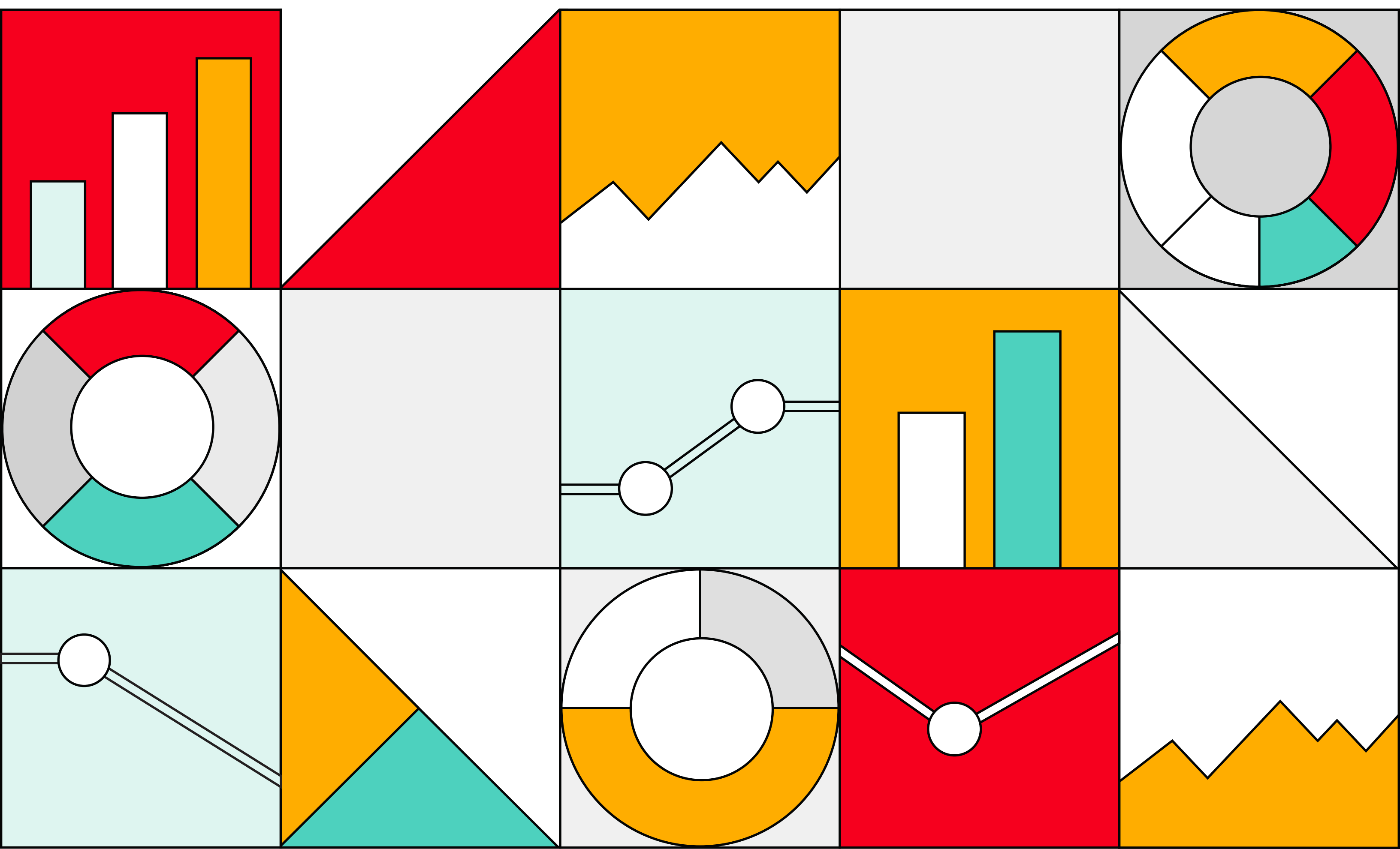
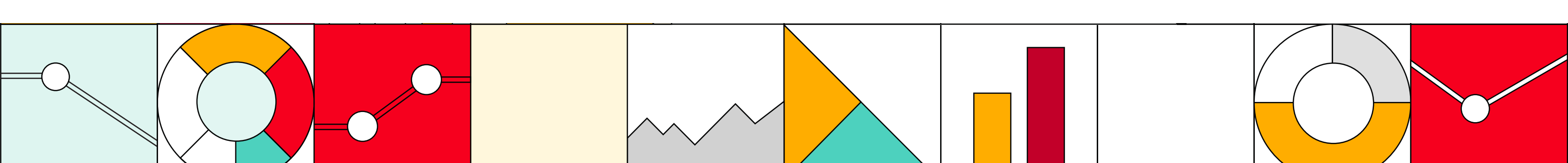
Vanguard

How America Saves 2022





John James
Managing Director
Institutional Investor Group

June 2022

Retirement plan participants broke new savings records in 2021, a testament to the willingness of plan sponsors to implement smart plan design.

We saw record-high participation and deferral rates as well as a higher percentage of participants in target-date funds and advised solutions such as managed accounts than ever before. These trends can be attributed to the increasing use of plan features such as automatic enrollment and automatic escalation. Their growing use continues to positively affect participant behaviors and outcomes, particularly when coupled with another trend—rising contribution default rates.

These are just some examples from *How America Saves 2022*—an examination of retirement plan data from 5 million defined contribution (DC) plan participants across Vanguard's recordkeeping business—that show we're headed in the right direction. We stayed on this path despite fears over rising inflation, global uncertainty, and the lingering economic and personal effects of the COVID-19 pandemic. We believe this commitment to smart plan design is a big reason why participant behaviors remained largely unaffected in 2021. Most participants simply did not access their retirement plans, and by year's end, average account balances had increased by 10%.

But there is more we can be doing to help participants achieve financial well-being—to have the confidence that short-term spending needs won't stop them from reaching their long-term retirement goals.

We believe participants need to reach a total saving rate of 12% to 15% or more to meet their retirement goals. And according to soon-to-be-published research from Vanguard Strategic Retirement Consulting, the same group responsible for *How America Saves*, we're not quite there yet. The good news is that about 20% of participants are within 1% to 3% of their target saving rate, so minor behavioral adjustments could benefit many of them. And Vanguard, working with plan sponsors, can help.

Using data from *How America Saves*, we offer industry benchmark reports that allow plans to be measured against their peers. We also publish *Insights to Action*, which uses data from *How America Saves* to identify actions that sponsors can take to improve retirement outcomes for their participants.

Additionally, our financial well-being program helps participants tackle the challenges that can get in the way of even the best plan design—challenges to retirement savings success, such as those posed by student loan debt and health care costs. Ours is a comprehensive approach, combining financial wellness experiences, actionable advice, and enduring investments.

How America Saves shows improvement is possible. It documents how sponsors have successfully used plan design to improve participant outcomes. And it points to how, together, we can take plan design to the next level.

Sincerely,

John

Contents

Executive summary

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

During 2021, the COVID-19 pandemic continued to impact many parts of the economy. While it pushed to recover, the economy faced prominent headwinds that stoked several forms of uncertainty: Inflation increased to the highest point in decades, supply-chain challenges tempered economic growth, and a tightened labor market continued to test employers while their employees left in record numbers—either changing jobs or leaving the workforce entirely. But despite all that, our metrics reveal that participant retirement plan behaviors remained largely unaffected and, in some areas, continued to improve. This is a testament to the growing use of automatic solutions, which leverage inertia for the benefit of the participant.

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 2021, 56% of Vanguard plans had adopted automatic enrollment, including 75% of plans with at least 1,000 participants. In 2021, because larger plans were more likely to offer it, 70% 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-eight percent of plans now default employees at a deferral rate of 4% or higher, compared with 32% of plans in 2012.

Ninety-nine percent of all plans with automatic enrollment defaulted participants into a balanced investment strategy in 2021—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 2021, 64% of all Vanguard participants were solely invested in an automatic investment program—compared with 7% at the end of 2004 and 36% at year-end 2012. Fifty-six 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.

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.

Increased use of target-date funds

Ninety-five percent of plans offered target-date funds at year-end 2021, up from 84% in 2012. Nearly all Vanguard participants (99%) were in plans offering target-date funds. Eighty-one percent of all participants used target-date funds and 69% 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 2021. The estimated plan-weighted participation rate was 85%, up from 78% in 2012 (see Methodology on page 106). The participant-weighted participation rate was 81% in 2021, up from 74% in 2012. Plans with automatic enrollment had a 93% participation rate, compared with a participation rate of 66% for plans with voluntary enrollment. Between 2012 and 2021, 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 7.3% in 2021, up modestly from 6.9% in 2012. The median deferral rate was 6.1% in 2021, in line with the past 10 years. 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 2021 was 11.2%, and the median was 10.4%. These rates have increased slightly over the past five years.

When including nonparticipants, employees hired under automatic enrollment plans saved an average of 10.9%, considering both employee and employer contributions. Employees hired under a voluntary enrollment design saved an average of 7.3%, due to significantly lower participation.

Roth 401(k) adoption

At year-end 2021, the Roth feature was adopted by 77% of Vanguard plans, and 15% of participants within these plans had elected the option. We anticipate steady growth in Roth adoption rates, given the feature's tax diversification benefits.

Account balances

In 2021, the average account balance for Vanguard participants was $141,542; the median balance was $35,345. Vanguard participants' average account balances increased by 10% since 2020, driven primarily by the increase in equity markets over the year.

Participant portfolio construction

Participant portfolio construction has improved dramatically over the past 15 years, with 78% of participants having a balanced strategy in 2021, 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 2021. In 2005, 13% of participants had no equities and 18% of participants held a concentration in company stock.

Participant trading muted

During 2021, 8% of DC plan participants traded within their accounts, while 92% 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 15 years, 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 3% of participants holding a single target-date fund traded in 2021.

Loan activity

During 2021, loan use increased slightly when compared to 2020, however remained below the typical usage rates of years prior to COVID-19. Thirteen percent of participants had a loan outstanding in 2021, compared with 16% in 2016. The average loan amount was about $10,600.

Plan withdrawals

In-service withdrawal activity was down in 2021, as compared to 2020, which was expected as access to assets through coronavirus-related distributions ended as of year-end 2020. Both traditional hardship and nonhardship withdrawals trended similarly to pre-pandemic levels in 2021.

Most assets preserved for retirement

Participants separating from service largely preserved their assets for retirement. During 2021, 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 2021, 64% of plans allowed retirees to take installments, and 37% of plans allowed for partial withdrawals.

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 $11 trillion in assets.

Sources: U.S. Department of Labor, *Private Pension Plan Bulletin: Abstract of 2019 Form 5500 Annual Reports*, September 2021; and Investment Company Institute, *Quarterly Retirement Market Data, Fourth Quarter 2021*, March 2022.

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 affect 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 an 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* 2022 reference	2017	2018	2019	2020	2021
Number of participant accounts (millions)		4.6	5.0	5.0	4.7	4.7
Number of plans (thousands)		1.9	1.9	1.8	1.7	1.7
Median participant age		45	44	44	44	44
Median participant tenure		6	7	6	7	7
Percentage male		58%	57%	57%	56%	57%
Median eligible employee income (thousands)		$62	$61	$64	$64	$68*
Median participant income (thousands)		$73	$70	$72	$73	$75*
Median nonparticipant income (thousands)		$33	$34	$34	$34	$40*
1. Accumulating						
Plan design—page 14						
Plans offering immediate eligibility for employee contributions	Figure 3	68%	69%	69%	71%	72%*
Plans requiring one year of service for matching contributions	Figure 3	24%	23%	22%	20%	18%*
Plans providing an employer contribution	Figure 6	95%	96%	96%	96%	95%*
Plans with automatic enrollment	Figure 17	46%	48%	50%	54%	56%
Plans with automatic enrollment with automatic annual increases	Figure 18	66%	66%	68%	69%	69%
Plans offering catch-up contributions	Figure 43	98%	98%	98%	97%	98%
Plans offering Roth contributions	Figure 44	68%	71%	74%	74%	77%
Plans offering after-tax contributions	Figure 45	17%	18%	18%	19%	21%
Participation rates—page 28						
Plan-weighted participation rate	Figure 24	81%	82%	83%	85%	85%*
Participant-weighted participation rate	Figure 24	72%	77%	78%	81%	81%*
Voluntary enrollment participant-weighted participation rate	Figure 31	60%	60%	60%	65%	66%*
Automatic enrollment participant-weighted participation rate	Figure 31	91%	92%	92%	92%	93%*
Participants using catch-up contributions (when offered)	Figure 43	16%	14%	15%	16%	16%*
Participants using Roth contributions (when offered)	Figure 44	11%	11%	12%	15%	15%*
Participants using after-tax contributions (when offered)	Figure 45	8%	8%	8%	10%	10%*
Employee deferrals—page 33						
Average participant deferral rate	Figure 33	7.0%	7.0%	7.1%	7.3%	7.3%*
Median participant deferral rate	Figure 33	6.0%	6.0%	6.0%	6.1%	6.1%*
Percentage of participants deferring more than 10%	Figure 35	21%	21%	22%	23%	23%*
Voluntary enrollment plan average participant deferral rate	Figure 41	7.2%	7.1%	7.0%	7.2%	7.4%*
Automatic enrollment plan average participant deferral rate	Figure 41	6.9%	6.9%	7.1%	7.4%	7.3%*
Participants reaching 402(g) limit ($19,500 in 2020)	Figure 42	15%	12%	12%	14%	14%*
Average total contribution rate (participant and employer)	Figure 47	10.8%	10.7%	11.3%	11.3%	11.2%*
Median total contribution rate (participant and employer)	Figure 47	10.0%	9.9%	10.5%	10.5%	10.4%*
Account balances—page 44						
Average balance	Figure 52	103,866	$92,148	$106,478	$129,157	$141,542
Median balance	Figure 52	$26,331	$22,217	$25,775	$33,472	$35,345

* These figures are estimated for 2021 as the data required to compute them will not be available until December 2022.

(Continued)

Figure 1. Highlights at a glance

2. Managing

	How America Saves 2022 reference	2017	2018	2019	2020	2021
Asset and contribution allocations—page 50						
Average plan asset allocation to equities	Figure 58	73%	71%	73%	72%	74%
Average plan contribution allocation to equities	Figure 59	75%	76%	77%	77%	77%
Average plan asset allocation to target-date funds	Figure 58	33%	35%	37%	37%	38%
Average plan contribution allocation to target-date funds	Figure 59	54%	57%	59%	60%	61%
Participants with balanced strategies	Figure 88	74%	75%	76%	76%	78%
Extreme participant asset allocations (100% fixed income or equity)	Figure 85	8%	9%	8%	8%	8%
Plan investment options—page 54						
Average number of funds offered	Figure 62	18.0	17.7	17.4	17.5	17.5
Average number of funds used	Figure 62	2.5	2.5	2.4	2.5	2.4
Plans offering an index core	Figure 66	61%	63%	64%	67%	67%
Participants offered an index core	Figure 66	72%	73%	70%	71%	70%
Percentage of plans designating a QDIA	Figure 69	79%	84%	86%	87%	88%
Among plans designating a QDIA, percentage target-date fund	Figure 69	96%	97%	97%	97%	97%
Plans offering target-date funds	Figure 79	92%	93%	94%	95%	95%
Participants using target-date funds (when offered)	Figure 81	75%	79%	80%	80%	82%
Plans offering managed account advice	Figure 89	30%	32%	37%	39%	41%
Participants offered managed account advice	Figure 89	55%	57%	63%	71%	74%
Participants with professionally managed allocations	Figure 76	58%	59%	62%	62%	64%
Participants using a single target-date fund	Figure 77	51%	52%	54%	54%	56%
Participants using a single risk-based balanced fund	Figure 77	3%	3%	3%	1%	1%
Participants using a managed account program	Figure 77	4%	4%	5%	7%	7%
Plans offering company stock	Figure 64	9%	8%	8%	8%	8%
Participants using company stock	Figure 73	10%	9%	9%	9%	8%
Participants with >20% company stock	Figure 88	5%	4%	4%	3%	3%
Investment returns—page 80						
Average 1-year participant total return rate	Figure 93	18.0%	(5.3%)	22.4%	15.1%	14.6%
Average 1-year participant personal return rate	Figure 93	17.4%	(7.0%)	21.2%	16.5%	13.6%
Trading activity—page 84						
Participant-directed trading	Figure 97	8%	8%	7%	10%	8%
Recordkeeping assets exchanged to equities (fixed income)	Figure 97	(0.3%)	(1.1%)	(1.3%)	(3.0%)	(3.0%)

(Continued)

Figure 1. Highlights at a glance

3. Accessing

	How America Saves 2022 reference	2017	2018	2019	2020	2021
Plan loans—page 90						
Plans offering loans	Figure 103	80%	78%	78%	79%	81%
Participants with an outstanding loan (when offered)	Figure 104	15%	13%	13%	13%	13%
Plan withdrawals—page 94						
Plans offering hardship withdrawals	Figure 109	85%	85%	88%	95%	94%
Participants using withdrawals (when offered)	Figure 111	3%	3%	4%	7%	4%
Recordkeeping assets withdrawn	Figure 111	1%	1%	1%	2%	1%
Participant account balance withdrawn	Figure 111	30%	34%	35%	40%	33%
Plan distributions and rollovers—page 96						
Terminated participants preserving assets	Figure 120	84%	81%	80%	83%	83%
Assets preserved that were available for distribution	Figure 120	98%	96%	96%	98%	98%
Participant access methods—page 102						
Participants not contacting Vanguard during the year	Figure 121	36%	36%	34%	31%	32%
Participants registered for website account access	Figure 125	73%	73%	76%	79%	79%
Participant account transactions processed via the web	Figure 126	88%	90%	91%	91%	92%

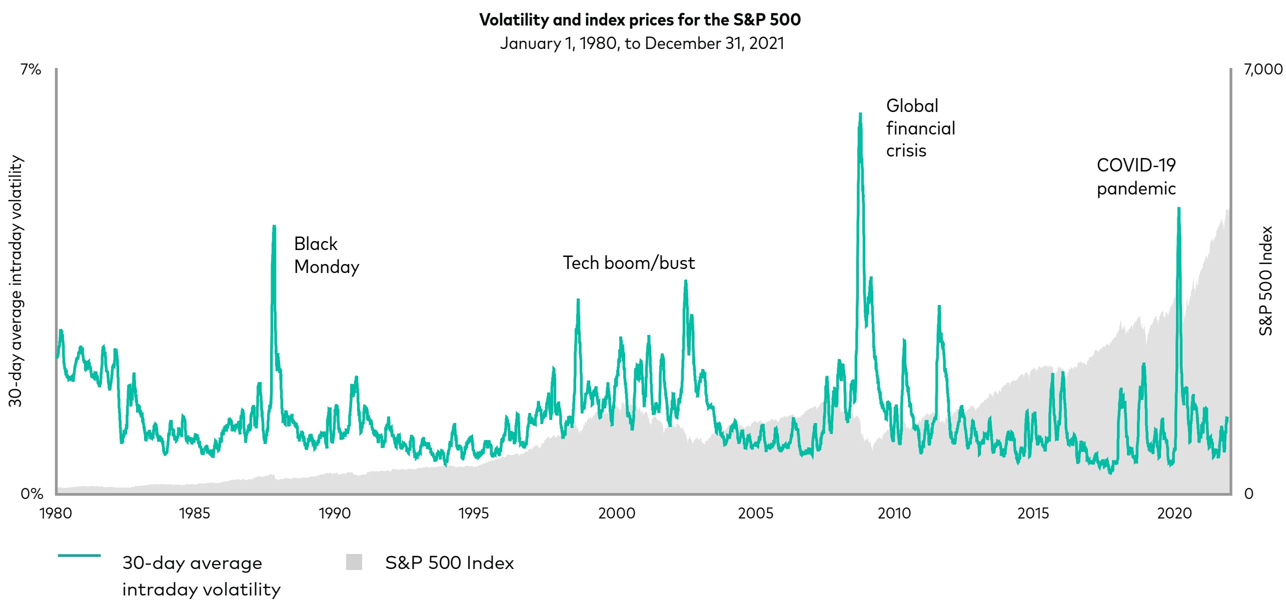
Source: Vanguard 2022.

Market overview

Stock prices increased by 29% in 2021 **(Figure 2)**. Volatility was relatively low, with only 21% of trading days seeing a change in stock prices of +/–1% and no trading days seeing a change of +/–3%. This was a significant decrease from 2020, when, amid the COVID-19 pandemic and economic uncertainty, market volatility reached its highest level since the 2008 global financial crisis, as more than 40% of trading days saw stock prices change by +/–1%, and 1 in 10 trading days saw a change of +/–3%.

During the past 10 years, 5 years saw no trading days with a change in stock prices of greater than +/–3% (2012, 2013, 2014, 2017, and 2021) and only two years had less than 1% of trading days with high levels of volatility (2016 and 2019).

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.

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Accumulating plan assets

Historically, employees have had to decide whether to participate in their employer's 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 permitted pre-tax elective deferrals by eligible employees in 2021. 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

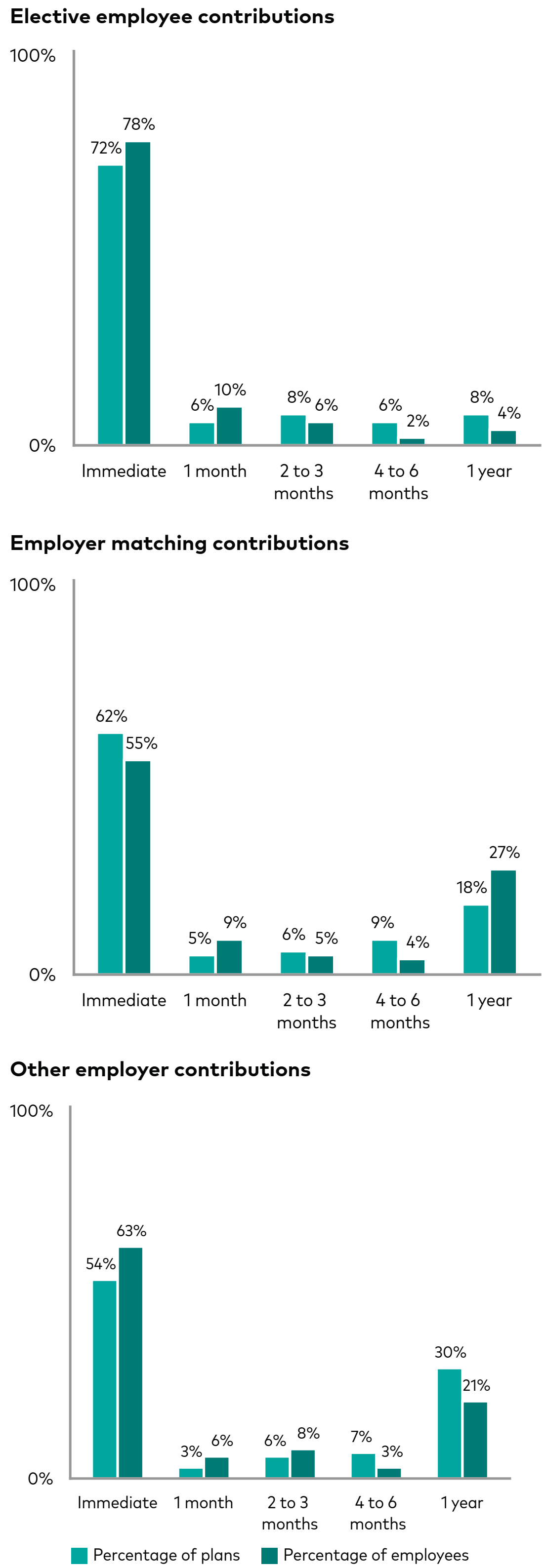
In 2021, nearly 3 in 4 Vanguard plans allowed employees to make voluntary contributions immediately after they joined their employer **(Figure 3)**. Larger plans were more likely than smaller plans to offer immediate eligibility. As a result, nearly 8 in 10 employees qualified for immediate eligibility (estimated; see the Methodology section on page 106).

At the other extreme, 8% 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 plans 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, 2021 estimated

Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2022.

The proportion of plans permitting immediate eligibility for employee-elective contributions has risen over the past 10 years **(Figure 4)**.

Fifty-eight percent of plans offered immediate eligibility in 2012; in 2021, 72% did. Because larger plans are more likely to offer immediate eligibility for employee-elective contributions, 80% of participants were in plans offering immediate eligibility in 2021. Similar trends are observed for both employer matching contributions and other employer contributions.

Vesting

In 2021, nearly half of plans immediately vested participants in employer matching contributions, and 48% 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

Employee-elective contributions

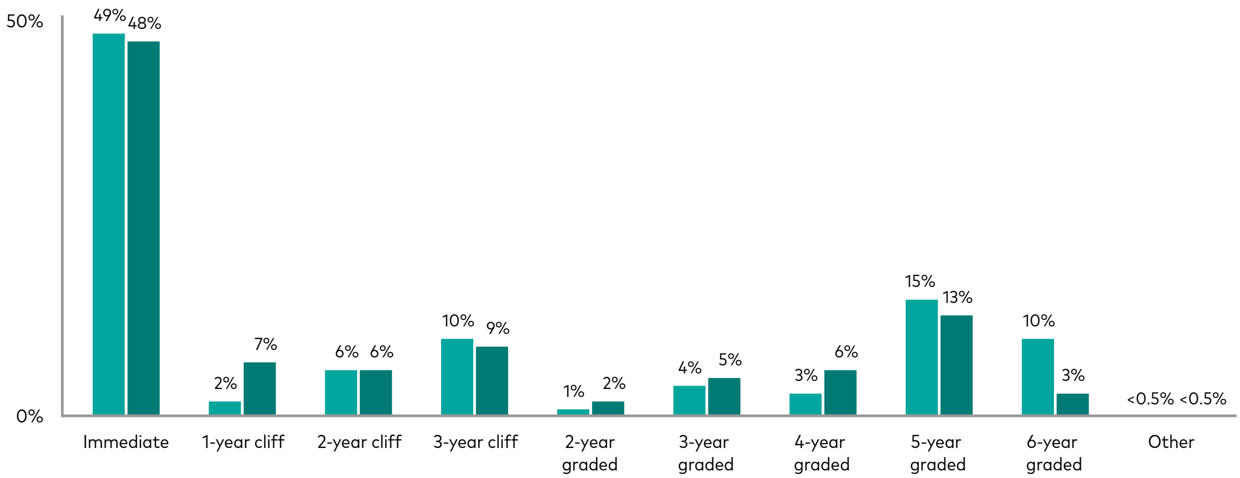
Source: Vanguard 2022.

Four in 10 plans immediately vested participants for other employer contributions, such as profit-sharing or ESOPs. On the other hand, 34% 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.

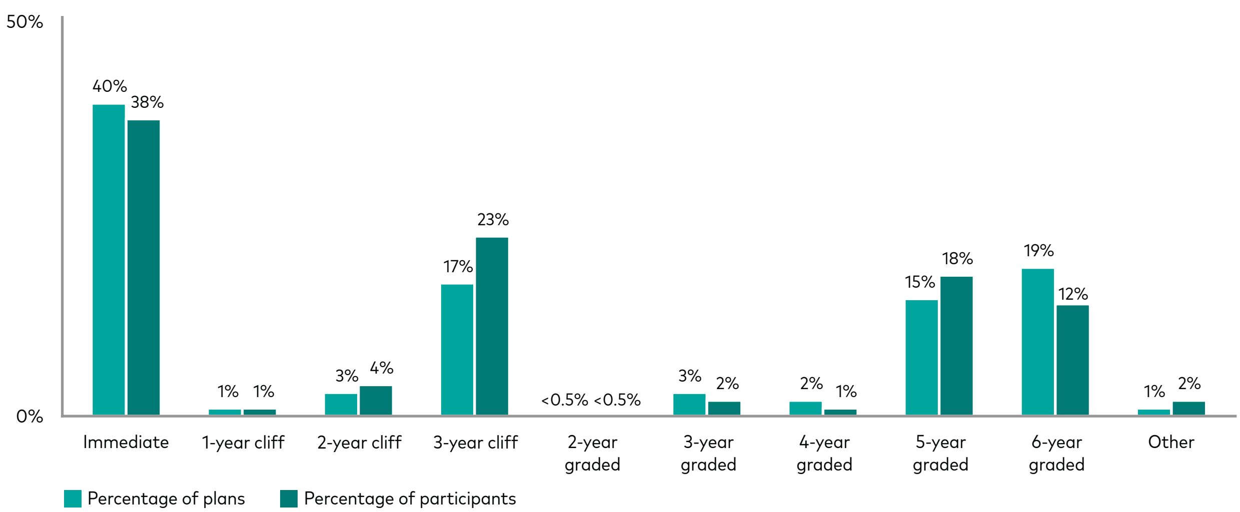
Figure 5. Vesting, 2021

Vanguard defined contribution plans with employer contributions

Employer matching contributions



Other employer contributions



Source: Vanguard 2022.

Employer contributions

Nearly half of Vanguard plans provided only a matching contribution in 2021, and 55% of participants were in such a plan **(Figure 6)**.

Thirty-six percent 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, 5% of plans made no employer contributions of any kind in 2021, and 1% of participants were in such a plan.

Figure 6. Types of employer contributions, 2021 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

Type of employer contribution	Percentage of plans	Percentage of participants
Matching contribution only	49%	55%
Nonmatching contribution only	10	3
Both matching and nonmatching contribution	36	41
Subtotal	**95%**	**99%**
No employer contribution	5%	1%

Source: Vanguard 2022.

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 2021, Vanguard administered more than 170 distinct match formulas for plans offering an employer match. Among those plans, 71% (covering 62% of participants) provided a single-tier match formula, such as $0.50 per dollar on the first 6% of pay **(Figure 7)**. Less common, used by 22% of plans (covering 27% of participants), were multitier 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 multitier 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.

Figure 7. Types of matching contributions, 2021 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	71%	62%
Multitier formula	$1.00 per dollar on first 3% of pay; $0.50 per dollar on next 2% of pay	22	27
Dollar cap	Single- or multitier formula with $2,000 maximum	5	9
Other	Variable formulas based on age, tenure, or similar variables	2	2

Most frequently used match formulas

Vanguard defined contribution plans with matching contributions

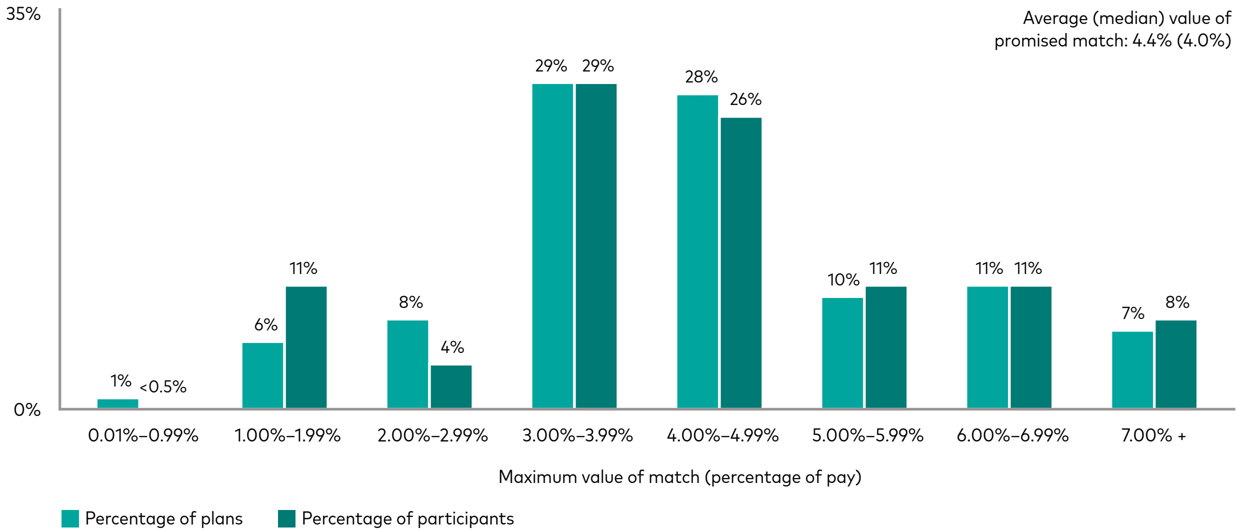
Match formula	Percentage of plans
50% on 6%	16%
100% on 6%	10
100% on 3%, 50% on 5	9
100% on 4%	7
100% on 5%	7

Source: Vanguard 2022.

