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Financial Crisis**

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Socioeconomic Status and Individual Investors' Behavior during a Financial Crisis

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ABSTRACT

The COVID-19 pandemic triggered a financial crisis that provides a unique opportunity to examine investor behavior using an administrative dataset of individuals in Israel. The dataset includes information on withdrawals from tax-sheltered training funds, switching to less risky or riskier investment tracks, and individual socioeconomic status (SES). Our analysis reveals that during the peak of the crisis in March 2020, low-SES investors were more likely to withdraw money from their training funds despite incurring a significant tax penalty for so doing. This resulted in a double loss for poorer investors, who were hit by both the stock-market decline and the tax penalty. In contrast, higher-SES investors were less likely to liquidate their funds. Additionally, investors were found to be more likely to increase risk as SES rises and less likely to decrease risk as SES rises.

Keywords: financial crisis, household finance, household saving, personal finance, COVID-19, socioeconomic status, SES

JEL classification: G11, G51

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1. Introduction

The composition of individuals' investment portfolios has been extensively investigated. Classical economic theory predicts that the share of risky assets (typically stocks) in individuals' portfolios is positively related to expectations of future return, negatively related to expected future risk, and positively related to risk appetite (Campbell, 2006).

Empirical studies also attest that individual investors reduce their portfolios' exposure to stocks following losses and financial crises (Andersen et al., 2019; Bucher-Koenen and Ziegelmeyer, 2014; Glaser et al., 2005; Guiso et al., 2018). Bucher-Koenen and Ziegelmeyer (2014) also demonstrate that financially illiterate households in Germany were more prone than others to sell losing assets during the global financial crisis.

In this article, we empirically investigate the response of individual investors in Israel to the 2020 financial shock that stemmed from the COVID-19 crisis. We use a unique dataset of investors' decisions regarding their training funds, a popular type of provident fund that confers substantial tax benefits. Investors may decide on any day to liquidate the fund entirely or partially or to transfer the accumulated savings to another training fund that offers a higher or lower exposure to stocks. The latter option allows investors to change their risk exposure without any withdrawal. We use micro-level data on these decisions in March–May 2020 and March–May 2019 to examine their determinants. Our main inquiry concerns how these decisions depend on investors' socioeconomic status, which we infer from their place of residence as reported in our source of personal data.

The setup of our study has several advantages for addressing our research question. First, liquidating a training fund is quite costly because it entails the loss of the enormous tax benefits that accrue to those who retain these funds. Second, investors are limited in what they can do: they cannot increase or decrease their contribution to the fund but only redeem the fund or transfer it to a different track. Third, the number of fund tracks is limited and differentiated mainly in exposure to stocks. Therefore, it is straightforward to link the decision to risk-taking or risk-avoidance.

We offer evidence that individuals of higher socioeconomic status (SES) are less inclined to liquidate their funds immediately after stock markets fall than they are in a non-crisis period, whereas lower-SES individuals respond contrarily, tending more to liquidate their funds in response to a crisis. This behavior has long-lasting wealth effects not only because lower-SES investors may forfeit the positive returns that a quick recovery of the markets would generate (roughly 10% on the most popular fund in the case at hand) but also, and mainly, because the substantial tax benefits associated with these funds (estimated at 42%) are also forgone.

To further investigate whether the documented behavior reflects attitudes toward risk, we analyze investors' decisions to transfer their balances to riskier or safer fund tracks. We again observe that lower-

SES individuals were more inclined to transfer their training-fund savings to tracks that had lower stock exposure. Interestingly, higher-SES investors tended to take the opposite path, transferring their savings to riskier tracks in order to gain more from the market recovery that they expected.

Several studies have investigated the influence of personal experiences on investment decisions. Choi et al. (2009) found that investors who achieve positive savings outcomes, such as a high average or low-variance return, tend to increase their savings rate more than do those with less favorable outcomes. Dominitz and Manski (2007), basing themselves on a survey of American households, found that as expected returns increase, portfolios tend to have a higher allocation to stocks. Malmendier and Nagel (2011), using survey data, discovered that individuals who have experienced poor stock-market returns during their lifetime generally exhibit less willingness to take financial risks. They are also less likely to participate in the stock market and invest a smaller proportion of their liquid assets in stocks if they do participate. In contrast to this literature, our paper uses administrative data to examine the immediate response of investors to a downswing in the market.

A selected number of studies utilized the 2008–2009 financial crisis to probe a similar question. Andersen et al. (2019) used administrative data from the crisis period to show that the personal experience of negative stock returns, rather than common shocks, made individuals more risk averse. Bateman et al. (2011) used survey data from 2007–2008 to document a slight decrease in risk tolerance among individual investors following the crisis. Bucher-Koenen and Ziegelmeier (2014), using survey data and portfolio choices of German investors to examine their response to the crisis, found that financially illiterate households were more likely to sell assets that had lost value. Guiso, Sapienza, and Zingales (2018) used repeated surveys and portfolio choices of Italian investors to test whether risk aversion increased following the crisis. They discovered that risk aversion increased significantly after the crisis and that the affected individuals divested more stocks. Hoffmann and Post (2017) used data from the Netherlands, combining brokerage records and monthly survey measurements, to examine how individual investors updated their beliefs and preferences following their personal experiences. They found that investors' past returns positively impacted their return expectations and risk tolerance while negatively impacting their risk perceptions. Hoffmann et al. (2013) combined monthly survey data with matching trading records and found that during the worst months of the crisis, investors' return expectations and risk tolerance decreased while their risk perceptions increased.

Our study adds to this literature by investigating how socioeconomic status affects individual investors' response to a financial crisis. We find that during a crisis, lower-SES investors tend to divest or reduce risk while high-SES investors tend to take advantage of the crisis to increase their returns. Notably, our study is the first to show that sophisticated investors increase their risk-taking during a financial crisis in order to capitalize on the anticipated recovery of the capital market.

This study is also related to Biliias et al. (2010), who used panel survey data from the 1990s and early 2000s to examine the behavior of individual investors over time. They found that households with brokerage accounts tend to overtrade while most of the population demonstrates significant inertia in both trading and stock-market participation. This inertia in investment behavior is associated with household characteristics but appears to be less sensitive to the state of the stock market. In our study, we also observe inertia in investing in provident funds but find it contingent upon the investors' socioeconomic status. Specifically, high-SES investors were less likely to divest from the market than were low-SES investors.

Our study also adds to the literature on how individuals responded to the COVID-19 pandemic in terms of their economic behavior. Bu et al. (2020) used survey data on students from Wuhan, China, and found that exposure to the pandemic resulted in a lower preference for risk and more pessimistic beliefs about the state of the economy. Hanspal et al. (2020) used survey data from the U.S. to examine the effect of the stock-market decline due to the COVID-19 pandemic on investors' beliefs about the stock-market recovery and their own wealth. Our study complements this literature by directly measuring the shift in investors' risk-taking during the pandemic and asking how it affects households at different levels of socioeconomic status.

Our paper proceeds as follows: Section 2 elaborates on the consequences of the COVID-19 pandemic for the Israeli economy and the government's policy response. In Section 3, we explain training funds and their tax treatment. The dataset, our research hypotheses, and the methodology are described in Section 4. Section 5 presents the results and Section 6 concludes.

2. COVID-19 and the economy

The COVID-19 pandemic came to Israel swiftly and received immediate government attention. The first case reported was on February 27, 2020. Two weeks later, a succession of lockdown measures accentuated the severity of the plague. The education system was shut down on March 14; restaurants and movie theaters were closed soon afterward. On March 19, restrictions on movement were imposed; on March 20, staff in public and private workplaces were downscaled to 30%. On March 20, the first fatality from the disease was reported. The Prime Minister appeared regularly on the evening news and explained the risk of an exponential spread of the virus and warned that it could quickly lead to 10,000 deaths. (At the present writing—August 2022—total fatalities in Israel have surpassed 11,000.)

The pandemic jolted Israel as it did the rest of the world. Beyond the acute morbidity and the mortality that came with it, the changes in individuals' behavior and the measures taken by the government to restrain the disease dealt the economy, welfare, and all ways of life a tremendous blow. The Israeli economy greeted this health-related and economic crisis at an auspicious point of departure: protracted economic growth, brisk activity, a meager jobless rate in a full-employment environment, an ongoing surplus on current

account, and bounteous foreign reserves. The range of measures that the government took to stanch the pandemic thrust the economy into a contraction in the last part of the first quarter of 2020 that continued in the second quarter. As a result, the unemployment rate careened wildly, starting with an upturn in the first half of 2020. The labor-market data for March 2020 showed that roughly a million employees applied for unemployment compensation, 850,000 more than those who did so in February 2020, and the share of jobseekers soared to 24% of the labor force. Gross Domestic Product dropped by 6.7% in the first quarter of 2020 relative to the previous quarter and by 28.8% in the second quarter relative to the first quarter (both rates annualized).

The sense of uncertainty that accompanied the pandemic and these responses was reflected on the Tel Aviv Stock Exchange. The primary index of the bourse, the Tel Aviv 35 (hereinafter: TA-35), plummeted from 1734 points on February 20, 2020, to 1182 on March 19, 2020—a total loss of 31.8%. Immediately afterward, however, a rebound began. The recovery of the domestic bourse was slower than that of the S&P-500 (Figure 1): the TA-35 returned to its pre-crisis level in May 2021; the S&P-500 did so in July 2020. In comparison, in March 2019, the TA-35 fell only by 1.8%, and the S&P-500 advanced by 1.8%. The Israeli provident funds, the class to which the training funds belong, diversify their portfolios by investing overseas. Therefore, both the TA-35 and the S&P-500 may be considered reference indices for these funds.

