2021-2022 iOme Challenge
A proposal to the 117th Congress for the Betterment of Retirement Savings
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1. Introduction

Generation Z's outlook was skewed by extreme global events. The Great Recession and the COVID-19 pandemic compromised the financial stability of America. Low-income families were most impacted and now have less money for retirement than ever before (FRB 2019). For members of Gen Z, finance continues to be a significant stressor (APA 2018). It is imperative that a plan is curated to reduce stress in the future.

Americans are living longer but birth rates are declining—by 20% since 1980 (Kearney et al. 2022, SSA 2022). These two factors dramatically increase savings needed for retirement and hinder social security—the ill-prepared safety net—as the workforce and their finances shrink.

Increased lifespans along with increased healthcare costs associated with old age will make retirement more costly for Gen Z than for previous generations (LaPonsie 2020). In 2019, the average retiree needed $541,000 in order to cover all living expenses compared to 1960 when retirees required $44,330 for the same coverage (Poindexter 2022). By the time Gen Z will begin to retire in 2065, it will cost $1,529,453 according to our calculations.[1] With longer lifespans, higher healthcare costs, and the decline of social security more retirement savings are required, and many Americans are not prepared.

We already see evidence of this shift in retirement; there is a 67% increase in elderly Americans living with their children due to a lack of retirement savings. This adds to younger generations' workloads and increases depression rates by 40% (Heller-Sahlgren 2013). Low-income Americans in particular succumb to these challenges, as upward economic mobility is often difficult.

Low-income families are disproportionately disadvantaged by the declining financial system. Social security replaces up to 40% of pre-retirement earnings—the lower your income, the lower your payout (SSA 2022). But society cultivates a negative perception of the low-income as "welfare scroungers" despite an equivalency in the amount individuals contribute and ultimately withdraw across income-level—the rich live longer and withdraw more in old age (Hills 2014). Increased retirement preparedness for the poor could increase their lifespans and correct this imbalance.

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[1] We denote cost of retirement as the nominal amount needed to accrue $60,000 (in 2022 dollars) in stock returns (at a rate of return of 9.95%). Values reported in paragraph are in nominal dollars.

Retirement plans beyond personal savings depend on employers which can be detrimental to low-income workers who have lower wages and lesser benefits. Only 42% of workers received access to any kind of retirement plan within the lowest quarter of wage earners but 88% of workers received access within the highest quarter of wage earners (BLS 2021). Bridging the gap in accessibility of retirement benefits would better prepare all Americans, regardless of income.

Beyond the inaccessibility of financial backing, another challenge is the lack of motivation. Rooij et al. (2011) revealed an overall lack of financial literacy in the typical American household and that demographics require different motivators to invest. Individuals who do not possess a high level of financial literacy benefit when the presentation of financial data is simplified (Foster et al. 2015).

Social comparisons can also affect savings motivations. Chetty et al. (2013) found a difference in investment behavior by neighborhood wealth. Those in richer neighborhoods invested more than comparable peers in poorer neighborhoods. Peers in rich neighborhoods were more likely to be highly educated and well-versed in investments that they passed on to their neighbors. Additionally, Beshears et al. (2015) found that low-income workers were unmotivated to contribute to their firm's investment plans once aware of the higher investment rates of their higher-paid coworkers. Some low-income workers withdrew from savings plans altogether because they felt their contributions were not as respected as their high-income coworkers.

Within households, couples pressure one another to invest more than they would while single (Hou and Sanzenbacher 2019). But younger generations are getting married later in life which can delay this incentive.

Gen Z needs positive peer effects and pressures early in life to invest and understand that most gains come from investments made in the initial years. Many societal problems pose threats to Gen Z's retirement; it is time that we take matters into our own hands for improvements.

1.1 PROPOSAL OVERVIEW

Our policy introduces a fairer retirement system that limits the many factors that advantage the rich.

To inform our policy we designed a survey to better understand retirement behavior amongst Gen Z. Our findings show that students from wealthy families were more likely to increase retirement contributions through peer effects. The literature echoes this and shows that the wealthy invest *more* when seeing peers who invest highly; in contrast with the poor who invest *less* (Chetty et al. 2013; Beshears et al. 2015). The poor are discouraged when they witness wealthier coworkers with excess income to invest.

We designed social investment groups to benefit the non-wealthy by reframing investment as a social process whereby workers—grouped by wage and job—earn fiscal rewards through the group's retirement investment.

