



Women versus men in DC plans

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- Women and men appear to have similar participation rates in their workplace savings plan. However, in voluntary enrollment plans at nearly all income levels, women have participation rates that are 5 to 14 percentage points higher than men.
- Women and men take similar levels of portfolio risk, in part because of the growing use of target-date funds. Men at the margin are more likely to hold aggressive equity allocations and are more likely to trade.
- In the aggregate, men's account balances are more than 50% larger than women's. But this difference reflects men's average wages, not superior retirement savings behavior. Controlling for income, women save more in defined contribution plans and have higher balances.
- The rising adoption of automatic enrollment is mitigating the differences in participation and saving rates between men and women. At first glance it appears that men are benefiting more from automatic enrollment than women. However, lower-wage individuals see the largest improvements from automatic enrollment, and a higher proportion of women than men have lower wages.

Introduction

A topical question today is whether men and women save and invest differently in retirement saving plans. Are women and men really different when it comes to retirement plan savings? What drives the sizable difference in 401(k) wealth accumulation between men and women? This paper will explore these questions.

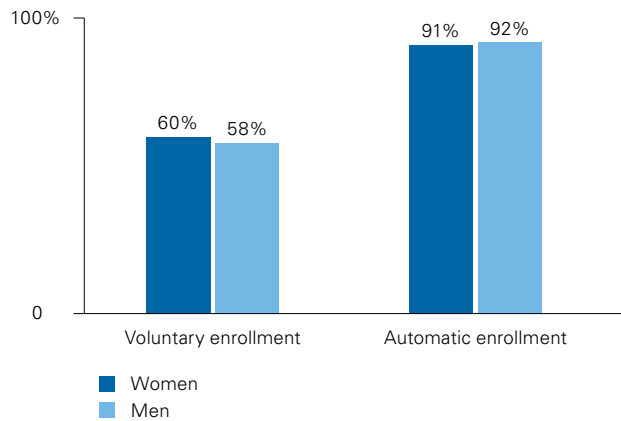
The data for this analysis are drawn from Vanguard's recordkeeping systems.¹ Sixty percent of participants in Vanguard-recordkept plans are men. Men and women have similar job tenure, both at the average (9 years for women, 10 years for men) and median (5 years for women, 6 years for men). Both, on average, are 43 years old.

Participation rates

Women and men have similar plan participation rates (**Figure 1**). In plans with voluntary enrollment designs, women are slightly more likely to join the plan than men. In plans with automatic enrollment, both women and men have higher participation rates than women and men in voluntary enrollment plans, but women and men participate at about the same rate.

Figure 1. Participation, 2016

Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard, 2018.

¹ The data are drawn from a subset of Vanguard recordkeeping clients for whom we perform nondiscrimination testing. The subset includes approximately 1,000 plans and 2.5 million participants and eligible nonparticipants. We are not able to identify the gender for 200,000 individuals, leaving us with 2.3 million participants and eligible nonparticipants.

A different picture emerges when income is considered. Women who earn less than \$100,000 have participation rates that are between 11 and 17 percentage points higher than men (Figure 2). Even at incomes of \$100,000 or more, women are more likely to be participants.

The rising adoption of automatic enrollment is mitigating these differences in participation and saving rates between men and women. At first glance it appears that

men are benefiting more from automatic enrollment than women. However, lower-wage individuals see the largest improvements from automatic enrollment, and a higher proportion of women have lower wages. Fifty-five percent of the female population has wages of less than \$50,000, compared with 35% of the male population—55% more women fall into the lower-income groups than men.

Figure 2. Participation by income, 2016

Vanguard defined contribution plans permitting employee–elective deferrals

Voluntary enrollment	Distribution of population		Participation rate		
	Women	Men	Women	Men	Women vs. men
Median age	43	43			
Median tenure (years)	5	6			
<\$15,000	16%	9%	32%	18%	+78%
\$15,000–\$29,999	22	12	42	30	+40
\$30,000–\$49,999	23	18	57	45	+27
\$50,000–\$74,999	16	23	76	59	+29
\$75,000–\$99,999	9	14	84	73	+15
\$100,000–\$149,999	8	13	88	83	+6
\$150,000+	6	11	90	90	0
All	100%	100%	60%	58%	+3%
Automatic enrollment					
Median age	42	42			
Median tenure (years)	4	5			
<\$15,000	6%	4%	74%	75%	–1%
\$15,000–\$29,999	13	8	83	84	–1
\$30,000–\$49,999	27	19	90	89	+1
\$50,000–\$74,999	23	24	94	93	+1
\$75,000–\$99,999	13	16	96	95	+1
\$100,000–\$149,999	11	16	97	96	+1
\$150,000+	7	13	98	97	+1
All	100%	100%	91%	92%	–1%

Source: Vanguard, 2018.