The matching formula most cited as a typical employer match is $0.50 per 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 2021 **(Figure 7)**.

Figure 8. Distribution of promised matching contributions, 2021 estimated

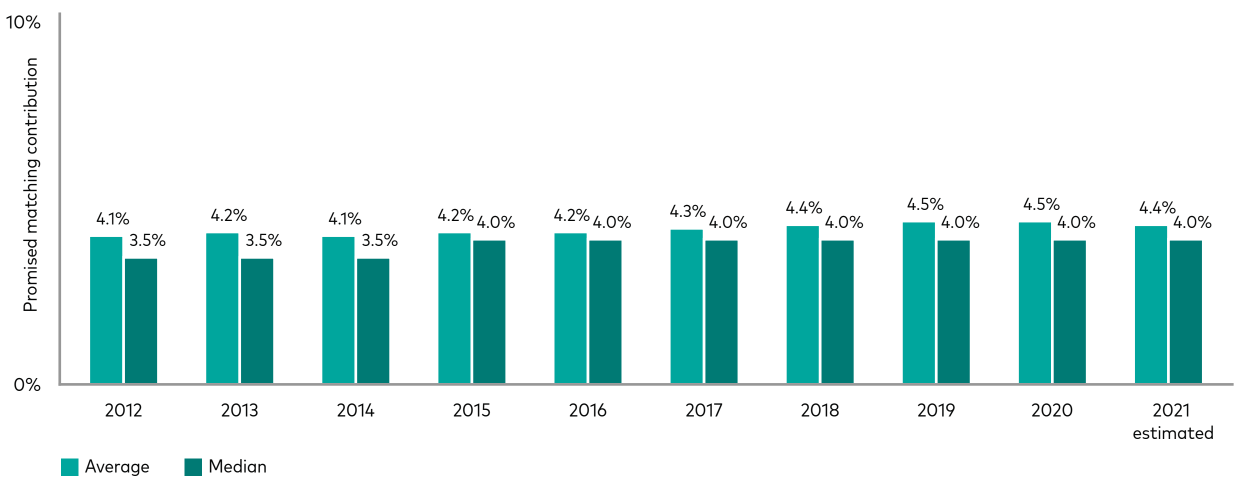
Vanguard defined contribution plans permitting employee-elective deferrals with a single- or multitier match formula



Source: Vanguard 2022.

Figure 9. Promised matching contributions

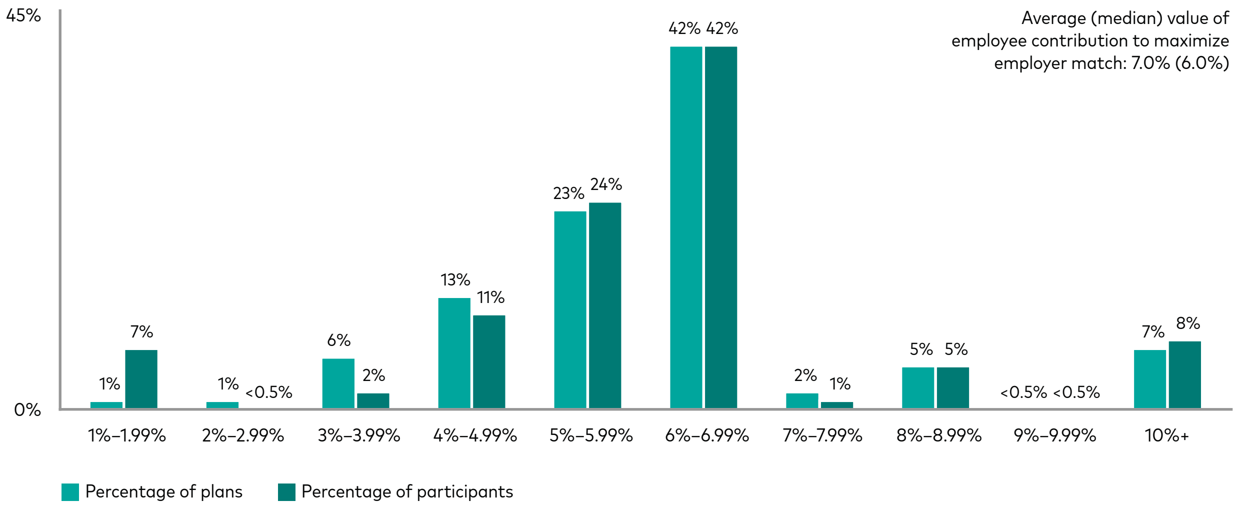
Vanguard defined contribution plans permitting employee-elective deferrals with a single- or multitier match formula



Source: Vanguard 2022.

Figure 10. Employee contributions for maximum match, 2021 estimated

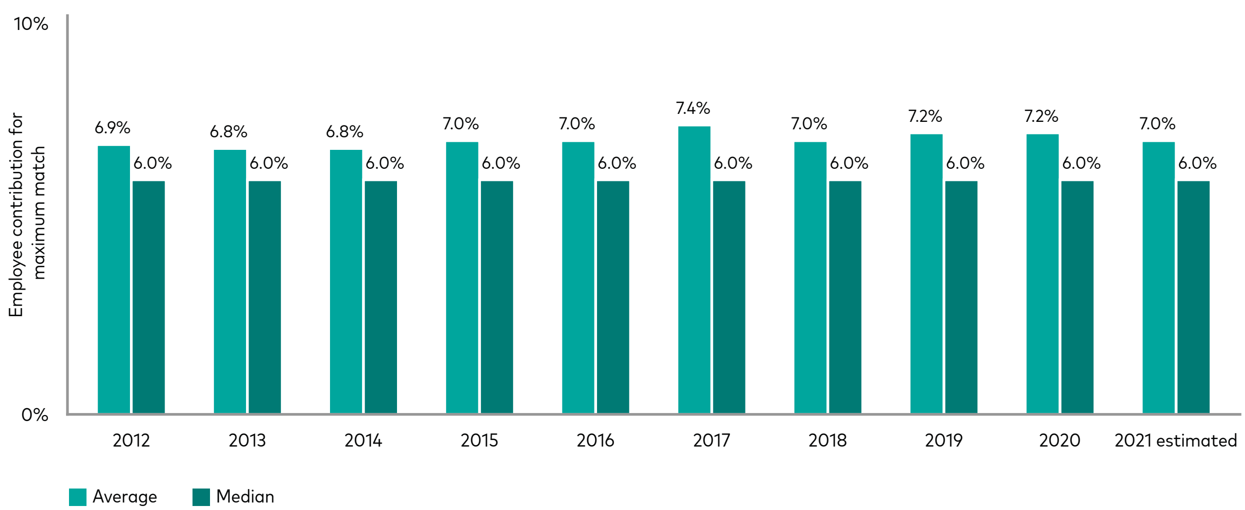
Vanguard defined contribution plans permitting employee-elective deferrals with a single- or multitier match formula



Source: Vanguard 2022.

Figure 11. Employee contributions for maximum match

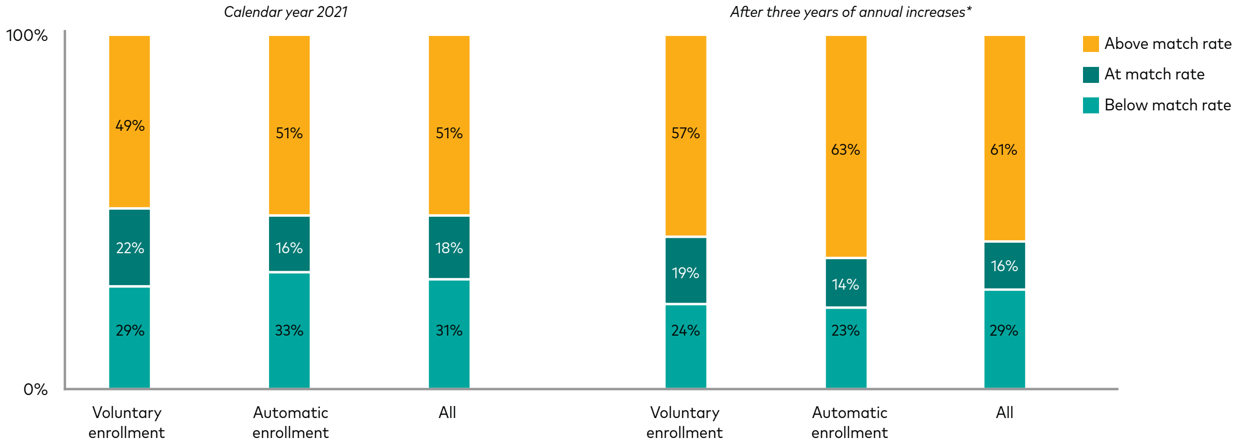
Vanguard defined contribution plans permitting employee-elective deferrals with a single- or multitier match formula



Source: Vanguard 2022.

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 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 2022.

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 per 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 matching contributions varied substantially from plan to plan in 2021. Among plans with single- or multi-tier match formulas, most promised a match of between 3.0% and 6.0% of pay **(Figure 8)**. The average value of the promised match was 4.4% of pay; the median value, 4.0%.

Average promised employer matches remained relatively stable from 2012 through 2016. Since 2016, average match rates have increased slightly through 2021 **(Figure 9)**. Median promised matches have remained stable since 2015.

Another way to assess matching formulas is to calculate the employee-elective deferral needed to realize the maximum value of the match. In 2021, about 8 in 10 plans (covering 77% of participants) required participants to defer between 4.0% and 6.99% of their pay to receive the maximum employer matching contribution **(Figure 10)**.

The average employee-elective deferral required to maximize the match was 7.0% of pay; the median, 6.0%. The average has remained relatively stable since 2012, with values between 6.8% and 7.4% **(Figure 11)**. The required median deferral has remained constant at 6.0% during the same period.

In 2021, two-thirds of participants received the full employer matching contribution **(Figure 12)**. Participants in automatic enrollment designs were slightly less likely to receive the full employer match than were participants subjected to voluntary enrollment. However, after three years of automatic annual increases, participants in automatic enrollment designs are more likely to be saving above the full employer match, and more than three-quarters of all participants will be receiving the full employer match, with 6 in 10 contributing at levels above the employer match.

Other employer contributions

As noted previously, in 46% of plans, 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 or not they contribute any part of their pay to the plan.

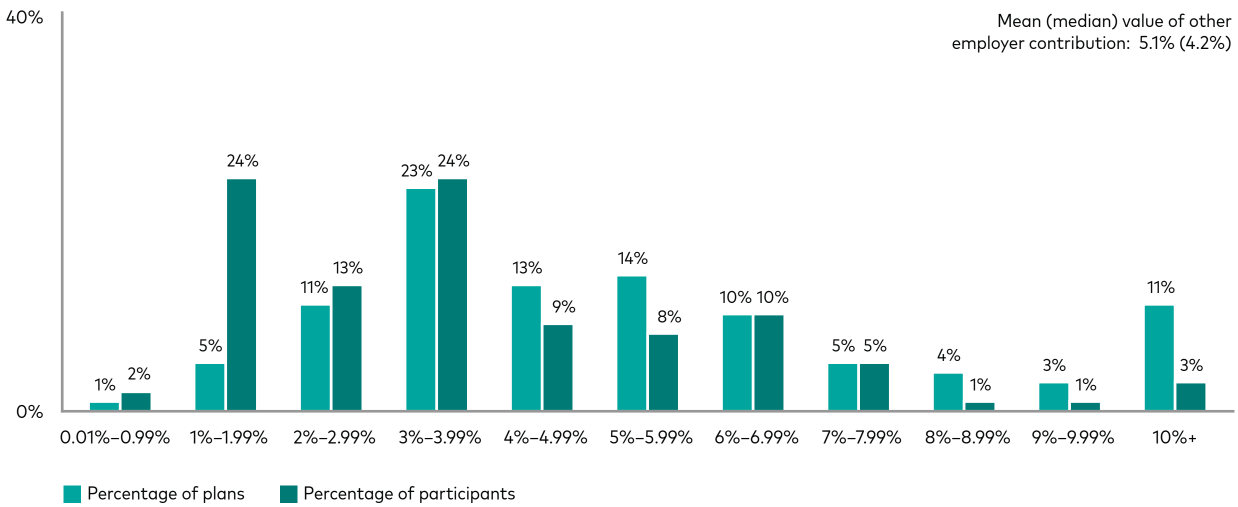
As with matching contributions, eligibility is more restrictive for these types of employer contributions—many employees are not entitled to receive these until they complete one year of service.

The value of other employer contributions varied significantly from plan to plan in 2021. Among plans offering such contributions, 52% of plans provided all participants with a contribution based on the same percentage of pay, while the other 48% 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 5.1% of pay; the median contribution, 4.2% of pay. Between 2012 and 2021, 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 nonmatching employer contribution in 2021. The median combined value of the promised match and other employer contributions was 8.0% **(Figure 15)**.

Figure 13. Other employer contributions, 2021 estimated

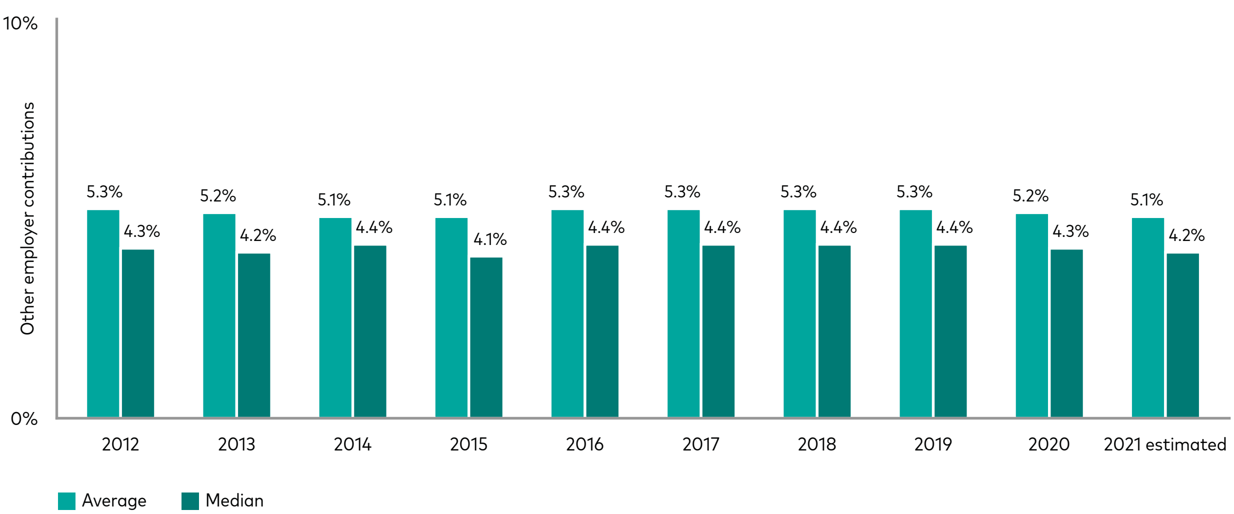
Vanguard defined contribution plans with other employer contributions



Source: Vanguard 2022.

Figure 14. Other employer contributions

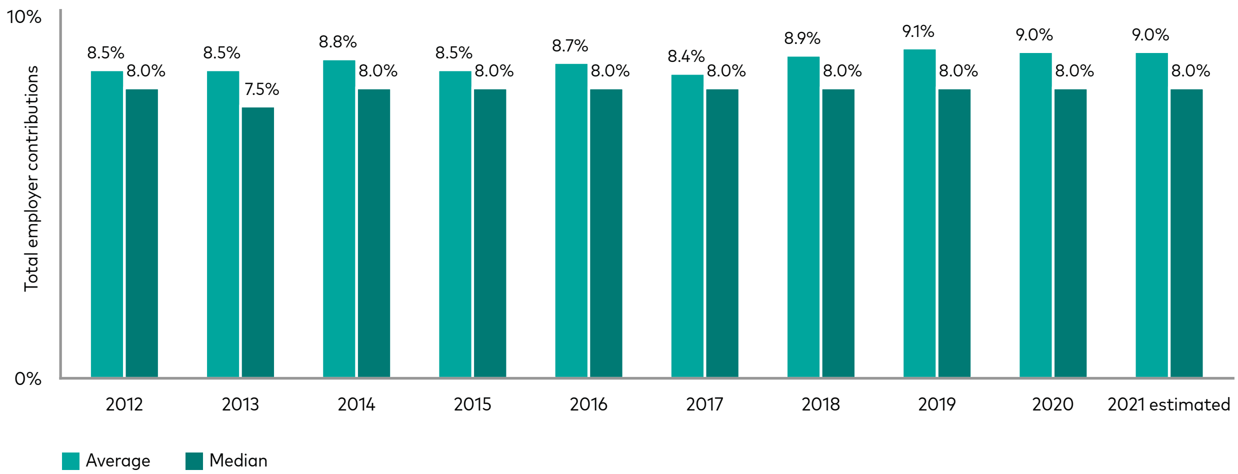
Vanguard defined contribution plans with other employer contributions



Source: Vanguard 2022.

Figure 15. Match and other employer contributions

Vanguard defined contribution plans with both match and other employer contributions



Source: Vanugard 2022.

Safe harbor plan designs

Plan sponsors who do not want to perform nondiscrimination tests are able to adopt 1 of 3 different plan design options that will satisfy the safe harbor contribution requirements. As of year-end 2021, 36% of plans that permitted employee-elective deferrals and employer contributions has adopted a safe harbor design **(Figure 16)**.

Figure 16. Safe harbor plan design

Vanguard defined contribution plans permitting employee-elective deferrals and employer contributions

Plan size (number of participants)	Percentage of plans with a safe harbor design
<500	37%
500–999	32
1,000–4,999	33
5,000+	44
All plans	36

Source: Vanguard 2022.

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 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 saving 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.

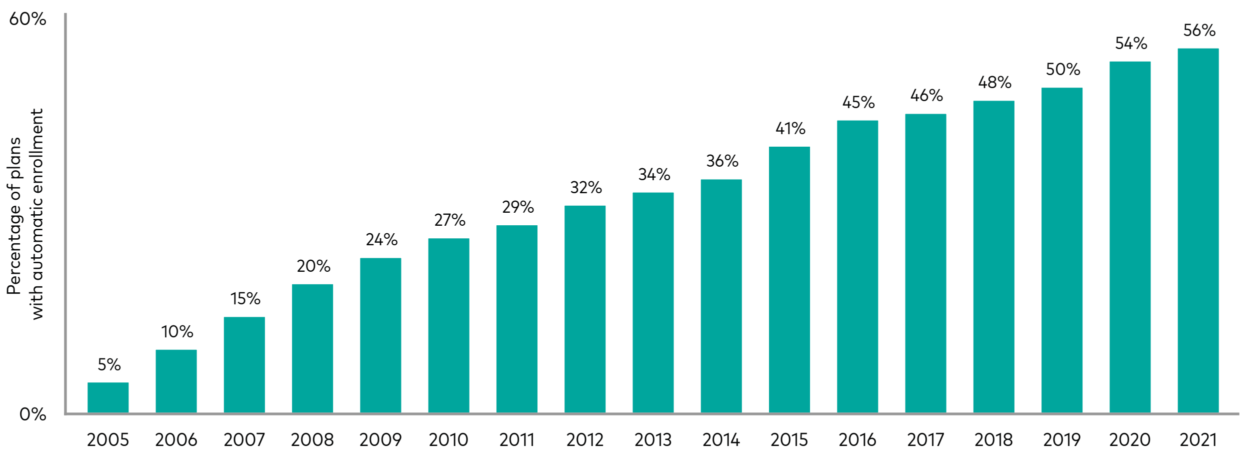
Automatic enrollment or autopilot plan designs reframe the savings decision. With an autopilot design, individuals are automatically enrolled into the plan, their deferral rates are automatically increased each year, and their contributions are automatically invested in a balanced investment strategy.[1] 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.

As of year-end 2021, 56% of Vanguard plans permitting employee-elective deferrals had adopted components of an autopilot design **(Figure 17)**. Plan adoption of automatic enrollment has been consistently increasing over the past 15 years.

Larger plans are more likely than smaller plans to implement automatic enrollment, with 75% of larger plans using the feature **(Figure 18)**. 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.

Figure 17. Automatic enrollment adoption

Vanguard defined contribution plans with employee elective contributions



Source: Vanguard 2022.

Figure 18. Automatic enrollment design by plan size, 2021

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	**56%**	**37%**	**68%**	**76%**	**74%**
Percentage of participants in plans offering	**70%**	**47%**	**68%**	**77%**	**69%**
For plans offering automatic enrollment					
Percentage of plans with automatic enrollment, automatic saving rate increases, and a balanced default fund	69%	62%	68%	74%	71%
Percentage of plans with automatic enrollment and a balanced default fund	30	36	32	26	29
Percentage of plans with automatic enrollment and a money market or stable value default fund	1	2	0	0	0

Source: Vanguard 2022.

[1] For an in-depth analysis of automatic escalation, see Daniel C. Proctor and Jean A. Young, *Automatic Escalation and DC Saving Rates*. Vanguard research. October 2021. institutional.vanguard.com

Figure 19. Automatic enrollment adoption by industry

Vanguard defined contribution plans permitting employee-elective deferrals

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Manufacturing	44%	48%	52%	56%	58%	61%	63%	66%	69%	70%
Finance, insurance, and real estate	41	42	45	48	49	50	52	56	59	64
Transportation, utilities, and communications	37	36	39	42	49	56	57	58	58	62
Media, entertainment, and leisure	32	36	39	45	49	49	53	55	55	58
Wholesale and retail trade	43	43	45	51	56	56	59	59	57	58
Agriculture, mining, and construction	36	39	41	44	46	48	50	52	54	54
Business, professional, and nonproft	25	25	28	29	32	34	36	39	43	45
Education and health	15	16	19	24	28	29	33	35	33	34

Source: Vanguard 2022.

Among plans automatically enrolling employees, 69% used all three features of an autopilot design in 2021. These plans automatically enrolled employees, automatically increased deferral rates annually, and automatically 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 19)**. 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 automatic enrollment design adoption over the past decade.

Thirty-six percent of these plans automatically enrolled participants at a 3% contribution rate **(Figure 20)**. Sixty-nine percent of plans automatically increased the contribution rate annually. Ninety-nine percent of plans were using a target-date or other balanced investment strategy as the default fund, with 98% choosing a target-date fund.[2]

Automatic enrollment plan design is improving. In 2021, 58% of plans chose a default of 4% or higher, compared with 2012 when only 32% did **(Figure 21)**. In fact, 27% of plans chose a default of 6% or more—more than double the proportion of plans choosing 6% or more in 2012.

Forty-one percent of plans with automatic enrollment and annual increases capped the annual increase at 10% in 2021, and 46% of annual-increase participants were capped at that level **(Figure 22)**. One in 3 plans implemented caps between 11% and 25%. Eight percent of plans had no cap—likely an error. We recommend plan sponsors set the cap at a level where participants are saving 15% or more, including employer contributions.

Plan sponsors may also elect to offer automatic annual increases in voluntary enrollment plans. Participants are then presented with the annual increase election at enrollment and when they change their employee-elective deferral rate. In 2021, 36% 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 23)**. Nearly 3 in 10 participants in these plans had elected automatic annual increases.

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

Figure 20. Automatic enrollment design trends

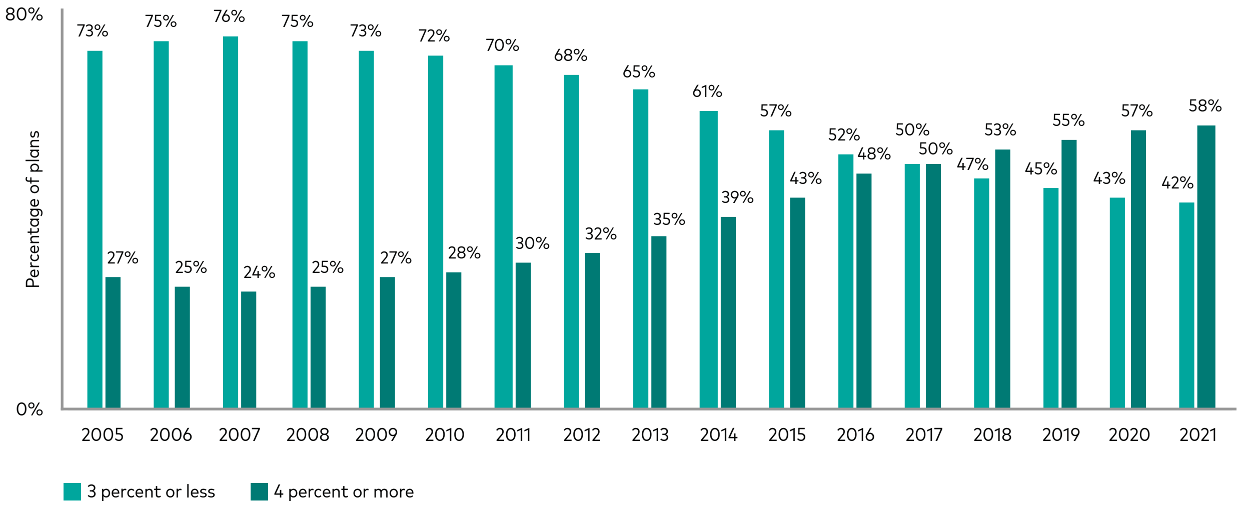
Vanguard defined contribution plans with automatic enrollment

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Default automatic enrollment rate										
1 percent	2%	2%	2%	1%	1%	1%	1%	2%	1%	1%
2 percent	13	12	10	8	7	8	6	5	5	5
3 percent	53	51	49	48	44	41	40	38	37	36
4 percent	12	13	15	16	15	15	15	15	15	14
5 percent	8	9	9	11	13	14	15	16	16	17
6 percent or more	12	13	15	16	20	21	23	24	26	27
Default automatic increase rate										
1 percent	67%	67%	68%	68%	65%	64%	64%	66%	67%	67%
2 percent	2	2	2	2	2	2	2	2	2	2
Voluntary election	17	17	18	20	24	25	26	26	24	24
Service feature not offered	14	14	12	10	9	9	8	6	7	7
Default automatic increase cap										
<6 percent	3%	3%	3%	2%	2%	3%	2%	2%	2%	2%
6 percent	21	20	18	16	14	14	13	13	13	12
7 to 9 percent	8	8	9	11	10	9	7	6	6	5
10 percent	39	41	42	42	44	44	46	47	46	42
11 to 20 percent	21	21	21	22	23	23	23	23	26	29
>20 percent	3	3	2	2	2	2	2	2	2	3
No cap	5	4	5	5	5	5	7	7	5	7
Default fund										
Target-date fund	91%	93%	95%	97%	97%	97%	98%	98%	98%	98%
Other balanced fund	6	5	3	2	2	2	1	1	1	1
Subtotal	**97%**	**98%**	**98%**	**99%**	**99%**	**99%**	**99%**	**99%**	**99%**	**99%**
Money market or stable value fund	3%	2%	2%	1%	1%	1%	1%	1%	1%	1%

Source: Vanguard 2022.

Figure 21. Automatic enrollment default trends

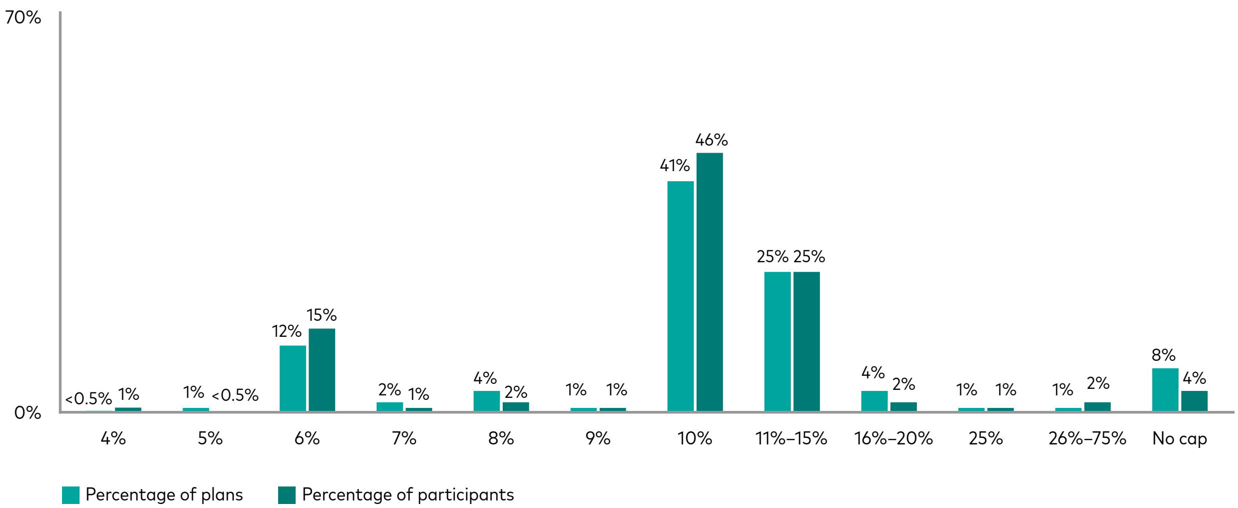
Vanguard defined contribution plans with automatic enrollment



Source: Vanguard 2022.

Figure 22. Automatic increase plan caps

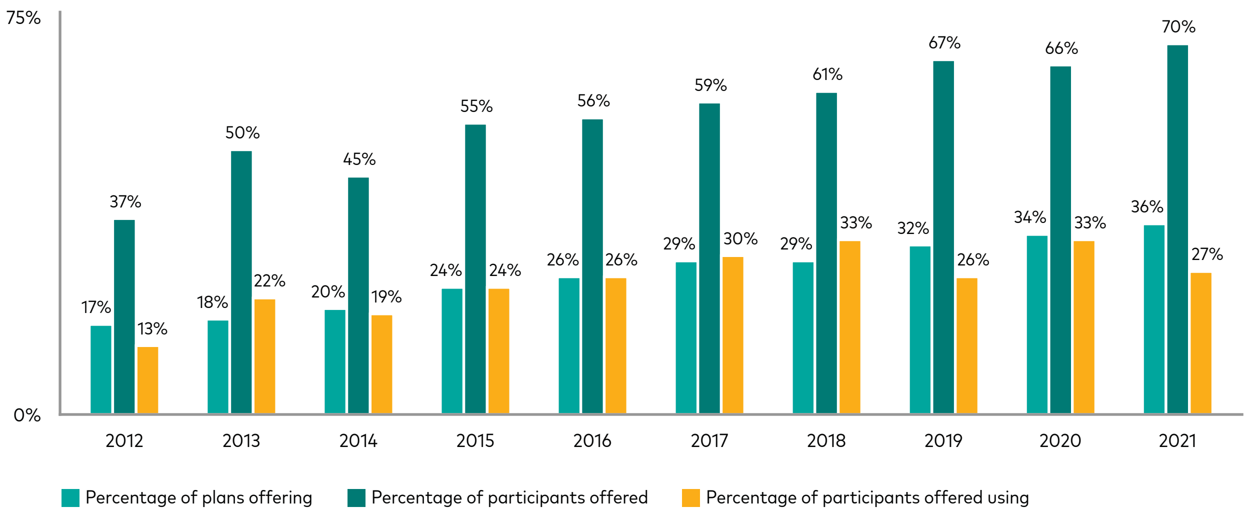
Automatic enrollment plans with an automatic annual increase as of December 31, 2021



Source: Vanguard 2022.

