

# Mutual Fund and Share Ownership in Finland: Trends and Patterns in 2004-2016\*

Nikolas Breitkopf, Samuli Knüpfer and Elias Rantapuska

## Abstract

27% of Finnish individuals hold stocks or mutual funds in 2016. This participation has increased from 21% in 2004 mostly due to new investors entering the market through mutual funds. In 2016, the mean individual portfolio equals 35,149 EUR and includes 1.7 stocks and 1.5 mutual funds. The participation rate, the portfolio value, and the number of securities are higher when aggregated at the household level. Balanced mutual funds comprise 40% of the average individual portfolio, followed by direct equity holdings at 32%. Wealthy, male, Swedish-speaking, urban, university and business educated, and high-IQ investors hold a higher portfolio share in equities. Differences in portfolio composition generate large differences from the average 9% annual investor realized return. The wealthiest 1% of the population own 62% of financial assets in 2016. The concentration of wealth has remained similar compared to 2004, except for the top 0.01% whose wealth share has decreased.

## Keywords:

Stock, mutual fund, stock market participation, wealth inequality

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## 1. Introduction

This paper documents patterns and trends in the ownership of stocks and mutual funds in the entire Finnish population over the period 2004-2016. We update the results in Keloharju, Knüpfer, and Rantapuska (2012) by using a longer sample period and a more comprehensive data set, and also provide new analyses on entries and exits and the risk and return of different types of investors. For the first time, we also report statistics at the household level. Our paper complements Ilmanen and Keloharju (1999), Karhunen and Keloharju (2001), and Keloharju and Lehtinen (2015, 2021) by including mutual funds.

We document the following trends and cross-sectional patterns: (1) aggregate participation rates; (2) aggregate portfolio statistics; (3) differences in portfolio composition across investors; (4) life-cycle patterns; (5) risk and return of different types of investors; and (6) concentration of financial wealth. We focus on patterns at the end of 2004 and 2016, but also report trends between these years.

The remainder of the paper is organized as follows. The next section describes the data. Section 3 presents the results. Section 4 summarizes our findings.

## 2. Data

We study investments in directly held stocks and mutual funds of the entire population of Finland. Our panel data on ownership in 2004-2016 come from the Finnish Tax Administration (FTA). Mutual fund management companies are required by law to report their clients' end-of-year fund holdings to FTA. Euroclear Finland delivers the information on end-of-year holdings in directly held stocks to FTA. Holdings in listed companies not featuring in the shareholder registry of Euroclear Finland and mutual funds not required to report to FTA are not included in the data. These holdings in foreign companies and funds likely comprise a small fraction of total financial wealth.

Our ownership data tags each holding in a stock or mutual fund with the personal identification number for the investor and the ISIN code for the security. Our data on socioeconomic characteristics from Statistics Finland are matched to the asset ownership data using the personal identification number. We complement these data with IQ test scores from the Finnish Defence Forces. These data are available for a subset of males who took the IQ test during military enlistment (see Grinblatt, Ikäheimo, Keloharju, and Knüpfer, 2016 for details).

We supplement the microdata with additional sources. We match the mutual funds to the Mutual Fund Report compiled by Suomen Sijoitustutkimus Oy to extract information on funds' asset class (money market, bond, equity, balanced, other) and monthly returns. Stock prices and returns come from NASDAQ Nordic and Datastream. All information allowing the identification of statistical units such as individuals has been anonymized in the data we use for analysis.

Fama-French four-factor USD returns for Europe originate from Kenneth French's website and our proxy for the risk-free rate is 12-month EURIBOR. We convert these returns into EUR returns. We use the factor returns to estimate security-level factor loadings at the end of each year by regressing 24 months of prior excess returns on the factor returns. We estimate the loadings for each security in our sample and aggregate them at the level of investor portfolios by using beginning-of-year weights of each security in the portfolio. Expected investor portfolio returns multiply the estimated factor loadings with the historical averages of the Fama-French factor premia in 1999-2017 and investor portfolio weights. Realized investor portfolio returns multiply the beginning-of-year portfolio weights in each security by their returns in the subsequent twelve months.

### 3. Results

#### 3.1. Aggregate participation rates

We begin by reporting aggregate participation rates at the individual level in Panel A of Table 1. In 2016, there are 1.5 million investors holding at least one security in the entire population of 5.5 million individuals. These numbers translate into a financial asset market participation rate of 27%. This rate has increased by 6 percentage points from 2004, which mostly reflects the fraction holding mutual funds having increased from 12% to 20%. In the same period, the fraction of individuals holding stocks directly has decreased from 13% to 12%.

**Table 1**

Participation rates in stocks and mutual funds

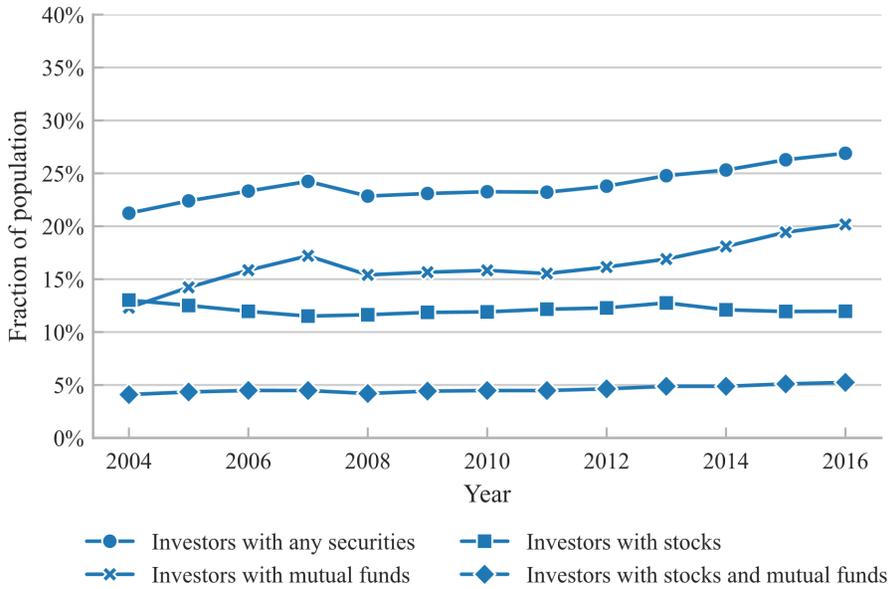
This table reports the number of investors of Finnish individuals, in absolute terms and relative to the population, investing in stocks and mutual funds in 2004, 2008, 2012, and 2016. Panel A calculates the statistics at the individual level whereas Panel B aggregates the participation rates at the household level.