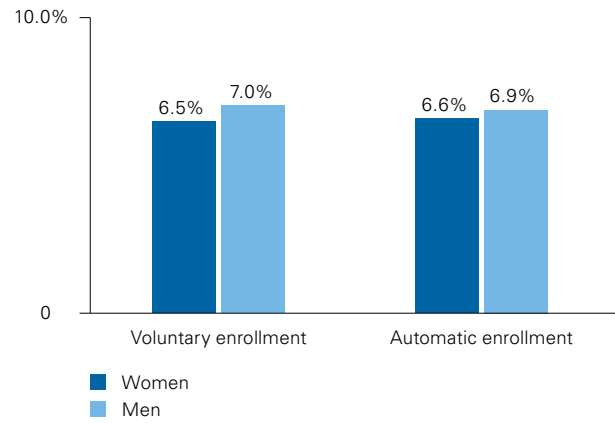
Deferral rates

Overall, men have higher employee-elective deferral rates (Figure 3). However, women in both automatic and voluntary enrollment plans with wages above \$50,000 have deferral rates between 3 and 6 percent

higher than their male counterparts (Figure 4). The data for this statistic focus on plan participants only, and so exclude those who are not saving (i.e., exclude “zero percent” employee elective deferral rates).

Figure 3. Participant employee-elective deferral rates, 2016

Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard, 2018.

Figure 4. Participant employee-elective deferral rates by income, 2016

Vanguard defined contribution plans permitting employee–elective deferrals

Voluntary enrollment	Women	Men	Women vs. men
<\$15,000	4.3%	6.5%	-51%
\$15,000–\$29,999	4.6	5.4	-17
\$30,000–\$49,999	5.6	5.6	+0
\$50,000–\$74,999	6.8	6.6	+3
\$75,000–\$99,999	8.2	7.7	+6
\$100,000–\$149,999	8.9	8.4	+6
\$150,000+	7.6	7.3	+4
All	6.5%	7.0%	-8%
Automatic enrollment			
<\$15,000	3.9%	4.4%	-13%
\$15,000–\$29,999	4.4	4.5	-2
\$30,000–\$49,999	5.5	5.4	+2
\$50,000–\$74,999	6.9	6.7	+3
\$75,000–\$99,999	8.2	7.8	+5
\$100,000–\$149,999	9.2	8.8	+5
\$150,000+	7.8	7.6	+3
All	6.6%	6.9%	-5%

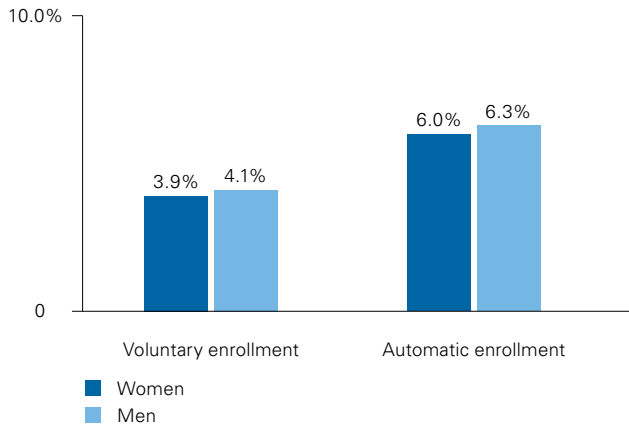
Source: Vanguard, 2018.

When we calculate an average deferral rate for all eligible employees, including those who are participating in the plan and those who are not (i.e., including the “zeros”), men still have higher employee-elective deferral rates than women (Figure 5). However, a different picture

emerges when we examine deferral rates by wages (Figure 6). Now at nearly all wage levels women as a group have employee-elective deferral rates ranging from 3 to 33 percent higher.