Figure 23. Voluntary annual increase adoption

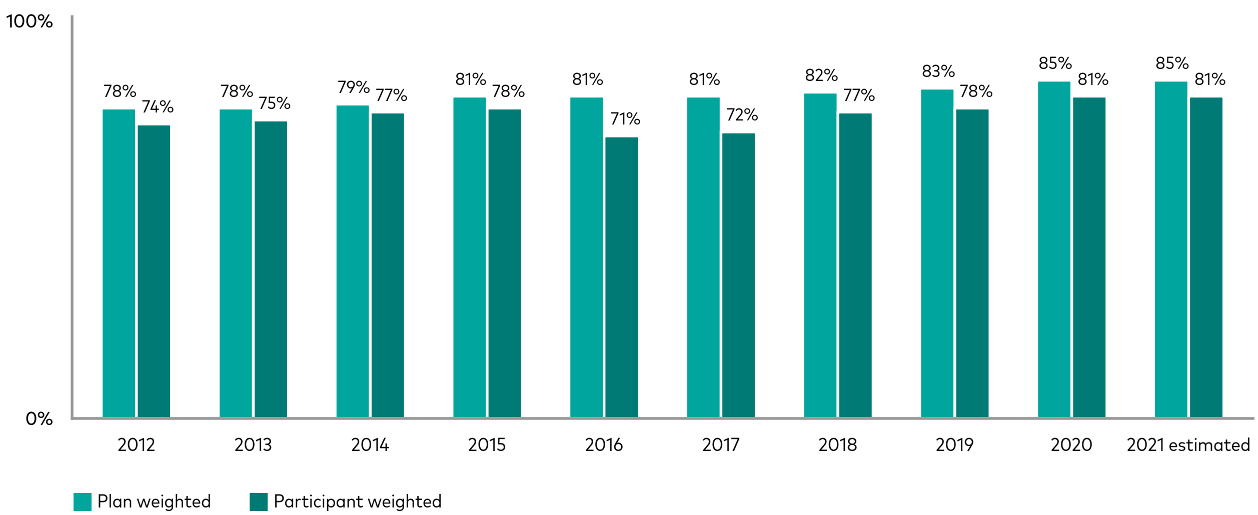
Voluntary enrollment plans with voluntary annual increase



Source: Vanguard 2022.

Figure 24. Plan participation rates

Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2022.

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 2021, Vanguard's plan-weighted participation rate was 85% (estimated; see the Methodology section on page 106) **(Figure 24)**. It has risen by 7 percentage points since 2012.

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, 81% of eligible employees were enrolled in their employer's voluntary saving program in 2021. This broader measure of plan participation rose between 2012 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 increased slightly.

These two measures provide different views of employee participation in retirement saving plans. The first measure indicates that in the average plan, about 1 in 6 eligible employees failed to contribute in 2021. The second measure 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 because it looks at all eligible employees across all plans.

Distribution of participation rates

Participation rates vary considerably across plans **(Figure 25)**. In 2021, 3 in 4 plans had a participation rate of 80% or higher, while 5% of plans had a participation rate of less than 50%.

Participation rates also vary by plan size, with smaller plans having lower participation rates in 2021 **(Figure 26)**. 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.

Figure 25. Distribution of participation rates

Vanguard defined contribution plans permitting employee-elective deferrals

Plan participation rate	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021 estimated
90%–100%	29%	31%	35%	40%	41%	44%	47%	51%	55%	55%
80%–89%	28	30	28	25	24	23	23	22	20	21
70%–79%	17	14	14	14	13	12	11	9	9	9
60%–69%	10	9	9	8	9	8	7	7	6	6
50%–59%	7	7	6	5	5	6	5	5	5	4
<50%	9	9	8	8	8	7	7	6	5	5
Average plan participation rate	**78%**	**78%**	**79%**	**81%**	**81%**	**81%**	**82%**	**83%**	**85%**	**85%**

Source: Vanguard 2022.

Figure 26. Participation rates by plan size

Vanguard defined contribution plans permitting employee-elective deferrals

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021 estimated
Plan-weighted participation rate										
<500	76%	76%	77%	79%	79%	80%	80%	81%	83%	83%
500–999	80	82	82	83	84	84	84	85	85	86
1,000–4,999	80	81	80	84	85	85	86	87	88	88
5,000+	81	81	74	82	77	78	82	83	83	84
All plans	**78%**	**78%**	**79%**	**81%**	**81%**	**81%**	**82%**	**84%**	**85%**	**85%**
Participant-weighted participation rate										
<500	70%	69%	72%	75%	73%	75%	72%	73%	77%	77%
500–999	77	78	77	77	73	77	79	80	80	81
1,000–4,999	72	72	73	80	78	81	82	84	85	84
5,000+	76	77	67	77	67	68	75	76	79	80
All participants	**74%**	**75%**	**77%**	**78%**	**71%**	**72%**	**77%**	**78%**	**81%**	**81%**

Source: Vanguard 2022.

Participation rates by employee demographics

Participation rates also vary considerably by employee demographics **(z)**. Income is one of the primary determinants. Forty-five percent of eligible employees with income of less than $15,000 contributed to their employer's DC plan in 2021, while 96% of employees with income of more than $150,000 elected to participate.

Participation rates were lowest for employees younger than 25. Fifty-six percent of those employees made employee-elective deferrals to their employer's plan in 2021, 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-eight 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 were participants.

Men and women appeared to participate at about the same level in 2021, 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 28)**. For example, 88% 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 29)**. 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 64%.

Figure 27. Participation rates by participant demographics

Vanguard defined contribution plans permitting employee-elective deferrals

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021 estimated
All	**74%**	**75%**	**77%**	**78%**	**71%**	**72%**	**77%**	**78%**	**81%**	**81%**
Income										
<$15,000	30%	29%	29%	27%	33%	18%	38%	36%	46%	45%
$15,000–$29,999	52	51	54	48	48	45	54	57	58	60
$30,000–$49,999	71	71	75	75	69	68	71	74	75	75
$50,000–$74,999	75	76	79	80	77	79	82	83	83	84
$75,000–$99,999	82	82	83	84	85	84	86	86	87	87
$100,000–$149,999	86	88	88	88	89	90	91	91	91	91
$150,000+	89	92	92	92	92	94	94	95	96	96
Age										
<25	52%	53%	57%	54%	42%	38%	51%	50%	54%	56%
25–34	70	71	74	74	69	70	75	77	80	81
35–44	75	76	79	79	75	76	80	81	83	84
45–54	78	79	81	81	76	78	81	82	84	84
55–64	79	80	82	83	77	79	82	83	85	85
65+	74	74	75	77	69	70	72	73	77	77
Gender										
Male	73%	75%	76%	77%	71%	71%	78%	79%	81%	81%
Female	74	77	77	79	71	73	78	78	82	82
Job tenure (years)										
0–1	61%	62%	67%	64%	56%	56%	63%	65%	67%	68%
2–3	71	72	75	78	72	72	77	79	82	82
4–6	73	75	79	81	76	78	82	82	85	86
7–9	78	78	79	81	76	80	83	83	85	85
10+	82	83	84	85	80	80	84	85	86	86

Source: Vanguard 2022.

Figure 28. Participation by income and gender, 2021 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

	Female	Male	All
<$15,000	50%	42%	45%
$15,000–$29,999	63	57	60
$30,000–$49,999	78	74	75
$50,000–$74,999	88	81	84
$75,000–$99,999	92	85	87
$100,000–$149,999	94	90	91
$150,000+	96	95	96

Source: Vanguard 2022.

Figure 29. Participation rates by industry sector, 2021 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

	Plan weighted	Participant weighted
Overall	**85%**	**81%**
Finance, insurance, and real estate	91%	93%
Agriculture, mining, and construction	86	84
Business, professional, and nonprofit	86	83
Manufacturing	85	87
Transportation, utilities, and communications	85	81
Education and health	81	87
Media, entertainment, and leisure	80	88
Wholesale and retail trade	76	64

Source: Vanguard 2022.

Figure 30. Participation rates by plan design, 2021 estimated

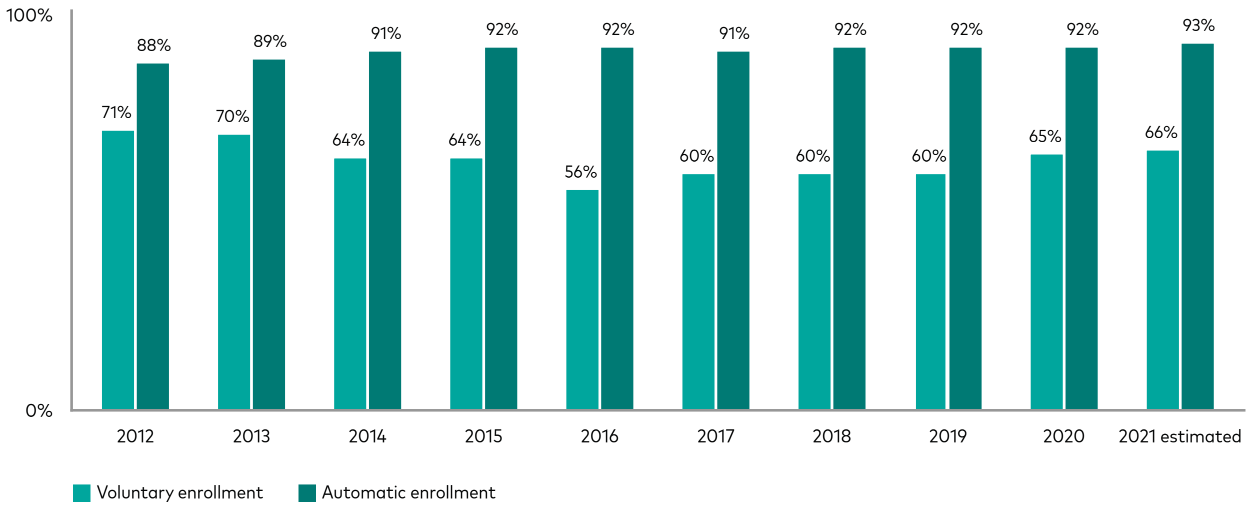
Vanguard defined contribution plans permitting employee-elective deferrals

	Voluntary enrollment	Automatic enrollment	All
All	**66%**	**93%**	**81%**
Income			
<$15,000	27%	77%	45%
$15,000–$29,999	37	86	60
$30,000–$49,999	57	89	75
$50,000–$74,999	72	93	84
$75,000–$99,999	78	94	87
$100,000–$149,999	85	96	91
$150,000+	92	98	96
Age			
<25	24%	86%	56%
25–34	59	93	81
35–44	71	93	84
45–54	74	93	84
55–64	75	94	85
65+	66	90	77
Gender			
Male	65%	93%	81%
Female	68	93	82
Job tenure (years)			
0–1	37%	87%	68%
2–3	60	94	82
4–6	70	95	86
7–9	75	95	85
10+	79	94	86

Source: Vanguard 2022.

Figure 31. Plan participation rates by plan design, participant-weighted trend

Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2022.

Impact of automatic enrollment on plan design

Reflecting increased adoption of automatic enrollment, there has generally been improvement in participation rates between 2012 and 2021 among demographic groups that traditionally have lower voluntary participation rates. Employees subjected to an automatic enrollment feature had an overall participation rate of 93% in 2021, compared with a rate of 66% for employees hired under plans with voluntary enrollment **(Figure 30)**.

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 2012 and 2021, plans with automatic enrollment have had consistently strong participation rates **(Figure 31)**. However, while plans with voluntary enrollment saw declining participation rates from 2012 through 2016, participation rates in voluntary plans have increased over the past few years.

In 2021, 93% of automatic enrollment plans had participation rates of 80% or higher, compared with 50% of voluntary enrollment plans **(Figure 32)**. One-third of voluntary enrollment plans had participation rates below 70%.

Figure 32. Distribution of participation rates by plan design

Vanguard defined contribution plans permitting employee-elective deferrals

Percentage of plans

	2021 estimated		
Plan participation rate	**All plans**	**Voluntary enrollment**	**Automatic enrollment**
90%–100%	55%	26%	73%
80%–89%	21	24	20
70%–79%	9	17	4
60%–69%	6	11	2
50%–59%	4	10	1
<50%	5	12	<0.5

Source: Vanguard 2022.

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 7.3% of their income, on average, in their employer's plan in 2021 **(Figure 33)**. The median participant deferral rate was 6.1%, 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 somewhat steady between 2012 and 2018 and have increased slightly over the past three years.

Changes to deferral rates

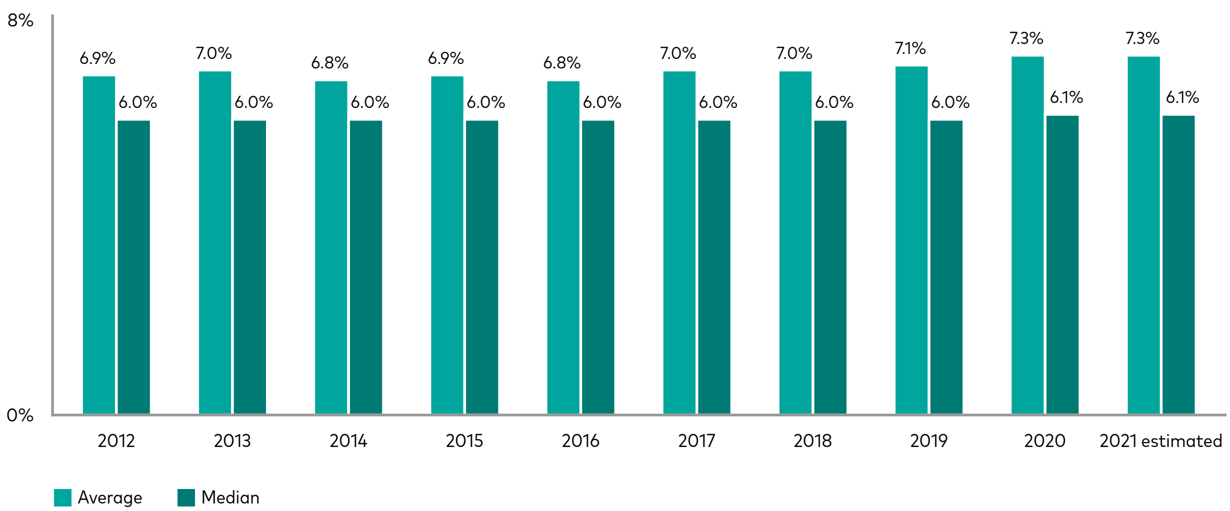
Forty-two percent of participants saw an increase to their elected deferral rate in 2021, either through an automatic increase feature or by their own direction **(Figure 34)**. Seven percent of participants decreased their elected deferral rate, and 2% stopped contributing. Overall, elected deferral rate changes were similar to those seen in 2020, during the COVID-19 uncertainty, and in 2019, before the pandemic.

Distribution of deferral rates

Individual deferral rates vary considerably among participants **(Figure 35)**. In 2021, 23% of participants had a deferral rate of 10% or higher, compared with 20% of participants in 2016. And while 26% of participants had a deferral rate of less than 4% in 2021, this compares favorably with 2016, when the rate was 30%. Only 14% of participants saved the statutory maximum of $19,500 ($26,000 for participants age 50 or older) (see page 9). In plans offering catch-up contributions, only 16% of participants 50 or older took advantage of this feature in 2021 (see page 9).

Figure 33. Participant employee-elective deferral rates

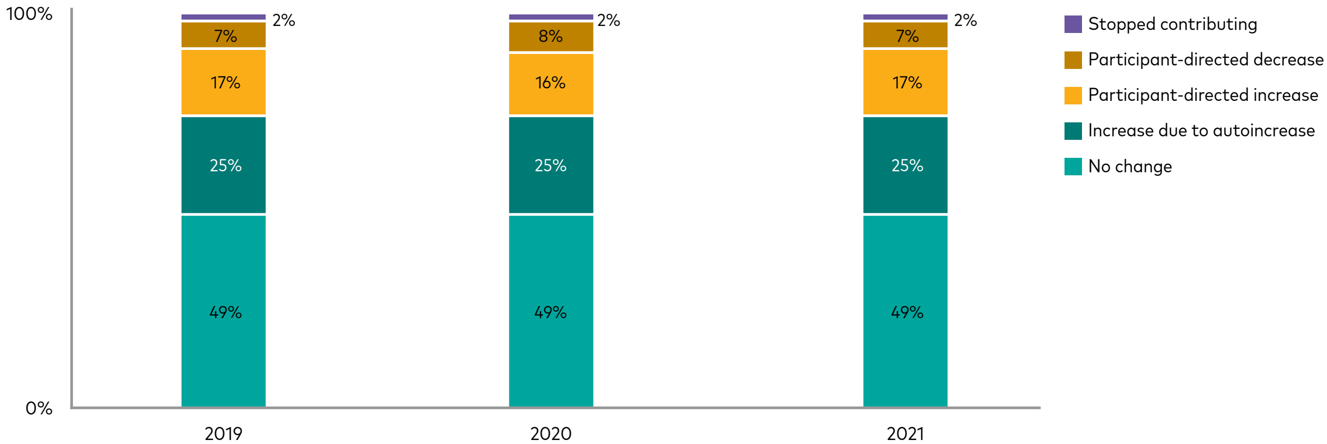
Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2022.

Figure 34. Trend in elected deferral rate changes

Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2022.

Figure 35. Distribution of participant employee-elective deferral rates

Vanguard defined contribution plans permitting employee-elective deferrals

Percentage of participants

Deferral rate	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021 estimated
0.1%–3.9%	29%	28%	30%	29%	30%	28%	28%	27%	26%	26%
4.0%–6.0%	23	23	23	22	22	22	22	21	20	20
6.1%–9.9%	28	29	28	29	28	29	29	30	31	31
10.0%–14.9%	14	14	13	14	14	15	15	16	16	16
15.0%+	6	6	6	6	6	6	6	6	7	7

Source: Vanguard 2022.

Figure 36. Participant employee-elective deferral rates by plan size

Vanguard defined contribution plans permitting employee-elective deferrals

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021 estimated
Average—all plans	**6.9%**	**7.0%**	**6.8%**	**6.9%**	**6.8%**	**7.0%**	**7.0%**	**7.1%**	**7.3%**	**7.3%**
Median	**6.0**	**6.0**	**6.0**	**6.0**	**6.0**	**6.0**	**6.0**	**6.0**	**6.1**	**6.1**
Average by plan size (number of participants)										
<500	7.0%	7.0%	6.9%	7.1%	7.2%	7.3%	7.3%	7.4%	7.7%	7.7%
500–999	6.8	6.8	7.1	6.8	7.0	7.0	7.1	7.3	7.6	7.6
1,000–4,999	6.8	6.9	6.7	6.9	6.8	6.9	7.0	7.1	7.3	7.4
5,000+	6.8	7.0	6.8	7.0	6.8	7.0	6.9	7.0	7.3	7.2

Source: Vanguard 2022.

Figure 37. Employee-elective deferral rates by participant demographic

Vanguard defined contribution plans permitting employee-elective deferrals

Average deferral rate	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021 estimated
All	**6.9%**	**7.0%**	**6.8%**	**6.9%**	**6.8%**	**7.0%**	**7.0%**	**7.1%**	**7.3%**	**7.3%**
Income										
<$15,000	5.4%	5.6%	6.3%	5.4%	4.6%	6.1%	5.0%	4.9%	5.0%	5.3%
$15,000–$29,999	4.7	4.8	4.9	4.6	4.6	4.7	4.7	4.5	4.8	4.7
$30,000–$49,999	5.7	5.8	5.8	5.7	5.7	5.4	5.5	5.5	5.7	5.7
$50,000–$74,999	6.9	7.0	6.9	6.9	6.9	6.7	6.8	6.9	7.0	7.0
$75,000–$99,999	8.1	8.1	7.9	8.0	7.9	7.9	8.0	8.1	8.2	8.3
$100,000–$149,999	8.6	8.8	8.7	8.8	8.7	8.8	8.9	9.1	9.2	9.3
$150,000+	7.2	7.5	7.3	7.7	7.6	7.7	7.9	8.1	8.2	8.2
Age										
<25	4.0%	4.4%	4.1%	4.7%	4.8%	5.0%	4.7%	4.9%	5.2%	5.1%
25–34	5.4	5.8	5.5	5.9	5.9	6.1	6.1	6.2	6.6	6.6
35–44	6.3	6.4	6.3	6.4	6.3	6.5	6.5	6.7	6.9	6.9
45–54	7.2	7.3	7.2	7.3	7.0	7.2	7.2	7.3	7.5	7.5
55–64	8.5	8.6	8.5	8.6	8.3	8.5	8.5	8.7	8.8	8.8
65+	9.8	9.8	9.7	9.7	9.0	9.4	9.1	9.1	9.2	9.1
Gender										
Male	6.9%	7.0%	6.9%	6.9%	6.9%	7.0%	7.1%	7.2%	7.4%	7.5%
Female	6.8	7.0	6.8	6.9	6.6	6.8	6.6	6.8	7.0	7.0
Job tenure (years)										
0–1	4.7%	4.9%	4.6%	5.0%	5.0%	5.1%	5.0%	5.1%	5.5%	5.4%
2–3	6.0	6.3	6.2	6.5	6.3	6.6	6.4	6.4	6.6	6.6
4–6	6.8	7.0	7.0	7.1	6.9	7.3	7.1	7.2	7.4	7.4
7–9	7.0	7.2	7.2	7.4	7.2	7.6	7.6	7.7	7.8	7.9
10+	7.9	8.0	8.0	8.0	7.9	8.1	8.2	8.4	8.6	8.6
Account balance										
<$10,000	3.8%	3.8%	3.8%	3.9%	3.9%	3.8%	3.9%	3.7%	4.0%	3.9%
$10,000–$24,999	5.8	5.9	6.1	6.4	6.4	6.2	6.6	6.4	6.3	6.4
$25,000–$49,999	6.7	6.9	6.9	7.4	7.5	7.2	7.6	7.5	7.5	7.6
$50,000–$99,999	7.8	7.7	7.7	8.1	8.2	8.2	8.5	8.5	8.5	8.6
$100,000–$249,999	9.6	9.2	9.1	9.3	9.1	9.2	9.5	9.5	9.6	9.6
$250,000+	10.4	10.4	10.2	10.4	10.2	10.3	10.5	10.6	10.6	10.7

Source: Vanguard 2022.

Figure 38. Deferral rates by income and gender, 2021
Vanguard defined contribution plans permitting employee-elective deferrals
Average deferral rate

	Female	Male	All
<$15,000	5.1%	6.1%	5.3%
$15,000–$29,999	4.7	5.1	4.7
$30,000–$49,999	5.8	5.7	5.7
$50,000–$74,999	7.1	7.0	7.0
$75,000–$99,999	8.4	8.2	8.3
$100,000–$149,999	9.3	9.0	9.3
$150,000+	8.2	7.9	8.2

Source: Vanguard 2022.

Plan size has little effect on participant deferral rates **(Figure 36)**. In 2021, plans with 5,000 or more participants had an average deferral rate of 7.2%—close to the overall average rate of 7.3%. 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.

Deferral rates by employee demographics

As with plan participation rates, employee demographics have a strong influence on deferral rates **(Figure 37)**. 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 $130,000 or more in 2020 (based on the prior year for 2021).

In 2021, participants with income of less than $30,000 had deferral rates in the 4.7%-to-5.3% range, while participants earning $75,000 to $99,999 had a deferral rate of 8.3%—a saving rate that is two-thirds higher. The deferral rate was 9.3% for participants earning between $100,000 and $149,999.

Age is another important variable influencing saving. Deferral rates were lowest for participants younger than 25. This group saved 5.1% of income. Deferral rates for participants ages 55 to 64 were nearly twice as high, averaging 8.8%. 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, 3.9%, in 2021. As account balances rose, so did average deferral rates. Overall, while men saved at slightly higher rates than women, upon examining the differences at higher income levels, women generally were saving at slightly higher rates **(Figure 38)**.

Deferral rates also varied by industry group **(Figure 39)**. Participants in media, entertainment, and leisure had the highest average deferral rates, while participants in wholesale and retail trade had the lowest deferral rates.

Figure 39. Deferral rates by industry sector, 2021 estimated
Vanguard defined contribution plans permitting employee-elective deferrals
Average deferral rate

	Mean	Median
Overall	**7.3%**	**6.1%**
Industry group		
Media, entertainment, and leisure	8.5%	7.6%
Finance, insurance, and real estate	7.8	6.9
Agriculture, mining, and construction	7.8	7.0
Business, professional, and nonprofit	7.6	6.7
Manufacturing	7.6	6.6
Education and health	7.4	5.9
Transportation, utilities, and communications	7.1	6.0
Wholesale and retail trade	5.8	5.0

Source: Vanguard 2022.

Impact of automatic enrollment

Participants automatically enrolled in their plan had an average deferral rate of 7.3% in 2021, similar to the average deferral rate for participants who voluntarily enrolled **(Figure 40)**.

In prior years, the gap between average deferral rates of participants automatically and voluntarily enrolled was wide **(Figure 41)**. In 2012, this spread was 2.2 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 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.

Maximum contributors

During 2021, 14% of participants saved the statutory maximum amount of $19,500 ($26,000 for those age 50 or older) **(Figure 42)**. 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-eight percent of participants with income of more than $150,000 contributed the maximum allowed, as did 4 in 10 participants with an account balance of more than $250,000. And 1 in 6 participants older than 65 contributed the maximum in 2021.

Figure 40. Participant deferral rates by plan design, 2021 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

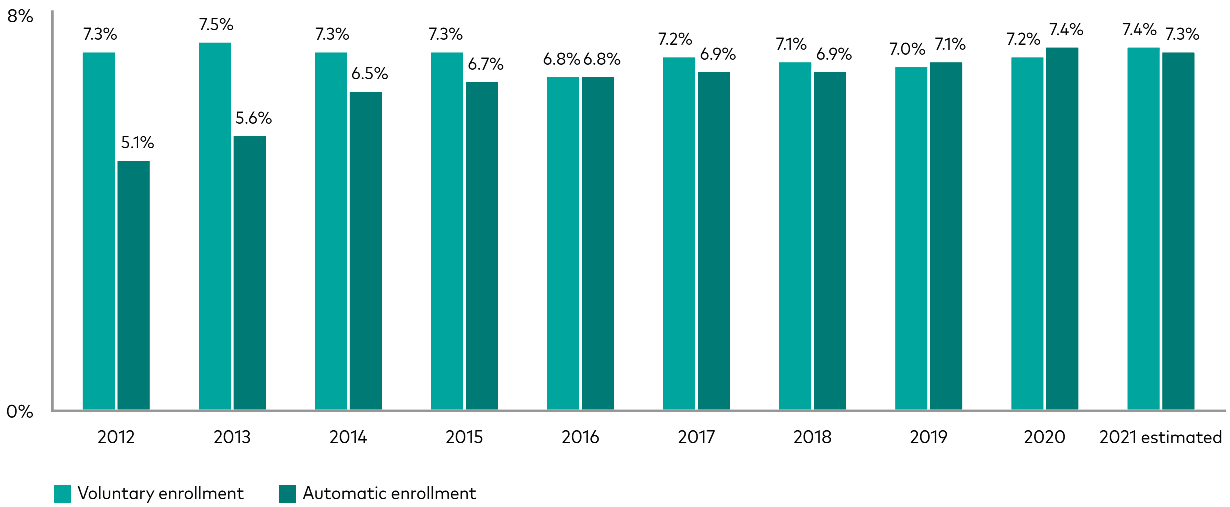
Average deferral rate

	Voluntary enrollment	Automatic enrollment	All
All	**7.4%**	**7.3%**	**7.3%**
Income			
<$15,000	6.8%	4.4%	5.3%
$15,000–$29,999	5.6	4.3	4.7
$30,000–$49,999	5.9	5.5	5.7
$50,000–$74,999	7.2	7.0	7.0
$75,000–$99,999	8.1	8.4	8.3
$100,000–$149,999	8.9	9.5	9.3
$150,000+	7.8	8.3	8.2
Age			
<25	5.3%	5.0%	5.1%
25–34	6.2	6.7	6.6
35–44	6.8	7.0	6.9
45–54	7.5	7.6	7.5
55–64	8.7	8.8	8.8
65+	9.2	9.1	9.1
Gender			
Male	7.5%	7.3%	7.5%
Female	7.3	6.8	7.0
Job tenure (years)			
0–1	5.7%	5.3%	5.4%
2–3	6.7	6.6	6.6
4–6	7.1	7.6	7.4
7–9	7.2	8.4	7.9
10+	8.1	9.1	8.6
Account balance			
<$10,000	4.3%	3.8%	3.9%
$10,000–$24,999	6.3	6.5	6.4
$25,000–$49,999	7.2	7.8	7.6
$50,000–$99,999	8.2	8.8	8.6
$100,000–$249,999	9.5	9.7	9.6
$250,000+	10.7	10.6	10.7

Source: Vanguard 2022.

Figure 41. Participant employee-elective deferral rates by plan design, average trend

Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2022.

Catch-up contributions

Nearly all Vanguard plans offered catch-up contributions in 2021. Catch-up contributions permit participants age 50 and older to contribute more than permitted for those younger than 50. Sixteen percent of eligible age-50-and-older participants took advantage of this feature in 2021 **(Figure 43)**. Participants earning less than $100,000 would need deferral rates higher than 20% of income to make catch-up contributions, suggesting that adoption of such contributions by participants is quite strong.

Participants making catch-up contributions had similar characteristics to participants making the maximum contribution to their plan—higher incomes and substantially higher account balances.

Six in 10 participants with income of more than $150,000 and 38% with an account balance of more than $250,000 made catch-up contributions in 2021.

Roth contributions

At year-end 2021, the Roth feature was offered by 77% of Vanguard plans and had been adopted by 15% of participants in plans offering the feature **(Figure 44)**. Those who used this feature tended to be younger or higher-income participants.

Twenty-five percent of plans offered Roth in-plan conversions, and 4% of participants with access to the option converted assets between 2012 and 2021.

After-tax contributions

After-tax employee-elective deferrals were available to participants in 21% of Vanguard plans in 2021 **(Figure 45)**. The after-tax feature is more likely to be offered by large plans, and 1 in 3 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.

Roth and after-tax offerings

While after-tax offerings have remained somewhat stable over the past five years, plans of all sizes have continued to adopt Roth accounts **(Figure 46)**. In addition, one-third of plans with at least 5,000 participants offered both Roth and after-tax contributions in 2021, up from 26% in 2017.

Figure 42. Participants contributing the maximum by participant demographics, 2021 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

All	**14%**
Income	
<$15,000	2%
$15,000–$29,999	1
$30,000–$49,999	1
$50,000–$74,999	2
$75,000–$99,999	5
$100,000–$149,999	19
$150,000+	58
Age	
<25	4%
25–34	10
35–44	15
45–54	16
55–64	18
65+	18
Gender	
Male	13%
Female	9
Job tenure (years)	
0–1	7%
2–3	13
4–6	15
7–9	16
10+	18
Account balance	
<$10,000	1%
$10,000–$24,999	3
$25,000–$49,999	6
$50,000–$99,999	10
$100,000–$249,999	19
$250,000+	40
Industry group	
Media, entertainment, and leisure	48%
Agriculture, mining, and construction	17
Finance, insurance, and real estate	15
Business, professional, and nonproft	15
Education and health	12
Manufacturing	9
Transportation, utilities, and communications	5
Wholesale and retail trade	4

Source: Vanguard 2022.

Figure 43. Catch-up contribution participation rates by participant demographics, 2021 estimated

Vanguard defined contribution plans permitting catch-up contributions

Percentage of plans offering	**98%**
Percentage of participants offered	**99%**
Percentage of participants using if offered	**16%**
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	23
$150,000+	60
Gender	
Male	17%
Female	11
Job tenure (years)	
0–1	7%
2–3	12
4–6	15
7–9	17
10+	18
Account balance	
<$10,000	1%
$10,000–$24,999	2
$25,000–$49,999	5
$50,000–$99,999	8
$100,000–$249,999	16
$250,000+	38
Industry group	
Agriculture, mining, and construction	27%
Media, entertainment, and leisure	25
Business, professional, and nonprofit	23
Education and health	22
Finance, insurance, and real estate	21
Manufacturing	13
Transportation, utilities, and communications	9
Wholesale and retail trade	8

Source: Vanguard 2022.

Figure 44. Roth participation rates by participant demographics, 2021 estimated

Vanguard defined contribution plans permitting Roth contributions

Percentage of plans offering	**77%**
Percentage of participants offered	**91%**
Percentage of participants using if offered	**15%**
Income	
<$15,000	7%
$15,000–$29,999	8
$30,000–$49,999	10
$50,000–$74,999	15
$75,000–$99,999	19
$100,000–$149,999	19
$150,000+	15
Age	
<25	15%
25–34	18
35–44	16
45–54	14
55–64	12
65+	8
Gender	
Male	16%
Female	14
Job tenure (years)	
0–1	13%
2–3	15
4–6	16
7–9	17
10+	14
Account balance	
<$10,000	11%
$10,000–$24,999	16
$25,000–$49,999	17
$50,000–$99,999	17
$100,000–$249,999	17
$250,000+	17
Industry group	
Transportation, utilities, and communications	20%
Business, professional, and nonprofit	19
Finance, insurance, and real estate	16
Agriculture, mining, and construction	15
Media, entertainment, and leisure	14
Education and health	14
Manufacturing	13
Wholesale and retail trade	12

Source: Vanguard 2022.