| <i>Panel A: All individuals</i>                                    |           |           |           |           |
|--|-----------|-----------|-----------|-----------|
|  | 2004      | 2008      | 2012      | 2016      |
| <i>Number of observations:</i>                                     |           |           |           |           |
| Investors with any securities                                      | 1,112,185 | 1,217,246 | 1,291,009 | 1,480,288 |
| Investors with stocks  | 682,165   | 620,178   | 666,567   | 658,761   |
| Investors with mutual funds  | 644,567   | 820,540   | 876,311   | 1,110,189 |
| Investors with stocks or equity mutual funds                       | 872,797   | 904,598   | 964,869   | 972,619   |
| Investors with stocks and mutual funds                             | 214,547   | 223,472   | 251,869   | 288,662   |
| Population   | 5,236,611 | 5,326,314 | 5,426,674 | 5,503,297 |
| <i>Number of investors as a fraction of the total population:</i>  |           |           |           |           |
| Investors with any securities                                      | 21%       | 23%       | 24%       | 27%       |
| Investors with stocks  | 13%       | 12%       | 12%       | 12%       |
| Investors with mutual funds  | 12%       | 15%       | 16%       | 20%       |
| Investors with stocks or equity mutual funds                       | 17%       | 17%       | 18%       | 18%       |
| Investors with stocks and mutual funds                             | 4%        | 4%        | 5%        | 5%        |
| <i>Panel B: Individuals aggregated to households</i>               |           |           |           |           |
|  | 2004      | 2008      | 2012      | 2016      |
| <i>Number of observations:</i>                                     |           |           |           |           |
| Households with any securities                                     | 811,740   | 881,954   | 934,539   | 1,058,286 |
| Households with stocks   | 539,583   | 498,008   | 533,375   | 528,198   |
| Households with mutual funds                                       | 490,748   | 613,487   | 656,612   | 819,583   |
| Households with stocks or equity mutual funds                      | 655,601   | 679,952   | 723,548   | 729,668   |
| Households with stocks and mutual funds                            | 218,591   | 229,541   | 255,448   | 289,495   |
| Population (households)  | 2,405,597 | 2,501,291 | 2,584,388 | 2,653,280 |
| <i>Number of households as a fraction of the total population:</i> |           |           |           |           |
| Households with any securities                                     | 34%       | 35%       | 36%       | 40%       |
| Households with stocks   | 22%       | 20%       | 21%       | 20%       |
| Households with mutual funds                                       | 20%       | 25%       | 25%       | 31%       |
| Households with stocks or equity mutual funds                      | 27%       | 27%       | 28%       | 28%       |
| Households with stocks and mutual funds                            | 9%        | 9%        | 10%       | 11%       |

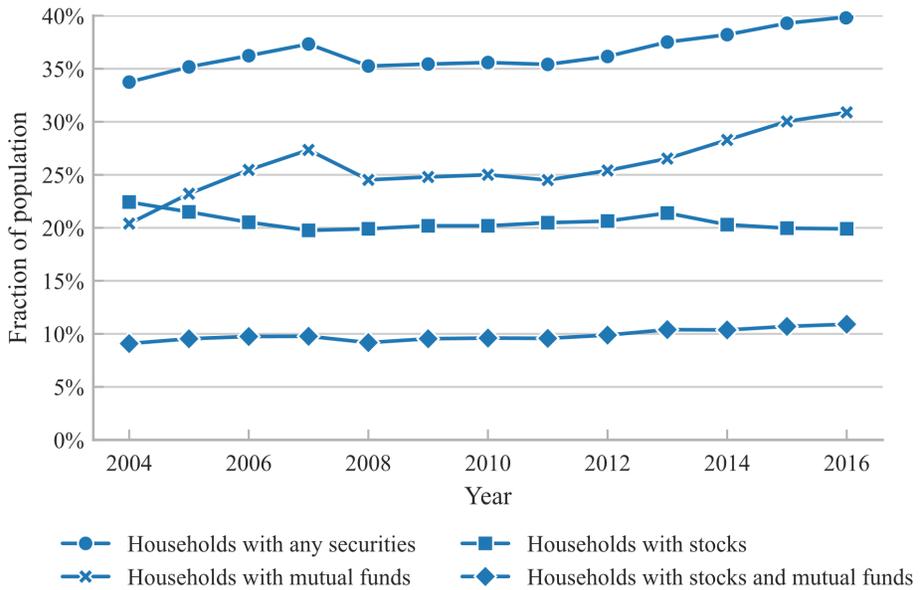
Panel B of Table 1 reports the participation rates by aggregating the individuals at the household level. This calculation makes the statistics comparable with studies using survey data (e.g., Badarınza, Campbell, and Ramadoradai, 2016). This household aggregation produces 1.1 million households with some holdings in stocks or mutual funds in 2016 whereas the population has 2.7 million households. These numbers suggest a participation rate of 40%, which is much higher than the individual-level rate of 27% in Panel A. This increase reflects the fact

that all members of one household do not typically hold securities. Figure 1 reports the annual numbers for individuals and households in Panels A and B, respectively.

**Panel A: Individuals**



**Panel B: Households**



**Figure 1.** Participation rates in stocks and mutual funds over time  
 This figure shows the evolution of the fraction of the population investing in stocks and mutual funds in 2004-2016. Panel A reports the statistics for individuals whereas Panel B aggregates individuals at the household level.

The year-to-year changes in participation rates combine the effects of new individuals entering and existing investors exiting the market (Fagereng et al., 2017). Table 2 reports the number of entering and exiting investors. It also scales these numbers by the number of investors at the beginning of each year. The difference between entries and exits amounts to net entry. It is positive when more investors enter than exit and negative in the opposite case.

**Table 2**

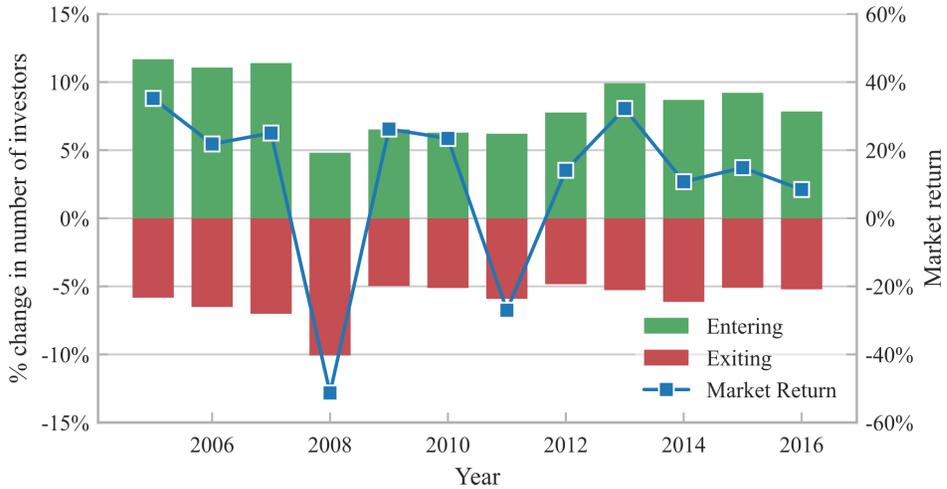
Yearly change in number of investors

This table reports the absolute number and fraction of investors entering and exiting stocks and mutual funds each year. Investors are regarded as *entering* if they hold stocks or mutual funds at the end of the current year but did not hold any stocks or mutual funds at the end of the previous year. Conversely, investors are regarded as *exiting* if they owned stocks or mutual funds at the end of the previous year but do not own stocks or mutual funds at the end of the current year. *Net entry* is the difference between the number of entering and exiting investors and can be equivalently expressed as the yearly change in the total number of investors. Percentage figures are calculated relative to the total number of investors at the end of the previous year. *Turnover* is the average of the number of entering and exiting investors divided by the total number of investors. *Market return* is the annual return of the OMX Helsinki All-Shares Index.

| Year    | Market return | Entering investors |      | Exiting investors |      | Net entry |      | Turnover |
|---------|---------------|--------------------|------|-------------------|------|-----------|------|----------|
|         |               | N                  | %    | N                 | %    | N         | %    | %        |
| 2004    | 7.6%          |                    |      |                   |      |           |      |          |
| 2005    | 35.2%         | 129,908            | 11.7 | 64,833            | 5.8  | 65,075    | 5.9  | 8.8      |
| 2006    | 21.8%         | 130,335            | 11.1 | 76,718            | 6.5  | 53,617    | 4.6  | 8.8      |
| 2007    | 25.0%         | 140,288            | 11.4 | 86,321            | 7.0  | 53,967    | 4.4  | 9.2      |
| 2008    | -51.3%        | 61,880             | 4.8  | 129,478           | 10.1 | -67,598   | -5.3 | 7.4      |
| 2009    | 26.2%         | 79,460             | 6.5  | 60,576            | 5.0  | 18,884    | 1.6  | 5.8      |
| 2010    | 23.5%         | 77,754             | 6.3  | 63,297            | 5.1  | 14,457    | 1.2  | 5.7      |
| 2011    | -27.0%        | 77,685             | 6.2  | 74,006            | 5.9  | 3,679     | 0.3  | 6.1      |
| 2012    | 14.1%         | 97,461             | 7.8  | 60,718            | 4.8  | 36,743    | 2.9  | 6.3      |
| 2013    | 32.2%         | 128,029            | 9.9  | 68,167            | 5.3  | 59,862    | 4.6  | 7.6      |
| 2014    | 10.7%         | 117,457            | 8.7  | 82,972            | 6.1  | 34,485    | 2.6  | 7.4      |
| 2015    | 14.9%         | 127,707            | 9.2  | 70,694            | 5.1  | 57,013    | 4.1  | 7.2      |
| 2016    | 8.5%          | 113,186            | 7.8  | 75,267            | 5.2  | 37,919    | 2.6  | 6.5      |
| Average | 10.9%         | 106,762            | 8.5  | 76,087            | 6.0  | 30,675    | 2.5  | 7.2      |

