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Research Report

The Effect of a Universal Automatic IRA With Emergency Savings on Household Wealth

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AARP's Public Policy Institute informs and stimulates public debate on the issues we face as we age. Through research, analysis, and dialogue with the nation's leading experts, PPI promotes development of sound, creative policies to address our common need for economic security, health care, and quality of life.
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I. Introduction

Household wealth varies widely across income levels and, importantly, by race and ethnicity; the ability to save for retirement is a significant part of building household assets.[1] The wealth gap by race and ethnicity not only is a consistent feature of American life, but it may also have even grown in recent years (Gale et al. 2022). As of 2019, the median wealth of a white household was $188,200, well above the $24,100 level for Black households and $36,100 for Hispanic households (Bhutta et al. 2020). The main cause of this disparity in household wealth—defined as the total value of all assets owned by a household (i.e., family, individual) minus the sum of all household debts—is differences in income levels, although differences in savings rates and other factors also play a role (Aliprantis and Carroll 2019). As a result, some experts believe that equalizing earnings would be the most effective way to permanently close the racial wealth gap (Aliprantis et al. 2022).

A similar gap is also seen in retirement savings balances—for households that have them. The median amount for white households is $80,000, while those for Black and Hispanic households are $35,000 and $31,000, respectively (Federal Reserve 2020).[2] Similarly, although 81 percent of white households report having some level of retirement savings, only 64 percent of Black and 61 percent of Hispanic households have any at all.

Part of the difference in both the presence of any retirement savings and the amount is due to whether individuals have access to a payroll deduction retirement savings program. Black and Hispanic people are less likely to work for an employer that offers retirement benefits. Another factor is the difference in income levels. Even under the best of circumstances, a 5 percent contribution from a $40,000 annual salary is substantially less than 5 percent of a $100,000 salary.

This disparity is also seen in which households have emergency savings. Such reserves are highly relevant to the assets and retirement-savings discussion in that they can help to stabilize household finances over time, thus making it easier for families to build assets. They can also reduce the need to prematurely take money out of a retirement account. A recent study found that 41 percent of Black households and 29 percent of Hispanic households, as compared with only 19 percent of white households, reported having no emergency savings (CFPB 2022).

The ability to use payroll deduction to save for the future, and to use some of those reserves to meet inevitable financial emergencies, is key to increasing household wealth. In this paper, we model the effects of a universal retirement savings account that is available to all workers whose employers do not offer another retirement plan. We use an Automatic Individual Retirement Account (Auto IRA), a simple retirement savings program that is currently in use in several states, along with a feature for emergency savings. Our modeling shows the effects to be substantial, with household wealth increasing significantly for all participants—and even higher growth for Black and Hispanic households. Unsurprisingly, however, the program does not eliminate the racial wealth gap. Again, this is largely because white households typically have higher earnings than do Black and Hispanic households. As a result, accounts of white households grow faster and reach higher levels.

Following this introduction, section 2 discusses the structure of the proposed reform and policy implications behind it. Section 3 considers the economic model we used, while section 4 looks at the results for both individual households and the overall economy. Section 5 concludes and is followed by a series of appendices that give detailed results as well as more information about the model, statistics used in it, and the methodology employed to convert household results into an aggregate projection of the increased assets for the entire economy.

As section 3 details, to make our results realistic, in all cases we have sought to be conservative in our modeling and its

1 The Federal Reserve's Survey of Consumer Finance (SCF) defines households as "an economically dominant single individual or couple (married or living as partners) in a household and all other individuals in the household who are financially interdependent with that individual or couple." The "economically dominant" individual or couple is the "householder."

2 This similarity is not surprising given that retirement savings balances are also a part of household wealth.

estimates. In addition to an optimal case based on actual statistics for participation, contributions, investment returns, and other variables, we have three pessimistic scenarios to show results if circumstances prove less advantageous. We also assume that having and using emergency savings stabilize household finances rather than improving them.

II. Improving household wealth and retirement security

A. Increasing retirement savings program coverage

There is no general requirement for private sector companies in the United States to offer a retirement plan. However, access to a payroll deduction retirement savings program is an essential part of building retirement security. About 58 percent of those who have such a benefit have saved more than $100,000 for their future, while only 14 percent have less than $10,000 saved. Conversely, only 9 percent of those without a payroll deduction program have saved over $100,000, while 75 percent have saved less than $10,000 (EBRI 2022).

Unfortunately, people of color and lower income workers are less likely than white employees to have access to a payroll deduction retirement savings account. Only 47 percent of Black employees and 36 percent of Hispanic employees work for a firm that offers a retirement plan or a similar benefit; 58 percent of white workers are offered such a plan (Sabelhaus 2022). Also, a substantial coverage gap by income, exists. Although 80 percent of workers earning over $78,000 are able to save at work, only 21 percent of those earning $18,000 or less annually and 36 percent of those earning between $18,000 and $31,000 have access to a workplace-based retirement savings program. Overall, 57 million Americans cannot save for a more secure future through a payroll deduction retirement savings program.

One reason for this coverage gap is that many of these uncovered employees work for smaller businesses, which are much less likely than larger firms to offer a retirement benefit. Nearly three-quarters (71 percent) of businesses with between 5 and 250 employees that do not have a retirement plan noted those plans are too expensive, and almost two-thirds (63 percent) said their organization did not have the resources to manage such a plan (Pew 2017). As a result, 78 percent of employees working for a firm with fewer than 10 workers do not have a retirement benefit, nor do 65 percent of those employed by companies with 11 to 25 workers (Sabelhaus 2022).

A breakthrough in expanding coverage to all employees is unlikely as long as employers can decline to offer a retirement benefit. But there is a savings structure, the Auto IRA, that both provides people with the ability to save through payroll deduction and meets the legitimate concerns of small employers. As of July 2023, seven states required employers that meet size requirements to either offer their employees a 401(k)-style retirement plan or use the state-facilitated Auto IRA; eight additional states are in the process of implementing a similar requirement.[3]

An Auto IRA combines a payroll deduction IRA with automatic enrollment. Automatic enrollment is a mechanism that simplifies participation and guides workers to saving an appropriate initial amount in a suitable investment choice. Employees have complete control over their savings decisions, but unless they choose not to participate or change suggested amounts, they are enrolled in the program and set aside a recommended amount in a particular investment choice. Unlike 401(k) s, Auto IRAs are not considered retirement plans and accordingly are not subject to ERISA or plan qualification rules.[4]

The seven operating state programs impose no fees on business owners. In fact, contrary to

3 In addition, four states have or are developing programs using different models. Massachusetts serves only certain types of nonprofit employers, Washington uses a voluntary marketplace, New Mexico is implementing a voluntary payroll IRA program, and Missouri plans to use a Multiple Employer Plan (MEP).

4 401(k) and similar retirement plans are considered employee benefits that are regulated by the Employee Retirement Income Security Act (ERISA). They are sponsored by the employer and require them to make and be responsible for plan decisions such as choice of provider and how the plan is structured. In an Auto IRA, those decisions are made by the state in which the program is located, and the employer's obligation is limited to enrolling workers and forwarding their contributions to the program.

the concerns of many small businesses, almost 80 percent of businesses that participate in OregonSaves, the first Auto IRA program, reported that they had no out-of-pocket expenses associated with participating (Scott and Shelton 2021). An employer's sole responsibility is to provide a list of its employees to a state-contracted recordkeeper and then implement payroll deductions for the employees who choose to participate. Employer contributions are not allowed in Auto IRAs, whether matching or otherwise. There is early evidence that Auto IRAs are also encouraging the creation of greater numbers of ERISA plans as certain employers choose to start a 401(k) or similar plan instead of joining the state's Auto IRA (Olson 2022).

We chose the Auto IRA for this exercise because as a simple and very low-cost savings program for both employers and employees, it meets the concerns of employers that do not currently offer a 401(k)-style retirement plan. In addition, we can use actual data from the three longest operating state programs as inputs for our model, and those programs already serve a population that does not have access to a retirement savings plan. Participation rates for state-facilitated Automatic IRAs, which primarily serve lower-income workers, are roughly 66 percent (Massena Associates 2023). Racial data generally have not been available for the state programs, but the largest, CalSavers, estimates that two-thirds of those who could potentially use it to save for the future are people of color (Werschkul 2020).

B. Emergency savings accounts help to stabilize family finances

An emergency savings account that is separate from general savings–and used when needed– is another tool that can help families to build and maintain financial health, especially when it accompanies retirement savings. Financial emergencies strike at all income, age, and education levels and can have lasting consequences, especially for Black, Hispanic, and low-income households, which generally have lower levels of savings or similar assets available to meet an unexpected expense. About 55 percent of all households and 53 percent of white households found it difficult to meet their usual household expenses after a financial emergency (Pew 2015). However, an unexpected expense caused 62 percent of Black and Hispanic households, and between two-thirds and three-quarters of lower-income households, to have difficulty meeting their usual expenses.

Financial emergencies happen often. Sixty percent of all households report having at least one financial shock in a 12-month period, and almost a third (32 percent) experienced two or more (Pew 2015). The median level of the most expensive shock was about $2,000; however, almost a quarter of households reported they needed to deal with one costing $6,000 or more.

The challenge of dealing with financial emergencies is closely tied to retirement savings. Lacking other resources to meet a financial emergency can force households to dip into their retirement funds. But having emergency savings can reduce that necessity. About 59 percent of workers with no emergency savings reported taking money from a retirement account in the past 12 months, as compared with 27 percent of those who had emergency savings of less than a month's income and 9 percent of those who had emergency savings equal to or exceeding a month's income (CFPB 2022).