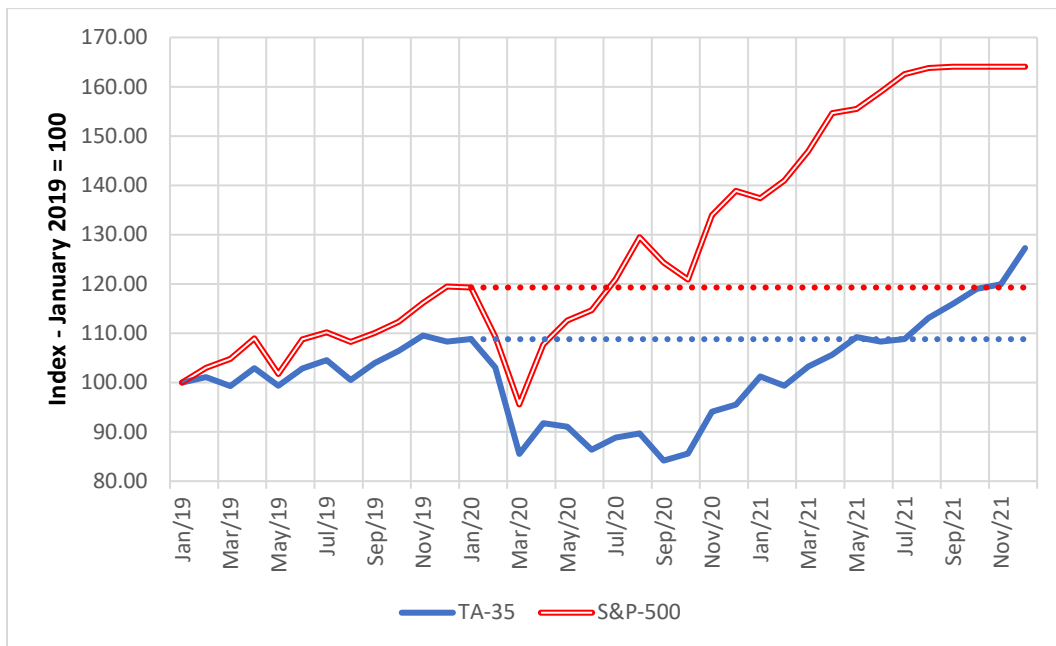


Fig. 1. The Israeli stock market (TA-35) vs. S&P 500, January 2019–December 2021 (January 2019 = 100.00). The dotted lines denote the index level in January 2020.

3. The Israeli training funds

Training funds are a specialty of the Israeli employment and financial markets. They deliver a benefit as employees and employers make monthly contributions from qualifying wages (at typical rates of 2.5% and 7.5%, respectively) into an investment fund. After six years of vesting, the money may be withdrawn tax-free. The fund belongs to the employee, who has total control of where it is invested, its risk profile, and when to withdraw the money.

Investors in these funds are entitled to two types of tax benefits. First, the employer's matching contributions are untaxed unless the amount is withdrawn in the first six years after the fund is initiated. Namely, sums invested or withdrawn after six years are untaxed. Second, while capital gains in Israel are generally subject to a flat 25% tax rate (irrespective of personal income), capital gains in training funds are untaxed. Therefore, cashing the fund before six years is ordinarily subject to personal tax on the employer's matching contribution, and cashing at any time wipes out the tax shelter against future capital gains. It bears emphasis that even the lowest-income investors are liable to the 25% capital-gains tax; therefore, the loss of this tax benefit is severely wealth-destructive for them. Moreover, given that training funds constitute a greater proportion of wealth for lower-income investors than for others, the loss of these capital-gains-tax benefits is much more meaningful for them. Consequently, investors are typically advised not to liquidate their funds. If investors are short on cash, fund managers offer loans at attractive interest rates, using the fund as collateral.¹

Although training funds were first launched in the 1960s for the purpose expressed in their name—allowing citizens to take advanced training with no tax liability—it was the introduction of the capital-gains taxation system in 2003 that transformed them into tax shelters and established their acute importance in the provident-fund market. Thus, the share of training funds in the provident-fund market soared from 28% in 2002² to approximately 47% in June 2021, their assets adding up to NIS 299 billion (roughly USD 90 billion) at the latter time.

The source of our data is an insurance company—one of the largest in Israel—that also operates as a money manager. In the latter capacity, it offers twelve different training funds that differ in their investment strategies. Some 85% of these funds' assets are kept in a single fund known as a general fund. We managed to secure data on the behavior of investors in these funds at the beginning of the COVID-19 crisis in Israel (March–May 2020) and in a control period (March–May 2019).

¹ Grace loans (and other types) are offered for a period of up to seven years at rates similar to those on mortgage loans, covering up to 50% of total savings in the first six years from initiation of the fund and up to 80% of accrual when fund maturity exceeds six years.

² All figures in this section are based on Gemelnet (<https://gemelnet.cma.gov.il/>), a platform managed by the Israel Ministry of Finance that reports performance measures on all provident funds in Israel in order to encourage competition and transparency.

Figure 2 shows the cumulative returns on three specific funds—a general fund, a stock fund, and a bond fund—from January 2020 onward. The funds differ mainly in the rate of stock investment (roughly 34%, 76%, and 0%, respectively). The stock fund and the general fund already showed negative returns in February 2020. March saw a tremendous loss, all funds reporting negative cumulative returns: 5% in the bond fund, 10% in the general fund, and 20% in the stock fund. In comparison, in March 2019 all three funds yielded positive returns: 0.93% (bond), 0.83% (general), and 0.59% (stock). The funds began to recover in April 2020 and recouped their total losses by November. Notably, they rebounded much more quickly than did the Tel Aviv Stock Exchange, which recouped its losses only in May 2021. The funds recovered more quickly because they invest overseas. Over 45% of general-fund assets, for example, are in foreign countries.

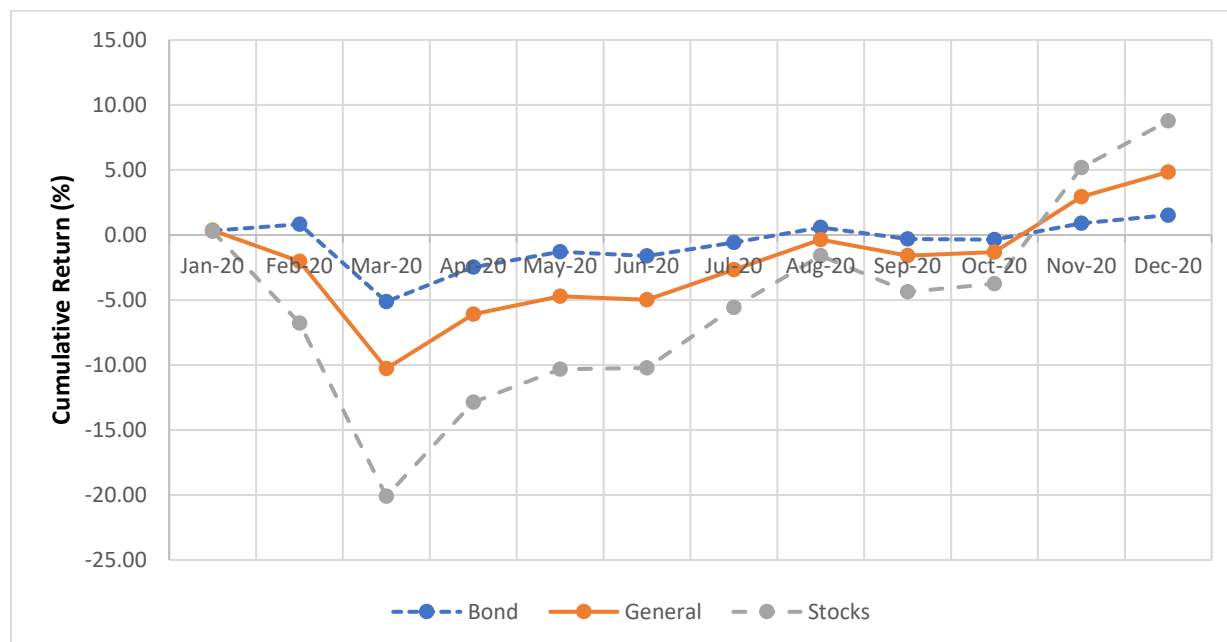


Fig. 2. Cumulative return starting January 2020, three funds

In view of these data, it is evident that any fund redemption in March 2020 came at a significant opportunity cost to the investor. Redemption of a general/stock fund at that time generated a 12%–25% loss in eight months. Market timing is tricky; missing out on a few “good” days in the stock market may degrade portfolio returns substantially. Therefore, any cash out due to a market decline leaves the investor seriously exposed to the risk of missing out on a stock-market recovery.

The loss of market recovery may represent hindsight; therefore, our research architecture is not based on it. Instead, we identify the destruction of the tax shelter against future capital gains as a significant loss. The average annual return on a general training fund from 1999 to 2020 was 7.5%; therefore, the exemption

from the 25% capital-gains tax potentially increased the net annual return by 1.9%. An NIS 100 contribution³ earning a compound return could increase to NIS 425 in twenty years given the tax benefit but only to NIS 299 without it.⁴ The present value of the difference (NIS 126), at a 5.6% (7.5%–1.9%) discount rate, is NIS 42 (42% of the original investment). A similar calculation for the bond and stock funds yields estimates of 28% and 52%, respectively—all depending on the expected term to redemption.