Groups work together to hit targets such as 3% of the group's income invested monthly or 80% investment participation (a 401(k) contribution above $0). The firm compensates groups that achieve targets with additional contribution matching for all individuals. And within groups, there is an element of competition such that workers are rewarded with bonus investment contributions based on relative placement within their groups. This gamification of investment will increase motivation and contribution. Our estimates show that this can increase retirement savings for the average member of Gen Z by $345,793 at the time of retirement.

We also found that Gen Z displays significant risk aversion which can drastically hinder investment. The risk-averse—86% of our sample—choose investment funds with 1.07% lower returns on average which translates to a loss of $514,789 by retirement age. To address this, we add to our policy the distribution of pamphlets (Figure 2) to present to new hires to alleviate concerns regarding risks and introduce our social investment groups.

1.2 COGNITIVE BIASES AT PLAY

Our proposal relies on the literature regarding human behavior in retirement savings. The literature demonstrates retirement decisions are made irrationally much of the time leading to financial inefficiency, particularly for low-income workers.

Chetty et al. (2013) discuss how Americans fail to invest because they perceive that their peers do not. This is specifically most prevalent in low-income groups where few are able to allocate resources beyond day-to-day expenses. To make matters worse,

risk-averse behaviors play a key role when loss aversion of investments becomes a possibility—again, most intense in low-income Americans (Rabin and Thaler 2001).

Research on loss aversion suggests that Americans fail to invest due to fear of losing money and perceive any upfront costs within the stock market as an unrecoverable loss. Understanding and using loss aversion as a factor in investing for retirement can lead to more lucrative outcomes for retirement savings (Lim et al. 2019).
In terms of investing, participants given positively framed information make "risk-free decisions" and increase investment. But when negatively framed, participants act risk-averse and decrease investment (Candraningrat et al. 2018). A positively framed presentation of investments can profoundly influence retirement investment outcomes. But to invest at all first requires the worker to make a conscious choice.

Choices require effort, especially in the rigorous environment of investment. Individuals often forgo this effort altogether and opt not to invest in retirement savings plans, particularly if the default at their organization is not to invest. Madrian and Shea (2001) found that employees were significantly more likely to contribute to 401(k) plans if they were automatically enrolled, suggesting that workplace revisions to their default plan could help workers better achieve investment goals. If workers are forced to make decisions about retirement investments without a default option, the optimal option can prevail if it is presented as the "smart" selection by their employer (Camilleri et al. 2019). This initial investment decision in employer-sponsored retirement begins with HR who can offer guidance and support on investment strategies to help minimize the social abundance of a *doom and gloom* attitude. Pessimism and lack of trust in the market are substantial demotivators that can lead to seeking information that validates that point of view.

As with (nearly) all behavior change, framing is key. Kahneman and Tversky (1979) showed in their seminal work that the presentation of choice has a profound impact on decision-making. Presenting a scenario as avoiding a loss encourages action much more than when the same scenario is presented as claiming a gain. Therefore, framing investment as necessary to avoid a loss relative to peers who invest is a good strategy.

Retirement investment is a life skill that many do not discuss. There is no college gen-ed focused on retirement strategies. Many Americans must take the time to learn how to invest on their own—often rushed through the process in their first job—and some never learn at all. Adjusting our habits and altering policies to improve American retirement outcomes is essential.

We want American retirees to be comfortable in their retirement without the worry of financial stability. An equitable retirement savings plan will benefit everyone, not just the poor. Decreased retirement security hinders those in the workforce and their descendants who lose the opportunity to become great innovators when financially restricted by their parents (Bell et al. 2018).

Gen Z should understand that most gains from investment come from the exponential growth of early investment through compound interest across one's working life. As shown in Figure 1, if workers start investing 3% of their income annually in 2021 in a safe index fund with 9.95%[2] returns, based on the median income of college graduates of $55,000 with annual wage growth of 5%, they would save $3,158,260 by the time they retire in 2069. But if these same individuals invest into accounts with only 5% annual returns throughout their working life, they will only save $850,180—below the minimum for a comfortable retirement of $1,529,453. Even delaying this investment until age 32 means you will not be able to comfortably retire by age 65 without significantly increasing your contribution rate.[3]

The financial stress associated with life often clouds the realization that saving for the future concurrently is important. Insufficient retirement savings strategies and workers who opt out of the maximum benefits within employer-sponsored retirement programs present an economic loss for the individual, the stock market, and American taxpayers whose taxes support the ill-prepared in retirement. If Americans do not optimally save for their retirement through correct fund choice, investment when young, and adjustment to changing market conditions then personal debt is increased, social programs are

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[2] Based on NYSE-Arca SPLV in April, 2022.
[3] This assumes that one invests in the best possible fund with returns of 9.95%

strained, and the individual may be inclined to work past retirement age—which may hinder their physical and mental health and pass these burdens to their children.