This reality also has significant implications for issues of disparity, as a similar pattern between those who lack retirement savings and those who do not have emergency savings. A CFPB study (2022) found that 41 percent of Black households and 29 percent of Hispanic households reported having no emergency savings, while only 19 percent of white households reported having none. In all cases, lower-income households were far more likely than those with higher incomes to report having no such savings.

Evidence confirms that having and using emergency savings can help to stabilize household finances and, in some cases, help those households realize a better future. Having liquid savings of approximately one month's earnings at any point in a four-year study period resulted in households with low to moderate incomes being significantly less likely to experience extreme financial hardship up to three years later (Sabat and Gallagher 2020). In addition, those high-hardship households with low and moderate

incomes that achieved the savings goal at any point during the study period had nearly twice the likelihood of improving their financial well-being, moving from high-hardship to low-hardship status, compared with households that did not achieve the savings goal.

No single emergency savings account structure meets the needs of all consumers; rather, several different account forms exist, and each has its own advantages and disadvantages (Beshears et al. 2019). Although a great deal is known about consumer preferences for how an emergency savings account is structured and how employers can meet a specific group's needs, that subject is beyond the scope of this study. Our model assumes participants withdraw a certain amount, based on Pew's 2015 research, from Auto IRA balances each year and presumably use the funds to meet unexpected expenses. Because Auto IRAs use after-tax Roth accounts, participants are not penalized for withdrawing their own contributions. Thus, a direct withdrawal from their retirement account is the method that most current Auto IRA savers use when they face a financial emergency. That said, it would be equally valid—and would produce an equivalent result in our model—to assume that the same amount is instead placed in an emergency savings account each year either through a separate payroll deduction that reduces the amount going into retirement savings or through some other means. In that case, the emergency savings could accumulate and be used as needed. In either approach, the deduction for emergency savings would be the same, and the results of our model would not be affected.

III. Modeling the impact of a universal Auto IRA system with emergency savings

Creating an economic model to accurately estimate the impact of introducing a universal Auto IRA with emergency savings by all employers that do not currently offer retirement savings plans to their employees required several steps. First, we obtained household financial data from a national survey of a representative sample of U.S. households. Second, using the existing public data on employment and financial status, we created a predictive model of household net wealth and liquid funds that could be used for financial emergencies over a working lifetime and simulated the impact of implementing an Auto IRA that uses a Roth IRA as its basic investment mechanism.[5] Further details are in the following section.

A. Data

This study is based on data from a survey of 1,491 US adults ages 18 and older, conducted by The National Opinion Research Center (NORC) at the University of Chicago in December 2020. The probability-based panel was designed to be representative of the US household population. Further information about this survey can be found in appendix A. Survey respondents were asked to report their household's financial status across several categories.

Survey subgroups used in this analysis were:

All respondents: We used data from all 1,491 NORC survey respondents to estimate the overall impact on the entire US workforce if eligible employees enrolled in Auto IRAs with emergency savings. Individuals who did not self-identify as a white, Black, or Hispanic were included in this category but not in a racial subgroup.

White respondents: This subgroup consisted of 1,030 respondents who self-identified as white.

Black & **Hispanic respondents**: The number of respondents for each of these two groups was somewhat low, which increases the effect of sampling error on estimates within the group. To minimize this effect, these groups were combined to obtain a reasonable sample of 335 households. The individual modeling results for the two groups are also reported separately in appendix A. However, those results may have an increased level of estimation error due to the relatively low number of respondents.

5 A Roth IRA invests contributions on which income taxes have already been paid. This tax treatment allows savers to withdraw their own contributions at any time without a tax penalty. At retirement, both contributions and any investment returns can be withdrawn without incurring any tax liability.

Lower-income respondents: This group included a total of 606 respondents whose household income was $45,000 or less.

B. Model description

Using the data from the NORC survey, we created a regression model to predict households' net worth and liquid funds available for financial emergencies at different ages, using 20 balance sheet variables. An interactive program based on this model was developed that enabled "what-if" analysis of various financial assumptions.

We then calibrated the basic model's predictions using the interactive program to reflect the actual median net worth of US households based on the age of the household head, as reported in a triannual Federal Reserve Survey of Consumer Finances conducted in 2019 (Federal Reserve 2020). Based on the sample data from NORC, the final model predicted median household net worth as reported by the Federal Reserve with a very high level of accuracy (correlation coefficient of 0.98).

To develop a Benchmark Case for US working households, the one against which the effects of an Auto IRA will be measured, our economic model was used to predict household liquid funds and net worth using the NORC survey means for each financial category at each householder age. Appendix C contains a table of these survey means. The Benchmark Case represents the finances of a typical working household between the ages of 20 and 70 that does not have access to a retirement savings plan. A detailed description of the development and validation procedure for our predictive model can be found in appendix B.

We then entered into the model a universal Auto IRA with emergency savings, and we calculated for households where participation began between the ages of 20 and 64, the improvement in net worth and liquid funds over the Benchmark Case. Tables detailing the results are in appendix A.

C. Various scenarios tested

As outlined below, this study examined the effects of the universal Auto IRA system with emergency savings under a variety of scenarios. Except for Auto IRA contributions, households' financial variables are assumed to be equal to the means from the NORC survey. In addition, all dollar values reported here do not include any potential tax liability; they are inflation-adjusted and expressed in constant 2020 dollars. We derived all other financial parameters from supporting literature.

The five scenarios are:

1. **Optimistic Case**. We assumed that all enrollees would continue to be employed and contribute at the assumed rate of 5.3 percent of income until age 68, when we assume that participants have started retirement.
2. **Pessimistic Case A**. Low Contribution Rate. We halved Optimistic Case contribution rates to 2.65 percent of income for the entire employment history. This scenario illustrates the potential impact of periods of unemployment, employment in an organization that did not offer Auto IRAs or any other type of retirement account, and/or times when participants are unable to make the full recommended contributions. This is only an approximation, as the effects of not contributing would vary depending on when in a career the gap occurred and how long it lasted. For instance, failing to save later in life when there was already a growing balance in the account would have less effect than a gap at a younger age. Much of the account level at age 68 comes from the growth over time of early contributions. Unfortunately, modeling the effect of savings gaps at various ages and differing durations was too complex for us to model, so we settled on this alternative of halving contributions for the entire employment history.
3. **Pessimistic Case B**. Poor Economy. We used all Optimistic Case assumptions except for the investment yield from the Auto IRA, which was reduced by half. This is a very conservative assumption, given the history of equities and bonds during the past 50 years.
4. **Worst Case**. This is a combination of both pessimistic cases; both contribution rate and investment yield were simultaneously reduced by 50 percent of the Optimistic case.
5. **Lower Income Case**. All the scenarios are applied only to households with gross incomes of $45,000 and under.

D. Benchmark case assumptions

- Individuals who are offered a retirement plan through their employers, and therefore do not participate in this benchmark case, continue to accumulate their 401(k) balances annually based on values reported by the NORC survey. It is conservatively assumed that reducing the assumed investment returns on contributions (i.e., Pessimistic Case B) will affect only Auto IRA participants. This somewhat strengthens white household finances, as they are more likely to have 401(k)-type accounts.
- Liquid funds available for financial emergencies consist of the sum of Adjusted Available Cash, which includes balances in checking, savings, emergency savings, and money markets, as well as stocks and bonds, which are assumed to be convertible into cash immediately, unlike401(k) balances. Appendix B contains additional details.

E. Basic Auto IRA case assumptions

- Auto IRA participants start saving at their age in the NORC data and continue saving until age 68, when we assume that all will have left the workforce. As this study focuses on improvements to household wealth, we do not make any assumptions about how retirement assets are used or how they interact with Social Security.
- When Auto IRA participants enroll, their balances in other wealth categories such as stocks, bonds, annuities, and CDs are conservatively assumed to be frozen at their current levels and adjusted only by inflation rates. Because all future contributions will be made to the Auto IRA, program participants will not accumulate additional contributions in these categories in the future.
- We assume that the enrollees did not ever participate in a plan offered by their employers prior to enrolling in the Auto IRA program. This is a conservative assumption, given that the enrollees may have had previous portable plan balances from earlier employers as well.
- The liquid funds that could be used in financial emergencies are assumed to be a combination of the Available Cash described in the Benchmark Case plus the Auto IRA contributions to the underlying Roth IRA, which are assumed to be withdrawable tax-free.
- We assume that participants will be able to withdraw only their actual contributions and not interest or other earnings to avoid having to deal with potential tax consequences since some withdrawals of earnings would be taxable and others might be tax-free. Therefore, for this analysis, liquid funds in an Auto IRA include only participant contributions, and not investment returns on those contributions. As a result, both Pessimistic Case A: Low Contribution Rate and Worst Case, which considers the same contribution rate in a poor economy have identical liquid funds impacts. For that reason, both cases are presented in a single table summarizing liquid funds availability in Appendix A. This is also true for the Optimistic and Pessimistic B: Poor Economy Cases, both of which have the same higher contribution amounts and therefore identical liquid funds impacts. They are also shown in a single table in Appendix A.
- A 5.3 percent annual contribution rate to the Auto IRA is based on the actual experience with existing Auto IRA programs in several states, as reported by Georgetown Center for Retirement Initiatives (CRI 2021). In accordance with statutory Roth contribution limits during the relevant years, these contributions were capped at $6,000 per year, the limit at the time of the study.
- We based the 5.3 percent rate of return on Auto IRA investments on the actual average inflation-adjusted annual returns between 2001 and 2020.
- Using estimates from a Pew study (Pew, 2015), we assumed that Auto IRA participants withdraw $660 of liquid funds for emergency use each year without replenishing them. Alternatively, participants could redirect the same amount into a separate emergency savings account and use it as needed. We assume that having and using these reserves stabilize household finances and allow individuals to avoid making other withdrawals from their retirement savings.