Figure 5. Eligible employee-elective deferral rates, 2016

Vanguard defined contribution plans permitting employee-elective deferrals



Source: Vanguard, 2018.

Figure 6. Eligible employee-elective deferral rates by income, 2016

Vanguard defined contribution plans permitting employee–elective deferrals

Voluntary enrollment	Women	Men	Women vs. men
<\$15,000	1.4%	1.2%	+17%
\$15,000–\$29,999	1.9	1.6	+19
\$30,000–\$49,999	3.2	2.5	+28
\$50,000–\$74,999	5.2	3.9	+33
\$75,000–\$99,999	6.9	5.6	+23
\$100,000–\$149,999	7.8	7.0	+11
\$150,000+	6.8	6.6	+3
All	3.9%	4.1%	-5%
Automatic enrollment			
<\$15,000	2.9%	3.3%	-14%
\$15,000–\$29,999	3.7	3.7	+0
\$30,000–\$49,999	5.0	4.8	+4
\$50,000–\$74,999	6.5	6.2	+5
\$75,000–\$99,999	7.9	7.5	+5
\$100,000–\$149,999	8.9	8.4	+6
\$150,000+	7.6	7.4	+3
All	6.0%	6.3%	-5%

Source: Vanguard, 2018.

Our research shows that plan design defaults have a strong impact on participant behavior.² However, higher-income participants are more likely to override the default. The men in our population have wages that are about 40% higher than those of the women (Figure 7), which accounts for the overall higher contribution rates by men in both voluntary and automatic enrollment plans.

wages, age, tenure, plan design, employer characteristics, and gender. Each of these factors was significant. Deferral rates rise with wages, age, and tenure. Participants in plans with automatic enrollment have lower deferral rates because of the default, which is generally 3%. When controlling for all of these factors, women have predicted deferral rates that are 2% higher than those of men.

Many factors affect deferral rates. We modeled the relationship between deferral rates and several factors using linear regression models.³ These factors included

Figure 7. Income, 2016

Vanguard defined contribution plans

	Women	Men	Women vs. men
Average	\$62,263	\$86,935	40%
Median	\$45,597	\$64,735	42
Voluntary enrollment			
Average	\$57,025	\$83,284	+46%
Median	\$38,799	\$61,548	+59
Automatic enrollment			
Average	\$69,684	\$91,474	+31%
Median	\$53,412	\$69,010	+29

Source: Vanguard, 2018.

² See Clark, Jeffrey W., and Jean A. Young, 2018. *Automatic Enrollment: The Power of the Default*, Vanguard research; available at institutional.vanguard.com.

³ Complete regression results, including coefficients, standard errors, and predicted marginal effects, are available from the authors.

Investments

Despite a commonly held view that women are more risk-averse than men, equity allocations for women and men are similar in their DC plan accounts (**Figure 8**). Average equity allocations are 75% for women and 76% for men. Men are somewhat more likely to hold employer stock than women. Women are more likely to have any target-date fund exposure.

Target-date funds are the main type of professionally managed allocations used in DC plans. Participants with professionally managed allocations have their entire

account balance invested in a single target-date fund, a single target-risk or traditional balanced fund, or a managed account advisory service.

Our research shows that the changing composition of DC plans stems from the behavioral effects arising from target-date fund use. There is a strong default effect, as the funds are being chosen as an automatic enrollment default. Moreover, target-date funds introduce a simplified portfolio choice heuristic (rule of thumb) in plans offering automatic enrollment—namely, choice of portfolio based on retirement age.⁴

Figure 8. Average asset class exposure, 2016

Vanguard defined contribution plans

	Women	Men
Equity	75%	76%
Index assets	72	68
Target-date funds	64	57
Company stock assets	3	4
Voluntary enrollment		
Equity	73%	73%
Index assets	62	56
Target-date funds	57	46
Company stock assets	4	6
Automatic enrollment		
Equity	77%	78%
Index assets	81	78
Target-date funds	71	66
Company stock assets	2	3

Source: Vanguard, 2018.

Investments in Target Retirement 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 work force. 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 Retirement Fund is not guaranteed at any time, including on or after the target date.