Given the propensity among most investors to treat these funds as supplemental to their retirement planning, a twenty-year horizon is a reasonable assumption. On the alternative assumption of ten years of additional investment, the cost of destroying the tax shelter falls to 19% (general fund), 23% (stock fund), and 13% (bond fund). We do not aim for an exact valuation of the tax shelter. Even our simplified calculations, however, point to a significant loss of tax benefit when a training fund is redeemed early. For older investors, the expected term to redemption is shorter; therefore, the value of the tax shelter is smaller. We would expect to find a higher tendency to liquidate among these investors.

Notably, training-fund owners can change the risk profile of their investment in the fund without incurring these significant losses and without redeeming their savings by switching to another type of fund. The outcomes of such actions are analyzed below.

4. Data and methodology

4.1. Data

In this study, we used several administrative databases obtained from a large insurance and financial-holding company in Israel and focused on information about transactions by training-fund investors in March–May 2019 and March–May 2020. We define March–May 2020 as the crisis period and March–May 2019 as a representative regular period. To verify this hypothesis, we analyzed monthly withdrawal rates from a single training fund. This fund constitutes approximately 85% of the total amount of training funds managed by our data contributor. Figure 3 shows the withdrawal rates for each of the months in the years 2019 and 2020 and for a reference period (2017, 2018, 2021, 2022). The figure clearly shows that the withdrawal rate in March 2020 was extraordinary while the withdrawal rates in 2019 strongly resembled those in the reference period. We then used all monthly observations of the withdrawal rates from this fund in the years 2006–2022 to determine the statistical significance of the observed behavior. We also ran an OLS regression, in which the explained variable is the withdrawal rate and the main explanatory variables

³ The New Israeli Shekel (NIS) was worth approximately USD 0.30 in August 2022.

⁴ In this estimation, we assume that capital gains are subject to annual taxation. This assumption considers another advantage of training funds: the tax exemption that kicks in when the investor changes fund tracks (e.g., from stock fund to bond fund). In any alternative investment except for retirement plans, a change in investment track is subject to immediate taxation on the accrued capital gain. If we assume taxation of the alternative only at liquidation after twenty years, then the sum of NIS 100 would increase to NIS 325 (after tax), and the present value of the difference (425–325) would be approximately 27% of the investment amount—still very high.

are dummy variables for each of the months March-May 2019 and 2020. We also included dummies for each calendar month (January–December) as control variables in order to control for seasonality and introduced a trend variable (1–204) to control for the observed decline in withdrawal rates over the years. The results indicate that the only extraordinary month in our sample period is March 2020, with a positive and statistically significant coefficient estimate. The coefficient estimates for March 2019, April 2019, and May 2019 are all small and statistically insignificant. Due to space considerations, we do not present the regression results; they are available upon request.

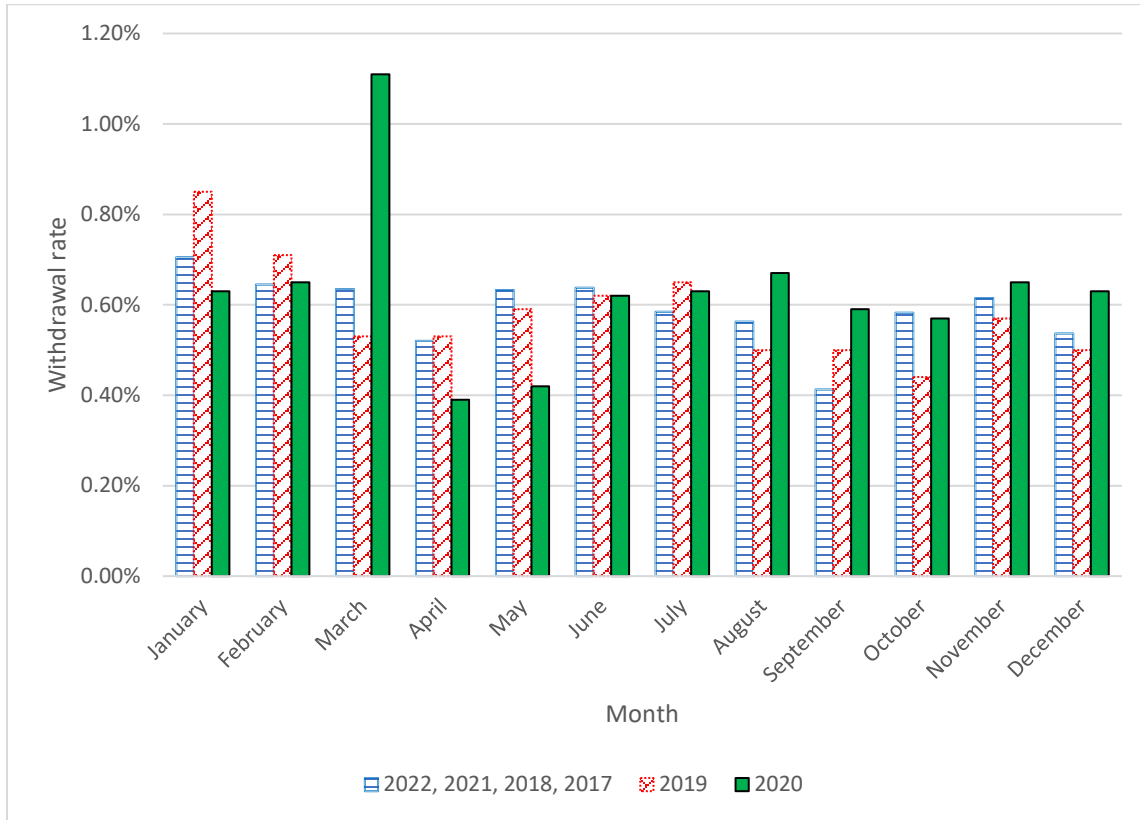


Fig. 3 Withdrawal rates (amounts) for each calendar month in 2019 and 2020, compared with a reference period (average of 2017, 2021, 2022)

We compiled three data files, each complementing the others in order to present a comprehensive and in-depth picture of events in the training-fund market and among those invested in it. The first data file provided information about investors who made no transaction in their training funds during any of the periods covered. The second data file sheds light on investors who liquidated their funds (fully or partly) in each period, including the total withdrawal and its date. The third data file yielded information about training-fund investors who transferred the money in their funds to different investment tracks at either time. The information in this file included the original investment track, the new investment track, and the date of the transfer. Use of the date of withdrawal/transfer generated dummy variables for the month of said

transfer. Our study focused on investors above the age of twenty-one because most Israelis perform military service up to that age and do not invest in training funds.

All three files also provided information on total accrual (the amount available for transfer or withdrawal), the investor's seniority with the training fund, whether the training fund was active (still receiving contributions) or not, whether the investor was employed by a large company (defined as one with a headcount of more than 100), and the investors' demographic characteristics—gender, age, and place of residence.

The Israel Central Bureau of Statistics provides data on the socioeconomic status of every investor's place of residence. We used this variable as a proxy for the investor's SES.⁵ To profile and document a socioeconomic area on the basis of geographic units, it is customary to express socioeconomic content by means of various indices. The indices are usually based on a set of variables, of which the main ones invoked for estimations and calculations are income, education, employment, and demographic characteristics of the region's population (Fleishman et al., 2011). In Israel, the SES of municipalities and local councils (municipalities of smaller localities) is sorted into homogeneous clusters on the basis of sixteen variables that the authorities furnish: average income per standardized person (including pensions), motorization level (percent owning a motor vehicle), housing density, average bathrooms per capita, percent who have an internet connection, average years of schooling, percent holding an academic degree, percent participating in the labor force, percent of women outside the labor force, percent of high-income persons, percent of low-income persons, median age, dependency ratio, average persons per household, and percent receiving an income-maintenance benefit. Each variable (component) is given a specific weight, yielding an index value in the first stage. In the second stage, local authorities are classified into ten homogeneous but unequal clusters based on the index values. The clustering is done by means of a cluster-analysis method that minimizes the variance of index values within the clusters and maximizes the variance of index values between the clusters. Cluster 1 denotes the lowest socioeconomic level and Cluster 10 the highest. The periodically calculated index, yields information about the SES of a given residential area, as stated.⁶

As mentioned above, those who liquidate a training fund after less than six years of accrual are liable to income tax on their employer's contribution, apart from some exceptions. Therefore, based on the variable of investor's seniority with the training fund (expressed in years), a new variable, "eligible to liquidate the training fund," was defined as a dichotomous variable: 1 = eligible to withdraw money with no income-tax

⁵ Justman and Spivak (2004), examining the SES dynamics illuminated by the Israel Central Bureau of Statistics, also point out that this variable highly resembles income per capita.

⁶ Tur-Sinai et al. (2018), examining the contribution of the income variable alone to the ranking of municipal authorities' SES in Israel, find no sizable difference in the ranking of municipal authorities when the total ranking is based on the average per-capita income variable as against the method described above.

liability and 0 = ineligible. Notably, all investors who withdraw their savings lose the capital-gain tax shelter irrespective of the seniority of their savings. In addition, a dichotomous variable called “active training fund” was defined: 1 = an active fund (investor still contributing to the fund) and 0 = an inactive fund. Inactive funds are those belonging to retired investors, unemployed investors, or persons who have multiple funds for whom the observed fund is inactive. A third dichotomous variable is “company size,” 1 denoting an investor employed by a large company and 0 otherwise. Based on the information about the person’s place of residence, the socioeconomic index calculated by the Israel Central Bureau of Statistics was then applied. Given the time that passes between the date on which the investor applies to liquidate the fund or transfer it to a different track and the date on which the transaction takes place, the exact date on which the investor applied to the insurance and financial-holding company for liquidation or transfer was adjusted for each application and its rules.