IV. Model results of the impact of a universal Auto IRA system with emergency savings

A. Effects on household wealth

Our modeling showed that the effects of a universal Auto IRA with emergency savings are substantial. Employees who saved in such an account across all working ages experienced a significant improvement in net wealth as well as in liquid funds available for financial emergencies. The retirement net worth of white households improved by about $199,000 in the Optimistic Case, slightly more than that of Black and Hispanic households, which increased by over $167,000. Even households with lower incomes would have an additional $41,000 in net worth at age 68 under the optimistic assumption that they made full contributions every year in the Auto IRA, placing their expected total net worth at retirement at $223,000–close to the current Federal Reserve median net worth of $234,000 for all households. Table 1 shows the results for household wealth.

Although white households had a larger increase in wealth, the combined Black and Hispanic households saw a greater rise in percentage terms. White assets increased by 71 percent, while Black and Hispanic households saw an 89 percent improvement. This projection averages participants of all ages when they started the program. Workers who started saving in their 20s saw an even greater increase in assets by age 68, with white assets growing by 109 percent and Black and Hispanic assets by 125 percent. Assuming Black and Hispanic households meet the requirements in the Optimistic Case and continue to make full contributions every year to the Auto IRAs until age 68, they will reach retirement with an increase in median net worth of just under $167,000 over the Benchmark Case. Even under the worst assumption of partial contributions and a poor investment return rate, their predicted net worth at age 68 would be very close to the current median net worth of all US households of $234,000.

A household's improvement due to Auto IRA enrollment is determined by the difference between the Benchmark Case and the Auto IRA predictions under the various scenarios described earlier. The difference between white and Black and Hispanic households is primarily due to the higher household income for white households.[6] Consequently, white households will make greater contributions to

TABLE 1

Estimate of Participants' Median Net Worth* by Age 68 in a Universal Auto IRA System With Emergency Savings

Participating Households		Optimistic: Best Case	Pessimistic A: Low Contributions	Pessimistic B: Poor Economy	Worst Case: Low Contributions and Poor Economy
All	Net worth at age 68	$450,651	$316,442	$384,717	$290,391
	Auto IRA improvement	$183,940	$49,731	$118,006	$23,680
White	Net worth at age 68	$478,591	$336,432	$406,041	$307,073
	Auto IRA improvement	$198,820	$56,662	$126,271	$27,302
Black & Hispanic	Net worth at age 68	$357,183	$248,899	$307,592	$231,019
	Auto IRA improvement	$167,809	$59,525	$118,218	$41,645
Lower Income	Net worth at age 68	$223,011	$173,019	$206,258	$171,558
	Auto IRA improvement	$41,502	($8,491)	$24,748	($9,665)

**Definition in appendix B.*

6 The NORC data showing the difference in income levels is available in appendix B.

the Auto IRA balance, and these deposits will generate higher compound investment returns.

The values in table 1 show the improvement in constant 2020 dollars at age 68 for an employee who was enrolled in 2020. To simplify the table, we averaged the amount across all enrollment ages from 20 to 64. The amount would be greater for younger employees, as their contributions would accrue and grow over a longer period. Appendix A includes detailed tables of improvements by age at which a participant was enrolled in the program. It should be noted that the improvement is very conservative under Pessimistic Case B's assumption about poor investment returns. In this comparison, the Benchmark Case incorporates 401(k)s and other investments, and although their value would also be affected by poor economic conditions, our model assumes that their investment returns would not change. This sets an exceptionally high bar for the Auto IRA to exceed in order to show a positive benefit over the Benchmark.

The net worth data in table 1 clearly illustrate improvements for all groups after the implementation of the Auto IRA system with emergency savings, except for lower-income households in two pessimistic scenarios. Assuming that an enrollee remains in the plan for a full work career, as in the Optimistic Case, a typical household reaches retirement at age 68 with a median net worth of about $450,000, significantly higher than the current Federal Reserve estimate of $266,400 for all US households ages 65 to 74.

Even under the Worst Case scenario of a 50 percent reduction in both contribution rates and investment yields compared with the Optimistic Case, a typical household at age 68 will have a net worth of $290,000, an increase of more than $23,000 over the Benchmark. This amount is also slightly higher than the current median household net worth in the United States, showing that, at worst, the Auto IRA program does not cause a deterioration in outcomes.

It is interesting to note that in an Auto IRA system, a low contribution rate assumption, found in Pessimistic Case A and the Worst Case, results in significantly less improvement in household net worth than does the poor economic scenario in Pessimistic Case B. When the contribution rate is reduced by 50 percent, the median household net worth will be improved by only $50,000 over the Benchmark Case; however, when investment performance is reduced by 50 percent, the median household net worth will be improved by $118,000. This important pattern holds true for other demographic groups, as shown in table 1, underlining the importance of maintaining contribution rates over time.

For households with lower incomes, the low contribution assumption results in a negative net benefit of under $10,000 compared with the stringent Benchmark Case. The 2.65 percent of income contributed to the Auto IRA leaves less available for other parts of household wealth and would grow slower than if the money instead was used for increasing home equity, savings, vehicles, business assets, etc. This is especially true for those who start saving at age 55 or later. However, raising the Auto IRA contribution to just 3.1 percent of income produces enough compound earnings to eliminate the deficits and to increase household income.[7]

Table 2 shows the same pattern of improvement in available liquid funds as that in net worth at retirement. With participation in the Auto IRA plan with emergency savings, liquid funds increased for all household groups, even under pessimistic assumptions. According to estimates, the universal Auto IRA system would raise median liquid funds by approximately $65,000 in an optimistic scenario and by approximately $9,000 in a worst-case one. This increase in liquid funds comes from both Auto IRA contributions and continued household financial activity and is in addition to the annual deduction of $660 from Auto IRA balances to meet unexpected expenses. As discussed earlier, we assume that this deduction could come either directly from the Auto IRA or from redirecting that amount of contributions into a separate emergency savings amount.

7 During the period of the study, regular household finances other than Auto IRA and emergency savings contributions are assumed to continue.

TABLE 2

Estimate of Participants' Median Liquid Funds* by Age 68 in a Universal Auto IRA System With Emergency Savings

Participating Households		Optimistic: Continued Participation & Pessimistic B: Poor Economy**	Pessimistic A: Low Contribution & Worst Case: Low Contribution and Poor Economy**
All	Available liquid funds	$134,895	$79,246
	Auto IRA improvement	$64,696	$9,047
White	Available liquid funds	$138,792	$81,636
	Auto IRA improvement	$66,943	$9,786
Black & Hispanic	Available liquid funds	$96,155	$56,376
	Auto IRA improvement	$57,693	$17,913
Lower income	Available liquid funds	$36,758	$16,780
	Auto IRA improvement	$21,723	$1,745

**Definition in appendix B.*

***Due to the assumption that participants can withdraw only actual contributions and not interest, the Pessimistic B Case has no effect on liquid funds.*

Lower income households whose dollar amount contributions were smaller benefited from the Auto IRA, but only slightly under both the Pessimistic A Case and the Worst Case. Under all assumptions, white households end up with higher median amounts of liquid funds than do non-white households. Black and Hispanic households, however, had greater improvements in percentage terms than did white households. In the Optimistic Case, Black and Hispanic households saw a 150 percent increase in liquid funds, while white households saw a 97 percent improvement. Similarly, under the pessimistic assumptions, Black and Hispanic households had a 47 percent increase, while their white counterparts had only a 14 percent improvement in liquid funds.

B. Effect on overall national savings

In addition to greatly increasing the wealth and liquidity of individual households, a universal Auto IRA with emergency savings could increase the amount of overall national retirement savings. This increase in investable wealth, totaling in the trillions, could spur additional growth in the economy and create new jobs. In calculating this figure, we consider only households that are eligible to participate in the Auto IRA program described earlier, and the increase comes only from Auto IRA contributions and their growth.

Overall, households headed by employees of all ages who participate in the Auto IRA program with emergency savings would be expected to benefit from an additional $6.2 trillion in wealth at retirement under the Optimistic Case. Again, this scenario assumes full contributions of 5.3 percent of gross income between the projected start of the program in 2020 and the employees reaching age 68.

Under the Pessimistic Case A, the accumulated wealth gain will still be $1.7 trillion over 50 years when all current employees reach age 68. As mentioned previously, this assumption reflects employees who for any reason at all either do not participate for part of their careers or contributed significantly less than 5.3 percent of income. Except for employees in the 55-to-64 age group, all younger enrollees will benefit from positive wealth gains. The explanation for the negative amounts in this group can be found on page 16.

Table 3 shows these aggregate numbers by the age at which an individual starts the

program and the total for all age groups. For example, 5.8 million households with employees currently ages 55 to 64 would have an increased net worth of $253 billion at retirement in the Optimistic Scenario.