The net entry rate is positive for all years except for 2008, in which net entry equaled -5.3%. The largest increase of 5.9% occurred in 2005. These percentages amount to 68,000 individuals exiting in 2008 and 65,000 individuals entering the market in 2005. These net numbers mask the fact that every year sees many more investors enter or exit the market. For example, 129,000 investors exit and 62,000 individuals enter in 2008. An alternative metric evaluates the fraction of investors in a year that changes because of either entry or exit. This turnover equals the absolute number of entries and exits divided by two, which is further divided by the total number of investors. The average turnover over our sample period suggests 7.2% of the investor population changes every year.

Why does the entry rate vary over time? Market returns during the year appear to play a large role. For example, OMX Helsinki All-Shares posted a large negative market return in 2008 (-51.3%), which is the only year that witnessed a negative net entry rate. Figure 2 displays this pattern, which is consistent with individuals extrapolating from recent market returns (Kautia and Knüpfer, 2012; Greenwood and Shleifer, 2014).



**Figure 2.** Fraction of investors entering and exiting stocks and mutual funds  
 This figure shows the yearly percentage of entering and exiting investors in 2005-2016. Investors are regarded as *entering* if they own securities at the end of the current year but did not own any securities at the end of the previous year. Conversely, investors are regarded as *exiting* if they owned securities at the end of the previous year but do not own securities at the end of the current year. The percentages are calculated relative to the total number of investors at the end of the previous year. *Market return* on the secondary vertical axis is the annual return of the OMX Helsinki All-Shares Index.

Do people exiting the market ever come back? Table 3 reports that about 12% of investors re-enter after one year of exit and this cumulative re-entry rate grows to about 30% after five years following the exit. The re-entry rates are lowest for investors who left the market in 2008, which saw the worst return during our sample period. This pattern is consistent with personal return experiences leaving permanent marks on the individual’s willingness to participate in financial markets (Knüpfer et al., 2017; Malmendier and Nagel, 2011).

**Table 3**  
 Fraction of investors re-entering stocks and mutual funds

This table reports the propensity of exiting investors to re-enter the market in subsequent years. Investors are regarded as *exiting* if they owned securities at the end of the previous year but do not own securities at the end of the current year. The fraction of re-entering investors is the fraction of investors who exited stocks and mutual funds in a year but return to the market at some point during the next *n* years after exit. Investors who are not alive five years after the exit are excluded from the denominator of the fraction of re-entering investors.

| Year | Num. exiting investors | Fraction of individuals re-entering within <i>n</i> years after exiting (in %) |         |         |         |         |
|------|------------------------|--|---------|---------|---------|---------|
|      |                        | 1 year   | 2 years | 3 years | 4 years | 5 years |
| 2005 | 64,833                 | 12.0   | 18.9    | 22.1    | 25.2    | 28.0    |
| 2006 | 76,718                 | 12.9   | 17.4    | 21.7    | 25.0    | 27.8    |
| 2007 | 86,321                 | 12.4   | 19.4    | 23.6    | 26.9    | 30.4    |
| 2008 | 129,478                | 9.5  | 14.8    | 18.3    | 22.3    | 26.6    |
| 2009 | 60,576                 | 10.1   | 15.2    | 19.5    | 23.6    | 27.2    |
| 2010 | 63,297                 | 12.5   | 19.1    | 24.7    | 29.2    | 33.1    |
| 2011 | 74,006                 | 13.1   | 20.6    | 26.1    | 30.5    | 34.0    |

### 3.2. Aggregate portfolio statistics

Panel A in Table 4 reports the mean and median portfolio value and the number of securities at the investor level. The mean portfolio value increases from 21,526 EUR in 2004 to 35,149 EUR in 2016, representing a value increase of 63%. This figure includes both capital flows and appreciation. Median portfolio value increases from 2,627 EUR to 4,640 EUR, respectively. This median corresponds to about 1.5 months of median gross salary in Finland (as reported in Statistics Finland’s Structure of Earnings statistics for 2016). Panel B shows that portfolio value is higher when aggregated at the household level; the mean and median are 48,456 EUR and 5,969 EUR in 2016, respectively. This increase can emanate from members of the same household being more likely to share their participation status than two randomly chosen individuals. Figure 3 displays the annual variation for investors in Panel A and households in Panel B. Years 2008 and 2011 saw a decline in portfolio value, likely due to low market returns in those years.

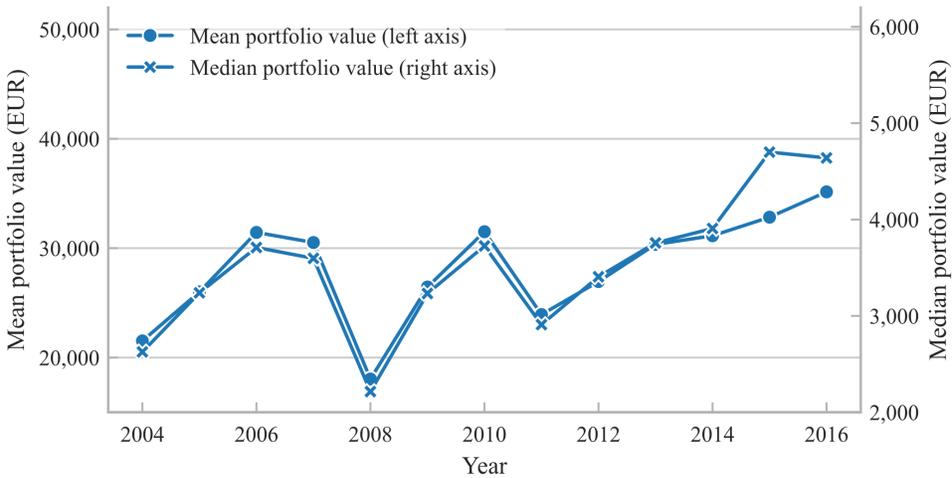
**Table 4**  
Mean and median holdings of stocks and mutual funds

This table reports the means and medians of the holdings of the Finnish investors holding stocks and mutual funds. The statistics for portfolio value and number of securities are calculated for investors who hold either stocks or mutual funds, only stocks, only mutual funds, directly held stocks or equity mutual funds, and both stocks and mutual funds. Panel A calculates the statistics at the investor level whereas Panel B aggregates investors at the household level.