Half of women in voluntary enrollment plans and two-thirds in automatic enrollment plans have adopted professionally managed allocations (Figure 9). In other words, women were more likely than men to have turned the portfolio construction task over to an investment professional vetted by the plan sponsor

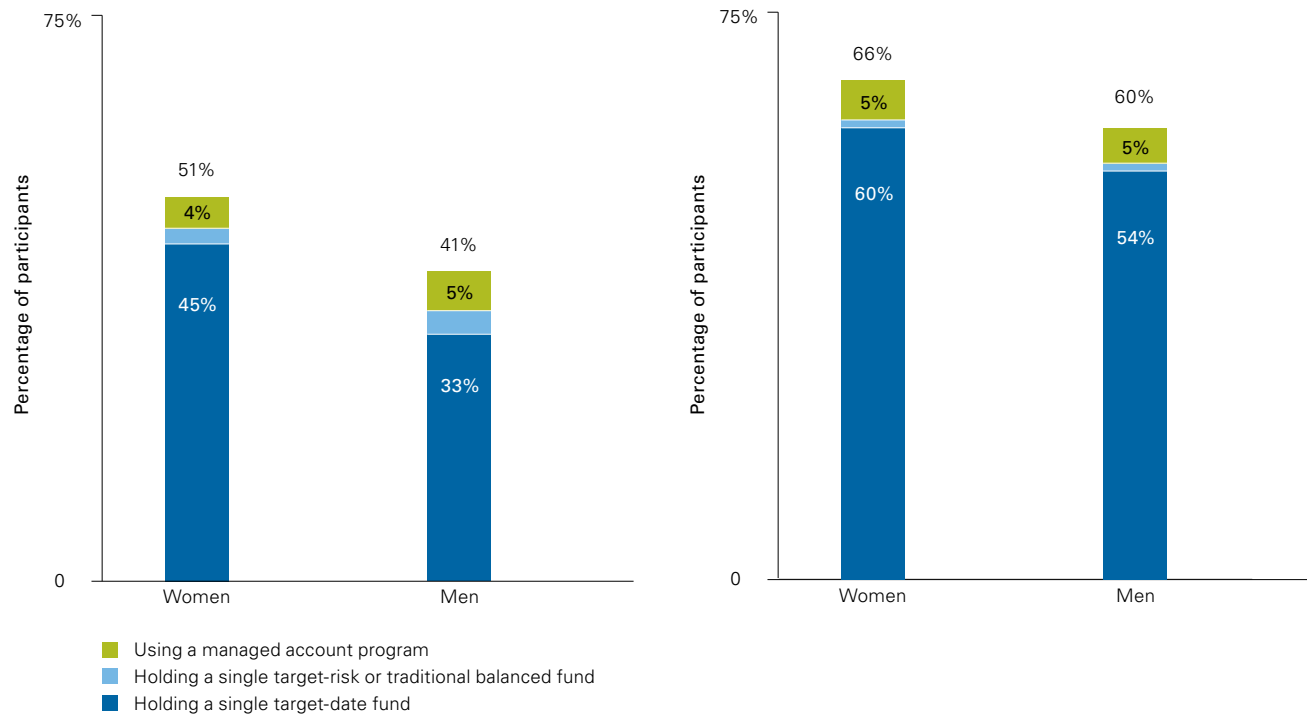
fiduciary. Importantly, our research shows that participants using professionally managed allocations have better portfolio outcomes than those who construct portfolios from the menu of plan options.⁵

Figure 9. Participants with professionally managed allocations, 2016

Vanguard defined contribution plans

Panel A. Voluntary enrollment

Panel B. Automatic enrollment



Note: Based on 3.6 million participants in 1,900 plans.

Source: Vanguard, 2018.