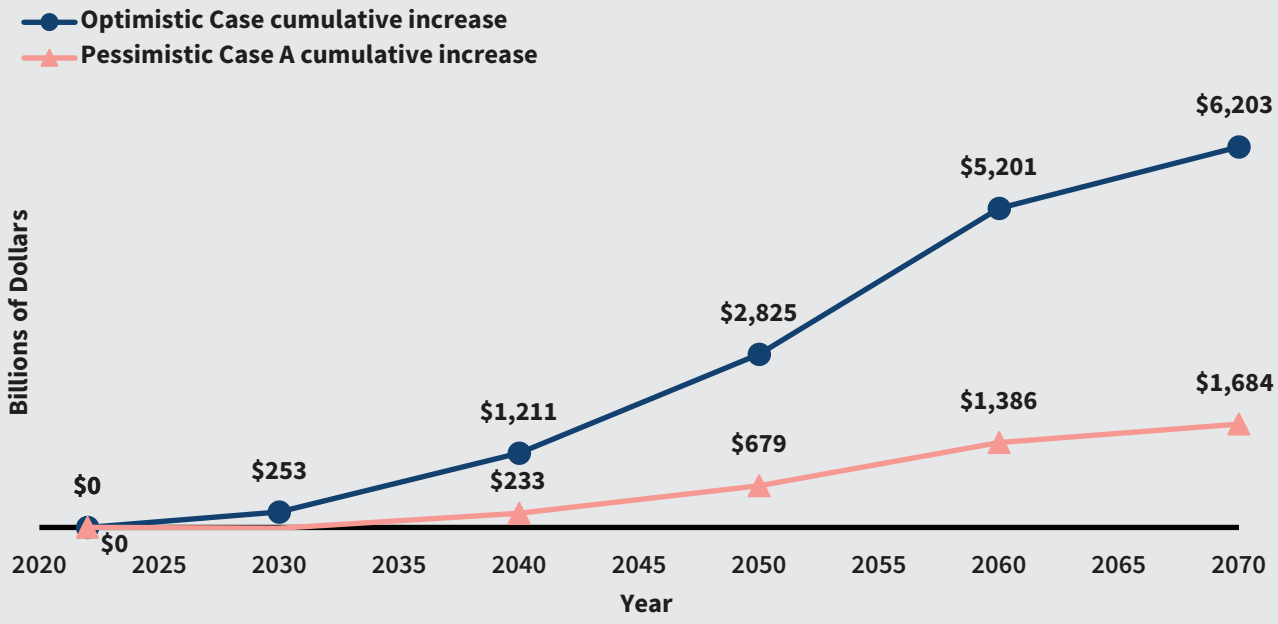
Figure 1 also illustrates the aggregate growth in household wealth due to the Auto IRA program through 2070, when all current assumed participants would reach age 68 under both cases.

TABLE 3
National Total Additional Net Worth* at Age 68 Due to Full Implementation of Auto-IRAs

Enrollment Age	20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	Total
Optimistic Case	$1,002	$2,376	$1,614	$958	$253	$6,203
Pessimistic Case A	$298	$707	$446	$246	($13)	$1,684

**In billions of dollars.*

FIGURE 1
Cumulative National Increase in Household Wealth at Age 68



V. Conclusion

A universal and simple savings system using payroll deduction could substantially improve household wealth for its participants. Unfortunately, this type of savings program is not available to millions of Americans. The gap in coverage especially hurts people of color, employees of small businesses, lower-income workers, and those just joining the workforce. The people who would especially benefit from a savings plan are often the ones who lack access to it.

The 401(k) system, despite its faults, has proven that it can build financial security, especially if it contains automatic mechanisms that simplify enrollment, investment choice, and the right amount to save. The Auto IRA allows small businesses to offer the same type of features to their employees as those of larger employers, through a simple, low-cost program. It is not a substitute for a more comprehensive 401(k) program, but, in addition to providing employees who don't have access to such a program with an important means of saving,

it can serve as a training ground for employers that may later choose to move to a 401(k)-type plan as they expand and prosper.

As our results show, Auto IRA access can greatly improve the ability of households to build wealth for all income levels—and for people of all races, ethnicities, and ages under almost all economic conditions. Further, the presence of emergency savings as either part of the Auto IRA or as a separate automatically enrolled account does not reduce this ability. In fact, having and using emergency savings reduces the chance that an unexpected expense will destabilize family finances. A side benefit of the program is that households have greater levels of liquid assets to meet future emergencies.

Black and Hispanic households benefit even more than white households from a universal Auto IRA. Nevertheless, it is important to underscore that this reform is not a cure for the racial wealth gap. Although Black, Hispanic, and lower-income households move to a much higher median wealth amount as a result of the program, the gap with white households would persist. Still, the benefits of implementing a universal Auto IRA with emergency savings are evident. Auto IRA programs already exist in a growing number of states and have an early track record of success. As our research shows, an expanded, universal program could substantially improve household wealth for millions of Americans.

Appendix A. Detailed predictions of household finances model

***NOTE**: In the following tables, the mean values for the combined sample of Black and Hispanic respondents will not necessarily exactly match the combined arithmetic means of the two groups considered as separate samples. This is due to differing imputed missing response values for a small number of respondents in the age categories.*

TABLE A1

Optimistic Case: Household Median Net Worth and Auto IRA Benefits at Age 68

Participating Households		Employee Enrollment Age					20 to 64 Years*
		20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	
Federal Reserve US median net worth							$234,000
All	Net worth	$545,855	$523,305	$471,013	$403,344	$309,737	$450,651
	Program benefit	$279,144	$256,594	$204,302	$136,633	$43,026	$183,940
White	Net worth	$584,182	$558,721	$499,014	$424,079	$326,961	$478,591
	Program benefit	$304,411	$278,950	$219,243	$144,308	$47,190	$198,820
Black & Hispanic	Net worth	$425,921	$413,483	$385,708	$318,153	$242,650	$357,183
	Program benefit	$236,546	$224,109	$196,334	$128,779	$53,275	$167,809
Black only	*Net worth*	$378,237	$370,118	$342,264	$287,242	$233,896	$322,351
	Program benefit	$171,790	$163,670	$135,816	$80,794	$27,448	$115,904
Hispanic only	*Net worth*	$459,173	$442,162	$403,224	$330,660	$262,110	$379,466
	Program benefit	$268,330	$251,319	$212,381	$139,817	$71,267	$188,623
Lower Income	Net worth	$246,548	$238,653	$223,927	$217,027	$188,902	$223,011
	Program benefit	$65,038	$57,143	$42,418	$35,518	$7,392	$41,502

**In all tables in this appendix, this column represents the mean improvement due to the Auto IRA program across all participant ages.*

TABLE A2

Pessimistic Case A: Low Contribution Rate Household Net Median Worth and Auto IRA Benefits at Age 68

Participating Households		Employee Enrollment Age					20 to 64 Years
		20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	
Federal Reserve US median net worth							$234,000
All	Net worth	$349,686	$343,108	$323,111	$301,745	$264,561	$316,442
	Program benefit	$82,975	$76,397	$56,400	$35,034	($2,150)	$49,731
White	Net worth	$374,905	$367,252	$342,429	$317,290	$280,285	$336,432
	Program benefit	$95,135	$87,481	$62,659	$37,519	$514	$56,662
Black & Hispanic	Net worth	$268,838	$267,854	$265,368	$236,450	$205,986	$248,899
	Program benefit	$79,464	$78,480	$75,994	$47,075	$16,612	$59,525
Black only	*Net worth*	$246,534	$245,916	$238,357	$218,570	$203,380	$230,551
	Program benefit	$40,087	$39,469	$31,910	$12,122	($3,068)	$24,104
Hispanic only	*Net worth*	$284,364	$279,092	$268,568	$236,719	$220,746	$257,898
	Program benefit	$93,521	$88,249	$77,725	$45,876	$29,903	$67,055
Lower income	Net worth	$172,022	$171,646	$169,925	$179,526	$171,975	$173,019
	Program benefit	($9,488)	($9,864)	($11,585)	($1,984)	($9,535)	($8,491)

TABLE A3

Pessimistic Case B: Poor Economy Household Median Net Worth and Auto IRA Benefits at Age 68

Participating Households		Employee Enrollment Age					20 to 64 Years
		20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	
Federal Reserve US median net worth							$234,000
All	Net worth	$457,769	$437,978	$395,932	$347,968	$283,938	$384,717
	Program benefit	$191,058	$171,267	$129,221	$81,257	$17,227	$118,006
White	Net worth	$486,169	$464,460	$416,720	$363,714	$299,144	$406,041
	Program benefit	$206,398	$184,689	$136,949	$83,944	$19,374	$126,271
Black & Hispanic	Net worth	$360,492	$349,857	$328,669	$276,078	$222,866	$307,592
	Program benefit	$171,118	$160,483	$139,295	$86,704	$33,492	$118,218
Black only	*Net worth*	$328,723	$320,754	$296,499	$253,336	$217,852	$283,433
	Program benefit	$122,276	$114,306	$90,052	$46,888	$11,404	$76,985
Hispanic only	*Net worth*	$385,328	$370,233	$338,800	$282,312	$238,847	$323,104
	Program benefit	$194,485	$179,390	$147,957	$91,469	$48,004	$132,261
Lower income	Net worth	$223,509	$216,678	$205,063	$203,416	$182,623	$206,258
	Program benefit	$41,999	$35,168	$23,553	$21,906	$1,113	$24,748

TABLE A4

Worst Case: Simultaneous Low Contribution Rate and Poor Economy Household Median Net Worth and Auto IRA Benefits at Age 68