To assess the impact of cognitive biases on Gen Z retirement behavior, section 2 presents the survey we administered and section 3 presents our analyses of those results. Section 4 then presents the policy proposal we designed to address these concerns. And section 5 concludes.

Figure 1   Visualization of Retirement Investment
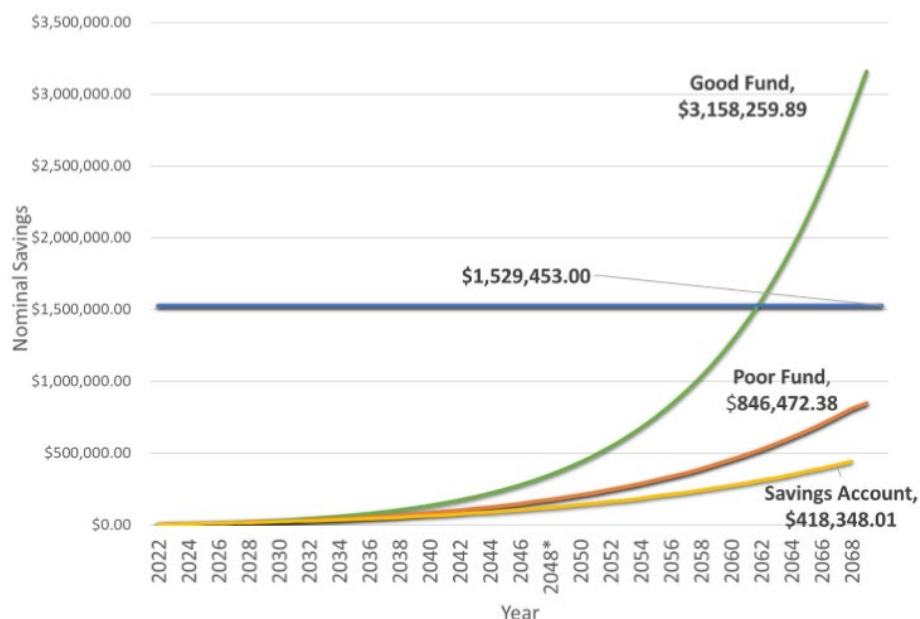
Note. We depict the nominal capital stored in three different retirement savings accounts. Figures are based on a consistent 3% contribution rate throughout one's full working life with average college graduate earnings of \$55,260 and 5.1% annual salary growth. A benchmark of \$1,529,453 is provided for the needed retirement savings to support annual spending of \$60,000 (in 2021 dollars) derived from account interest. A good fund (green) returns 9.95% annually, a poor fund (red) returns 5% annually, and a simple savings account returns 2%.

2. Survey Overview

To better understand the cognitive biases present when Gen Z makes investment decisions and the adverse effect of those biases by socio-economic group, we distributed a survey to college students enrolled in our university in return for financial or course-based incentives.

Students were directed to an online survey on Qualtrics where they gave consent to participate and then responded to a series of investment-related questions designed

on investment decision-making as well as demographic questions (see Appendix A). We had 61 respondents but excluded anyone who did not answer all questions or was over the age of 25 leaving a sample size of 51 students.

Our survey contained three question sets: 1) demographic and socioeconomic questions;[4] 2) investment choice questions that asked students to pick one of three funds to invest in;[5] and 3) judgment-based questions designed to determine a participant's cognitive biases—skepticism, risk aversion, loss aversion, status quo bias, projection bias, and confidence. We further discuss question set 3 below.

2.1 DIRECT EXPRESSIONS OF COGNITIVE BIASES

We asked participants to report their trust in the stock market in question 3; we scaled responses from 20-100% trust in the market where "Very low trust" was labeled 20% trust and "Very high trust" was labeled 100% trust with 20% increments between. The average trust in our sample was 54.90%.

We marked participants as risk-averse if they refused to accept the favorable gamble (with positive expected returns of $25) listed in question 4. Risk-averse individuals would (almost) always opt to avoid this gamble while the risk-neutral would accept it given the positive expected returns. We labeled 86.30% of our sample risk-averse.

We asked participants to report their investment confidence in question 22, again scaling from 20-100%. Participants reported average confidence of 49.42%.