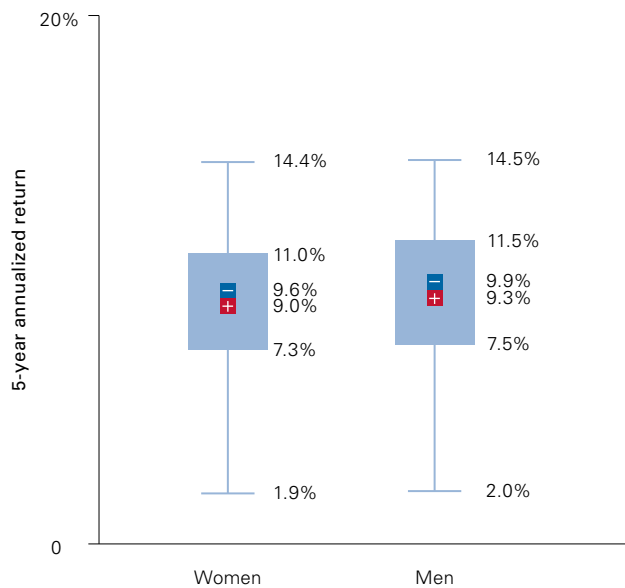
Reflecting the similar equity holdings of women and men, annualized five-year investment returns were similar as well, with men holding a slight edge (Figure 10). Returns for men at the 75th percentile in plans with voluntary enrollment were 11.5%, compared with 11.0% for women. On average, men in voluntary enrollment plans had total returns of 9.3%, compared with 9.0% for women. Returns for both men and women were very

similar in plans with automatic enrollment—reflecting the power of plan defaults. At the margin, men are more likely to hold higher equity exposure—especially active equity funds. During this particular period, that strategy worked well.

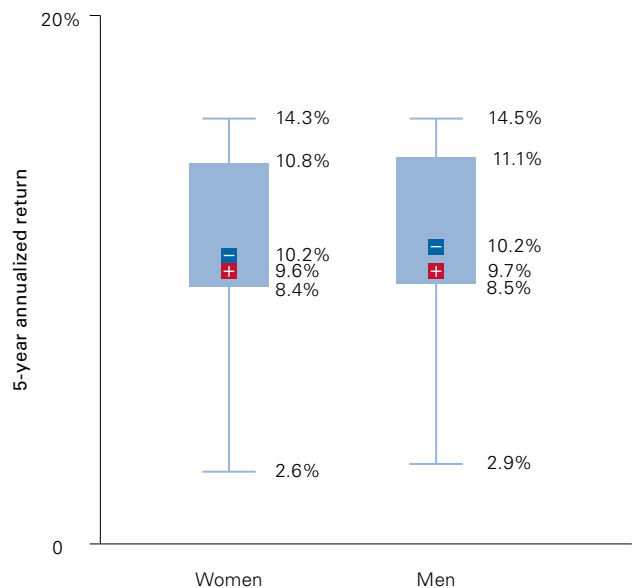
Figure 10. Distribution of 5-year total returns, 2016

Vanguard defined contribution plans

Panel A. Voluntary enrollment



Panel B. Automatic enrollment



Note: Based on 104,000 observations for female investors and 204,000 for male investors in voluntary enrollment plans, and 117,000 observations for female investors and 229,000 for male investors in automatic enrollment plans.

Source: Vanguard, 2018.

Percentiles key:

- 95th
- 75th
- 50th (median)
- + Average
- 25th
- 5th

How to read a box and whisker chart:

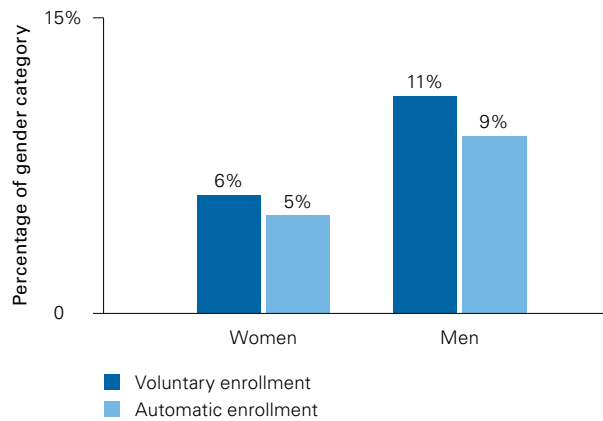
This box and whisker chart shows the range of outcomes. Plot values represent the 95th, 75th, 50th, 25th, and 5th percentile values. The average value is represented by a white + and the median value by a white line. An example of how to interpret the data in Figure 10 is: For the 5-year period, 5% of women in voluntary enrollment plans had total return rates (TRR) greater than 14.4%; 25% had TRRs greater than 11.0%; half had TRRs greater than 9.6%; 75% had TRRs greater than 7.3%; 95% had TRRs greater than 1.9%; and 5% had TRRs less than 1.9%. The average 5-year TRR was 9.0%.