4.2. Descriptive statistics

The characteristics of the total population examined (investors who made no transactions in their funds together with those who cashed out either wholly or partly) in 2019 are compared with those in 2020 in Table 1. The socio-demographic characteristics of the two populations are found to be very similar. Their average SES is slightly greater than 5.5, indicating that training funds are not the exclusive instrument of choice among high-income investors. Some 52% of those examined each year were men, their average age was 48.8 years (leaving them approximately eighteen years away from the official retirement age in Israel), and 58% were eligible to withdraw money from their funds. The total accrued sum available to the training-fund investor was the same at both times, as was the share of active training funds and the share of investors employed by large firms (50% and 63%, respectively). These findings should not be surprising since the population of the training funds is rather stable.

Table 1

Descriptive Characteristics of the Total Population, by Year

		Year 2019 (N=35,106)	Year 2020 (N=34,926)	P. Value
Gender (%)	Female	47.50	47.41	0.817
	Male	52.50	52.59	
Age (mean, SD)		48.76 (14.07)	48.77 (15.71)	0.9854
Eligibility (%)	No	42.38	42.59	0.602
	Yes	57.62	57.41	
SES (mean, SD)		5.95 (2.20)	5.94 (2.20)	0.4802
Total saving (ln) (mean, SD)		9.16 (2.20)	9.15 (2.19)	0.9268
Active (%)	No	49.79	49.59	0.602
	Yes	50.21	50.41	
Employer size (%)	Fewer than 100 persons	37.36	37.30	0.866
	More than 100 persons	62.64	62.70	

On average, 1.95% of people who had training funds decided to cash out during the investigation period—2.07% in 2019 (the pre-coronavirus period) and 1.82% in 2020 (the coronavirus period). The withdrawal rate seems to have decreased during the coronavirus period. A breakdown of this finding, however, yields a different picture. The withdrawal rate among the lowest SES deciles (1–6) increased by 16%, from 1.78% in 2019 to 2.06% in 2020, as against a 31% decrease in the highest SES deciles (7–10), from 2.33% to 1.61% in the respective years.

Figure 4 shows the breakdown of withdrawal rates for each SES cluster in March–May 2019 and March–May 2020. We dropped Clusters 1 and 10 because almost no one in these clusters makes withdrawals. The figure clearly shows the change in investors’ behavior. Investors of lower SES (except for Cluster 2) were more inclined to withdraw in 2020 and higher-SES investors less so. The upturn in withdrawal rate was 53.3% for Cluster 4 and the decrease was 42.4% for Cluster 9.

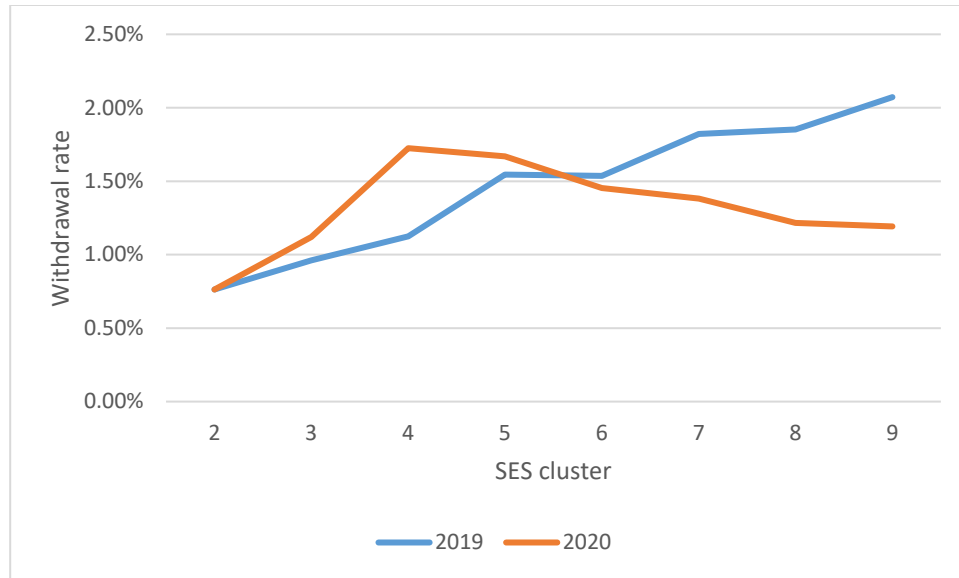


Fig. 4. Withdrawal rates for each SES cluster, March–May 2020 vs. March–May 2019

The relatively sluggish rate of withdrawal matches the findings of Brunnermeier and Nagel (2008), who show that households hardly re-equilibrate their liquid portfolios in response to changes in wealth. We conjecture that our data should show even greater inertia given the relative illiquidity of training funds and the tremendous tax benefits attached to them. Indeed, many investors are known to wait until retirement to cash out their funds. Our findings imply that lower-SES investors tend to withdraw their savings when the market falls while investors of higher-SES tend to refrain from doing so. Therefore, even though the withdrawal rates in the three months of our observation period were small, the overall effect is amplified when the longevity of savings in this vehicle is taken into account.

The characteristics of persons examined who decided to withdraw money from their funds in the two years of the investigation are compared in Table A1 in the Appendix. Here again, the two groups—that of March–May 2019 (hereinafter: 2019) as against that of March–May 2020 (hereinafter: 2020)—were highly similar in most of their socio-demographic traits. No difference was found between them in gender distribution, average age, rate of eligibility to withdraw money from training funds, the share of active training funds, and the share of employees working for large firms. The average SES among withdrawing investors, however, was lower in 2020 than in 2019.

4.3. Research hypotheses and methodology

We used three samples to test four hypotheses, two of which relate to the liquidation of financial assets. In previous literature such as Biliias et al. (2010), it was found that investors with low income and education are more likely to exit stock markets than are others. Additionally, Bucher-Koenen and Ziegelmeyer (2014)

showed that households with lower financial literacy not only invest less in stocks but are also more likely to leave the market following a decline. There is some evidence of a link between socioeconomic characteristics and financial literacy (e.g., Disney and Gathergood, 2013). In this study, we directly tested the influence of socioeconomic status on investors' behavior.

HYPOTHESIS 1: *Investors of higher/lower socioeconomic status are less/more likely to liquidate some or all their training funds in response to the financial crisis.*

HYPOTHESIS 2: *Investors of higher/lower socioeconomic status tend to cash out smaller/larger amounts from their training funds in response to the financial crisis.*

We tested these hypotheses using a merged database of two samples of investors: those who did not liquidate their funds and those who did. Our data are monthly. To test Hypothesis 1, we ran regressions in which the explained variable was a binary one that indicated a decision to liquidate the fund. To test Hypothesis 2, we used a joint sample of investors who cashed out in March–May 2020 and March–May 2019. We ran regressions in which the explained variable was the amount withdrawn and used, the total accumulated amount as a control variable (among other variables).

An economic slowdown may create liquidity needs that investors meet by cashing out their training funds. To separate this determinant of fund redemption from others, we used the third sample, which omits withdrawals and includes only changes in risk composition. We examined whether investors' tendency to move away from risky investments is initiated by changes in their subjective return expectations and volatility and their level of risk aversion. We reasoned that investors of lower SES are more prone to panic than are others. High-SES investors, in contrast, may increase the weight of stocks in their portfolios during financial crises in order to take advantage of the low stock prices. Hence, we proposed two additional research hypotheses:

HYPOTHESIS 3: *Investors of lower socioeconomic status are more likely to transfer their funds to safer (less stock-intensive) tracks.*

HYPOTHESIS 4: *Investors of higher socioeconomic status are more likely to transfer their funds to riskier (more stock-intensive) tracks.*

To test these hypotheses, we used a joint sample of investors who moved their funds to a different investment track in March–May 2020 and March–May 2019. We then ran a regression in which the

explained variable was composed of indicators of transfers to funds with greater/smaller shares of stocks; with this, we tested how SES affected the tendency to take a greater or lesser risk during the financial crisis.

5. Results

5.1 Decision to liquidate

In the first stage, we focused on identifying the determinants of the likelihood of liquidating a training fund during each of the research periods. For this purpose, we used the first data file, which, as stated, includes information about training-fund investors who made no transactions in their funds, together with the second data file, which gives information about investors who liquidated their funds in whole or in part. The research variable “liquidating the training fund” was defined as a dichotomous one, 1 denoting a liquidated fund and 0 representing a non-liquidated fund. A logit equation was estimated on this basis. Probit regressions left the qualitative results unchanged. The estimation results of the probit regressions are not presented here for reasons of brevity.

It was found that in 2019, the likelihood of liquidating a training fund declined in tandem with the investor’s age, was higher among investors who were eligible to liquidate their funds than among others, and increased commensurate with the total accrual available to the investor for liquidation (Table 2, Model 1). Interestingly, SES is statistically insignificant in this regression. Therefore, the positive relationship between the rate of liquidation and SES, exhibited in Figure 3, is sourced in the other attributes of the population, possibly the amount of accrued savings. The lower tendency of older investors to liquidate contrasts with the greater value of the tax shelter in training funds for younger investors due to their longer expected saving period, but it may be explained by a decision to reserve the assets for retirement.

