on the employer contribution, such as $2,000. Finally, a very small percentage of plans used a match formula that varied by age, tenure, or similar variables.

The matching formula most cited as a typical employer match is $0.50 on the dollar on the first 6% of pay, which is the match most frequently offered by Vanguard DC plans and thus most frequently received by Vanguard DC plan participants. Among plans offering a match, about 1 in 6 provided exactly this match formula in 2020, covering 14% of participants.

Figure 6. Types of employer contributions, 2020 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

Type of employer contribution	Percentage of plans	Percentage of participants
Matching contribution only	50%	55%
Nonmatching contribution only	10	3
Both matching and nonmatching contribution	36	41
Subtotal	**96%**	**99%**
No employer contribution	4%	1%

Source: Vanguard 2021.

Figure 7. Types of matching contributions, 2020 estimated

Vanguard defined contribution plans with matching contributions

Match type	Example	Percentage of plans	Percentage of participants
Single-tier formula	$0.50 per dollar on 6% of pay	72%	62%
Multi-tier formula	$1.00 per dollar on first 3% of pay; $0.50 per dollar on next 2% of pay	21	27
Dollar cap	Single- or multi-tier formula with $2,000 maximum	5	9
Other	Variable formulas based on age, tenure, or similar variables	2	2

Source: Vanguard 2021.

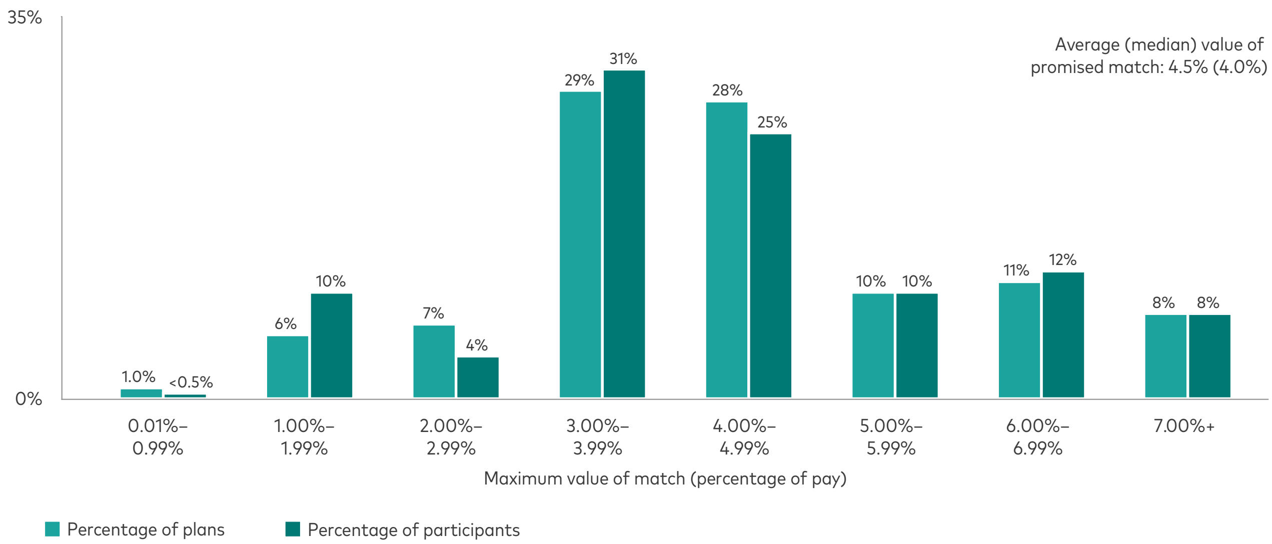
Given the multiplicity of match formulas, one way to summarize matching contributions is to calculate the maximum value of the match promised by the employer. For example, a match of $0.50 on the dollar on the first 6% of pay promises the same matching contribution—3% of pay—as a formula of $1.00 per dollar on the first 3% of pay.

The promised value of the match varied substantially from plan to plan in 2020. Among plans with single- or multi-tier match formulas, most plans promised a match of between 3.0% and 6.0% of pay **(Figure 8)**. The average value of the promised match was 4.5% of pay; the median value, 4.0%.

Average promised employer matches remained relatively stable from 2011 through 2016. Since 2016, average match rates have increased slightly through 2020 **(Figure 9)**. Median promised matches have remained stable since 2015.

Figure 8. Distribution of promised matching contributions, 2020 estimated

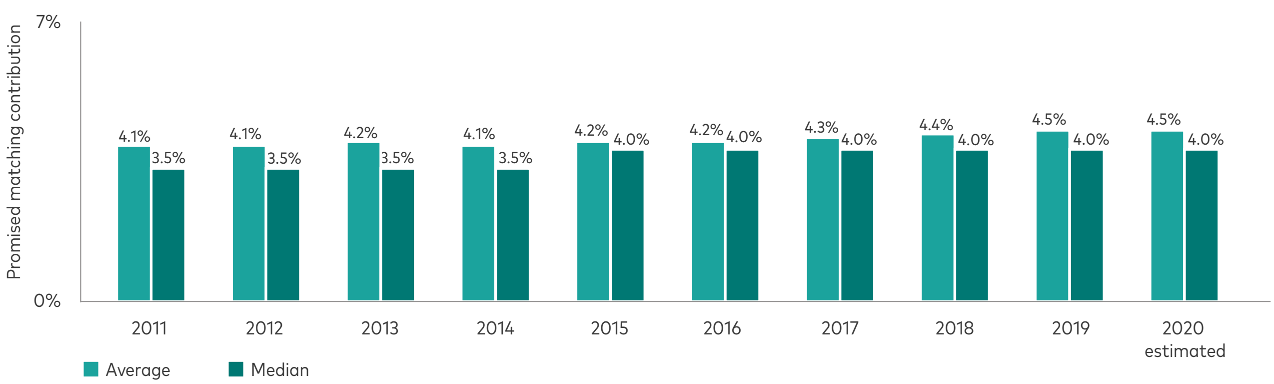
Vanguard defined contribution plans permitting employee-elective deferrals with a single- or multi-tier match formula



Source: Vanguard 2021.

Figure 9. Promised matching contributions

Vanguard defined contribution plans permitting employee-elective deferrals with a single- or multi-tier match formula



Source: Vanguard 2021.

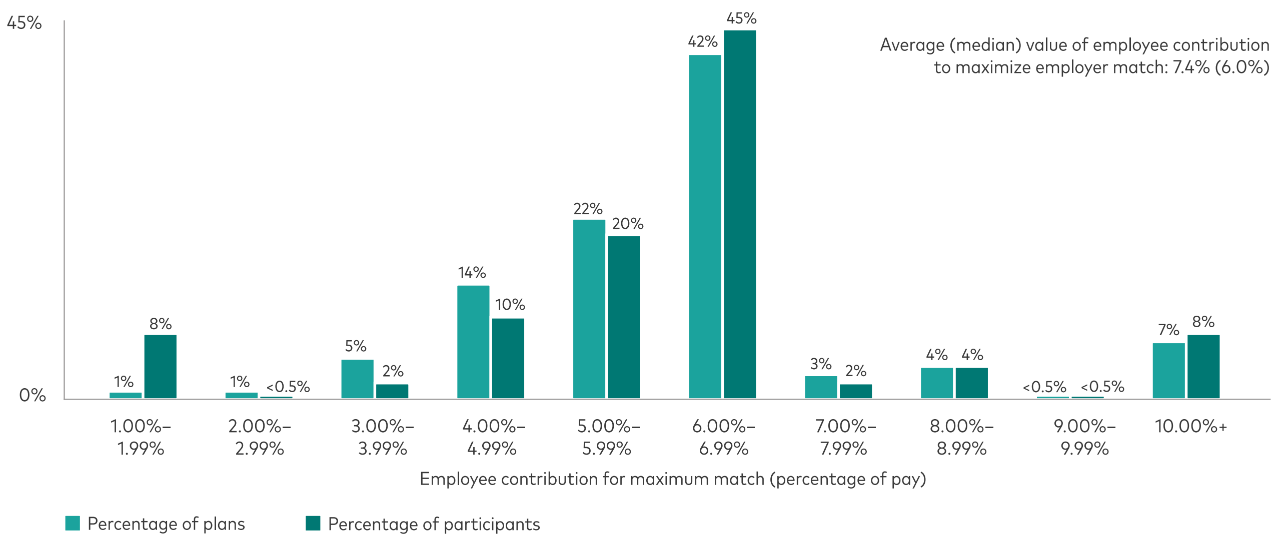
Another way to assess matching formulas is to calculate the employee-elective deferral needed to realize the maximum value of the match. In 2020, about 8 in 10 plans (covering 77% of participants) required participants to defer between 4.0% and 7.99% of their pay to receive the maximum employer matching contribution **(Figure 10)**.

The average employee-elective deferral required to maximize the match was 7.4% of pay; the median value, 6.0%.

The average employee-elective deferral required to maximize the match has remained relatively stable since 2011, with an average between 6.8% and 7.4% **(Figure 11)**. The required median deferral remained constant at 6.0%.

Figure 10. Employee contributions for maximum match, 2020 estimated

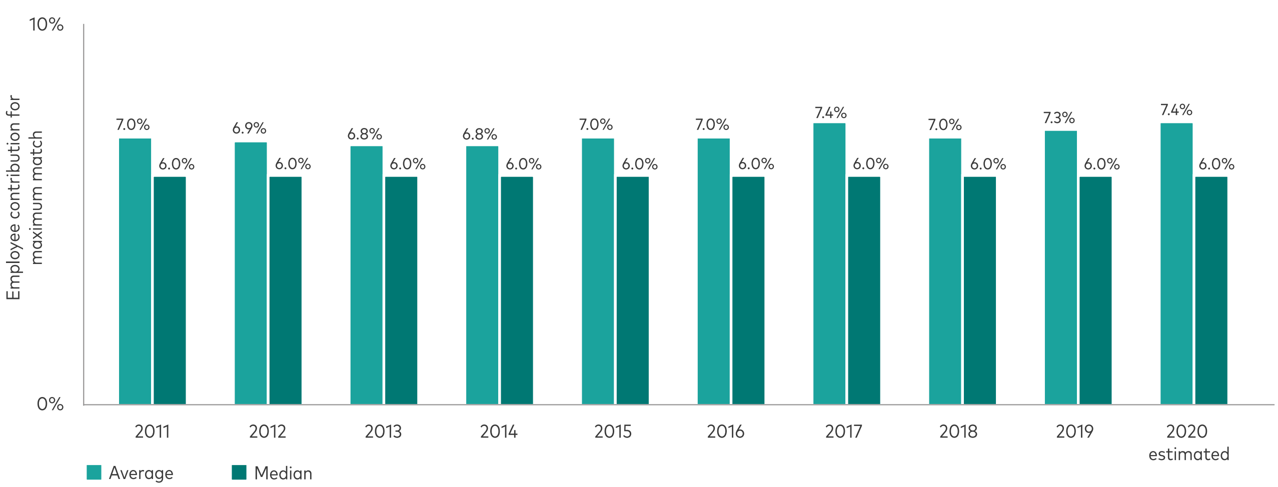
Vanguard defined contribution plans permitting employee-elective deferrals with a single- or multi-tier match formula



Source: Vanguard 2021.

Figure 11. Employee contributions for maximum match

Vanguard defined contribution plans permitting employee-elective deferrals with a single- or multi-tier match formula



Source: Vanguard 2021.

One strategy proposed to increase plan contributions in plans not opting for automatic enrollment is to "stretch the match." When plan sponsors stretch the match, they apply an existing dollar match to a higher contribution rate. For example, instead of matching 100% on the first 4% of pay, they match 50% on the first 8% of pay. The idea is that the higher match threshold will encourage participants to contribute more to the plan. Our research finds that higher match thresholds are typically associated with lower plan participation and lower employee contribution rates. Counterintuitively, stretching the match does not appear to lead to higher plan contribution rates.[1]

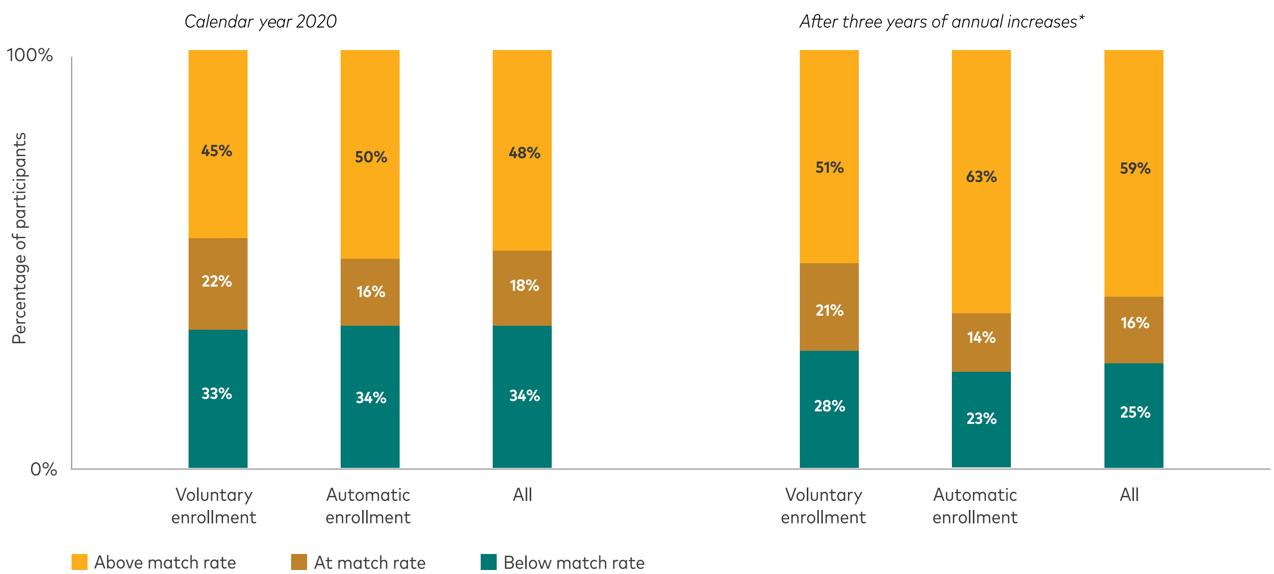
In 2020, two-thirds of participants received the full employer matching contribution **(Figure 12)**. Participants in automatic enrollment designs were as likely to receive the full employer match as were participants subjected to voluntary enrollment. However, after three years of automatic annual increases, participants in automatic enrollment designs are more likely to receive the full employer match. After three years of annual increases, three-quarters of all participants will be receiving the full employer match, and 6 in 10 participants will be contributing at levels above the employer match.

Other employer contributions

As noted previously, in a minority of plan designs, employers may make another contribution to eligible employees' accounts in the form of a variable or fixed profit-sharing contribution or an ESOP contribution. Unlike matching contributions, these may be made on behalf of eligible employees, whether they contribute any part of their pay to the plan or not. As with matching contributions, eligibility is more restrictive for these types of employer contributions—many employees are not entitled to receive these until they complete one year of service.

Figure 12. Maximizing the match

Fraction of participants deferring at, above, or below plan-specific match level



* For participants in plans with automatic enrollment designs, annual increases are assumed only for those plans where the feature is offered and the participant has not opted out of the feature. For participants in voluntary enrollment designs, annual increases are assumed only for participants who have elected the option. The three-year projection assumes participants enrolled in annual increases do not opt out.

Source: Vanguard 2021.

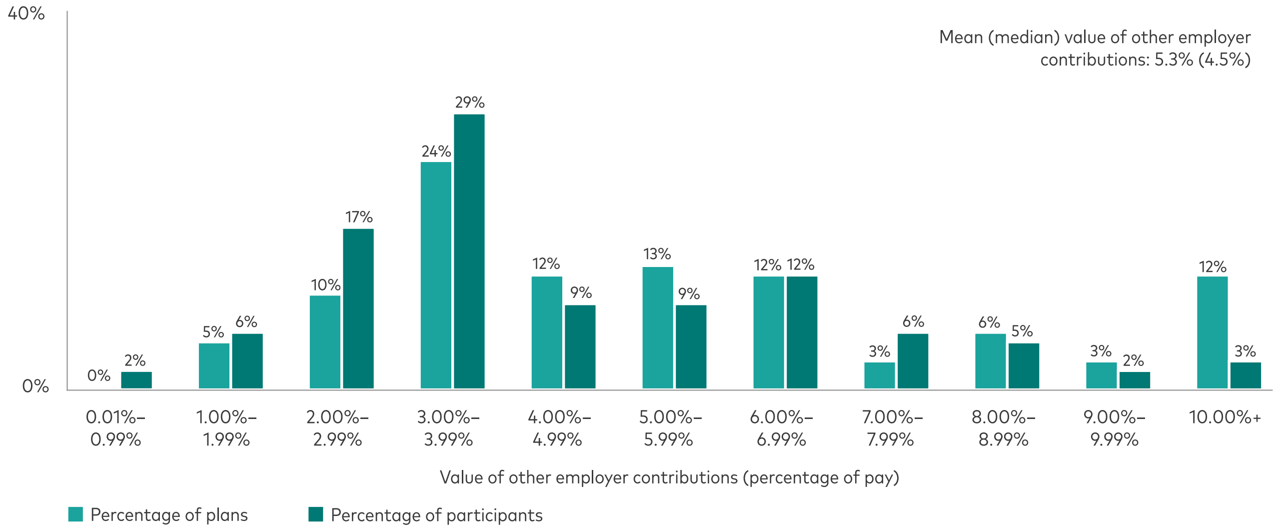
[1] For an in-depth analysis of stretching the match, see Galina Young, and Jean A. Young, *Stretching the Match: Unintended Effects on Plan Contributions*, December 2018, Vanguard research, institutional.vanguard.com

The value of other employer contributions varied significantly from plan to plan in 2020. Among plans offering such contributions, 54% of plans provided all participants with a contribution based on the same percentage of pay, while the other 46% varied the contribution by age and/or tenure. These nonmatching contributions varied in value from about 1% of pay to more than 10% of pay **(Figure 13)**. Among plans with a nonmatching employer contribution, the average contribution was equivalent to 5.3% of pay; the median contribution, 4.5% of pay. Between 2011 and 2020, the average value of other employer contributions remained stable **(Figure 14)**.

As noted previously, 36% of plans, covering 4 in 10 participants, provided both a matching and a non-matching employer contribution. In 2020, the median combined value of the promised match and the other employer contribution was 8.0% **(Figure 15)**.

Figure 13. Other employer contributions, 2020 estimated

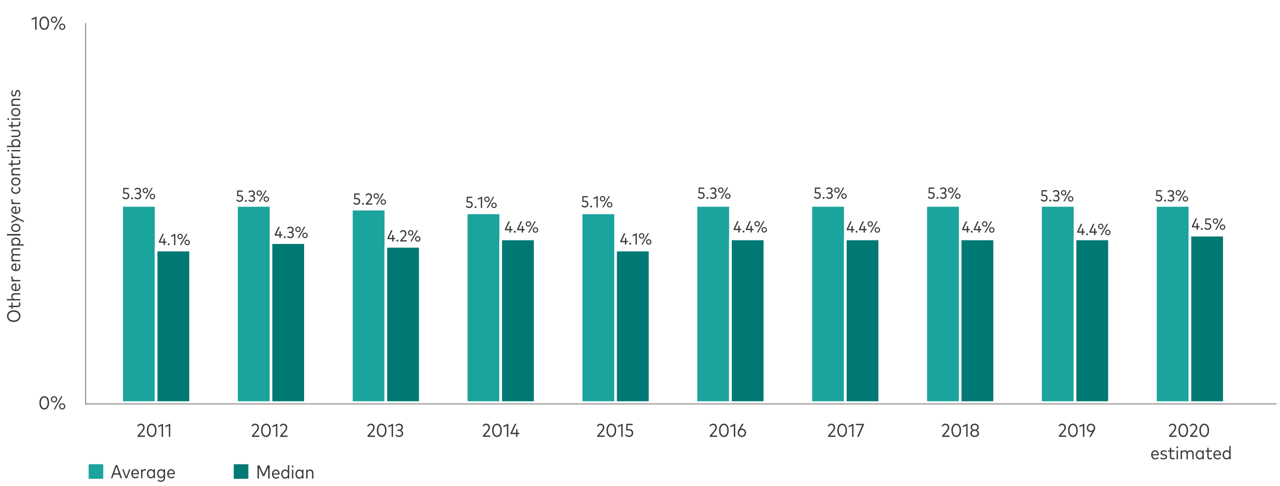
Vanguard defined contribution plans with other employer contributions



Source: Vanguard 2021.

Figure 14. Other employer contributions

Vanguard defined contribution plans with other employer contributions



Source: Vanguard 2021.

Automatic enrollment designs

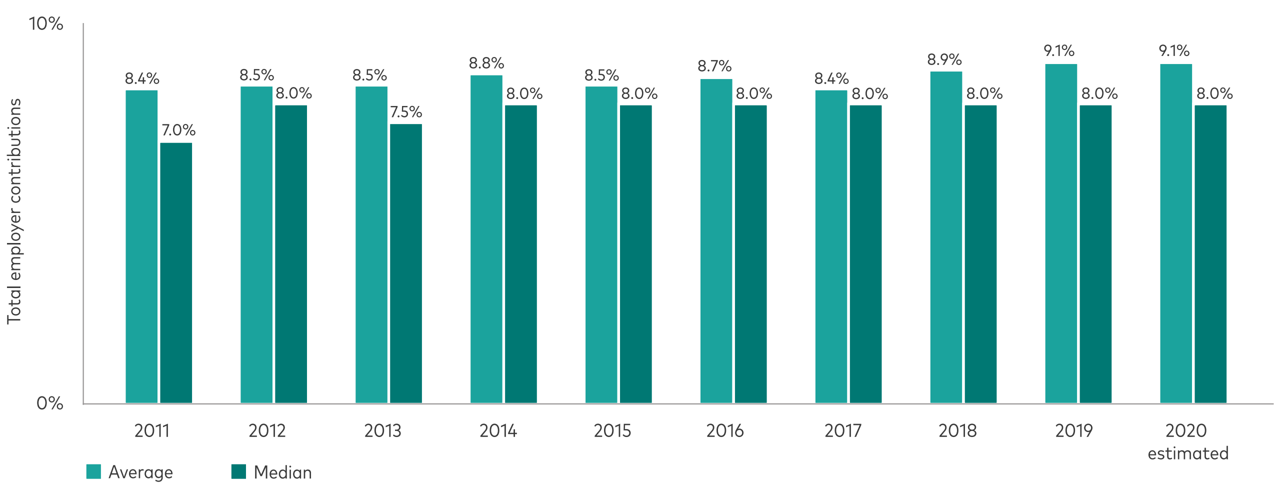
Historically, employees in a 401(k) or 403(b) plan have had to make an active choice to join the plan, but this trend is shifting. In voluntary enrollment plans, decisions were framed as a positive election: "Decide if you'd like to join the plan." Why have some employees failed to take advantage of their employer's plan? Research in the field of behavioral finance provides a number of explanations:

- **Lack of planning skills.** Some employees are not active, motivated decision-makers when planning for retirement. They have weak planning skills and find it difficult to defer gratification.
- **Default decisions.** Faced with a complex choice and unsure what to do, many individuals often take the default or "no decision" choice. In the case of a voluntary savings plan, which requires that a participant take action to sign up, the "no decision" choice is a decision to not contribute to the plan.
- **Inertia and procrastination.** Many individuals deal with a difficult choice by deferring it to another day. Eligible nonparticipants, unsure what to do, postpone their decision. While many employees know they are not saving enough and express an interest in saving more, they simply never get around to joining the plan—or to increasing their contribution rates over time if they do join.

Automatic enrollment or autopilot plan designs reframe the savings decision. With an autopilot design, individuals are automatically enrolled into the plan, their deferral rates are automatically increased each year, and their contributions are automatically invested in a balanced investment strategy. Under an autopilot plan, the decision to save is framed negatively: "Quit the plan if you'd like." In such a design, "doing nothing" leads to participation in the plan and investment of assets in a long-term retirement portfolio.

Figure 15. Match and other employer contributions

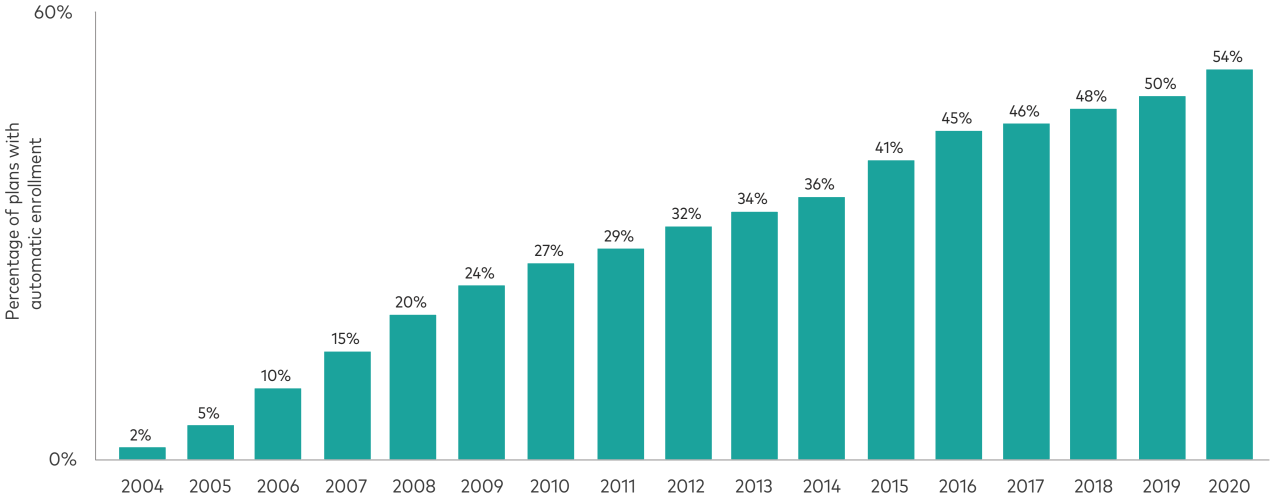
Vanguard defined contribution plans with both match and other employer contributions



Source: Vanguard 2021.

Figure 16. Automatic enrollment adoption

Vanguard defined contribution plans with employee-elective contributions



Source: Vanguard 2021.

Figure 17. Automatic enrollment design by plan size, 2020

Vanguard defined contribution plans with automatic enrollment

	Number of participants				
	All	**<500**	**500–999**	**1,000–4,999**	**>5,000**
Percentage of plans with employee-elective contributions offering	**54%**	**36%**	**66%**	**74%**	**72%**
Percentage of participants in plans offering	**69%**	**45%**	**66%**	**75%**	**69%**
For plans offering automatic enrollment					
Percentage of plans with automatic enrollment, automatic saving rate increases, and a balanced default fund	69%	64%	67%	73%	72%
Percentage of plans with automatic enrollment and a balanced default fund	30	35	33	27	28
Percentage of plans with automatic enrollment and a money market or stable value default fund	1	1	0	<0.5	0

Source: Vanguard 2021.

As of December 2020, 54% of Vanguard plans permitting employee-elective deferrals had adopted components of an autopilot design **(Figure 16)**.

Larger plans are more likely than smaller plans to implement automatic enrollment, with 72% of larger plans using the feature **(Figure 17)**. As a result, 7 in 10 participants are now in plans with autopilot designs, although automatic enrollment itself may only apply to newly eligible participants.

Among plans automatically enrolling employees, 69% were using all three features of an autopilot design in 2020. These plan sponsors automatically enrolled employees, automatically increased the deferral rate annually, and invested participants' assets in a balanced fund. Another 3 in 10 plan sponsors automatically enrolled employees and invested participants' assets in a balanced fund but did not automatically increase participant deferral rates.

Automatic enrollment adoption varied by industry group **(Figure 18)**. Plans in the manufacturing industry were the most likely to adopt automatic enrollment, with 7 in 10 plans offering the design, while plans in the education and health industry group were the least likely to automatically enroll employees. All industries have substantially increased their adoption of automatic enrollment designs over the past decade.

Figure 18. Automatic enrollment adoption by industry

Vanguard defined contribution plans permitting employee-elective deferrals

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Manufacturing	43%	44%	48%	52%	56%	58%	61%	63%	66%	69%
Agriculture, mining, and construction	33	36	39	41	44	46	48	50	52	54
Wholesale and retail trade	39	43	43	45	51	56	56	59	59	57
Transportation, utilities, and communications	30	37	36	39	42	49	56	57	58	58
Education and health	12	15	16	19	24	28	29	33	35	33
Media, entertainment, and leisure	29	32	36	39	45	49	49	53	55	55
Finance, insurance, and real estate	40	41	42	45	48	49	50	52	56	59
Business, professional, and nonprofit	23	25	25	28	29	32	34	36	39	43

Source: Vanguard 2021.

Thirty-seven percent of these plans automatically enrolled participants at a 3% contribution rate **(Figure 19)**. Sixty-nine percent of plans automatically increased the contribution rate annually. Ninety-nine percent of these plans were using a target-date or other balanced investment strategy as the default fund, with 98% choosing a target-date fund. Automatic enrollment plan design is improving. In 2020, 57% of plans chose a default of 4% or higher, compared with 2011 when only 30% did. In fact, 26% of plans chose a default of 6% or more—more than double the proportion of plans choosing 6% or more in 2011.

Forty-six percent of plans with automatic enrollment and annual increases capped the annual increase at 10% in 2020, and almost half of annual-increase participants were capped at 10% **(Figure 20)**. However, about one-quarter of plans used caps between 11% and 25%. Five percent of plans had no cap—likely an error. We recommend plan sponsors set the cap at a level where participants are saving 12% to 15% or more, factoring in employer contributions.

Figure 19. Automatic enrollment design trends

Vanguard defined contribution plans with automatic enrollment

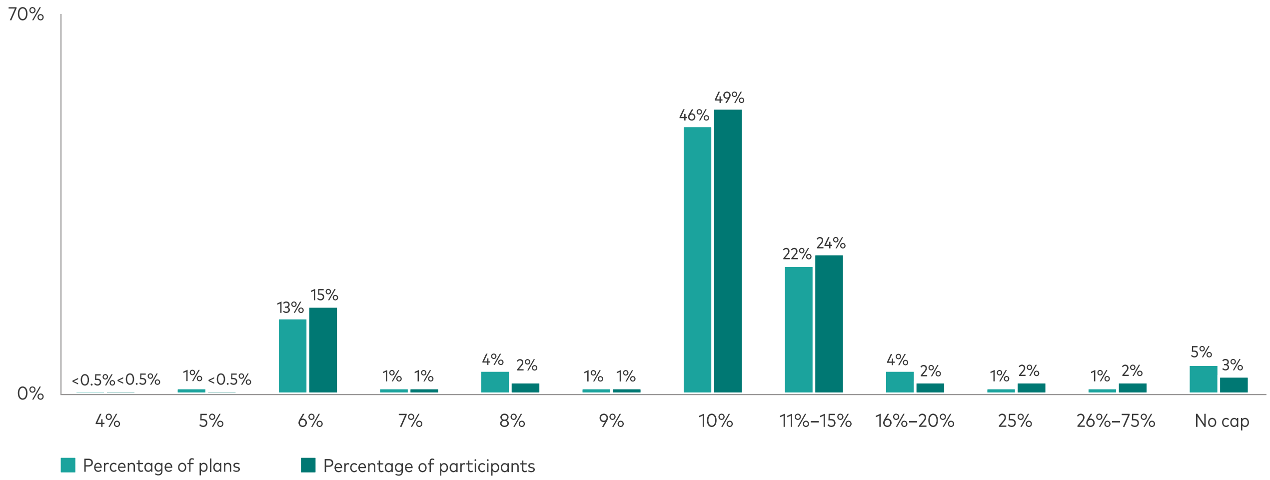
Default automatic enrollment rate	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
1 percent	2%	2%	2%	2%	1%	1%	1%	1%	2%	1%
2 percent	13	13	12	10	8	7	8	6	5	5
3 percent	55	53	51	49	48	44	41	40	38	37
4 percent	11	12	13	15	16	15	15	15	15	15
5 percent	8	8	9	9	11	13	14	15	16	16
6 percent or more	11	12	13	15	16	20	21	23	24	26
Default automatic increase rate										
1 percent	67%	67%	67%	68%	68%	65%	64%	64%	66%	67%
2 percent	2	2	2	2	2	2	2	2	2	2
Voluntary election	16	17	17	18	20	24	25	26	26	24
Service feature not offered	15	14	14	12	10	9	9	8	6	7
Default automatic increase cap										
<6 percent	5%	3%	3%	3%	2%	2%	3%	2%	2%	2%
6 percent	22	21	20	18	16	14	14	13	13	13
7 to 9 percent	8	8	8	9	11	10	9	7	6	6
10 percent	38	39	41	42	42	44	44	46	47	46
11 to 20 percent	19	21	21	21	22	23	23	23	23	26
>20 percent	4	3	3	2	2	2	2	2	2	2
No cap	4	5	4	5	5	5	5	7	7	5
Default fund										
Target-date fund	90%	91%	93%	95%	97%	97%	97%	98%	98%	98%
Other balanced fund	7	6	5	3	2	2	2	1	1	1
Subtotal	**97%**	**97%**	**98%**	**98%**	**99%**	**99%**	**99%**	**99%**	**99%**	**99%**
Money market or stable value fund	3%	3%	2%	2%	1%	1%	1%	1%	1%	1%

Source: Vanguard 2021.