| <i>Panel A: All individuals</i>              |        |        |        |        |
|--|--------|--------|--------|--------|
|  | 2004   | 2008   | 2012   | 2016   |
| <i>Mean portfolio value (EUR):</i>           |        |        |        |        |
| Investors with any securities                | 21,526 | 18,043 | 26,954 | 35,149 |
| Investors with stocks                        | 30,609 | 29,648 | 44,927 | 65,929 |
| Investors with mutual funds                  | 22,797 | 19,002 | 27,338 | 33,300 |
| Investors with stocks or equity mutual funds | 25,436 | 22,101 | 33,759 | 48,747 |
| Investors with stocks and mutual funds       | 54,227 | 53,772 | 75,856 | 98,280 |
| <i>Median portfolio value (EUR):</i>         |        |        |        |        |
| Investors with any securities                | 2,627  | 2,215  | 3,407  | 4,640  |
| Investors with stocks                        | 3,558  | 3,690  | 6,033  | 9,389  |
| Investors with mutual funds                  | 3,737  | 2,524  | 3,764  | 4,311  |
| Investors with stocks or equity mutual funds | 2,954  | 2,505  | 4,293  | 6,351  |
| Investors with stocks and mutual funds       | 14,471 | 11,979 | 17,259 | 22,186 |
| <i>Mean number of stocks:</i>                |        |        |        |        |
| Investors with any securities                | 1.6    | 1.5    | 1.8    | 1.7    |
| Investors with stocks                        | 2.6    | 3.0    | 3.6    | 3.8    |
| Investors with mutual funds                  | 1.1    | 1.0    | 1.3    | 1.2    |
| Investors with stocks or equity mutual funds | 2.0    | 2.0    | 2.5    | 2.6    |
| Investors with stocks and mutual funds       | 3.3    | 3.8    | 4.5    | 4.5    |
| <i>Median number of stocks:</i>              |        |        |        |        |
| Investors with any securities                | 1      | 1      | 1      | 0      |
| Investors with stocks                        | 1      | 1      | 2      | 2      |
| Investors with mutual funds                  | 0      | 0      | 0      | 0      |
| Investors with stocks or equity mutual funds | 1      | 1      | 1      | 1      |
| Investors with stocks and mutual funds       | 2      | 2      | 2      | 2      |
| <i>Mean number of mutual funds:</i>          |        |        |        |        |
| Investors with any securities                | 1.1    | 1.3    | 1.5    | 1.5    |
| Investors with stocks                        | 0.8    | 1.0    | 1.2    | 1.3    |
| Investors with mutual funds                  | 1.9    | 2.0    | 2.2    | 2.0    |
| Investors with stocks or equity mutual funds | 1.1    | 1.4    | 1.6    | 1.7    |
| Investors with stocks and mutual funds       | 2.5    | 2.7    | 3.1    | 2.9    |
| <i>Median number of mutual funds:</i>        |        |        |        |        |
| Investors with any securities                | 1      | 1      | 1      | 1      |
| Investors with stocks                        | 0      | 0      | 0      | 0      |
| Investors with mutual funds                  | 1      | 1      | 1      | 1      |
| Investors with stocks or equity mutual funds | 0      | 1      | 1      | 1      |
| Investors with stocks and mutual funds       | 2      | 2      | 2      | 2      |

| <i>Panel B: Individuals aggregated to households</i> |        |        |        |         |
|--|--------|--------|--------|---------|
|  | 2004   | 2008   | 2012   | 2016    |
| <i>Mean portfolio value (EUR):</i>                   |        |        |        |         |
| Households with any securities                       | 29,188 | 24,604 | 36,838 | 48,456  |
| Households with stocks                               | 39,572 | 37,981 | 57,547 | 84,571  |
| Households with mutual funds                         | 32,968 | 27,309 | 39,465 | 48,563  |
| Households with stocks or equity mutual funds        | 34,169 | 29,773 | 45,363 | 65,596  |
| Households with stocks and mutual funds              | 63,307 | 60,858 | 86,829 | 114,653 |
| <i>Median portfolio value (EUR):</i>                 |        |        |        |         |
| Households with any securities                       | 3,565  | 3,093  | 4,693  | 5,969   |
| Households with stocks                               | 4,870  | 5,114  | 8,373  | 13,200  |
| Households with mutual funds                         | 5,851  | 3,942  | 5,622  | 6,543   |
| Households with stocks or equity mutual funds        | 4,127  | 3,682  | 6,081  | 9,283   |
| Households with stocks and mutual funds              | 16,507 | 13,631 | 19,870 | 26,316  |
| <i>Mean number of stocks:</i>                        |        |        |        |         |
| Households with any securities                       | 1.9    | 1.9    | 2.3    | 2.1     |
| Households with stocks                               | 2.9    | 3.4    | 4.0    | 4.3     |
| Households with mutual funds                         | 1.7    | 1.6    | 1.9    | 1.8     |
| Households with stocks or equity mutual funds        | 2.4    | 2.5    | 3.0    | 3.1     |
| Households with stocks and mutual funds              | 3.7    | 4.2    | 4.9    | 5.0     |
| <i>Median number of stocks:</i>                      |        |        |        |         |
| Households with any securities                       | 1      | 1      | 1      | 0       |
| Households with stocks                               | 1      | 2      | 2      | 2       |
| Households with mutual funds                         | 0      | 0      | 0      | 0       |
| Households with stocks or equity mutual funds        | 1      | 1      | 1      | 1       |
| Households with stocks and mutual funds              | 2      | 2      | 3      | 3       |
| <i>Mean number of mutual funds:</i>                  |        |        |        |         |
| Households with any securities                       | 1.4    | 1.6    | 1.8    | 1.9     |
| Households with stocks                               | 1.1    | 1.4    | 1.7    | 1.8     |
| Households with mutual funds                         | 2.2    | 2.4    | 2.6    | 2.5     |
| Households with stocks or equity mutual funds        | 1.4    | 1.8    | 2.0    | 2.2     |
| Households with stocks and mutual funds              | 2.8    | 3.1    | 3.5    | 3.3     |
| <i>Median number of mutual funds:</i>                |        |        |        |         |
| Households with any securities                       | 1      | 1      | 1      | 1       |
| Households with stocks                               | 0      | 0      | 0      | 1       |
| Households with mutual funds                         | 1      | 2      | 2      | 2       |
| Households with stocks or equity mutual funds        | 1      | 1      | 1      | 1       |
| Households with stocks and mutual funds              | 2      | 2      | 2      | 2       |

Panel A: Investors



Panel B: Households

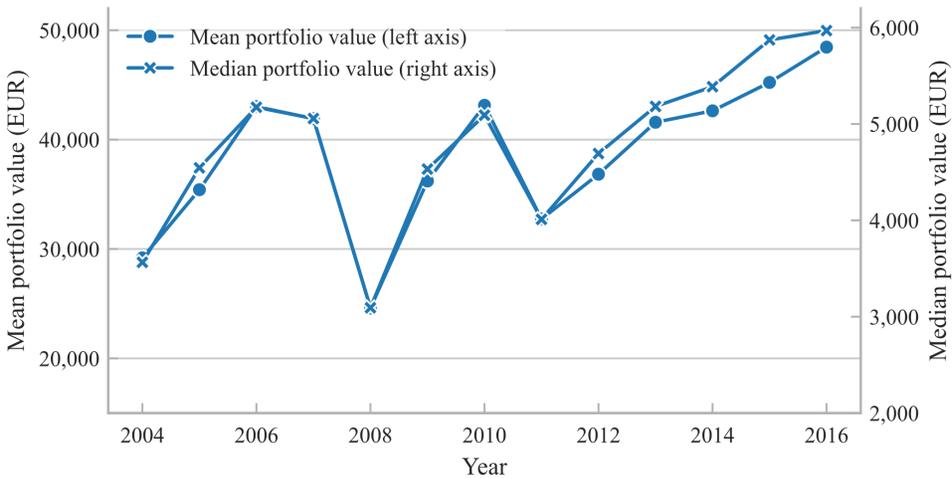
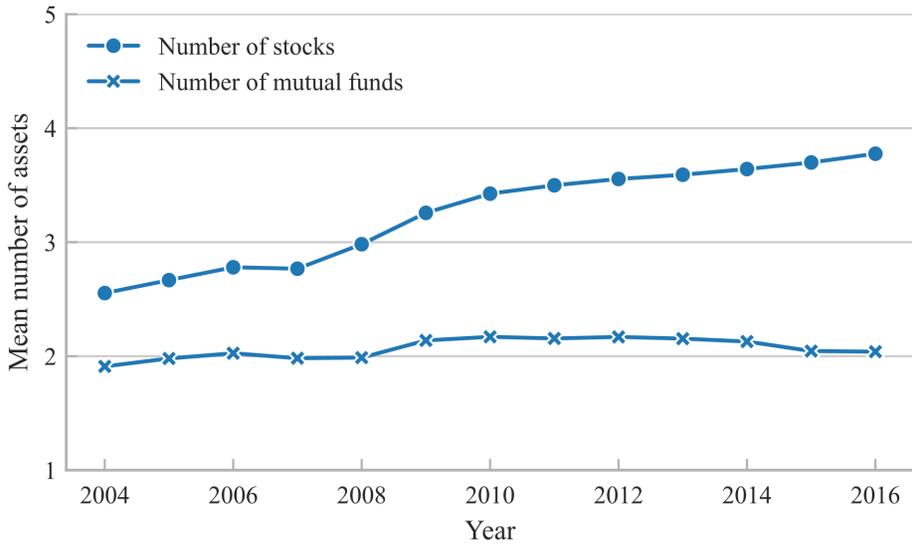