Daily trading, or exchange activity, is nearly universal for Vanguard DC plans, with virtually all plan sponsors allowing it. Few participants traded in 2016, and women traded about 45% less frequently than men (**Figure 11**).⁶

Participants holding only target-date funds trade very infrequently, and women are more likely than men to hold a single target-date fund.

Figure 11. Participant-directed trading, 2016

Vanguard defined contribution plans



Source: Vanguard, 2018.

⁶ Our finding is consistent with the seminal work in this area: Barber, Brad, and Terrance Odean, 2001. Boys Will Be Boys: Gender, Overconfidence, and Common Stock Investment, *Quarterly Journal of Economics* 116 (2001): 261–292.

Account balances

Although women are more likely to save in DC plans, men have larger account balances (Figure 12). The average account balance of our male participants was \$118,131, while the average account balance for our

female participants was \$78,437. The median account balance of our male participants was \$33,573, while the median account balance for our female participants was \$19,823. Male participants have average and median account balances that are about 50 to 70 percent higher than those of female participants.

Figure 12. Account balances, 2016

Vanguard defined contribution plans

	Women	Men	Women vs. men
Average	\$78,437	\$118,131	51%
Median	\$19,823	\$33,573	69
Voluntary enrollment			
Average	\$83,038	\$129,505	+56%
Median	\$19,620	\$35,407	+80
Automatic enrollment			
Average	\$73,919	\$108,205	+46%
Median	\$20,014	\$32,100	+60

Source: Vanguard, 2018.

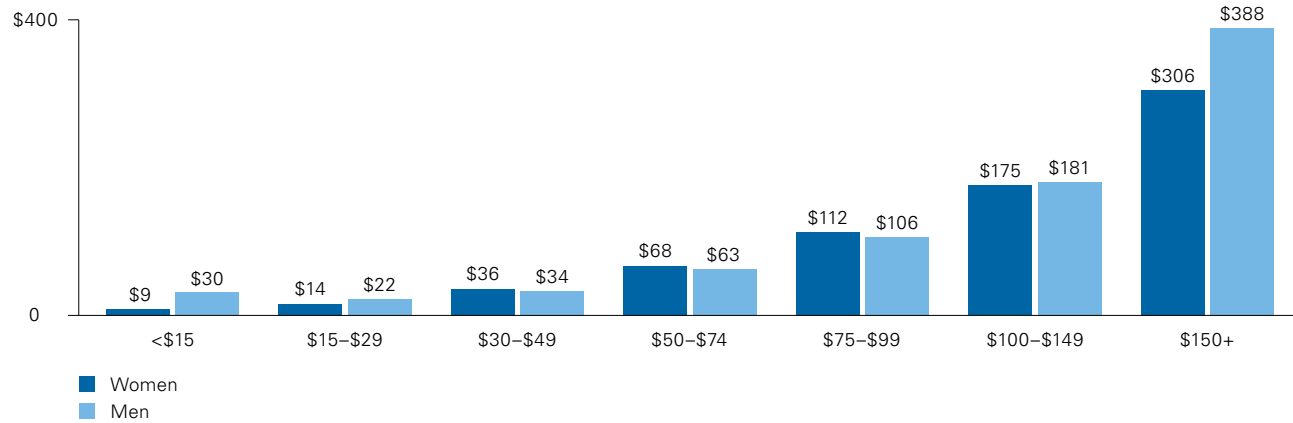
Why is this? The difference is not due to savings behavior but the higher wages of men. As noted previously, in these plans, men have wages that are about 40% higher than women. A more nuanced picture emerges when comparing account balances for women and men by income bands (Figure 13). Controlling for

income differences, we find that the account balances of men and women tend to converge. However, at the highest income band, men still have higher account balances. This is because of higher wages as well as somewhat longer tenure among men at these wage levels.