Plan sponsors may also elect to offer automatic annual increases in plans with voluntary enrollment designs. Participants are then presented with the annual increase election at enrollment and when they change their employee-elective deferral rate. In 2020, one-third of plans with voluntary enrollment offered an automatic annual increase option, and two-thirds of participants in these designs had access to the option **(Figure 21)**. One-third of participants in these plans had elected automatic annual increases.

Figure 20. Automatic increase plan caps

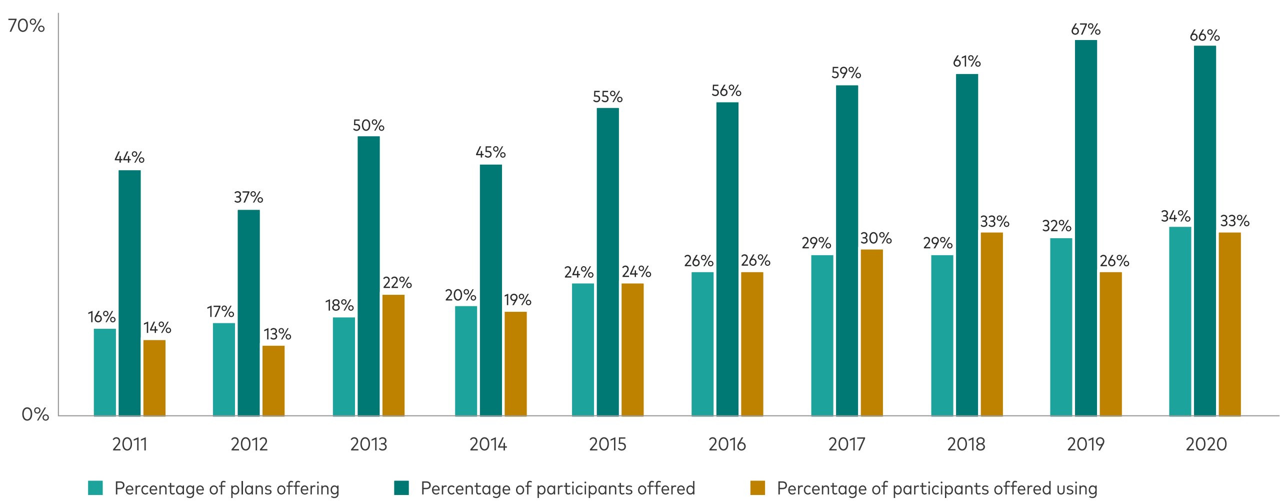
Automatic enrollment plans with an automatic annual increase as of December 31, 2020



Source: Vanguard 2021.

Figure 21. Voluntary annual increase adoption

Voluntary enrollment plans with voluntary annual increase



Source: Vanguard 2021.

Industry group

The distribution of eligible employees by industry group has evolved over time **(Figure 22)**. Most notably, the proportion of eligible employees in the wholesale and retail trade industry group has more than doubled, while the proportions in several other industry groups have declined modestly. Industry groups have different benefit and wage profiles. Both wages and the level of employer contributions impact plan participation and employee-elective deferral rates.

Figure 22. Distribution of eligible employees by industry group by year

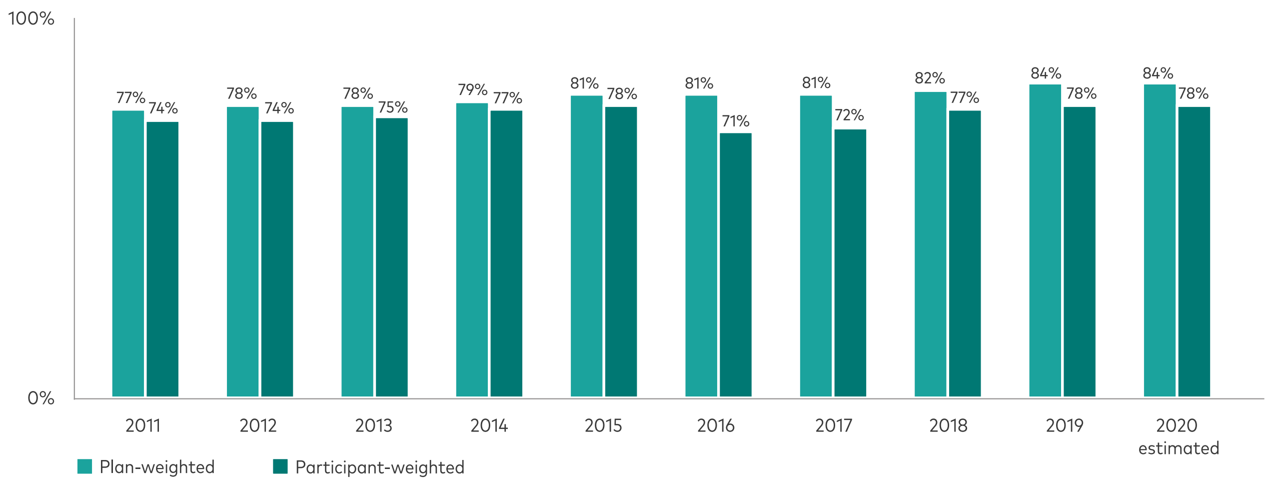
Vanguard defined contribution plans permitting employee-elective deferrals

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 estimated
Manufacturing	25%	23%	25%	27%	23%	21%	24%	22%	21%	22%
Agriculture, mining, and construction	7	6	6	5	5	3	4	4	5	5
Wholesale and retail trade	8	8	11	6	6	20	15	20	21	19
Transportation, utilities, and communications	21	22	22	22	21	14	12	11	17	17
Education and health	9	9	9	9	9	8	10	10	8	8
Media, entertainment, and leisure	7	8	6	9	15	13	16	15	11	11
Finance, insurance, and real estate	9	9	8	9	8	7	9	8	6	6
Business, professional, and nonprofit	14	15	13	13	13	14	10	10	11	12

Source: Vanguard 2021.

Figure 23. Plan participation rates

Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2021.

Participation rates

A plan's participation rate—the percentage of eligible employees who choose to make voluntary contributions—remains the broadest metric for gauging 401(k) plan performance. The most common measure of participation rates is calculated by taking the average of rates among a group of plans. We refer to this as the plan-weighted participation rate. In 2020, Vanguard's plan-weighted participation rate was 84% (estimated; see the Methodology section on page 117) **(Figure 23)**. It has risen by 7 percentage points since 2011.

A second measure of participation rates considers all employees in Vanguard-administered plans as if they were in a single plan. We refer to this as the participant-weighted participation rate. Across the universe of Vanguard participants, 78% of eligible employees were enrolled in their employer's voluntary savings program in 2020. This broader measure of plan participation rose between 2011 and 2015 from 74% to 78%, reflecting the adoption of automatic enrollment by larger plan sponsors. However, this measure fell to 71% in 2016, reflecting a change in the underlying sectors these plans represent—specifically an increase in the proportion of employees in retail plans with low participation. Since 2018, this measure has modestly increased.

These two measures provide different views of employee participation in retirement savings plans. The first measure indicates that in the average plan, about 1 in 6 eligible employees failed to contribute in 2020. The second measure, however, shows that within the entire employee universe, about 1 in 5 employees failed to take advantage of their employer's plan. The first measure is a useful benchmark for an individual plan sponsor because it is calculated at the plan level; the second is a valuable measure of the progress of 401(k) plans as a whole because it looks at all eligible employees across all plans.

Distribution of participation rates

Participation rates vary considerably across plans **(Figure 24)**. In 2020, 3 in 4 plans had a participation rate of 80% or higher, while 6% of plans had a participation rate of less than 50%.

Figure 24. Distribution of participation rates

Vanguard defined contribution plans permitting employee-elective deferrals

Plan participation rate	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 estimated
90%–100%	24%	29%	31%	35%	40%	41%	44%	47%	51%	52%
80%–89%	31	28	30	28	25	24	23	23	22	22
70%–79%	17	17	14	14	14	13	12	11	9	8
60%–69%	12	10	9	9	8	9	8	7	7	7
50%–59%	7	7	7	6	5	5	6	5	5	5
<50%	9	9	9	8	8	8	7	7	6	6
Average plan participation rate	**77%**	**78%**	**78%**	**79%**	**81%**	**81%**	**81%**	**82%**	**83%**	**84%**

Source: Vanguard 2021.

Participation rates also vary by plan size, with smaller plans having lower participation rates than other plans in 2020 **(Figure 25)**. One reason for lower participation rates at small companies may be the lower adoption of automatic enrollment designs, which are proven to increase plan participation.

Participation rates by employee demographics

Participation rates also vary considerably by employee demographics **(Figure 26)**. Income is one of the primary determinants of plan participation rates. Thirty-seven percent of eligible employees with income of less than $15,000 contributed to their employer's DC plan in 2020, while 95% of employees with income of more than $150,000 elected to participate. Even among the highest-paid employees, 5% of eligible workers still failed to take advantage of their employer's DC plan.

Participation rates were lowest for employees younger than 25. Only one-half of those employees made employee-elective deferrals to their employer's plan in 2020, while more than 8 in 10 eligible employees between ages 35 and 64 made such deferrals. Tenure also had a significant influence on plan participation. Sixty-five percent of eligible employees with less than two years on the job participated in their employer's plan, while more than 8 in 10 employees with four or more years of tenure participated.

Figure 25. Participation rates by plan size

Vanguard defined contribution plans permitting employee-elective deferrals

Plan-weighted participation rate	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020 estimated**
<500	75%	76%	76%	77%	79%	79%	80%	80%	81%	82%
500–999	79	80	82	82	83	84	84	84	85	85
1,000–4,999	79	80	81	80	84	85	85	86	87	87
5,000+	80	81	81	74	82	77	78	82	83	84
All plans	**77%**	**78%**	**78%**	**79%**	**81%**	**81%**	**81%**	**82%**	**84%**	**84%**
Participant-weighted participation rate										
<500	70%	70%	69%	72%	75%	73%	75%	72%	73%	74%
500–999	76	77	78	77	77	73	77	79	80	80
1,000–4,999	70	72	72	73	80	78	81	82	84	84
5,000+	76	76	77	67	77	67	68	75	76	76
All participants	**74%**	**74%**	**75%**	**77%**	**78%**	**71%**	**72%**	**77%**	**78%**	**78%**

Source: Vanguard 2021.

Figure 26. Participation rates by participant demographics

Vanguard defined contribution plans permitting employee-elective deferrals

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 estimated
All	**74%**	**74%**	**75%**	**77%**	**78%**	**71%**	**72%**	**77%**	**78%**	**78%**
Income										
<$15,000	26%	30%	29%	29%	27%	33%	18%	38%	36%	37%
$15,000–$29,999	51	52	51	54	48	48	45	54	57	56
$30,000–$49,999	70	71	71	75	75	69	68	71	74	75
$50,000–$74,999	75	75	76	79	80	77	79	82	83	84
$75,000–$99,999	82	82	82	83	84	85	84	86	86	87
$100,000–$149,999	86	86	88	88	88	89	90	91	91	91
$150,000+	90	89	92	92	92	92	94	94	95	95
Age										
<25	51%	52%	53%	57%	54%	42%	38%	51%	50%	49%
25–34	69	70	71	74	74	69	70	75	77	78
35–44	74	75	76	79	79	75	76	80	81	82
45–54	78	78	79	81	81	76	78	81	82	83
55–64	78	79	80	82	83	77	79	82	83	84
65+	71	74	74	75	77	69	70	72	73	74
Gender										
Male	74%	73%	75%	76%	77%	71%	71%	78%	79%	79%
Female	75	74	77	77	79	71	73	78	78	78
Job tenure (years)										
0–1	61%	61%	62%	67%	64%	56%	56%	63%	65%	65%
2–3	69	71	72	75	78	72	72	77	79	78
4–6	72	73	75	79	81	76	78	82	82	83
7–9	76	78	78	79	81	76	80	83	83	84
10+	81	82	83	84	85	80	80	84	85	85

Source: Vanguard 2021.

Figure 27. Participation by income and gender, 2020 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

	Female	Male	All
<$15,000	44%	34%	37%
$15,000–$29,999	61	55	56
$30,000–$49,999	78	74	75
$50,000–$74,999	89	81	84
$75,000–$99,999	92	85	87
$100,000–$149,999	94	91	91
$150,000+	95	94	95

Source: Vanguard 2021.

Figure 28. Participation rates by industry sector, 2020 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

	Plan-weighted	Participant-weighted
Overall	**84%**	**78%**
Finance, insurance, and real estate	90%	93%
Manufacturing	85	87
Business, professional, and nonprofit	84	82
Agriculture, mining, and construction	84	81
Transportation, utilities, and communications	83	78
Education and health	78	88
Media, entertainment, and leisure	78	85
Wholesale and retail trade	75	61

Source: Vanguard 2021.

Figure 29. Participation rates by plan design, 2020 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

	Voluntary enrollment	Automatic enrollment	All
All	**62%**	**92%**	**78%**
Income			
<$15,000	22%	74%	37%
$15,000–$29,999	36	83	56
$30,000–$49,999	57	90	75
$50,000–$74,999	72	93	84
$75,000–$99,999	77	95	87
$100,000–$149,999	85	96	91
$150,000+	90	97	95
Age			
<25	20%	84%	49%
25–34	55	93	78
35–44	67	93	82
45–54	71	93	83
55–64	73	94	84
65+	62	90	74
Gender			
Male	61%	92%	79%
Female	64	92	78
Job tenure (years)			
0–1	35%	87%	65%
2–3	52	94	78
4–6	65	95	83
7–9	72	95	84
10+	77	94	85

Source: Vanguard 2021.

Men and women appeared to participate at about the same level in 2020. But these overall averages fail to account for the income differences between men and women. At all income levels, women were more likely than men to join their employer's plan **(Figure 27)**. For example, 89% of women earning $50,000 to $74,999 participated in their employer's plan—compared with 81% of men in the same income group.

Participation rates also varied by industry group **(Figure 28)**. Employees in the finance, insurance, and real estate industry group had the highest participation rates, with 9 in 10 workers participating in their employer's plan, while employees in the wholesale and retail trade group had the lowest participation rate at 61%.

Impact of automatic enrollment on plan design

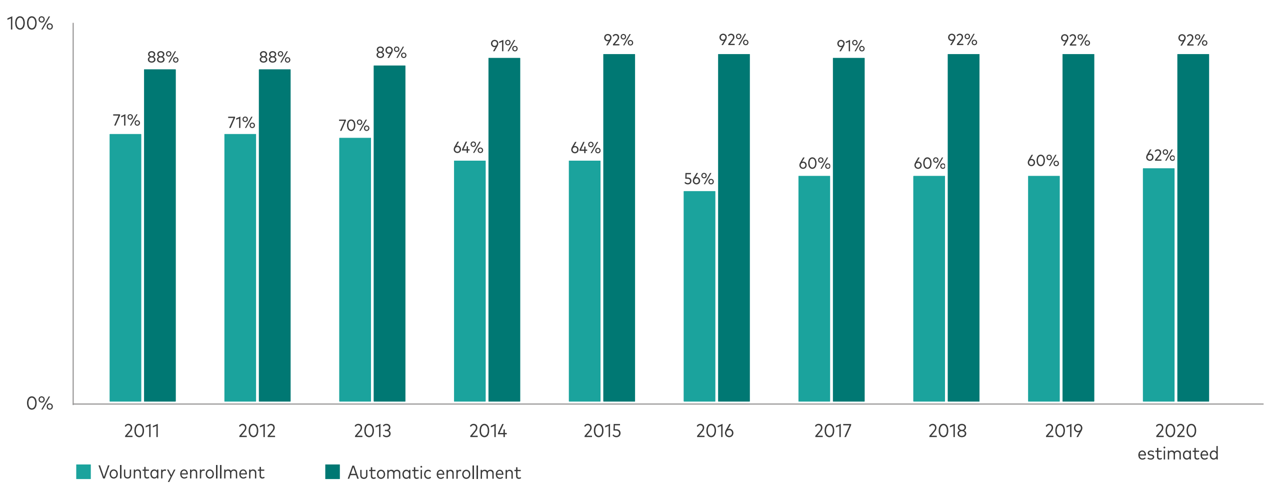
Reflecting increased adoption of automatic enrollment designs, there has generally been an improvement in participation rates between 2011 and 2020 among demographic groups that traditionally have lower voluntary participation rates. Employees subjected to an automatic enrollment feature had an overall participation rate of 92% in 2020, compared with a participation rate of 62% for employees hired under plans with voluntary enrollment **(Figure 29)**.

Plans with automatic enrollment had higher participation rates across all demographic variables. For individuals earning less than $30,000 in plans with automatic enrollment, the participation rate was more than double that of individuals with voluntary enrollment.

Between 2011 and 2020, plans with automatic enrollment have had consistently strong participation rates **(Figure 30)**. However, as more plans adopt automatic enrollment, the remaining pool of plans with voluntary enrollment have seen participation rates decline.

Figure 30. Plan participation rates by plan design, participant-weighted trend

Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2021.

Employee deferrals

In a typical DC plan, employees are the main source of funding, while employer contributions play a secondary role. Thus, the level of participant deferrals is a critical determinant of whether the DC plan will generate an adequate level of retirement savings.

Vanguard participants saved 7.2% of their income, on average, in their employer's plan in 2020 **(Figure 31)**. The median participant deferral rate was 6.0%, meaning that half of participants were saving above this rate and half were saving below it.

Vanguard deferral rates are drawn from recordkeeping data and exclude eligible employees not contributing to their plans. Industry deferral rates sometimes include eligible employees not contributing to their plans and are generally self-reported by plan sponsors.

Average and median deferral rates were fairly steady between 2011 and 2020.

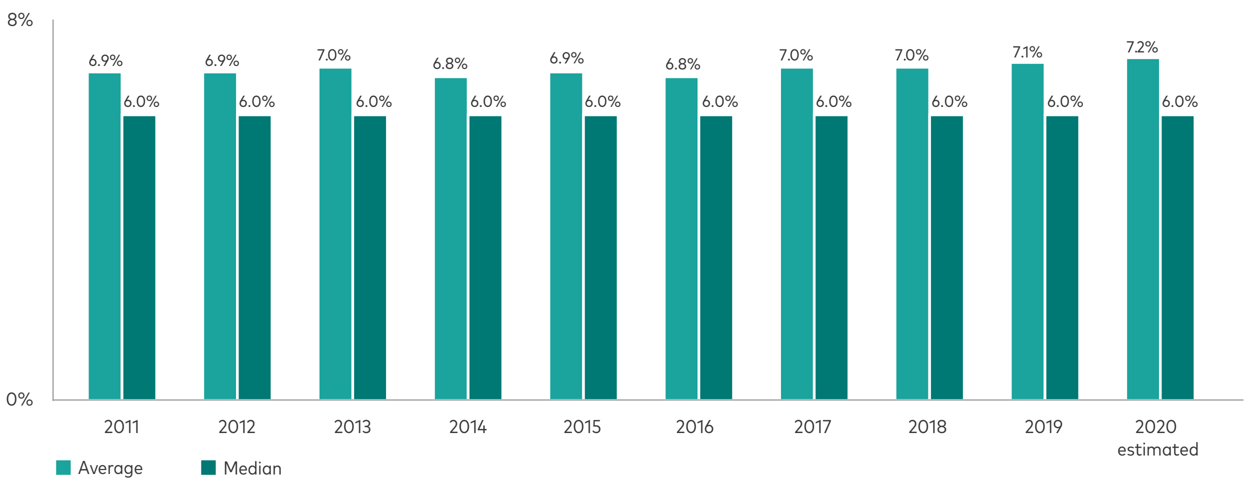
Distribution of deferral rates

Individual deferral rates vary considerably among participants **(Figure 32)**. One in 5 participants had a deferral rate of 10% or higher in 2020, while 27% had a deferral rate of less than 4%. Only 12% of participants saved the statutory maximum of $19,500 ($26,000 for participants age 50 or older) (see page 42). In plans offering catch-up contributions, only 15% of participants age 50 or older took advantage of this feature in 2020 (see page 43).

Plan size has little effect on participant deferral rates **(Figure 33)**. In 2020, plans with 5,000 or more participants had an average deferral rate of 7.1%—close to the overall average rate of 7.2%. Employees at large firms typically have more generous compensation packages and so arguably should have a higher propensity to save than employees at small companies. But the presence of other employer-funded retirement benefits as part of that package may dilute this effect.

Figure 31. Participant employee-elective deferral rates

Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2021.

Figure 32. Distribution of participant employee-elective deferral rates

Vanguard defined contribution plans permitting employee-elective deferrals

Percentage of participants

Deferral rate	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 estimated
0.1%–3.9%	28%	29%	28%	30%	29%	30%	28%	28%	27%	27%
4.0%–6.0%	25	23	23	23	22	22	22	22	21	21
6.1%–9.9%	27	28	29	28	29	28	29	29	30	30
10.0%–14.9%	14	14	14	13	14	14	15	15	16	16
15.0%+	6	6	6	6	6	6	6	6	6	6

Source: Vanguard 2021.

Figure 33. Participant employee-elective deferral rates by plan size

Vanguard defined contribution plans permitting employee-elective deferrals

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 estimated
Average—all plans	**6.9%**	**6.9%**	**7.0%**	**6.8%**	**6.9%**	**6.8%**	**7.0%**	**7.0%**	**7.1%**	**7.2%**
Median	**6.0**	**6.0**	**6.0**	**6.0**	**6.0**	**6.0**	**6.0**	**6.0**	**6.0**	**6.0**
Average by plan size (number of participants)										
<500	6.9%	7.0%	7.0%	6.9%	7.1%	7.2%	7.3%	7.3%	7.4%	7.5%
500–999	6.9	6.8	6.8	7.1	6.8	7.0	7.0	7.1	7.3	7.4
1,000–4,999	6.8	6.8	6.9	6.7	6.9	6.8	6.9	7.0	7.1	7.2
5,000+	6.9	6.8	7.0	6.8	7.0	6.8	7.0	6.9	7.0	7.1

Source: Vanguard 2021.

Figure 34. Employee-elective deferral rates by participant demographics

Vanguard defined contribution plans permitting employee-elective deferrals

Average deferral rate	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 estimated
All	**6.9%**	**6.9%**	**7.0%**	**6.8%**	**6.9%**	**6.8%**	**7.0%**	**7.0%**	**7.1%**	**7.2%**
Income										
<$15,000	5.4%	5.4%	5.6%	6.3%	5.4%	4.6%	6.1%	5.0%	4.9%	5.0%
$15,000–$29,999	4.8	4.7	4.8	4.9	4.6	4.6	4.7	4.7	4.5	4.6
$30,000–$49,999	5.8	5.7	5.8	5.8	5.7	5.7	5.4	5.5	5.5	5.6
$50,000–$74,999	7.0	6.9	7.0	6.9	6.9	6.9	6.7	6.8	6.9	7.0
$75,000–$99,999	8.2	8.1	8.1	7.9	8.0	7.9	7.9	8.0	8.1	8.2
$100,000–$149,999	8.7	8.6	8.8	8.7	8.8	8.7	8.8	8.9	9.1	9.1
$150,000+	7.2	7.2	7.5	7.3	7.7	7.6	7.7	7.9	8.1	8.1
Age										
<25	4.2%	4.0%	4.4%	4.1%	4.7%	4.8%	5.0%	4.7%	4.9%	5.0%
25–34	5.6	5.4	5.8	5.5	5.9	5.9	6.1	6.1	6.2	6.3
35–44	6.1	6.3	6.4	6.3	6.4	6.3	6.5	6.5	6.7	6.7
45–54	7.2	7.2	7.3	7.2	7.3	7.0	7.2	7.2	7.3	7.4
55–64	8.6	8.5	8.6	8.5	8.6	8.3	8.5	8.5	8.7	8.7
65+	9.8	9.8	9.8	9.7	9.7	9.0	9.4	9.1	9.1	9.2
Gender										
Male	6.9%	6.9%	7.0%	6.9%	6.9%	6.9%	7.0%	7.1%	7.2%	7.3%
Female	6.9	6.8	7.0	6.8	6.9	6.6	6.8	6.6	6.8	6.9
Job tenure (years)										
0–1	4.8%	4.7%	4.9%	4.6%	5.0%	5.0%	5.1%	5.0%	5.1%	5.2%
2–3	6.3	6.0	6.3	6.2	6.5	6.3	6.6	6.4	6.4	6.5
4–6	6.8	6.8	7.0	7.0	7.1	6.9	7.3	7.1	7.2	7.3
7–9	7.0	7.0	7.2	7.2	7.4	7.2	7.6	7.6	7.7	7.7
10+	7.8	7.9	8.0	8.0	8.0	7.9	8.1	8.2	8.4	8.5
Account balance										
<$10,000	3.9%	3.8%	3.8%	3.8%	3.9%	3.9%	3.8%	3.9%	3.7%	3.8%
$10,000–$24,999	5.9	5.8	5.9	6.1	6.4	6.4	6.2	6.6	6.4	6.3
$25,000–$49,999	6.8	6.7	6.9	6.9	7.4	7.5	7.2	7.6	7.5	7.5
$50,000–$99,999	8.1	7.8	7.7	7.7	8.1	8.2	8.2	8.5	8.5	8.5
$100,000–$249,999	9.8	9.6	9.2	9.1	9.3	9.1	9.2	9.5	9.5	9.6
$250,000+	10.3	10.4	10.4	10.2	10.4	10.2	10.3	10.5	10.6	10.7

Source: Vanguard 2021.

Deferral rates by employee demographics

As with plan participation rates, employee demographics have a strong influence on deferral rates **(Figure 34)**. Income is the primary determinant of deferral rates, which generally rise with income. The statutory maximum contribution was $19,500 ($26,000 for participants age 50 and older), and a highly compensated employee was one who earned $125,000 or more in 2019 (based on the prior year for 2020).

In 2020, participants with an income of less than $30,000 had deferral rates in the 4.6%-to-5.0% range, while participants earning $75,000 to $99,999 had a deferral rate of 8.2%—a saving rate that is two-thirds higher. The deferral rate was 9.1% for participants earning between $100,000 and $149,999.

Age is another important variable influencing saving. In 2020, deferral rates were lowest for participants younger than 25. This group saved 5.0% of income. Deferral rates for participants ages 55 to 64 were nearly twice as high, averaging 8.7%. Deferral rates also rose directly with employee tenure.

Deferral rates also correlated with account balances. Participants with account balances of less than $10,000 had the lowest average deferral rate, 3.8%, in 2020. As account balances rose, average deferral rates also rose. Overall, men and women appeared to save at similar rates, with women at higher income levels generally saving at slightly higher rates **(Figure 35)**.

Figure 35. Deferral rates by income and gender, 2020 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

Average deferral rate

	Female	Male	All
<$15,000	4.8%	5.7%	5.0%
$15,000–$29,999	4.6	4.9	4.6
$30,000–$49,999	5.7	5.6	5.6
$50,000–$74,999	7.1	7.0	7.0
$75,000–$99,999	8.4	8.0	8.2
$100,000–$149,999	9.2	8.9	9.1
$150,000+	8.3	8.0	8.1

Source: Vanguard 2021.

Figure 36. Deferral rates by industry sector, 2020 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

Average deferral rate

	Mean	Median
Overall	**7.2%**	**6.0%**
Industry group		
Media, entertainment, and leisure	8.3%	7.1%
Agriculture, mining, and construction	7.5	6.9
Education and health	7.5	6.0
Manufacturing	7.5	6.4
Business, professional, and nonprofit	7.4	6.3
Finance, insurance, and real estate	7.4	6.2
Transportation, utilities, and	7.0	6.0
Wholesale and retail trade	5.6	5.0

Source: Vanguard 2021.

Figure 37. Participant deferral rates by plan design, 2020 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

Average deferral rate

	Voluntary enrollment	Automatic enrollment	All
All	**7.2%**	**7.2%**	**7.2%**
Income			
<$15,000	6.4%	4.0%	5.0%
$15,000–$29,999	5.3	4.3	4.6
$30,000–$49,999	5.7	5.6	5.6
$50,000–$74,999	7.0	6.9	7.0
$75,000–$99,999	8.0	8.3	8.2
$100,000–$149,999	8.7	9.3	9.1
$150,000+	7.7	8.3	8.1
Age			
<25	4.9%	5.0%	5.0%
25–34	5.9	6.5	6.3
35–44	6.6	6.8	6.7
45–54	7.3	7.5	7.4
55–64	8.6	8.8	8.7
65+	9.1	9.2	9.2
Gender			
Male	7.3%	7.2%	7.3%
Female	7.1	6.7	6.9
Job tenure (years)			
0–1	5.3%	5.2%	5.2%
2–3	6.5	6.5	6.5
4–6	6.7	7.5	7.3
7–9	7.0	8.3	7.7
10+	8.0	9.0	8.5
Account balance			
<$10,000	4.0%	3.7%	3.8%
$10,000–$24,999	6.1	6.5	6.3
$25,000–$49,999	7.1	7.7	7.5
$50,000–$99,999	8.1	8.7	8.5
$100,000–$249,999	9.4	9.6	9.6
$250,000+	10.7	10.6	10.7

Source: Vanguard 2021.

Deferral rates also varied by industry group **(Figure 36)**. Participants in the media, entertainment, and leisure industry group had the highest average deferral rates in 2020, while participants in the wholesale and retail trade industry group had the lowest deferral rates.

Impact of automatic enrollment

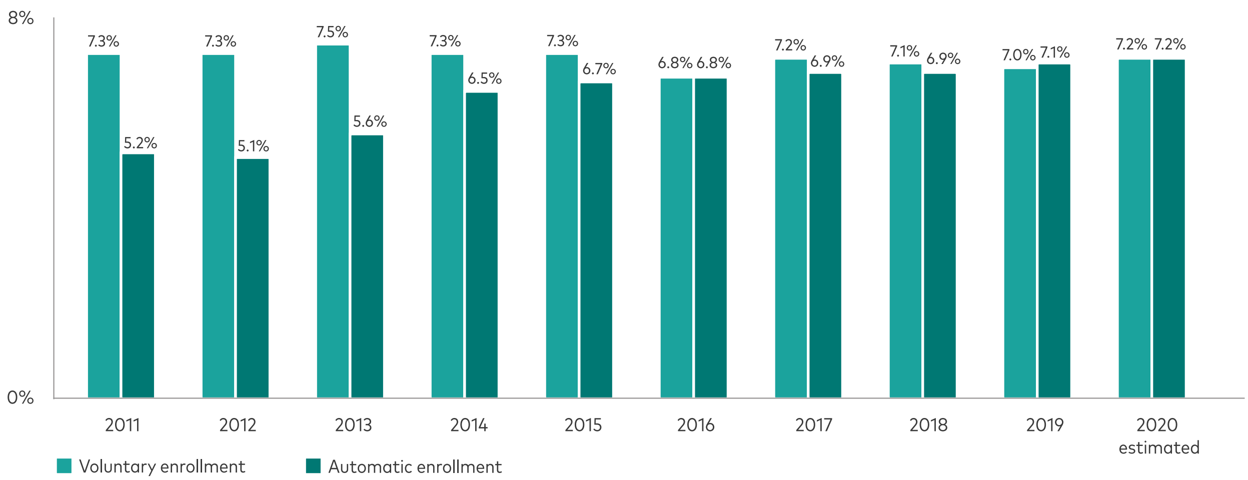
Participants joining a plan under an automatic enrollment feature had an average deferral rate of 7.2% in 2020, which is identical to the average deferral rate for participants in plans with voluntary enrollment **(Figure 37)**.

In prior years, the gap between average deferral rates of participants in automatic enrollment and voluntary enrollment plans was wide **(Figure 38)**. In 2011, this spread was 2.1 percentage points. However, it appears that automatic annual increases as well as higher default deferral rates have caused deferral rates to converge.

This suggests that higher default deferral rates would be amenable to plan participants in automatic enrollment designs. Our research on automatic enrollment indicates that "quit rates" do not deteriorate when higher default percentages are used to enroll employees.[2]

Figure 38. Participant employee-elective deferral rates by plan design, average trend

Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2021.

2 For an in-depth analysis of automatic enrollment, see Jeffrey W. Clark and Jean A. Young, *Automatic Enrollment: The Power of the Default*, February 2021, Vanguard research, institutional.vanguard.com

Maximum contributors

During 2020, 12% of participants saved the statutory maximum dollar amount of $19,500 ($26,000 for participants age 50 or older) **(Figure 39)**. Participants who contributed the maximum dollar amount tended to have higher incomes, were older, had longer tenures with their current employer, and had accumulated substantially higher account balances.