Figure 45. After-tax participation rates by participant demographics, 2021 estimated

Vanguard defined contribution plans permitting after-tax contributions

Percentage of plans offering	**21%**
Percentage of participants offered	**34%**
Percentage of participants using if offered	**10%**
Income	
<$15,000	2%
$15,000–$29,999	2
$30,000–$49,999	4
$50,000–$74,999	6
$75,000–$99,999	7
$100,000–$149,999	7
$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+	10
Industry group	
Media, entertainment, and leisure	39%
Agriculture, mining, and construction	17
Education and health	9
Finance, insurance, and real estate	8
Transportation, utilities, and communications	7
Business, professional, and nonprofit	5
Manufacturing	5
Wholesale and retail trade	2

Source: Vanguard 2022.

Figure 46. Plans offering Roth and after-tax trend

Vanguard defined contribution plans permitting employee-elective deferrals

Percentage of plans offering Roth

Plan size (number of participants)	2017	2018	2019	2020	2021
<500	59%	61%	65%	65%	68%
500-999	72	78	78	81	80
1,000-5,000	78	81	83	82	86
>5,000	83	87	88	88	91
All plans	68	71	74	74	77

Percentage of plans offering after-tax

Plan size (number of participants)	2017	2018	2019	2020	2021
<500	8%	10%	10%	10%	11%
500-999	18	19	17	21	23
1,000-5,000	30	28	28	27	28
>5,000	34	34	34	36	39
All plans	17	18	18	19	21

Percentage of plans offering both Roth and after-tax

Plan size (number of participants)	2017	2018	2019	2020	2021
<500	5%	6%	6%	6%	7%
500-999	13	14	13	17	18
1,000-5,000	24	23	24	24	25
>5,000	26	28	28	29	34
All plans	13	13	14	15	17

Source: Vanguard 2022.

Aggregate contributions

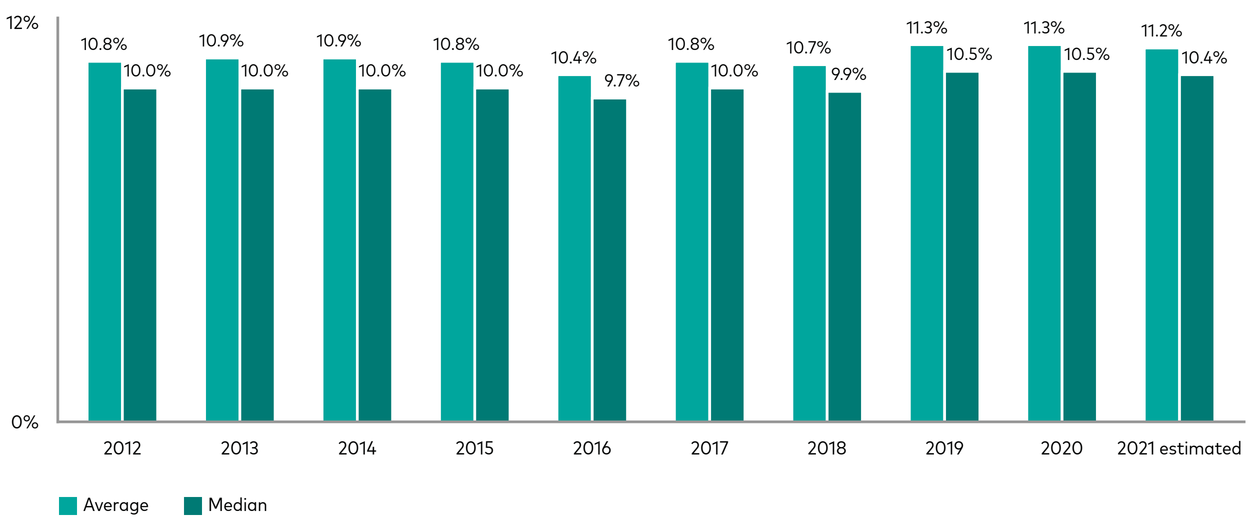
Considering both employee and employer contributions, the average total participant contribution rate in 2021 was 11.2% (estimated; see the Methodology section on page 106), and the median was 10.4% **(Figure 47)**. These rates exclude eligible nonparticipants. Aggregate participant and employer contribution rates were somewhat stable between 2012 and 2018 and have increased slightly over the past three years.

When eligible nonparticipants are included, with their 0% contribution rate, the average aggregated contribution rate was 9.4%, and the median rate was 9.1% **(Figure 48)**. Aggregate employee and employer contribution rates generally rose between 2012 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 increased slightly.

Participants automatically enrolled in their plan had an average total contribution rate of 11.5% in 2021, compared with 10.6% for those who voluntarily enrolled **(Figure 50)**.

Figure 47. Aggregate participant and employer contribution rates

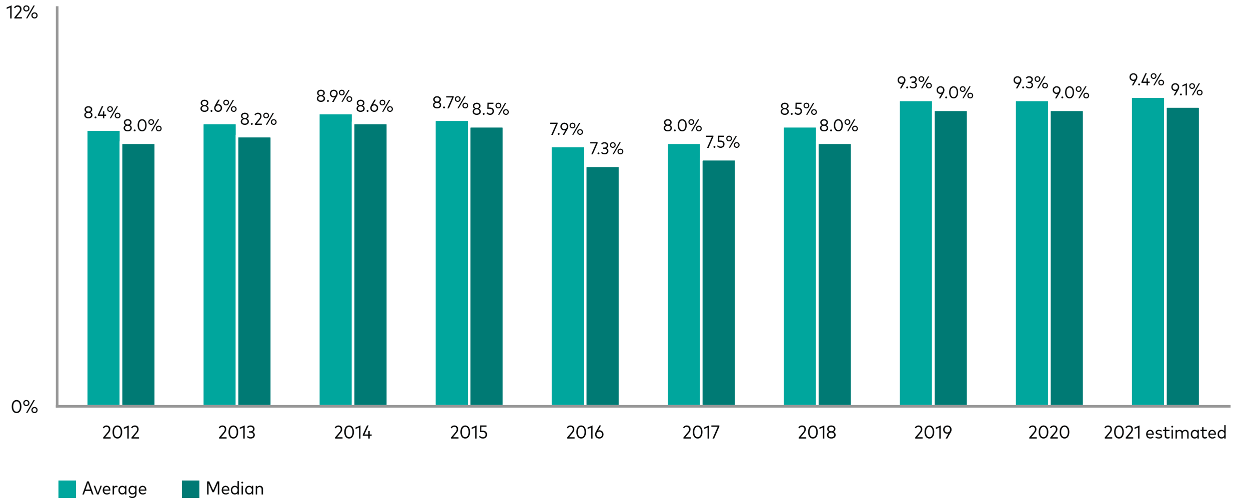
Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2022.

Figure 48. Aggregate employee and employer contribution rates

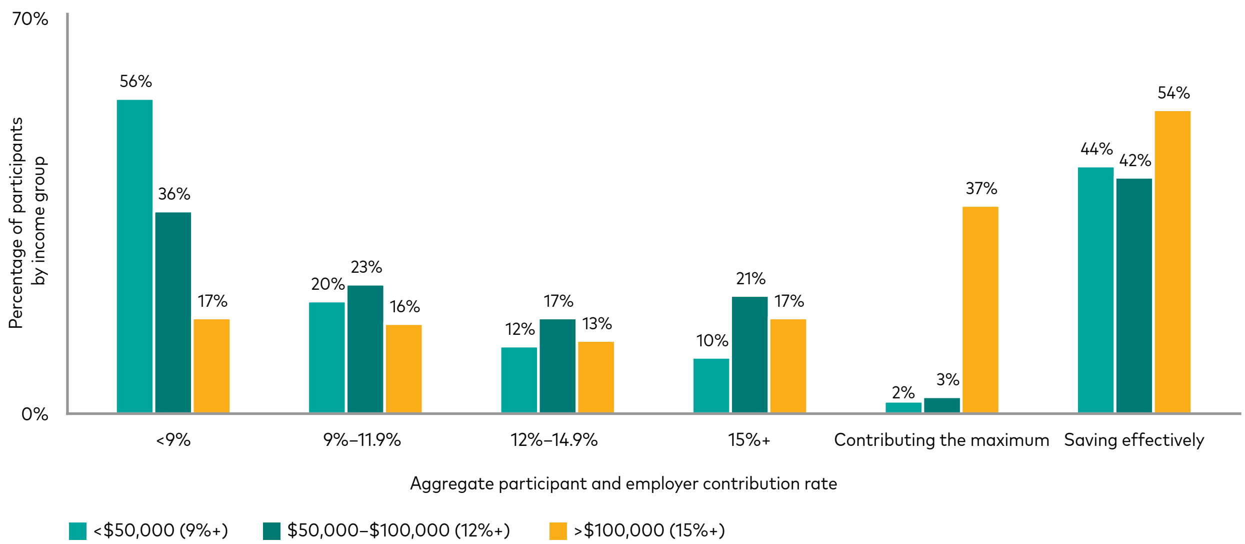
Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard 2022.

Figure 49. Distribution of aggregate participant and employer contribution rates, 2021 estimated

Vanguard defined contribution plans permitting employee-elective deferrals



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

Source: Vanguard 2022.

Figure 50. Aggregate participant and employer contribution rates by plan design, 2021 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

	Voluntary enrollment	Automatic enrollment	All
All	**10.6%**	**11.5%**	**11.2%**
Income			
<$15,000	6.7%	9.3%	7.7%
$15,000–$29,999	6.5	8.0	6.9
$30,000–$49,999	8.7	9.0	8.8
$50,000–$74,999	10.8	10.2	10.5
$75,000–$99,999	12.6	11.2	12.0
$100,000–$149,999	13.9	12.3	13.3
$150,000+	14.7	12.0	14.0
Age			
<25	8.0%	8.1%	8.0%
25–34	10.8	9.7	10.5
35–44	11.3	10.0	10.8
45–54	11.9	10.6	11.4
55–64	13.3	12.0	12.7
65+	13.1	12.2	12.7
Gender			
Male	11.6%	10.8%	11.3%
Female	10.6	10.4	10.5
Job tenure (years)			
0–1	8.5%	8.4%	8.5%
2–3	10.6	10.7	10.7
4–6	11.8	11.0	11.6
7–9	13.3	10.4	12.1
10+	14.0	11.0	12.5
Account balance			
<$10,000	5.4%	5.4%	5.4%
$10,000–$24,999	10.1	8.9	9.5
$25,000–$49,999	11.6	10.3	11.0
$50,000–$99,999	12.9	11.5	12.2
$100,000–$249,999	14.0	13.1	13.6
$250,000+	15.3	15.3	15.3

Source: Vanguard 2022.

Figure 51. Aggregate employee and employer contribution rates by plan design, 2021 estimated

Vanguard defined contribution plans permitting employee-elective deferrals

	Voluntary enrollment	Automatic enrollment	All
All	**7.3%**	**10.9%**	**9.4%**
Income			
<$15,000	2.9%	5.7%	3.9%
$15,000–$29,999	3.1	5.9	4.4
$30,000–$49,999	5.5	8.2	7.0
$50,000–$74,999	7.7	10.2	9.2
$75,000–$99,999	9.1	12.1	10.7
$100,000–$149,999	10.8	13.5	12.4
$150,000+	11.2	14.5	13.5
Age			
<25	2.0%	7.2%	4.7%
25–34	6.0	10.3	8.7
35–44	7.4	10.8	9.4
45–54	8.2	11.4	9.9
55–64	9.4	12.8	11.2
65+	8.8	12.4	10.4
Gender			
Male	7.5%	11.1%	9.6%
Female	7.5	10.1	8.9
Job tenure (years)			
0–1	3.3%	7.7%	6.1%
2–3	6.8	10.3	9.1
4–6	8.0	11.5	10.2
7–9	8.2	12.9	10.7
10+	9.2	13.5	11.2

Source: Vanguard 2022.

Eligible employees hired under an automatic enrollment feature had an average total contribution rate of 10.9%, which is nearly 50% higher than the rate of 7.3% for those hired under voluntary enrollment **(Figure 51)**. 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.

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. Forty-seven percent of participants in 2021 had total employee and employer contribution rates that met those thresholds or reached the statutory contribution limit **(Figure 49)**.

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. They are determined by contribution levels and investment performance over time.

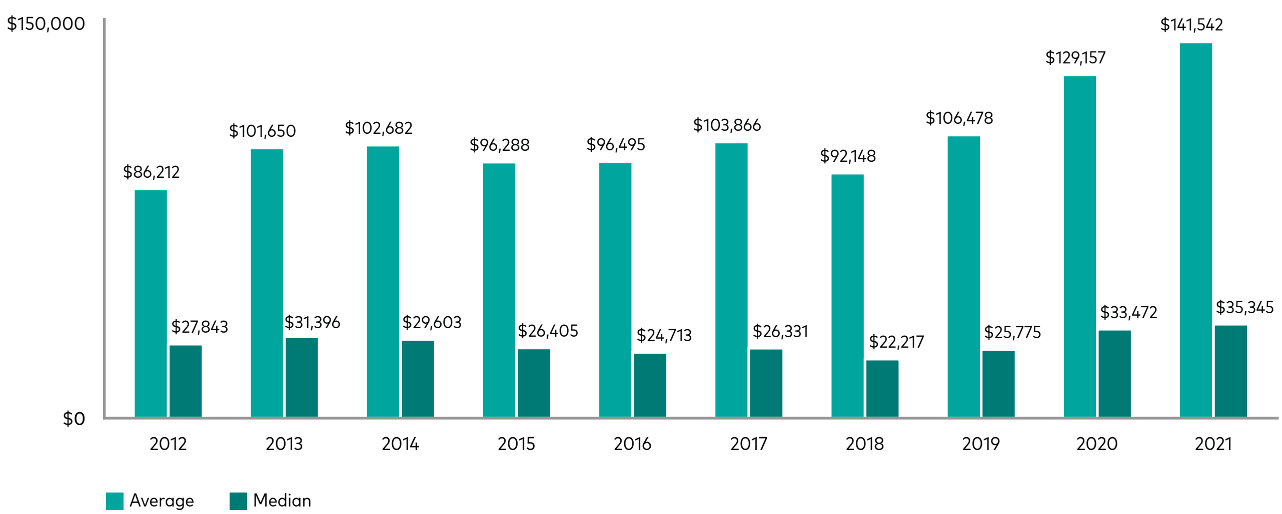
Vanguard account balances are a measure of how much plan participants have accumulated for retirement at a given employer. In the United States, DC plans are not a closed system. When participants change jobs or retire, their plan assets may remain with the plan of the employer they are leaving, may 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.

Average versus median balances

In 2021, the average account balance for Vanguard participants was $141,542, and the median balance was $35,345 **(Figure 52)**—increases of 10% and 6%, respectively, from 2020. The average one-year participant total return was 14.6% (see page 80).

Figure 52. Account balances

Vanguard defined contribution plans



Source: Vanguard 2022.

Figure 53. Distribution of account balances

Vanguard defined contribution plans

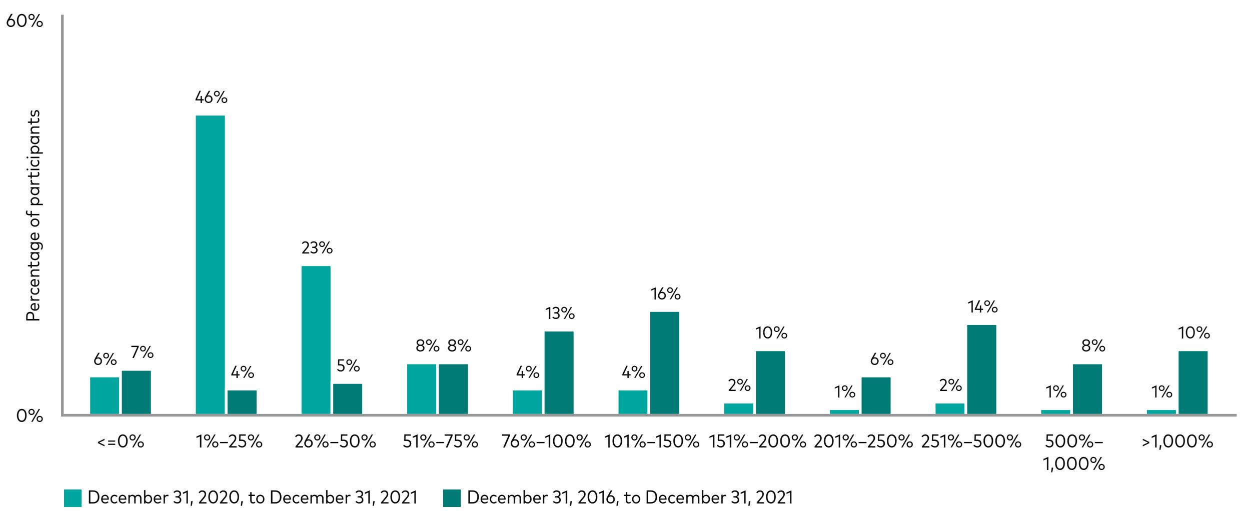
Percentage of accounts

Range of balance	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<$10,000	31%	30%	31%	33%	34%	33%	36%	33%	29%	29%
$10,000–$19,999	12	12	11	12	12	11	12	12	11	11
$20,000–$39,999	14	14	13	13	13	13	13	13	13	12
$40,000–$59,999	9	8	8	8	8	8	7	8	8	8
$60,000–$79,999	6	6	6	5	5	5	5	5	6	5
$80,000–$99,999	4	4	4	4	4	4	4	4	4	4
$100,000–149,999	7	7	7	7	7	7	6	7	7	7
$150,000–199,999	5	5	5	4	4	4	4	4	5	5
$200,000–249,999	3	3	3	3	3	3	3	3	3	3
$250,000+	9	11	11	11	11	12	10	12	14	15

Source: Vanguard 2022.

Figure 54. Change in account balances, continuous participants

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



	December 31, 2020–December 31, 2021	December 31, 2016–December 31, 2021
Median change	24%	141%
Percentage of participants with positive changes	94	93

Source: Vanguard 2022.

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 53)**. Three in 10 participants had a 2021 account balance of less than $10,000, while another 3 in 10 had balances of more than $100,000. Fifteen percent of participants had a balance of $250,000 or more.

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.

Change in account balances

Market performance and evolution in the participant base caused the change in average and median account balances in 2021. When we examined continuous participants—those with an account balance in both December 2020 and December 2021—the median account balance rose by 24% **(Figure 54)**. Ninety-four percent 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 2016 and December 2021, the median account balance rose 141%, and 93% of continuous participants had a higher account balance in 2021 than in 2016.

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 55)**. 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-seven percent of Vanguard participants are male, and men have average and median balances that are almost 44% higher than those of women. Gender is often a proxy for other factors, such as income. Women in our sample tended to have lower incomes than men. However, as noted earlier in this report, women tended to save more than men at each respective income level.

A different picture emerges when account balances are compared based on income. When income is factored in, account balances are closer **(Figure 56)**. For example, female participants with incomes between $30,000 and $49,999 had average account balances that are within 1% 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 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 57)**.

Figure 55. Account balances by participant demographics, 2021

Vanguard defined contribution plans

	All participants	
	Average	**Median**
All	**$141,542**	**$35,345**
Income		
<$15,000	$26,759	$3,341
$15,000–$29,999	$17,101	$4,678
$30,000–$49,999	$31,546	$10,665
$50,000–$74,999	$76,851	$32,842
$75,000–$99,999	$133,701	$65,201
$100,000–$149,999	$219,651	$116,223
$150,000+	$397,882	$225,478
Terminated	$143,185	$35,882
Age		
<25	$6,264	$1,786
25–34	$37,211	$14,068
35–44	$97,020	$36,117
45–54	$179,200	$61,530
55–64	$256,244	$89,716
65+	$279,997	$87,725
Gender		
Male	$170,942	$45,106
Female	$118,849	$31,291
Job tenure (years)		
0–1	$16,047	$2,657
2–3	$42,964	$17,067
4–6	$74,143	$36,130
7–9	$119,673	$64,411
10+	$303,138	$150,912

Source: Vanguard 2022.

Figure 56. Account balances by income and gender, 2021

Vanguard defined contribution plans permitting employee-elective deferrals

	Female	Male	All
Average			
<$15,000	$20,984	$36,784	$26,759
$15,000–$29,999	$16,833	$20,727	$17,101
$30,000–$49,999	$33,977	$34,268	$31,546
$50,000–$74,999	$78,348	$83,030	$76,851
$75,000–$99,999	$135,154	$142,777	$133,701
$100,000–$149,999	$215,386	$242,258	$219,651
$150,000+	$359,968	$466,782	$397,882
Terminated	$121,705	$167,843	$143,185
Median			
<$15,000	$2,993	$4,058	$3,341
$15,000–$29,999	$4,305	$6,054	$4,678
$30,000–$49,999	$11,792	$11,607	$10,665
$50,000–$74,999	$34,491	$35,960	$32,842
$75,000–$99,999	$67,570	$71,259	$65,201
$100,000–$149,999	$115,852	$132,917	$116,223
$150,000+	$207,407	$275,595	$225,478
Terminated	$34,309	$40,390	$35,882

Source: Vanguard 2022.

Figure 57. Balances by industry sector, 2021

Vanguard defined contribution plans

	Average	Median
All	**$141,542**	**$35,345**
Agriculture, mining, and construction	$190,181	$46,954
Finance, insurance, and real estate	$177,417	$53,927
Media, entertainment, and leisure	$173,818	$71,586
Business, professional, and nonprofit	$166,893	$40,994
Manufacturing	$150,825	$42,025
Transportation, utilities, and communications	$111,404	$22,699
Education and health	$106,928	$26,418
Wholesale and retail trade	$94,689	$16,319

Source: Vanguard 2022.

02

Managing participant accounts

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

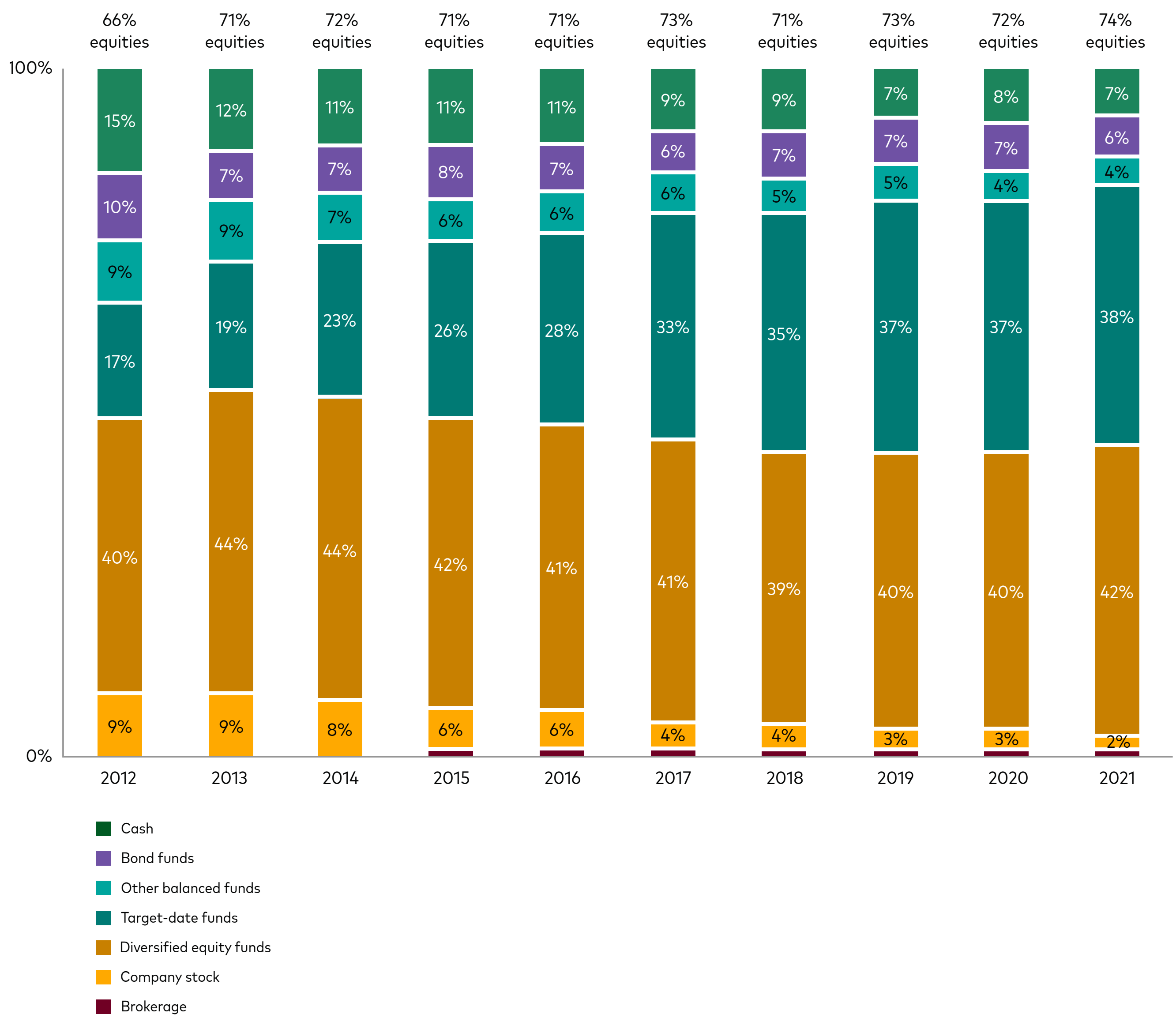
Asset and contribution allocations

Seventy-four percent of plan assets were invested in equities in 2021 **(Figure 58)**. This allocation includes the equity component of balanced strategies. The overall equity allocation was up from 66% in 2012, a shift of 8 percentage points, due to the rise in equity markets as well as improved participant portfolio construction.

In 2021, investments in balanced strategies reached 42%, including 38% 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 58. Plan asset allocation summary

Vanguard defined contribution plans



Source: Vanguard 2022.

Seventy-seven percent of plan contribution dollars were invested in equities during 2021, and 6 in 10 plan contribution dollars were invested in target-date funds **(Figure 59)**.

Asset allocation by participant demographics

The average participant-weighted asset allocation to equities was 77% in 2021, and asset allocation decisions varied somewhat by participant demographics **(Figure 60)**. 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, participants of all income segments have similar equity risk.

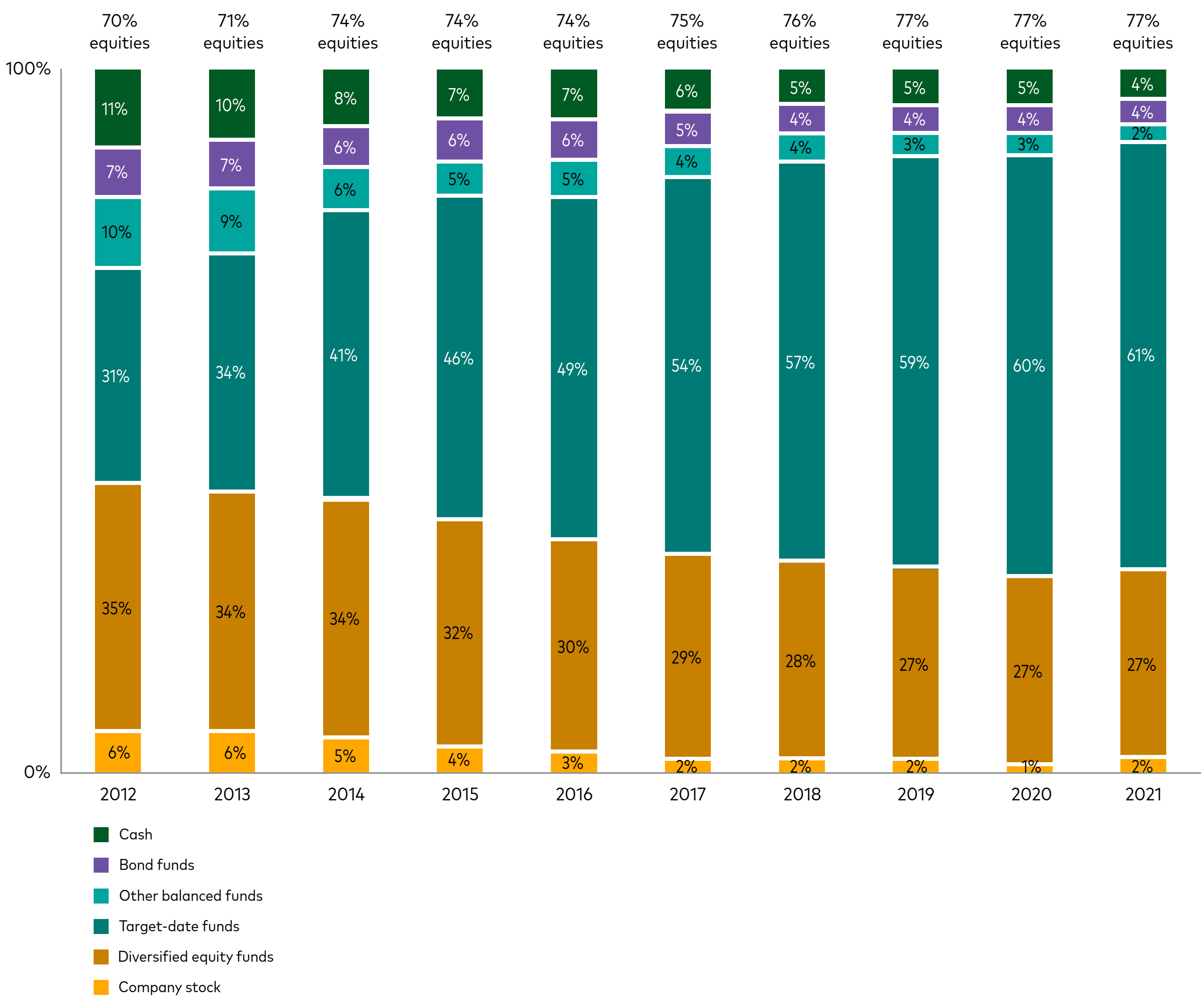
All participants, regardless of income level, had slightly more than three-quarters of their average account balance allocated to equities in 2021; at the median, participants allocated 87% to equities.

Participants younger than 45 had the highest equity exposure, with about 90% of plan assets, at the median, invested in equities in 2021.

Equity allocations were lowest for participants older than 65, many of whom are currently retired or will soon be retired. Participants older than 65 had a median equity allocation of 45%. The age-related variation in equity exposure has changed markedly because of the rising use of target-date funds (see page 72).

Figure 59. Plan contribution allocation summary

Vanguard defined contribution plans



Source: Vanguard 2022.

Figure 60. Asset allocation by participant demographics, 2021

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%**	**2%**	**42%**	**38%**	**4%**	**6%**	**7%**	**—**	**—**
	Average participant weighted	**<0.5%**	**2%**	**20%**	**68%**	**2%**	**3%**	**5%**	**77%**	**87%**
Income	<$15,000	1%	2%	38%	45%	3%	6%	5%	80%	88%
	$15,000–$29,999	<0.5	2	27	58	3	5	5	77	87
	$30,000–$49,999	<0.5	3	28	56	3	5	6	78	87
	$50,000–$74,999	<0.5	3	33	49	3	5	6	77	87
	$75,000–$99,999	<0.5	3	38	43	3	6	6	77	87
	$100,000–$149,999	1	3	42	39	3	6	6	78	86
	$150,000+	2	2	45	36	4	7	5	78	85
	Terminated	1	3	42	33	4	7	10	74	86
Age	<25	<0.5%	1%	17%	79%	1%	1%	1%	88%	89%
	25–34	1	1	23	71	1	1	1	88	89
	35–44	1	2	35	54	2	3	2	85	88
	45–54	1	2	47	37	3	5	4	75	79
	55–64	1	3	44	31	5	8	8	62	64
	65+	1	4	40	24	6	10	15	48	45
Gender	Male	1%	3%	43%	36%	4%	7%	7%	76%	87%
	Female	<0.5	2	40	41	4	7	6	75	85
Job tenure (years)	0–1	1%	1%	25%	67%	1%	3%	2%	83%	89%
	2–3	1	1	24	69	1	3	2	82	89
	4–6	1	1	26	65	2	3	2	81	89
	7–9	1	1	30	60	2	4	3	79	87
	10+	1	3	46	31	4	7	8	69	77
Account balance	<$10,000	<0.5%	1%	9%	85%	1%	1%	3%	79%	89%
	$10,000–$24,999	<0.5	2	13	78	2	2	4	78	87
	$25,000–$49,999	<0.5	2	18	71	2	3	4	77	87
	$50,000–$99,999	<0.5	2	23	63	2	3	5	76	86
	$100,000–$149,999	<0.5	2	28	57	3	4	6	75	83
	$150,000–$199,999	<0.5	2	32	52	3	5	7	74	81
	$200,000–$249,999	<0.5	2	35	47	3	5	7	74	81
	$250,000+	1	3	48	29	4	8	7	73	79

Source: Vanguard 2022.