2.2 INDIRECT EXPRESSIONS OF COGNITIVE BIASES

We used the method of Kahneman and Tversky (1984) to measure loss aversion. We asked participants two questions (7 and 14) assessing if they would buy a $50 ticket to a concert given they had: lost $50 or lost their first ticket. Loss-averse individuals are more reluctant to repurchase the ticket after losing the first ticket than after losing $50 because they feel worse after losing something they owned (the ticket) than simply losing money. We labeled participants as loss averse if they reported they would purchase a ticket after losing $50 but not after losing their first ticket. We may have missed loss-averse

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[4] Questions 19, 20, 21 and 1 respectively
[5] Questions 6, 10, 12 and 15

individuals who did not value the ticket at $50 and answered that they would never buy the $50 ticket in either question. We labeled 25.49% of our sample as loss averse.

Questions 8 and 9 measured the reaction of participants to the perceived actions of the wealthy. In question 8, participants (they) were asked if they believed a rich coworker (he) contributed more to his 401(k) than them. In question 9, participants were asked if they would contribute more or less to their 401(k) based on their response in question 8. If participants acted in parity with their rich coworker and invested more when they believed he invested more than them then we labeled them as 100% correlated with the rich. If participants acted out of parity with their rich coworker and invested opposite (less or more) of what they believed he invested (more or less) then we labeled them as -100% correlated with the rich. Our sample was split with an average of 2% correlation.

We asked several questions centered around projection bias but did not use them in our main analysis.[6]

2.3 OUTCOME MEASURES

Our main analysis focused on investment choice questions which presented three funds for participants to choose from. Funds listed their expected returns rate, range of returns, minimum investment, and maximum investment; our focus was the expected returns rate (return).

We specified the correct fund choice as the fund with the highest return. Our sample chose 0.75 correct funds across the 4 fund sets. Based on fund choice we calculated participants' average returns per choice—5.86% per year which is 2.64% below the optimal of 8.5%. It is important to note that this difference is extremely close to the optimal selection example we presented at the beginning of this paper based on real investment options.

We asked participants to state their willingness to invest given a scenario in three questions—11, 13, and 18. These scenarios were meant to invoke a societal comparison based on the investment behavior of the wealthy described through higher than average income, spending, and parental income respectively. We scaled these responses on a

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[6] Questions 5, 16, and 17

scale from -100% to 100% to measure participant responses from "Very unlikely" to "Very likely" to invest.

3. Analysis

A dichotomy of response to societal pressures in investment by wealth is well studied for older generations (Danes 1994; Behaghel and Blau 2010; Beshears et al. 2015) but is not well known for Gen Z (nor Millennials). Our analysis focused on disparities in investment choices between wealthy and non-wealthy participants identified through self-reported parental wealth above $150,000.

Table 1 presents a summary of key variables from our survey results separated by parental wealth (wealth). Table 2 presents a summary split by risk aversion—which we show later is a key determinant in investment choice—including correlation with wealth.

Table 1 shows no significant difference in fund choice, returns, loss aversion, market trust, nor correlation of action with perceived rich by wealth status. Our sample is well balanced by respondents across these groups. For now, we take note of the similarity in wealth.

Table 2 shows a clear advantage for the risk-neutral in fund selection as an increase in correction selection by 0.96 funds and average returns with 0.99% higher returns. There are no other significant differences in risk tolerance and risk aversion split by wealth.

The correlation between risk aversion and wealth is only 8.1%. Risk aversion is only 1.5% correlated with self-reported confidence in the investment. Self-reported confidence itself is only -13.3% correlated with parental wealth. And loss aversion is uncorrelated with risk aversion. Therefore, we can claim that these factors are not interrelated and use them all in our primary analysis.

Table 1   Survey Results Separated by Parental Wealth

Variable	Non-wealthy	Wealthy
Correct fund choices		
Funds correctly selected across 4 questions	0.75 ± 0.94	0.74 ± 0.98
Average returns (percent)		
Average expected returns across funds chosen	5.84 ± 1.00	5.88 ± 1.05
Loss Aversion		
Loss aversion indicated by responses	20.83 ± 41.49	29.63 ± 46.53
Trust in Market		
Self-reported trust in stock market	56.67 ± 16.33	53.33 ± 14.68
Correlation with Perceived Rich		
Correlation of action with perceived action of wealthy	-8.33 ± 101.80	11.11 ± 101.27
Respondents	24	27

Mean $\pm$ standard deviations are reported for each variable in percentage terms (aside from correct fund choices). Non-wealthy and wealthy are separated based on response to a self-reported response to the survey question asking if parents' income is below (non-wealthy) or above (wealthy) $150,000