Participating Households		Employee Enrollment Age					20 to 64 Years
		20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	
Federal Reserve US median net worth							$234,000
All	Net worth	$315,088	$309,504	$293,363	$279,706	$254,294	$290,391
	Program benefit	$48,377	$42,793	$26,652	$12,995	($12,417)	$23,680
White	Net worth	$335,343	$329,181	$309,074	$292,757	$269,009	$307,073
	Program benefit	$55,573	$49,411	$29,303	$12,987	($10,762)	$27,302
Black & Hispanic	Net worth	$245,568	$245,101	$244,640	$221,062	$198,726	$231,019
	Program benefit	$56,194	$55,727	$55,266	$31,687	$9,352	$41,645
Black only	*Net worth*	$231,222	$230,294	$223,267	$207,266	$197,990	$218,008
	Program benefit	$24,774	$23,846	$16,819	$819	($8,458)	$11,560
Hispanic only	*Net worth*	$256,886	$252,187	$244,148	$218,195	$211,747	$236,632
	Program benefit	$66,043	$61,344	$53,305	$27,352	$20,904	$45,789
Lower income	Net worth	$169,947	$169,719	$168,285	$178,370	$171,468	$171,558
	Program benefit	($11,562)	($11,791)	($11,791)	($3,140)	($10,042)	($9,665)

TABLE A5

Optimistic Case and Pessimistic Case B: Poor Economy: Household Median Available Liquid Funds and Auto IRA Benefits at Age 68

Participating Households		Employee Enrollment Age					20 to 64 Years
		20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	
All	Available liquid funds	$176,653	$162,105	$137,235	$115,701	$82,781	$134,895
	Program benefit	$106,454	$91,906	$67,036	$45,502	$12,582	$64,696
White	Available liquid funds	$183,599	$169,057	$140,289	$113,531	$87,486	$138,792
	Program benefit	$111,750	$97,207	$68,440	$41,681	$15,636	$66,943
Black & Hispanic	Available liquid funds	$136,724	$124,260	$105,475	$60,741	$53,575	$96,155
	Program benefit	$93,956	$81,491	$62,707	$39,502	$10,807	$57,693
Black only	*Available liquid funds*	$113,447	$105,861	$88,928	$54,109	$51,192	$82,707
	Program benefit	$87,029	$79,443	$62,510	$27,692	$24,775	$56,290
Hispanic only	*Available liquid funds*	$154,013	$139,491	$121,548	$75,950	$41,130	$106,426
	Program benefit	$116,354	$101,831	$83,889	$38,290	$3,471	$68,767
Lower income	Available liquid funds	$45,116	$39,485	$30,575	$42,708	$25,904	$36,758
	Program benefit	$30,081	$24,450	$15,541	$27,673	$10,869	$21,723

***These cases do not differ in the amount of contributions. Interest on these contributions is not available for withdrawal, so liquid funds amounts and program benefits on liquid funds are identical in both cases.*

TABLE A6

Pessimistic Case A: Low Contribution Rate and Worst Case: Simultaneous Low Contribution Rate and Poor Economy: Household Median Available Liquid Funds and Auto IRA Benefits at Age 68

Participating Households		Employee Enrollment Age					20 to 64 Years
		20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	
All	Available liquid funds	$86,254	$84,149	$78,793	$79,571	$67,463	$79,246
	Program benefit	$16,055	$13,950	$8,594	$9,372	($2,736)	$9,047
White	Available liquid funds	$89,847	$88,590	$80,204	$77,027	$72,512	$81,636
	Program benefit	$17,997	$16,740	$8,355	$5,177	$662	$9,786
Black & Hispanic	Available liquid funds	$63,230	$59,648	$57,029	$37,533	$41,231	$51,734
	Program benefit	$20,462	$16,880	$14,261	($5,235)	($1,537)	$8,966
Black only	*Available liquid funds*	$49,556	$48,552	$45,779	$30,051	$41,394	$43,066
	Program benefit	$23,138	$22,135	$19,361	$3,634	$14,976	$16,649
Hispanic only	*Available liquid funds*	$71,563	$66,094	$66,524	$41,280	$27,919	$54,676
	Program benefit	$33,903	$28,435	$28,864	$3,621	($9,741)	$17,016
Lower income	Available liquid funds	$11,949	$12,003	$10,452	$29,547	$19,950	$16,780
	Program benefit	($3,086)	($3,032)	($4,583)	$14,512	$4,916	$1,745

***These cases do not differ in the amount of contributions. Interest on these contributions is not available for withdrawal, so liquid funds amounts and program benefits on liquid funds are identical in both cases.*

Appendix B. Development of household finances model

An initial requirement of the research was to develop a simulation model that could predict household net worth and the availability of emergency funds under various assumptions about household finances. We used these steps to develop the simulation model:

- We estimated household balances in various financial categories obtained from a representative national sample.
- We took the balances of these accounts to construct a statistical model of a typical household that can be used to predict the net worth of the household and the amount of liquid funds available for possible emergency expenditures.
- We validated and calibrated the model to conform to the Federal Reserve's reported median net worth of American households.

Survey of financial status of US households

The findings of this study are based on a survey, conducted by the National Opinion Research Center (NORC) at the University of Chicago, among 1,491 members of the AmeriSpeak Panel, which represents adults ages 18 and over in the United States.

This probability-based panel is designed to be representative of the US household population. Interviews were conducted via the web, telephone, and in person to ensure a high response rate. For the panel, NORC collected demographic data in 2019 and weighted them based on age, gender, education, race and ethnicity, housing tenure, telephone status, and US Census divisions to generate an accurate sample of national residence.

The Retirement Research Center (RRC) analyzed the data in mid-2021 after respondents were asked the Household Finance questions used in this study in December 2020. A household's net worth was determined from the responses to the following question:

> *Suppose you and your spouse or partner were to sell all of your major possessions, such as your car, your home, etc. and turn all of your investments and other assets into cash, including any financial assets such as stocks, bonds, mutual funds, 401(k) plans, savings and checking accounts and so on, and pay all of your debts, including your mortgage, any other loans, and credit cards. Would you have money left over, break even, or be in debt? (Then asked, "How much?" in dollars, as a follow-up question.)*

Adjustment of reported available cash

The NORC questionnaire requested information for four categories that could be sources of readily available cash for household emergencies. These categories were emergency savings, savings accounts, checking accounts, and money markets. The initial examination of the household balances revealed that some respondents did not recognize that these categories were mutually exclusive, and some dollars were effectively double counted. A household respondent may report some funds in an ordinary savings account that they consider reserved for emergencies, so they also report those funds as emergency savings, for example. In this instance, the amount of funds available for emergencies was overestimated by simply adding the balances of these categories.

This double counting of funds was corrected by using a Principal Components Factor Analysis method to construct a formula that estimated the unduplicated balance of the combination of the four categories, called adjusted available cash, based on the four categories:

$$CFscore_i = 0.38\ Z_{ES} + 0.34\ Z_{SA} + 0.27\ Z_{MM} + 0.32\ Z_{CA}$$

where:

$CFScore_i$ is the factor score called adjusted available cash for respondent i.

$$Z_x = \frac{x_i - mean_x}{standard\ deviation_x}$$

This formula discounted the reported sum of the four categories by a factor of 0.446.[8] In the statistical model predicting household net worth, the sum of the categories from the survey responses was multiplied by this factor.

Multivariate linear regression model predicting household net worth

We took the household balances for the financial categories in the full NORC survey to predict household net worth using a multivariate linear regression model. A regression model calculates weights for the independent effects of each predictor variable, whose values can be added together to predict variation in the dependent variable, in this case, household net worth (see table B1). After estimating the coefficients, we performed subsequent simulations to estimate the changes in household net worth due to changes in household finance balances caused by the hypothetical Auto IRA programs, personal savings decisions, or macroeconomic factors.

Based on the *R*-square, this regression gives a very good prediction of 62 percent of the variation in household net worth in the NORC sample. Three factors are responsible for the remaining unexplained 38 percent of the variation:

- **Nonlinearity**. A linear regression represents the straight trend line of household net worth as the householder ages. However, building net worth does not follow such a simple proportional pattern over an age range of 25 to 65 years. The unexplained variation includes deviations from the increasing straight line because of differences in lifestyles at different ages.
- **Sample error**. The NORC weightings, although partially accounting for some external factors that could affect the net worth, have some random errors when applied to an actual sample. According to NORC, the demographic category error is approximately 2 to 3 percent. Consequently, the sample does not perfectly represent the US household, but it is a good approximation.
- **Unmeasured variables**. Saving and spending behavior differs according to many other factors that are not measured in the NORC questionnaire or are not accounted for by the demographic weighting of the survey.

TABLE B1
Regression Coefficients†

	Net Worth at Householder's Age
Available cash *(sum of savings, checking balance, emergency savings, money market balance)*	0.46***
Age in years	2464.94***
Household income	0.69***
Account 401(k)	0.31***
Emergency savings spent	0.38
Stocks	0.18
Mutual funds	0.39**
Corporate bonds	3.00**
CDs	0.17
Annuity	0.58***
Insurance cash value	0.14*
Business ownership	0.02
College savings 529	0.49**
Real estate	0.17***
Mortgage debt	–0.08**
Student debt	–0.95***
Payday debt	–11.35**
Credit card debt	–1.68***
Medical debt	–2.09**
US bonds	–2.33***
Constant	–47507.33***
***R*-square**	0.62***