Asset allocation by industry group

In 2021, asset allocations varied somewhat by industry group **(Figure 61)**. Participants in the media, entertainment, and leisure group had the most aggressive allocations and the highest allocations to target-date funds, while participants in the agriculture, mining, and construction group had high allocations to company stock and the highest allocations to cash.

Figure 61. Asset allocation by industry group, 2021.

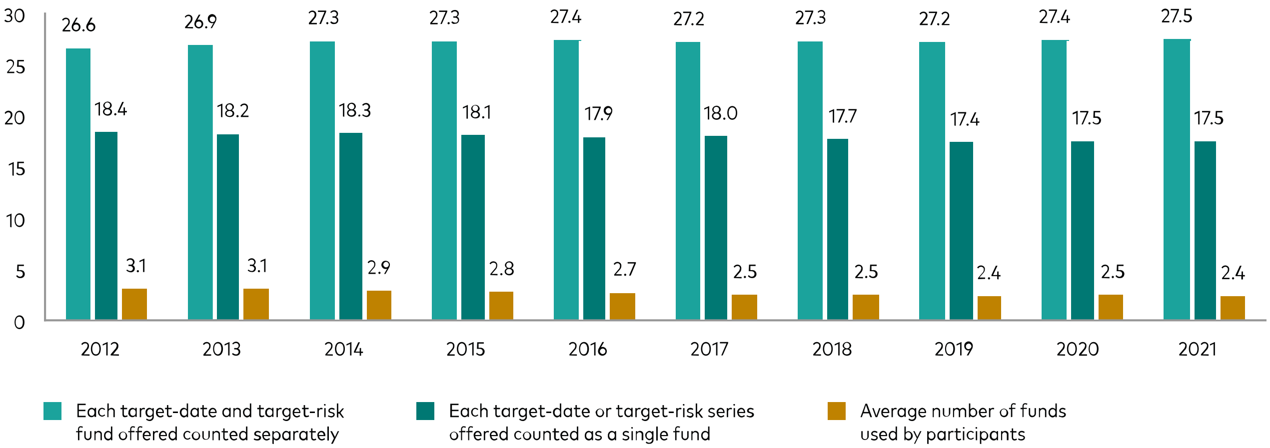
Vanguard defined contribution plans

	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%	2%	42%	38%	4%	6%	7%	—	—
Average participant weighted	<0.5%	2%	20%	68%	2%	3%	5%	77%	87%
Industry group									
Media, entertainment, and leisure	2%	<0.5%	37%	48%	6%	5%	3%	79%	89%
Business, professional, and nonprofit	1	3	45	35	4	7	6	78	87
Transportation, utilities, and communications	<0.5	5	45	29	6	7	8	77	87
Agriculture, mining, and construction	<0.5	5	35	40	4	6	10	76	87
Manufacturing	<0.5	3	39	42	3	6	7	76	87
Education and health	1	<0.5	41	39	6	7	6	76	87
Finance, insurance, and real estate	1	2	41	38	3	7	9	76	87
Wholesale and retail trade	<0.5	3	47	33	1	7	9	75	87

Source: Vanguard 2022.

Figure 62. Averge number of investment options offered and used

Vanguard defined contribution plans



Source: Vanguard 2022.

Plan investment options

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

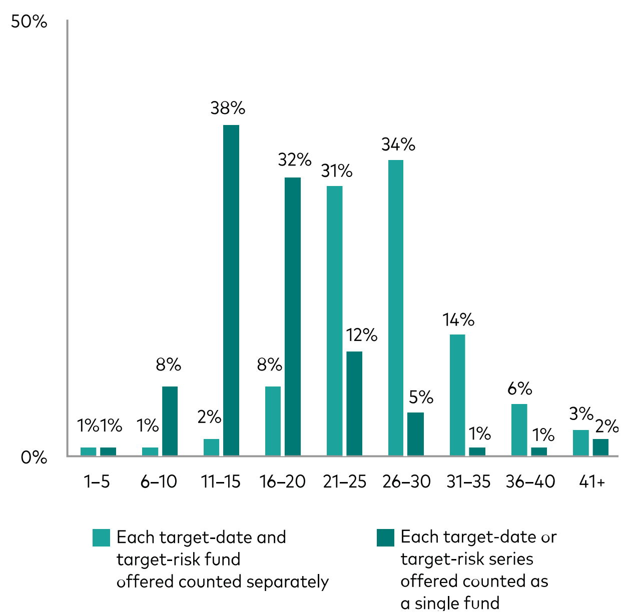
Number of options offered

The average Vanguard plan offered 27.5 investment options in 2021, essentially unchanged from 27.4 investment options in 2020 and 26.6 options in 2012 **(Figure 62)**. When each distinct target-date (or target-risk) fund is counted as a single offering, the average number of investment options for 2021 was 17.5. By this measure, sponsors have dropped one investment option on a net basis since 2012—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 2021. Only 9% of plans offered more than 25 distinct investment options, while 9% of plans offered 10 or fewer **(Figure 63)**.

Figure 63. Number of options offered, 2021

Vanguard defined contribution plans



Source: Vanguard 2022.

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 64)**.

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 64. Types of investment options offered, 2021

Vanguard defined contribution plans

	Number of participants				
	All	**<500**	**500–999**	**1,000–4,999**	**5,000+**
Cash	**99%**	**99%**	**>99.5%**	**>99.5%**	**99%**
Money market	69	71	71	65	66
Stable value/Investment contract	67	61	69	71	79
Bond funds	**98%**	**97%**	**99%**	**>99.5%**	**99%**
Active	79	73	83	84	90
Index	89	88	87	88	96
Inflation-protected securities	34	33	34	34	41
Multisector	7	6	6	10	6
High yield	17	18	19	17	15
International	19	20	20	20	15
Global	6	4	5	9	6
Emerging markets	1	1	1	1	1
Balanced funds	**99%**	**99%**	**>99.5%**	**>99.5%**	**100%**
Traditional balanced	63	69	59	58	53
Target-risk	13	19	9	9	4
Target-date	95	91	97	>99.5	99
Equity funds	**99%**	**99%**	**>99.5%**	**100%**	**100%**
Domestic equity funds	**99%**	**99%**	**>99.5%**	**100%**	**100%**
Large-cap index	98	97	99	>99.5	98
Large-cap active	91	90	90	93	87
Large-cap value	87	89	85	89	78
Large-cap growth	91	91	91	92	90
Large-cap blend	99	98	99	100	99
Mid-cap index	82	79	88	84	84
Mid-cap active	53	56	48	54	45
Small-cap index	63	65	65	63	48
Small-cap active	64	64	69	64	61
Socially responsible	13	11	11	14	26
International equity funds	**97%**	**96%**	**97%**	**99%**	**98%**
Index international	77	71	78	82	93
Active international	83	80	85	86	84
Emerging markets	35	33	36	38	28
Global equity funds	**18%**	**22%**	**15%**	**12%**	**19%**
Sector funds	**36%**	**39%**	**33%**	**36%**	**25%**
Company stock	**8%**	**2%**	**5%**	**13%**	**27%**
Self-directed brokerage	**20%**	**17%**	**18%**	**19%**	**36%**
Managed account program	**41%**	**20%**	**50%**	**60%**	**78%**

Source: Vanguard 2022.

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 65)**. One in 5 plans offered a self-directed brokerage feature.

Meanwhile, plan sponsor interest in target-date funds remained strong. At year-end 2021, 95% of plans offered target-date funds.

The types of investment options offered did not vary substantially by plan size. However, large plans were 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 socially responsible funds. Smaller plans were more likely than large plans to offer sector funds.

Figure 65. Types of sector options offered, 2021

Vanguard defined contribution plans

	Number of participants				
	All	**<500**	**500–999**	**1,000–4,999**	**5,000+**
Sector funds	**36%**	**39%**	**33%**	**36%**	**25%**
Real estate	32	33	31	34	25
Health care	9	12	8	6	4
Energy	5	6	5	4	4
Precious metals	2	3	1	2	2
Technology	3	3	4	2	2
Utilities	1	2	1	1	2
Natural resources	1	<0.5	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	0
Consumer	<0.5	<0.5	1	<0.5	1
Industrials	<0.5	0	<0.5	0	1

Source: Vanguard 2022.

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 2021.

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 2021, 67% of Vanguard plans offered at least four options within an index core **(Figure 66)**. 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-five percent of plans offered both an index core and passive target-date funds, and 7 in 10 participants had access to these fund lineups. In 2012, 46% of plans offered an index core, and 40% offered both an index core and passive target-date funds **(Figure 67)**. In 2012, 56% of participants were offered an index core, and 52% were offered both an index core and passive target-date funds **(Figure 68)**.

Figure 66. Index core offered, 2021

Vanguard defined contribution plans

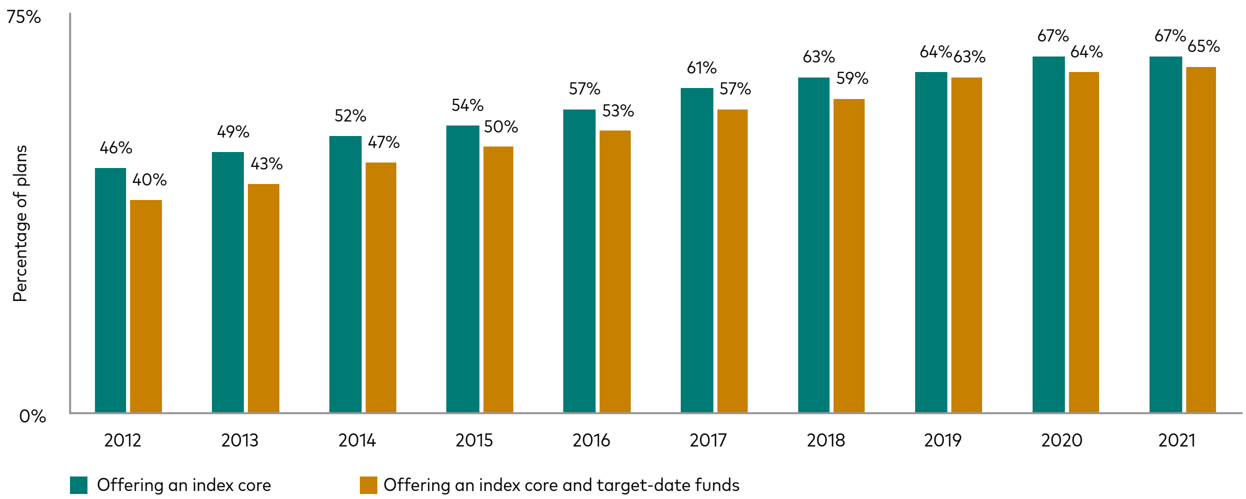
	Number of participants				
	All	**<500**	**500–999**	**1,000–4,999**	**5,000+**
Percentage of plans offering an index core	67%	61%	71%	74%	76%
Percentage of plans offering an index core and target-date funds	65	57	69	73	75
Percentage of participants offered an index core	70	66	71	75	69
Percentage of participants offered an index core and target-date funds	69	63	69	74	69

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 2022.

Figure 67. Index core offered trend, plans

Vanguard defined contribution plans

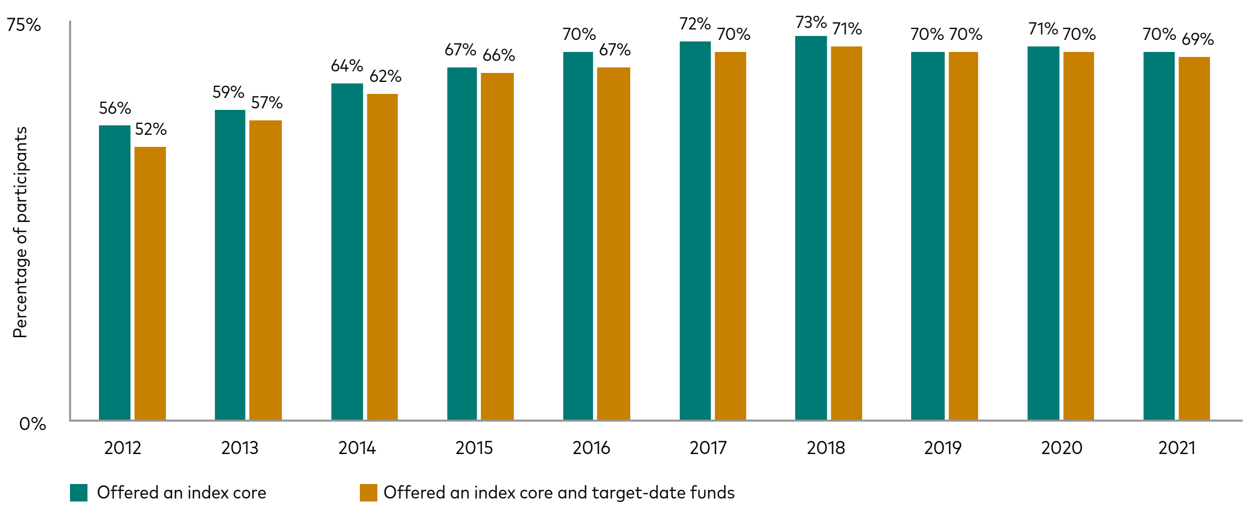


An index core includes broadly diversified index funds for U.S. stocks, U.S. bonds, and international stocks. At a minimum, the definition includes index funds for large-cap U.S. stocks, intermediate- or long-term bonds, and developed markets.

Source: Vanguard 2022.

Figure 68. 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 2022.

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 and 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, 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 had designated a default fund, and 93% had selected a target-date or balanced fund option as the default option in 2021 **(Figure 69)**. In 2012, about 1 in 6 plan sponsors had designated a money market or stable value fund as the default option **(Figure 70)**. Eighty-eight percent of plans in 2021 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 69. Default fund designations, 2021

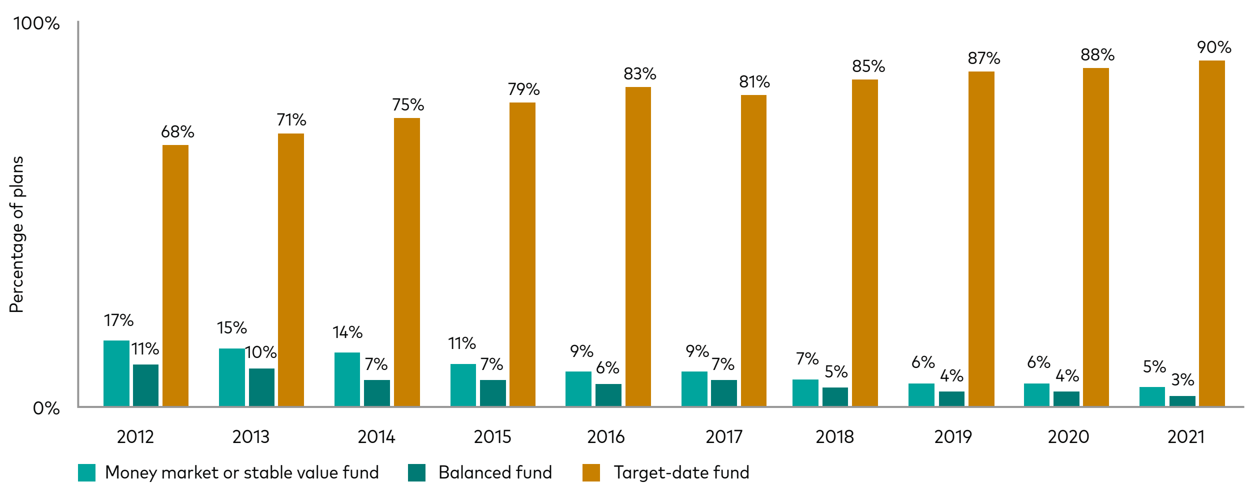
Vanguard defined contribution plans

	QDIA plans	Non-QDIA plans	All plans
Among all plans			
Target-date fund	86%	4%	90%
Balanced fund	2	1	3
Money market or stable value	—	5	5
Total plans designating default	**88%**	**10%**	**98%**
Among plans designating a QDIA			
Target-date fund	97%		
Balanced fund	3		
Total plans designating a QDIA	**100%**		

Source: Vanguard 2022.

Figure 70. Default fund designation trend

Vanguard defined contribution plans



Source: Vanguard 2022.

Number of options used

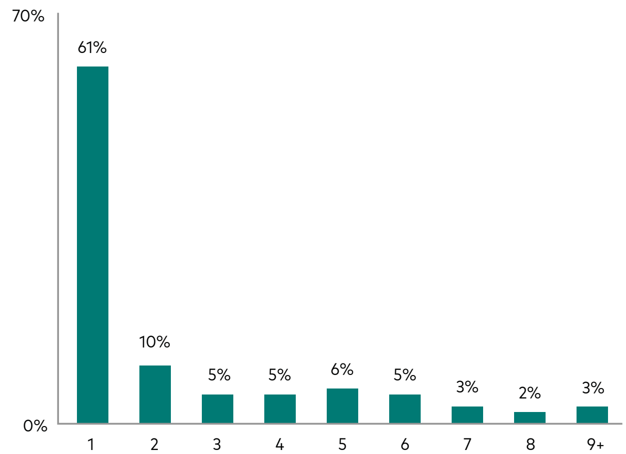
Although sponsors tend to offer a large menu of investment choices, 61% of participants used only one fund in 2021 **(Figure 71)**. On average, Vanguard participants used 2.4 options, and the median participant used just 1.0 option—fewer than the 3.1 options used in 2012. The median participant used just 2.0 funds in 2012.

One reason for this change is the growing number of single target-date fund investors. Of the 61% of participants who held a single-fund option in their account in 2021, 92% were invested in a single target-date fund **(Figure 72)**. Since 2012, the percentage of single-fund investors holding cash investments has declined from 14% to 4% due to the growth of automatic enrollment, the availability of target-date funds, and a shift in default fund designations by employers.

Figure 71. Number of options used, 2021

Vanguard defined contribution plans

Percentage of participants using

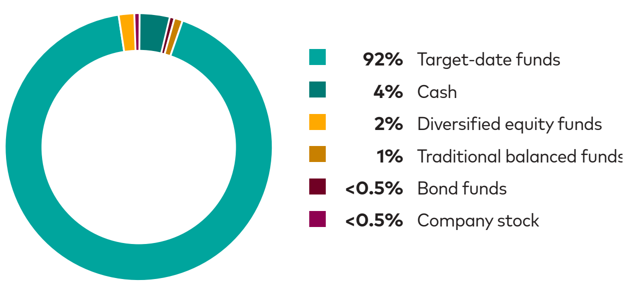


Source: Vanguard 2022.

Figure 72. Single-fund holders, 2021

Vanguard defined contribution plans

Percentage of single-fund participants using



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Percentage of participants holding a single fund	43%	44%	48%	51%	55%	59%	60%	62%	60%	61%
Percentage of single-fund participants using										
Cash	14%	11%	8%	7%	6%	5%	4%	4%	4%	4%
Bond funds	1	1	1	1	1	<0.5	1	<0.5	<0.5	<0.5
Traditional balanced funds	4	3	3	3	5	4	4	4	1	1
Target-date funds	64	69	81	84	83	87	87	88	91	92
Diversified equity funds	4	4	4	3	3	2	2	2	2	2
Company stock	4	2	1	1	1	1	1	1	1	<0.5

Source: Vanguard 2022.

Types of options used

Which options offered by DC plans do participants actually use? In 2021, a balanced fund (including target-date and other balanced funds) was the most common participant holding (86% of all participants), followed by a diversified domestic equity fund (31% of all participants) **(Figure 73)**. Among the balanced options held, target-date funds were overwhelmingly more likely to be held (82% of participants offered) than traditional balanced funds (13% of participants offered) or target-risk funds (9% of participants offered).

Ninety-four percent of participants were offered a large-cap U.S. equity index fund in 2021, yet only 1 in 6 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, 83% of Vanguard participants held some U.S. equity index exposure.

Figure 73. Types of sector options offered and used, 2021

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%**	**13%**	**13%**
Money market	69	62	6	4
Stable value/Investment contract	67	81	11	9
Bond funds	**98%**	**99%**	**18%**	**18%**
Active	79	91	7	<0.5
Index	89	94	15	14
Inflation-protected securities	34	39	3	1
Multisector	7	7	2	<0.5
High-yield	17	11	4	<0.5
International	19	17	3	1
Global	6	5	2	<0.5
Emerging markets	1	1	3	<0.5
Balanced funds	**99%**	**>99.5%**	**86%**	**86%**
Traditional balanced	63	56	13	7
Target-risk	13	5	9	<0.5
Target-date	95	>99.5	82	81
Equity funds	**99%**	**>99.5%**	**32%**	**32%**
Domestic equity funds	**99%**	**>99.5%**	**31%**	**31%**
Large-cap index	98	94	16	15
Large-cap active	91	91	25	23
Large-cap value	87	82	10	8
Large-cap growth	91	88	14	12
Large-cap blend	99	99	24	24
Mid-cap index	82	81	15	12
Mid-cap active	53	44	8	3
Small-cap index	63	48	11	5
Small-cap active	64	58	8	4
Socially responsible	13	30	6	2
International equity funds	**97%**	**98%**	**20%**	**20%**
Index international	77	90	14	13
Active international	83	86	11	10
Emerging markets	35	31	9	3
Global equity funds	**18%**	**19%**	**4%**	**1%**
Sector funds	**36%**	**26%**	**7%**	**2%**
Company stock	**8%**	**23%**	**36%**	**8%**
Self-directed brokerage	**20%**	**36%**	**1%**	**<0.5%**
Managed account program	**41%**	**74%**	**10%**	**7%**

Source: Vanguard 2022.

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 1 in 5 chose to use one. Emerging markets funds were offered and used even less frequently, with 1 in 3 participants having access, but only 9% choosing 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 2021 and were used infrequently; only 7% of participants offered these funds used them **(Figure 74)**.

Figure 74. Types of sector options offered and used, 2021

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%**	**26%**	**7%**	**2%**
Real estate	32	25	6	2
Health care	9	4	6	<0.5
Energy	5	3	4	<0.5
Precious metals	2	1	2	<0.5
Technology	3	1	6	<0.5
Utilities	1	1	2	<0.5
Natural resources	1	1	4	<0.5
Financials	<0.5	<0.5	1	<0.5
Communications	<0.5	<0.5	1	<0.5
Commodities	<0.5	<0.5	6	<0.5
Consumer	<0.5	<0.5	2	<0.5
Industrials	<0.5	<0.5	1	<0.5

Source: Vanguard 2022.

One in 3 Vanguard participants was 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 2021. In these plans, about 2% of plan assets were invested in the self-directed brokerage feature.[3]

The offering and use of equity funds that incorporate environmental, social, and governance (ESG) factors have been modestly increasing over the past five years **(Figure 75)**. Larger plans have been more likely to include these funds in their investment lineup than smaller plans.

Figure 75. Socially responsible funds offered and used

Vanguard defined contribution plans

	2017	2018	2019	2020	2021
All plans					
Percentage of plans offering socially responsible funds	9%	10%	11%	12%	13%
Percentage of participants offered socially responsible funds	20	22	27	26	30
Percentage of participants offered socially responsible funds using	3	4	4	5	6
Plans with <1,000 participants					
Percentage of plans offering socially responsible funds	8%	8%	9%	10%	11%
Percentage of participants offered socially responsible funds	9	9	9	10	11
Percentage of participants offered socially responsible funds using	3	3	4	3	3
Plans with 1,000+ participants					
Percentage of plans offering socially responsible funds	12%	14%	14%	16%	18%
Percentage of participants offered socially responsible funds	21	23	29	28	31
Percentage of participants offered socially responsible funds using	3	4	4	5	6

Source: Vanguard 2022.

[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*. Vanguard research. May 2021. institutional.vanguard.com

Professionally managed allocations

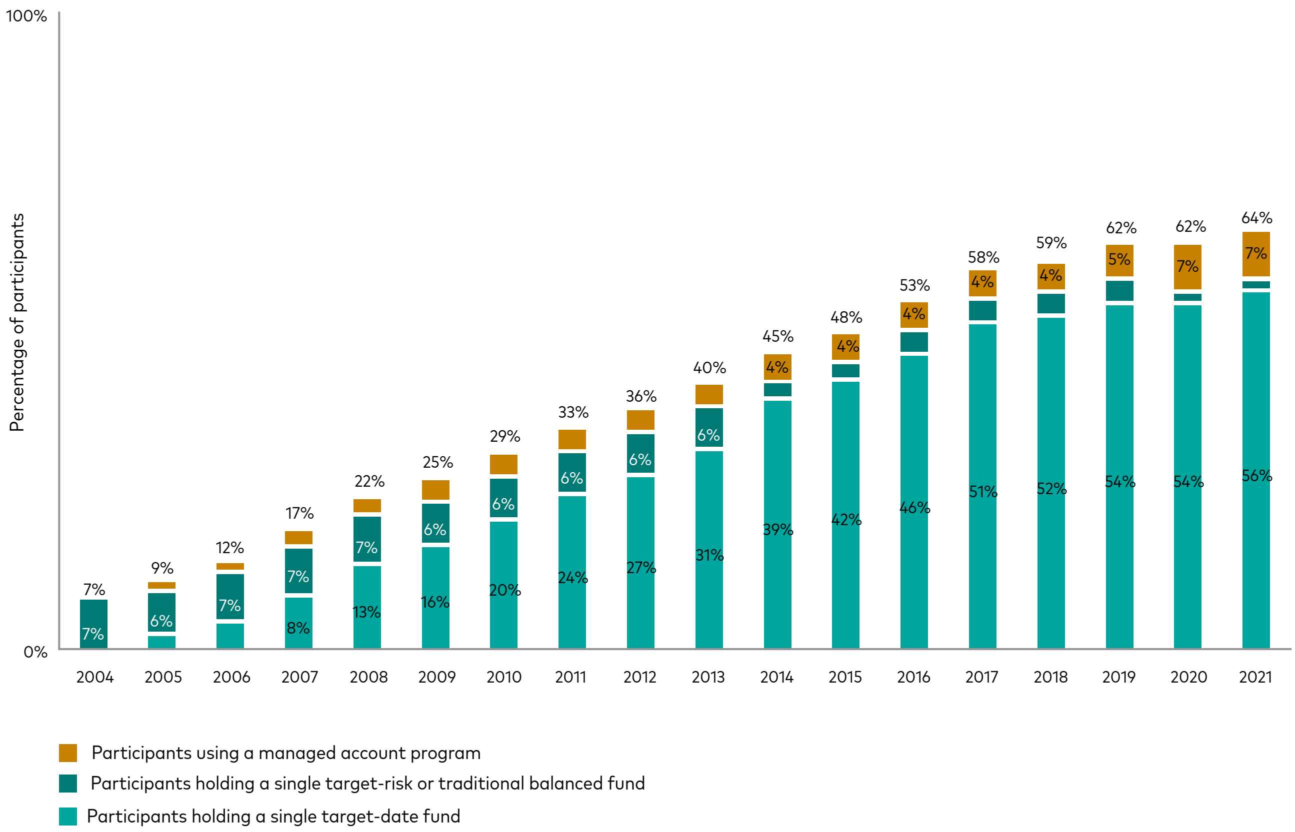
The most notable effect of plan investment menus on participant choices is the expanded offering and use of professionally managed allocations. Participants with professionally managed allocations have their entire account balance invested in a single target-date, target-risk, or traditional balanced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

In 2021, 64% of Vanguard participants were invested in a professionally managed allocation **(Figure 76)**.

Driving this development is the growing use of target-date funds. Fifty-six percent of participants were invested in a single target-date fund in 2021, more than twice as many as in 2012. 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.

Figure 76. Participants with professionally managed allocations

Vanguard defined contribution plans



Source: Vanguard 2022.

There were distinct differences between participants with professionally managed allocations and those without, as well as distinctions among participants with each of the three types of managed allocations **(Figure 77)**. Participants who construct their own portfolios tended to be older and longer tenured with higher average and median balances. Single target-date fund investors were shorter tenured with lower account balances. They were more likely to be in an automatic enrollment plan and to have been defaulted into the fund. In contrast, managed account investors were older, longer tenured, and had 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 2021.

Professionally managed allocations by participant demographics

The percentage of participants with a professionally managed allocation varied somewhat by participant demographics in 2021 **(Figure 78)**. Younger and less tenured participants were more likely to be single target-date fund investors. Higher-paid participants, with higher balances, tended to use managed account programs more often. However, use of the strategy was distributed evenly across most demographics, highlighting the value managed accounts can provide to various cohorts of participants.

Participants in automatic enrollment plans were more likely to have a professionally managed allocation than were those in voluntary arrangements because of a higher percentage of single target-date fund investors.

Figure 77. Demographic characteristics of participants with professionally managed allocations, 2021

Vanguard defined contribution plans

	All	All other participants	Single target-date fund	Single balanced fund	Managed account
Percentage of participants	—	36%	56%	1%	7%
Percentage male	57%	60%	54%	61%	58%
Median age	44	50	39	47	49
Median tenure	7	14	4	11	11
Average account balance	$141,542	$264,586	$55,521	$118,272	$200,196
Median account balance	$35,345	$110,345	$14,550	$36,901	$91,926
Percentage web-registered	79%	86%	70%	69%	96%
Percentage defaulted under automatic enrollment	35	—	62	21	—
Percentage defaulted under reenrollment	1	—	1	<0.5	—

Source: Vanguard 2022.

Figure 78. Professionally managed allocations by demographics, 2021

Vanguard defined contribution plans

		Participants holding a single target-date fund	Participants holding a single target-risk or traditional balanced fund	Participants using a managed account program	Total
All participants		**56%**	**1%**	**7%**	**64%**
Income	<$15,000	79%	1%	4%	84%
	$15,000–$29,999	82	1	4	87
	$30,000–$49,999	73	<0.5	6	79
	$50,000–$74,999	60	<0.5	10	70
	$75,000–$99,999	50	<0.5	12	62
	$100,000–$149,999	44	1	12	57
	$150,000+	40	1	11	52
	Terminated	50	1	5	56
Age	<25	85%	1%	1%	87%
	25–34	74	1	4	79
	35–44	60	1	7	68
	45–54	49	1	8	58
	55–64	41	1	9	51
	65+	33	1	8	42
Gender	Male	53%	1%	7%	61%
	Female	58	1	7	66
Job tenure (years)	0–1	83%	<0.5%	2%	85%
	2–3	75	<0.5	5	80
	4–6	67	1	7	75
	7–9	60	1	7	68
	10+	32	1	10	43
Account balance	<$10,000	83%	1%	2%	86%
	$10,000–$24,999	68	1	6	75
	$25,000–$49,999	59	1	7	67
	$50,000–$99,999	49	1	9	59
	$100,000–$149,999	40	1	10	51
	$150,000–$199,999	34	1	11	46
	$200,000–$249,999	30	1	11	42
	$250,000+	17	1	11	29
Plan design	Automatic enrollment	59%	1%	7%	67%
	Voluntary enrollment	51	1	7	59

Source: Vanguard 2022.

Target-date funds

Target-date funds base portfolio allocations on an expected retirement date, with allocations growing more conservative as the participant approaches the fund's target year.

The percentage of plans offering target-date funds has grown from 84% in 2012 to 95% in 2021 **(Figure 79)**. At year-end 2021, nearly all participants were in plans offering target-date funds.

Figure 79. Use of target-date funds

Vanguard defined contribution plans

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Percentage of all plans offering target-date funds	84%	86%	88%	90%	92%	92%	93%	94%	95%	95%
Percentage of recordkeeping assets in target-date funds	17	19	23	26	28	33	35	37	37	38
Percentage of all contributions directed to target-date funds	31	34	41	46	49	54	57	59	60	61
Percentage of all participants offered target-date funds	88	90	97	98	97	97	97	98	99	>99.5
Percentage of all participants using target-date funds	51	55	64	69	72	75	77	78	80	81

Source: Vanguard 2022.