Figure 3. Mean and median portfolio value

This figure shows the yearly mean (primary vertical axis) and median (secondary vertical axis) portfolio values across all investors in 2004-2016. Panel A reports the statistics for individuals whereas Panel B aggregates individuals at the household level.

Portfolios are better diversified in 2016 than in 2004. Panel A in Table 4 shows the median number of stocks increases from one to two for investors directly holding equity. The median number of mutual funds remains unchanged at one. Considering all investors, the means increase from 1.6 to 1.7 stocks and from 1.1 to 1.5 mutual funds, which translates into an average of 3.2 securities in 2016. Panel B shows the aggregation of investors to the household level yields on average 2.1 stocks and 1.9 mutual funds, which amounts to a total of 4.0 securities in 2016. Figure 4 visualizes the development of portfolio diversification in 2004-2016. While the mean number of stocks has increased steadily since 2008, the mean number of mutual funds has remained flatter.

Panel A: Investors



Panel B: Households

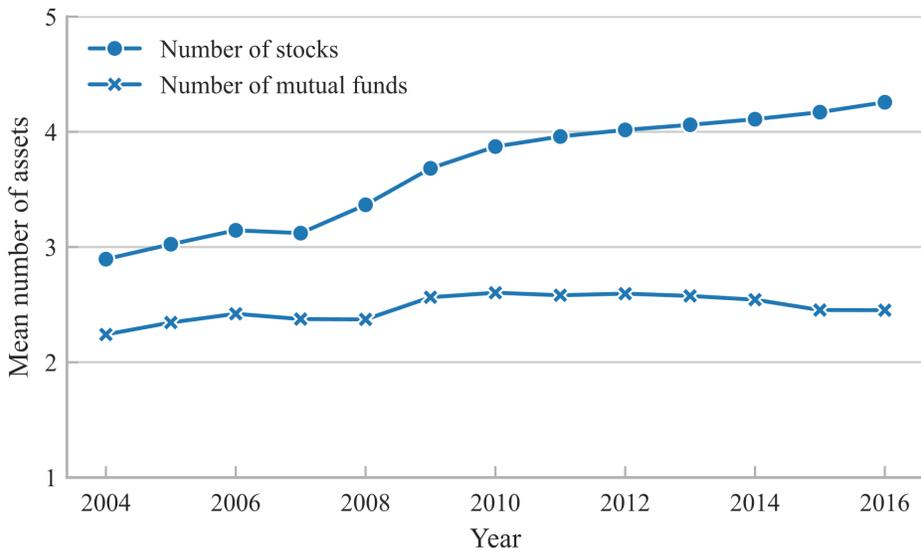


Figure 4. Mean number of stocks and mutual funds

This figure shows the mean number of stocks conditional on holding any stocks and the mean number of mutual funds conditional on holding any mutual funds across all investors in 2004-2016. Panel A reports the statistics for individuals whereas Panel B aggregates individuals at the household level.

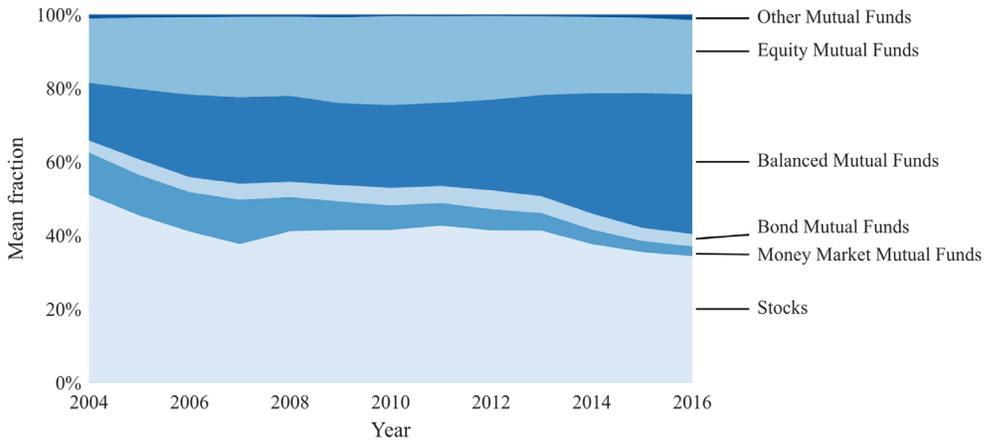
**Table 5**  
Portfolio composition by investor characteristics

This table reports the average fraction of investment wealth allocated to stocks and different types of mutual funds by Finnish individuals in 2016. The statistics are calculated across all investors (top panel) and broken down into groups of investors formed by socioeconomic characteristics (bottom panels). The fraction allocated to each type of security is first calculated at the individual investor level and then equally weighted across investors. The table also reports the median portfolio value, mean number of stocks, mean number of mutual funds, and the number of investors. The sample is restricted to individuals who held stocks or mutual funds in 2016 and it excludes a stock with the highest number of individual shareholders who only hold that one stock. *Top 5 city* refers to individuals residing in one of the top five most populated municipalities in Finland. Results by *IQ stanine* are based on the subsample of men who took the IQ test during military enlistment.