Note: *$^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.*

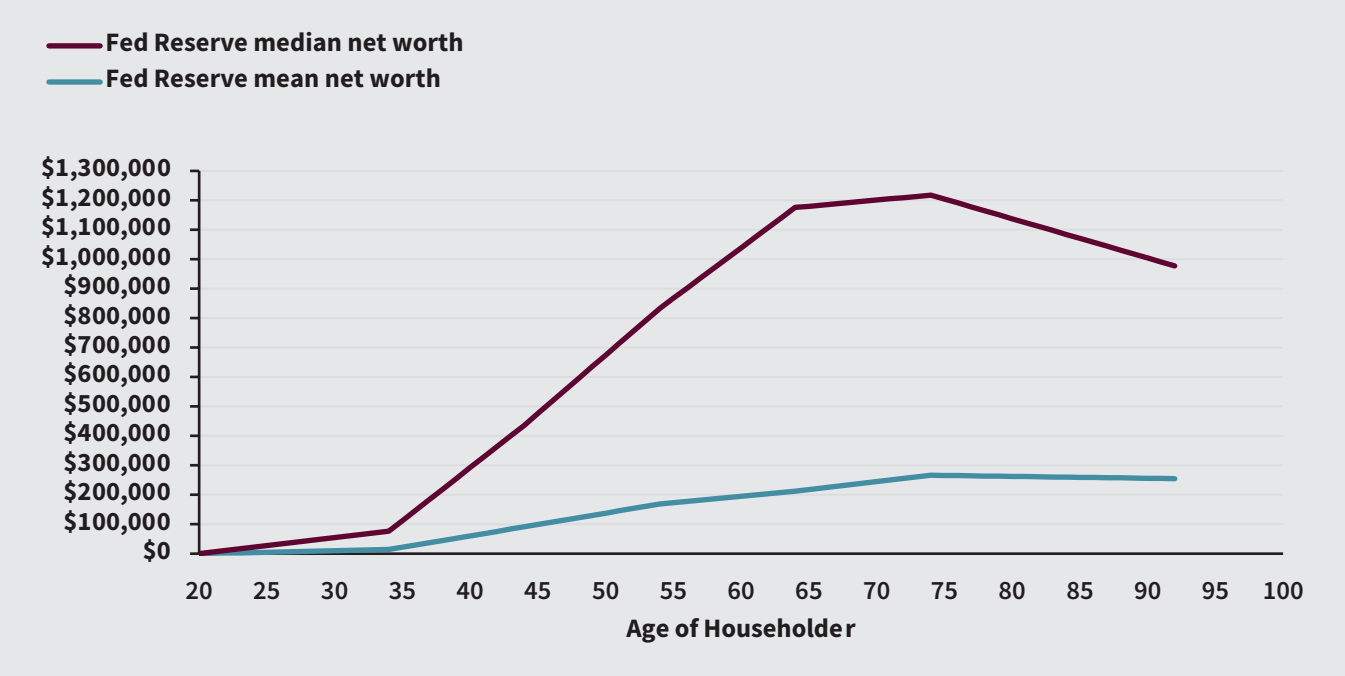
†The non-significance of individual coefficients does not indicate that they are not important or equal to zero, just that their independent contribution to explanation of net worth cannot be separated from all other predictor variables. They still may add to predictive accuracy when included in the full set of predictors. The model R-square *is based on the ability of the full set of variables to accurately predict net worth.*

8 With some algebraic manipulation, substituting the means and standard deviations of the original variables, the z-score can be converted back to equivalent dollar units. This procedure showed that a single dollar addition to the sum of the four balances resulted in a 44.6 cent increase in net worth.

Variations due to unmeasured variables cannot be corrected. Nonlinearity and some sources of sample error may, however, be corrected through additional statistical modeling analyses and calibration with external independent measures of actual household net worth. Figure B1 shows that the net worth of US households varies nonlinearly with age, based on data from the Federal Reserve Bank's triannual survey (Federal Reserve 2020).

FIGURE B1

Mean and Median Net Worth of US Households (Federal Reserve 2020)



Using piecewise linear regression, we partially corrected nonlinearity over the householder age span. Essentially, this involves conducting several linear regressions, each covering a 10-year period of the sample in order to predict the error between predicted and actual net worth within that 10-year period. The coefficients generated by this correction function can then be added to the regression prediction to adjust the prediction of households' net worth and incorporated into the final predictive model.

As table B2 shows, self-reported net worth values for the same age group are generally lower than those reported by the Federal Reserve for the same age group. This may be due to how respondents interpreted the survey question regarding the net worth, or the sample after weighting might have been slightly less wealthy. In any case, to make the model predictions more consistent with the national median net worth, we calculated an additional calibration factor by determining the difference between the model's predictions and the Federal Reserve median net worth at the beginning and end of the same 10-year intervals and interpolating the difference linearly for each intervening year. To arrive at the final predicted value for a household, we combined this additional calibration constant with the interpolated nonlinearity correction values at yearly intervals.

TABLE B2

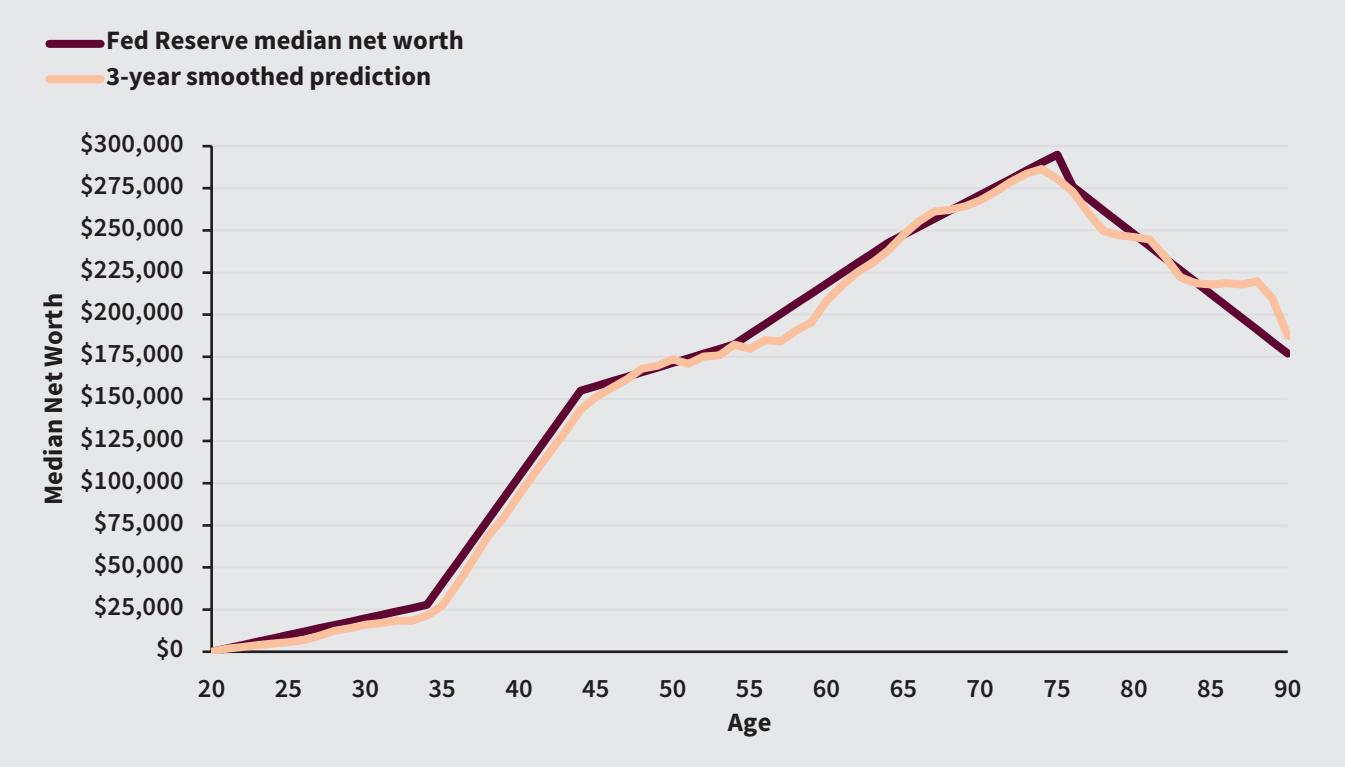
Nonlinearity and Sample Corrections Constant by Age

Age	Prediction Correction	Age	Prediction Correction	Age	Prediction Correction	Age	Prediction Correction
20	–$31,701.56	38	–$33,845.02	56	–$13,364.96	74	$46,195.19
21	–$33,202.72	39	–$26,711.08	57	–$6,673.79	75	$24,579.60
22	–$34,703.88	40	–$15,706.24	58	$17.39	76	$2,964.00
23	–$36,205.04	41	–$4,701.40	59	$6,708.56	77	–$18,651.60
24	–$37,706.20	42	$6,303.44	60	$11,303.19	78	–$40,267.19
25	–$39,207.36	43	$17,308.29	61	$15,897.83	79	–$61,882.79
26	–$40,708.52	44	$28,313.13	62	$20,492.47	80	–$62,648.90
27	–$42,209.68	45	$22,395.89	63	$25,087.10	81	–$63,415.01
28	–$45,091.26	46	$16,478.65	64	$29,681.74	82	–$64,181.12
29	–$47,972.85	47	$10,561.41	65	$29,017.39	83	–$64,947.23
30	–$50,854.43	48	$4,644.18	66	$28,353.04	84	–$65,713.34
31	–$53,736.01	49	–$1,273.06	67	$27,688.70	85	–$59,301.77
32	–$56,617.59	50	–$6,367.91	68	$27,024.35	86	–$52,890.21
33	–$59,499.18	51	–$11,462.76	69	$26,360.00	87	–$46,478.65
34	–$62,380.76	52	–$16,557.61	70	$30,327.04	88	–$40,067.09
35	–$55,246.82	53	–$21,652.46	71	$34,294.08	89	–$33,655.53
36	–$48,112.89	54	–$26,747.31	72	$38,261.12	90	–$33,655.53
37	–$40,978.95	55	–$20,056.13	73	$42,228.16		

Figure B2 shows the final predicted values of the final net worth model based on the means of the NORC sample against the Federal Reserve national median. The small year-to-year differences were smoothed using a three-year moving average (using the year before and after). As a result, the predicted values correlate well with the Federal Reserve values at $r = 0.98$, which indicates excellent accuracy across the entire age range. Thus, the NORC sample averages representing typical US households' finances accurately predict the actual Federal Reserve net worth amounts, validating the use of the model predictions to simulate a typical household's financial situation.