Fifty-six percent of participants with an income of more than $150,000 contributed the maximum allowed. Similarly, 4 in 10 participants with an account balance of more than $250,000 contributed the maximum allowed in 2020. One in 6 participants older than 65 contributed the maximum.

Figure 39. Participants contributing the maximum by participant demographics, 2020 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

All	**12%**
Income	
<$15,000	1%
$15,000–$29,999	<0.5
$30,000–$49,999	<0.5
$50,000–$74,999	1
$75,000–$99,999	4
$100,000–$149,999	18
$150,000+	56
Age	
<25	3%
25–34	8
35–44	12
45–54	14
55–64	17
65+	16
Gender	
Male	11%
Female	8
Job tenure (years)	
0–1	5%
2–3	10
4–6	13
7–9	15
10+	16
Account balance	
<$10,000	<0.5%
$10,000–$24,999	1
$25,000–$49,999	4
$50,000–$99,999	8
$100,000–$249,999	17
$250,000+	40
Industry group	
Media, entertainment, and leisure	32%
Agriculture, mining, and construction	16
Business, professional, and nonprofit	15
Finance, insurance, and real estate	14
Education and health	14
Manufacturing	9
Transportation, utilities, and communications	5
Wholesale and retail trade	4

Source: Vanguard 2021.

Catch-up contributions

Nearly all Vanguard plans offered catch-up contributions in 2020. Catch-up contributions permit participants age 50 and older to contribute more than permitted for participants younger than 50. Fifteen percent of age-50-and-older participants eligible for catch-up contributions took advantage of this feature in 2020 **(Figure 40)**. Participants earning less than $100,000 would need deferral rates higher than 20% of income in order to make catch-up contributions, suggesting that adoption of catch-up contributions by participants is actually quite strong.

The characteristics of participants making catch-up contributions are similar to those of participants making the maximum contribution to their plan. They tended to have higher incomes and have accumulated substantially higher account balances.

Six in 10 participants with an income of more than $150,000 made catch-up contributions. Similarly, 36% of participants with an account balance of more than $250,000 made catch-up contributions in 2020.

Figure 40. Catch-up contribution participation rates by participant demographics, 2020 estimated

Vanguard defined contribution plans permitting catch-up contributions

Percentage of plans offering	**97%**
Percentage of participants offered	**98%**
Percentage of participants using if offered	**15%**
Income	
<$15,000	1%
$15,000–$29,999	<0.5
$30,000–$49,999	<0.5
$50,000–$74,999	2
$75,000–$99,999	6
$100,000–$149,999	22
$150,000+	58
Gender	
Male	16%
Female	11
Job tenure (years)	
0–1	6%
2–3	11
4–6	14
7–9	15
10+	16
Account balance	
<$10,000	<0.5%
$10,000–$24,999	1
$25,000–$49,999	4
$50,000–$99,999	8
$100,000–$249,999	14
$250,000+	36
Industry group	
Agriculture, mining, and construction	26%
Education and health	24
Media, entertainment, and leisure	22
Business, professional, and nonprofit	20
Finance, insurance, and real estate	19
Manufacturing	12
Transportation, utilities, and communications	8
Wholesale and retail trade	6

Source: Vanguard 2021.

Roth contributions

At year-end 2020, the Roth feature was offered by 74% of Vanguard plans and had been adopted by 14% of participants in plans offering the feature **(Figure 41)**. Those who used this feature tended to be younger or higher-income participants.

Twenty-two percent of plans offered Roth in-plan conversions, and 4% of participants with access to the option converted assets between 2011 and 2020.

Figure 41. Roth participation rates by participant demographics, 2020 estimated

Vanguard defined contribution plans permitting Roth contributions

Percentage of plans offering	**74%**
Percentage of participants offered	**88%**
Percentage of participants using if offered	**14%**
Income	
<$15,000	7%
$15,000–$29,999	8
$30,000–$49,999	10
$50,000–$74,999	14
$75,000–$99,999	17
$100,000–$149,999	17
$150,000+	14
Age	
<25	14%
25–34	17
35–44	15
45–54	12
55–64	10
65+	7
Gender	
Male	15%
Female	13
Job tenure (years)	
0–1	12%
2–3	14
4–6	15
7–9	16
10+	13
Account balance	
<$10,000	10%
$10,000–$24,999	15
$25,000–$49,999	16
$50,000–$99,999	16
$100,000–$249,999	15
$250,000+	15
Industry group	
Transportation, utilities, and communications	18%
Business, professional, and nonprofit	17
Agriculture, mining, and construction	15
Finance, insurance, and real estate	15
Education and health	13
Media, entertainment, and leisure	13
Manufacturing	12
Wholesale and retail trade	11

Source: Vanguard 2021.

After-tax contributions

After-tax employee-elective deferrals were available to participants in 19% of Vanguard plans in 2020 **(Figure 42)**. The after-tax feature is more likely to be offered by large plans, and 4 in 10 participants had access to this feature. Ten percent of employees offered the after-tax deferral feature took advantage of it. Those who used the feature tended to have higher incomes and longer tenures.

Figure 42. After-tax participation rates by participant demographics, 2020 estimated

Vanguard defined contribution plans permitting after-tax contributions

Percentage of plans offering	**19%**
Percentage of participants offered	**38%**
Percentage of participants using if offered	**10%**
Income	
<$15,000	1%
$15,000–$29,999	2
$30,000–$49,999	5
$50,000–$74,999	7
$75,000–$99,999	7
$100,000–$149,999	8
$150,000+	27
Age	
<25	4%
25–34	10
35–44	13
45–54	10
55–64	8
65+	6
Gender	
Male	10%
Female	9
Job tenure (years)	
0–1	6%
2–3	9
4–6	12
7–9	13
10+	11
Industry group	
Media, entertainment, and leisure	38%
Agriculture, mining, and construction	16
Education and health trade	9
Transportation, utilities, and communications	6
Finance, insurance, and real estate	6
Business, professional, and nonprofit	6
Manufacturing	5
Wholesale and retail trade	2

Source: Vanguard 2021.

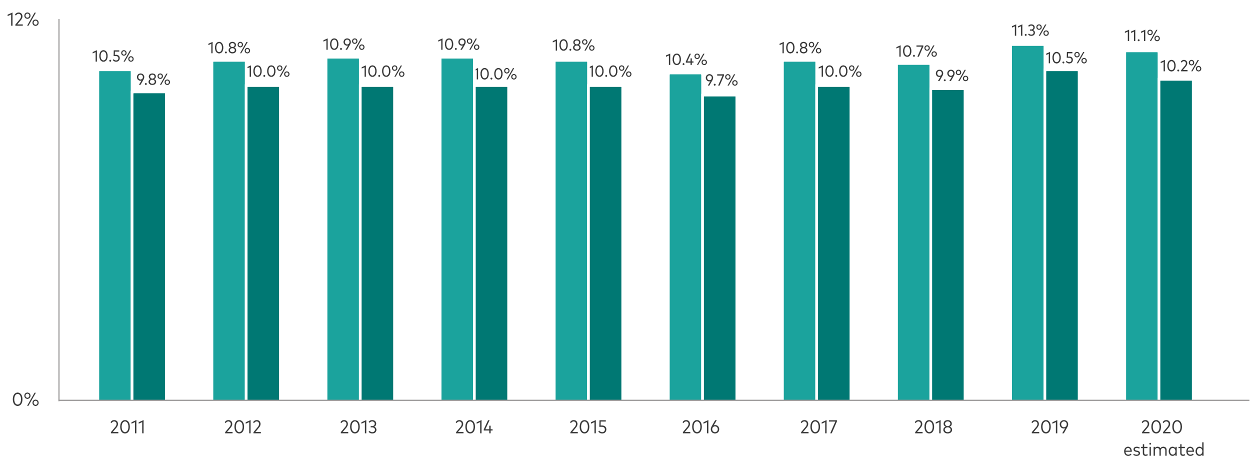
Aggregate contributions

Considering both employee and employer contributions, the average total participant contribution rate in 2020 was 11.1% (estimated; see the Methodology section on page 117), and the median was 10.2% **(Figure 43)**. These rates exclude eligible nonparticipants. Aggregate participant and employer contribution rates were fairly stable between 2011 and 2020.

When eligible nonparticipants, with their 0% contribution rate, are included, both the average and the median aggregate contribution rate was 8.9% **(Figure 44)**. Aggregate employee and employer contribution rates generally rose between 2011 and 2015, reflecting the rising adoption of automatic enrollment, which results in fewer individuals deferring 0%. The decline in 2016 reflects a change in the underlying sectors these plans represent—specifically an increase in the proportion of retail plans with voluntary enrollment. Since 2016, this measure has modestly increased.

Figure 43. Aggregate participant and employer contribution rates

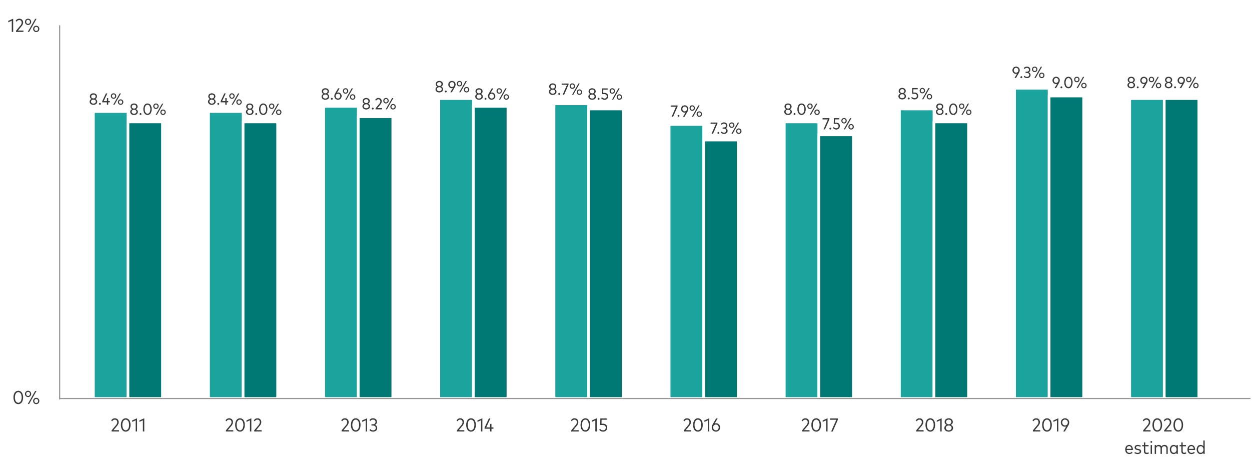
Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2021.

Figure 44. Aggregate employee and employer contribution rates

Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2021.

Participants joining a plan under an automatic enrollment feature had an average total contribution rate of 11.4%, compared with 10.5% for those hired under voluntary enrollment **(Figure 45)**.

Figure 45. Aggregate participant and employer contribution rates by plan design, 2020 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

	Voluntary enrollment	Automatic enrollment	All
All	**10.5%**	**11.4%**	**11.1%**
Income			
<$15,000	8.6%	6.0%	7.1%
$15,000–$29,999	7.8	6.6	7.0
$30,000–$49,999	8.9	9.1	9.0
$50,000–$74,999	10.0	10.9	10.6
$75,000–$99,999	11.1	12.6	12.0
$100,000–$149,999	12.2	13.9	13.2
$150,000+	12.2	14.4	13.7
Age			
<25	7.6%	8.2%	8.1%
25–34	9.3	10.5	10.2
35–44	9.8	11.1	10.6
45–54	10.5	11.9	11.3
55–64	12.0	13.4	12.8
65+	12.4	13.6	13.0
Gender			
Male	10.5%	11.5%	11.2%
Female	10.3	10.7	10.5
Job tenure (years)			
0–1	8.2%	8.4%	8.4%
2–3	10.3	10.6	10.5
4–6	10.5	11.9	11.4
7–9	10.3	13.2	12.0
10+	11.2	13.9	12.5
Account balance			
<$10,000	5.5%	5.1%	5.2%
$10,000–$24,999	8.4	9.2	8.9
$25,000–$49,999	9.6	11.3	10.5
$50,000–$99,999	10.8	12.7	11.7
$100,000–$249,999	12.5	14.1	13.3
$250,000+	14.2	16.4	15.2

Source: Vanguard 2021.

Eligible employees hired under an automatic enrollment feature had an average total contribution rate of 10.7%, which is more than 50% higher than the rate of 6.8% for those hired under voluntary enrollment **(Figure 46)**. Plans with automatic enrollment had higher total contribution rates across all demographic variables, with the widest gaps for younger, less-tenured, and lower-income employees.

Figure 46. Aggregate employee and employer contribution rates by plan design, 2020 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

	Voluntary enrollment	Automatic enrollment	All
All	**6.8%**	**10.7%**	**8.9%**
Income			
<$15,000	1.9%	4.5%	2.7%
$15,000–$29,999	2.9	5.5	4.1
$30,000–$49,999	5.4	8.3	7.0
$50,000–$74,999	7.5	10.3	9.1
$75,000–$99,999	8.9	12.1	10.7
$100,000–$149,999	10.8	13.5	12.3
$150,000+	11.3	14.1	13.2
Age			
<25	1.6%	7.0%	4.1%
25–34	5.4	9.8	8.1
35–44	7.0	10.5	9.0
45–54	7.9	11.2	9.6
55–64	9.2	12.8	11.0
65+	8.1	12.5	10.0
Gender			
Male	6.9%	10.9%	9.3%
Female	6.8	10.0	8.7
Job tenure (years)			
0–1	3.1%	7.4%	5.6%
2–3	5.8	10.0	8.4
4–6	7.2	11.4	9.6
7–9	7.8	12.8	10.3
10+	9.0	13.3	11.0

Source: Vanguard 2021.

Distribution of aggregate contribution rates

Vanguard estimates that a typical participant should target a total contribution rate of 12% to 15%, including both employee and employer contributions. Four in 10 participants in 2020 had total employee and employer contribution rates that met those thresholds or reached the statutory contribution limit **(Figure 47)**.

For participants with lower wages, Social Security is expected to replace a higher percentage of income, and so a lower retirement saving rate may be appropriate. For higher-wage participants, Social Security replaces a lower percentage of income, and saving rates may need to be higher. In fact, higher-wage participants may not be able to achieve sufficient saving rates within the plan because of statutory contribution limits.

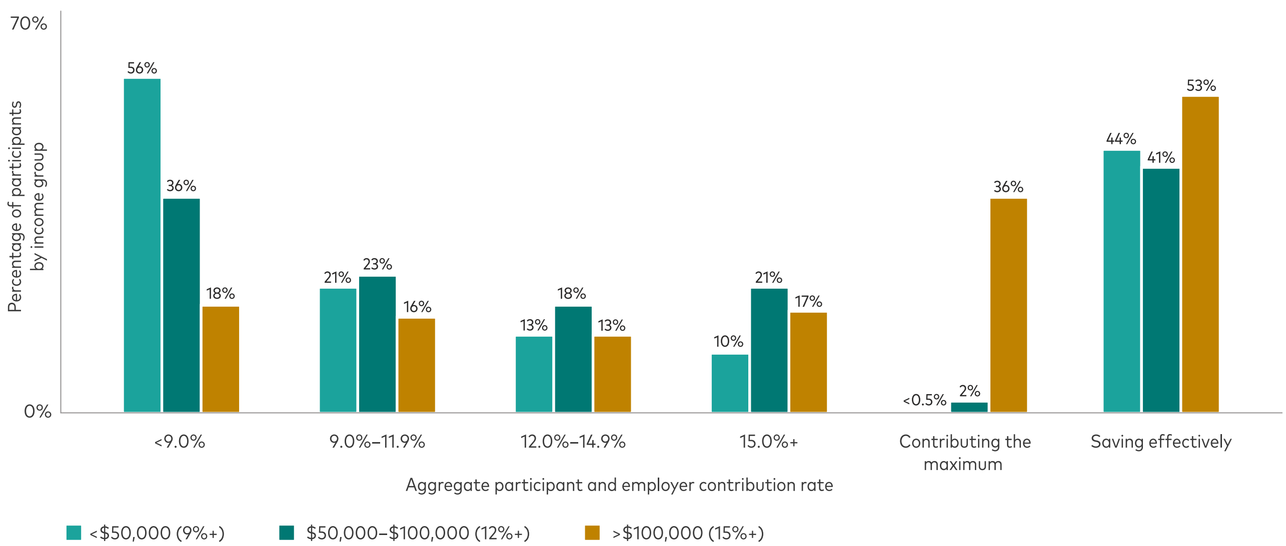
Account balances

Account balances are a widely cited measure of the overall effectiveness of DC plans and are determined by contribution levels and investment performance over time.

Vanguard account balances are a measure of how much plan participants have accumulated for retirement at a given employer. In the United States, DC plans are not a closed system. When participants change jobs or retire, their plan assets may remain with the plan of the employer they are leaving, may be rolled over to another employer plan or to an IRA, or may be cashed out. As a result, current DC plan balances often do not reflect lifetime savings and are only a partial measure of retirement preparedness for most participants.

Figure 47. Distribution of aggregate participant and employer contribution rates, 2020 estimated

Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2021.

Note: The percentage noted after the income range is the total contribution rate recommended for effective savings.

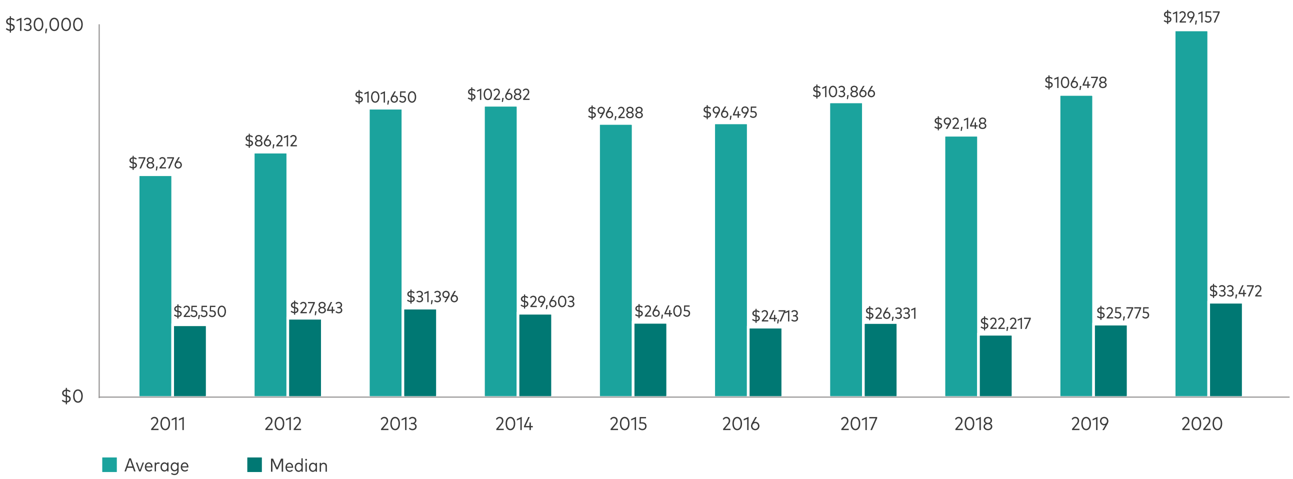
Average versus median balances

In 2020, the average account balance for Vanguard participants was $129,157, and the median balance was $33,472 **(Figure 48)**. Vanguard participants' average account balance increased by 21%, and the median account balance increased by 30%. The average one-year participant total return was 15.1% (see page 9).

The wide divergence between the median and the average balance is due to a small number of very large accounts that significantly raised the average above the median **(Figure 49)**. Three in 10 participants had a 2020 account balance of less than $10,000, while another 3 in 10 had balances of more than $100,000.

Figure 48. Account balances

Vanguard defined contribution plans



Source: Vanguard 2021.

Figure 49. Distribution of account balances

Vanguard defined contribution plans

Percentage of accounts

Range of balance	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
<$10,000	32%	31%	30%	31%	33%	34%	33%	36%	33%	29%
$10,000–$19,999	13	12	12	11	12	12	11	12	12	11
$20,000–$39,999	14	14	14	13	13	13	13	13	13	13
$40,000–$59,999	9	9	8	8	8	8	8	7	8	8
$60,000–$79,999	6	6	6	6	5	5	5	5	5	6
$80,000–$99,999	4	4	4	4	4	4	4	4	4	4
$100,000+	22	24	26	27	25	24	26	23	25	29

Source: Vanguard 2021.

Because of the skewed distribution of assets, average balances are indicative of participants at about the 75th percentile (i.e., about 75% of all participants had balances below the average, and 25% had balances above). Average balances are more indicative of the results experienced by longer-tenured, more affluent, or older participants. The median balance represents the typical participant: Half of all participants had balances above the median, and half had balances below.

Average account balances also varied somewhat by plan size, with smaller plans having higher balances than larger plans **(Figure 50)**. Automatic enrollment is one factor driving differences in average balances—larger plans have been much more likely to adopt automatic enrollment.

Change in account balances

Market performance and evolution in the participant base caused the change in average and median account balances in 2020. When we examined continuous participants—those with an account balance in both December 2019 and December 2020—the median account balance rose by 26% **(Figure 51)**. More than 9 in 10 of these continuous participants saw their balances rise because of equity-oriented asset allocations and/or ongoing contributions. Among continuous participants with a balance in both December 2015 and December 2020, the median account balance rose 128%, and 93% of continuous participants had a higher account balance in 2020 than in 2015.

Figure 50. Account balances by plan size

Vanguard defined contribution plans

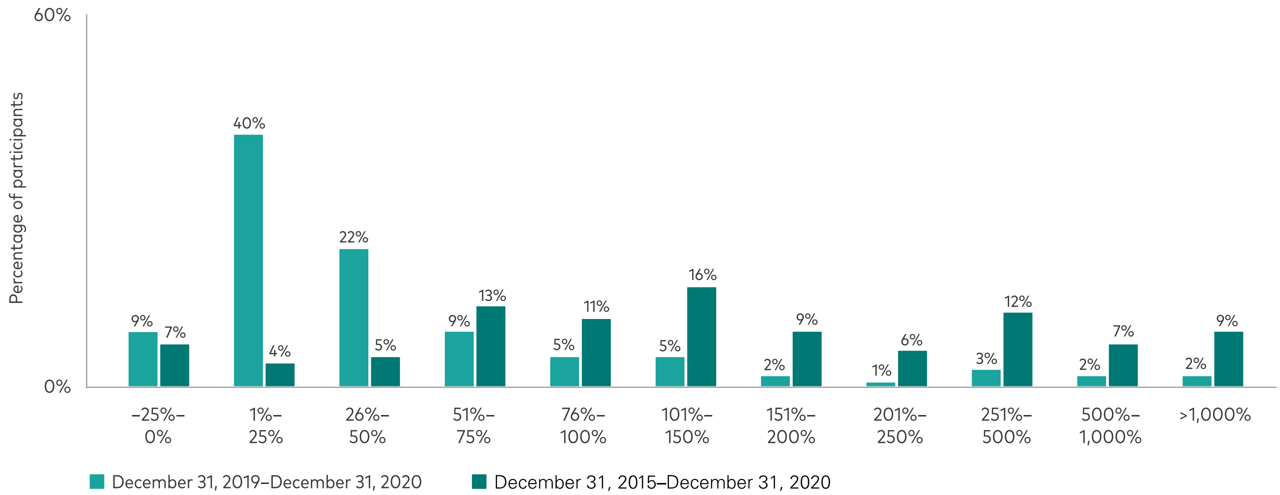
Number of participants

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Average										
<500	$100,806	$111,799	$133,126	$141,332	$136,610	$143,869	$162,703	$150,290	$179,355	$202,514
500–999	$76,679	$86,615	$101,835	$104,972	$99,203	$103,460	$120,009	$111,008	$128,887	$147,002
1,000–4,999	$76,613	$85,385	$99,389	$101,376	$98,101	$100,827	$110,189	$101,414	$116,238	$131,705
>5,000	$77,030	$84,285	$99,883	$100,070	$92,679	$81,786	$97,722	$85,883	$99,422	$123,815
All plans	$78,276	$86,212	$101,650	$102,682	$96,288	$96,495	$103,866	$92,148	$106,478	$129,157
Median										
<500	$33,225	$36,388	$41,195	$41,848	$37,792	$38,685	$42,705	$37,699	$44,528	$50,809
500–999	$28,345	$30,627	$34,348	$33,447	$29,147	$29,789	$34,943	$31,919	$34,728	$39,426
1,000–4,999	$23,217	$29,283	$32,603	$30,710	$28,425	$27,768	$29,678	$26,340	$29,987	$34,296
>5,000	$24,414	$26,453	$30,024	$28,197	$24,943	$22,850	$24,280	$20,264	$23,745	$32,264
All plans	$25,550	$27,843	$31,396	$29,603	$26,405	$24,713	$26,331	$22,217	$25,775	$33,472

Source: Vanguard 2021.

Figure 51. Change in account balances, continuous participants

Vanguard defined contribution plan participants with a balance at both the beginning and end of the period



	December 31, 2019–December 31, 2020	December 31, 2015–December 31, 2020
Median change	26%	128%
Percentage of participants with positive changes	91	93

Source: Vanguard 2021.

Figure 52. Account balances by participant demographics, 2020

Vanguard defined contribution plans

	All participants	
	Average	**Median**
All	**$129,157**	**$33,472**
Income		
<$15,000	$16,524	$2,557
$15,000–$29,999	$15,766	$4,866
$30,000–$49,999	$29,719	$10,317
$50,000–$74,999	$69,438	$28,880
$75,000–$99,999	$121,570	$58,572
$100,000–$149,999	$193,944	$100,833
$150,000+	$354,569	$195,076
Terminated	$131,962	$34,459
Age		
<25	$6,718	$2,240
25–34	$33,272	$13,265
35–44	$86,582	$32,664
45–54	$161,079	$56,722
55–64	$232,379	$84,714
65+	$255,151	$82,297
Gender		
Male	$156,121	$42,516
Female	$107,147	$29,095
Job tenure (years)		
0–1	$17,104	$3,709
2–3	$36,428	$14,724
4–6	$65,560	$31,753
7–9	$105,655	$56,500
10+	$267,627	$132,718

Source: Vanguard 2021.

Figure 53. Account balances by income and gender, 2020

Vanguard defined contribution plans permitting

Average	**Female**	**Male**	**All**
<$15,000	$14,807	$20,802	$16,524
$15,000–$29,999	$16,190	$17,690	$15,766
$30,000–$49,999	$31,085	$32,269	$29,719
$50,000–$74,999	$68,410	$76,573	$69,438
$75,000–$99,999	$121,131	$130,639	$121,570
$100,000–$149,999	$185,440	$216,829	$193,944
$150,000+	$316,688	$408,413	$354,569
Terminated	$110,906	$154,530	$131,962
Median			
<$15,000	$2,439	$2,966	$2,557
$15,000–$29,999	$4,989	$5,337	$4,866
$30,000–$49,999	$10,681	$11,658	$10,317
$50,000–$74,999	$28,674	$32,961	$28,880
$75,000–$99,999	$59,345	$64,627	$58,572
$100,000–$149,999	$97,289	$116,602	$100,833
$150,000+	$177,452	$230,975	$195,076
Terminated	$32,572	$38,578	$34,459

Source: Vanguard 2021.

Account balances are widely available on statements and websites and are often cited as participants' principal tool for monitoring investment results.

Because of ongoing contributions, account balances will appear to be less negatively impacted during falling markets. This "contribution effect" may mask the psychological impact of falling stock prices on participants.

Account balances by participant demographics

Median and average account balances vary considerably by participant demographics **(Figure 52)**. Income, age, and job tenure are among the factors influencing account balances. These three factors are intertwined. Not only does income, on average, tend to rise somewhat with age, making saving more affordable, but older participants generally save at higher rates. Also, the longer an employee's tenure with a firm, the more likely they are to earn a higher salary, participate in the plan, and contribute at higher levels. Longer-tenured participants also have higher balances because they have been contributing to their employer's plan for a longer period.

Gender also influences current balances. Fifty-six percent of Vanguard participants are male, and men have average and median balances that are almost 50% higher than those of women. Gender is often a proxy for other factors, such as income and job tenure.

Women in our sample tended to have lower incomes and shorter job tenure than men. However, as noted earlier in this report, women tended to save more than men at each respective income level.

Figure 54. Balances by industry sector, 2020

Vanguard defined contribution plans

	Average	Median
All	**$129,157**	**$33,472**
Agriculture, mining, and construction	$176,369	$44,769
Finance, insurance, and real estate	$154,841	$46,562
Business, professional, and nonprofit	$154,716	$38,777
Media, entertainment, and leisure	$151,110	$61,488
Manufacturing	$141,066	$41,149
Transportation, utilities, and communications	$102,411	$22,102
Education and health	$97,401	$23,992
Wholesale and retail trade	$87,390	$15,658

Source: Vanguard 2021.

A different picture emerges when account balances are compared based on income. When income is factored in, account balances are closer **(Figure 53)**. For example, female participants with incomes between $30,000 and $49,999 had average account balances that are within 4% of their male counterparts.

Balances by industry group

There are significant variations in account balances by industry sector, which reflect a complex mixture of firm characteristics (influencing employer contributions) and workforce demographics (influencing participant saving rates). Participants employed in the agriculture, mining, and construction industry group had average and median account balances that are about two times higher than some other industries **(Figure 54).**

02
Managing participant accounts

Participant investment decisions are a critical determinant of long-term retirement savings growth.

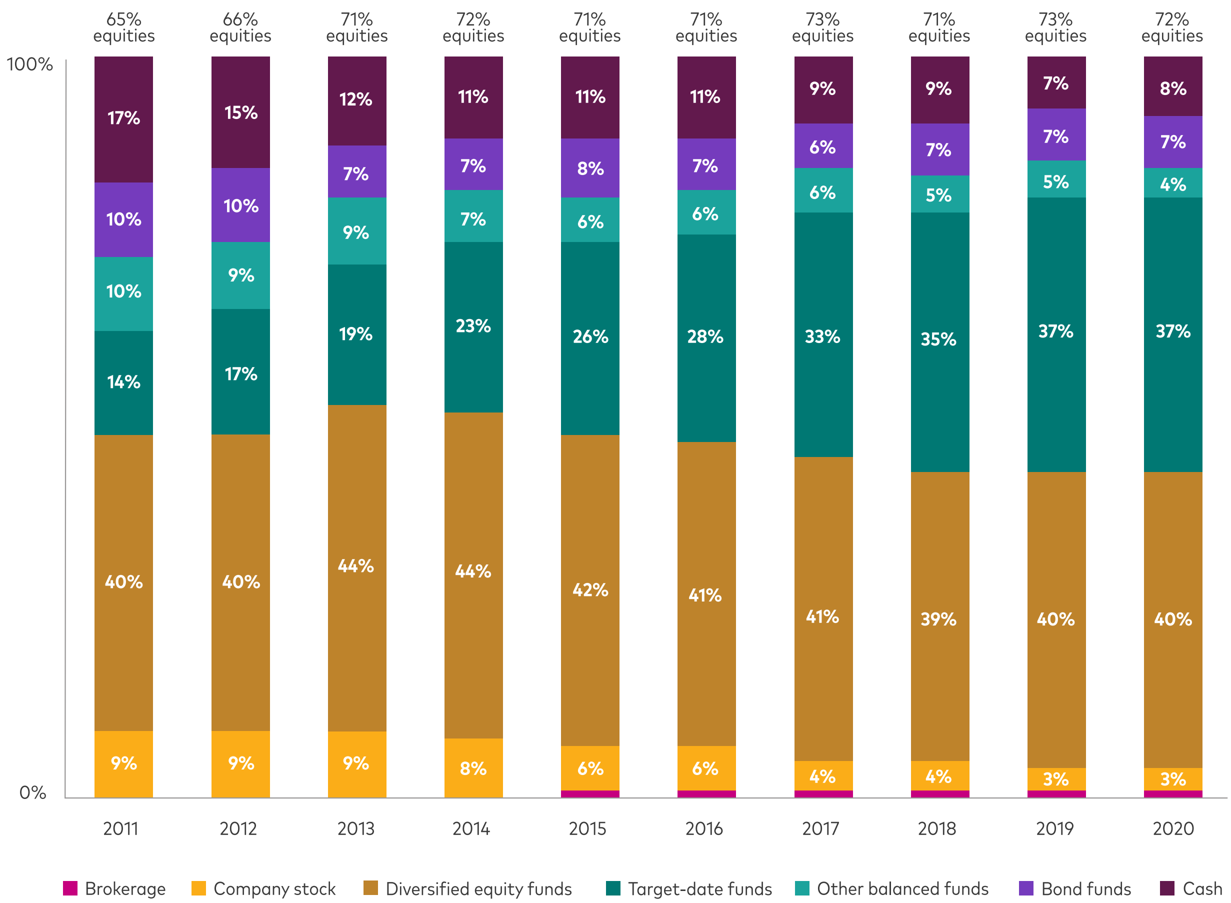
Asset and contribution allocations

The percentage of plan assets invested in equities stood at 72% in 2020 **(Figure 55).** The allocation to equities includes the equity component of balanced strategies. The overall equity allocation is up from 65% in 2011, a shift of 7 percentage points, due to the rise in equity markets as well as improved participant portfolio construction.