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.

Among plans offering the strategy, target-date options accounted for 38% of all plan assets **(Figure 80)**.

In these plans, 61% of all contributions were directed to target-date funds.

Figure 80. Plan use of target-date funds

Vanguard defined contribution plans offering target-date funds

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Percentage of plan assets invested in target-date funds	**19%**	**20%**	**24%**	**26%**	**29%**	**33%**	**35%**	**37%**	**37%**	**38%**
Percentage of plan contributions invested in target-date funds	**35%**	**38%**	**42%**	**47%**	**50%**	**55%**	**58%**	**60%**	**60%**	**61%**
Distribution of percentage of plan assets in target-date funds										
<10%	25%	21%	16%	13%	11%	9%	7%	6%	5%	5%
10%–19%	34	31	28	26	22	19	16	14	13	11
20%–29%	20	23	25	25	25	23	23	20	20	19
30%–39%	8	10	11	13	15	18	18	20	22	23
40%–49%	4	5	7	8	9	10	12	13	13	14
50%+	9	10	13	15	18	21	24	27	27	28
Distribution of percentage of plan contributions to target-date funds										
<10%	9%	7%	6%	4%	4%	3%	2%	1%	2%	2%
10%–19%	17	14	10	8	7	6	4	4	3	2
20%–29%	23	21	17	14	10	8	8	7	6	5
30%–39%	21	22	22	18	17	14	12	9	9	7
40%–49%	13	16	17	21	20	19	18	16	14	14
50%+	17	20	28	35	42	50	56	63	66	70

Source: Vanguard 2022.

An investment in target-date funds is not guaranteed at any time, including on or after the target date.

Participant use of target-date funds

Among participants using target-date funds, 60% of their account balances were invested in these funds **(Figure 81)**. They directed 81% of their 2021 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 69% of all target-date investors in 2021.

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 81. Participant use of target-date funds

Vanguard defined contribution plan participants using target-date funds

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Percentage of all participants offered target-date funds	**88%**	**90%**	**97%**	**98%**	**97%**	**97%**	**97%**	**98%**	**99%**	**>99.5%**
Percentage of participants using target-date funds when offered	**58**	**61**	**66**	**70**	**74**	**75**	**79**	**80**	**80**	**82**
Percentage of participant account balances in target-date funds	**46**	**48**	**50**	**51**	**53**	**57**	**58**	**60**	**59**	**60**
Percentage of total participant and employer contributions in target-date funds	**72**	**74**	**75**	**76**	**78**	**80**	**81**	**81**	**81**	**81**
Distribution of percentage of participant assets in target-date funds										
1%–24%	19%	17%	15%	14%	13%	11%	11%	10%	11%	10%
25%–49%	10	10	9	9	8	8	8	8	9	9
50%–74%	8	8	7	7	6	5	5	5	4	4
75%–99%	7	7	7	7	7	7	6	6	6	6
100%	56	58	62	63	66	69	70	71	70	71
Distribution of percentage of total participant and employer contributions in target-date funds										
1%–24%	11%	9%	9%	8%	8%	6%	6%	6%	7%	6%
25%–49%	9	8	8	8	7	7	6	7	8	8
50%–74%	7	7	6	6	4	4	4	4	4	4
75%–99%	4	5	8	5	5	4	4	4	3	3
100%	69	71	69	73	76	79	80	79	78	79
Percentage of participants owning										
One target-date fund only	54%	56%	60%	62%	65%	67%	68%	69%	67%	69%
One target-date fund plus other funds	38	36	33	31	28	26	26	25	27	25
Two or more target-date funds only	2	2	2	2	2	2	2	2	2	2
Two or more target-date funds plus other funds	6	6	5	5	5	5	4	4	4	4

Source: Vanguard 2022.

Mixed target-date investors arise through sponsor action as well as through participant choice. Such sponsor actions 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.

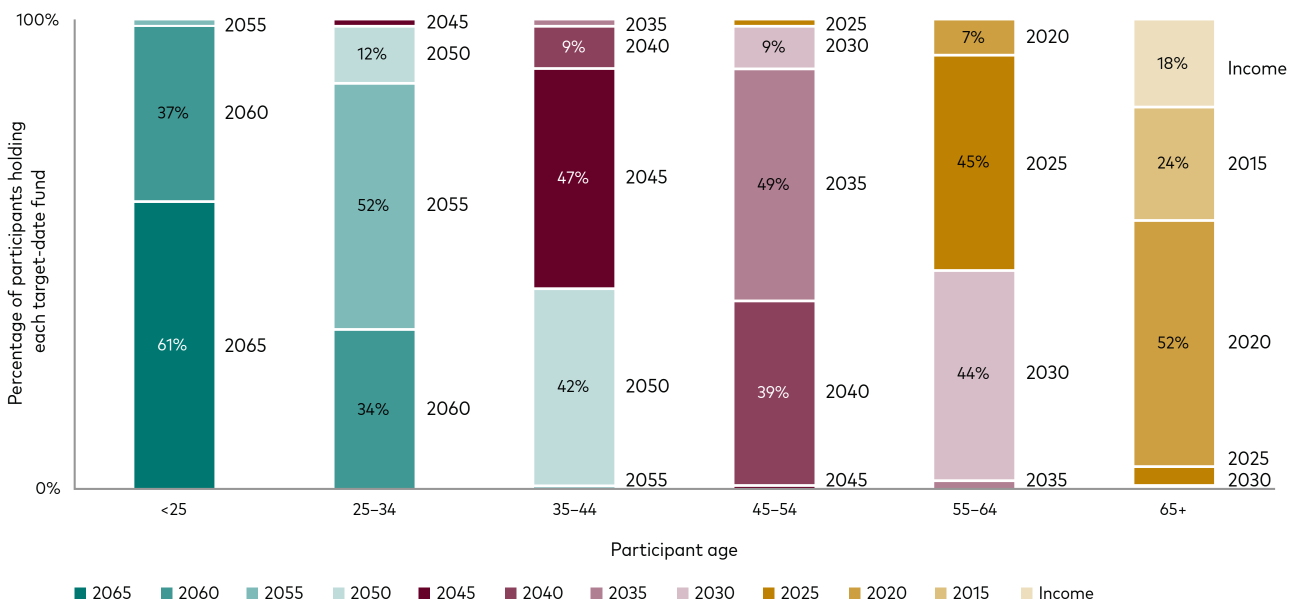
Mixed investors who choose to combine a target-date fund with other plan options appear to pursue a range of reasonable diversification strategies, although they do not fit within the all-in-one portfolio approach of the target-date concept.

Single target-date fund investors appeared to select, or are defaulted into, a target-date fund with an appropriate target date **(Figure 82)**. Half of participants ages 25 to 34 were invested in a 2055 target-date fund in 2021, and most of the remaining participants were in either a 2050 or a 2060 target-date fund.

Similarly, 45% 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.

Figure 82. Target-date fund use by age, 2021

Vanguard defined contribution plan participants holding a single target-date fund (56% of all participants)



	<25	**25–34**	**35–44**	**45–54**	**55–64**	**65+**
Percentage of single target-date fund holders	7%	30%	26%	19%	14%	4%

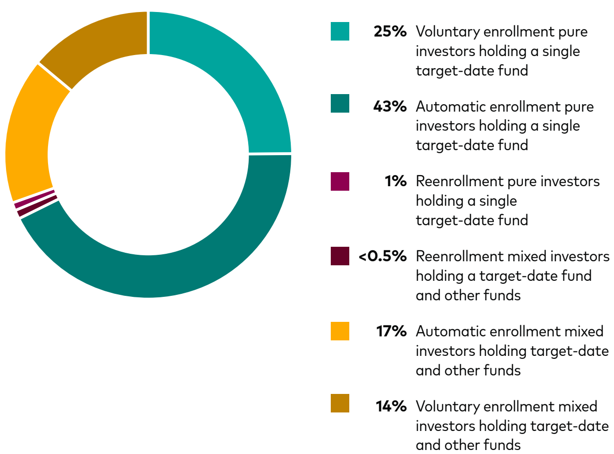
Source: Vanguard 2022.

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 selected target-date options voluntarily.

Of the 69% of participants who were pure investors in 2021, a large portion of them were in plans not offering automatic enrollment. Thirty-six percent of pure investors were in plans where participants made the choice to select the fund **(Figure 83)**.

Figure 83. Plan design and target-date funds, 2021

Vanguard defined contribution plan participants holding target-date funds



Source: Vanguard 2022.

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-aged participants holding the highest equity exposure, and older participants having equity exposure on par with younger participants **(Figure 84)**. In 2021, the equity allocation among Vanguard DC participants was 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.

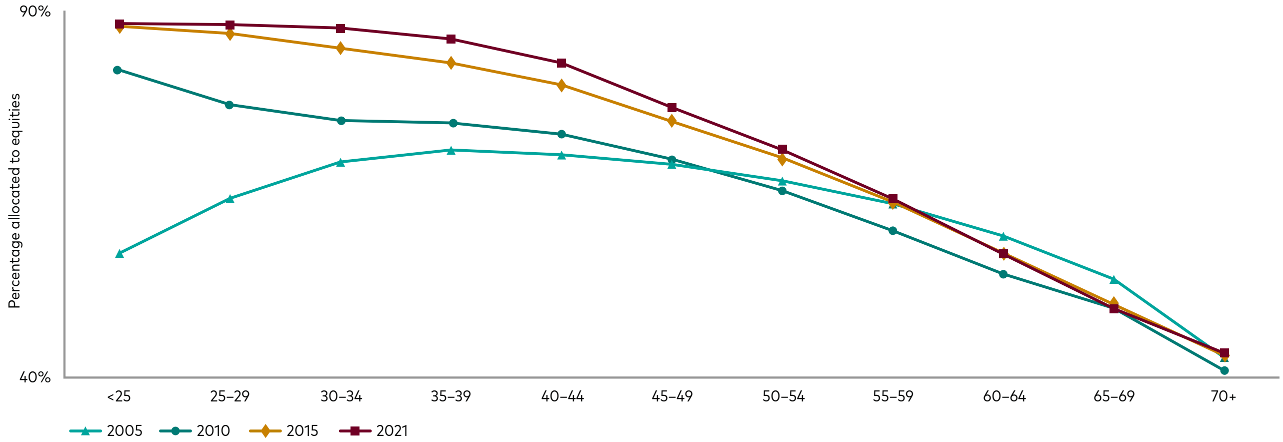
One development influencing this change is the growth of default funds under automatic enrollment and the designation of target-date funds as the most common type of default investment. However, participants choosing target-date funds on a voluntary basis are also contributing in a meaningful way to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

The factors influencing age-related equity exposure in DC plans are undergoing a transition. On 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.

Figure 84. Trend in asset 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+
2021	88%	88%	88%	86%	83%	77%	71%	64%	57%	49%	43%
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 2022.

Extreme equity allocations

The rising use of professionally managed allocations is also influencing extreme portfolio allocations **(Figure 85)**. The percentage of participants with no allocation to equities has fallen by three-quarters, from 13% in 2006, when the Pension Protection Act of 2006 was passed, to 3% in 2021. 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 constructed their own portfolios tend to hold greater extremes in equity exposure **(Figure 86, Panel D)**.

Twenty percent of do-it-yourself investors held extreme portfolios in 2021 (7% with no equities, 13% with only equities). Professionally managed investors generally do not hold extreme positions because these portfolios typically 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 2021. A large group of pure target-date investors had equity allocations in the 81%-to-90% range.

Figure 85. Distribution of equity exposure

Vanguard defined contribution plans

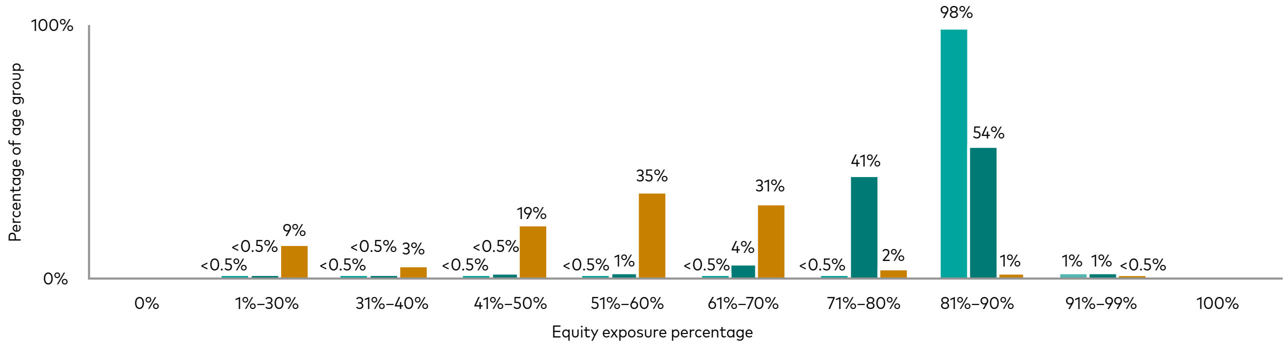
											Participant weighted	
	0%	**1%–30%**	**31%–40%**	**41%–50%**	**51%–60%**	**61%–70%**	**71%–80%**	**81%–90%**	**91%–99%**	**100%**	**Average**	**Median**
Percentage of contributions to equities, 2021	**3%**	**2%**	**1%**	**3%**	**7%**	**10%**	**13%**	**50%**	**6%**	**5%**	**78%**	**87%**
Percentage of contributions to equities												
2021	3%	3%	1%	3%	6%	9%	17%	44%	9%	5%	77%	87%
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 2022.

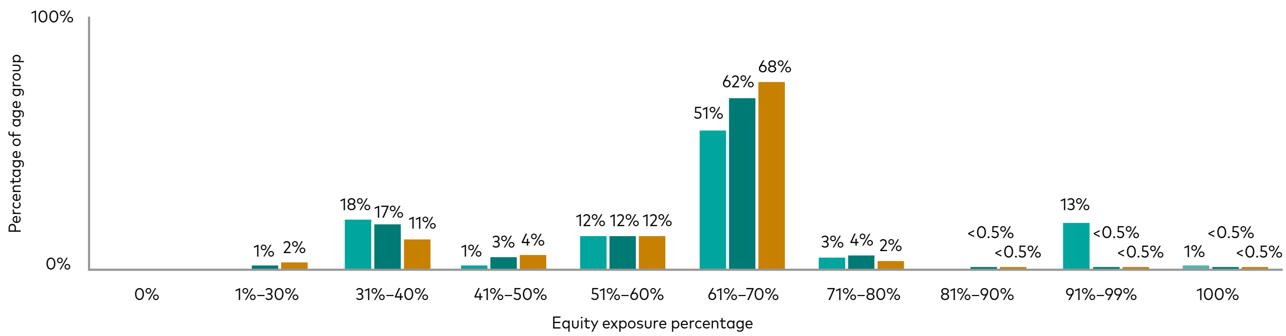
Figure 86. Distribution of equity exposure by investor type, 2021

Vanguard defined contribution plan participants

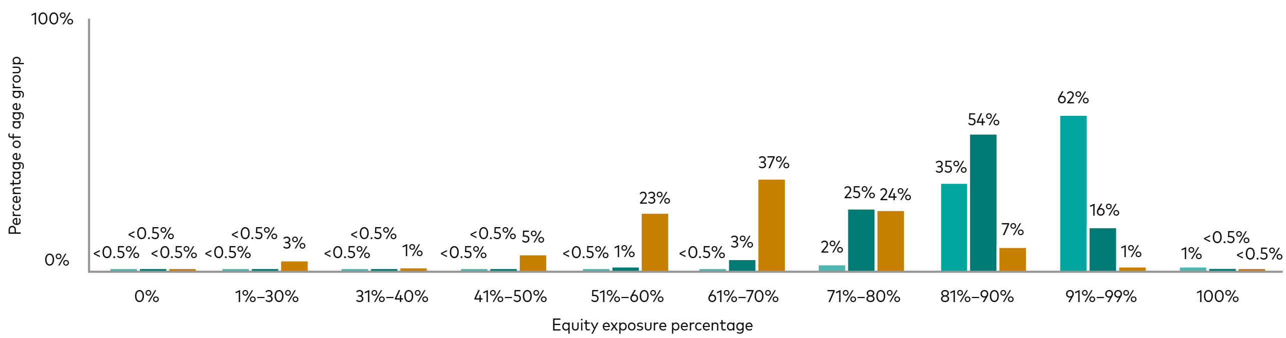
A. Single target-date participants (56% of all participants)



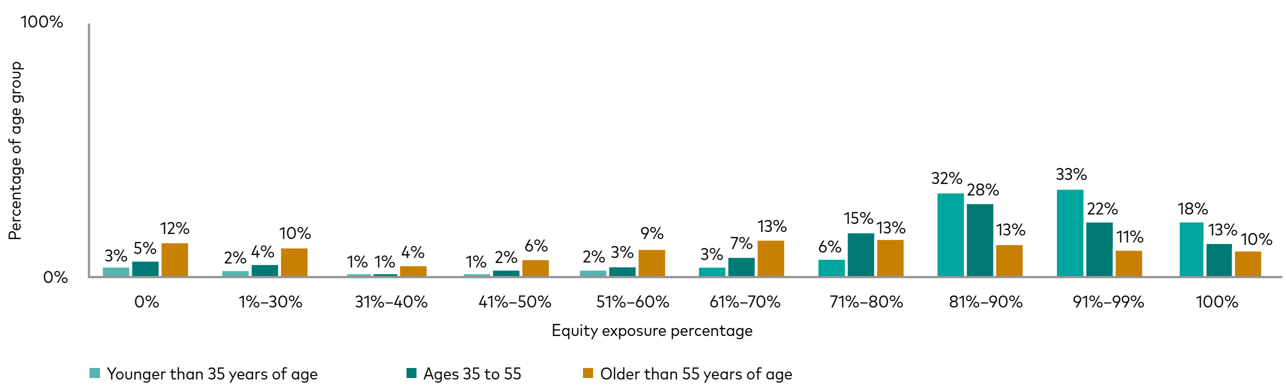
B. Single balanced fund participants (1% of all participants)



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



D. All other participants (36% of all participants)



Source: Vanguard 2022.

This 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.

Older participants, who were perhaps preparing for or already in retirement, were most likely to construct their own portfolio **(Figure 87)**. Fifty-one percent of participants 55 or older created their own allocations in 2021, with nearly 4 in 10 using a single target-date fund and 9% using a managed account program. While older participants with professionally managed allocations had equity exposure between 40% and 80%, those who constructed their own portfolio had a wide dispersion of equity allocations, which were evenly distributed from 0% to 100%. These participants also had the highest balances.

This rising use of professionally managed allocations is also contributing to a reduction in portfolio construction errors **(Figure 88)**. The fraction of participants holding broadly diversified portfolios rose from 42% in 2006 to 78% in 2021.

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

Advice

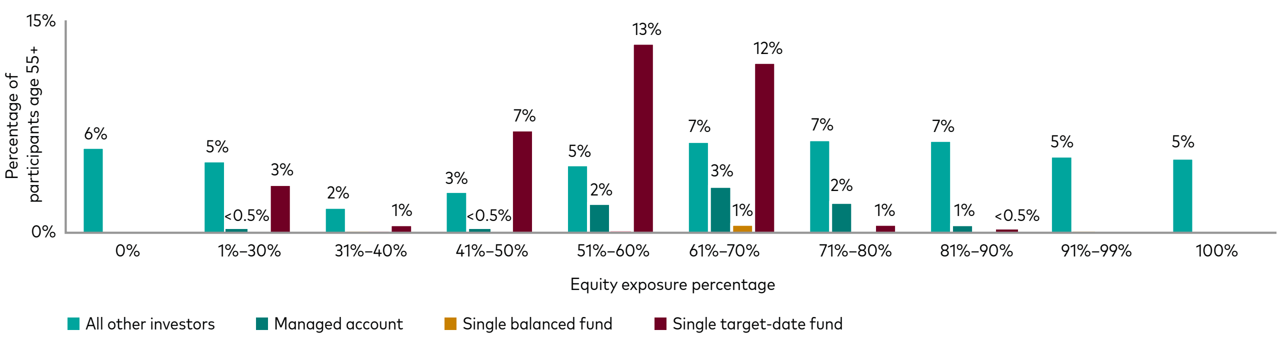
To address participant needs for assistance with investing and planning decisions, plan sponsors are increasingly offering managed account advice services.

Forty-one percent of all Vanguard DC plans offered managed account advice in 2021, and nearly 8 in 10 larger plans offered the service **(Figure 89)**. As larger plans were more likely to offer advice, 3 in 4 participants had access to the service.

Balancing competing goals with retirement saving can be complicated. 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 more than 30%, and in turn, the percentage of participants offered the service has grown by a similar amount **(Figure 90)**.

Figure 87. Distribution of equity exposure by older participants, 2021

Vanguard defined contribution plan participants age 55+

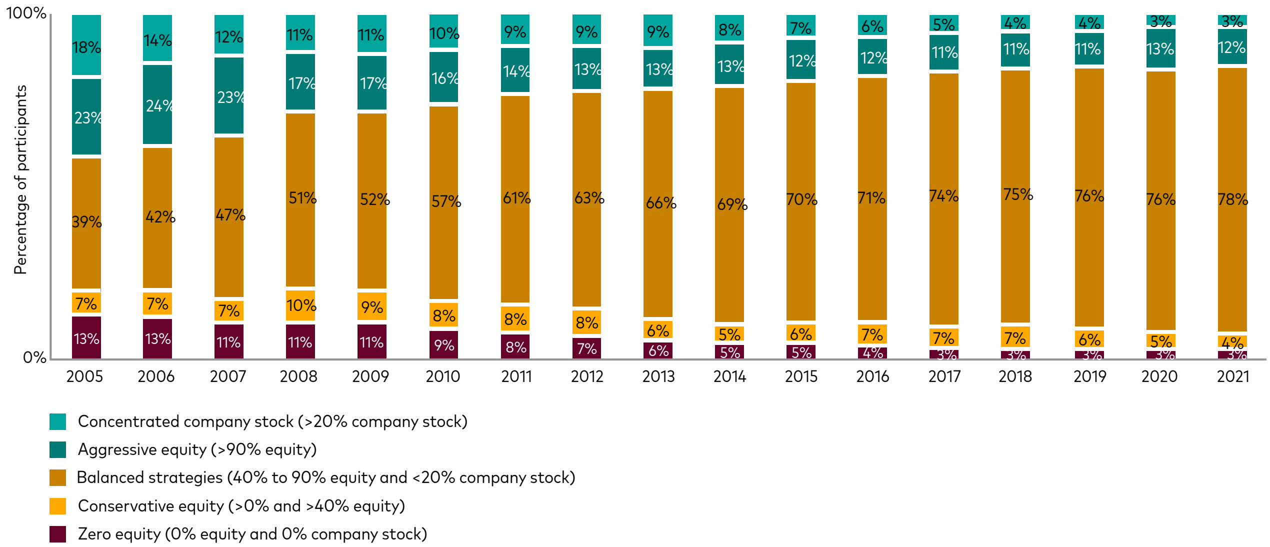


	All other investors	Managed account	Single balanced fund	Single target-date fund
Percentage of population	**51%**	**9%**	**1%**	**39%**
Average balance	$384,332	$297,334	$193,116	$94,531
Median balance	$178,853	$159,119	$72,489	$26,052

Source: Vanguard 2022.

Figure 88. Participant portfolio construction

Vanguard defined contribution plan participants



Source: Vanguard 2022.

Figure 89. Advice offered, 2021

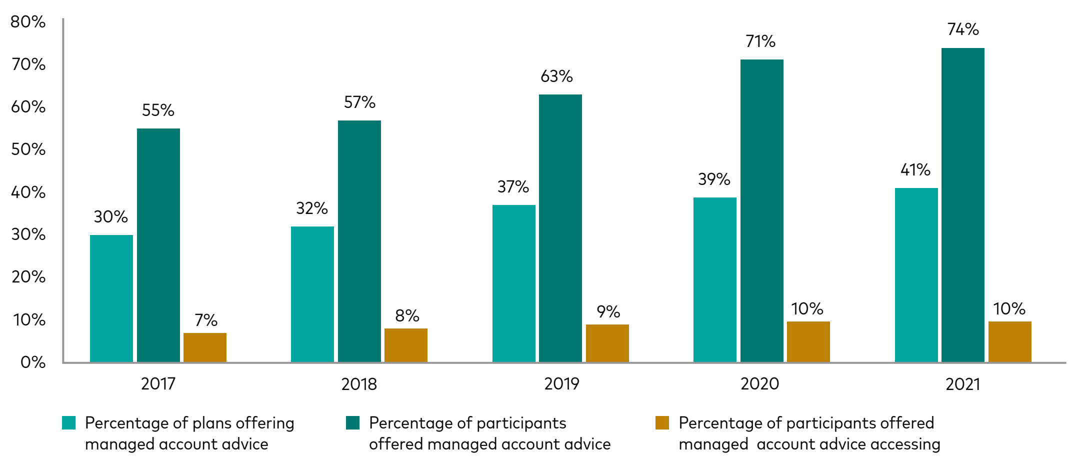
Vanguard defined contribution plans

	Number of participants				
	All	**<500**	**500–999**	**1,000–4,999**	**5,000+**
Managed account advice					
Percentage of plans offering managed account advice	41%	20%	50%	60%	78%
Percentage of participants offered managed account advice	74	26	49	61	81
Percentage of participants offered managed account advice accessing	10	8	8	9	10

Source: Vanguard 2022.

Figure 90. Advice offered trend

Vanguard defined contribution plans



Source: Vanguard 2022.

Company stock

Company stock is more likely to be offered as an investment option by a large plan—27% of Vanguard plans with 5,000 or more participants offered company stock in 2021, compared with 2% of plans with fewer than 500 participants. In some plans that offer company stock, participants can choose whether 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 2021, 8% of Vanguard recordkeeping plans offered company stock as an investment option. However, because large plans are more likely to offer company stock, 23% of Vanguard recordkeeping participants had access to company stock in their employer's plan.

Among all Vanguard participants in 2021:

- 92% had no company stock investments—either because their employer did not offer company stock (77%) or because they chose not to invest in it (15%).
- 5% had company stock holdings of 1% to 20% of their account balance.
- 3% had concentrated company stock positions exceeding 20% of their account balance.

Among Vanguard plans actively offering company stock, 88% had 20% or less of plan assets invested in the option **(Figure 91)**. The remaining 12% had concentration levels between 21% and 60%.

In 2021, nearly two-thirds of Vanguard participants offered company stock chose not to invest their contributions—or their employer's contributions—in the option. 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 2021, 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 2012 to 2% in 2021, 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 some participants view company stock as a safer investment than a diversified equity fund. Another factor is that some plan sponsors decide to make employer contributions in company stock. This implied endorsement often leads participants to invest more of their savings in the option 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 company stock. In 2021, plans offering company stock as an investment option but making employer contributions in cash had an average of 9% of plan assets invested in company stock **(Figure 92)**. Meanwhile, plans offering company stock as an investment option and making employer contributions in the stock had an average of 15% 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*. Vanguard research. December 2020. institutional.vanguard.com

Figure 91. Company stock exposure for plans and participants

Vanguard defined contribution plans actively offering company stock

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Balance of plan in company stock—percentage of plans										
1%–20%	77%	78%	79%	82%	81%	81%	82%	86%	88%	88%
21%–40%	16	16	15	14	16	18	16	12	11	11
41%–60%	6	6	6	4	3	1	1	1	1	1
61%–80%	0	0	0	0	0	0	0	0	0	0
>80%	1	0	0	0	0	0	0	1	0	0
Balance in company stock—percentage of participants										
0%	45%	47%	50%	50%	55%	61%	64%	67%	65%	66%
1%–20%	24	22	22	22	21	20	17	18	23	22
21%–40%	13	14	14	13	12	10	8	7	6	7
41%–60%	5	7	6	8	6	5	4	3	3	2
61%–80%	3	4	3	2	2	1	2	1	1	1
>80%	10	6	5	5	4	3	5	4	2	2

Source: Vanguard 2022.

Figure 92. Impact of company stock employer contributions on asset allocation, 2021

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	—	**94%**	**6%**	**<0.5%**
Brokerage	1%	1%	<0.5%	<0.5%
Company stock	2	<0.5	9	15
Diversified equity funds	42	41	42	42
Balanced funds	42	45	35	32
Bond funds	6	6	7	6
Cash	7	7	7	5

Source: Vanguard 2022.

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 equity markets during 2021, average total and personal returns for DC participants were 14.6 % and 13.6%, respectively, for the one-year period ended December 31, 2021 **(Figure 93)**. Reflecting positive U.S. equity markets, average personal returns for DC participants were 16.7% across the three-year period and 12.2% for the five-year period ended December 31, 2021. Five-year participant total returns averaged 12.2% per year, or 78% cumulatively.

Distribution of returns

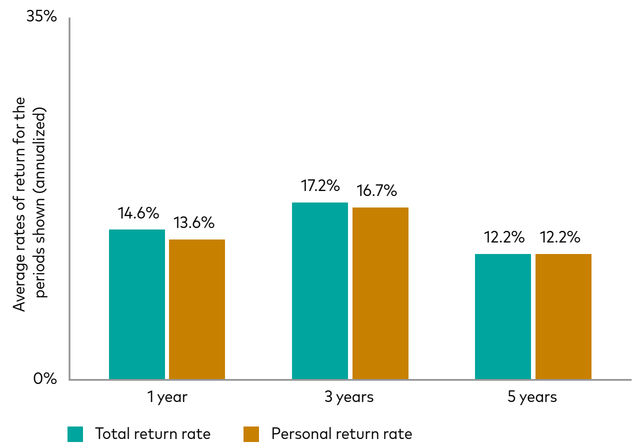
As of December 2021, five-year personalized annual returns were positive for nearly all Vanguard DC plan participants. There was wide variation in returns among participants **(Figure 94)**. Participants in the 5th percentile had five-year personalized returns of 3.3% per year in 2021. At the other extreme, participants above the 95th percentile had five-year personalized returns greater than 18.0% 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 9.3% for the 5th percentile to 13.7% for the 95th percentile, a difference of 4.4 percentage points **(Figure 95)**. For managed account participants, the 5th-to-95th percentile differences were 6.9 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 2.1% per year for the 5th percentile to 18.4% for the 95th percentile, a difference of 16.3 percentage points.

Figure 93. Participant rates of return, December 2021
Vanguard defined contribution plans



Market returns ended December 31, 2021	1 year	3 years	5 years
60/40 Balanced*	12.3%	16.3%	11.6%
70/30 Balanced*	14.7	18.2	12.9
S&P 500	28.7	26.1	18.5
Bloomberg Barclays US Aggregate	-1.5	4.8	3.6
FTSE Developed ex US	10.1	13.9	10.0

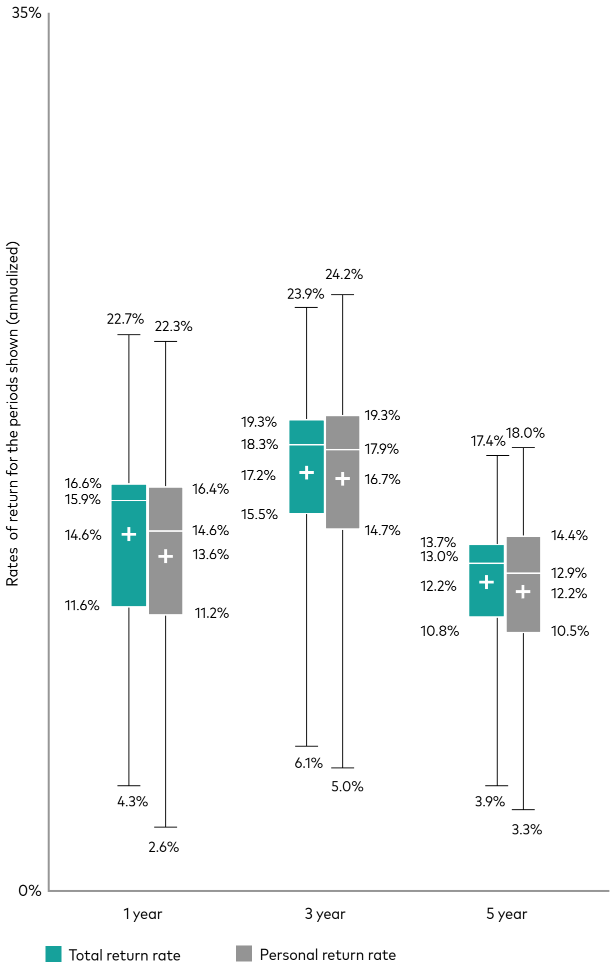
Past performance is not a guarantee of future returns. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index.