FIGURE B2

Net Worth Model Predictions of US Median Net Worth Using NORC Questionnaire Household Finance Category Means[9]



Definition of variables and some of the assumptions

Adjusted Available Cash: The available cash sum value is multiplied by a factor of 0.456 in the net worth model to eliminate double reporting of amounts but is shown as a simple sum of reported values in the mean value tables in appendix B. This adjustment factor was determined in a separate analysis (shown earlier in this appendix).

All Retirement Funds Other Than Auto IRA: Sum of restricted retirement funds plus stocks and mutual funds.

Average Yearly Withdrawal from Auto IRA Contributions: According to a Pew survey (2015), 60 percent of households experience a financial shock each year, and 55 percent report financial hardship following the shock. The average financial shock was $2000. Hence, it was assumed households withdraw 0.60 × 0.55 × $2000 = $660 annually to cover a financial emergency. A conservative assumption was also made that the full $660 would be deducted from the Auto IRA balance and not from any other source of liquid funds that could be used in an emergency.

9 In both figure B1 and figure B2, the line for Federal Reserve median net worth is the same, but the two figures are drawn to different scales. In figure B1, the *y*-axis runs to $1.3 million and is divided by each $100,000, while in figure B2 it runs only to $300,000 and is divided by each $25,000. Similarly, the *x*-axis in figure B1 runs to age 100, while in figure B2 it runs to age 90.

Auto IRA Liquid Retirement Funds:	Accumulated total contributions to the new plan evaluated at the current age. These funds are not taxable on withdrawal and can be used for emergencies without a penalty.
Auto IRA Restricted Retirement Funds:	Accumulated compound interest earning from accumulated Auto IRA contributions evaluated at the current age. Investment earnings in this new plan are not available tax- and penalty-free until retirement and are not included as liquid fund totals but are included in the net worth estimate.
Available Cash Sum:	Sum of self-reported emergency savings, savings account, checking account, and money market.
Liquid Emergency Sources Balance:	Sum of adjusted available cash, stocks, and mutual funds, the latter two categories assumed to be accessible quickly.
Other Liquid Emergency Sources Balance:	Sum of available cash, stocks, and mutual funds excluding Auto IRA liquid retirement funds.
Net Worth Impact of New Plan:	Net worth including all new retirement funds minus net worth of the Benchmark model based on the current situations reflected in the NORC survey means. This shows the relative benefit in estimated net worth of the Auto IRA compared with the current household finances averages.
Net Worth Including All Retirement Funds:	Net worth as evaluated at current age with the basic Household Finances Model. This model includes all sources of funds shown in the above narrative description of the regression model in an estimate of likely household net worth plus Auto IRA contributions and interest.
Net Worth Including All New Retirement Funds:	Net worth evaluated as in the previous item above plus the sum of Auto IRA liquid and Auto IRA restricted funds.
Restricted Retirement Funds:	Sum of 401(k) account, annuity balance, corporate bonds, US bonds, and CDs and accumulated interest and earnings on Auto IRA.
Total Liquid Funds Available for Emergency:	Sum of the Auto IRA liquid retirement funds and the other liquid emergency sources balance.
Total Restricted Retirement Funds:	Restricted retirement funds plus Auto IRA restricted retirement funds from investment yield.

Appendix C. Household balance sheet means for NORC survey groups

TABLE C1

NORC Survey Balance Sheet Means for All Respondents (*N* = 1491)

		Age					
		20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	65 Years and over
Assets	Available cash sum	$10,532	$16,774	$22,979	$25,362	$34,190	$52,838
	Household income	$45,583	$62,803	$80,346	$86,854	$69,125	$71,556
	Account 401(k)	$7,987	$23,927	$58,241	$104,298	$92,461	$51,808
	Stocks	$1,464	$3,838	$7,393	$16,020	$11,017	$22,079
	Mutual funds	$1,251	$4,220	$3,927	$13,103	$16,904	$22,720
	Annuity	$979	$695	$1,026	$4,121	$7,527	$16,839
	Insurance cash value	$3,390	$7,128	$16,075	$16,639	$19,576	$19,805
	Business ownership	$3,590	$3,045	$8,890	$6,244	$10,616	$12,246
	Corporate bonds	$19	$129	$253	$526	$851	$883
	US bonds	$24	$93	$256	$516	$1,003	$1,766
	CDs	$70	$668	$830	$4,756	$8,690	$13,859
	College savings 529	$607	$672	$2,117	$6,751	$3,209	$1,912
	Real estate	$29,728	$7,253	$20,550	$41,593	$38,990	$60,813
Liabilities	Mortgage debt	$23,264	$53,796	$85,339	$69,361	$55,590	$48,692
	Student debt	$8,045	$12,446	$13,123	$5,700	$3,201	$1,248
	Payday debt	$0	$192	$54	$20	$96	$48
	Credit card debt	$1,766	$2,099	$3,433	$4,092	$3,502	$2,080
	Medical debt	$180	$1,449	$1,197	$1,357	$701	$278
	Emergency savings spent in past year	$94	$227	$475	$120	$580	$251
Self-reported Net Worth		$29,581	$41,767	$90,525	$153,426	$191,631	$247,832

TABLE C2

NORC Survey Balance Sheet Means for White Respondents (*N* = 1030)

		Age					
		20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	65 Years and over
Assets	Available cash sum	$9,548	$18,053	$25,266	$26,497	$35,562	$56,833
	Household income	$52,242	$65,695	$83,724	$90,491	$66,949	$73,405
	Account 401(k)	$8,507	$27,283	$66,990	$107,187	$93,254	$52,196
	Stocks	$254	$4,522	$7,840	$14,117	$13,265	$23,692
	Mutual funds	$2,416	$5,821	$4,107	$11,720	$17,637	$24,755
	Annuity	$1,517	$806	$1,701	$5,957	$7,796	$16,211
	Insurance cash value	$3,089	$6,557	$15,680	$18,182	$19,931	$22,826
	Business ownership	$14	$3,964	$8,138	$8,606	$10,074	$15,464
	Corporate bonds	$39	$194	$19	$224	$859	$1,023
	US bonds	$47	$131	$257	$615	$887	$2,034
	CDs	$92	$566	$659	$5,583	$9,161	$15,383
	College savings 529	$1,226	$836	$3,169	$5,337	$2,269	$2,046
	Real estate	$21,131	$4,856	$17,207	$39,427	$46,695	$62,403
Liabilities	Mortgage debt	$24,017	$56,820	$94,913	$64,516	$54,145	$39,105
	Student debt	$9,993	$11,875	$13,450	$4,645	$2,200	$213
	Payday debt	$0	$156	$31	$19	$44	$0
	Credit card debt	$2,616	$2,167	$3,029	$2,811	$3,190	$1,916
	Medical debt	$222	$1,746	$1,396	$783	$599	$311
	Emergency savings spent in past year	$84	$182	$351	$106	$718	$195
Self-reported Net Worth		$43,034	$44,868	$113,590	$171,922	$208,475	$269,692

TABLE C3

NORC Survey Balance Sheet Means for Black and Hispanic Respondents (*N* = 335)

		Age					
		20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	65 Years and over
Assets	Available cash sum	$10,773	$6,572	$16,908	$14,725	$21,882	$31,993
	Household income	$39,609	$43,569	$69,281	$68,958	$65,330	$57,055
	Account 401(k)	$2,803	$10,714	$40,710	$54,063	$72,385	$22,380
	Stocks	$3,603	$1,197	$5,876	$1,394	$4,014	$1,851
	Mutual funds	$147	$1,344	$4,660	$2,565	$9,520	$11,183
	Annuity	$614	$111	$0	$382	$2,740	$14,110
	Insurance cash value	$2,153	$10,042	$15,624	$13,078	$12,226	$10,765
	Business ownership	$87	$1,737	$13,298	$1,802	$128	$17
	Corporate bonds	$0	$0	$836	$0	$0	$475
	US bonds	$0	$23	$348	$235	$35	$857
	CDs	$46	$309	$1,227	$396	$4,873	$9,826
	College savings 529	$0	$497	$438	$905	$446	$876
	Real estate	$47,288	$7,064	$31,137	$20,072	$5,589	$32,240
Liabilities	Mortgage debt	$30,749	$20,993	$61,400	$63,668	$38,419	$73,070
	Student debt	$8,371	$13,514	$13,263	$8,569	$7,836	$6,613
	Payday debt	$1	$358	$77	$30	$365	$231
	Credit card debt	$1,164	$2,154	$4,655	$7,701	$4,679	$3,270
	Medical debt	$0	$1,218	$1,111	$3,106	$950	$204
	Emergency savings spent in past year	$132	$269	$417	$203	$181	$441
Self-reported Net Worth		$9,296	$28,076	$51,974	$75,689	$94,857	$136,876

TABLE C4

NORC Survey Balance Sheet Means for Black Respondents (*N* = 122)