In 2020, the probability of liquidating a training fund was found to be higher among men, higher among investors who were eligible to liquidate their funds, and higher insofar as the total accrual available to the investor was larger and if the fund was active. Furthermore, an increase in the socioeconomic index of the investor’s place of residence lowered the likelihood of liquidating the fund that year (Table 2, Model 2).

Table 2

Probability of Liquidating Training Fund, 2019–2020, Logit Model (1=Training Fund Liquidated, 0=Training Fund Not Liquidated), Coefficient Estimates

	Model 1 Year 2019	Model 2 Year 2020	Model 3 Years 2019- 2020	Model 4 Years 2019- 2020	Model 5 2019-2020 (SES 1-6)	Model 6 2019-2020 (SES 7-10)
Male	0.082 (0.08)	0.313*** (0.08)	0.189*** (0.06)	0.190*** (0.06)	0.393*** (0.11)	0.112 (0.07)
Age	-0.011*** (0.00)	-0.003 (0.00)	-0.008*** (0.00)	-0.007*** (0.00)	-0.014** (0.00)	-0.007* (0.00)
Eligibility	1.308*** (0.11)	0.839*** (0.11)	1.082*** (0.08)	1.082*** (0.08)	1.153*** (0.14)	1.040*** (0.09)
SES	0.025 (0.02)	-0.089*** (0.02)	-0.029* (0.01)	0.026 (0.02)	0.159* (0.07)	-0.082** (0.03)
Ln_saving	0.100*** (0.02)	0.182*** (0.03)	0.135*** (0.02)	0.135*** (0.02)	0.241*** (0.04)	0.108*** (0.02)
Active	0.002 (0.09)	0.287** (0.09)	0.136* (0.06)	0.137* (0.06)	-0.022 (0.12)	0.172* (0.08)
Size	0.000 (0.08)	0.050 (0.08)	0.021 (0.06)	0.023 (0.06)	0.080 (0.11)	-0.015 (0.07)
Year2020			-0.130* (0.05)	0.564*** (0.16)	0.261* (0.11)	-0.276*** (0.06)
Ses×Year2020				-0.115*** (0.03)		
Constant	-5.092*** (0.25)	-5.705*** (0.28)	-5.255*** (0.19)	-5.599*** (0.20)	-6.967*** (0.42)	-4.490*** (0.27)
N	26227	26068	52295	52295	14834	37461
Log-likelihood	-3225.56	-2899.55	-6153.78	-6143.50	-1634.58	-4493.74

* p<0.05, ** p<0.01, *** p<0.001

When we combined the two years of the investigation, we obtained results that emphasized the trends noted above. In general, we found a lower tendency to liquidate in 2020 (Table 2, Model 3). However, controlling for the socioeconomic differences in 2020, the probability of liquidating the fund was higher in 2020 than in 2019 (Table 2, Model 4). We found that an increase in the socioeconomic index reduced the probability of liquidating the training fund that year (Table 2, Model 4). In addition to all this, we ran the same regression on two sub-samples: lower SES (1–6) and higher SES (7–10). The estimated models (Table 2, Models 5–6) are more informative because they allow a refined separation to be established between the behaviors of the poor (those of low SES) and the rich (high SES) in response to the crisis. The results indicate diversity in investors' responses to the crisis. Confirming our first hypothesis, we discover that while lower-SES investors were more inclined to liquidate their funds in 2020 (Table 2, Model 5), higher-SES investors were less inclined to do so that year (Table 2, Model 6).

The findings regarding lower-SES investors alone are in line with Guiso et al. (2018), Hoffman and Post (2017), and Hoffman et al. (2013), who analyzed survey data to report a decrease in investors' return expectations and risk tolerance at times of financial crisis.

The findings regarding wealthier (higher-SES) investors reveal a different aspect of the phenomenon. They not only refute the hypothesis that wealthier investors tend to lose faith in the capital markets during financial crises but show the opposite. Such investors tend to avoid liquidation during the crisis, in line with the hypothesis of increased faith in the market and future return expectations.

It is not out of the question that the observed phenomenon reflects greater liquidity needs among lower-SES households than among others. Accepting this argument would not change our conclusion that the consequences of the financial crisis for the capital market were direr for the poor.

Having mapped the determinants of the likelihood of liquidating a training fund at each time studied, we turn to the second purpose of our research. We now focus on profiling the patterns of training-fund liquidation in search of a significant difference between the average sum liquidated by investors who decided to liquidate in 2019 and the average among those who liquidated in 2020.

To allow a precise comparison of the two study times and to neutralize the question of seasonality that may affect individuals' decisions, we focused on comparing the steps taken by investors who decided to liquidate their training-fund assets in March–May 2020 (the first three months of the pandemic) with those of fund owners who made this decision in the previous period (March–May 2019). For this purpose, we used our second data source, which, as stated, includes information on training-fund owners who liquidated some or all of their funds. The research variable was defined as (the natural log of) the sum withdrawn by the investor, and an OLS equation was estimated on this basis. This analysis is obviously limited, given the selection criteria. Therefore, we examined the determinants of the amount liquidated with the decision to liquidate any amount taken as given.

First, we estimated an equation that included, as explanatory factors, the month of liquidation of the fund and the total accrual available to the fund owner. In 2019, we found no difference between March, April, and May in the size of the sum liquidated, even though the increase in total accrual available to fund investors would of course result in larger liquidations of fund balances. Furthermore, surprisingly, the sum liquidated was not dependent on eligibility to liquidate the fund (Table 3, Model 1). Relating to 2020, in contrast, the sums liquidated from training funds in April and May were significantly lower than those in March; again, an increase in total accrual available to the investor led to a larger liquidation from the fund; eligibility to liquidate the fund also had a positive effect (Table 3, Model 2). Combining 2019 and 2020 into a single estimate, we found an increase in investors' liquidations of training funds in each month researched in 2019, and 2020 was not significantly different relative to the sum liquidated by investors in training funds in March 2019, except for March 2020. For that month, the average liquidation was

significantly higher than in March 2019 (and in all subsequent months). Furthermore, an increase in total accrual available to the training-fund investor increased the size of his or her liquidation of the fund, as did eligibility to liquidate the fund (Table 3, Model 3).

Table 3

Sums Liquidated from Training Funds (Ln), 2019–2020, OLS Model

	Model 1 Year 2019	Model 2 Year 2020	Model 3 Years 2019–2020
Total saving	0.000*** (0.00)	0.000*** (0.00)	0.000*** (0.01)
March 2019	Ref.		Ref.
April 2019	0.057 (0.16)		0.039 (0.14)
May 2019	-0.058 (0.17)		-0.046 (0.15)
March 2020		Ref.	0.671*** (0.13)
April 2020		-0.378** (0.13)	0.270 (0.16)
May 2020		-0.415** (0.13)	0.217 (0.17)
Eligibility	-0.014 (0.20)	0.665*** (0.12)	0.391*** (0.11)
Constant	9.059*** (0.21)	9.070*** (0.12)	8.667*** (0.14)
N	660	563	1223
Adj-R ²	0.138	0.384	0.233
F	27.302	88.620	54.024

* p<0.05, ** p<0.01, *** p<0.001

Having established the monthly pattern of liquidation with emphasis on March 2020, the month that saw the outbreak of the pandemic, we now turn to Table 4 for a more detailed model of investors' behavior. Our data, allowing for the inclusion of individual investors' characteristics, shed light on the way investors react to a sudden shock according to our theoretical framework.

Model 1 in Table 4 shows the time effect (coefficients of month dummies), ignoring individuals' characteristics. The regression reveals a significant increase in sums liquidated in March 2020 relative to the other sample periods. The coefficient of March 2020 in Model 2 resembles that found in Table 3—0.642 elasticity. The novelty is the effect of investors' socio-demographic and economic characteristics. An increase in an investor's age raised the sum of his or her liquidation from the fund, as did an increase in total accrual available to the investor. The amount liquidated was larger among those eligible to liquidate,

smaller among those who worked for large companies, and smaller among those living in higher-SES localities (Table 4, Model 2).

Confirming our second hypothesis, we found that an increase in the investor's SES in March 2020 lowered the sum liquidated (Table 4, Model 3). This result is validated by the interaction between the March 2020 variable and the SES variable. Expanding the last-mentioned research model by means of interactions between the March 2020 variable and all the other research variables, we were able to discover the extent to which the determinants of investors' liquidations of training funds in March 2020 differed from those of liquidations during the rest of the research period. It was found that men made smaller liquidations of their training funds in March 2020 than women that month as did men and women in the rest of the research period. This result is in line with Hanspal et al. (2020), who found men less pessimistic than women after personally experiencing losses during economic crashes. It also confirms Dominitz and Manski's (2007) finding that the decline in expected returns is steeper for men than for women. In contrast, no dependency was found on the investor's age, the investor's eligibility to liquidate the training fund, the size of the company employing the investor, and the time of liquidation (Table 4, Model 4).