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

Source: Vanguard 2022.

Figure 94. Variation in participant total and personal return rates, 2021

Vanguard defined contribution plans



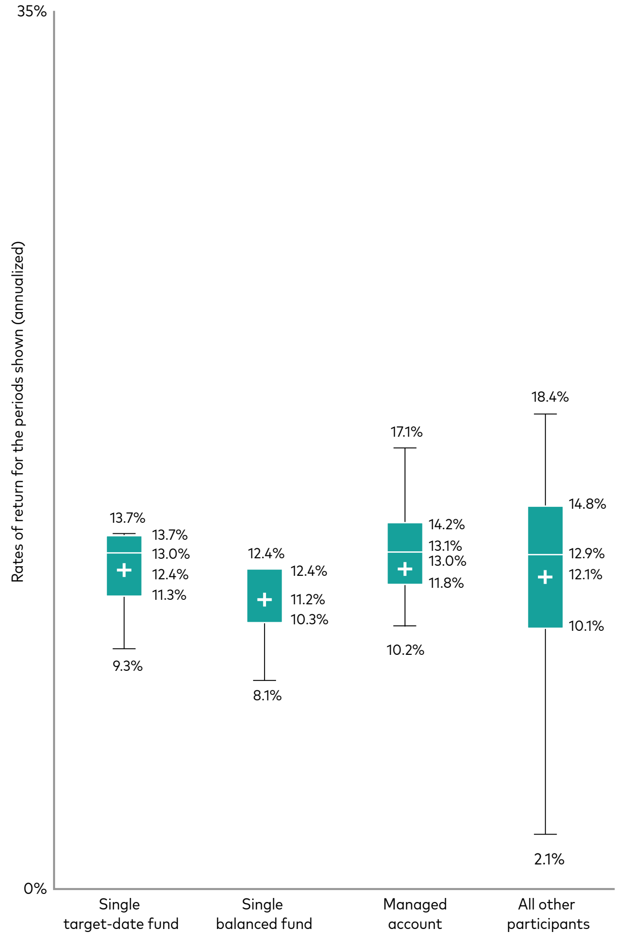
Note: Based on 4.0 million observations for 1 year; 3.0 million for 3 year; and 2.2 million for 5 year.

Source: Vanguard 2022.

Past performance is not a guarantee of future returns.

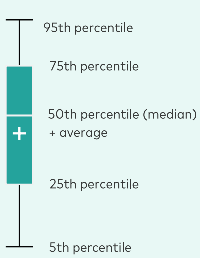
Figure 95. Distribution of five-year total returns by strategy, 2021

Vanguard defined contribution plans



Note: Based on 835,000 observations for single target-date fund investors; 21,000 for balanced fund investors; 81,000 for managed account investors; and 1.3 million for all other participants.

Source: Vanguard 2022.



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 94 is: For the one-year period, 5% of participants had total return rates (TRR) greater than 22.7%; 25% had TRRs greater than 16.6%; half had TRRs greater than 15.9%; 75% had TRRs greater than 11.6%; 95% had TRRs greater than 4.3%; and 5% had TRRs less than 4.3%. The average one-year TRR was 14.6%.

Dispersion of outcomes

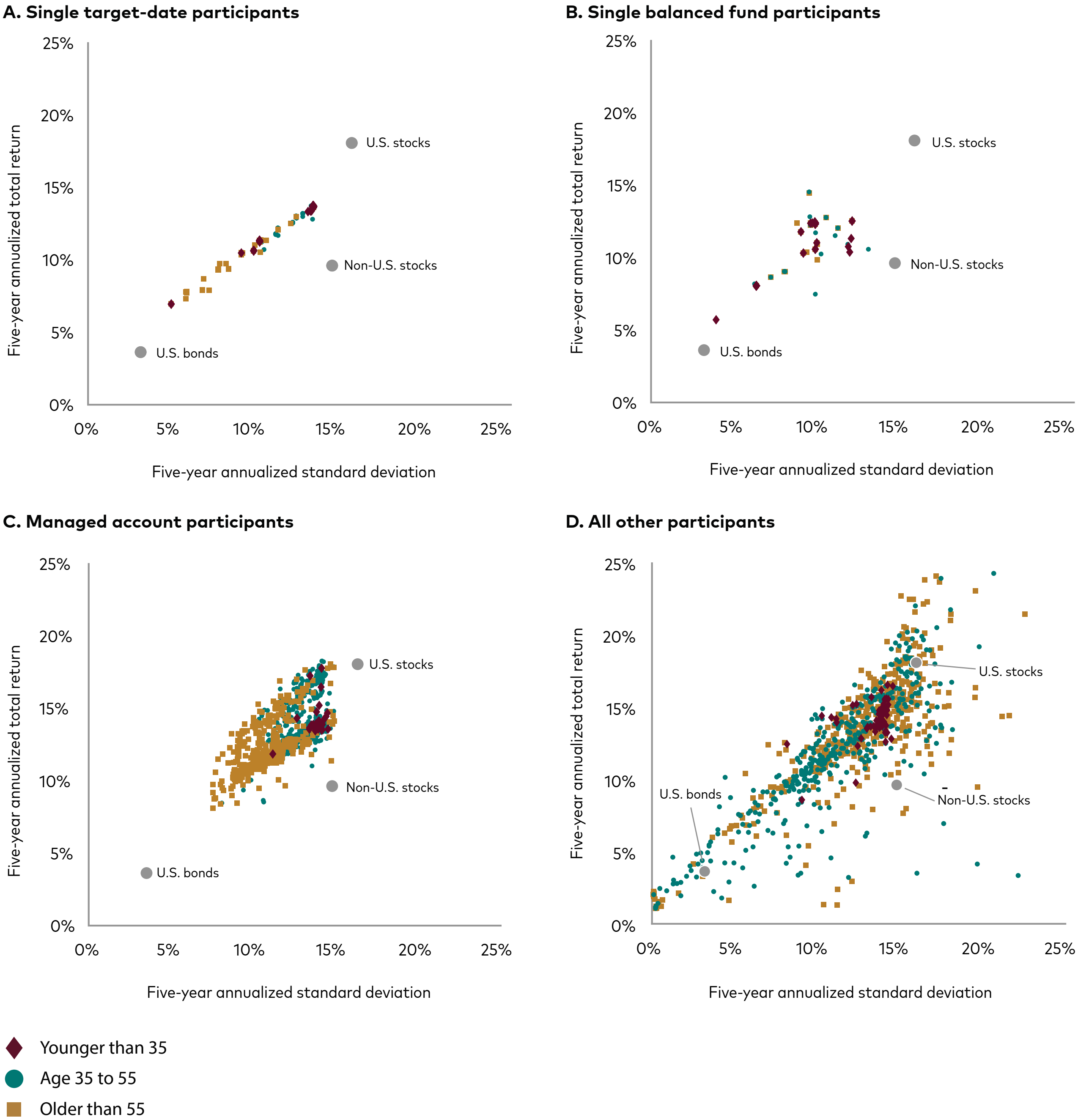
The outcomes of the different types of participants also are apparent when examining both return and risk outcomes in scatterplots. For ease of presentation, we created a random sample of 1,000 participants for each group of investors.

During the five-year period ended December 31, 2021, outcomes for single target-date investors were distributed among major market indexes **(Figure 96, 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 rhombuses and in long-dated portfolios) are to the right of the chart; older participants (represented by dark yellow squares 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 96, Panel B)**. Managed account investors are more dispersed, reflecting the customized nature of managed account advice **(Figure 96, Panel C)**. The greatest dispersion of risk/return outcomes is among participants making their own investment choices **(Figure 96, Panel D)**. Over time, because of the growing use of professionally managed allocations in DC plans, this population is expected to decline.

Figure 96. Risk and return characteristics, 2017–2021

Defined contribution plan participants for the five-year period ended December 31, 2021



Past performance is not a guarantee of future returns.

Note: Includes 1,000 random samples of participant accounts drawn from respective samples.
Excludes 0.5% top and 0.5% bottom outliers for both risk and return, for a net sample of 980 observations.

Source: Vanguard 2022.

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

In 2021, only 15% of participants made at least one portfolio trade or exchange during the year, down from 20% in 2004 **(Figure 97)**.

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 8% of participants initiated an exchange, a decrease of 2 percentage points from 2020, when trading activity increased because of market volatility related to COVID-19. Trading activity in 2021 was similar to more recent pre-pandemic years.

Another measure of trading is the volume of dollars traded. We measure dollar volume movements as a fraction of total recordkeeping assets 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 2021, traders exchanged the dollar equivalent of 11.2% of average DC recordkeeping assets at Vanguard. On a net basis, 3.0% of assets were shifted from equities to fixed income in 2021, similar to the shift from equities to fixed income in 2020.

Since 2012, dollar-trading levels have generally remained stable, with the exception of periods of high market volatility **(Figure 98)**. The most notable spike in dollars traded occurred in spring 2020 at the onset of the COVID-19 pandemic.

Figure 97. Participant trading summary

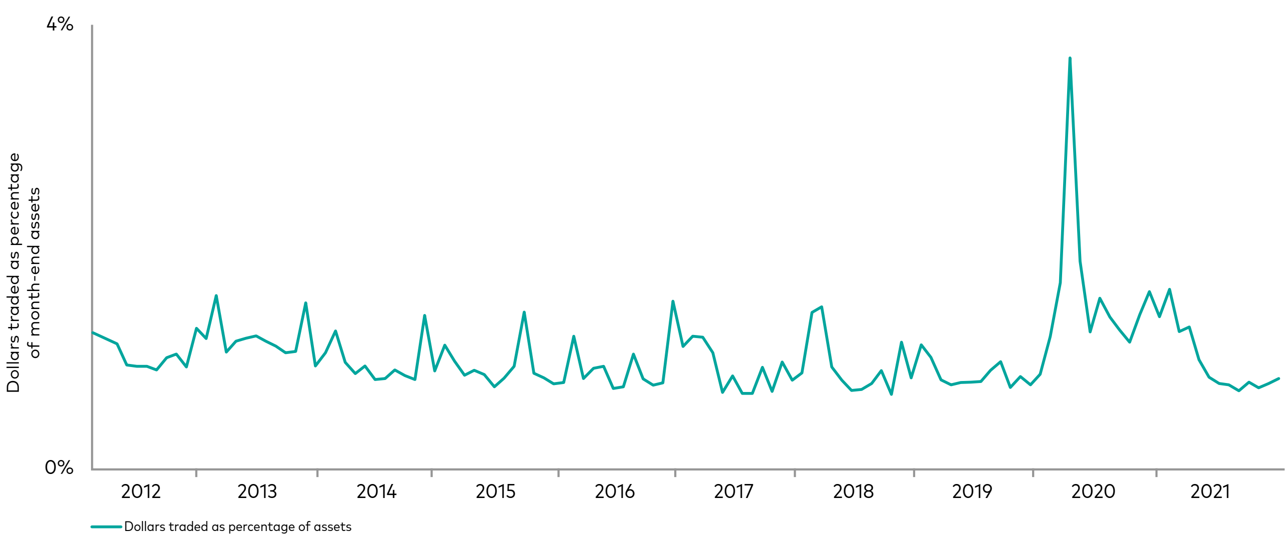
Vanguard defined contribution plans

	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
2021	15%	8%	11.2%	–3.0%	$72.0	–$2.2	0.0	0.0	13%	8%
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 2022.

Figure 98. Trading activity, January 2012–December 2021

Vanguard defined contribution plan participants



Source: Vanguard 2022.

Direction of money movement

Summary statistics may sometimes portend that all participant trading is in one direction. However, in any given month, participants who trade are trading meaningful dollar amounts both in and out of equities **(Figure 99)**. 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.

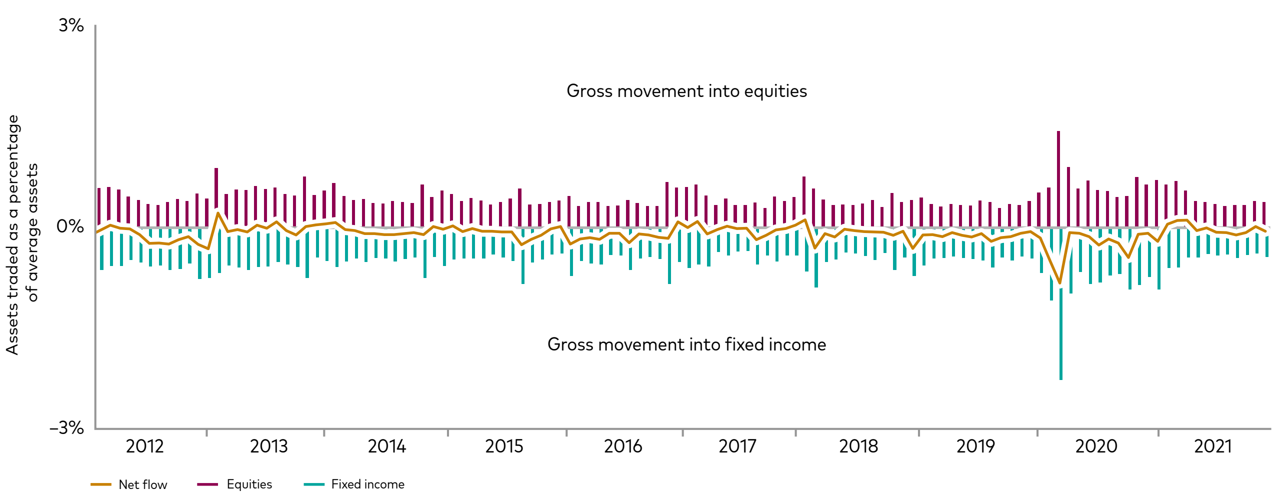
Participants who are pure target-date fund investors not only benefit from continuous rebalancing but are also far less likely to trade when compared with all other investors. In 2021, only 3% of all pure target-date fund investors made an exchange, a rate nearly five times lower than all other investors **(Figure 100)**.

Women traded about 50% less frequently than men **(Figure 101)**.[5] Participants holding only target-date funds traded very infrequently, and women were more likely than men to hold a single target-date fund.

Figure 99. Direction of money movement, January 2012–December 2021

Vanguard defined contribution plan participants

Money movement as a percentage of average assets

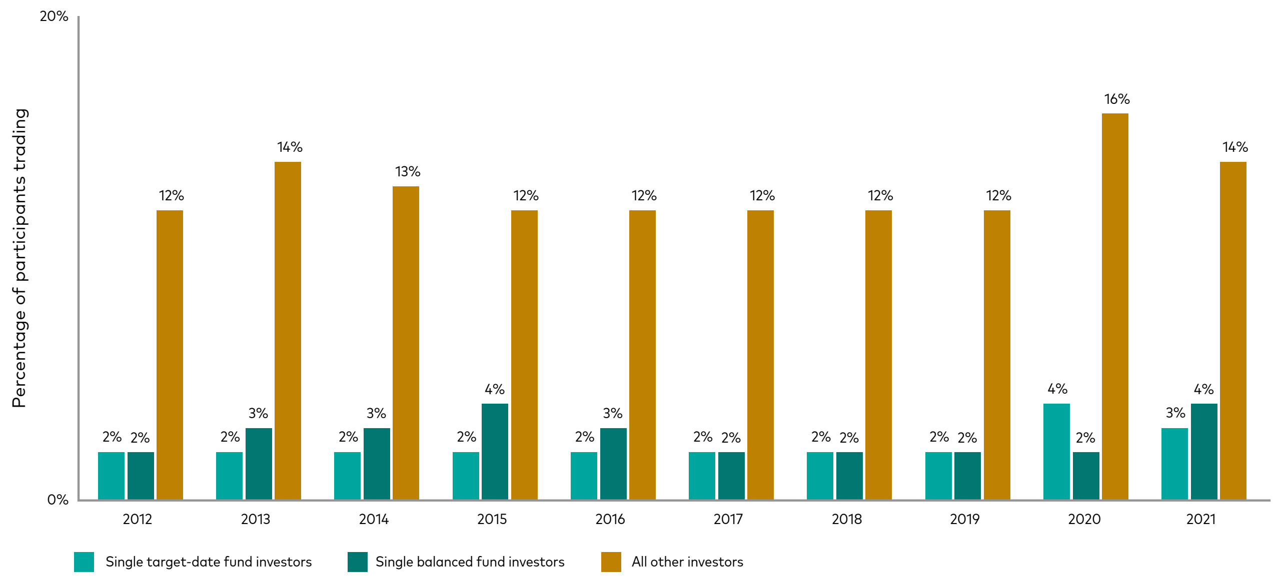


Source: Vanguard 2022.

[5] For an in-depth analysis of trading, see Jeffrey W. Clark, Stephen P. Utkus, and Jean A. Young, *Understanding Household Trading Behavior 2012–2018*. Vanguard research. August 2019. institutional.vanguard.com

Figure 100. Participant trading by investor type

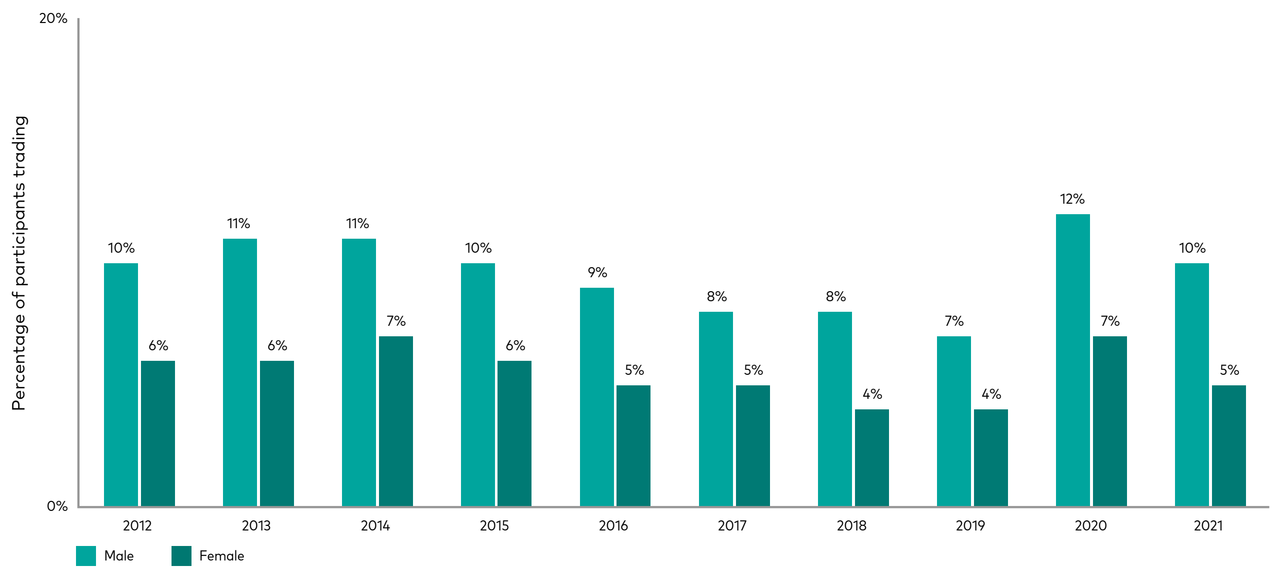
Vanguard defined contribution plan participants



Source: Vanguard 2022.

Figure 101. Participant trading by gender

Vanguard defined contribution plan participants



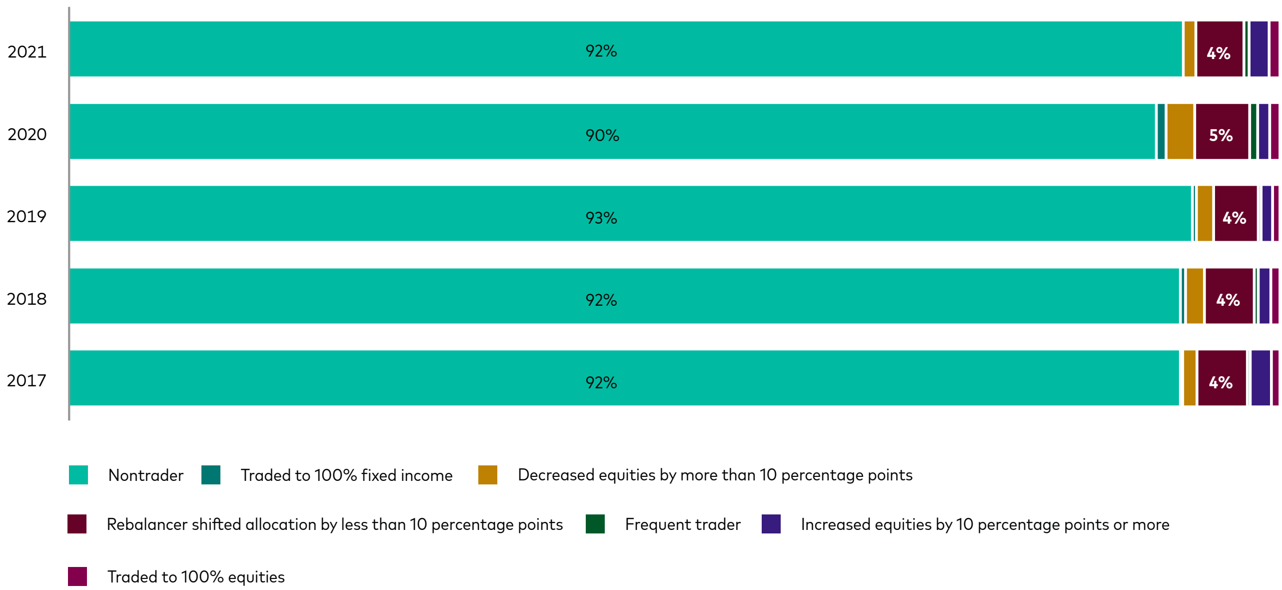
Source: Vanguard 2022.

Types of trading activity

The kinds of exchanges varied among participants who traded in their accounts in 2021. Ninety-two percent of nonmanaged account participants did not make an exchange, but of those who did, the most common action was rebalancing of their account **(Figure 102)**.

Figure 102. Participant trading decisions

Vanguard defined contribution plan participants (nonadvised)



Source: Vanguard 2022.

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 in 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 2021, 81% of Vanguard DC plans permitted participants to borrow from their plan, and 87% of active participants had access to a loan feature **(Figure 103)**. 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 2021, 53% of Vanguard DC plans offering loans permitted one loan at a time. Thirty-eight percent of plans allowed two, and 9% of plans allowed three or more.

Figure 103. Plan loans, 2021

Vanguard defined contribution plans

Percentage of plans offering loans	**81%**
Percentage of participants in plans offering loans	**87%**
Plans offering loans	
Number of loans permitted	
1 loan	53%
2 loans	38
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%	71
Prime plus 2%	12
Prime plus other rates	4
Plans permitting terminated participants to continue loan repayment	**39%**

Source: Vanguard 2022.

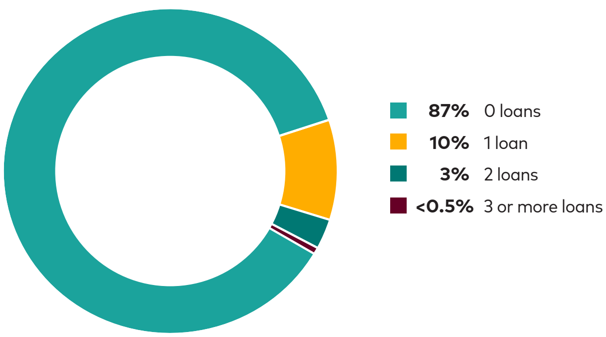
Some plan sponsors impose loan-issuance waiting periods to discourage repetitive loans. In 2021, 3% of plans required a waiting period—most commonly one month—after a loan was paid off before a new loan could be taken by the participant. Two percent of plans imposed a waiting period—most commonly one year—after loan issuance before another loan could be taken. Finally, nearly 4 in 10 plans permitted participants terminating with an outstanding loan to continue repayment. When terminated participants were permitted to continue loan payments, 5% continued to make payments, and 19% paid off the loan.

[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

Thirteen percent of participants had a loan outstanding at year-end 2021 **(Figure 104)**.[7] On average, the outstanding loan account balance was 8% of the participant's account balance, excluding the loan, and the average participant had borrowed about $10,600 **(Figure 105)**. 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.

Figure 104. Participant loan use, 2021
Vanguard defined contribution plans offering loans



Source: Vanguard 2022.

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 2021. Men and women used loans at similar rates.

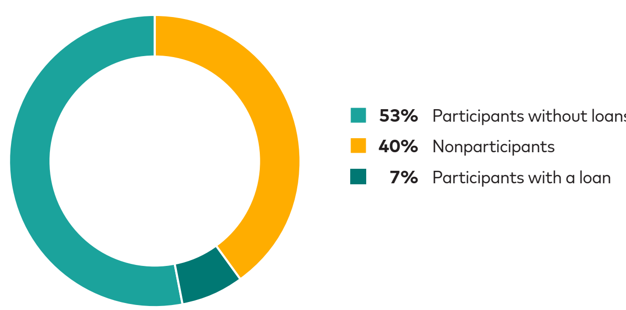
Income appears to have a greater influence than age on loan use. In 2021, 1 in 4 participants with a household income between $30,000 and $99,999 had a loan, while 12% of participants with an income of more than $150,000 had a loan. This difference reflects liquidity constraints among those with low wealth and income—that is, higher-income households have less of a need to borrow.

Participants with an account balance of less than $10,000 were less likely to have a loan, yet they borrowed the largest percentage of their account balance. Seven percent of this group had a loan, but the loan accounted for 35% of their account balance, on average.

In 2021, participants with loans outstanding had saved slightly less for retirement than those without loans. Older, longer-tenured, higher-income participants with loans had saved less for retirement than participants without loans who shared those demographics. However, younger, newly hired, lower-income, lower-balance participants with loans had saved more for retirement than participants without loans in the same demographics. These differences in part reflect the interplay of demographic differences in terms of age, income, and tenure between borrowers and nonborrowers.

Eleven percent of participants who earned between $15,000 and $29,999 in 2021 had a loan outstanding. However, earlier in this report, we noted that participation rates are lowest among this group, with 60% 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 who earn between $15,000 and $29,999 and do not participate in their employer's plan **(Figure 106)**.

Figure 106. Participation and loans, 2021.
All employees earning between $15,000 and $29,999



Source: Vanguard 2022.

[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 105. Participant loan demographics, 2021

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%**	**8%**	**$10,614**	**$124,442**	**$135,056**	**$146,785**
Income						
<$15,000	7%	11%	$5,834	$49,625	$55,459	$23,674
$15,000–$29,999	11	15	3,610	20,493	24,104	16,742
$30,000–$49,999	20	12	5,290	37,460	42,750	29,978
$50,000–$74,999	26	10	8,713	76,044	84,757	77,789
$75,000–$99,999	23	9	11,855	125,533	137,388	138,242
$100,000–$149,999	18	7	15,628	204,590	220,218	225,658
$150,000+	12	5	20,048	350,534	370,582	404,457
Terminated	1	8	10,576	121,267	131,843	147,340
Age						
<25	2%	21%	$3,147	$11,823	$14,970	$6,199
25–34	9	16	6,934	36,390	43,324	38,471
35–44	15	11	10,614	85,981	96,594	102,367
45–54	18	7	12,066	152,622	164,688	190,889
55–64	13	5	11,557	203,731	215,288	269,858
65+	4	5	9,793	186,564	196,356	283,439
Gender						
Male	13%	7%	$ 11,337	$145,315	$156,652	$145,315
Female	12	8	9,785	107,618	117,403	107,618
Job tenure (years)						
0–1	2%	17%	$6,064	$30,012	$36,075	$15,277
2–3	9	16	6,206	31,684	37,890	42,092
4–6	14	14	7,826	47,085	54,911	72,857
7–9	16	12	10,003	73,684	83,687	113,027
10+	16	6	13,045	192,908	205,953	300,631
Account balance						
<$10,000	7%	35%	$2,857	$5,333	$8,190	$3,111
$10,000–$24,999	15	25	5,721	16,831	22,552	16,619
$25,000–$49,999	17	21	9,378	36,284	45,662	36,175
$50,000–$99,999	17	15	12,633	72,061	84,694	72,057
$100,000–$149,999	16	11	14,773	122,803	137,576	123,017
$150,000–$199,999	15	8	16,021	173,119	189,140	173,438
$200,000–$249,999	15	7	16,578	223,544	240,121	223,626
$250,000+	11	3	17,903	523,705	541,608	660,557

Source: Vanguard 2022.

Loan use by industry group

Loan use varied significantly by industry sector in 2021 **(Figure 107)**. 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 2012 **(Figure 108)**. In addition, there appears to be a pronounced seasonality to taking loans, with borrowing typically peaking in the summer months. The reasons for this pattern are not well understood.

Throughout 2021, overall loan initiations increased slightly from 2020 but remained below the pre-pandemic rate. We speculate this trend is partly attributable to an increase in consumer savings since the pandemic started.

Figure 107. Participant loans by industry sector, 2021

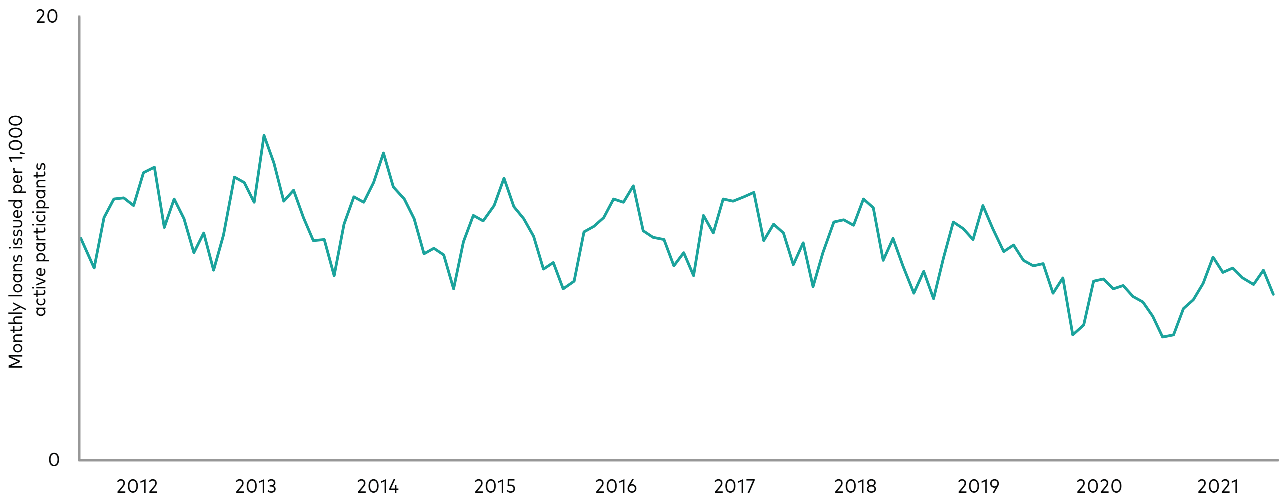
Vanguard defined contribution plans offering loans

	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%**	**8%**	**$10,614**	**$124,442**	**$135,056**	**$146,785**
Industry group						
Transportation, utilities, and communications	17%	9%	$9,569	$100,106	$109,675	$113,680
Manufacturing	15	7	9,918	127,991	137,909	155,491
Finance, insurance, and real estate	15	7	12,155	159,382	171,537	181,349
Agriculture, mining, and construction	14	7	13,396	178,427	191,823	198,216
Wholesale and retail trade	13	9	8,956	93,112	102,067	97,122
Education and health	13	10	10,576	94,428	105,004	110,194
Media, entertainment, and leisure	8	9	13,112	139,205	152,317	179,058
Business, professional, and nonprofit	7	7	12,043	167,458	179,501	171,872

Source: Vanguard 2022.

Figure 108. Loan origination trend

Vanguard defined contribution active participants in plans offering loans



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Monthly average (per 1,000 participants)	11.1	11.5	11.0	10.2	10.2	10.5	9.8	9.6	7.4	7.6
Annual increase (decrease) in loans issued per 1,000 participants	(3%)	4%	(4%)	(7%)	0%	3%	(7%)	(2%)	(22%)	3%

Source: Vanguard 2022.

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.