		Age					
		20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	65 Years and over
	Available cash sum	$670	$3,267	$11,653	$9,823	$10,422	$22,360
	Household income	$13,806	$28,896	$62,829	$52,616	$51,605	$53,360
	Account 401(k)	$376	$3,524	$28,615	$58,433	$49,198	$35,306
	Stocks	$226	$288	$1,463	$1,940	$6,730	$2,540
	Mutual funds	$0	$18	$381	$1,402	$5,687	$3,970
	Annuity	$0	$0	$0	$1,001	$70	$509
Assets	Insurance cash value	$0	$13,377	$14,612	$4,392	$21,010	$14,750
	Business ownership	$1,128	$9	$28,335	$0	$205	$0
	Corporate bonds	$0	$0	$0	$0	$0	$1,253
	US bonds	$0	$0	$0	$23	$67	$509
	CDs	$0	$573	$121	$795	$1,601	$2,791
	College savings 529	$0	$266	$1,070	$367	$738	$2,309
	Real estate	$0	$850	$38,899	$36,557	$327	$36,014
	Mortgage debt	$0	$9,921	$47,040	$45,429	$45,689	$59,488
	Student debt	$14,973	$22,832	$19,510	$15,193	$14,292	$8,742
	Payday debt	$0	$998	$81	$35	$382	$73
Liabilities	Credit card debt	$0	$1,007	$3,658	$4,925	$3,921	$1,344
	Medical debt	$0	$1,102	$774	$2,638	$1,767	$91
	Emergency savings spent in past year	$129	$72	$240	$11	$309	$57
Self-reported Net Worth		$5,000	($10,958)	$16,075	$56,135	$32,019	$138,726

TABLE C5

NORC Survey Balance Sheet Means for Hispanic Respondents (*N* = 213)

		Age					
		20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	65 Years and over
	Available cash sum	$11,615	$8,256	$20,385	$17,751	$34,195	$37,879
	Household income	$41,760	$51,046	$73,551	$79,047	$80,076	$59,313
	Account 401(k)	$3,005	$14,378	$48,714	$51,365	$97,296	$14,482
	Stocks	$3,885	$1,660	$8,796	$1,057	$1,097	$1,430
	Mutual funds	$160	$2,019	$7,491	$3,283	$13,639	$15,590
	Annuity	$665	$168	$0	$0	$5,609	$22,421
Assets	Insurance cash value	$2,332	$8,343	$16,294	$18,441	$2,789	$8,330
	Business ownership	$0	$2,617	$3,348	$2,915	$44	$27
	Corporate bonds	$0	$0	$1,390	$0	$0	$0
	US bonds	$0	$34	$579	$366	$0	$1,069
	CDs	$50	$175	$1,959	$150	$8,388	$14,125
	College savings 529	$0	$615	$21	$1,238	$133	$0
	Real estate	$51,231	$10,231	$26,002	$9,895	$11,243	$29,935
	Mortgage debt	$33,312	$26,634	$70,902	$74,929	$30,609	$81,369
	Student debt	$7,821	$8,765	$9,129	$4,480	$899	$5,313
	Payday debt	$1	$32	$73	$27	$346	$327
Liabilities	Credit card debt	$1,261	$2,739	$5,315	$9,415	$5,494	$4,447
	Medical debt	$0	$1,276	$1,333	$3,394	$72	$273
	Emergency savings spent in past year	$132	$369	$533	$321	$43	$676
Self-reported Net Worth		$9,654	$47,965	$75,730	$87,761	$162,369	$135,745

TABLE C6

NORC Survey Balance Sheet Means for Lower-Income Respondents (*N* = 606)

		Age					
		20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	65 Years and over
Assets	Available cash sum	$5,911	$7,844	$2,848	$11,759	$12,087	$27,162
	Household income	$26,061	$25,013	$28,577	$27,961	$25,984	$30,501
	Account 401(k)	$5,154	$3,772	$7,415	$25,167	$24,521	$14,086
	Stocks	$1,012	$717	$1,122	$5,794	$2,811	$4,274
	Mutual funds	$14	$1,017	$605	$5,769	$4,835	$6,142
	Annuity	$5	$38	$0	$100	$4,780	$14,671
	Insurance cash value	$646	$2,303	$2,694	$6,538	$11,296	$11,153
	Business ownership	$5,069	$3,061	$2,420	$0	$2,336	$2,829
	Corporate bonds	$0	$64	$0	$1,073	$648	$24
	US bonds	$0	$75	$0	$10	$179	$66
	CDs	$24	$352	$25	$459	$5,113	$8,541
	College savings 529	$0	$583	$0	$252	$823	$0
	Real estate	$17,303	$831	$1,652	$1,901	$29,781	$13,378
Liabilities	Mortgage debt	$14,871	$11,314	$11,155	$18,488	$24,289	$18,607
	Student debt	$4,319	$9,045	$10,385	$2,606	$5,107	$3,172
	Payday debt	$0	$319	$105	$27	$122	$57
	Credit card debt	$1,530	$1,707	$2,370	$2,440	$3,812	$2,708
	Medical debt	$237	$1,734	$2,574	$3,066	$1,173	$503
	Emergency savings spent in past year	$127	$197	$452	$34	$622	$417
Self-reported Net Worth		$13,560	$9,790	($4,623)	$50,352	$92,780	$126,334

Appendix D. Converting household results into improvement to national aggregate savings

To estimate the number of new employees who are likely to participate in a universal Auto IRA system if one becomes a reality, we begin by reviewing the total number of employed workers, by age group, according to the Bureau of Labor Statistics (BLS 2021). This is shown in table D1. Next, we take the percentage of employees in each age group who were employed at organizations that did not offer retirement savings plans using estimates from John and Koenig (2022). As shown in table D2, applying that coverage data to the BLS statistics provides an estimate of the total number of employees whose employers do not offer a workplace retirement plan. More than 71 million Americans, or approximately 47 percent of employees in this country, are not offered a plan and therefore could be eligible to participate in an Auto IRA program.[10]

TABLE D1

Employed Persons in the United States by Age in 2021*

	Age							
	16 to 19 Years	20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	65 Years and over	Total
Total Workers	5,266,000	13,409,000	34,578,000	32,734,000	30,554,000	25,912,000	10,127,000	152,581,000
Percentage of Total	3.5	8.8	22.7	21.5	20.0	17.0	6.6	100.0

**BLS 2021.*

TABLE D2

Employees Who Are Not Currently Offered an Employer Retirement Plan

	Age							
	16 to 19 Years	20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	65 Years and over	Total
Percent of Employees Not Offered*	56.6	56.6	56.6	43.0	40.9	40.4	40.4	46.7
Total Workers Not Offered	2,980,556	7,589,494	19,571,148	14,075,620	12,496,586	10,468,448	4,091,308	71,273,160

**John & Koenig 2022.*

To estimate the actual number of participants in the Auto IRA program, we begin by using the ICI (2021) data on the percentage of employees, by age, who are offered and enroll in an employer-sponsored retirement savings plan. For the younger workers, that level is 59 percent growing to 70 percent after age 35. As the opt-in rate is lower than the continuing participation rate for operating state Auto IRA programs, all of which use automatic enrollment, the ICI data constitutes a very conservative estimate. Applying this data to the number of potential target employees who are estimated not to have an employer-sponsored retirement plan shown in

10 While John and Koenig 2022 considered only private sector workers ages 18 to 64, this analysis covers the entire US workforce.

table D2, we can estimate the potential number of new enrollees for each age group. Table D3 presents these numbers. According to this estimate, a universal Auto IRA with emergency savings has the potential to cover almost 45 million employees, or 29 percent of the working population.

TABLE D3
Participation Rate of Employees in a Universal Auto IRA

	20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	65 Years and over	Total
Participation Rate*	59.0%	59.0%	70.0%	70.0%	70.0%	70.0%	62.9%
Total Workers	4,477,801	11,546,977	9,852,934	8,747,610	7,327,914	2,863,916	44,817,152
Percent of Population	2.9	7.6	6.5	5.7	4.8	1.9	29.4

**ICI 2021.*

Note: *Workers under 20 years of age are assumed to uniformly opt out of any retirement plan, due to the prevalence of part-time and low-paying work.*

The next step is to get household dollar amounts that are equivalent to those used in the other analyses in this report by translating the number of employees affected to the number of households. Combining information available from the US Bureau of Labor Statistics and the Census Bureau results in an estimate that there are an average of 1.25 employed individuals per household, as shown in table D4. Dividing the number of possible Auto IRA enrollees by that result produces an estimate of just under 36 million households that would be newly covered if a universal Auto IRA is implemented for the full working population. This estimate is shown in table D5.

TABLE D4
Employed Persons per Household*

Total Adult US Population	Employed Population	Percent of Population Employed	US Households	Average Employed Persons per Household
257,791,000	152,580,000	59.2	122,354,219	1.25

**BLS 2021 and Census Bureau 2021.*

TABLE D5
Participating Households by the Age of Household Head

	16 to 19 years	20 to 24 years	25 to 34 years	35 to 44 years	45 to 54 years	55 to 64 years	65 years and over	Total
Total Participating Households	0	3,590,758	9,259,545	7,901,088	7,014,727	5,876,269	2,296,580	35,938,967

Note: *Workers under 20 years of age are assumed to uniformly opt out of any retirement plan, due to the prevalence of part-time and low-paying work.*

Combining these estimates with the estimates of net worth benefits to Auto IRA participants presented in the previous section, it is possible to calculate the total amount of additional retirement savings that could be generated by application of a system of Auto IRAs to the full workforce, as shown in table D6.

TABLE D6

National Total Additional Net Worth* at Retirement Due to Full Implementation of Auto IRAs

Enrollment Age	20 to 24 Years	25 to 34 Years	35 to 44 Years	45 to 54 Years	55 to 64 Years	Total
Optimistic Case	$1,002	$2,376	$1,614	$958	$253	$6,203
Pessimistic Case A	$298	$707	$446	$246	($13)	$1,684

**In billions of dollars.*

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