In 2020, investments in balanced strategies reached 41%, including 37% in target-date funds and 4% in other balanced options. The growth of target-date funds is dramatically reshaping DC plan investment patterns by increasing age-appropriate equity allocations and reducing extreme allocations.

Figure 55. Plan asset allocation summary

Vanguard defined contribution plans



Source: Vanguard 2021.

Seventy-seven percent of plan contribution dollars were invested in equities during 2020, and 6 in 10 plan contribution dollars were invested in target-date funds **(Figure 56)**.

Asset allocation by participant demographics

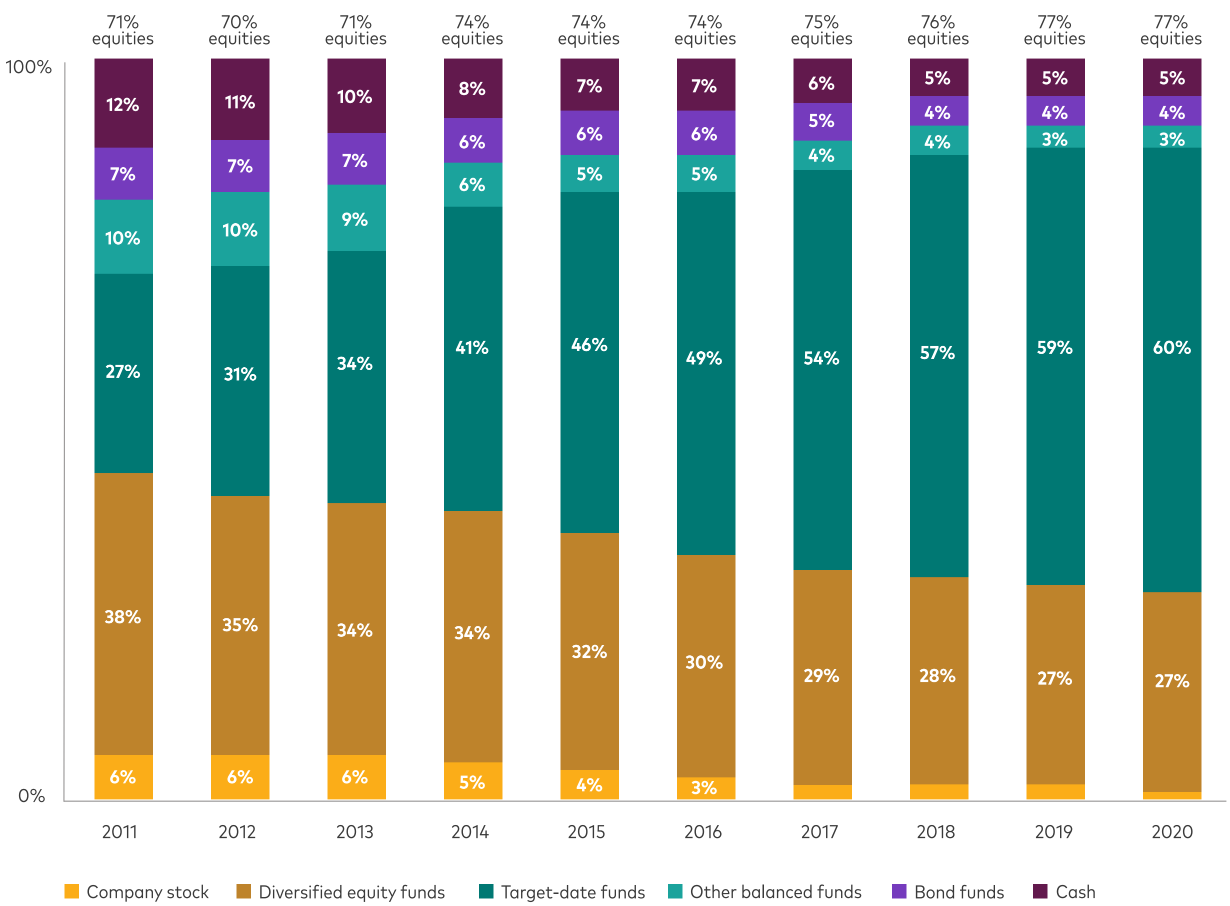
The average participant-weighted asset allocation to equities was 76% in 2020, and asset allocation decisions varied somewhat by participant demographics **(Figure 57)**. In the past, higher-income participants tended to assume somewhat more equity market risk, on average, than lower-income participants. However, with the rising adoption of target-date funds and automatic enrollment, lower-income participants now assume slightly more equity risk.

All participants, regardless of income level, had slightly more than three-quarters of their average account balance allocated to equities in 2020; at the median, participants allocated 86% to equities.

Participants younger than 45 had the highest equity exposure, with about 90% of plan assets, at the median, invested in equities in 2020. Equity allocations were lowest for participants older than 65, many of whom are currently retired or will soon retire. Participants older than 65 had a median equity allocation of 48%. The age-related variation in equity exposure has changed markedly because of the rising use of target-date funds (see page 74).

Figure 56. Plan contribution allocation summary

Vanguard defined contribution plans



Source: Vanguard 2021.

Figure 57. Asset allocation by participant demographics, 2020

Vanguard defined contribution plans

	Brokerage	Company stock	Diversified equity funds	Target-date funds	Other balanced funds	Bond funds	Cash	Average equity participant-weighted	Median equity participant-weighted
All asset-weighted	**1%**	**3%**	**40%**	**37%**	**4%**	**7%**	**8%**		
Average participant-weighted	**<0.5%**	**2%**	**21%**	**66%**	**2%**	**4%**	**6%**	**76%**	**86%**
Income									
<$15,000	1%	2%	31%	53%	2%	6%	5%	82%	89%
$15,000–$29,999	<0.5	2	25	59	3	5	6	80	89
$30,000–$49,999	<0.5	3	27	55	3	5	7	78	89
$50,000–$74,999	<0.5	3	34	47	4	6	7	77	86
$75,000–$99,999	<0.5	3	38	42	4	7	7	77	85
$100,000–$149,999	1	3	41	38	4	7	7	77	85
$150,000+	1	2	44	35	4	8	7	76	83
Terminated	1	4	40	31	4	8	12	73	83
Age									
<25	<0.5%	1%	15%	80%	1%	1%	1%	88%	89%
25–34	1	2	22	70	2	2	1	88	90
35–44	1	2	36	52	3	4	3	84	89
45–54	1	3	46	35	4	6	6	75	76
55–64	1	3	42	30	5	9	10	62	65
65+	1	3	37	24	6	11	18	48	48
Gender									
Male	1%	3%	41%	35%	4%	7%	9%	76%	85%
Female	<0.5	2	39	39	4	7	8	75	84
Job tenure (years)									
0–1	1%	1%	23%	67%	2%	3%	3%	83%	89%
2–3	1	1	23	68	2	3	3	82	89
4–6	1	1	25	65	2	4	3	81	89
7–9	1	2	29	58	3	4	4	78	87
10+	1	3	44	29	5	8	10	68	75
Account balance									
<$10,000	<0.5%	2%	9%	84%	1%	1%	3%	79%	89%
$10,000–$24,999	<0.5	2	14	76	2	2	4	78	89
$25,000–$49,999	<0.5	2	19	69	2	3	5	77	87
$50,000–$99,999	<0.5	2	24	60	3	4	7	75	83
$100,000–$149,999	<0.5	2	29	53	3	5	7	74	82
$150,000–$199,999	<0.5	2	33	47	4	6	8	73	82
$200,000–$249,999	<0.5	2	36	44	4	6	8	72	81
$250,000+	1	3	46	28	5	9	9	71	78

Source: Vanguard 2021.

Asset allocation by plan size and industry group

The average allocation to equities did not vary by plan size in 2020 **(Figure 58)**. However, among larger plans there was a modest substitution of company stock holdings for other assets. Large plans are more likely than small plans to offer company stock and, as a result, certain large firms have significantly higher exposure to company stock as an asset class.

Company stock accounted for 3% of assets for all DC plans at Vanguard. Among large plans, 3% of assets were allocated to company stock at year-end 2020, compared with a 1%-or-less allocation among small plans. These averages include plans offering—and plans not offering—company stock. The averages for those plans actively offering company stock to participants were higher (see page 86).

Balanced funds, including target-date funds, accounted for 41% of assets for all DC plans at Vanguard. Among smaller plans, 37% of assets were allocated to balanced funds at year-end 2020, compared with 41% among larger plans. Larger plans are more likely to have adopted automatic enrollment, with the target-date funds as the default investment.

Overall, asset allocations vary somewhat by industry group **(Figure 59)**. Participants in the media, entertainment, and leisure group had the most aggressive allocations. While participants in the agriculture, mining, and construction group had the highest allocations to company stock as well as the highest allocations to cash.

Figure 58. Asset allocation by plan size, 2020

Vanguard defined contribution plans

	Plan participants				
	<500	**500–999**	**1,000–4,999**	**5,000+**	**All plans**
Total equity asset weighted	**70%**	**70%**	**71%**	**72%**	**72%**
Brokerage	2	1	1	1	1
Company stock	<0.5	<0.5	1	3	3
Diversified equity	44	41	40	40	40
Target-date funds	30	36	37	37	37
Other balanced funds	7	5	5	4	4
Bond funds	8	7	7	7	7
Cash	8	9	9	8	8

Source: Vanguard 2021.

Figure 59. Asset allocation by industry group, 2020

Vanguard defined contribution plans

	Brokerage	Company stock	Diversified equity funds	Target-date funds	Other balanced funds	Bond funds	Cash	Average equity participant-weighted	Median equity participant-weighted
All asset-weighted	**1%**	**3%**	**40%**	**37%**	**4%**	**7%**	**8%**		
Average participant-weighted	**<0.5%**	**3%**	**19%**	**65%**	**5%**	**3%**	**5%**	**76%**	**86%**
Industry group									
Media, entertainment, and leisure	1%	<0.5%	36%	46%	6%	6%	5%	78%	89%
Business, professional, and nonprofit	1	3	43	34	4	8	7	77	87
Transportation, utilities, and communications	<0.5	5	44	28	6	8	10	77	87
Agriculture, mining, and construction	<0.5	6	34	39	4	6	12	76	85
Manufacturing	<0.5	4	37	40	3	7	9	75	84
Education and health	1	<0.5	40	37	6	8	7	75	84
Finance, insurance, and real estate	1	2	40	36	2	8	10	75	86
Wholesale and retail trade	<0.5	3	45	32	1	8	10	75	85

Source: Vanguard 2021.

Plan investment options

Participant DC plan investment decisions occur within the context of a set or a menu of choices offered by the employer.

Number of options offered

The average Vanguard plan offered 27.4 investment options in 2020, essentially unchanged from 27.2 investment options in 2019 and 26.8 options in 2011 **(Figure 60)**. When each distinct target-date (or target-risk) fund is counted as a single offering, the average number of investment options for 2020 was 17.5. By this measure, sponsors have dropped one investment option on a net basis since 2011—not the one additional option implied by the aggregate number.

The number of funds used by participants has declined. This is directly attributable to the growth of target-date funds. Counting a target-date or target-risk series as a single-fund offering, the median plan sponsor offered 16 investment options in 2020. Only 8% of plans offered more than 25 distinct investment options, while 10% of plans offered 10 or fewer **(Figure 61)**.

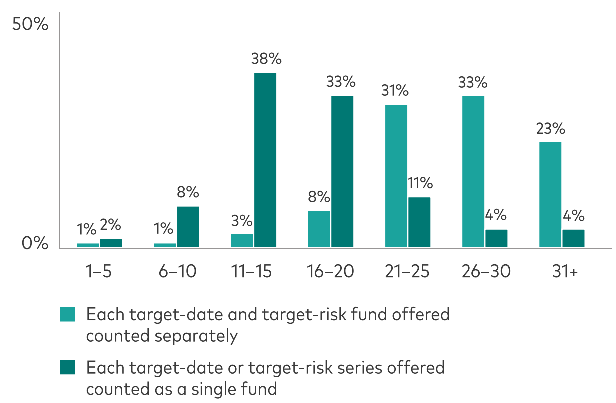
Types of options offered

Nearly all Vanguard DC plans offer an array of investment options covering four major investment categories: equities, bonds, balanced funds (including target-date and target-risk strategies), and money market or stable value options **(Figure 62)**. Given most sponsors' desire to promote equity-oriented portfolios for retirement, diversified equity funds continued to be the most popular type of fund offered. Equity offerings typically included both indexed and actively managed U.S. stock funds, including large-, mid-, or small-capitalization stocks, as well as one or more international funds.

Figure 61. Number of options offered, 2020

Vanguard defined contribution plans

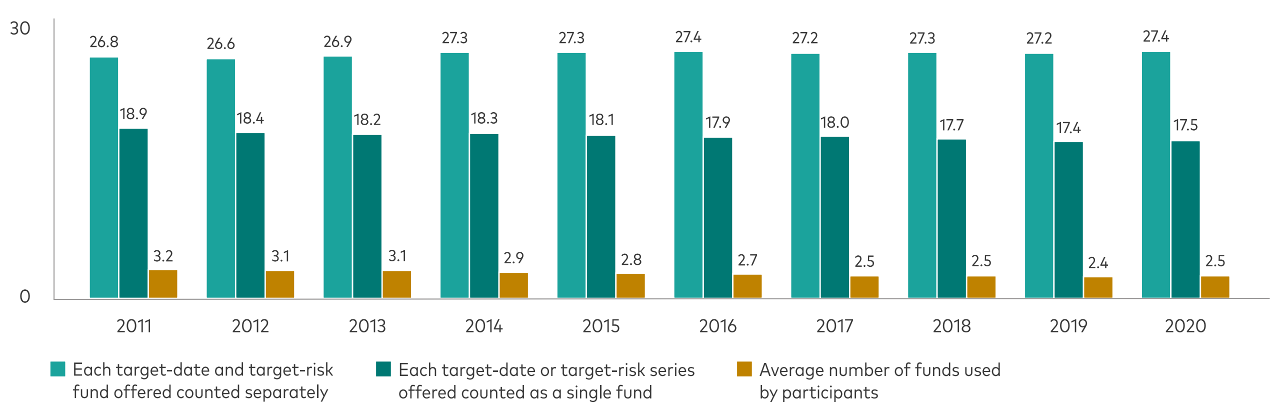
Percentage of plans offering



Source: Vanguard 2021.

Figure 60. Average number of investment options offered and used

Vanguard defined contribution plans



Source: Vanguard 2021.

Figure 62. Type of investment options offered, 2020

Vanguard defined contribution plans

	Number of participants				
	All	**<500**	**500–999**	**1,000–4,999**	**5,000+**
Cash	**99%**	**98%**	**>99.5%**	**>99.5%**	**99%**
Money market	67	70	67	63	63
Stable value/Investment contract	66	61	69	70	77
Bond funds	**98%**	**97%**	**99%**	**>99.5%**	**99%**
Active	78	72	82	84	88
Index	89	88	88	88	96
Inflation-protected securities	34	32	32	35	40
Multisector	7	6	6	10	5
High-yield	18	18	18	17	15
International	19	19	21	19	13
Global	4	2	5	6	4
Emerging markets	1	1	1	<0.5	2
Balanced funds	**99%**	**98%**	**>99.5%**	**>99.5%**	**100%**
Traditional balanced	64	70	60	59	56
Target-risk	14	20	8	9	6
Target-date	95	90	98	99	99
Equity funds	**99%**	**98%**	**>99.5%**	**100%**	**100%**
Domestic equity funds	**99%**	**98%**	**>99.5%**	**100%**	**100%**
Large-cap index	96	95	97	97	94
Large-cap active	71	75	70	67	62
Large-cap value	87	89	86	90	78
Large-cap growth	90	91	91	91	87
Large-cap blend	98	97	99	100	99
Mid-cap index	81	77	86	84	82
Mid-cap active	53	55	50	55	45
Small-cap index	61	65	62	60	44
Small-cap active	34	41	34	23	29
Socially responsible	12	10	10	12	23
International equity funds	**97%**	**96%**	**98%**	**99%**	**98%**
Index international	76	69	78	82	90
Active international	82	79	87	86	84
Emerging markets	34	33	35	39	30
Global equity funds	**18%**	**22%**	**12%**	**12%**	**23%**
Sector funds	**36%**	**39%**	**35%**	**36%**	**24%**
Company stock	**8%**	**2%**	**5%**	**13%**	**29%**
Self-directed brokerage	**20%**	**17%**	**19%**	**18%**	**38%**
Managed account program	**39%**	**19%**	**45%**	**60%**	**72%**

Source: Vanguard 2021.

Virtually all plans offered international equity funds, but only one-third offered separate emerging markets funds. Many of the broader international funds already include emerging markets exposure, as do target-date and some balanced strategies. Thirty-six percent of plans offered sector funds, such as technology or health care funds **(Figure 63)**. One in 5 plans offered a self-directed brokerage feature. Meanwhile, plan sponsor interest in target-date funds remains strong. At year-end 2020, 95% of plans offered target-date funds.

The types of investment options offered do not vary substantially by plan size. However, large plans are much more likely than small plans to offer company stock, self-directed brokerage accounts, and managed account programs. In addition, larger plans have been quicker than smaller plans to add target-date and inflation-protected securities funds. Smaller plans are more likely to offer sector funds than are large plans.

Tiering

Tiering is a clear, effective way to present plan investment choices to participants. Investment options are presented in categories or tiers. Typically, tiers are all-in-one options, such as target-date or risk-based balanced funds; an index core; and supplemental investment options. Many Vanguard plan sponsors tier their investment lineup.

All index

Money market, stable value, and company stock funds, by definition, are not indexed funds. Excluding these nonindexed options, only 3% of all Vanguard plans offered an all-index menu in 2020.

Index core

A newer development in investment menu design is offering a passive (or index) core. A passive core is a comprehensive set of low-cost index options that span the global capital markets. In our definition, a passive core, at a minimum, consists of four options covering U.S. equities, non-U.S. equities, U.S. taxable bonds, and cash. A passive core of these four options offers participants broad diversification, varying levels of risk exposure, and very low investment costs.

In 2020, 67% of Vanguard plans offered at least four options within an index core **(Figure 64)**. Because larger plans have been quicker to offer this approach, 7 in 10 Vanguard participants were offered an index core. In addition, many of these plans also offered a passive target-date fund to further simplify participant portfolio construction. Sixty-four percent of plans offered both an index core and passive target-date funds, and 7 in 10 participants had access to

Figure 63. Types of sector options offered, 2020

Vanguard defined contribution plans

	Number of participants				
	All	**<500**	**500–999**	**1,000–4,999**	**5,000+**
Sector funds	**36%**	**39%**	**35%**	**36%**	**24%**
Real estate	32	33	32	33	24
Health care	9	12	9	6	4
Energy	5	6	5	4	3
Precious metals	3	3	1	2	2
Technology	3	3	4	2	1
Utilities	1	1	1	1	2
Natural resources	1	1	1	1	1
Financials	<0.5	<0.5	<0.5	<0.5	1
Communications	<0.5	<0.5	1	0	1
Commodities	<0.5	<0.5	0	<0.5	1
Consumer	<0.5	<0.5	1	<0.5	1
Industrials	<0.5	0	<0.5	0	1

Source: Vanguard 2021.

Figure 64. Index core offered, 2020

Vanguard defined contribution plans

	Number of participants				
	All	**<500**	**500–999**	**1,000–4,999**	**5,000+**
Percentage of plans offering an index core	67%	61%	72%	73%	76%
Percentage of plans offering an index core and target-date funds	64	56	70	72	75
Percentage of participants offered an index core	71	65	72	74	70
Percentage of participants offered an index core and target-date funds	70	61	70	73	70

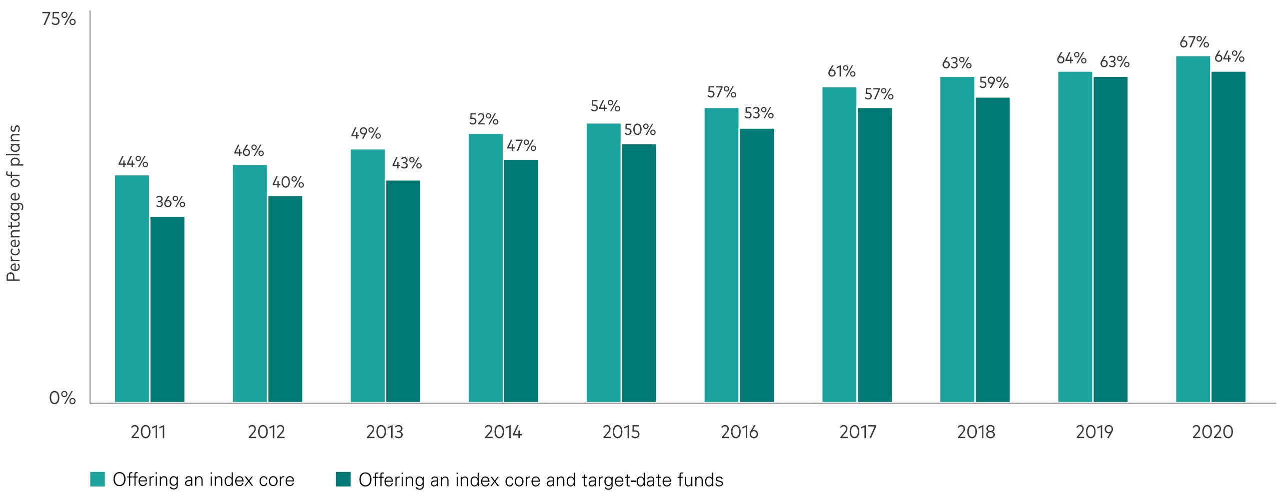
An index core includes broadly diversified index funds for U.S. stocks, U.S. bonds, and international stocks. At a minimum, the definition includes index funds for large-cap U.S. stocks, intermediate or long-term bonds, and developed markets.

Source: Vanguard 2021.

these fund lineups. In 2011, 44% of plans offered an index core, and 36% offered both an index core and passive target-date funds **(Figure 65)**. In 2011, 53% of participants were offered an index core, and one-half were offered both an index core and passive target-date funds **(Figure 66).**

Figure 65. Index core offered trend, plans

Vanguard defined contribution plans

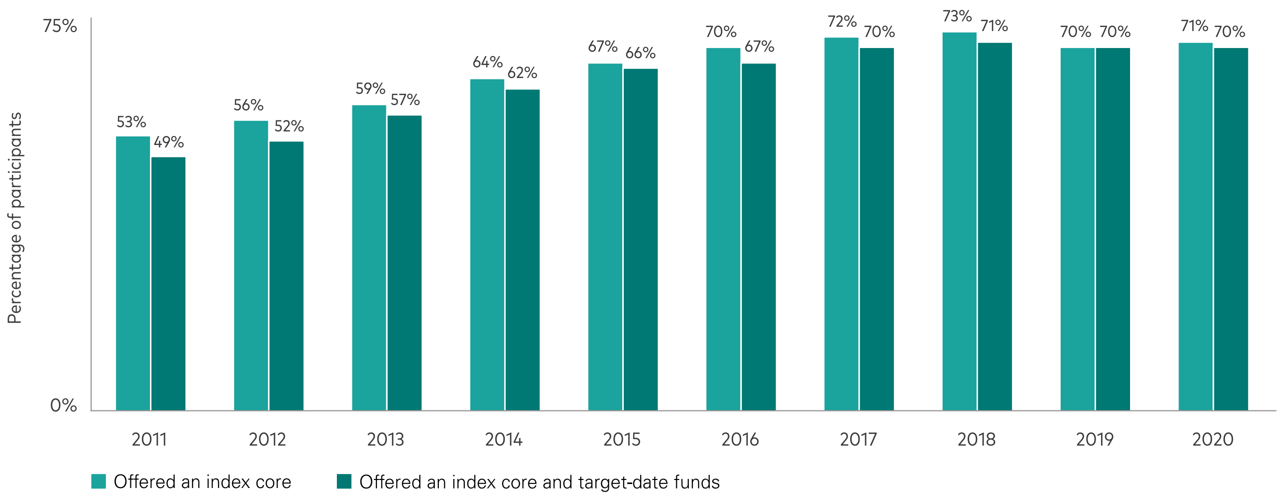


An index core includes broadly diversified index funds for U.S. stocks, U.S. bonds, and international stocks. At a minimum, the definition includes index funds for large-cap U.S. stocks, intermediate or long-term bonds, and developed markets.

Source: Vanguard 2021.

Figure 66. Index core offered trend, participants

Vanguard defined contribution plans



An index core includes broadly diversified index funds for U.S. stocks, U.S. bonds, and international stocks. At a minimum, the definition includes index funds for large-cap U.S. stocks, intermediate or long-term bonds, and developed markets.

Source: Vanguard 2021.

Default funds

Increasingly, participants are being directed into plan sponsor-selected default investments rather than making their own active investment choices. Default investing is becoming more important because of concerns about participants' lack of investment knowledge, as well as the growing use of automatic enrollment. In response to these developments, the U.S. Department of Labor (DOL), acting under the Pension Protection Act of 2006 (PPA), deemed three types of default investments as eligible for special fiduciary protection. These options, known as qualified default investment alternatives (QDIAs), include target-date funds, other balanced funds, and managed account advisory services.

Nearly all Vanguard plans have designated a default fund, and 92% had selected a target-date or balanced fund option as the default option in 2020 **(Figure 67)**. In 2011, about 2 in 10 plan sponsors had designated a money market or stable value fund as the default option **(Figure 68)**.

Eighty-seven percent of plans in 2020 had specifically designated a QDIA under the DOL's regulations. Typically, these were plans with automatic enrollment or employer contributions other than a match. Among plans choosing a QDIA, 97% of designated QDIAs were target-date funds and 3% were balanced funds.

Figure 67. Default fund designations, 2020

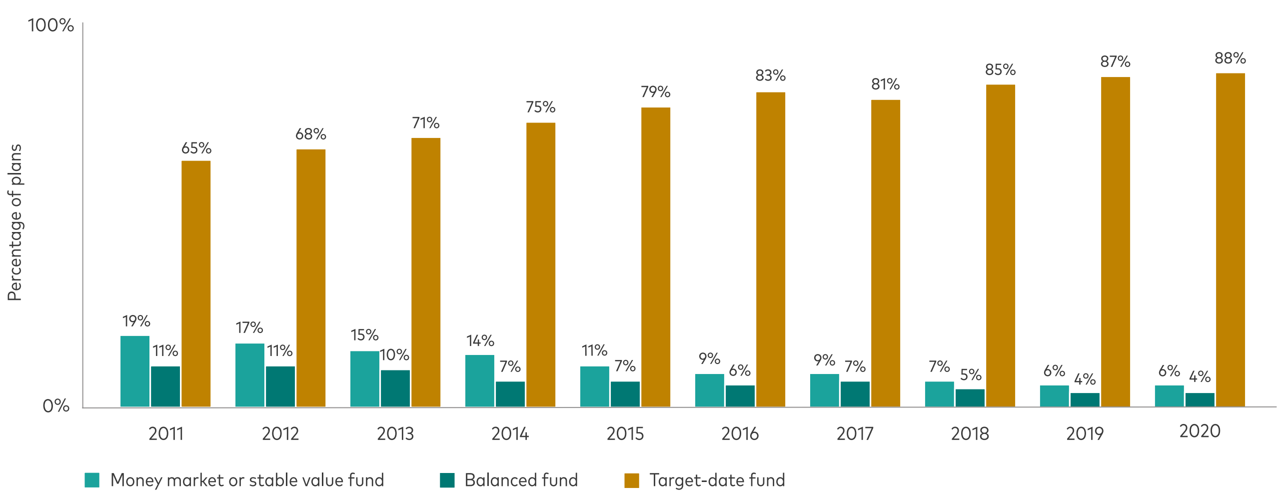
Vanguard defined contribution plans

	QDIA plans	Non-QDIA plans	All plans
Among all plans			
Target-date fund	84%	4%	88%
Balanced fund	3	1	4
Money market or stable value		6	6
Total plans designating default	**87%**	**11%**	**98%**
Among plans designating a QDIA			
Target-date fund	97%		
Balanced fund	3		
Total plans designating a QDIA	**100%**		

Source: Vanguard 2021.

Figure 68. Default fund designation trend

Vanguard defined contribution plans

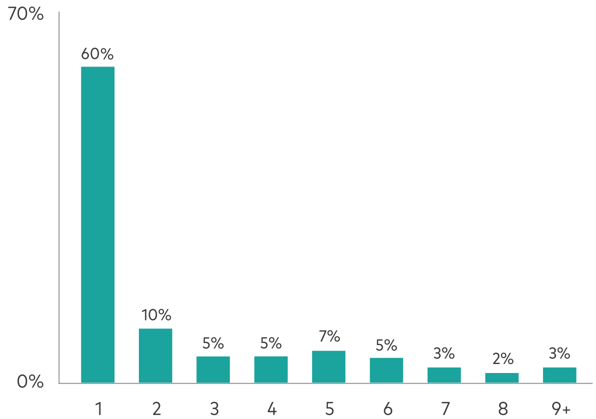


Source: Vanguard 2021.

Figure 69. Number of options used, 2020

Vanguard defined contribution plans

Percentage of participants using



Source: Vanguard 2021.

Number of options used

Although sponsors tend to offer a large menu of investment choices, 60% of participants used only one fund in 2020 **(Figure 69)**. On average, Vanguard participants used 2.5 options, and the median participant used just 1 option—fewer than the 3.2 options used in 2011. The median participant used just 2 funds in 2011.

One reason for this change is the growing number of single target-date fund investors. In 2020, 60% of participants held a single-fund option in their account **(Figure 70)**. Ninety-one percent of these participants were invested in a single target-date fund. Since 2011, the percentage of single-fund investors holding cash investments has declined from 16% to 4% due to the growth of automatic enrollment, the availability of target-date funds, and a shift in default fund designations by employers.

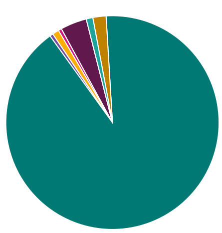
Types of options used

Which options offered by DC plans do participants actually use? In 2020, a balanced fund (including target-date and other balanced funds) was the most common participant holding (85% of all participants), followed by a diversified domestic equity fund (33% of all participants) **(Figure 71)**. Among the balanced options held, target-date funds were overwhelmingly more likely to be held (80% of participants offered) than traditional balanced funds (14% of participants offered) or target-risk funds (7% of participants offered).

Figure 70. Single-fund holders, 2020

Vanguard defined contribution plans

Percentage of single-fund participants using



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Percentage of participants holding a single fund	**41%**	**43%**	**44%**	**48%**	**51%**	**55%**	**59%**	**60%**	**62%**	**60%**
Percentage of single-fund participants using										
Cash	16%	14%	11%	8%	7%	6%	5%	4%	4%	4%
Bond funds	1	1	1	1	1	1	<0.5	1	<0.5	<0.5
Traditional balanced funds	5	4	3	3	3	5	4	4	4	1
Target-risk funds	10	9	10	2	1	1	<0.5	<0.5	<0.5	<0.5
Target-date funds	59	64	69	81	84	83	87	87	88	91
Diversified equity funds	5	4	4	4	3	3	2	2	2	2
Company stock	4	4	2	1	1	1	1	1	1	1

Source: Vanguard 2021.

Figure 71. Type of investment options offered and used, 2020

Vanguard defined contribution plans

	Percentage of plans offering	Percentage of participants offered	Percentage of participants offered using	Percentage of all participants using
Cash	**99%**	**>99.5%**	**14%**	**14%**
Money market	67	59	7	4
Stable value/Investment contract	66	78	13	11
Bond funds	**98%**	**99%**	**19%**	**19%**
Active	78	89	8	<0.5
Index	89	94	16	15
Inflation-protected securities	34	40	3	1
Multisector	7	5	3	<0.5
High-yield	18	14	5	1
International	19	15	3	<0.5
Global	4	3	2	<0.5
Emerging markets	1	3	3	<0.5
Balanced funds	**99%**	**>99.5%**	**85%**	**85%**
Traditional balanced	64	59	14	8
Target-risk	14	7	7	1
Target-date	95	99	80	80
Equity funds	**99%**	**>99.5%**	**33%**	**33%**
Domestic equity funds	**99%**	**>99.5%**	**32%**	**32%**
Large-cap index	96	92	24	22
Large-cap active	71	64	15	10
Large-cap value	87	82	10	8
Large-cap growth	90	89	14	13
Large-cap blend	98	99	24	24
Mid-cap index	81	81	15	12
Mid-cap active	53	40	8	3
Small-cap index	61	41	10	4
Small-cap active	34	29	7	2
Socially responsible	12	26	5	1
International equity funds	**97%**	**98%**	**20%**	**20%**
Index international	76	89	14	13
Active international	82	86	12	10
Emerging markets	34	33	9	3
Global equity funds	**18%**	**26%**	**4%**	**1%**
Sector funds	**36%**	**25%**	**7%**	**2%**
Company stock	**8%**	**25%**	**37%**	**9%**
Self-directed brokerage	**20%**	**33%**	**1%**	**<0.5%**
Managed account program	**39%**	**71%**	**10%**	**7%**

Source: Vanguard 2021.