Among all Vanguard DC plans in 2021, 94% allowed hardship withdrawals and 87% allowed plan withdrawals for those 59½ and older **(Figure 109)**. Of the participants permitted to take each type of withdrawal, 2.1% took a hardship withdrawal and 4.0% took a nonhardship withdrawal **(Figure 110)**. Overall, the average portion of account balance withdrawn was 32% **(Figure 111)**.

Assets withdrawn totaled about 1% of Vanguard active participant assets. Of the participants who took withdrawals, 90% took the money in cash, withdrawing, on average, about 18% of account savings. They had a median age of 51. Meanwhile, 10% of participants taking withdrawals rolled over their assets from the plan to an IRA.

Figure 109. Plan withdrawals, 2021
Vanguard defined contribution plans

Percentage of plans offering	
Hardship withdrawals	94%
Withdrawals after age 59½	87

Source: Vanguard 2022.

Figure 110. Participant use of plan withdrawals
Vanguard defined contribution plans

	2017	2018	2019	2020	2021
Hardship withdrawals	1.8%	1.9%	2.3%	1.7%	2.1%
Nonhardship withdrawals	3.4	3.4	3.3	3.4	4.0
Coronavirus distributions				5.7	

Source: Vanguard 2022.

Figure 111. Use of all plan withdrawals, 2021
Vanguard defined contribution plans

	All	Cash	Rollover
Percentage of participants using	4.4%	4.0%	0.5%
Percentage of assets withdrawn	1.3	0.6	0.8
Percentage of participant account assets withdrawn	32.5	18.3	60.7
Median age	52	51	61

Source: Vanguard 2022.

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 61% of their account balance. These participants rolling over assets accounted for 59% of the assets being withdrawn.

Beginning in 2012, the rate of new nonhardship withdrawals, such as post-age-59½ in-service or other withdrawals, grew by nearly 20% through 2019 **(Figure 112)**.

The nonhardship withdrawal rate decreased in 2020, in part because of the availability of coronavirus-related distributions (CRDs), which were provided for in March 2020 when Congress passed the CARES Act. Incorporated within the bill were several provisions that provided flexibility for retirement savers, including 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 had three years to return the funds to their account. Through the end of 2021, less than 1% of participants who withdrew assets through a CRD repaid the assets back to their plan. As the availability of CRDs expired in 2020, nonhardship withdrawal activity has reverted to pre-pandemic levels.

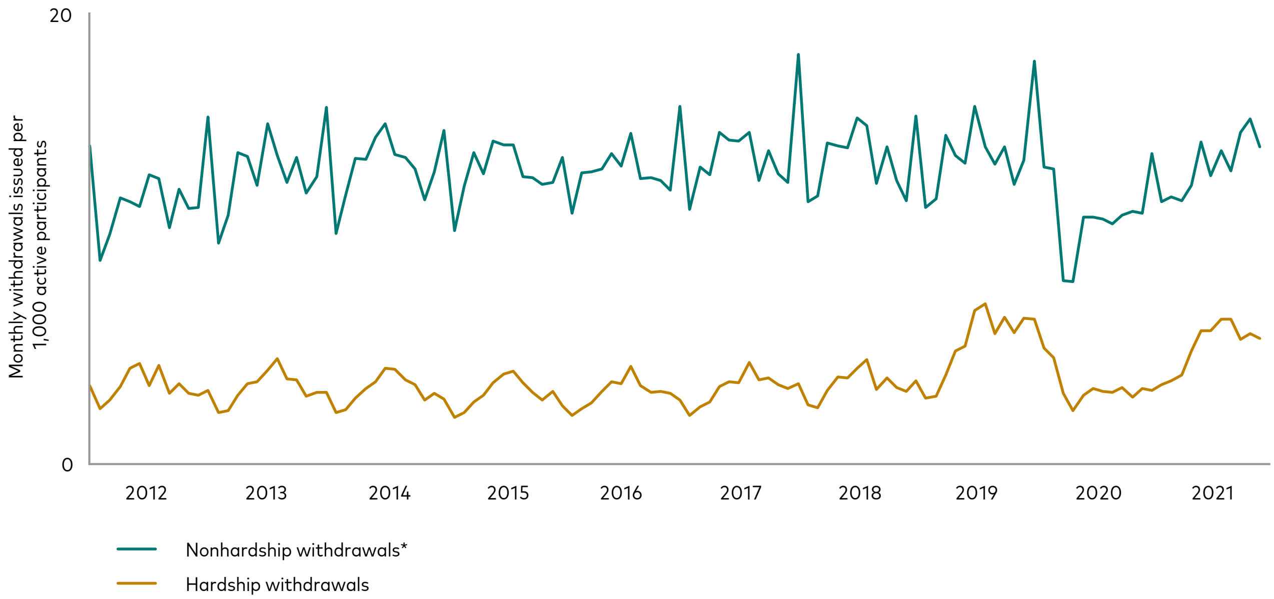
From 2012 to 2018, the new hardship withdrawal rate remained relatively consistent while holding at a low absolute level. But in 2019, hardship withdrawal activity increased by nearly 50%. The Bipartisan Budget Act of 2019 introduced changes to hardship withdrawal provisions. These changes were designed 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. In 2021, overall hardship withdrawal activity increased from 2020 but remained slightly below pre-pandemic levels from 2019.

Plan withdrawals are used infrequently in the aggregate. However, 56% of participants taking a cash withdrawal in 2021 had also taken one in 2020. Some participants could, over time, jeopardize their retirement savings if they continue to rely on this feature throughout their working careers.

Figure 112. In-service withdrawal trend

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



Monthly average per 1,000 active participants	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Nonhardship withdrawals	7.0	7.8	8.0	7.9	7.8	8.2	8.3	8.2	6.9	8.0
Hardship withdrawals	2.1	2.0	2.0	1.9	1.9	2.0	2.1	3.1	2.2	3.0
Annual increase (decrease) per 1,000 active participants										
Nonhardship withdrawals	9%	11%	3%	(1%)	(1%)	5%	1%	(1%)	(16%)	16%
Hardship withdrawals	(5)	(5)	0	(5)	0	5	5	48	(29)	38

*Coronavirus-related distributions are excluded from this figure.

Source: Vanguard 2022.

Plan distributions and rollovers

When changing jobs or retiring, DC plan participants have the option of preserving their retirement savings (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 participants. In the short run, they incur taxes and possible penalties on any amounts they spend. In the long run, because of the lost opportunity for compound earnings, participants significantly increase the amount they need to save during the remainder of their working years.

Policymakers have employed several methods to discourage leakage from participants who have terminated their employment. Generally, participants may keep 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. Two percent of plans allowed participants with a balance of less than $1,000 to remain in the plan in 2021 **(Figure 113)**. In some cases, the sponsor may allow participants to retain a balance of $1,000 or more in the plan—15% of plans permitted 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 3% of sponsors required terminated participants to leave the plan by age 65 or age 70 **(Figure 114)**.

Nearly two-thirds of sponsors allowed participants to establish installment payments, and nearly 2 in 10 offered an annuity option for at least a portion of the plan assets. Eleven 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, 37% of plans permitted terminated participants to take partial ad hoc cash distributions in 2021.[8] Nineteen percent of plans offered this option in 2016—the rate nearly doubling in five years. Seventy-two percent of 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.

Figure 113. Frequency of automatic distributions, 2021

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)	2%	3%	2%	3%	2%
Automatic cash out if balance is <$1,000, remain in plan if balance is higher	15	12	15	16	22
Automatic cash out if balance is <$1,000, rollover if balance is between $1,000 and <$5,000	83	85	83	81	76
Percentage of participants offered					
Remain in plan (no automatic distribution)	2%	2%	2%	3%	1%
Automatic cash out if balance is <$1,000, remain in plan if balance is higher	27	12	15	15	31
Automatic cash out if balance is <$1,000, rollover if balance is between $1,000 and <$5,000	71	86	83	82	68

Note: This analysis excludes approximately 85 403(b) plans and approximately 243,000 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 2022.

[8] 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*. Vanguard research. December 2019. institutional.vanguard.com

Figure 114. Distribution options, 2021

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	3	3	3	2	1
Deferral only to age 70	<0.5	<0.5	<0.5	0	1
Installments other than RMDs	64	58	62	67	84
Annuity	11	12	9	9	12
Annuity grandfathered source only	7	7	6	7	7
Ad hoc partial distributions	37	22	37	51	72
Percentage of participants offered					
Deferral	100%	100%	100%	100%	100%
Deferral only to age 65	1	4	3	3	1
Deferral only to age 70	4	<0.5	<0.5	0	6
Installments other than RMDs	80	61	62	67	85
Annuity	13	14	9	8	15
Annuity grandfathered source only	1	1	1	1	<0.5
Ad hoc partial distributions	72	27	38	53	81

Source: Vanguard 2022.

Participant and asset flows

Plan distributions are somewhat common when participants change jobs or retire, and they represent a large portion of total plan and participant assets. In 2021, 14% of participants left their employer and were eligible for a distribution. Their assets totaled 7% of Vanguard recordkeeping assets. Seven in ten 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 115)**.

In 2021, 30% of participants took a cash distribution. Ninety-five percent of the assets available for distribution were preserved for retirement.

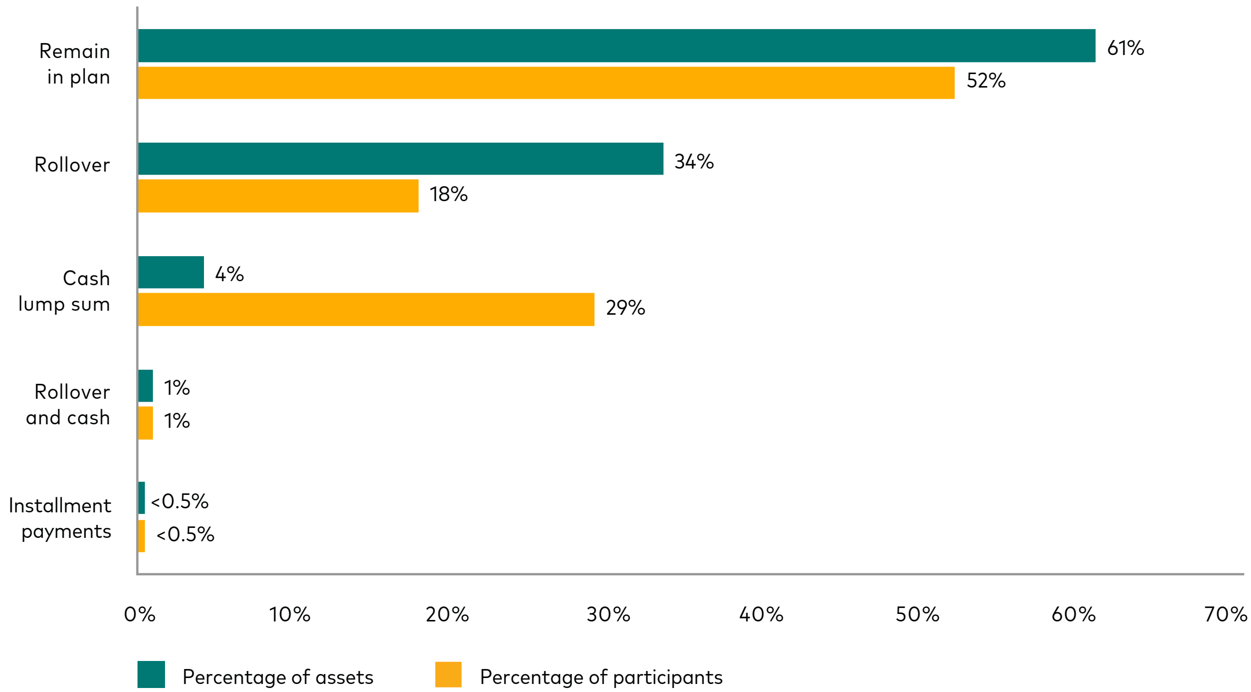
The percentage of participants choosing to take cash and presumably spending their savings has remained stable over time **(Figure 116)**.

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 who took a distribution from their plan, more participants took cash distributions (30%) than rolled over their assets to another plan or IRA (18%). 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.

Figure 115. Plan distributions, 2021

Vanguard defined contribution plans

Participants with termination dates in 2021



Source: Vanguard 2022.

Figure 116. Trends in distribution of plan assets

Vanguard defined contribution plans

Participants with termination dates in the given year

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Percentage of participants choosing										
Remain in plan	48%	49%	49%	51%	50%	51%	48%	46%	49%	52%
Rollover	21	22	22	20	19	18	18	18	19	18
Installment payments	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5
Participants preserving assets	69%	71%	71%	71%	69%	69%	66%	65%	68%	70%
Cash lump sum	29%	28%	28%	28%	30%	30%	33%	34%	31%	29%
Rollover and cash	2	1	1	1	1	1	1	1	1	1
Percentage of assets available for distribution										
Remain in plan	53%	54%	53%	56%	59%	61%	56%	60%	63%	61%
Rollover	39	39	40	37	35	34	37	34	32	34
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%	93%	93%	93%	94%	95%	93%	94%	95%	95%
Cash lump sum	5%	5%	5%	5%	5%	4%	6%	5%	4%	4%
Rollover and cash	3	2	2	2	1	1	1	1	1	1

Source: Vanguard 2022.

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 2021, 33% of participants in their 20s chose to cash out their plan assets, compared with 20% of participants in their 60s **(Figure 117)**.

In terms of assets, 91% 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-three percent of participants with balances of less than $1,000 kept their balance in a tax-deferred account **(Figure 118)**.

However, once balances reached $100,000, 93% 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 119)**. 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 117. Plan distribution behavior by age, 2021

Vanguard defined contribution plans

Participants with termination dates in 2021

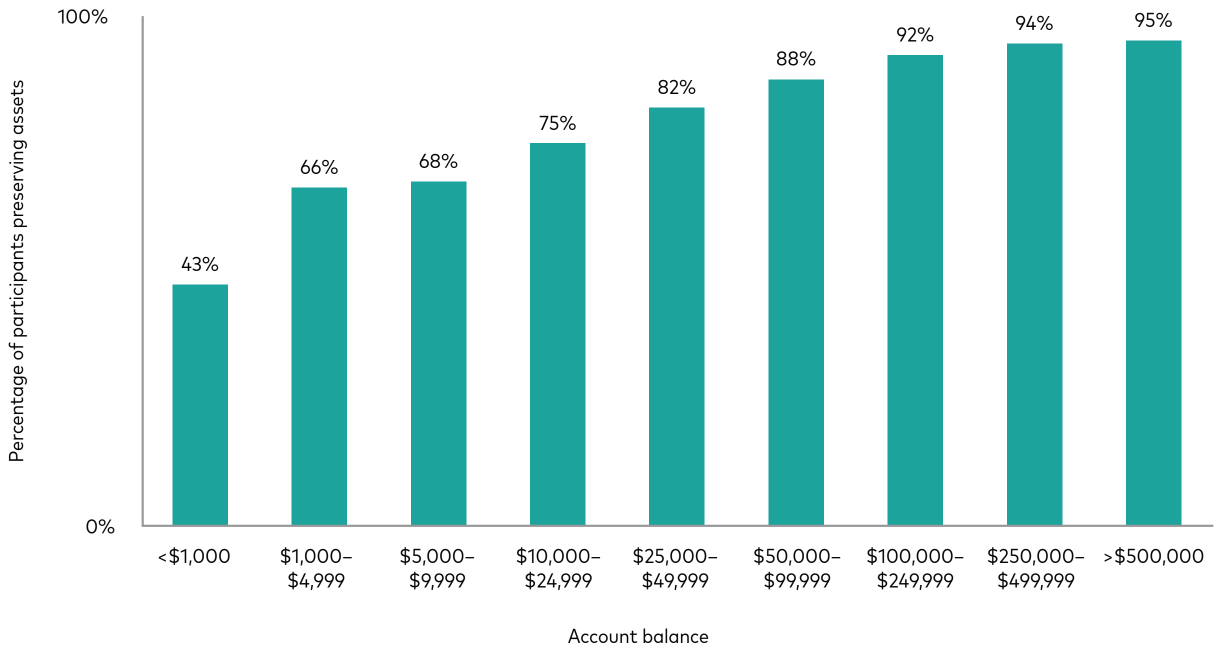
	20s	30s	40s	50s	60s	70s	Total
Percentage of participants choosing							
Remain in plan	54%	55%	52%	53%	46%	27%	52%
Rollover	13	15	16	20	32	28	18
Installment payments	0	0	0	0	1	16	<0.5
Participants preserving assets	67%	70%	68%	73%	79%	71%	70%
Cash lump sum	33%	30%	31%	26%	20%	28%	29%
Rollover and cash	0	0	1	1	1	1	1
Percentage of assets available for distribution							
Remain in plan	72%	72%	68%	63%	53%	41%	61%
Rollover	19	21	25	32	44	52	34
Installment payments	0	0	0	0	0	1	<0.5
Assets preserved for retirement	91%	93%	93%	95%	97%	94%	95%
Cash lump sum	9%	7%	6%	4%	2%	5%	4%
Rollover and cash	0	0	1	1	1	1	1

Source: Vanguard 2022.

Figure 118. Plan distribution behavior by account balance, 2021

Vanguard defined contribution plans

Participants with termination dates in 2021

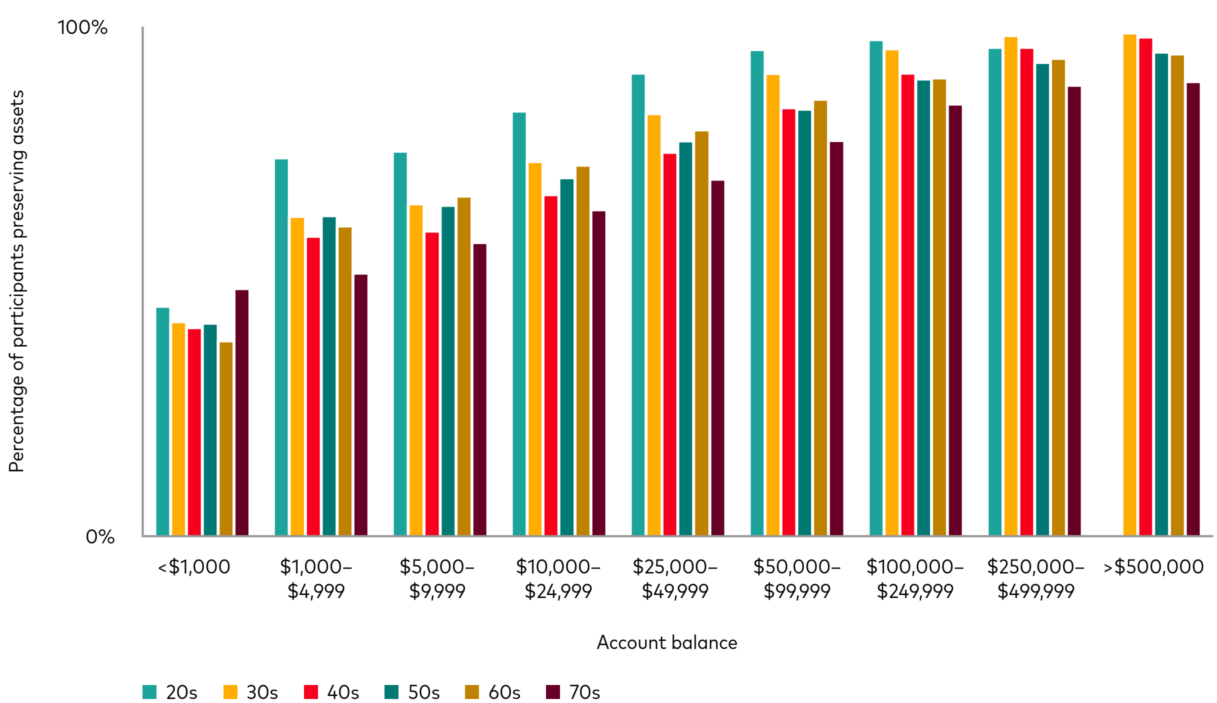


Source: Vanguard 2022.

Figure 119. Plan distribution behavior by age and account balance, 2021

Vanguard defined contribution plans

Participants with termination dates in 2021



Source: Vanguard 2022.

A more optimistic picture of plan distribution behavior emerges if we analyze the total plan assets available for distribution at any given time. During 2021, 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 120)**. 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 did not contact their provider at all in a given year to those who did so multiple times a month.

Figure 120. Alternative view of distribution of plan assets

Vanguard defined contribution plans

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

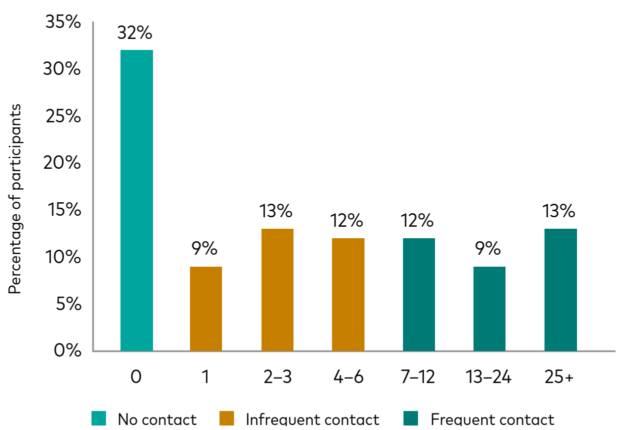
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Percentage of participants choosing										
Remain in plan	67%	68%	68%	69%	67%	68%	65%	63%	67%	67%
Rollover	13	14	14	13	12	12	12	13	13	12
Installment payments	2	3	3	3	3	4	4	4	3	4
Participants preserving assets	82%	85%	85%	85%	82%	84%	81%	80%	83%	83%
Cash lump sum	16%	14%	14%	14%	17%	15%	18%	19%	17%	17%
Rollover and cash	2	1	1	1	1	1	1	1	<0.5	<0.5
Percentage of assets available for distribution										
Remain in plan	75%	76%	76%	77%	78%	80%	76%	78%	82%	81%
Rollover	20	20	20	19	18	17	19	17	15	16
Installment payments	1	1	1	1	1	1	1	1	1	1
Assets preserved for retirement	96%	97%	97%	97%	97%	98%	96%	96%	98%	98%
Cash lump sum	3%	2%	2%	2%	2%	1%	3%	3%	2%	2%
Rollover and cash	1	1	1	1	1	1	1	1	<0.5	<0.5

Source: Vanguard 2022.

Frequency of account access

In 2021, 32% of plan participants never contacted Vanguard regarding their plan account **(Figure 121)**. However, 68% did contact Vanguard—a ratio that has improved from 2012, when 57% of participants did so **(Figure 122)**. 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 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.

Figure 121. Participant contact frequency, 2021
Vanguard defined contribution plans



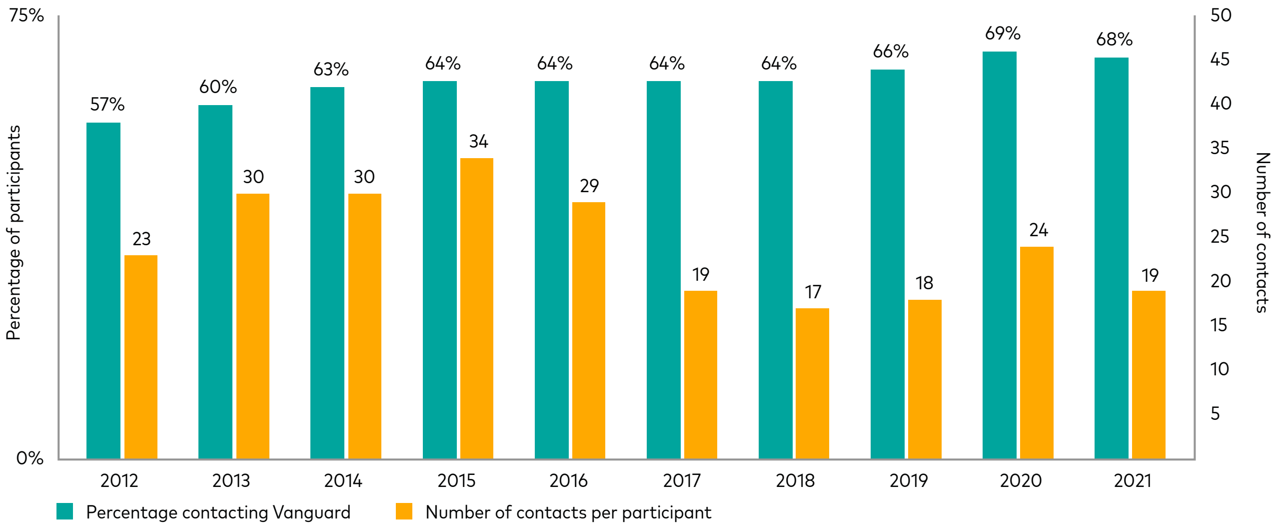
Source: Vanguard 2022.

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. Another one-third of 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-third of all Vanguard participants—contacted Vanguard 58% more often compared with the entire participant population.

Figure 122. Participant contact trend

Vanguard defined contribution plans



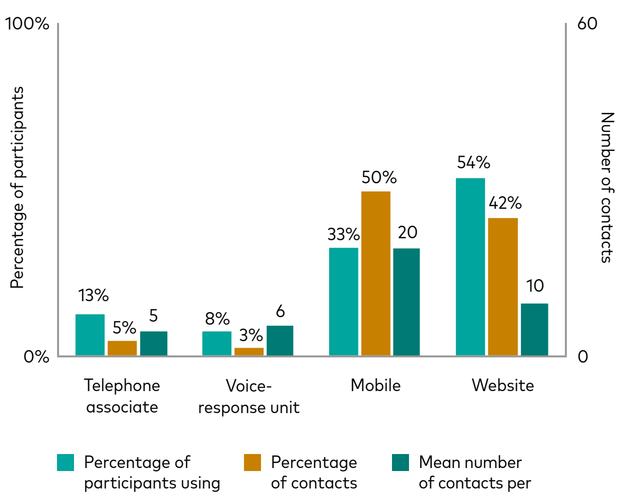
Source: Vanguard 2022.

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 2021—54% used the website, compared with 13% who used telephone associates **(Figure 123)**. Mobile applications were used by 33% 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%.

Figure 123. Account access methods, 2021

Vanguard defined contribution plans



Source: Vanguard 2022.

In addition, while participants using the website as a contact method averaged about 10 website interactions per year, participants using mobile applications averaged twice as many contacts per year. Each distinct logon is counted as a unique contact event.

The portion of participants selecting the website as an access channel has grown 19% since 2012 **(Figure 124)**. 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.

Figure 124. Account access trend

Vanguard defined contribution plans

Percentage of participants contacting Vanguard via ...

	2012	2021	Change
Website, mobile, telephone associate, or voice response	57%	68%	19%
Website	49	54	10
Mobile	*	33	*
Telephone associate	17	13	-24
Voice-response unit	11	8	-27
Participants registered for website access	68	79	16

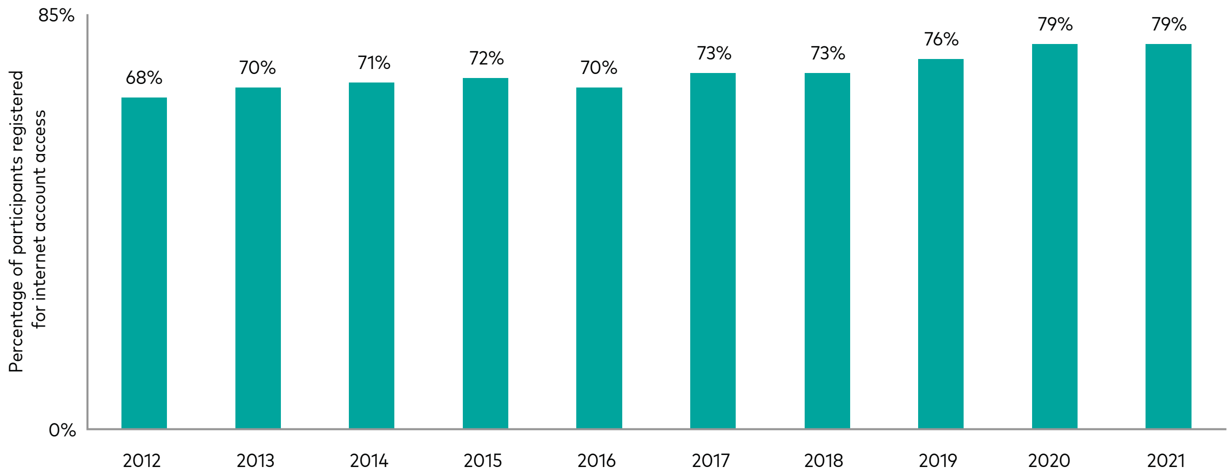
Source: Vanguard 2022.

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 2021, 16% more than in 2012 **(Figure 125)**.

Increasingly, participants are choosing the website as the preferred access channel for transactions, as 60% of all transactions were processed via the website during 2021, and another 32% were processed via mobile devices **(Figure 126)**. Over the past three years, transactions processed via mobile devices have doubled from 16% in 2018 to 32% in 2021.

Figure 125. Website access trend

Vanguard defined contribution plans

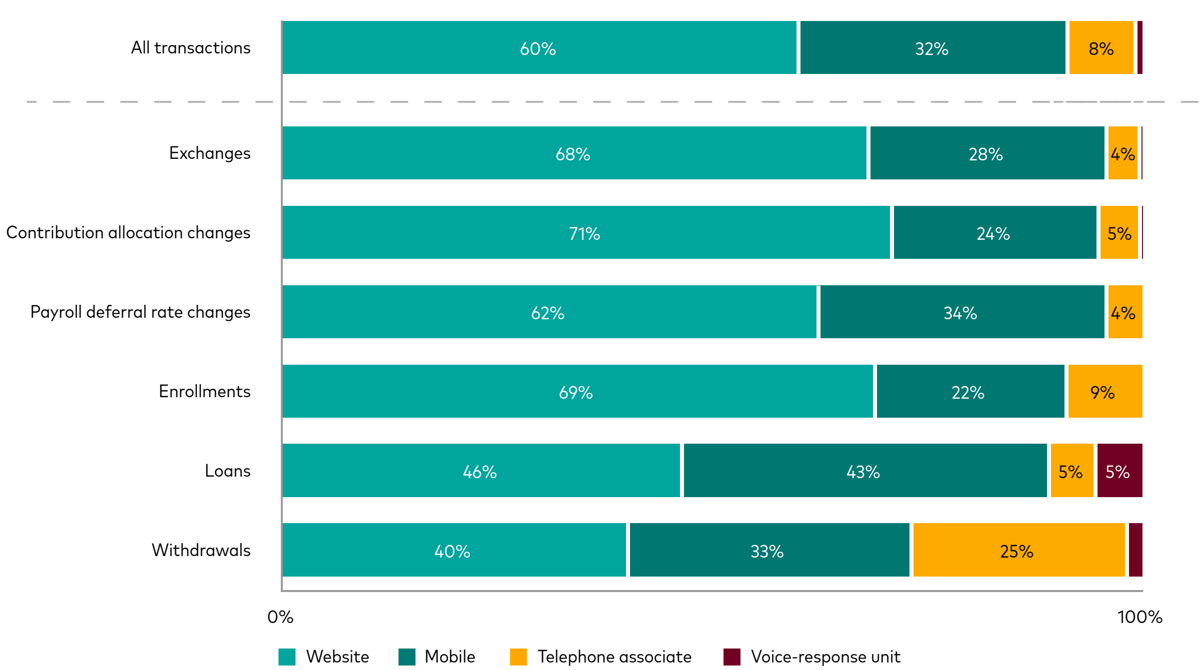


Source: Vanguard 2022.

Figure 126. Participant channel utilization, 2021

Vanguard defined contribution plans

Percentage of transactions processed by channel



Source: Vanguard 2022.

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 nearly 5 million participant accounts 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, 2021.

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 2021 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 typically improve. Plan design features derived from this data will also most likely improve.

Based on the trends experienced over previous years, we have estimated participation and deferral rates for 2021. 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 2020 restated analysis includes approximately 900 plans and 2.2 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 2022: Small Business Edition

We also make available *How America Saves 2022: 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 $20 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 17,200 plan sponsors with more than 810,000 participants as of year-end 2021.

Industry benchmark data supplemental to *How America Saves 2022*

Industry benchmarking based on the data behind *How America Saves 2022* is available for the following industries on the institutional.vanguard.com website:

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

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