Table 2   Survey Results Separated by Risk Aversion

Variable	Risk neutral	Risk averse
Correct fund choices		
Funds correctly selected across 4 questions	1.57 ± 1.40	0.61 ± 0.81
Average returns (percent)		
Average expected returns across funds chosen	6.71 ± 0.98	5.72 ± 0.97
Loss Aversion		
Loss aversion indicated by responses	28.57 ± 48.80	25.00 ± 43.80
Trust in Market		
Self-reported trust in stock market	60.00 ± 11.55	54.09 ± 15.89
Correlation with Perceived Rich		
Correlation of action with perceived action of wealthy	14.29 ± 106.90	0.00 ± 101.16
Wealthy Parents		
If self-reported wealth of parents exceeds $150,000	42.86 ± 53.45	54.55 ± 50.37
Respondents	7	44

Mean $\pm$ standard deviations are reported for each variable in percentage terms (aside from correct fund choices). Risk neutral and risk averse are separated based on response to a self-reported response to a question which asks if they are willing to accept (risk neutral) a favorable bet on a fair coin flip or not (risk averse).

3.1 FUND CHOICE

We are interested in optimal investment which we define as the ability to choose investments with the highest possible expected return. We use average returns calculated across the investment choice questions on our survey. We measure the impact of parental wealth, proclivity to mimic the actions of the wealthy, risk aversion, self-reported investment confidence, and loss aversion on average returns across our survey respondents.

We use the ordinary least squares regression of average returns on parental wealth exceeds $150,000 (wealthy), if they correlate with the wealthy (mimic), risk aversion (risk), self-reported investment confidence as "Confident" (1) or "Very confident" (2) (conf), and loss aversion (loss) to measure the influence of these factors on optimal investment choice. We assume our error term is normally distributed independently and identically distributed.

The regression results follow with standard errors shown in parentheses:

$$Returns = 0.20(Wealthy) - 0.68(Mimic) - 1.07(Risk) + 0.30(Conf) - 0.20(Loss)$$
$$(0.26) \qquad\qquad (0.27) \qquad\qquad (0.37) \qquad\quad (0.37) \qquad\quad (0.31)$$

Our results suggest that risk aversion and mimicry of the actions of the wealthy significantly determine expected returns in investment choice. Other factors present logical signs but were not significant and will be discussed no further.

Risk-averse participants chose funds with 1.07% lower returns than their risk-neutral counterparts. Risk aversion appears to be a key factor to address to improve investment choice.

This risk aversion may translate into nonoptimal (or too little investment) that can hurt retirement outcomes. The 1.07% deficit compared to optimal investment translates into a $1,953 loss after 10 years, $79,172 after 30 years, and $514,789 at retirement.

Those that mimic the wealthy chose funds with 0.68% lower returns than those who acted opposite. This mimicry could indicate a lack of understanding in the market and thus the desire to follow someone with high status—shown through wealth. This lack of understanding may drive the nonoptimal fund choice that translates into a $1,254 gap

from an optimal investment after 10 years, $52,198 after 30 years, and $345,793 at retirement.

If an individual were to succumb to both biases, they would see an investment deficit of $3,133 after 10 years, $121,614 after 30 years, and $766,781 in retirement. This puts them at $1,353,702 in total savings which is below the required amount to live comfortably on investment returns ($1,529,453).

3.2 SOCIAL COMPARISONS

The literature suggests that positive social comparison may increase retirement investment (Danes 1994; Duflo and Saez 2003; Lim and Magwegwe 2021). But sometimes this social comparison has adverse effects that discourage the poor from investing but encourage the wealthy (Beshears et al. 2015). We explore this possible discrepancy in response to social comparisons by wealth status. To do this we measure the difference in means in the reaction of participants to scenarios depicting the investment choice of the wealthy, ultra-wealthy, and minorly wealthy across participants' wealth.

Question 11 states that the wealthy (top 1.5%) invest. This question does not discourage the non-wealthy who choose to invest 25% of the time but does significantly encourage the wealthy to invest relative to the non-wealthy. Our wealthy participants reported a 67% intent to invest—a significant increase of 41.67% compared to the non-wealthy.

Question 13 states that the ultra-wealthy (top 0.5%) invest. This question does not affect the non-wealthy—who are neutral at 2.08%—but significantly discourages the wealthy from investing at -24.31% relative to the non-wealthy. This presentation of the ultra-wealthy establishes a boomerang effect for the wealthy. This adds an element of needed caution when trying to encourage investment through societal comparison.