More than 90% of participants were offered a large-cap U.S. equity index fund in 2020, yet only one-quarter used that option. However, participants holding balanced strategies (whether traditional, target-date, or target-risk) are often holding substantial equity index exposure. When participants holding index investments through all balanced options are factored in, 81% of Vanguard participants hold some U.S. equity index exposure.

Only 1 in 5 participants chose to hold a bond fund, and about 1 in 7 chose a money market or stable value cash investment.

Most Vanguard DC participants were offered a stand-alone international equity fund, but only one-fifth of them chose to use one. Emerging markets funds were offered and used even less frequently; 1 in 3 participants had access to them, and only 9% of those chose to use one. Increasingly, international equity exposure is occurring through packaged investment programs, such as target-date funds.

Sector funds were offered to one-quarter of participants in 2020 and were also used infrequently; only 7% of participants offered these funds used them **(Figure 72)**.

One in 3 Vanguard participants were offered a self-directed brokerage feature. Self-directed brokerage accounts allow participants to choose investments from thousands of individual stocks, bonds, and mutual funds. In plans offering a self-directed brokerage feature, only 1% of these participants used the feature in 2020. In these plans, about 2% of plan assets were invested in the self-directed brokerage feature.[3]

Professionally managed allocations

The most notable effect of plan investment menus on participant choices is the expanded offering and use of professionally managed allocations. Participants with professionally managed allocations have their entire account balance invested in a single target-date, target-risk, or traditional balanced fund or in a managed account advisory service.

In 2020, 62% of Vanguard participants were invested in a professionally managed allocation **(Figure 73)**.

Driving this development is the growing use of target-date funds. Fifty-four percent of participants were invested in a single target-date fund in 2020, more than twice as many as in 2011. These professionally managed investment options signal a shift in responsibility for investment decision-making away from the participant and toward employer-selected investment and advice programs.

[3] For an analysis of participant brokerage holdings in DC plans, see John A. Lamancusa and Jean A. Young, *The Brokerage Option in DC Plans*, May 2020, Vanguard research, institutional.vanguard.com

Figure 72. Type of sector options offered and used, 2020

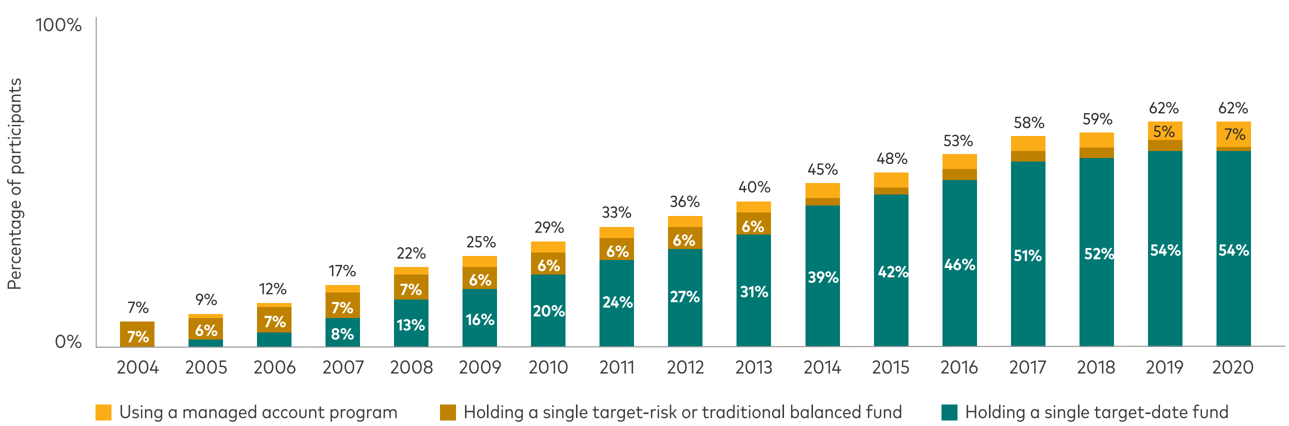
Vanguard defined contribution plans

	Percentage of plans offering	Percentage of participants offered	Percentage of participants offered using	Percentage of all participants using
Sector funds	**36%**	**25%**	**7%**	**2%**
Real estate	32	24	6	1
Health care	9	4	6	<0.5
Energy	5	3	3	<0.5
Precious metals	3	1	2	<0.5
Technology	3	1	5	<0.5
Utilities	1	1	2	<0.5
Natural resources	1	1	3	<0.5
Financials	<0.5	<0.5	<0.5	<0.5
Communications	<0.5	<0.5	1	<0.5
Commodities	<0.5	<0.5	3	<0.5
Consumer	<0.5	<0.5	1	<0.5
Industrials	<0.5	<0.5	<0.5	<0.5

Source: Vanguard 2021.

Figure 73. Participants with professionally managed allocations

Vanguard defined contribution plans



Source: Vanguard 2021.

Professionally managed allocation strategy users are quite distinct from nonusers, and users of each of the three types of managed allocations are quite different from one another **(Figure 74)**. Participants who construct their own portfolios tend to be older and longer tenured with higher average and median balances. Single target-date fund investors are shorter tenured with lower account balances and are more likely to be in an automatic enrollment plan and to have been defaulted into the fund. In contrast, managed account investors are older, longer tenured, and have higher balances. Finally, some plan sponsors have opted to reenroll participants into the plan's QDIA. This most often occurs when changing providers. One percent of single target-date fund investors were reenrolled in 2020.

Target-date funds

Target-date funds base portfolio allocations on an expected retirement date; allocations grow more conservative as the participant approaches the fund's target year. The percentage of plans offering target-date funds has grown from 82% in 2011 to 95% in 2020 **(Figure 75)**. At year-end 2020, nearly all participants were in plans offering target-date funds.

Among plans offering the strategy, target-date options accounted for 37% of plan assets **(Figure 76)**. In these plans, 60% of all contributions were directed to target-date funds.

Figure 74. Demographic characteristics of participants with professionally managed allocations, 2020

Vanguard defined contribution plans

	All	All other participants	Single target-date fund	Single balanced fund	Managed account
Percentage of participants		38%	54%	1%	7%
Percentage male	56%	60%	54%	61%	57%
Median age	44	50	39	47	49
Median tenure	7	14	4	11	12
Average account balance	$129,157	$232,783	$49,880	$103,806	$179,347
Median account balance	$33,472	$98,002	$13,714	$33,418	$81,492
Percentage web-registered	79%	82%	70%	69%	96%
Percentage defaulted under automatic enrollment	33%		61%	13%	
Percentage defaulted under reenrollment	1%		1%	<0.5%	

Source: Vanguard 2021.

Figure 75. Use of target-date funds

Vanguard defined contribution plans

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Percentage of all plans offering target-date funds	82%	84%	86%	88%	90%	92%	92%	93%	94%	95%
Percentage of recordkeeping assets in target-date funds	14	17	19	23	26	28	33	35	37	37
Percentage of all contributions directed to target-date funds	27	31	34	41	46	49	54	57	59	60
Percentage of all participants offered target-date funds	87	88	90	97	98	97	97	97	98	99
Percentage of all participants using target-date funds	47	51	55	64	69	72	75	77	78	80

Source: Vanguard 2021.

Figure 76. Plan use of target-date funds

Vanguard defined contribution plans offering target-date funds

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Percentage of plan assets invested in target-date funds	**17%**	**19%**	**20%**	**24%**	**26%**	**29%**	**33%**	**35%**	**37%**	**37%**
Percentage of plan contributions invested in target-date funds	**31%**	**35%**	**38%**	**42%**	**47%**	**50%**	**55%**	**58%**	**60%**	**60%**
Distribution of percentage of plan assets in target-date funds										
<10%	31%	25%	21%	16%	13%	11%	9%	7%	6%	5%
10%–19%	34	34	31	28	26	22	19	16	14	13
20%–29%	17	20	23	25	25	25	23	23	20	20
30%–39%	7	8	10	11	13	15	18	18	20	22
40%–49%	4	4	5	7	8	9	10	12	13	13
50%+	7	9	10	13	15	18	21	24	27	27
Distribution of percentage of plan contributions to target-date funds										
<10%	13%	9%	7%	6%	4%	4%	3%	2%	1%	2%
10%–19%	20	17	14	10	8	7	6	4	4	3
20%–29%	25	23	21	17	14	10	8	8	7	6
30%–39%	19	21	22	22	18	17	14	12	9	9
40%–49%	10	13	16	17	21	20	19	18	16	14
50%+	13	17	20	28	35	42	50	56	63	66

Source: Vanguard 2021.

Note: Investments in target-date funds are subject to the risks of their underlying funds. The year in the fund name refers to the approximate year (the target date) when an investor in the fund would retire and leave the workforce. The fund will gradually shift its emphasis from more aggressive investments to more conservative ones based on its target date. An investment in target-date funds is not guaranteed at any time, including on or after the target date.

Target-date funds are replacing target-risk funds, which maintain a static risk allocation **(Figure 77)**. Since 2006, when the PPA was passed, the fraction of plans offering target-risk funds as an investment option declined from 41% of plans to 14% of plans. However, 12% of plans maintain both target-risk and target-date funds.

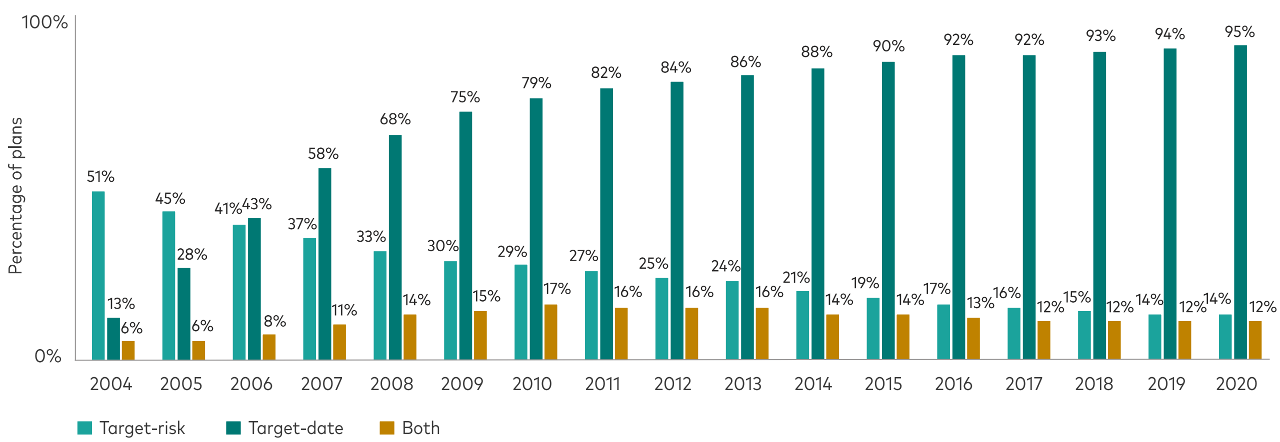
Participant use of target-date funds

Among participants using target-date funds, 59% of account balances were invested in these funds **(Figure 78)**. These target-date participants directed 81% of their 2020 total contributions to target-date funds. Participants invest in target-date funds in one of two ways. "Pure" investors hold a single target-date fund. They accounted for 67% of all target-date investors in 2020. The remaining target-date investors are "mixed" investors. They hold a target-date fund in combination with other investments or, less commonly, multiple target-date funds and/or other options.

Figure 77. Trend in plan adoption of target-date and target-risk funds

Vanguard defined contribution plans

Percentage of plans offering



Source: Vanguard 2021.

Figure 78. Participant use of target-date funds

Vanguard defined contribution plan participants using target-date funds

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Percentage of all participants offered target-date funds	**87%**	**88%**	**90%**	**97%**	**98%**	**97%**	**97%**	**97%**	**98%**	**99%**
Percentage of participants using target-date funds when offered	**54%**	**58%**	**61%**	**66%**	**70%**	**74%**	**75%**	**79%**	**80%**	**80%**
Percentage of participant account balances in target-date funds	**43%**	**46%**	**48%**	**50%**	**51%**	**53%**	**57%**	**58%**	**60%**	**59%**
Percentage of total participant and employer contributions in target-date funds	**71%**	**72%**	**74%**	**75%**	**76%**	**78%**	**80%**	**81%**	**81%**	**81%**
Distribution of percentage of participant assets in target-date funds										
1%–24%	21%	19%	17%	15%	14%	13%	11%	11%	10%	11%
25%–49%	10	10	10	9	9	8	8	8	8	9
50%–74%	8	8	8	7	7	6	5	5	5	4
75%–99%	8	7	7	7	7	7	7	6	6	6
100%	53	56	58	62	63	66	69	70	71	70
Distribution of percentage of total participant and employer contributions in target-date funds										
1%–24%	11%	11%	9%	9%	8%	8%	6%	6%	6%	7%
25%–49%	9	9	8	8	8	7	7	6	7	8
50%–74%	7	7	7	6	6	4	4	4	4	4
75%–99%	4	4	5	8	5	5	4	4	4	3
100%	69	69	71	69	73	76	79	80	79	78
Percentage of participants owning										
One target-date fund only	52%	54%	56%	60%	62%	65%	67%	68%	69%	67%
One target-date fund plus other funds	41	38	36	33	31	28	26	26	25	27
Two or more target-date funds only	1	2	2	2	2	2	2	2	2	2
Two or more target-date funds plus other funds	6	6	6	5	5	5	5	4	4	4

Source: Vanguard 2021.

Figure 79. Participant use of target-date funds by age

Vanguard defined contribution plan participants using target-date funds

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Distribution of pure target-date fund holders by age										
<25	8%	7%	7%	6%	6%	7%	7%	7%	7%	6%
25–34	32	32	32	31	31	31	31	31	31	30
35–44	26	26	26	26	26	25	25	25	26	26
45–54	21	21	21	21	21	20	20	20	19	10
55–64	11	12	12	13	13	14	14	14	14	14
65+	2	2	2	3	3	3	3	3	3	4
Distribution of mixed target-date fund holders by age										
<25	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
25–34	19	18	18	17	17	17	17	17	17	17
35–44	27	26	26	26	25	25	25	25	25	25
45–54	30	30	29	29	28	28	27	27	26	26
55–64	20	20	21	22	23	23	23	23	23	23
65+	3	4	4	4	4	5	6	6	7	7
Percentage of all participants holding a single target-date fund by age										
<25	69%	69%	71%	76%	77%	82%	85%	84%	84%	84%
25–34	40	46	51	60	63	67	71	71	72	73
35–44	24	28	31	41	45	49	54	55	58	58
45–54	18	21	23	31	34	38	42	44	46	47
55–64	14	16	19	25	28	31	35	37	39	39
65+	11	13	15	20	23	25	28	30	32	31
Percentage of all participants holding target-date funds with other options by age										
<25	12%	14%	14%	14%	15%	11%	9%	9%	9%	11%
25–34	22	22	22	22	22	20	19	18	17	19
35–44	24	24	25	27	27	27	26	25	25	26
45–54	24	25	26	28	29	28	28	28	28	29
55–64	22	24	25	28	29	28	29	29	29	30
65+	17	18	20	22	24	24	24	25	25	28

Source: Vanguard 2021.

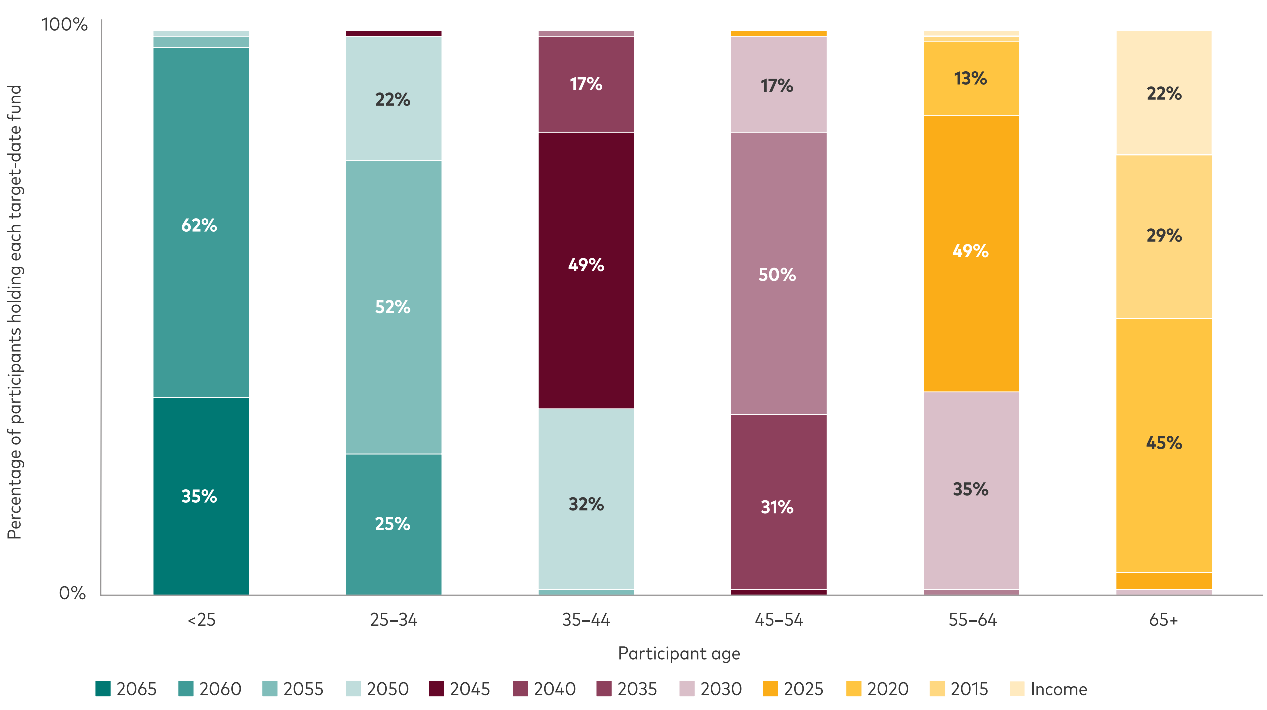
Pure target-date investors are more likely to be younger, lower-wage, shorter-tenured participants with lower 401(k) account balances than other investors. Meanwhile, mixed investors appear very much like non-target-date investors in terms of their demographic and portfolio characteristics. Sixty-two percent of single target-date fund investors were younger than 45 in 2020, compared with 44% of mixed investors **(Figure 79)**. Seventy-four percent of plan participants younger than 35 held a single target-date fund in 2020.

Mixed target-date investors arise through sponsor action as well as through participant choice. Sponsor actions leading to mixed investors include employer contributions in company stock; nonelective contributions to the plan's default fund; recordkeeping corrections applied to the plan's default fund; or mapping of assets from an existing investment option to the default fund because of a plan menu change. Mixed investors who choose to combine a target-date fund with other plan options appear to pursue a range of reasonable diversification strategies, although they do not fit within the all-in-one portfolio approach of the target-date concept.

Single target-date fund investors appear to select, or are defaulted into, a target-date fund with an appropriate target date **(Figure 80)**. Half of participants ages 25 to 34 were invested in a 2055 target-date fund in 2020, and most of the remaining participants were using either a 2050 or a 2060 target-date fund.

Figure 80. Target-date fund utilization by age, 2020

Vanguard defined contribution plan participants holding a single target-date fund (54% of all participants)



Percentage of single target-date fund holders

<25	25–34	35–44	45–54	55–64	65+
6%	30%	26%	20%	14%	4%

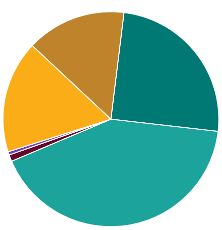
Source: Vanguard 2021.

Similarly, about one-half of participants ages 55 to 64 were invested in a 2025 target-date fund, and most of the remaining participants were using either a 2020 or a 2030 target-date fund.

Automatic enrollment into a target-date fund default is one important factor explaining the increase in the number of pure target-date investors. However, a large percentage of pure investors select target-date options voluntarily. Of the 67% of participants who were pure investors in 2020, a large portion of them were in plans not offering automatic enrollment. Thirty-seven percent of pure investors were in plans where participants made the choice to select the fund **(Figure 81)**.

Figure 81. Plan design and target-date funds, 2020

Vanguard defined contribution plan participants holding target-date funds



- 25% Voluntary-enrollment pure investors holding a single target-date fund
- 42% Automatic-enrollment pure investors holding a single target-date fund
- 1% Reenrollment pure investors holding a single target-date fund
- 0.5% Reenrollment mixed investors holding target-date and other funds
- 17% Automatic-enrollment mixed investors holding target-date and other funds
- 15% Voluntary-enrollment mixed investors holding target-date and other funds

Source: Vanguard 2021.

Participant equity allocations

Equities are the dominant asset class holding of many plan participants. From an investment risk perspective, an asset allocation to equities of 80% or more appears appropriate considering the long-term retirement objectives of most DC plan participants.

The growing use of professionally managed allocations within DC plans, including target-date funds, is reshaping equity allocations by age and reducing extreme allocations.

Equity allocations by age

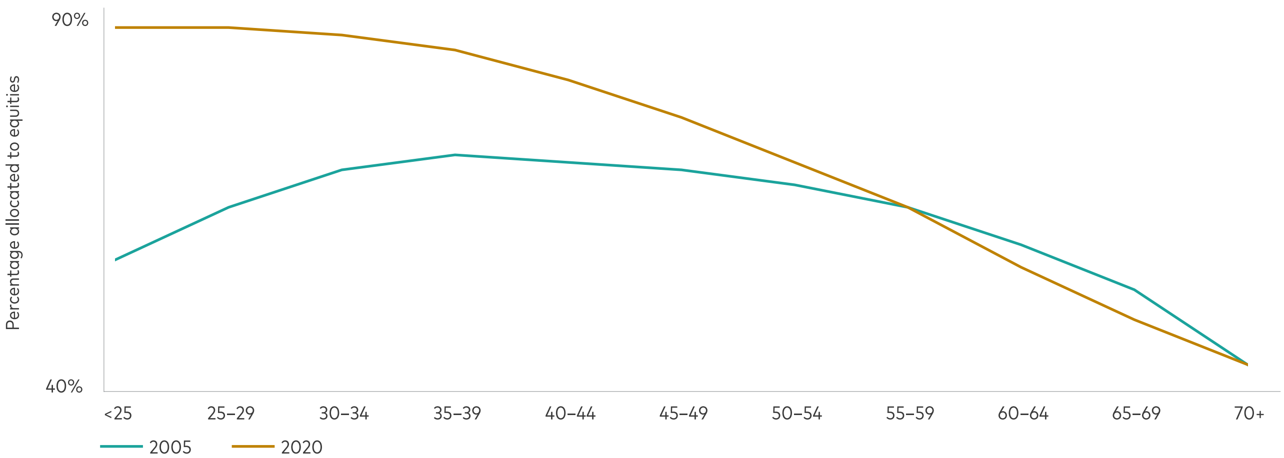
In prior reports, we have noted that participants' age-based equity allocation was hump-shaped, with younger participants adopting more conservative allocations, middle-age participants holding the highest equity exposure, and older participants having equity exposure on par with younger participants **(Figure 82)**. In 2020, the equity allocation among Vanguard DC participants is downward sloping by age. This phenomenon is tied directly to the growing use of target-date funds and the increased use of managed account advice, both of which provide for a declining equity exposure with age.

One development influencing this change is the growth of default funds under automatic enrollment and the designation of target-date funds as the most common type of default investment. However, participants choosing target-date funds on a voluntary basis are also contributing in a meaningful way to this change.

Figure 82. Trend in equity allocation by participant age

Vanguard defined contribution plans

Average equity allocation participant-weighted



Equity allocation by age	<25	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65–69	70+
2020	88%	88%	87%	85%	81%	76%	70%	64%	56%	49%	43%
2019	88	88	87	85	81	76	70	64	56	49	43
2018	88	87	86	84	80	75	69	62	55	47	42
2017	88	87	86	84	81	76	71	64	57	50	43
2016	87	87	85	83	80	75	69	63	56	49	43
2015	88	87	85	83	80	75	70	64	57	50	43
2014	87	86	84	82	79	75	70	64	57	51	45
2013	85	83	80	79	76	73	68	63	56	51	44
2012	85	81	78	76	74	70	65	59	53	48	41
2011	84	79	76	75	73	69	64	59	52	48	40
2010	82	77	75	75	73	70	66	60	54	49	41
2009	77	73	72	72	71	68	64	58	53	48	40
2008	73	70	70	71	69	66	62	57	52	47	39
2007	67	69	72	73	72	70	68	63	59	54	44
2006	61	66	70	72	71	70	67	64	59	54	44
2005	57	64	69	71	70	69	67	64	59	53	43

Source: Vanguard 2021.

The factors influencing age-related equity exposure in DC plans are undergoing a transition. On the one hand, existing participants make few changes in their allocations as they grow older because of inertia in financial decision-making. On the other hand, the growing use of professionally managed allocations is contributing to a sharper delineation of equity risk-taking by age.

Extreme equity allocations

The rising use of professionally managed allocations is also influencing extreme portfolio allocations **(Figure 83)**. The percentage of participants with no allocation to equities has fallen by three-quarters, from 13% in 2006, when the PPA was passed, to 3% in 2020. At the other extreme, the percentage of participants investing exclusively in equities has fallen from 19% to 5% over the same period.

One of the benefits of target-date funds is the elimination of extreme equity allocations. Participants who construct their own portfolios tend to hold greater extremes in equity exposure **(Figure 84, Panel D)**.

Figure 83. Distribution of equity exposure

Vanguard defined contribution plans

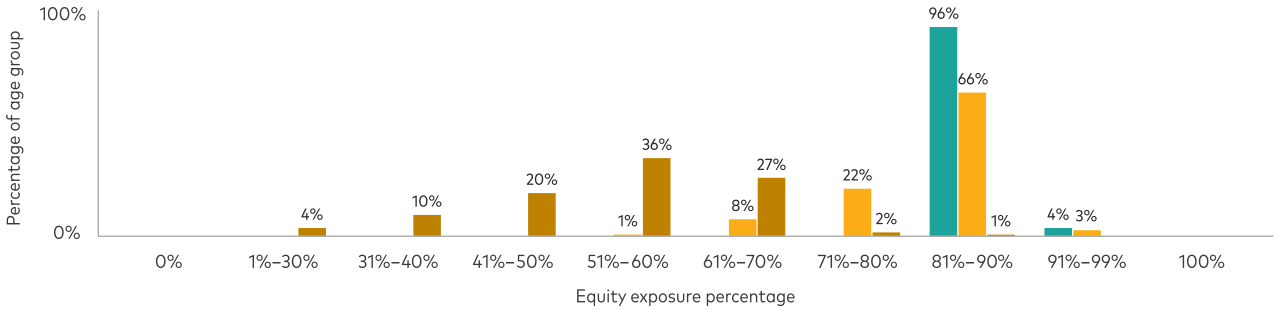
											Participant-weighted	
	0%	**1%–30%**	**31%–40%**	**41%–50%**	**51%–60%**	**61%–70%**	**71%–80%**	**81%–90%**	**91%–99%**	**100%**	**Average**	**Median**
Percentage of contributions to equities, 2020	**3%**	**2%**	**1%**	**3%**	**7%**	**10%**	**13%**	**50%**	**6%**	**5%**	**78%**	**85%**
Percentage of account balances in equities												
2020	3%	3%	2%	3%	7%	9%	12%	46%	10%	5%	76%	86%
2019	3	3	4	2	7	12	13	44	8	5	76	84
2018	3	3	4	2	6	13	13	42	8	6	75	84
2017	3	4	3	3	6	9	18	40	9	5	75	84
2016	4	4	4	3	6	10	16	38	9	6	74	83
2015	5	4	2	3	7	10	12	40	10	7	74	83
2014	5	4	3	2	8	10	13	37	10	8	74	83
2013	6	5	6	2	6	12	12	33	10	8	72	82
2012	7	6	5	4	7	10	15	28	9	9	69	79
2011	8	7	5	4	7	10	14	26	9	10	68	79
2010	9	6	3	6	6	10	12	26	9	13	68	79
2009	11	6	3	6	7	11	11	22	9	14	66	76
2008	11	7	4	4	9	12	11	18	8	16	65	74
2007	11	5	2	6	5	11	11	19	13	17	68	80
2006	13	6	3	5	5	10	11	16	12	19	68	79
2005	13	6	3	6	6	10	9	14	12	21	67	78

Source: Vanguard 2021.

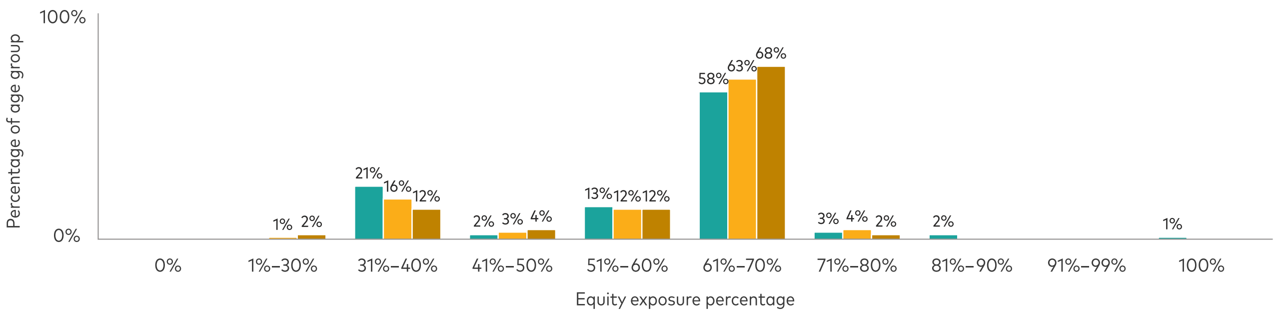
Figure 84. Distribution of equity exposure by investor type, 2020

Vanguard defined contribution plan participants

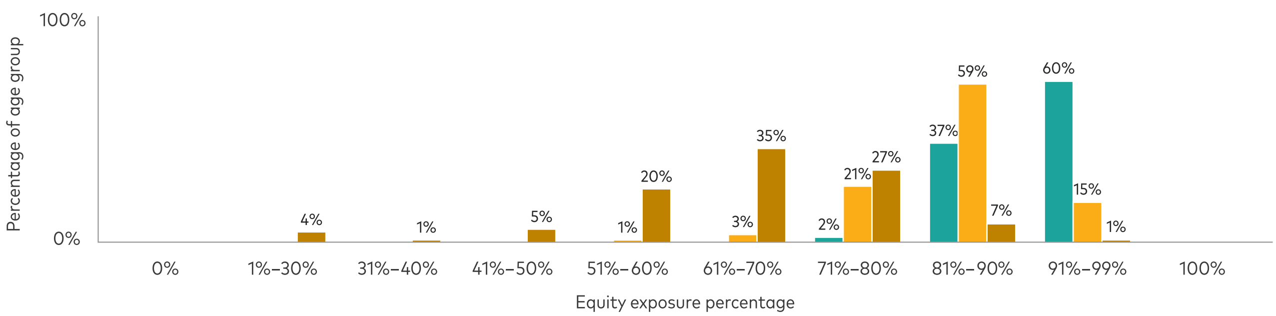
A. Single target-date participants (54% of all participants)



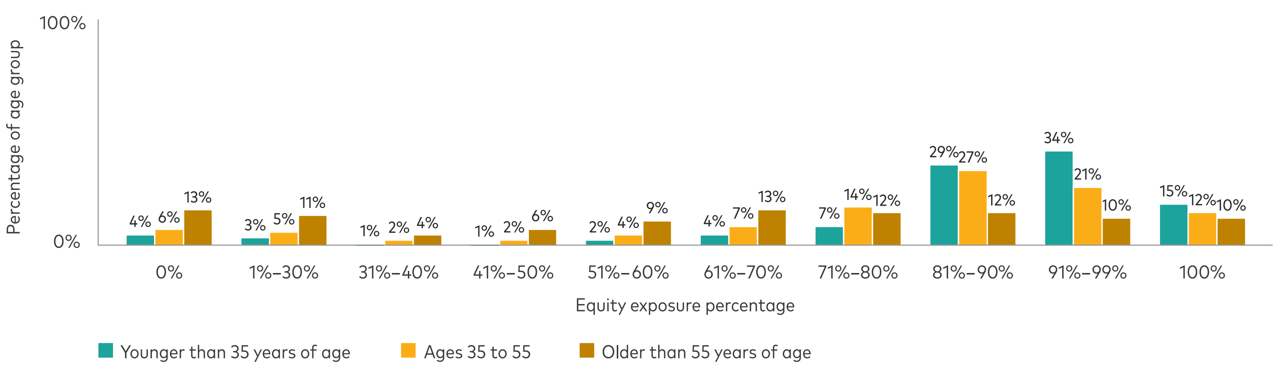
B. Single balanced fund participants (1% of all participants)



C. Managed account participants (7% of all participants)



D. All other participants (38% of all participants)



Source: Vanguard 2021.