Table 4

Sums Liquidated from Training Funds (Ln), 2019–2020, OLS Model

	Model 1	Model 2	Model 3	Model 4
March 2019	Ref.	Ref.		
April 2019	0.041 (0.16)	0.070 (0.14)		
May 2019	-0.115 (0.17)	-0.048 (0.15)		
March 2020	0.763*** (0.15)	0.642*** (0.13)	0.777*** (0.11)	0.650 (0.47)
April 2020	0.145 (0.18)	0.265 (0.16)		
May 2020	0.060 (0.19)	0.202 (0.17)		
Male		0.128 (0.09)	0.130 (0.09)	0.247* (0.10)
Age		0.009* (0.00)	0.008* (0.00)	0.008* (0.00)
Eligibility		0.378** (0.11)	0.339** (0.11)	0.219 (0.13)
Size		-0.384*** (0.09)	-0.382*** (0.09)	-0.379*** (0.10)
SES		-0.064** (0.02)	-0.061** (0.02)	-0.059** (0.02)
Total saving		0.000***	0.000***	0.000***

		(0.00)	(0.00)	(0.00)
SES×March2020			-0.490***	-0.491***
			(0.10)	(0.10)
Male×March2020				-0.464*
				(0.20)
Age×March2020				0.001
				(0.01)
Eligibility×March2020				0.431
				(0.25)
Size×March2020				-0.000
				(0.20)
Constant	9.493***	8.805***	8.683***	8.700***
	(0.11)	(0.25)	(0.24)	(0.28)
N	1223	1222	1222	1222
Adj-R ²	0.031	0.253	0.266	0.269
F	8.881	38.567	56.369	38.458

* p<0.05, ** p<0.01, *** p<0.001

5.2 Decision to change risk profile

In addition to the option of liquidating their funds (in whole or part), investors may retain their investment in the fund by transferring it to other tracks under the same management. Each track is typified by a different mix of assets (stocks, bonds, etc.), through which an investor may set the risk level of her or his fund. The next step in our research was to further explore the disparity in investors' responses to the crisis by examining transfers of savings among four tracks on which training funds are managed.

An accepted indicator for the estimation of risk in a training fund is the proportion of stocks in its portfolio: the higher the rate, the riskier the fund. For investors who decided to transfer their money to other tracks, we compared the average share of stocks in the previous track with that in the new track and present the findings—money transferred in, and money transferred out—in Figure 5. Panel (a) shows the weekly evolution over time of these rates in 2019; Panel (b) does the same for 2020. Individuals who transferred their investments in 2019 tended to switch to a higher level of risk (Figure 5a). In March and April 2020, in contrast, those transferring their funds tended to choose a lower risk level (a lower share of stocks); from April 2020 and May 2020, however, they tended to switch to riskier tracks (Figure 5b).

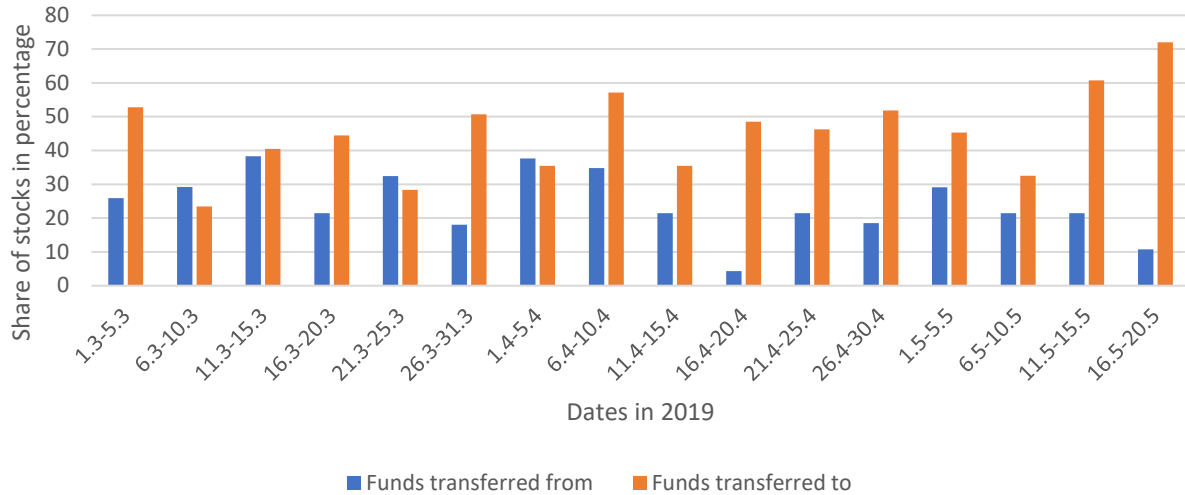


Fig. 5a. Year 2019

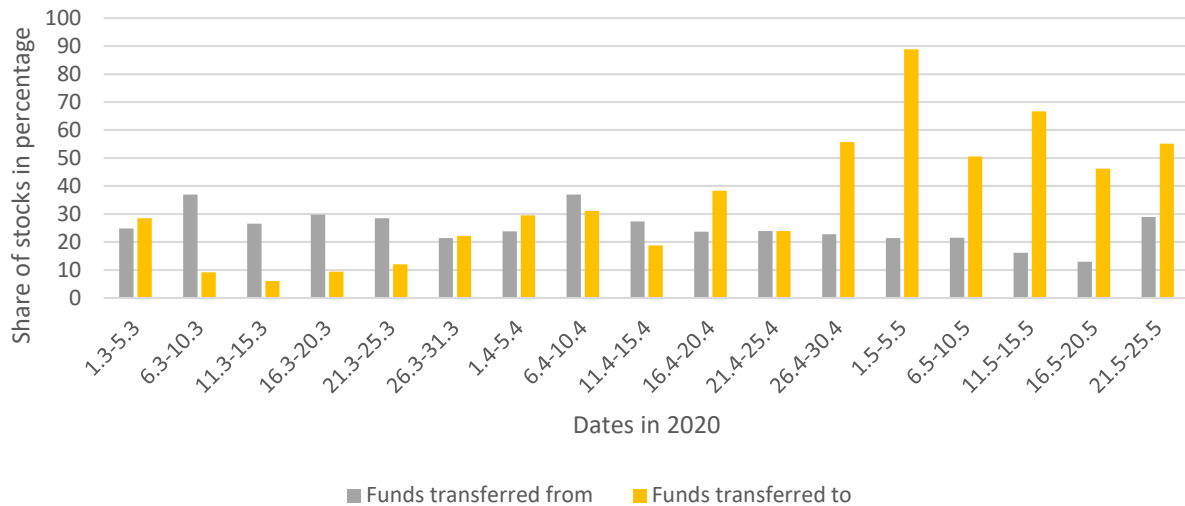


Fig 5b. Year 2020

Fig. 5. Share of stocks (in percentage terms) in funds transferred from and funds transferred to, in each week during the sample period

Basing ourselves on our information about levels of exposure and risk in training funds, we then defined an additional research variable: the nature of change in the risk level of an individual’s training fund. This variable accepted three answers: 1 = risk level remained unchanged (if the investor decided to stay with his or her current training fund or to transfer his or her money with no change in risk level), 2 = risk level increased, and 3 = risk level declined. For this purpose, we sorted all funds into four levels of risk based on their policy regarding the share of stocks in their portfolio: <10%, 10%–20%, 20%–50%, and >50%.⁷

⁷ The distribution of funds based on their stock composition in 2019 was as follows: 4 funds (<10%), 3 funds (10-25%), 4 funds (25-50%), and 1 fund (50-75%). However, in 2020, the distribution of funds based on their stock composition underwent slight changes, despite their declared investment policy remaining intact. The updated

Using this variable, we estimated a multinomial logit equation for 2019–2020 combined. The multinomial probit regressions left the qualitative results unchanged. The estimation results of the multinomial probit regressions are not presented here for reasons of brevity. To identify accurately the contribution of March–May 2020 (as against 2019) to individuals’ inclination to change the exposure and risk levels of their training funds, three dichotomous variables were defined: March 2020, April 2020, and May 2020. Each received the value of 1 in the corresponding month and 0 otherwise. We did not include the month effects for 2019 because we discovered insignificant seasonality in 2019 (results omitted for brevity).

The likelihood of an investor moving his or her training-fund investment to a riskier track was found to be higher among men and to decline commensurate with age. When the socioeconomic index rises, the likelihood of increasing the level of risk of the training fund rises, as it does when the total accrual available to the investor goes up. The probability of raising the risk level of the training fund was lower in March–April 2020 but higher in May 2020 than in all other months investigated (Table 5, Model 1).

Alternately, the probability of lowering the risk level was found to have risen commensurate with the investor’s age and if the training fund was active. An increase in SES reduced the likelihood of lowering the risk level of the training fund, whereas the more total accrual was available to the investor, the more inclined the investor was to lower the level of risk. The probability of raising the level of risk was higher in March–April 2020 but lower in May 2020 than in the other months studied (Table 5, Model 1).

To identify the contribution of the socioeconomic index in each pandemic month beyond all other variables, we then added the interaction between the index and the research period. Here we found that the likelihood of raising the level of risk of a training fund grew with an increase in SES in March 2020 (Table 5, Model 2). Alternatively, the probability of lowering the risk level declined with an upturn in SES in March 2020 and May 2020 (Table 5, Model 2). The direction of the contribution of all other variables to the likelihood of raising or lowering the risk level of the training fund remained as found in the previous estimations.

classification in 2020 was as follows: 4 funds (<10%), 2 funds (10-25%), 6 funds (25-50%), 0 funds (50-75%), and 1 fund (75-90%). In order to maintain consistency in the classification between the two years, we made a decision to adjust the fund categorization slightly. The current classification we are using is as follows: 4 funds (<10%), 2 funds (10-20%), 5 funds (20-50%), and 1 fund (50-100%).