|                            | Portfolio composition (%) |              |      |          |        |       | Aggregate portfolio statistics |                 |                |               |
|----------------------------|---------------------------|--------------|------|----------|--------|-------|--------------------------------|-----------------|----------------|---------------|
|                            | Stocks                    | Money Market | Bond | Balanced | Equity | Other | Median portfolio value         | Mean no. stocks | Mean no. funds | No. investors |
| <i>Overall:</i>            | 31.8                      | 2.8          | 3.5  | 39.5     | 21.0   | 1.5   | 4,588                          | 1.7             | 1.6            | 1,424,177     |
| <i>Gender:</i>             |                           |              |      |          |        |       |                                |                 |                |               |
| Male                       | 37.0                      | 2.2          | 3.0  | 34.0     | 22.3   | 1.5   | 4,931                          | 2.2             | 1.6            | 744,307       |
| Female                     | 26.0                      | 3.5          | 3.9  | 45.4     | 19.7   | 1.5   | 4,232                          | 1.2             | 1.5            | 679,870       |
| <i>Mother tongue:</i>      |                           |              |      |          |        |       |                                |                 |                |               |
| Finnish                    | 31.3                      | 2.9          | 3.5  | 40.0     | 20.8   | 1.5   | 4,654                          | 1.7             | 1.6            | 1,280,120     |
| Swedish                    | 40.1                      | 1.7          | 3.0  | 29.6     | 24.3   | 1.2   | 4,783                          | 2.0             | 1.6            | 119,336       |
| Other                      | 17.5                      | 2.8          | 4.7  | 57.2     | 17.0   | 0.9   | 1,519                          | 0.7             | 1.5            | 24,721        |
| <i>Place of residence:</i> |                           |              |      |          |        |       |                                |                 |                |               |
| Top 5 city                 | 36.8                      | 2.7          | 3.7  | 35.6     | 20.0   | 1.3   | 6,032                          | 2.2             | 1.7            | 458,710       |
| Other                      | 29.4                      | 2.8          | 3.4  | 41.3     | 21.5   | 1.6   | 3,949                          | 1.5             | 1.5            | 965,467       |
| <i>Level of education:</i> |                           |              |      |          |        |       |                                |                 |                |               |
| Graduate deg.              | 40.2                      | 2.4          | 3.3  | 32.3     | 20.3   | 1.6   | 6,607                          | 2.6             | 1.9            | 418,921       |
| Other                      | 28.2                      | 3.0          | 3.5  | 42.5     | 21.3   | 1.5   | 3,896                          | 1.3             | 1.5            | 1,005,256     |
| <i>Field of education:</i> |                           |              |      |          |        |       |                                |                 |                |               |
| Business deg.              | 36.9                      | 2.6          | 3.3  | 35.9     | 19.7   | 1.6   | 5,442                          | 2.2             | 1.8            | 202,351       |
| Other                      | 30.9                      | 2.8          | 3.5  | 40.1     | 21.2   | 1.5   | 4,442                          | 1.6             | 1.6            | 1,221,826     |
| <i>IQ stanine:</i>         |                           |              |      |          |        |       |                                |                 |                |               |
| 1-4                        | 29.0                      | 2.7          | 3.1  | 40.9     | 23.2   | 1.1   | 1,647                          | 1.4             | 1.5            | 67,046        |
| 5                          | 35.2                      | 2.1          | 2.7  | 34.7     | 24.1   | 1.2   | 2,580                          | 1.9             | 1.6            | 54,321        |
| 6                          | 38.8                      | 1.9          | 2.6  | 31.1     | 24.4   | 1.2   | 3,449                          | 2.3             | 1.8            | 48,578        |
| 7                          | 43.7                      | 1.8          | 2.6  | 26.8     | 23.7   | 1.4   | 5,168                          | 2.7             | 1.8            | 42,161        |
| 8                          | 46.2                      | 1.6          | 2.6  | 24.4     | 23.8   | 1.4   | 6,752                          | 3.1             | 2.0            | 22,829        |
| 9                          | 48.8                      | 1.6          | 3.0  | 21.2     | 24.0   | 1.4   | 10,060                         | 3.5             | 2.2            | 20,383        |

Table 5 reports on portfolio composition in 2016.<sup>1</sup> By far the largest asset classes are balanced mutual funds (combining stocks and bonds in one investment vehicle) at 40% and direct equity at 32% of total portfolio value. These asset classes are followed by equity mutual funds at 21% and fixed income funds (money market and bonds) at 6%. Assuming a 60:40 allocation into bonds and stocks for balanced funds, about 30% of the mean portfolio is invested in fixed income securities. Figure 5 displays the development of portfolio composition in 2004-2016. Balanced mutual funds have grown in importance whereas stocks have become a smaller fraction of the average portfolio.

<sup>1</sup> Tables 5 to 10 exclude a stock with the highest number of individual shareholders who only hold that one stock.



**Figure 5.** Portfolio composition over time  
 This figure shows the equally weighted average fraction of investment wealth allocated to stocks and different types of mutual funds by Finnish individuals in 2004-2016. The width of the colored bands corresponds to the average percentage allocated in each type of security each year.

### 3.3. Differences in portfolio composition across investor characteristics

The aggregate statistics mask a substantial degree of portfolio heterogeneity. Table 5 reports that males, Swedish-speaking, urban, university and business educated, and high-IQ individuals allocate more wealth to direct equity investments. The higher equity allocations by these types of investors are consistent with earlier work highlighting the role of financial literacy and cognitive abilities (Van Rooij, Lusardi, and Alessie, 2011; Grinblatt, Keloharju, and Linnainmaa, 2011) in explaining stock market participation. However, the differences in holdings of equity mutual funds are much less pronounced, suggesting one of the main margins that makes some investors systematically differ is their tendency to invest in directly held stock.

**Table 6**  
 Portfolio composition by wealth

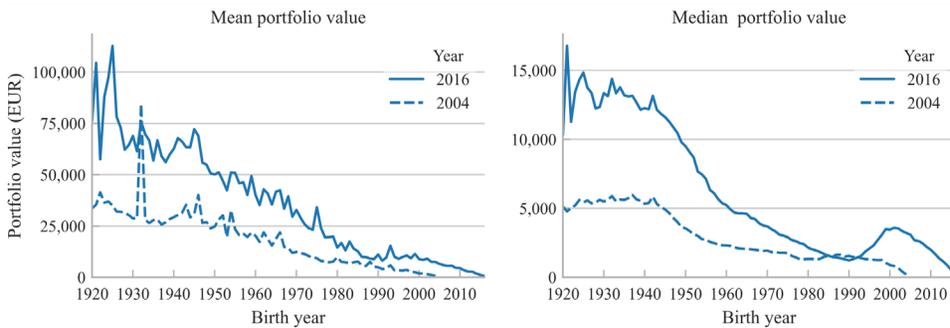
This table reports the equally weighted average fraction of investment wealth allocated to stocks and different types of mutual funds by Finnish individuals in 2016, grouped by wealth decile. The wealth deciles are based on the distribution of individual investment wealth in 2016. The table also reports, for each decile, the median portfolio value, the mean number of stocks, the mean number of mutual funds, and the number of investors. The sample is restricted to individuals who held stocks or mutual funds in 2016 and it excludes a stock with the highest number of individual shareholders who only hold that one stock.

|                       | Portfolio composition (%) |              |      |          |        |       | Aggregate portfolio statistics |                 |                |               |
|-----------------------|---------------------------|--------------|------|----------|--------|-------|--------------------------------|-----------------|----------------|---------------|
|                       | Stocks                    | Money Market | Bond | Balanced | Equity | Other | Median portfolio value         | Mean no. stocks | Mean no. funds | No. investors |
| <i>Wealth Decile:</i> |                           |              |      |          |        |       |                                |                 |                |               |
| Lowest                | 15.6                      | 4.9          | 3.4  | 52.5     | 23.5   | 0.2   | 68                             | 0.2             | 1.0            | 142,418       |
| 2                     | 24.9                      | 2.5          | 2.7  | 47.2     | 22.3   | 0.5   | 339                            | 0.3             | 1.0            | 142,418       |
| 3                     | 24.2                      | 2.4          | 2.7  | 47.4     | 22.8   | 0.5   | 886                            | 0.4             | 1.1            | 142,418       |
| 4                     | 25.5                      | 2.3          | 3.1  | 44.6     | 24.1   | 0.4   | 1,805                          | 0.6             | 1.2            | 142,417       |
| 5                     | 28.0                      | 2.5          | 3.4  | 40.2     | 25.4   | 0.5   | 3,407                          | 0.8             | 1.4            | 142,934       |
| 6                     | 33.1                      | 2.8          | 3.5  | 36.4     | 22.8   | 1.5   | 5,891                          | 1.1             | 1.4            | 141,901       |
| 7                     | 34.0                      | 2.8          | 3.7  | 36.0     | 21.7   | 1.8   | 10,173                         | 1.4             | 1.6            | 142,418       |
| 8                     | 36.7                      | 2.8          | 4.0  | 35.3     | 19.2   | 2.2   | 18,203                         | 2.0             | 1.9            | 142,417       |
| 9                     | 40.5                      | 2.7          | 4.1  | 33.4     | 15.7   | 3.7   | 36,960                         | 3.1             | 2.2            | 142,418       |
| Highest               | 55.2                      | 2.3          | 4.2  | 21.7     | 13.0   | 3.6   | 117,906                        | 7.2             | 3.0            | 142,418       |

Table 6 reports portfolio composition by breaking down market participants into deciles by their total portfolio value. Financial wealth is positively associated with direct equity investment. The top decile has 55% invested in stocks whereas the bottom decile has only 16%. These numbers are 68% and 39%, respectively, when equity mutual funds are included. Wealth also associates positively with the fraction invested in the other funds that fall outside the main-stream asset classes (e.g., hedge funds, commodities, and real estate). Balanced funds absorb most of these increases by showing a substantial decline by wealth. Only 22% of the top decile is invested in balanced funds.