Twenty percent of do-it-yourself investors held extreme portfolios in 2020 (8% with no equities, 12% with only equities). Professionally managed investors cannot hold extreme positions because professionally managed options generally include both equity and fixed income assets.

Among pure target-date investors, virtually all had equity allocations ranging from 51% to 90% of their portfolios in 2020. A large group of pure target-date investors had equity allocations in the 81%-to-90% range.

This phenomenon reflects two facts: (1) automatic enrollment into target-date funds typically applies to new hires who are disproportionately younger than 40; and (2) in voluntary enrollment plans, a single target-date fund is a popular strategy among new hires. Among pure target-date investors, there is also age-appropriate variation in the equity allocation.

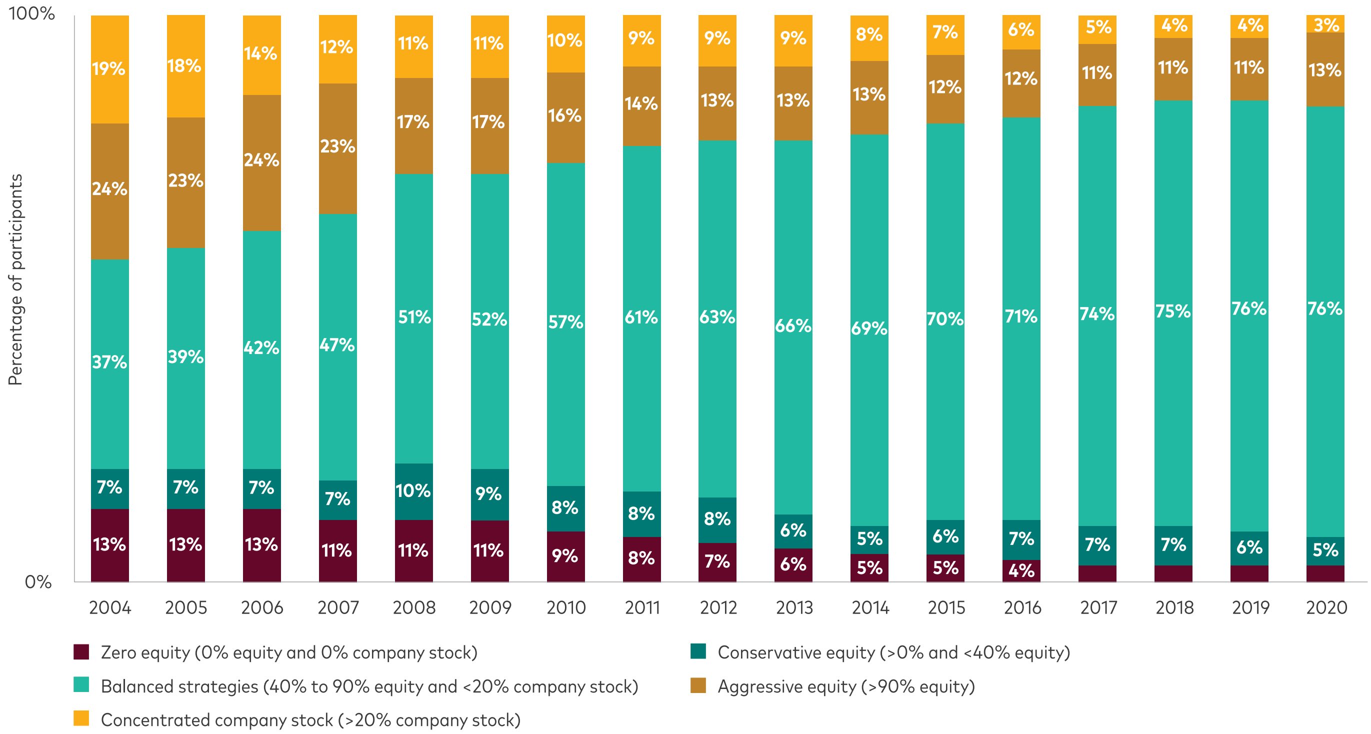
This rising use of professionally managed allocations is also contributing to a reduction in portfolio construction errors **(Figure 85)**. The fraction of participants holding broadly diversified portfolios rose from 42% in 2006 to 76% in 2020.

The percentage of participants holding concentrated company stock positions is nearly one-fifth of the percentage from 2006. In addition, there have been reductions in all other extreme portfolios.

More than 8 in 10 participants younger than 35 held balanced portfolios, compared with 74% of participants ages 55 to 64 **(Figure 86)**. Participants 65 or older held more conservative equity allocations.

Figure 85. Participant portfolio construction

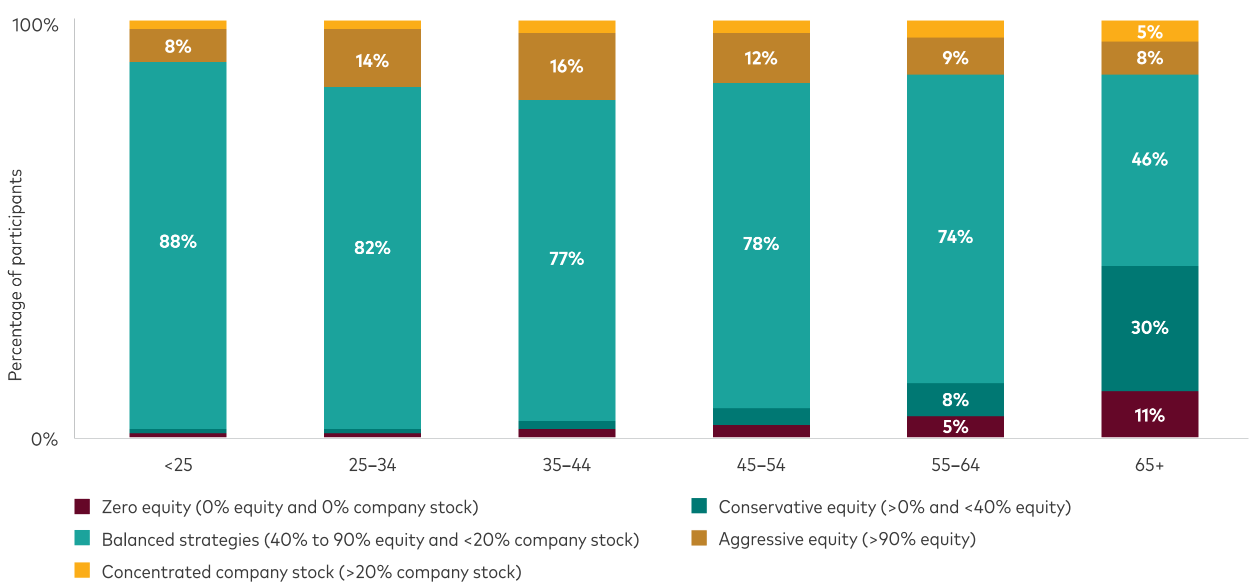
Vanguard defined contribution plan participants



Source: Vanguard 2021.

Figure 86. Participant portfolio construction by age, 2020

Vanguard defined contribution plan participants



Source: Vanguard 2021.

Advice

To address participants' needs for assistance with investment and planning decisions, plan sponsors using Vanguard as their recordkeeper offer a range of advice programs. The Vanguard Personalized Advice and Guidance suite consists of two offers: Advice from Vanguard and Advice powered by Edelman Financial Engines, a third-party advisor.

Advice from Vanguard is built as a modern offer with portfolio advice and financial planning support to help participants with multiple saving goals. Through this collective offer, participants can choose to receive advice digitally, from an advisor, or through a combination of both.

Three services are offered: Vanguard Situational Advisor™, which provides personalized advice and guidance through a one-time engagement with a Vanguard advisor; Vanguard Digital Advisor®, an online solution; and Vanguard Personal Advisor Services®, a hybrid offer with both a digital dashboard and ongoing advisor-led advice.

Thirty-nine percent of all plans offered managed account advice in 2020, and more than 7 in 10 larger plans offered the service **(Figure 87)**. As larger plans are more likely to offer advice, more than 7 in 10 of all participants had access to the service.

Balancing competing goals with retirement saving can be a complicated financial landscape to navigate. As a result, supporting participants in creating holistic financial well-being has become a priority for plan sponsors. During the past five years, the percentage of plans offering a managed account advice program has grown by 44%, and in turn, the percentage of participants offered the service has grown by 34% **(Figure 88)**.

Figure 87. Advice offered, 2020

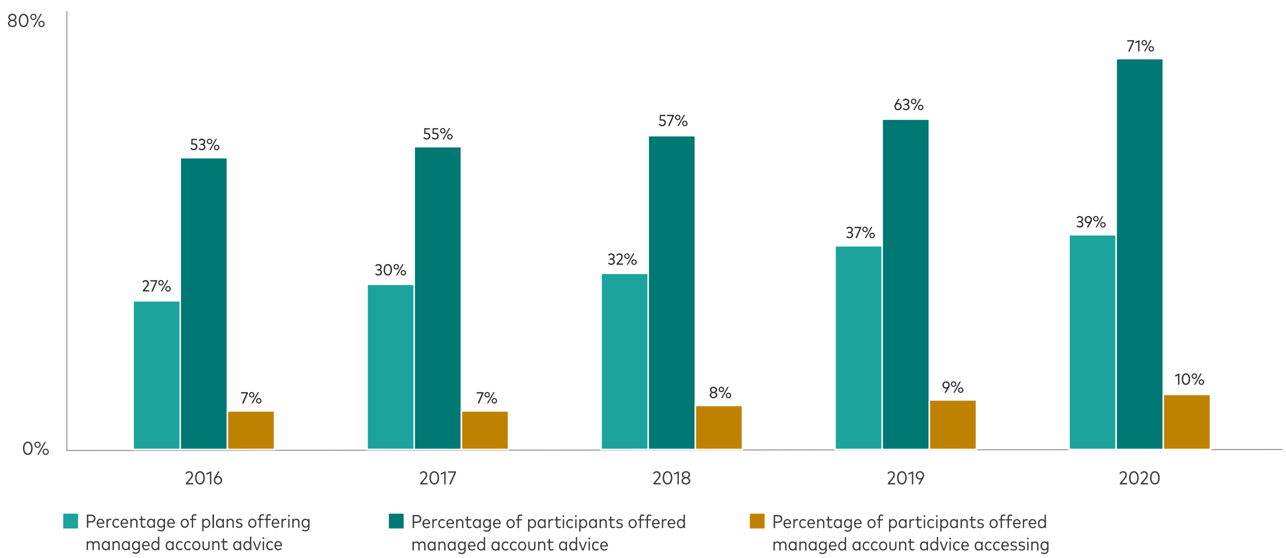
Vanguard defined contribution plans

	Number of participants				
	All	**<500**	**500–999**	**1,000–4,999**	**5,000+**
Managed account advice					
Percentage of plans offering managed account advice	39%	20%	45%	61%	72%
Percentage of participants offered managed account advice	71	24	44	63	78
Percentage of participants offered managed account advice accessing	5	6	5	5	5

Source: Vanguard 2021.

Figure 88. Advice offered trend

Vanguard defined contribution plans



Source: Vanguard 2021.

Company stock

Company stock is more likely to be offered as an investment option by a large plan—3 in 10 Vanguard plans with 5,000 or more participants offered company stock in 2020, compared with only 2% of plans with fewer than 500 participants. In some plans that offer company stock, participants can choose whether or not to invest their own contributions in this option.[4]

Employer contributions—which may be 401(k) matching, profit-sharing, or ESOP contributions—are either directed to company stock by the employer, invested at the participant's discretion, or a combination of the two.

As of 2020, only 8% of Vanguard recordkeeping plans offered company stock as an investment option. However, because large plans are more likely to offer company stock, 25% of Vanguard recordkeeping participants had access to company stock in their employer's plan. Among all Vanguard participants in 2020:

- 91% had no company stock investments—either because their employer did not offer company stock (75%) or because they chose not to invest in it (16%).
- 6% had company stock holdings of 1% to 20% of their account balance.
- 3% had concentrated positions exceeding 20% of their account balance.

Among Vanguard plans actively offering company stock, 88% had 20% or less of plan assets invested in company stock **(Figure 89)**. The remaining 12% had concentration levels between 21% and 60%.

In 2020, nearly two-thirds of Vanguard participants offered the option chose not to invest their contributions—or their employer's contributions—in company stock. If they received employer stock contributions, they diversified these assets. At the other extreme, 1 in 8 participants in plans actively offering company stock had more than 20% of their account balance invested in it, and 2% had more than 80% of their account balance in company stock.

During 2020, the shift away from participant company stock holdings persisted. The number of participants in plans with company stock and holding a concentrated position of more than 80% of their account balance in company stock fell from 10% in 2011 to 2% in 2020, and fewer plans are offering company stock.

Despite this shift, why do 1 in 8 participants in plans offering company stock continue to hold a concentrated position in it? One reason is that most participants view company stock as a safer investment than a diversified equity fund. Another factor encouraging concentrated stock holdings is the plan sponsor's decision to make an employer contribution in company stock. This implied endorsement often leads participants to invest more of their savings in the stock as well.

The effect is evident in the average company stock allocation for plans making employer contributions in cash compared with those making employer contributions in stock. In 2020, plans offering company stock as an investment option but making employer contributions in cash had an average of 7% of plan assets invested in company stock **(Figure 90)**. Meanwhile, plans offering company stock as an investment option and making employer contributions in stock had an average of 23% of plan assets in company stock.

[4] For an in-depth analysis of company stock in DC plans, see John A. Lamancusa and Jean A. Young, *Company Stock in DC Plans*, December 2020, Vanguard research, institutional.vanguard.com

Figure 89. Company stock exposure for plans and participants

Vanguard defined contribution plans actively offering company stock

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Balance of plan in company stock—percentage of plans										
1%–20%	75%	77%	78%	79%	82%	81%	81%	82%	86%	88%
21%–40%	17	16	16	15	14	16	18	16	12	11
41%–60%	7	6	6	6	4	3	1	1	1	1
61%–80%	0	0	0	0	0	0	0	0	0	0
>80%	1	1	0	0	0	0	0	0	1	0
Balance in company stock—percentage of participants										
0%	45%	45%	47%	50%	50%	55%	61%	64%	67%	65%
1%–20%	25	24	22	22	22	21	20	17	18	23
21%–40%	12	13	14	14	13	12	10	8	7	6
41%–60%	5	5	7	6	8	6	5	4	3	3
61%–80%	3	3	4	3	2	2	1	2	1	1
>80%	10	10	6	5	5	4	3	5	4	2

Source: Vanguard 2021.

Figure 90. Impact of company stock employer contributions on asset allocation, 2020

Vanguard defined contribution plans

		All Vanguard 401(k) plans with an employer contribution		
	Vanguard defined contribution plans	Plans making employer contributions in cash	Plans offering company stock making employer contributions in cash	Plans offering company stock making an employer contribution in company stock
Percentage of plans		**93%**	**6%**	**1%**
Brokerage	1%	1%	<0.5%	1%
Company stock	3	<0.5	7	23
Diversified equity funds	40	40	41	39
Balanced funds	41	44	35	22
Bond funds	7	7	8	8
Cash	8	8	9	7

Source: Vanguard 2021.

Investment returns

There are two categories of investment returns: total returns and personalized returns. Total returns reflect time-weighted investment performance and allow comparison with benchmark indexes. Personalized returns are dollar-weighted returns, reflecting account investment performance, adjusted for each participant's unique pattern of contributions, exchanges, and withdrawals. They are not directly comparable to time-weighted performance data for market indexes or mutual funds. Both return measures are influenced by market conditions; however, only total returns can be compared with published benchmark indexes.

Participant returns

Because of robust markets during the second half of 2020, average total and personal returns for DC participants were 15.1% and 16.5%, respectively, for the one-year period ended December 31, 2020 **(Figure 91)**. Reflecting positive U.S. equity markets, average personal returns for DC participants were 10.4% across the three-year period and 11.0% for the five-year period ended December 31, 2020. Five-year participant total returns also averaged 11.0% per year, or 68% cumulatively.

Distribution of returns

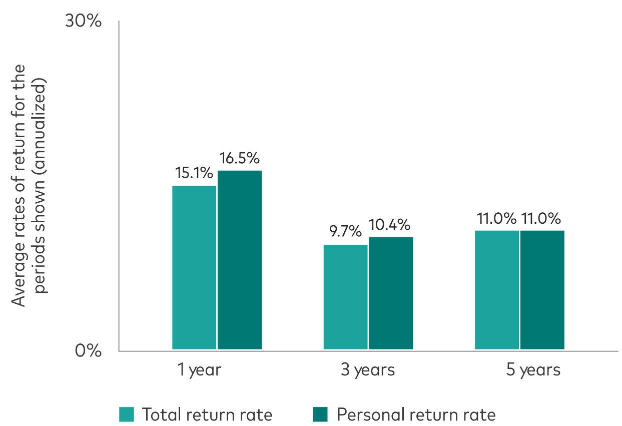
As of December 2020, five-year personalized annual returns were positive for nearly all Vanguard DC plan participants. There was wide variation in returns among participants **(Figure 92)**. Participants in the fifth percentile had five-year personalized returns of 2.5% per year in 2020. At the other extreme, participants above the 95th percentile had five-year personalized returns greater than 16.3% per year. The variation in returns is largely due to the variation in participant asset allocations and their individual account holdings.

Participants with managed allocations—notably target-date funds and managed account advisory services—had less dispersion in outcomes. Total five-year returns for single target-date investors ranged from 8.8% for the 5th percentile to 12.2% for the 95th percentile, a difference of approximately 3.4 percentage points **(Figure 93)**. For the managed account participants, the 5th-to-95th percentile differences were 6.5 percentage points. The managed account is a customized portfolio approach, and thus results are, accordingly, more dispersed than with target-date funds.

By comparison, among all other participants, realized returns for those making their own choices ranged from 2.2% per year for the 5th percentile to 16.2% for the 95th percentile, a difference of 14 percentage points.

Figure 91. Participant rates of return, December 2020

Vanguard defined contribution plans



Market returns ended December 31, 2020	1 year	3 years	5 years
60/40 Balanced*	16.1%	10.4%	10.8%
70/30 Balanced*	17.1	11.1	11.7
S&P 500	18.4	14.2	15.2
Bloomberg Barclays US Aggregate	7.5	5.3	4.4
FTSE Developed ex US	10.3	4.8	8.2

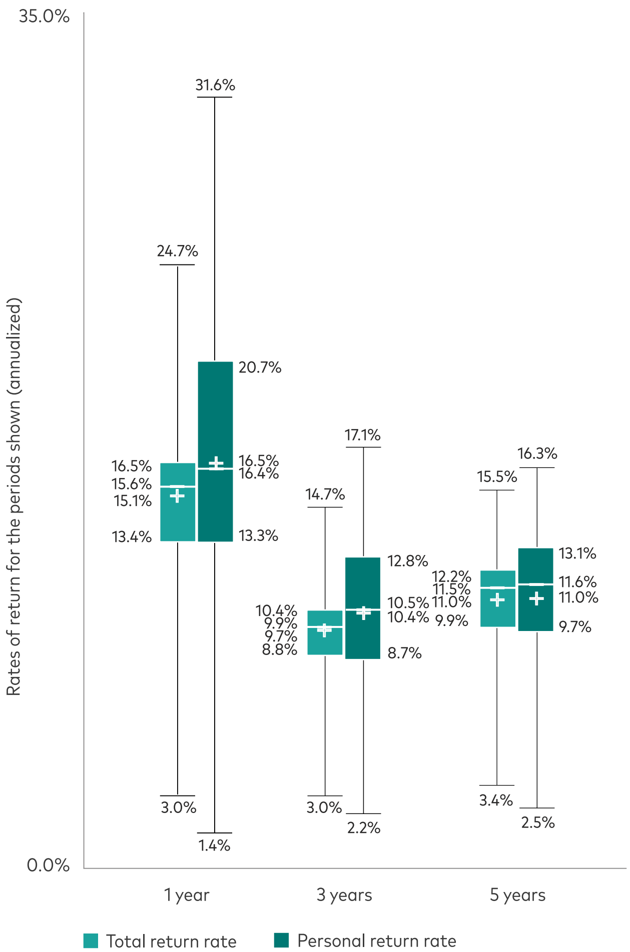
Past performance is no guarantee of future returns.
The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

* Balanced composites based on S&P 500 and Bloomberg Barclays US Aggregate Indexes for periods and percentages shown; rebalanced monthly.

Source: Vanguard 2021.

Figure 92. Variation in participant total and personal return rates, 2020

Vanguard defined contribution plans



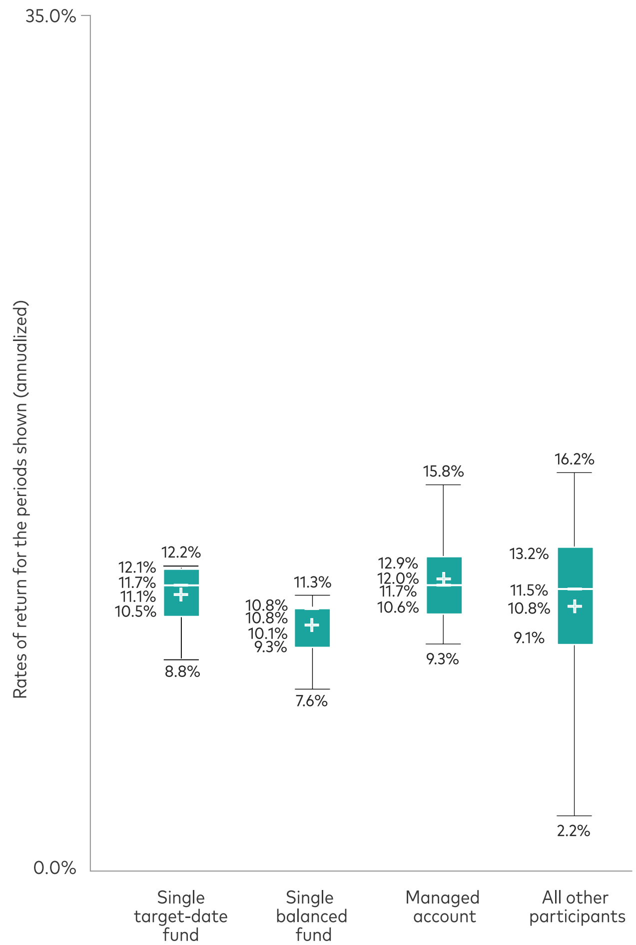
Past performance is no guarantee of future returns.

Note: Based on 4.0 million observations for one year; 2.9 million for three years; and 2.2 million for five years.

Source: Vanguard 2021.

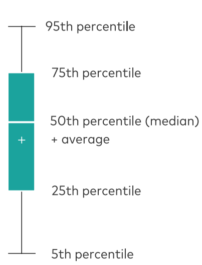
Figure 93. Distribution of 5-year total returns by strategy, 2020

Vanguard defined contribution plans



Note: Based on 728,000 observations for single target-date fund investors; 22,000 for balanced fund investors; 81,000 for managed account investors; and 1.3 million for all other participants.

Source: Vanguard 2021.



How to read a box and whisker chart:

This box and whisker chart shows the range of outcomes. Plot values represent the 95th, 75th, 50th, 25th, and 5th percentile values. The average value is represented by a white + and the median value by a white line. An example of how to interpret the data in Figure 92 is: For the one-year period, 5% of participants had total return rates (TRR) greater than 24.7%; 25% had TRRs greater than 16.5%; half had TRRs greater than 15.6%; 75% had TRRs greater than 13.4%; 95% had TRRs greater than 3.0%; and 5% had TRRs less than 3.0%. The average one-year TRR was 15.1%.

Dispersion of outcomes

These differences are also apparent when examining both return and risk outcomes in scatterplots. For ease of presentation, we created a random sample of 1,000 participants for each group of investors.

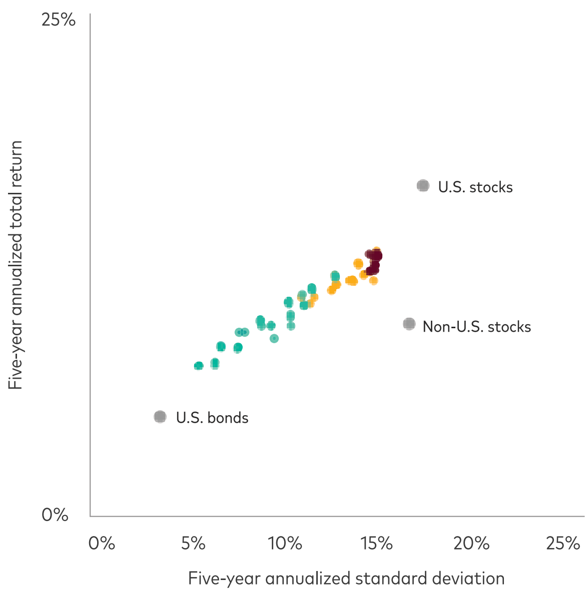
During the five-year period ended December 31, 2020, outcomes for single target-date investors were distributed among major market indexes **(Figure 94, Panel A)**, with upward sloping reflecting a positive equity risk premium. These results are consistent with the fact that most of the target-date portfolios in our sample are a specific combination of indexed U.S. equities, international equities, U.S. bonds, and international bonds. In the target-date scatterplot, younger participants (represented by dark red dots and in long-dated portfolios) are to the right of the chart; older participants (represented by teal dots and in near-dated portfolios) are to the left.

The figure includes about 1,000 observations. There appear to be far fewer because while there are many observations in our sample, they are all invested in a limited set of target-date portfolios, which means the range of portfolio outcomes is also limited. For example, if a plan offered 16 target-date options, then 1,000 participants invested solely in a single target-date fund would have 16 outcomes, not 1,000. The results for single balanced fund investors reflect the fact that most balanced funds have similar equity allocations, typically around 35% to 65% of assets **(Figure 94, Panel B)**. Managed account investors are more dispersed, reflecting the customized nature of managed account advice **(Figure 94, Panel C)**. The greatest dispersion of risk/return outcomes is among participants making their own investment choices **(Figure 94, Panel D)**. Over time, because of the growing use of professionally managed allocations in DC plans, this population is expected to decline.

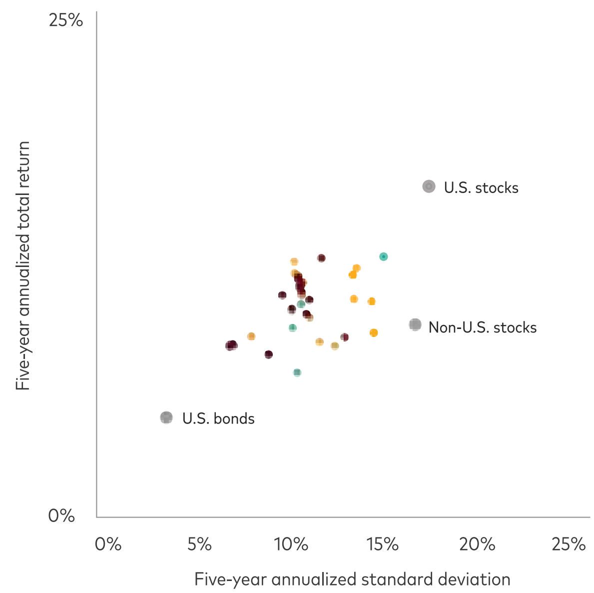
Figure 94. Risk and return characteristics, 2016–2020

Defined contribution plan participants for the five-year period ended December 31, 2020

A. Single target-date fund participants

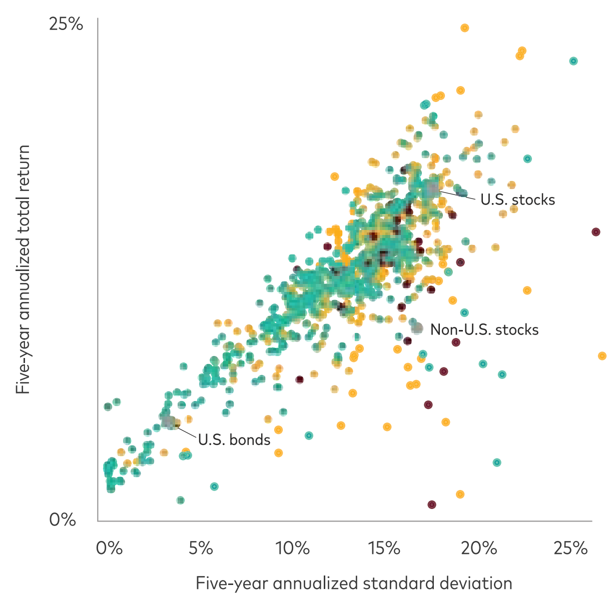


B. Single balanced fund participants



C. Managed account participants

D. All other participants



Younger than 35 Ages 35 to 55 Older than 55

Past performance is no guarantee of future returns.

Note: Includes 1,000 random samples of participant accounts drawn from respective samples. Excludes ½% top and ½% bottom outliers for both risk and return, for a net sample of 980 observations.

Source: Vanguard 2021.

Trading activity

Participant trading or exchange activity is the movement of existing account assets from one plan investment option to another. This transaction is distinct from a contribution allocation decision, in which participants decide how future contributions to the plan should be invested. Exchange activity is a proxy for a participant's holding period for investments, as well as a measure of the participant's willingness to change their portfolio in response to short-term market volatility.

Exchange provisions

Daily trading is nearly universal for Vanguard DC plans, with virtually all plan sponsors allowing it. While assets can be traded daily, Vanguard and other investment companies serving DC plans typically have "round-trip" restrictions designed to thwart the minority of individual participants who seek to engage in active market-timing or day-trading.

Volume of exchanges

Even with the increased volatility in U.S. equity markets in 2020, only 16% of participants made at least one portfolio trade or exchange during the year, down from 20% in 2004 **(Figure 95)**.

It is important to note that nearly all participants using a managed account had exchanges. In a managed account, the advisor oversees multiple fund holdings in a typical participant's account. The trading activity reflects the advisor rebalancing the participant's portfolio (or, with those initially signing up for the service, portfolio changes needed to arrive at the target portfolio strategy).

When participants using the managed account program are excluded, only 10% of participants initiated an exchange. As in prior years, most participants did not trade. Not only did participant trading activity remain low during 2020 despite the increased volatility, but the percentage of participants trading in 2020 was lower than at the beginning of the financial crisis in 2008 and somewhat like 2010–2014 trading activity.

Another measure of trading is the volume of dollars traded. We measure dollar volume movements as a fraction of total recordkeeping assets in order to scale them to growth in assets and growth in the underlying recordkeeping business. In effect, the fraction of assets traded is a measure of portfolio turnover.

In 2020, traders exchanged the dollar equivalent of 19% of average DC recordkeeping assets at Vanguard. On a net basis, 3.0% of assets were shifted from equities to fixed income in 2020, compared with a 1.3% shift from equities to fixed income in 2019.

Since 2011, dollar-trading levels have generally remained stable, with the exception of periods of high market volatility **(Figure 96)**. The most notable spike in dollars traded occurred in August 2011 during the U.S. debt crisis and in early 2020 with the COVID-19 crisis.