Table 5

Probability of Change in Risk Level of Training Fund, 2019–2020, Multinomial Logit Model (Benchmark Group: No Change in Risk Level), Coefficient Estimates

	Model 1		Model 2	
	Raising the risk level	Lowering the risk level	Raising the risk level	Lowering the risk level
Male	1.037*** (0.27)	0.242 (0.24)	1.028*** (0.27)	0.240 (0.24)
Age	-0.049*** (0.01)	0.033*** (0.01)	-0.050*** (0.01)	0.033*** (0.01)
Eligibility	0.115 (0.29)	-0.276 (0.27)	0.115 (0.29)	-0.278 (0.27)
Active	0.373 (0.28)	0.915*** (0.27)	0.374 (0.28)	0.915*** (0.27)
Size	-0.108 (0.25)	-0.025 (0.24)	-0.111 (0.26)	-0.045 (0.24)
SES	0.200** (0.06)	-0.008* (0.00)	0.150** (0.08)	-0.033* (0.08)
Total saving	0.128* (0.07)	0.325*** (0.07)	0.131* (0.07)	0.326*** (0.07)
March 2020	-7.945*** (0.46)	10.258*** (0.43)	-5.451*** (1.59)	9.250*** (1.26)
April 2020	-6.464*** (0.34)	7.821*** (0.29)	-6.331*** (1.14)	7.696*** (0.86)
May 2020	8.433*** (0.52)	-7.071*** (0.66)	7.187*** (1.85)	-5.209* (2.74)
SES×March 2020			0.387*** (0.09)	-0.171** (0.02)
SES×April 2020			0.022 (0.16)	-0.020 (0.13)
SES×May 2020			0.200 (0.28)	-0.285*** (0.04)
Constant	6.108*** (1.00)	-5.847*** (1.11)	3.831 (2.01)	-7.674** (2.77)
N	51,361		51,361	
Log-likelihood	-791.79143		-790.04271	

* p<0.05, ** p<0.01, *** p<0.001

In conclusion, higher-SES investors tended to transfer their savings to riskier funds, particularly in March 2020, while investors of lower SES tended to unload risk, mainly in March 2020 and May 2020.

The next question is whether the determinants of people's tendency to change the level of exposure and risk of their training fund vary as a function of their SES ranking. To answer, we divide the investigation groups into two parts based on the distribution of persons examined by the socioeconomic index, such as

to assure equal distribution of the number of persons examined in each group—those living in low-SES localities (Clusters 1–6 on the socioeconomic index) and those in high-ranking localities (7–10).⁸

Among those living in low-SES localities, the likelihood of raising the level of risk of their training fund was found to be higher among men and to decline as the investor’s age climbed. An increase in the socioeconomic index of the investor’s place of residence increased the probability of raising the level of risk of the training fund, and the likelihood of raising the level of risk of the training fund was lower in March 2000–May 2020 than in the other months investigated (Table 6, Model 1). Alternatively, the likelihood of an investor’s lowering the risk level of his or her training fund rose commensurate with his or her age and declined with an increase in the socioeconomic index of his or her place of residence, whereas the larger the total accrual available to the investor, the more inclined the investor was to switch to a lower level of risk. The probability of raising the level of risk of the training fund was higher in March 2000–May 2020 than in the other months investigated (Table 6, Model 2).

In high-SES localities, the likelihood of switching to a higher level of risk was found to be greater among men and to decline as the investor aged. An increase in the socioeconomic index of the investor’s place of residence made raising the risk level of the training fund more likely, and the likelihood of raising the risk level of the training fund was lower in March 2000 but higher in April 2020–May 2020 than in all other months investigated (Table 6, Model 3). Alternatively, the likelihood of an investor’s lowering the risk level of his or her training fund was higher if the training fund was active, increased with the investor’s age, and declined with an upturn in the socioeconomic index of the investor’s place of residence. Contrastingly, the more money was available to the investor, the more he or she tended to lower the level of risk. The probability of raising the risk level of a training fund was greater in March 2000 but lower in April 2020–May 2020 than in all other months investigated (Table 6, Model 4).

Comparing the two SES groups (lower and higher), we detected a significant difference in April–May 2020. While lower-SES investors tended to lower the riskiness of their funds, higher-SES investors tended to do the opposite. The coefficient estimates for the April 2020 and May 2020 effects were statistically significant in all four regressions but with different signs for lower-SES investors (Models 1 and 2) than for higher-SES investors (Models 3 and 4). These findings confirm our third and fourth hypotheses. Multinomial probit regressions left the qualitative results unchanged. These estimation results are not presented here for reasons of brevity.

⁸ In order to test the statistical robustness of the result obtained, we estimated the equation again on the basis of an alternative division of the two groups: those in SES 1–5 and those in SES 6–10. The results based on the alternative definition were the same.

Table 6

Probability of Change in Risk Level of Training Fund, 2019–2020
 Multinomial Logit Model (Benchmark Group: No Change in Risk Level), Coefficient Estimates

	Lower SES (1-6)		Higher SES (7-10)	
	Raising the risk level (Model 1)	Lowering the risk level (Model 2)	Raising the risk level (Model 3)	Lowering the risk level (Model 4)
Male	1.127* (0.48)	0.142 (0.38)	1.049** (0.34)	0.280 (0.32)
Age	-0.050* (0.02)	0.039* (0.02)	-0.052** (0.01)	0.029* (0.01)
Eligibility	0.434 (0.49)	-0.348 (0.42)	-0.026 (0.36)	-0.227 (0.36)
Active	0.584 (0.51)	0.872 (0.45)	0.268 (0.34)	0.905* (0.35)
Size	-0.803 (0.43)	0.024 (0.39)	0.200 (0.32)	-0.024 (0.32)
SES	0.200* (0.09)	-0.012* (0.01)	0.083* (0.08)	-0.174* (0.09)
Total saving	0.228 (0.14)	0.374** (0.12)	0.094 (0.09)	0.299** (0.09)
March 2020	-6.699*** (0.76)	10.045*** (0.62)	-8.682*** (0.67)	10.566*** (0.65)
April 2020	-6.259*** (0.61)	7.806*** (0.46)	6.629*** (0.42)	-7.870*** (0.38)
May 2020	-7.702*** (0.92)	7.427*** (1.02)	8.709*** (0.66)	-6.875*** (0.85)
Constant	11.623*** (1.99)	-13.774*** (1.61)	1.611 (1.75)	3.726 (1.96)
N	23,890		27,471	
Log-likelihood	-297.54969		-486.66465	

* p<0.05, ** p<0.01, *** p<0.001

5.3 Liquidity needs

Investors may liquidate their training funds because they prefer liquidity for reasons of acute uncertainty or because their households need cash. These possibilities, we believe, have some explanatory power. One must bear in mind, however, that when the economic crisis erupted, the government offered generous monetary transfers to employees who lost their jobs or were furloughed. Second, even if an investor still needed liquidity, cashing out a training fund was one of the most expensive ways of raising it. To dissuade investors from taking this option, fund managers offer very attractive loans that use the training fund as prime collateral; investors are better off taking such loans until they find an alternative source of income. Unfamiliarity with this option reflects financial illiteracy and abets a bad outcome. Lastly, greater liquidity needs during the financial crisis cannot explain the decision of high-SES investors to refrain from liquidation during the crisis (compared with regular times) and the decisions of low-SES and high-SES to

change the risk profiles of their investments while avoiding liquidation. All this said, we cannot reject the hypothesis that liquidation decisions of low-SES investors were affected by greater liquidity needs.

Liquidity needs were present globally during the Covid-19 financial crisis. A senior official at the New York Fed remarked⁹:

The pandemic crisis resulted in an extraordinary increase in the demand for dollar liquidity. The demand arose out of both immediate funding needs and the desire to raise precautionary liquidity.

Israel was not an exception in this picture. An indication of this is the monetary aggregate M1, which grew by 11.3% in March 2020. The government met these needs by offering households with out-of-work breadwinners a direct subsidy and by expanding the money supply. Investors withdrew money from the stock market on a scale that resulted in a tumble of almost 30 percent in March 2020. The liquidation of money from training funds may belong to this phenomenon, at least in part. In this subsection, we report on an attempt to make a quantitative analysis of liquidity needs as a factor in the decision to liquidate training funds.

We asked whether the observed difference in the behavior of high-SES investors and low-SES investors depends on the level of liquidity proxied by the amount of savings. It is tacitly assumed that investors with high savings are more robust in general, in turn, less in need of liquidity at times of crisis. We created a dummy variable that takes the value of 1 if the investor belongs to the group of the top 25% in terms of amount of savings, and 0 otherwise. Another dummy variable obtains the value of 1 if the investor belongs to the lowest 25% in terms of the amount of saving and 0 otherwise. We consider the first group (the top 25%) highly liquid (less in need of liquidity) and the second group (the lowest 25%) mostly illiquid (more in need of liquidity). Next, we ran logit regressions as in Model 4 in Table 2, introducing two additional interaction variables: (SES×Year2020×Low liquidity) and (SES×Year2020×High liquidity). With this regression we are able to test whether the effect of SES on liquidation rates during the financial crisis depended on the level of investors' liquidity needs. The results are presented in Table 7, Model 2. We also present the results of Model 1, which excludes the additional interaction variables as does Model 4 in Table 2. Probit regressions left the qualitative results unchanged; their estimation results are not presented for reasons of brevity.