Finally, question 18 states that the wealthy (top 7.5%) invest. We see no significant response from either the non-wealthy (12.5%) or the wealthy (16.7%) to this question.

It is important to note that our sample is biased by those who can afford to attend college and likely only captures the wealthy and the middle class rather than the full wealth spectrum of the US. This left censoring is likely the cause of the neutrality seen in

our non-wealthy group. Question 11 shows a channel for inequality in investment by income as the wealthy are encouraged to invest by the observation of other members of their socioeconomic class investing—findings that are supported by Chetty et al. (2013).

Also, these surveys represent the choices of the young. We know that investment participation grows with marriage and that marriage is more likely for wealthier individuals who are better able to afford it (Hou and Sanzenbacher 2019). So we may underestimate the advantages of the wealthy over the non-wealthy.

Our results appear to indicate that societal comparisons only encourage investment when of the same social class (Beshears et al. 2015). This is a key result in the formation of our proposal.

4. Proposal

Our proposal targets sources of biased thinking (e.g., risk aversion) through concise graphics supported by the social influence of an interactive, gamified approach to ongoing investments.

Our survey found that risk aversion is the most significant deterrent to optimal investment and that social pressures alleviate these concerns to an extent. The literature supports that risk aversion inhibits optimal investment when opportunities are framed with a chance of negative returns (Candraningrat et al. 2018). The main goal of our program is to address risk aversion directly by showing how risk-averse decisions compromise optimal investing as the risk of missing out on money that one's peers accrue when they invest and oneself does not. Saving behaviors depend on the framing of information and the ease with which the information is understood, so this information will be presented using visualizations that even those with little financial knowledge can understand.

We plan to introduce this information in social investment groups to capitalize on peer effects that affect investment decisions. New hires will be automatically enrolled in a social investment group with the opportunity to opt out. To announce the social investment groups and basic information about investing we designed a simple pamphlet for HR to distribute to new hires, as shown in Figure 2. The pamphlet will make the new hires aware of the benefits plus dispel any concerns about the risks associated with the investment.

Figure 2   Sample Pamphlet
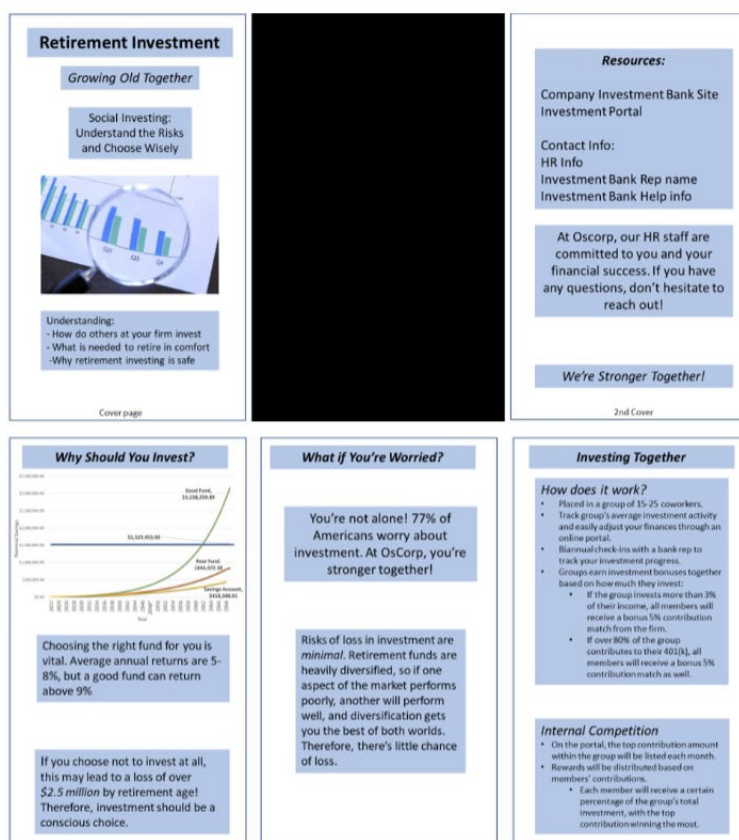
Note. A sample of an HR pamphlet we suggest. The top panel shows the outer cover of the pamphlet and the inner cover. The bottom panel shows the fully opened pamphlet which includes a description of losses accrued when not investing and an outline of our social investment group programs.

Groups will consist of 15-25 newly hired employees (from the same firm) and be run by the bank that handles their retirement accounts. Groups should have similar wage and job characteristics amongst employees to enable positive peer effects. Employees will reap returns from their individual accounts but will be aware of investment statistics within their groups—total investment, average investment (per contributor), top investment, and participation rate—that are made easily accessible in a group investment portal run by the bank; workers should also be able to easily modify their contribution rate through the portal. The display of investment from individuals of the same income class should encourage the investment of workers within the group.