Figure 95. Participant trading summary

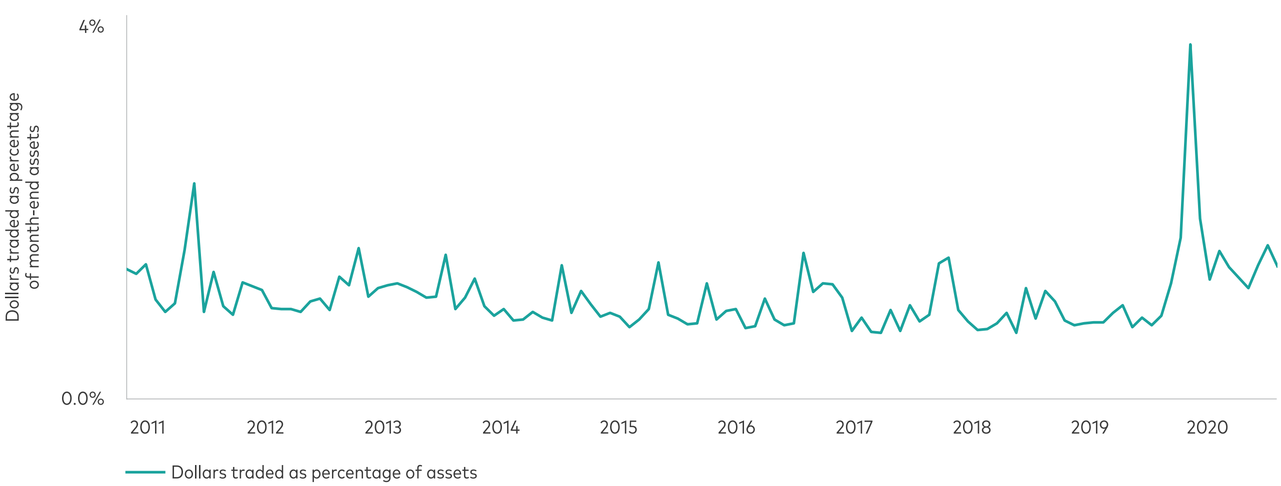
Vanguard defined contribution plans

	Percentage of participants		Percentage of average recordkeeping assets		Dollar flows (in billions)		S&P 500 Index volatility			
							Percentage of days			
	Percentage trading including managed account investors	Percentage with participant-directed exchanges	Percentage traded	Percentage moved to equities (fixed income)	Dollars traded	Dollars moved to equities (fixed income)	Up 3% or more	Down 3% or more	Up 1% or more	Down 1% or more
2020	16%	10%	19.3%	–3.0%	$102.4	($16.2)	4.8%	6.3%	25%	18%
2019	12	7	10.0	–1.3	$50.7	($7.0)	0.4	0.0	9	6
2018	12	8	11.6	–1.1	$56.3	($5.6)	0.4	2.0	13	13
2017	12	8	10.6	–0.3	$48.6	($1.5)	0.0	0.0	2	2
2016	12	8	11.4	–1.5	$44.7	($6.0)	0.4	0.4	10	9
2015	13	9	10.7	–0.8	$40.9	($3.0)	0.4	0.8	17	12
2014	14	10	11.6	–0.6	$41.8	($2.3)	0.0	0.0	8	8
2013	13	10	14.0	0.2	$44.8	$0.5	0.0	0.0	9	7
2012	12	9	12.6	–1.7	$36.2	($4.9)	0.0	0.0	12	8
2011	11	10	14.8	–2.5	$40.6	($6.9)	2.4	2.4	19	18
2010	12	10	13.4	–1.1	$32.5	($2.8)	1.2	2.0	15	14
2009	13	11	14.1	–0.6	$29.0	($1.2)	4.4	4.4	25	21
2008	16	14	16.6	–3.9	$39.7	($9.3)	9.1	7.5	24	29
2007	15	14	14.7	–1.5	$36.2	($3.7)	0.4	0.0	12	13
2006	14	13	12.7	–0.6	$27.0	($1.3)	0.0	0.0	6	5
2005	19	18	13.0	–0.7	$23.6	($1.3)	0.0	0.0	6	6
2004	20	20	14.6	–0.2	$22.5	($0.3)	0.0	0.0	8	8

Source: Vanguard 2021.

Figure 96. Trading activity, January 2011–December 2020

Vanguard defined contribution plan participants



Source: Vanguard 2021.

Direction of money movement

Summary statistics may sometimes portend that all participant trading is in one particular direction. However, in any given month, participants who trade are trading meaningful dollar amounts both in and out of equities **(Figure 97)**. Even in volatile markets, as some traders shift their portfolios toward fixed income assets, there are others who shift toward equities.

During the past decade, the net movement of money among participants trading in their accounts has been generally toward fixed income investments. Nonetheless, even at the height of market volatility, there were significant gross flows toward equities among some participants.

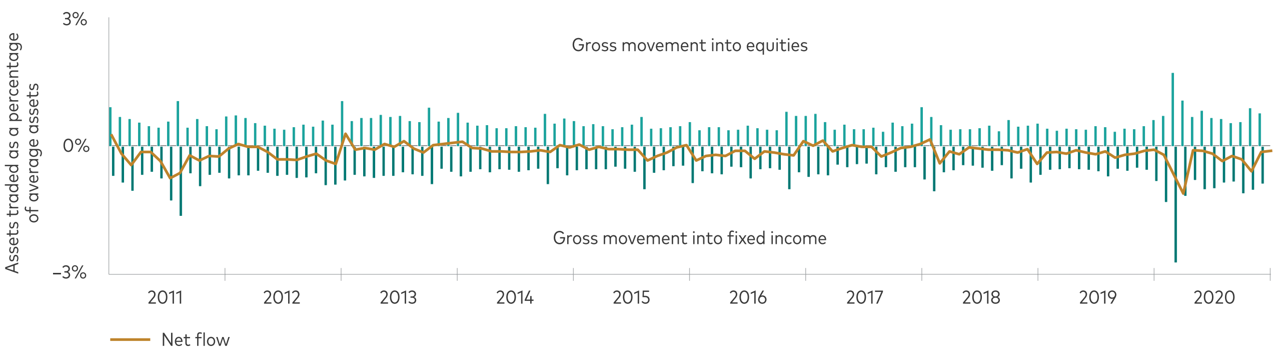
The growing reliance on single-fund investment programs, such as target-date funds, has likely contributed to lower trading levels by participants.

Pure target-date and single balanced fund investors traded much less frequently than all other participants, although their portfolios are rebalanced daily by the fund managers **(Figure 98)**. Women traded about 40% less frequently than men **(Figure 99)**.[5] Participants holding only target-date funds trade very infrequently, and women are more likely than men to hold a single target-date fund.

Figure 97. Direction of money movement, January 2011–December 2020

Vanguard defined contribution plan participants

Money movement as a percentage of average assets

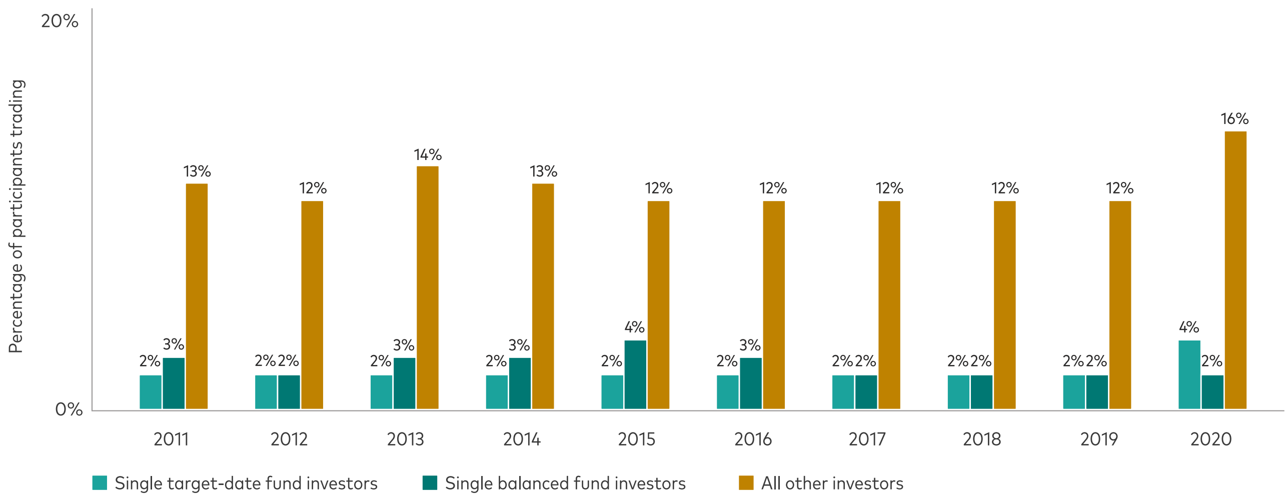


Source: Vanguard 2021.

[5] For an in-depth analysis of trading, see Jeffrey W. Clark, Stephen P. Utkus, and Jean A. Young, *Understanding Household Trading Behavior 2011–2018*, August 2019, Vanguard research, institutional.vanguard.com

Figure 98. Participant trading by investor type

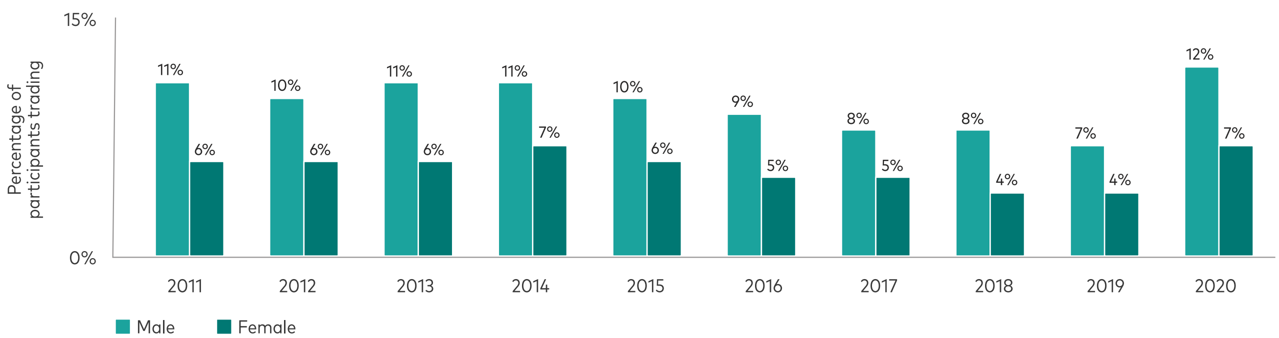
Vanguard defined contribution plan participants



Source: Vanguard 2021.

Figure 99. Participant trading by gender

Vanguard defined contribution plan participants



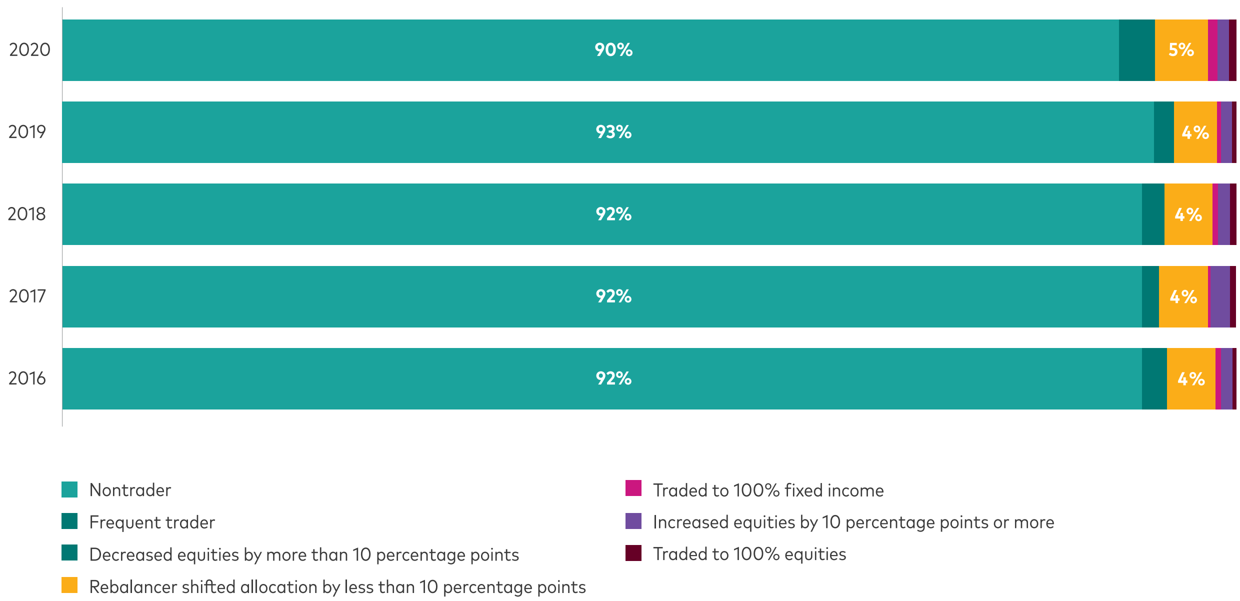
Source: Vanguard 2021.

Types of trading activity

Among participants who traded in their accounts, the types of their exchanges are varied. In 2020, 90% of nonmanaged account participants did not make an exchange. Of the participants that did make an exchange, the most common action was rebalancing their account. Only 1% of participants abandoned equities and another 1% traded into all equities. **(Figure 100).**

Figure 100. Participant trading decisions

Vanguard defined contribution plan participants (nonadvised)



Source: Vanguard 2021.

03
Accessing plan assets

Participants can access their plan assets by taking a loan or a withdrawal while they are working or through a withdrawal or a rollover when they change jobs or retire.

Plan loans

Plan loans allow DC plan participants to access their plan savings before retirement without incurring income taxes or tax penalties. If permitted by the plan, participants can borrow up to 50% of their balance (up to a maximum of $50,000) from their DC plan account. Loans are more common in plans accepting employee contributions and less common for employer-funded DC plans, such as money purchase or profit-sharing plans.

Offering loans appears to beneficially affect retirement savings, raising contribution rates above what they would otherwise be. Yet loans also come with risks. Cash that has been borrowed earns fixed income rather than equity market returns. Also, participants who leave their employer usually must repay any loan balance immediately—or risk paying taxes as well as a penalty and incurring a reduction in retirement savings by the amount of the loan outstanding.[6]

Loan availability

Loans are widely offered by employee-contributory DC plans. In 2020, 79% of Vanguard DC plans permitted participants to borrow from their plan, and 88% of active participants had access to a loan feature **(Figure 101)**. Loan availability depends on plan size. Large plans tend to offer loans; small plans often do not. Loans are expensive to administer, and loan origination and maintenance fees are increasing. With loan fees, sponsors can allocate costs directly to those participants incurring loan-related expenses. Most plans allow participants to have only one loan outstanding. In 2020, 54% of Vanguard DC plans offering loans permitted only one loan at a time. Thirty-seven percent of plans allowed two, and 9% of plans allowed three or more.

Some plan sponsors impose loan-issuance waiting periods to discourage repetitive loans. In 2020, 3% of plans required a waiting period after a loan was repaid before a new loan could be taken by the participant, most commonly one month. Two percent of plans imposed a waiting period between new loan issuance once a loan had been taken, most commonly one year. Finally, one-third of plan sponsors permitted participants terminating with an outstanding loan to continue to repay the loan. Only 4% of participants terminating with an outstanding loan took advantage of this feature.

Figure 101. Plan loans, 2020

Vanguard defined contribution plans

Percentage of plans offering loans	**79%**
Percentage of participants in plans offering loans	**88%**
Plans offering loans	
Number of loans permitted	
1 loan	54%
2 loans	37
3 or more loans	9
Plans imposing a loan waiting period	
Waiting period after a loan is paid off before a new loan may be issued	3%
Waiting period after a loan is issued before another loan is permitted	2%
Interest rate	
Prime	13%
Prime plus 1%	72
Prime plus 2%	12
Prime plus other rates	3
Plans permitting terminated participants to continue loan repayment	**34%**

Source: Vanguard 2021.

[6] For a comprehensive analysis of loans, see Timothy (Jun) Lu, Olivia S. Mitchell, Stephen P. Utkus, and Jean A. Young, *Borrowing from the Future: 401(k) Plan Loans and Loan Defaults*, pensionresearchcouncil.org/publications

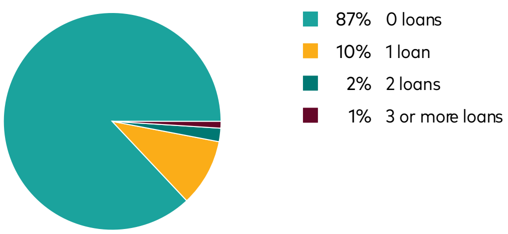
Loan use by participant demographics

Only 13% of participants had a loan outstanding at year-end 2020 **(Figure 102)**.[7]

On average, the outstanding loan account balance was 9% of the participant's account balance, excluding the loan, and the average participant had borrowed about $10,400 **(Figure 103)**. Outstanding loans are typically excluded from measures of plan and participant assets because these assets have, in effect, been withdrawn from the plan and are not currently available as a retirement resource. However, more than 90% of loans are repaid, and outstanding loans do represent participant and plan assets. Only about 1% of aggregate plan assets were borrowed by participants during 2020.

Figure 102. Participant loan use, 2020

Vanguard defined contribution plans offering loans



Source: Vanguard 2021.

Loans are sometimes criticized as a form of revolving credit for younger, lower-income workers. While that may be partly true, loan use by age follows a hump-shaped profile, with use highest among participants in their prime working years. Among those workers, ages 35 to 54, loan use averaged about 17% in 2020. Men and women used loans at the same rate.

Income appears to have a greater influence on loan use than age does. In 2020, 1 in 4 participants with a household income between $30,000 and $99,999 had a loan, while only 13% of participants with an income of more than $150,000 did. This difference reflects liquidity constraints among those with low wealth and income—i.e., higher-income households have less need for borrowing because of their higher income or other savings.

Participants with an account balance of less than $10,000 were somewhat less likely to have a loan, yet they borrowed the largest percentage of their account balance. Only 8% of participants in this group had a loan, but the loan accounted for 45% of their account balance, on average.

[7] Our analysis of the percentage of participants with loans considers all participants with an account balance in plans offering loans. Some of these participants no longer work for the plan sponsor and are not eligible for a new loan. Some participants with loans also no longer work for the plan sponsor but are repaying loans. Loan use would likely be about five percentage points higher if based solely on active employees.

Figure 103. Participant loan demographics, 2020

Vanguard defined contribution plans offering loans

	Participants with loans					Participants with no loans
	Percentage of participants with loans	Percentage of account balance in loans	Average loan amount	Average account balance	Total average account balance including loans	Average account balance
All	**13%**	**9%**	**$10,383**	**$111,118**	**$121,501**	**$131,787**
Income						
<$15,000	5%	15%	$4,549	$26,486	$31,034	$15,989
$15,000–$29,999	12	17	3,347	16,765	20,112	15,630
$30,000–$49,999	22	13	5,240	33,686	38,926	28,627
$50,000–$74,999	26	11	8,479	66,893	75,372	70,338
$75,000–$99,999	24	9	11,536	111,255	122,791	124,849
$100,000–$149,999	19	9	14,965	174,596	189,561	198,526
$150,000+	13	6	18,677	295,676	314,353	363,125
Terminated	1	9	10,500	108,486	118,987	132,308
Age						
<25	3%	21%	$2,743	$10,496	$13,239	$6,614
25–34	9	17	6,350	30,998	37,348	33,497
35–44	16	12	10,241	75,185	85,426	88,674
45–54	18	8	12,003	135,975	147,978	166,477
55–64	13	6	11,584	185,969	197,554	239,245
65+	4	5	9,548	173,151	182,699	258,229
Gender						
Male	13%	8%	$ 11,178	$ 130,250	$ 141,429	$ 160,073
Female	13	9	9,545	95,417	104,963	108,851
Job tenure (years)						
0–1	3%	17%	$6,075	$29,217	$35,291	$15,945
2–3	9	16	5,354	27,200	32,554	34,894
4–6	14	15	7,315	41,347	48,662	62,943
7–9	16	13	9,929	66,760	76,689	98,099
10+	16	7	12,971	171,280	184,250	258,691
Account balance						
<$10,000	8%	45%	$3,791	$4,544	$8,336	$3,302
$10,000–$24,999	14	25	5,735	16,819	22,554	16,597
$25,000–$49,999	16	20	9,235	36,293	45,528	36,100
$50,000–$99,999	16	15	12,809	71,906	84,715	71,989
$100,000–$149,999	16	11	14,960	122,675	137,635	122,889
$150,000–$199,999	15	8	16,067	173,382	189,449	173,406
$200,000–$249,999	14	7	16,699	223,519	240,219	223,698
$250,000+	11	3	17,988	503,339	521,327	625,234

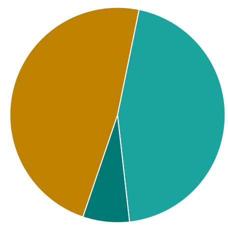
Source: Vanguard 2021.

Participants with loans outstanding in 2020 appeared to have accumulated slightly less in retirement savings than those without loans. Participants with loans who are older, are longer tenured, and have higher income and balances appeared to have lower retirement savings accumulations when compared with participants without loans. However, participants with loans who are younger, are shorter tenured, and have lower income and balances appeared to have higher retirement savings accumulations when compared with participants without loans. These differences in part reflect the interplay of demographic differences in terms of age, income, and tenure between borrowers and nonborrowers.

Twelve percent of participants who earned between $15,000 and $29,999 in 2020 had a loan outstanding. However, earlier in this report, we noted that participation rates are lowest among this group, with only 56% of these workers joining their plan. Arguably, participants who earn between $15,000 and $29,999 but have borrowed from their retirement savings (7% of these workers) are better off than those employees who earn between $15,000 and $29,999 and do not participate in their employer's plan **(Figure 104)**.

Figure 104. Participation and loans, 2020

All employees earning between $15,000 and $29,999



Source: Vanguard 2021.

Figure 105. Participant loans by industry sector, 2020

Vanguard defined contribution plans offering loans

	Participants with loans					Participants with no loans
	Percentage of participants with loans	**Percentage of account balance in loan**	**Average loan amount**	**Average account balance**	**Total average account balance including loans**	**Average account balance**
All	13%	9%	$10,383	$111,118	$121,501	$131,787
Industry group						
Transportation, utilities, and communications	18%	11%	$9,678	$86,518	$96,196	$106,000
Finance, insurance, and real estate	17	9	11,318	127,049	138,367	160,456
Manufacturing	16	8	9,828	116,589	126,417	145,645
Agriculture, mining, and construction	16	8	13,305	167,926	181,231	177,948
Wholesale and retail trade	14	10	8,719	84,175	92,894	87,915
Education and health	10	12	10,160	84,945	95,105	98,796
Media, entertainment, and leisure	9	10	12,305	122,822	135,1279	153,758
Business, professional, and nonprofit	7	8	11,727	156,322	168,049	154,603

Source: Vanguard 2021.

Loan use by industry group

Loan use varied significantly by industry sector **(Figure 105)**. Participants in the business, professional, and nonprofit group used loans at a lower rate than other participants, suggesting that more highly educated participants use loans less frequently.

Trends in new loan issuance

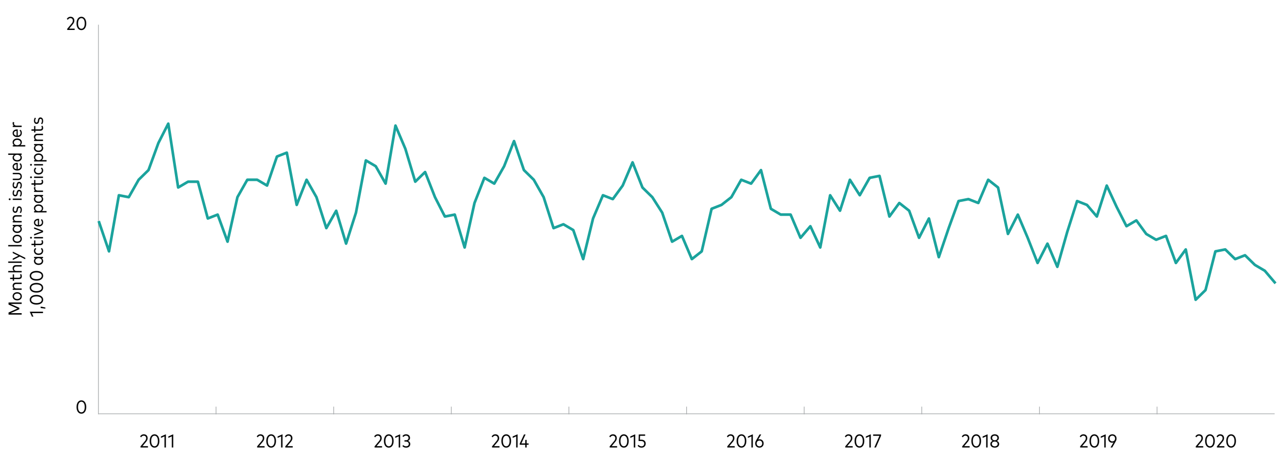
Among Vanguard plans, the fraction of participants taking loans from their DC plans has generally declined since 2011 **(Figure 106)**. In addition, there appears to be a pronounced seasonality to loan-taking, with borrowing typically peaking in the summer months. The reasons for this pattern are not well understood. In March 2020, in response to the COVID-19 pandemic, Congress passed the Coronavirus Aid, Relief, and Economic Security (CARES) Act.[8]

One provision plan sponsors could adopt was to expand the traditional loan limits and allow participants to borrow up to 100% of their balance (up to a maximum of $100,000). Of plans that offer loans, 56% allowed participants to borrow up to these expanded limits, although less than 1% of participants initiated a loan based on this provision.

Throughout 2020, overall loan initiations decreased by more than 20%, with significant declines in April and May, as many parts of the economy were closed due to the pandemic. We speculate the decline in loan use is partly attributable to a decrease in consumer spending, along with a decline in housing transactions between April and June.

Figure 106. Loan origination trend

Vanguard defined contribution active participants in plans offering loans



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Monthly average (per 1,000 participants)	11.4	11.1	11.5	11.0	10.2	10.2	10.5	9.8	9.6	7.4
Annual increase (decrease) in loans issued per 1,000 participants	(1%)	(3%)	4%	(4%)	(7%)	0%	3%	(7%)	(2%)	(22%)

Source: Vanguard 2021.

[8] For more details on the CARES Act, please see page 105.

Plan withdrawals

Plan withdrawals allow participants to access their plan savings before a job change or retirement. Withdrawals are optional plan provisions and availability varies from plan to plan. They can be broadly classified into two categories—hardship and nonhardship withdrawals.

Hardship withdrawals allow participants to access a portion of their savings when they have a demonstrated financial hardship, such as receipt of an eviction or home foreclosure notice, but may also be used for such purposes as a college education, medical expenses, and the purchase of a first home.

Nonhardship withdrawals include both post-age-59½ withdrawals and other withdrawals. Post-age-59½ withdrawals allow participants age 59½ and older to access their savings while they are working and are exempt from the 10% penalty on premature distributions. Some plans may also allow participants to withdraw employer profit-sharing contributions or after-tax contributions, or roll over assets while they are working.

As mentioned, in March 2020 Congress passed the CARES Act. Incorporated within the bill were several provisions that provided flexibility for retirement savers, including coronavirus-related distributions (CRDs). Individuals affected by COVID-19 were able to withdraw up to $100,000 from their retirement plan penalty free until December 30, 2020. In addition, the income tax due on these distributions could be spread over a three-year period, and investors have three years to return the funds to their account.

Among all Vanguard DC plans in 2020, 95% allowed hardship withdrawals, 88% allowed plan withdrawals for those age 59½ and older, and 73% of plans allowed for CRDs **(Figure 107)**. Of the participants permitted to take each type of withdrawal, 1.7% of participants took a hardship withdrawal, 3.4% took a nonhardship withdrawal, and 5.7% initiated a CRD **(Figure 108)**. Overall, 7.4% of Vanguard participants in plans offering any type of withdrawal used this feature, and the average portion of account balance withdrawn was about 40% **(Figure 109)**.

Figure 107. Plan withdrawals, 2020

Vanguard defined contribution plans

Percentage of plans offering	
Hardship withdrawals	95%
Withdrawals after age 59½	88
Coronavirus distributions	73

Source: Vanguard 2021.

Figure 108. Participant use of plan withdrawals

Vanguard defined contribution plans

	2016	2017	2018	2019	2020
Hardship withdrawals	1.7%	1.8%	1.9%	2.3%	1.7%
Nonhardship withdrawals	3.4	3.4	3.4	3.3	3.4
Coronavirus distributions					5.7

Source: Vanguard 2021.

Figure 109. Use of all plan withdrawals, 2020

Vanguard defined contribution plans

	All	Cash	Rollover
Percentage of participants using	7.4%	7.1%	0.3%
Percentage of assets withdrawn	1.9	1.3	0.6
Percentage of participant account assets withdrawn	39.7	32.8	69.4
Median age	47	46	61

Source: Vanguard 2021.

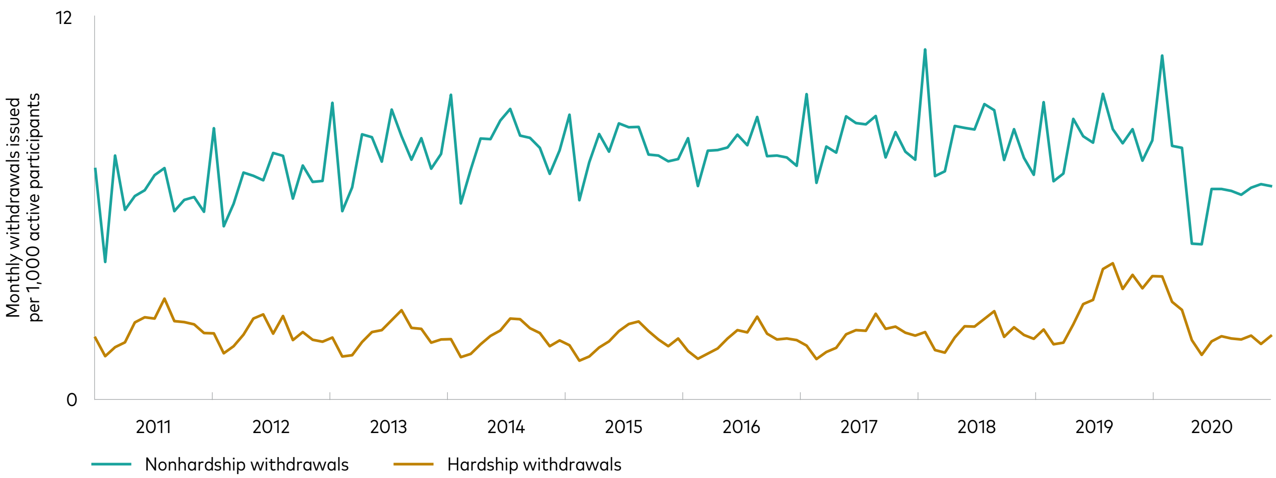
CRDs composed about one-half of all active participant withdrawal activity in 2020, with nonhardship withdrawals at 38% and hardship withdrawals at 12%. Assets withdrawn totaled less than 2% of Vanguard recordkeeping assets. Of the participants who took withdrawals, 96% took the money in cash, withdrawing, on average, about 33% of account savings. They had a median age of 46. Meanwhile, 4% of participants taking withdrawals rolled over their assets from the plan to an IRA.

A major contributor to withdrawal rollovers is likely participants older than 59½ rolling over their plan savings even as they continue to work and participate in the plan. Participants choosing a rollover had a median age of 61, and, on average, they rolled over almost 70% of their account balance. These participants rolling over assets accounted for 31% of the assets being withdrawn.

Beginning in 2011, the rate of new nonhardship withdrawals, such as post-age-59½ in-service or other withdrawals, grew by nearly 30% through 2019 **(Figure 110)**. Nonhardship withdrawals have a seasonal pattern and often spike in the first quarter of the year. This spike in activity is likely due to the withdrawal of employer profit-sharing contributions, which are frequently made early in the calendar year.

Figure 110. In-service withdrawal trend

Vanguard defined contribution active participants in plans offering in-service withdrawals



Source: Vanguard 2021.

Monthly average per 1,000 active participants	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Nonhardship withdrawals	6.4	7.0	7.8	8.0	7.9	7.8	8.2	8.3	8.2	6.9
Hardship withdrawals	2.2	2.1	2.0	2.0	1.9	1.9	2.0	2.1	3.1	2.2
Annual increase (decrease) per 1,000 active participants										
Nonhardship withdrawals	14%	9%	11%	3%	(1%)	(1%)	5%	1%	(1%)	(16%)
Hardship withdrawals	0	(5)	(5)	0	(5)	0	5	5	48	(29)

Note: CRDs are excluded from this figure.
Source: Vanguard 2021.

From 2011 to 2018, the rate of new hardship withdrawals remained relatively consistent while holding at a low absolute level. In 2019, hardship withdrawal activity increased by nearly 50%. The Bipartisan Budget Act of 2019 introduced changes to hardship withdrawal provisions. These changes were designed to ease restrictions for participants who need to access their qualified retirement plan assets because of an immediate financial need.

In 2020, the frequency of nonhardship and hardship withdrawals decreased by 16% and 29%, respectively. We speculate that the favorable treatment associated with CRDs led participants to utilize that withdrawal option if they met the criteria and their plan permitted it. Plan withdrawals are used infrequently in the aggregate. However, 1 in 4 participants taking a plan withdrawal in 2020 had also taken one in 2019. Some participants could, over time, jeopardize their retirement program if they continue to rely on this feature throughout their working careers.