The results show that the effect of SES on liquidation decisions during the crisis was exacerbated among investors with lower liquidity (greater liquidity needs). The coefficient estimate for (SES×Year2020×Low liquidity) is negative and statistically significant, whereas that for

⁹ Liquidity Shocks: Lessons Learned from the Global Financial Crisis and the Pandemic, August 11, 2021, [Lorie K. Logan](https://www.newyorkfed.org/newsevents/speeches/2021/log210811#footnote1), Executive Vice President. <https://www.newyorkfed.org/newsevents/speeches/2021/log210811#footnote1>

(SES×Year2020×High liquidity) is small, positive, and not statistically significant. Assuming that the amount of savings indeed proxies for liquidity needs, we find that at least some of the observed behavior regarding the liquidation decision originates in higher liquidity needs.

Table 7

Probability of Liquidating Training Fund, 2019–2020, Logit Model (1=Training Fund Liquidated, 0=Training Fund Not Liquidated), Coefficient Estimates

	Model 1	Model 2
Male	0.190*** (0.06)	0.197*** (0.06)
Age	-0.007*** (0.00)	-0.007** (0.00)
Eligibility	1.082*** (0.08)	1.102*** (0.08)
SES	0.026 (0.02)	0.030 (0.02)
Ln_saving	0.135*** (0.02)	0.091*** (0.02)
Active	0.137* (0.06)	0.147* (0.06)
Size	0.023 (0.06)	0.023 (0.06)
year2020	0.564*** (0.16)	0.615*** (0.16)
SES×Year2020	-0.115*** (0.03)	-0.116*** (0.03)
SES×Year2020×Low liquidity		-0.133*** (0.03)
SES×Year2020×High liquidity		0.012 (0.02)
Constant	-5.599*** (0.20)	-5.242*** (0.22)
N	52295	52295
Log-likelihood	-6143.4984	-6130.4884

6. Conclusions

Although the COVID-19 pandemic took Israel by surprise, the authorities met it swiftly and decisively. Lockdowns, a ban on public gatherings, and the closure of malls, restaurants, cinemas, and theaters gave the population the feeling that the country was at war with the virus. People were ordered to shelter at home and grandchildren were not allowed to visit grandparents, who were defined as a high-risk group. In March 2020, Israelis felt they were facing an unknown and bleak future. The unemployment rate rocketed from 3.9% in February 2020 to 27.5% in April. The stock market reacted accordingly, losing more than 30% of its value in the first two weeks of March. This kind of crisis offers a rare opportunity to examine the robustness of financial systems and the maturity of investors: Will they create a run on their savings? And how is their behavior affected by their financial capabilities?

In this study, we drew on a unique administrative data set that includes personal data on investors including the socioeconomic status of their locality of residence. Data on individual assets are quite hard to come by. By having data on individual investors' behavior before and during the crisis, we were able to set up a semi-natural experiment.

Israel's training funds are a special type of provident fund that entitle their holders to two types of substantial tax benefits: an income-tax exemption on employers' contributions and a capital-gains-tax exemption on the entire saving. Investors who liquidate their funds in the first six years after they begin to invest forfeit the income-tax waiver. Liquidation at any time results in the loss of shelter against future capital-gains taxes. We roughly estimate the value of the capital gains tax shelter at 42% of the amount saved. Therefore, investors who need cash should prefer to liquidate other savings or borrow using the training fund as collateral.

Our analysis shows that during the early stage of the COVID-19 pandemic in Israel and its corresponding stock-market drop, many investors liquidated their training funds, losing out not only on the quick recovery of the market but also on the huge embedded tax benefit. Interestingly, this behavior was much more common among investors of lower socioeconomic status (the relatively poor), whereas investors of higher status (the relatively rich) liquidated their funds to a lesser extent than they did in the previous year.

The special characteristics of training funds also allow us to examine whether the contrasting behaviors of the poor and the rich traced only to liquidity needs or may have been partly occasioned by changes in risk appetite or market expectations. Instead of liquidating their savings, investors had the alternative option of revising the riskiness of their funds by moving to a less risky track. Given the small number of possible tracks, we could easily identify investors who increased or decreased their savings exposure to the stock market. We found that immediately after the crisis began, lower-SES investors tended to decrease their exposure to the stock market and higher-SES investors did the opposite.

Overall, we conclude that the crisis was more harmful to investors of lower socioeconomic status. Sophisticated investors, mostly of higher socioeconomic status, gained from the crisis by holding onto their funds and increasing their exposure to the stock market.

The current study has several limitations that should be borne in mind. First, it examines the behavior of people over the course of a given period and does not track their conduct in the capital market over years. Although a long-term study of investors is of interest, the requisite information for such an inquiry is lacking. This drawback, however, does not impair the quality and insights of the findings in the case at hand due to the nature of the financial instrument in question.

Another noteworthy limitation is our lack of information about other financial assets that the training-fund investor holds. Therefore, when we examined investors' decisions on whether to withdraw money from their training funds, we obtained accurate information only about the investors' specific funds and not about their other financial assets, if any. Notably, however, training funds are unique financial instruments that confer enormous tax benefits. Therefore, investors' mistaken behavior with respect to them may say a lot about their overall financial conduct.

At the time the study was written, the investment regulations in Israel prohibited full disclosure of the financial portfolios of individuals and their households. Future research may examine investors' behavior with respect to their entire portfolio or over a longer observation period, yielding supplemental aspects of the phenomenon that we presented in the current study. Despite the drawbacks, as stated, it is proper and important to emphasize that our administrative database allowed us to examine with precision the actual behavior of a population of investors at the time of an exogenous event, with emphasis on individual investors' socio-demographic and socioeconomic characteristics. Thus, the study makes a significant contribution to the literature and sheds light on a previously opaque issue that deserves thought.

References

- Bateman H., Islam T., Louviere J., Satchell S., Thorp S. 2011. Retirement investor risk tolerance in tranquil and crisis periods: Experimental survey evidence. *J. Behav. Finance* 12 (4), 201–218.
- Bilias Y., Georgarakos D., Haliassos M. 2010. Portfolio inertia and stock market fluctuations. *J Money Credit Bank* 42 (4), 715–742.
- Brunnermeier M.K., Nagel S. 2008. Do wealth fluctuations generate time-varying risk aversion? Micro-evidence on individuals. *Am Econ Rev.* 98 (3), 713–736.
- Bu D., Hanspal T., Liao Y., Liu Y. 2020. Risk-taking during a global crisis: Evidence from Wuhan. *COVID Economics* 5: 106–146.

- Bucher-Koenen T., Ziegelmeyer M. 2014. Once burned, twice shy? Financial literacy and wealth losses during the financial crisis. *Rev Financ.* 18 (6), 2215–2246.
- Campbell J.Y. 2006. Household finance. *J Finance* 61 (4), 1553–1604.
- Choi J.J., Laibson D., Madrian B.C., Metrick A. 2009. Reinforcement learning and savings behavior. *J Finance* 64 (6), 2515–2534.
- Disney, R., Gathergood, J. 2013. Financial literacy and consumer credit portfolios. *J Bank Financ.* 37(7), 2246-2254.
- Dominitz J., Manski, C.F. 2007. Expected equity returns and portfolio choice: Evidence from the Health and Retirement Study. *J E E A.* 5 (2–3), 369–379.
- Fleishman L., Gubman Y., Tur-Sinai A. 2011. The value of residential property as an indicator of socio-economic level. *Economic Quarterly* 58 (3/4), 199–231 (Hebrew).
- Glaser M., Weber M. 2005. September 11 and stock return expectations of individual investors. *Rev Finance* 9 (2), 243–279.
- Guiso L., Sapienza, P Zingales L (2018) Time-varying risk aversion. *J. financ. econ.* 128 (3), 403–421.
- Hanspal T., Weber A., Wohlfart J. 2020. Exposure to the COVID-19 stock market crash and its effect on household expectations. *Rev Econ Stat.* 1–45.
- Hoffmann A.O., Post T. 2017. How return and risk experiences shape investor beliefs and preferences. *Account. Finance* 57 (3), 759–788.
- Hoffmann A.O., Post T., Pennings J.M. 2013. Individual investor perceptions and behavior during the financial crisis. *J Bank Financ.* 37 (1), 60–74.
- Justman M., Spivak A. 2004. Socioeconomic dynamics of local authorities in Israel. *Israel Economic Review* 2 (1).
- Malmendier U., Nagel S. 2011. Depression babies: Do macroeconomic experiences affect risk-taking? *Q J Econ.* 126 (1), 373–416.
- Tur-Sinai A., Golan Y., Yitzhaki S. 2018. Municipal authorities ranking—by the socio-economic index. *Economic Quarterly* 62 (3/4), 13–23 (Hebrew).

Appendix

Table A1

Descriptive Characteristics of Persons Who Decided to Withdraw Money from Their Funds, by Year

		Year 2019 (N=737)	Year 2020 (N=647)	P. Value
Gender (%)	Female	45.45	43.41	0.103
	Male	54.55	56.59	
Age (mean, SD)		49.70 (12.31)	50.32 (14.11)	0.389
Eligibility	No	16.01	15.72	0.832
	Yes	83.99	84.28	
SES (mean, SD)		6.32 (2.07)	5.78 (2.08)	0.000
Total saving (ln) (mean, SD)		9.98 (1.86)	10.30 (1.56)	0.001
Active	No	53.87	51.73	0.134
	Yes	46.13	48.27	
Employer size	Fewer than 100 persons	42.06	40.65	0.594
	More than 100 persons	57.94	59.35	