To incentivize investment, we provide rewards for participation in social investment groups. We recommend firms lower their contribution matching from 100% to 65% to spend the same amount with this policy in place as before. Rewards will be based on

monthly investment targets associated with group contributions and participation rates. If a group invests at least 3% of their income (as a group) then they all get a bonus 5% contribution match from the firm. Groups get an additional 5% match for every 0.5% of their income they invest beyond the initial 3% target. If a group has an 80% monthly participation rate then they all get a bonus 5% contribution match. Workers should increase contributions to meet these targets to gain the reward for themselves and their fellow group members.

Within groups, there will be a competition that is made fair through the wage matching within groups. The social investment group portal will always list the top monthly contribution and participants will get additional funds based on their relative placement within the group. Still, the placement itself will not be reported to preserve the financial privacy of individual members. We designed a payout scheme to maintain previous levels of contribution matching for the firm (when they matched 100%). Participants will receive $2\frac{(N-P+1)}{N} \times 2^{(20-N)}$% of the total group's investment in additional funds added to their 401(k) accounts. Where P is placement (starting at 1 for first) and N is the number of participants. Those that do not contribute to their 401(k) will not receive this bonus.

The reward scheme will match exactly 100% of contributions if the group invests 3.5% of their income and 80% of the group participates. The most common default contribution rate is 3% so firms will spend less unless contribution rates increase with the game but this matching scheme may easily be modified to account for that possibility.

To capitalize on the influence of peer effects and the social nature of these groups we recommend firms and banks institute a biannual check-in for the entire group with a bank representative. In the meeting, the representative will cover the simple statistics of the group, how much money the group has earned together, and encourage them to ask any questions. We expect these social investment groups to increase investment across all income levels through positive peer effects rather than exclusively benefitting from the highest income as previous attempts have managed and may also serve to enhance general financial literacy.

5. Conclusion

Our proposed policy can avoid a financial loss of $766,781 for individuals who tend not to invest optimally. And this is an underestimate of the full societal costs of nonoptimal investment as a lack of retirement preparedness is passed on to children (Heller-Sahlgren 2013). Our generation struggles with this adverse external cost of unpreparedness and with our policy, we wish to affect a positive change to disrupt this harmful cycle.

By automatically enrolling new employees into social investment groups with their coworkers, coordination with investment experts is easier and participants benefit from positive peer effects. These groups will increase retirement investment participation through an incentive system—private and social—and decrease pessimism causing risk aversion through the socialization of investment to bolster the financial prospects of Gen Z. These groups benefit all income levels by grouping workers based on wage to elicit the most relevant peer effects whereas previous policies have disproportionately benefited the rich (Beshears et al. 2015).

Our proposed policy can be easily evolved to maximize benefits. Ongoing assessment of social investment group performance can be integrated to modify group targets, expert feedback, and presentation of financial data. With more data, pamphlets and other materials may be curated to target biases that were underexplored in our work—the hot hand fallacy, the law of small numbers, and the perception of fairness in the financial system. But our policy does not touch on the social security system that is failing and is expected to run out of excess reserves by 2034—only 12 years from this proposal (SSA 2022). Gen Z has given up on the idea that we will reap the benefits of social security, especially since birth rates are declining and the workforce will only shrink as a result. Our work will make up for the loss of social security with equitable personal savings to enhance retirement prospects across all income levels for Gen Z.

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7. Appendix

A. SURVEY QUESTIONNAIRE

1. What is your household's estimated yearly earnings (sum of parents' earnings)?
    a. Below $150,000 a year
    b. Above $150,000 a year
2. In the US, on average, entry-level undergraduate workers earn $55,000/yr and invest 3% of those earnings ($1650) in their firm's mutual 401(k) fund—returns on investment are typically 5-8%. These 401(k) funds are tax-advantaged, and investments are often matched by employers (92% of firms match investment in the US) making 401(k) funds preferable to direct investment in stocks. Given this knowledge of average investor behavior in the US, how much money do you plan to invest in your company's 401(k)?
    a. Enter amount (in US Dollars) you are likely to contribute per year:_____
3. How much do you trust the stock market? (In other words, do you believe stock prices are correctly valued?)
    a. Very low trust   b. Low trust   c. Neutral   d. High trust   e. Very high trust
4. Would you accept a coin toss that yields $200 if heads but costs $150 if tails?
    a. Yes
    b. No
5. If there was a dip in the stock market (when stock prices drop), would you purchase additional shares of a stock while prices are low?
    a. Yes
    b. No
6. Which investment fund would you invest in?