Figure 13. Account balances by income, 2016

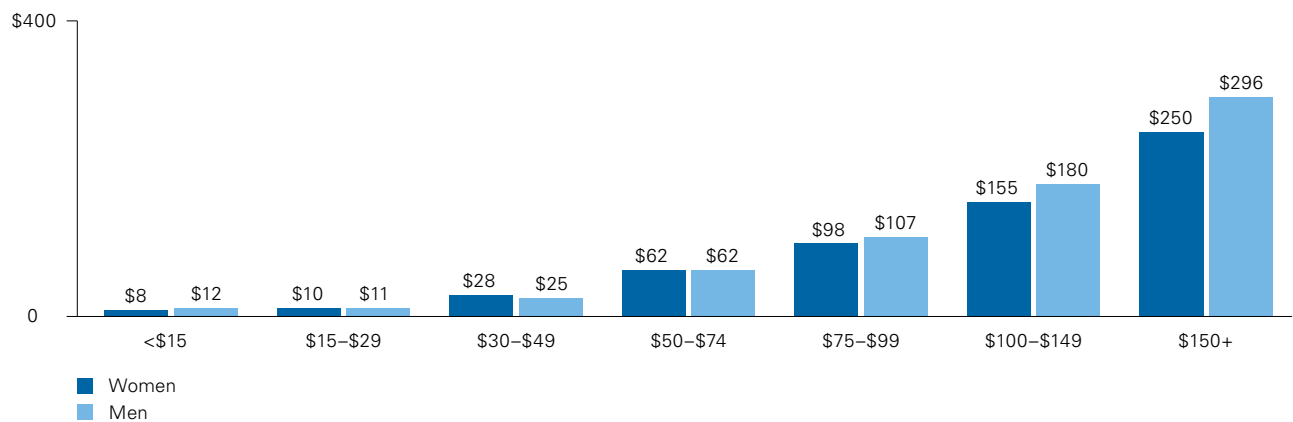
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Panel A: Vountary enrollment average participant account balances (in thousands)



Source: Vanguard, 2018.

Panel B: Automatic enrollment average participant account balances (in thousands)



Source: Vanguard, 2018.

Figure 13. (Continued). Account balances by income, 2016

Vanguard defined contribution plans

Panel C: Vountary enrollment median participant account balances (in thousands)

	Distribution of population		Median account balance		Median tenure	
	Women	Men	Women	Men	Women	Men
<\$15,000	2%	1%	\$1	\$2	2	2
\$15,000–\$29,999	3	2	\$3	\$3	3	2
\$30,000–\$49,999	4	5	\$13	\$10	9	5
\$50,000–\$74,999	4	8	\$28	\$23	9	9
\$75,000–\$99,999	2	5	\$54	\$47	9	10
\$100,000–\$149,999	2	5	\$94	\$93	9	10
\$150,000+	1	4	\$180	\$229	9	10
All	18%	30%				

Source: Vanguard, 2018.

Panel D: Automatic enrollment median participant account balances (in thousands)

	Distribution of population		Median account balance		Median tenure	
	Women	Men	Women	Men	Women	Men
<\$15,000	1%	1%	\$0.5	\$0.6	2	2
\$15,000–\$29,999	2	2	\$2	\$2	2	2
\$30,000–\$49,999	5	6	\$9	\$7	4	3
\$50,000–\$74,999	5	8	\$26	\$25	6	6
\$75,000–\$99,999	3	6	\$48	\$53	6	7
\$100,000–\$149,999	2	6	\$84	\$97	6	8
\$150,000+	1	4	\$154	\$181	6	7
All	19%	33%				

Source: Vanguard, 2018.

Implications

Our data suggest that women and men may be different when it comes to retirement plan savings behavior. Women are more likely to participate in these plans, and when they participate, they save more as well. Women are also more likely to use professionally managed allocations than men, although, on average, men and women take very similar risk levels and hold similar types of portfolios. However, men have higher wealth accumulation overall than women because of their higher wages.

The rising adoption of automatic enrollment is mitigating the differences in participation and saving rates between men and women. At first glance it might appear that men are benefiting more from automatic enrollment than women. However, lower-wage individuals see the

largest improvements in retirement savings from automatic enrollment, and a higher proportion of women than men have lower wages.

It is important to acknowledge that within both genders, some participants are doing better than others. Rather than focus on differences between men and women, it is probably more important to focus on behavioral differences regardless of gender. Those who save at low rates need to boost plan contributions, ideally through stronger automatic enrollment plan design or through behavioral nudges to higher savings. Similarly, those with poorly diversified portfolios need to be encouraged to move to a professionally managed portfolio, again whether by default or by choice.

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