Plan distributions and rollovers

When changing jobs or retiring, DC plan participants have the option of preserving their savings for retirement (by retaining savings in the plan or rolling it over to an IRA or another DC plan) or taking a cash lump sum (and spending or investing it). If they choose to roll over their savings to an IRA or another qualified retirement plan, participants avoid paying taxes on the accumulated balance. If participants spend the lump-sum distribution or invest it in a taxable account, they incur a possible income tax liability (and a 10% penalty if they are younger than 59½).

Leakage from the retirement system—the spending of plan savings before retirement—is a concern for the future retirement security of plan participants. In the short run, participants incur taxes and possible penalties on any amounts they spend. In the long run, because of the lost opportunity for compound earnings, they significantly increase the amount they need to save during the remainder of their working years.

Figure 111. Frequency of automatic distributions, 2020

Vanguard defined contribution plans

	Number of participants				
	All	**<500**	**500–999**	**1,000–4,999**	**5,000+**
Percentage of plans					
Remain in plan (no automatic distribution)	3%	3%	3%	2%	3%
Automatic cash out if balance is <$1,000, remain in plan if balance is higher	15	13	15	16	25
Automatic cash out if balance is <$1,000, rollover if balance is between $1,000 and <$5,000	82	84	82	82	72
Percentage of participants offered					
Remain in plan (no automatic distribution)	2%	3%	3%	3%	2%
Automatic cash out if balance is <$1,000, remain in plan if balance is higher	28	12	15	15	34
Automatic cash out if balance is <$1,000, rollover if balance is between $1,000 and <$5,000	70	85	82	82	64

Note: This analysis excludes approximately 88 403(b) plans and approximately 257,000 participants in those plans. Most 403(b) plan sponsors retain the right to execute these automatic distributions within their plan documents. However, due to the multiprovider environment many 403(b) plans operate within, and the coordination required to process these distributions, most 403(b) plan sponsors do not process these distributions.

Source: Vanguard 2021.

Figure 112. Distribution options, 2020

Vanguard defined contribution plans

	Number of participants				
	All	**<500**	**500–999**	**1,000–4,999**	**5,000+**
Percentage of plans					
Deferral	100%	100%	100%	100%	100%
Deferral only to age 65	2	3	2	2	1
Deferral only to age 70	<0.5	<0.5	<0.5	0	1
Installments other than RMDs	63	58	61	65	83
Annuity	12	13	10	9	14
Annuity grandfathered source only	7	7	7	7	5
Ad hoc partial distributions	35	21	36	48	70
Percentage of participants offered					
Deferral	100%	100%	100%	100%	100%
Deferral only to age 65	1	3	2	3	<0.5
Deferral only to age 70	6	<0.5	<0.5	0	8
Installments other than RMDs	80	60	60	67	85
Annuity	14	14	11	8	16
Annuity grandfathered source only	1	2	2	1	<0.5
Ad hoc partial distributions	71	26	37	52	80

Source: Vanguard 2021.

Policymakers have attempted to discourage leakage in several ways from participants who have terminated their employment. Generally, participants may keep their plan savings in their employer's plan if their account balance is more than $5,000. Also, plan distributions between $1,000 and $5,000 are generally rolled over automatically to an IRA unless the participant elects otherwise. Balances of less than $1,000 may be distributed to the terminated participant. Most plans have adopted these provisions—only 3% of plans allow participants to remain in the plan when balances are less than $1,000 **(Figure 111)**. In some cases, the sponsor may allow participants to retain a balance of $1,000 or more in the plan—15% of plans permit these balances to remain in the plan.

Most sponsors permitted indefinite deferral of savings, meaning that participant balances could remain in the employer plan if they are above the $5,000 (or $1,000) threshold. However, about 2% of sponsors required terminated participants to leave the plan by age 65 or age 70 **(Figure 112)**.

Nearly two-thirds of sponsors allowed participants to establish installment payments and 2 in 10 offered an annuity option for at least a portion of the plan assets. Twelve percent of plans offered an annuity as a general distribution option, while 7% of plans offered an annuity for a grandfathered source only, these annuity features are mostly associated with plan assets relating to a prior money purchase plan.

Finally, 35% of plan sponsors permitted terminated participants to take partial ad hoc cash distributions in 2020.[9] Only 16% of plans offered this option in 2015—the rate more than doubling in five years. Seven in 10 participants can now take a partial ad hoc distribution. If a plan does not offer ad hoc distributions, it requires any terminated participant seeking to use any part of their retirement savings to withdraw or roll over the entire account balance. When it offers an ad hoc distribution feature, a plan can be used directly as a flexible source of income and withdrawals.

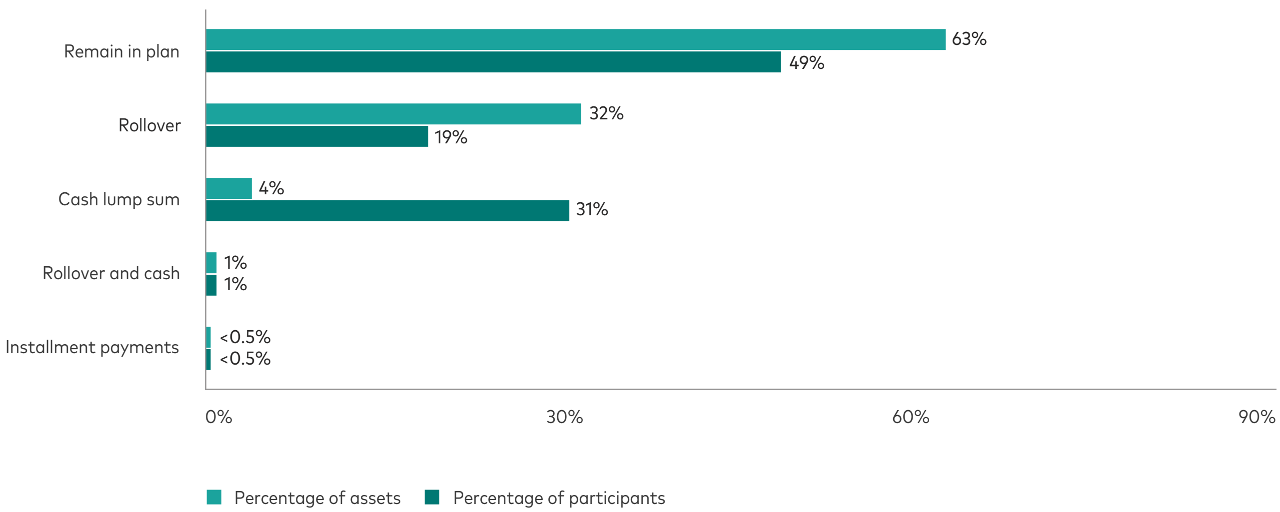
Participant and asset flows

Plan distributions can occur somewhat frequently as participants change jobs or retire, and they represent a large portion of total plan and participant assets. In 2020, 13% of participants left their employer and were eligible for a distribution. Their assets totaled 6% of Vanguard recordkeeping assets. Two-thirds of these participants preserved their assets, either retained in the prior employer's plan, rolled over to an IRA, or rolled over to the new employer's plan **(Figure 113)**.

Figure 113. Plan distributions, 2020

Vanguard defined contribution plans

Participants with termination dates in 2020



Source: Vanguard 2021.

[9] For a comprehensive analysis of distributions, and the effect ad hoc distribution features have on participant behavior, see Daniel C. Proctor and Jean A. Young, *Retirement Distribution Decisions among DC Participants*, December 2019, Vanguard research, institutional.vanguard.com

Figure 114. Trends in distribution of plan assets

Vanguard defined contribution plans

Participants with termination dates in the given year

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Percentage of participants choosing										
Remain in plan	49%	48%	49%	49%	51%	50%	51%	48%	46%	49%
Rollover	21	21	22	22	20	19	18	18	18	19
Installment payments	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5
Participants preserving assets	70%	69%	71%	71%	71%	69%	69%	66%	65%	68%
Cash lump sum	28%	29%	28%	28%	28%	30%	30%	33%	34%	31%
Rollover and cash	2	2	1	1	1	1	1	1	1	1
Percentage of assets available for distribution										
Remain in plan	54%	53%	54%	53%	56%	59%	61%	56%	60%	63%
Rollover	38	39	39	40	37	35	34	37	34	32
Installment payments	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Assets preserved for retirement	92%	92%	93%	93%	93%	94%	95%	93%	94%	95%
Cash lump sum	5%	5%	5%	5%	5%	5%	4%	6%	5%	4%
Rollover and cash	3	3	2	2	2	1	1	1	1	1

Source: Vanguard 2021.

In 2020, one-third of participants took a cash distribution. Ninety-five percent of the assets available for distribution were preserved for retirement. The percentage of participants choosing to take cash and presumably spending their savings has remained stable over time **(Figure 114)**.

These figures differ from other reported statistics on plan distributions because they include participants who chose to retain their assets in their prior employer's plan when they changed jobs or retired. Among only those participants who took a distribution from their plan, more took cash distributions (31%) than rolled over their assets to another plan or IRA (19%). But in our view, a full assessment of plan distribution behavior must include participants who kept their assets within their prior employer's plan at the time of a job change or retirement.

Determinants of distribution behavior

Age has a significant impact on distribution behavior. Younger participants are more likely than older participants to cash out, rather than save, their plan distributions. Yet most of the assets available for distribution are still preserved for retirement, even by younger individuals. In 2020, 35% of participants in their 20s chose to cash out their plan assets, compared with 21% of participants in their 60s **(Figure 115)**.

In terms of assets, 88% of assets owned by participants in their 20s and 97% of assets owned by participants in their 60s were preserved. Account balances also have a significant impact on distribution behavior. Participants with smaller account balances are less likely to preserve their assets for retirement. Forty-two percent of participants with balances of less than $1,000 kept their balance in a tax-deferred account **(Figure 116)**. However, once balances reached $100,000, more than 90% of participants chose to preserve their assets.

A more nuanced view emerges when you consider both age and account balance. At most asset levels, younger participants are more likely to preserve their assets **(Figure 117)**. While participants in their 40s did overwhelmingly preserve their assets for retirement, at most asset levels they are slightly more likely than most other age groups to cash out their DC plan when changing jobs or retiring.

Our analysis thus far reflects the behavior of individuals who terminated employment in a given year, either by changing jobs or retiring. But it is also true that participants who terminated in previous years retain the right to withdraw their plan assets from their prior employer's plan at any time and roll over or spend the money.

Figure 115. Plan distribution behavior by age, 2020

Vanguard defined contribution plans

Participants with termination dates in 2020

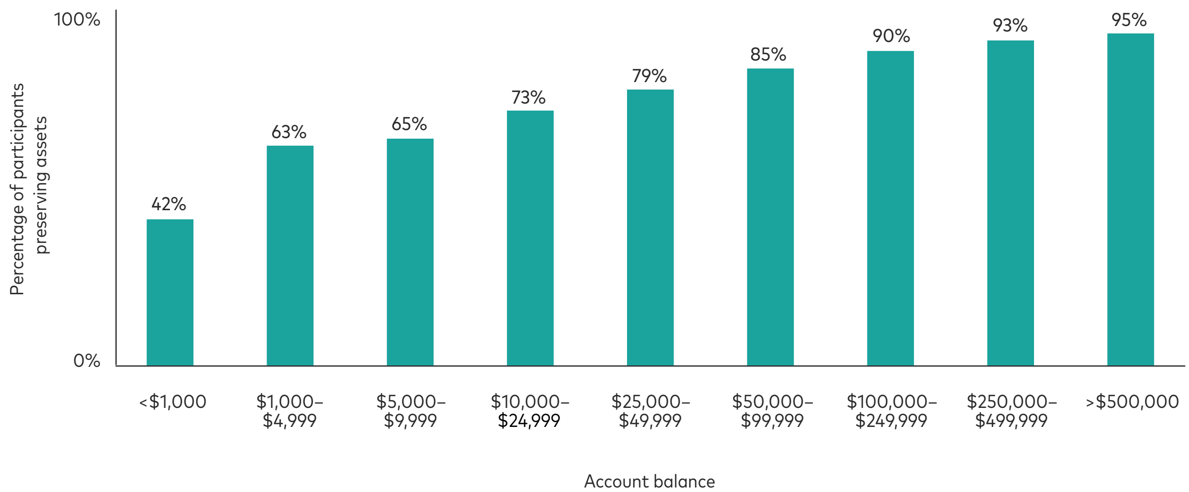
	20s	30s	40s	50s	60s	70s	Total
Percentage of participants choosing							
Remain in plan	51%	51%	49%	50%	47%	42%	49%
Rollover	14	15	17	22	30	28	19
Installment payments	<0.5	<0.5	<0.5	<0.5	1	2	<0.5
Participants preserving assets	65%	66%	66%	72%	78%	72%	68%
Cash lump sum	35%	33%	33%	27%	21%	27%	31%
Rollover and cash	<0.5	1	1	1	1	1	1
Percentage of assets available for distribution							
Remain in plan	70%	70%	68%	64%	58%	55%	63%
Rollover	18	20	24	31	39	41	32
Installment payments	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Assets preserved for retirement	88%	90%	92%	95%	97%	96%	95%
Cash lump sum	12%	9%	7%	4%	2%	3%	4%
Rollover and cash	<0.5	1	1	1	1	1	1

Source: Vanguard 2021.

Figure 116. Plan distribution behavior by account balance, 2020

Vanguard defined contribution plans

Participants with termination dates in 2020

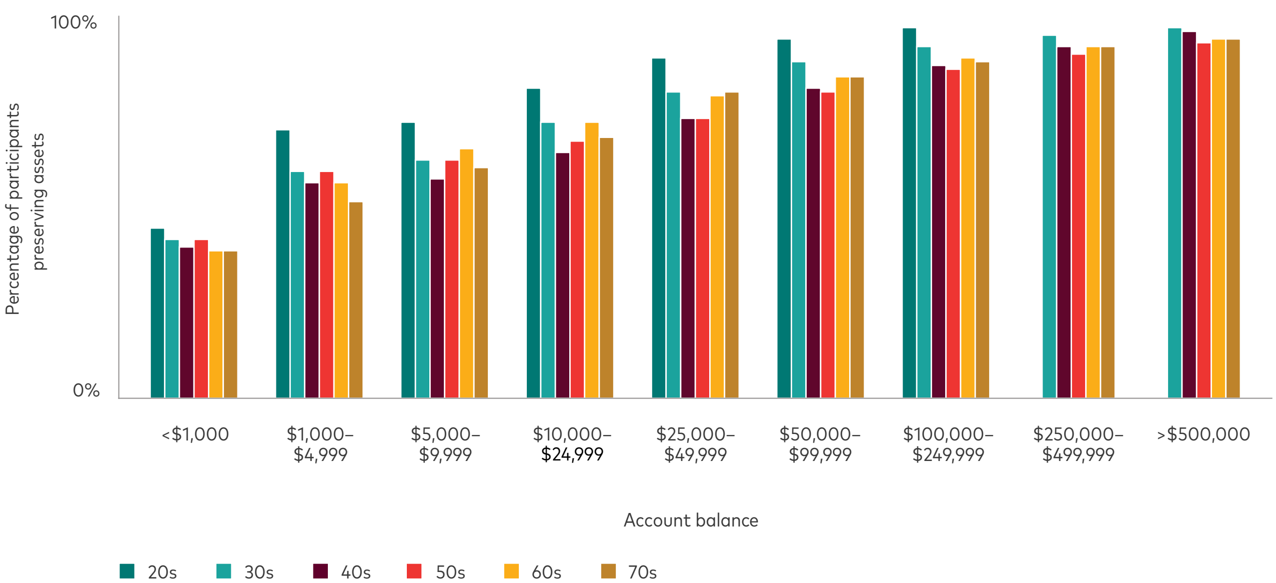


Source: Vanguard 2021.

Figure 117. Plan distribution behavior by age and account balance, 2020

Vanguard defined contribution plans

Participants with termination dates in 2020



Source: Vanguard 2021.

A more optimistic picture of plan distribution behavior emerges if we analyze the total plan assets available for distribution at any given time. During 2020, more than one-quarter of all Vanguard qualified plan participants could have taken their plan account as a cash distribution because they had separated from service in the current year or prior years. However, just 17% of participants eligible for a cash distribution took one, while the vast majority (83%) continued to preserve their plan assets for retirement **(Figure 118)**. In terms of assets, 98% of all plan assets available for distribution were preserved—either rolled over to an IRA or other qualified plan or left in the former employer's plan. Only 2% of assets were distributed in cash.

Access methods

Within Vanguard DC plans, a variety of services have evolved to foster participant control of plan savings and to facilitate savings, investment, and withdrawal decisions—including telephone associates, voice-response systems, websites, and mobile applications. Participant access to retirement accounts is quite varied, ranging from those who do not contact their provider at all in a given year to those who do so multiple times a month.

Frequency of account access

In 2020, 31% of plan participants never contacted Vanguard regarding their plan account **(Figure 119)**. However, 69% did contact Vanguard—a ratio that has improved from 2011, when only 55% of participants did so **(Figure 120)**. One reason for this increased contact may be the broad adoption of website and mobile options; another may be the strong equity markets, which may have led to higher levels of investor attention to their accounts. For participants who did not contact Vanguard, their sole method for reviewing plan balances was

Figure 118. Alternative view of distribution of plan assets

Vanguard defined contribution plans

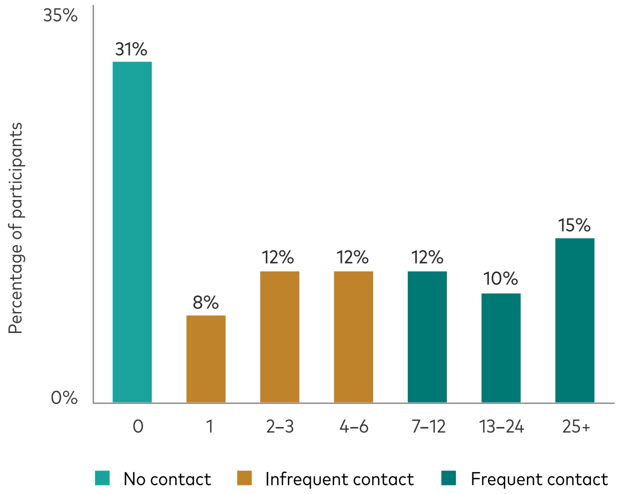
All terminated participants with access to plan savings in the given year

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Percentage of participants choosing										
Remain in plan	68%	67%	68%	68%	69%	67%	68%	65%	63%	67%
Rollover	13	13	14	14	13	12	12	12	13	13
Installment payments	2	2	3	3	3	3	4	4	4	3
Participants preserving assets	**83%**	**82%**	**85%**	**85%**	**85%**	**82%**	**84%**	**81%**	**80%**	**83%**
Cash lump sum	16%	16%	14%	14%	14%	17%	15%	18%	19%	17%
Rollover and cash	1	2	1	1	1	1	1	1	1	<0.5
Percentage of assets available for distribution										
Remain in plan	75%	75%	75%	76%	76%	77%	78%	80%	78%	82%
Rollover	20	20	20	20	20	19	18	17	17	15
Installment payments	1	1	1	1	1	1	1	1	1	1
Assets preserved for retirement	**96%**	**96%**	**96%**	**97%**	**97%**	**97%**	**97%**	**98%**	**96%**	**98%**
Cash lump sum	3%	3%	3%	2%	2%	2%	2%	1%	3%	2%
Rollover and cash	1	1	1	1	1	1	1	1	1	<0.5

Source: Vanguard 2021.

Figure 119. Participant contact frequency, 2020

Vanguard defined contribution plans



Source: Vanguard 2021.

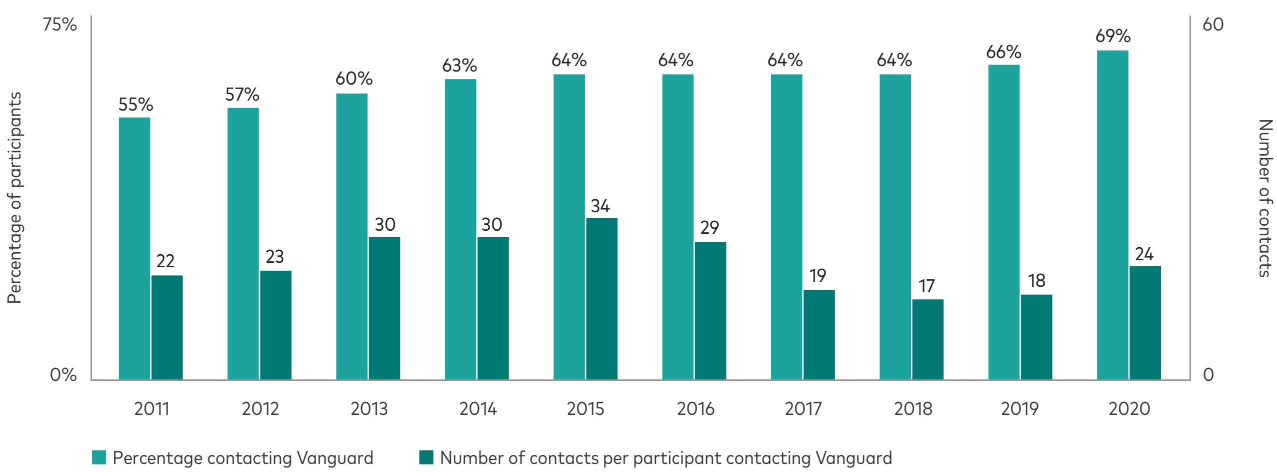
quarterly account statements. These participants also received Vanguard's participant electronic newsletter, fee and other regulatory disclosures, and education or communication programs in print or via electronic means.

About one-third of participants contacted Vanguard intermittently. This group interacted with Vanguard between one and six times per year through a telephone associate, an automated voice-response system, a mobile application, or the website. Almost 4 in 10 participants contacted Vanguard frequently. This group, using all channels, contacted Vanguard monthly, if not more often. This level of contact may seem high, but keep in mind, for those using a mobile application or the website, a brief logon to examine account balances constitutes a unique contact event.

Account balances are a strong influence on contact behavior. The larger a participant's balance, the more likely they are to be proactive in obtaining information about their Vanguard plan account. Participants with account balances of more than $100,000—about one-quarter of all Vanguard participants—contacted Vanguard 57% more often when compared with the entire participant population.

Figure 120. Participant contact trend

Vanguard defined contribution plans



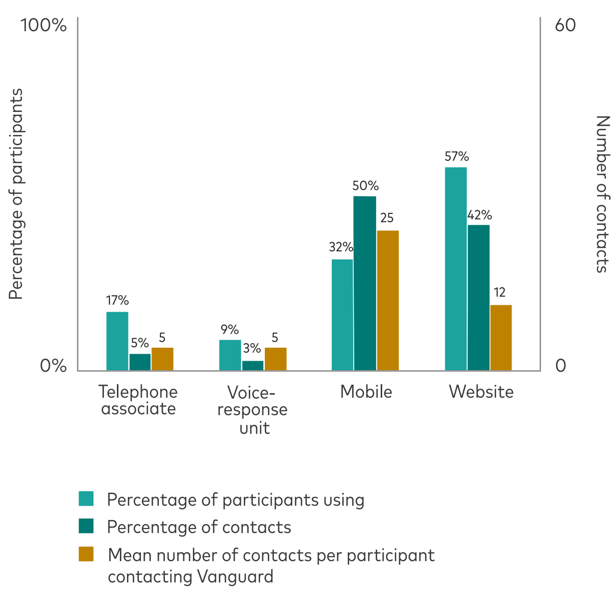
Source: Vanguard 2021.

Types of account access

Participants have four access channels at their disposal: toll-free phone calls to telephone associates, toll-free phone calls to an automated voice-response system, a mobile application, and the website. When measured in terms of total participant use, the website remained the most widely used channel in 2020—57% used the website, compared with 17% who used telephone associates **(Figure 121)**. Mobile applications were used by 32% of participants. In terms of total contacts, the website and mobile access dominated with 92% of total contacts. Website interactions accounted for 42% of all participant contacts and mobile access stood at 50%. This was the first year that mobile interactions surpassed website contacts. In addition, while participants using the website as a contact method averaged about 12 website interactions per year, participants using mobile applications averaged more than twice as many contacts per year. Each distinct logon is counted as a unique contact event.

Figure 121. Account access methods, 2020

Vanguard defined contribution plans



Source: Vanguard 2021.

Figure 122. Account access trend

Vanguard defined contribution plans

Percentage of participants contacting Vanguard via . . .

	2011	2020	Change
Website, mobile, telephone associate, or voice response	55%	69%	25%
Website	48	57	19
Mobile		32	
Telephone associate	15	17	13
Voice-response unit	9	9	0
Participants registered for website access	66	79	20

Source: Vanguard 2021.

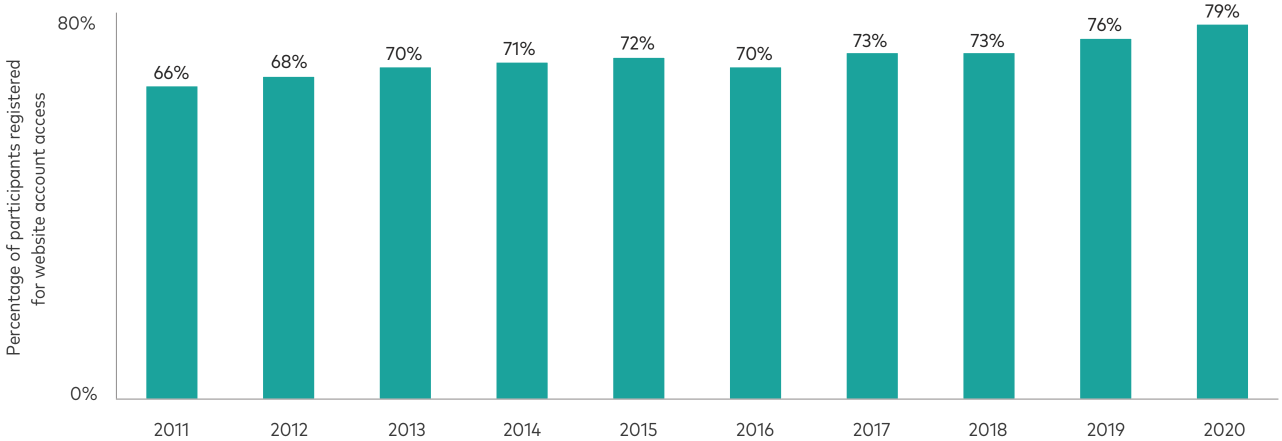
The portion of participants selecting the website as an access channel has grown 19% since 2011 **(Figure 122)**. Given current trends, the website and mobile applications are expected to continue as dominant contact channels, and the increasing adoption of mobile applications is likely to continue over the next few years.

Participant registration for website access to their DC plan account has fueled this growth. Seventy-nine percent of participants were registered for the website in 2020, 20% more than in 2011 **(Figure 123)**.

Increasingly, participants are choosing the website as the preferred access channel for transactions, as 75% of all transactions were processed via the website during 2020, and another 16% were processed via mobile devices **(Figure 124).** Moreover, 95% of all exchanges, payroll deferral, and contribution allocation changes occurred on the website or mobile devices.

Figure 123. Website access trend

Vanguard defined contribution plans

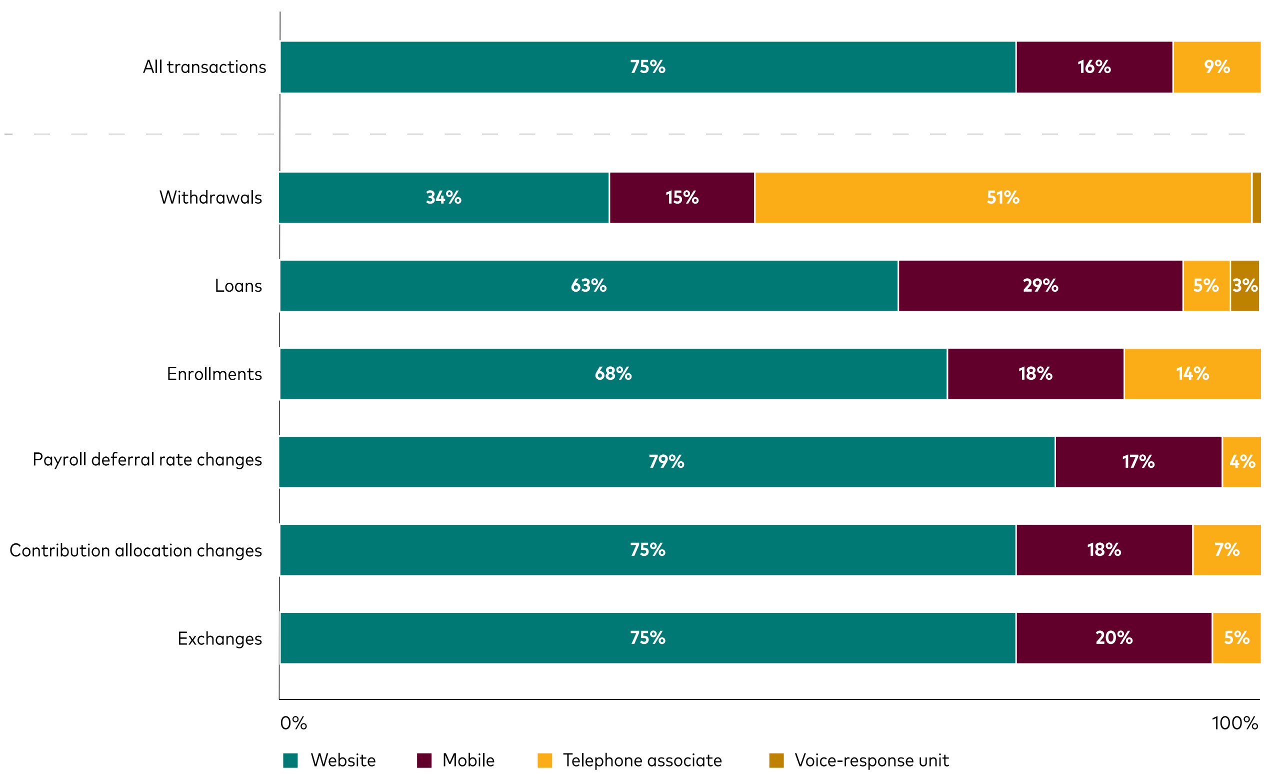


Source: Vanguard 2021.

Figure 124. Participant channel utilization, 2020

Vanguard defined contribution plans

Percentage of transactions processed by channel



Source: Vanguard 2021.

Methodology

The Vanguard data included in this report is drawn from several sources.

Defined contribution clients

This universe consists of 1,700 qualified plans, 1,400 clients, and 4.7 million participants for which Vanguard directly provides recordkeeping services. About 9 in 10 of these plans have a 401(k) or 403(b) employee-contributory feature; the other 1 in 10 is an employer-contributory DC plan, such as a profit-sharing or money purchase plan, in which investments are directed by participants. Unless otherwise noted, all references to "Vanguard" are to this universe, and all data is as of December 31, 2020.

Vanguard participation and deferral rates

Data on participation and deferral rates is drawn from a subset of Vanguard recordkeeping clients for whom we perform nondiscrimination testing. Selected plan design features are also derived from this data. For the 2020 analysis, the subset is composed of plans that complete their testing by March and represents approximately one-third of the clients for whom we perform testing. Plans that complete their testing by March generally have lower participation rates and generally include plans with concerns related to passing testing. When all plans have completed their testing by the end of 2021, the participation rates should improve. Plan design features derived from this data should also improve.

Based on the trends experienced over previous years, we have estimated participation and deferral rates for 2020. The estimations use a combination of linear extrapolation and subjective estimation. The same approach is applied to plan design features derived from this data. We will continue to restate these results in the following year based on the final compliance testing results.

The 2019 restated analysis includes approximately 1,000 plans and 2.3 million participants and eligible nonparticipants. Almost all of these plans are 401(k) or paired 401(k)/profit-sharing plans. Income data used in participation and deferral rate analyses also come from this subset of plans.

How America Saves: Small Business Edition

We also make available *How America Saves: Small Business Edition*, a benchmarking analysis for the small-business plans for which we provide service. Launched in 2011, the Vanguard Retirement Plan Access™ (VRPA) offer is a comprehensive service for retirement plans with less than $50 million in assets. Ascensus, LLC—a nationally recognized recordkeeping firm—provides the administration of these plans on Vanguard's behalf. Through VRPA, we served an additional 15,200 plan sponsors with more than 702,000 participants as of year-end 2020.

Industry benchmark data supplemental to How America Saves

Industry benchmarking based on the data behind *How America Saves* is available for the following industries on the institutional.vanguard.com website.

- Ambulatory health care services
- Architecture and engineering
- Construction
- Finance
- Information firms
- Insurance
- Legal services
- Manufacturing
- Mining, oil, and gas extraction
- Retail trade
- Technology
- Transportation and warehousing
- Unions
- Utilities
- Wholesale trade

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