### 3.4. Life-cycle patterns of investor holdings

Figure 6 reports mean and median portfolio value by birth year. Older investors have larger portfolios. For example, investors born in 1940 on average own 62,647 EUR worth of stocks and mutual funds in 2016 whereas the corresponding value is 14,487 EUR for investors born in 1980. The inequality in portfolio value related to birth year has increased in 2004-2016. For example, the median value for investors born in 1940 has increased by 130%, whereas the corresponding number for investors born in 1980 equals 61%. The earlier generations have thus captured a disproportionate fraction of the gains in investment wealth.



**Figure 6.** Mean and median portfolio value by birth year  
This figure shows the mean (left panel) and median (right panel) portfolio values of Finnish investors in 2004 and 2016 as a function of birth year.

Age has also to do with portfolio composition. Table 7 reports older investors hold relatively more fixed income mutual funds. They also have a more diversified portfolio when judged by the number of securities they hold. However, the fraction of directly held stocks is higher in the older investor’s portfolios. This perhaps reflects the relatively young age of the Finnish mutual fund industry. Mutual funds were first recognized in law in 1987 and the mutual fund industry did not proliferate until the mid-1990s.

**Table 7**

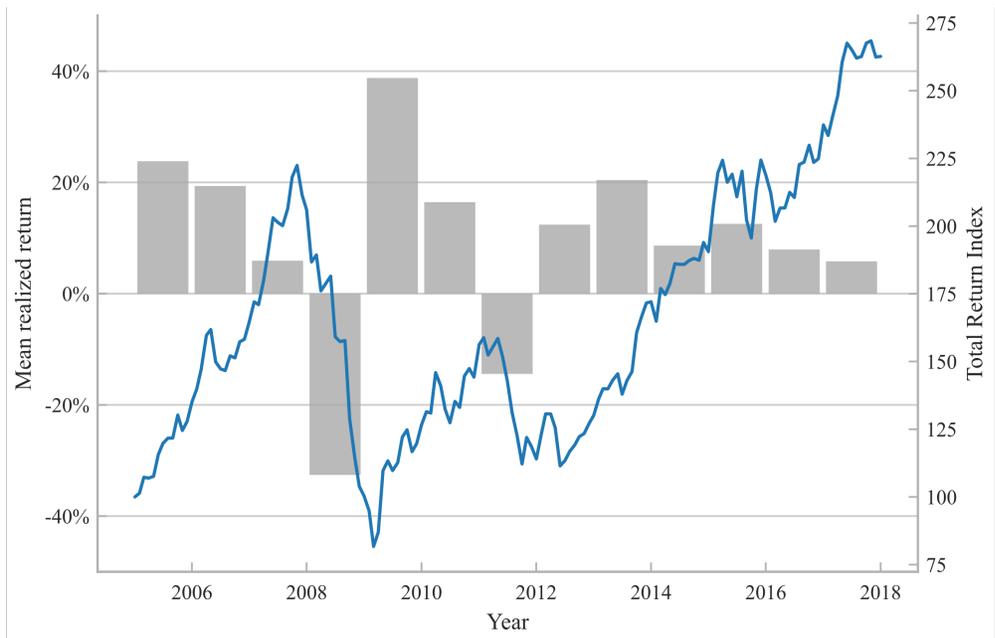
Portfolio composition by age

This table reports the average fraction of investment wealth allocated to stocks and different types of mutual funds by Finnish individuals in 2016, grouped by investor age. The table also reports, for each age group, the median portfolio value, the mean number of stocks, the mean number of mutual funds, and the number of investors. The sample is restricted to individuals who held stocks or mutual funds in 2016 and it excludes a stock with the highest number of individual shareholders who only hold that one stock.

|       | Portfolio composition (%) |              |      |          |        |       | Aggregate portfolio statistics |                 |                |               |
|-------|---------------------------|--------------|------|----------|--------|-------|--------------------------------|-----------------|----------------|---------------|
|       | Stocks                    | Mutual funds |      |          |        |       | Median portfolio value         | Mean no. stocks | Mean no. funds | No. investors |
|       |                           | Money Market | Bond | Balanced | Equity | Other |                                |                 |                |               |
| Age:  |                           |              |      |          |        |       |                                |                 |                |               |
| 80–   | 44.9                      | 5.7          | 4.8  | 34.4     | 8.8    | 1.5   | 17,453                         | 2.1             | 1.3            | 68,691        |
| 75–79 | 41.7                      | 3.4          | 4.0  | 37.5     | 11.3   | 2.1   | 14,994                         | 2.3             | 1.5            | 68,406        |
| 70–74 | 41.4                      | 2.9          | 3.8  | 36.8     | 12.8   | 2.3   | 14,134                         | 2.5             | 1.6            | 98,155        |
| 65–69 | 37.0                      | 2.8          | 3.8  | 38.9     | 14.8   | 2.7   | 11,407                         | 2.2             | 1.7            | 129,867       |
| 60–64 | 34.1                      | 3.1          | 3.8  | 39.6     | 16.9   | 2.5   | 8,512                          | 2.0             | 1.7            | 120,053       |
| 55–59 | 33.8                      | 3.0          | 3.6  | 38.8     | 18.7   | 2.1   | 6,028                          | 1.9             | 1.7            | 112,129       |
| 50–54 | 34.9                      | 2.9          | 3.4  | 37.2     | 19.9   | 1.7   | 4,597                          | 1.9             | 1.6            | 111,331       |
| 45–49 | 35.7                      | 2.6          | 3.0  | 35.9     | 21.3   | 1.4   | 3,656                          | 1.9             | 1.6            | 101,128       |
| 40–44 | 33.4                      | 2.7          | 3.2  | 36.3     | 23.3   | 1.1   | 2,911                          | 1.8             | 1.7            | 98,403        |
| 35–39 | 29.3                      | 2.8          | 3.4  | 39.5     | 24.0   | 0.9   | 2,302                          | 1.5             | 1.7            | 101,418       |
| 30–34 | 26.2                      | 2.8          | 3.6  | 43.8     | 22.8   | 0.8   | 1,681                          | 1.3             | 1.7            | 97,086        |
| 25–29 | 23.6                      | 2.4          | 3.4  | 47.0     | 23.0   | 0.6   | 1,331                          | 1.1             | 1.6            | 83,788        |
| 20–24 | 23.1                      | 2.1          | 3.2  | 43.9     | 27.1   | 0.6   | 1,771                          | 1.1             | 1.5            | 63,431        |
| 15–19 | 18.4                      | 2.1          | 3.0  | 40.0     | 36.0   | 0.5   | 3,264                          | 0.8             | 1.5            | 50,596        |
| 10–14 | 14.9                      | 2.1          | 2.6  | 42.4     | 37.6   | 0.4   | 3,157                          | 0.7             | 1.4            | 49,437        |
| 5–9   | 17.4                      | 0.9          | 2.3  | 40.5     | 38.7   | 0.3   | 2,178                          | 0.7             | 1.4            | 41,913        |
| 0–4   | 14.3                      | 0.3          | 1.4  | 48.0     | 35.9   | 0.2   | 856                            | 0.4             | 1.3            | 28,345        |

### 3.5. Risk and return of different types of investors

What are the consequences of the great degree of portfolio heterogeneity? We evaluate this question by documenting realized returns, realized volatility, and expected returns as a function of individual characteristics. Figure 7 reports the portfolio returns of the average investor and the cumulative return on the OMX Helsinki All-Shares index in 2005–2017 (here the years shift by one because the end-of-year holdings of a year enter the calculation of returns in the next year). The average portfolio return closely tracks that of the stock market. In all the years except for 2008 and 2011, the average return was positive. Table 8 shows the average investor made 9% per year on her holdings of stocks and mutual funds. Cumulated over the 13 years in our sample, this return amounts to 153%. During the same period, the Finnish stock market returned 163%.