Fund 1	Fund 2	Fund 3
Expected Returns Rate: **2%**	Expected Returns Rate: **5%**	Expected Returns Rate: **8%**
Range of Returns: **1% to 8%**	Range of Returns: **0% to 10%**	Range of Returns: **1% to 13%**
Minimum Investment: **$2,000**	Minimum Investment: **$5,000**	Minimum Investment: **$12,000**
Maximum Investment: **$30,000**	Maximum Investment: **$50,000**	Maximum Investment: **$80,000**

7. Imagine that you have decided to see a concert with a $50 per ticket admission. As you enter the concert venue you discover that you have lost a $50 bill. Would you still pay $50 for a ticket for the concert?
    a. Yes
    b. No
8. Your coworker arrives in his brand-new 2022 Maserati MC20 ($212,000) an hour late to work every day. Do you believe his 401(k) contribution rate is higher or lower than yours?
    a. Higher
    b. Lower
9. Given your response above, does that make you more or less likely to invest in your firm's retirement fund?
    a. More likely
    b. Less likely
10. Which investment fund would you invest in?

Fund 1	Fund 2	Fund 3
Expected Returns Rate: **5%**	Expected Returns Rate: **6%**	Expected Returns Rate: **4.5%**
Range of Returns: **0% to 9%**	Range of Returns: **-2% to 12%**	Range of Returns: **4% to 5%**
Minimum Investment: **$1,000**	Minimum Investment: **$4,000**	Minimum Investment: **$6,000**
Maximum Investment: **$25,000**	Maximum Investment: **$40,000**	Maximum Investment: **$70,000**

11. 90% of people who earn more than $250,000 invest in 401(k) funds. Given this news, how likely are you to invest?
    a. Very unlikely   b. Unlikely   c. Neutral   d. Likely   e. Very likely

12. Default Bias 2 (high to low): Which investment fund would you invest in?

Fund 1	Fund 2	Fund 3
Expected Returns Rate: 9%	Expected Returns Rate: 7%	Expected Returns Rate: 6%
Range of Returns: 0% to 12%	Range of Returns: 1% to 9%	Range of Returns: 0% to 8%
Minimum Investment: $13,000	Minimum Investment: $4,500	Minimum Investment: $2,000
Maximum Investment: $90,000	Maximum Investment: $55,000	Maximum Investment: $35,000

13. Your neighbors who just bought a summer home at the beach tell you they invested in Peloton. After hearing this, how likely are you to invest in that same stock?
    a. Very unlikely   b. Unlikely   c. Neutral   d. Likely   e. Very likely

14. Imagine that you have decided to see a concert with a $50 per ticket admission. As you enter the concert venue you discover that you have lost your ticket. The ticket was not individualized and cannot be recovered. Would you pay $50 for a new ticket for the concert?
    a. Yes   b. No

15. Which investment fund would you invest in?

Fund 1	Fund 2	Fund 3
Expected Returns Rate: 4%	Expected Returns Rate: 11%	Expected Returns Rate: 6.5%
Range of Returns: 0% to 6%	Range of Returns: -10% to 15%	Range of Returns: 1% to 9%
Minimum Investment: $2,500	Minimum Investment: $5,500	Minimum Investment: $8,000
Maximum Investment: $20,000	Maximum Investment: $40,000	Maximum Investment: $70,000

16. Your employer's fund had 9% returns last year and your personal stock investments had 12% returns last year. How likely are you to invest in your employer's account?
    a. Very unlikely   b. Unlikely   c. Neutral   d. Likely   e. Very likely

17. Retirement requires $60,000 in yearly returns from a portfolio. If your investments of $300,000 earned 20% interest last year, how likely are you to invest this year?
    a. Very unlikely   b. Unlikely   c. Neutral   d. Likely   e. Very likely

18. Recent studies have shown that the average Gen Z workers invest $6,000 based on average parents' earnings of $150,000 and investment support from their parents. After seeing this, how likely are you to invest?
    a. Very unlikely   b. Unlikely   c. Neutral   d. Likely   e. Very likely

19. How old are you?: _____

20. Please specify your ethnicity.

21. What gender do you identify as?

22. How confident are you that you could make adequate financial investments if asked to do so today?
a. Not at all confident   b. Not confident   c. Neutral   d. Confident   e. Very confident