**Figure 7.** Realized investor returns and OMX Helsinki All-Shares index  
 The grey bars in this figure depict the average realized annual returns across all investors in each year, based on their portfolio holdings at the beginning of the year and the returns on those holdings during the year. The solid line depicts the monthly time series of the total return index of the OMX Helsinki All-Shares index (secondary vertical axis) rescaled at 100 in 2005.

Table 8 further shows the average investor has a market beta of 0.8 relative to the Fama-French value-weighted market portfolio of European countries. The loadings on the three other factors reveal the average investor prefers small growth firms (positive loading on the size factor and negative on the value factor) and securities that have declined in value recently (negative loading on the momentum factor). These findings are consistent with Grinblatt and Keloharju (2000) and Betermier, Calvet, and Sodini (2017).

**Table 8**

Performance and factor loadings

This table reports equally weighted averages of portfolio performance and factor loadings in 2005-2017 (using end-of-year holdings of the previous year to calculate returns for the next year). The statistics are calculated across all investors (top panel) and broken down into groups of investors based on socioeconomic characteristics (bottom panels). The sample excludes a stock with the highest number of individual shareholders who only hold that one stock. Factor loadings and the expected excess return are estimated using the Fama-French four-factor returns for Europe and the twelve-month EURIBOR as a proxy for the risk-free rate. Returns and volatility are expressed in annual terms. Expected exc. return is the arithmetic equally weighted average expected annual return estimated from the four-factor model in excess of the risk-free rate.  $\beta_{RMRF}$  refers to the market factor,  $\beta_{SMB}$  refers to the size factor,  $\beta_{HML}$  refers to the value factor, and  $\beta_{MOM}$  refers to the momentum factor. Top 5 city refers to individuals who reside in one of the top five most populated municipalities in Finland. Results by IQ stanine are based on the subsample of men who took the IQ test during military enlistment.

|                            | Performance (%) |                     |                      | Factor loadings |               |               |               |
|----------------------------|-----------------|---------------------|----------------------|-----------------|---------------|---------------|---------------|
|                            | Realized return | Realized volatility | Expected exc. return | $\beta_{RMRF}$  | $\beta_{SMB}$ | $\beta_{HML}$ | $\beta_{MOM}$ |
| <i>Overall:</i>            | 8.9             | 14.3                | 1.9                  | 0.78            | 0.11          | -0.08         | -0.05         |
| <i>Gender:</i>             |                 |                     |                      |                 |               |               |               |
| Male                       | 9.5             | 15.6                | 2.0                  | 0.83            | 0.13          | -0.10         | -0.06         |
| Female                     | 8.3             | 12.9                | 1.8                  | 0.72            | 0.09          | -0.05         | -0.05         |
| <i>Mother tongue:</i>      |                 |                     |                      |                 |               |               |               |
| Finnish                    | 8.9             | 14.3                | 1.9                  | 0.77            | 0.10          | -0.07         | -0.05         |
| Swedish                    | 9.4             | 15.3                | 2.2                  | 0.87            | 0.17          | -0.09         | -0.07         |
| Other                      | 7.9             | 13.3                | 1.9                  | 0.70            | 0.13          | -0.16         | -0.00         |
| <i>Place of residence:</i> |                 |                     |                      |                 |               |               |               |
| Top 5 city                 | 9.4             | 14.6                | 1.9                  | 0.80            | 0.10          | -0.09         | -0.05         |
| Other                      | 8.7             | 14.2                | 1.9                  | 0.77            | 0.11          | -0.07         | -0.06         |
| <i>Level of education:</i> |                 |                     |                      |                 |               |               |               |
| Graduate deg.              | 9.8             | 15.8                | 2.1                  | 0.85            | 0.11          | -0.09         | -0.06         |
| Other                      | 8.6             | 13.8                | 1.9                  | 0.76            | 0.11          | -0.07         | -0.05         |
| <i>Field of education:</i> |                 |                     |                      |                 |               |               |               |
| Business deg.              | 9.4             | 15.0                | 2.0                  | 0.81            | 0.10          | -0.08         | -0.06         |
| Other                      | 8.8             | 14.2                | 1.9                  | 0.78            | 0.11          | -0.07         | -0.05         |
| <i>IQ stanine:</i>         |                 |                     |                      |                 |               |               |               |
| 1-4                        | 8.6             | 15.0                | 1.9                  | 0.79            | 0.14          | -0.10         | -0.06         |
| 5                          | 9.3             | 16.2                | 2.0                  | 0.84            | 0.13          | -0.12         | -0.05         |
| 6                          | 9.7             | 16.7                | 2.1                  | 0.87            | 0.13          | -0.12         | -0.05         |
| 7                          | 10.0            | 17.4                | 2.2                  | 0.90            | 0.13          | -0.13         | -0.04         |
| 8                          | 10.2            | 17.6                | 2.3                  | 0.91            | 0.13          | -0.14         | -0.04         |
| 9                          | 10.4            | 17.7                | 2.3                  | 0.92            | 0.13          | -0.14         | -0.04         |

Table 8 also shows males, Swedish-speaking, urban, university and business educated, and high-IQ individuals generally have higher returns (both realized and expected) and higher volatility. For example, the top IQ stanine earns almost 2% more in annualized realized returns than the lowest four stanines.

Table 9 shows the returns are highest for the top wealth decile. The volatility the wealthy assume to earn their higher returns is lower than that of the investors below the median wealth. This finding likely reflects better diversification and suggests a better risk-return trade-off for the wealthy. Table 9 also shows the larger returns enjoyed by wealthier individuals partly emanate from differences in exposures to factors. Cumulated over long investment horizons, these patterns matter for wealth inequality (e.g., Piketty, 2014, Bach et al., 2020, and Fagereng et al., 2020).

**Table 9**

Performance and factor loadings by wealth

This table reports equally weighted averages of portfolio performance and factor loadings in 2005-2017 (using end-of-year holdings of the previous year to calculate returns for the next year), grouped by wealth deciles. The wealth deciles are based on the cross-sectional distribution of individual investment wealth in each year. See Table 8 for details.

|                       | Performance (%) |                     |                      | Factor loadings |               |               |               |
|-----------------------|-----------------|---------------------|----------------------|-----------------|---------------|---------------|---------------|
|                       | Realized return | Realized volatility | Expected exc. return | $\beta_{RMRF}$  | $\beta_{SMB}$ | $\beta_{HML}$ | $\beta_{MOM}$ |
| <i>Wealth Decile:</i> |                 |                     |                      |                 |               |               |               |
| Lowest                | 8.9             | 15.8                | 1.9                  | 0.75            | 0.20          | -0.07         | -0.08         |
| 2                     | 8.5             | 15.8                | 1.8                  | 0.79            | 0.17          | -0.09         | -0.08         |
| 3                     | 8.4             | 14.8                | 2.0                  | 0.78            | 0.12          | -0.08         | -0.05         |
| 4                     | 8.7             | 14.6                | 2.1                  | 0.79            | 0.09          | -0.06         | -0.04         |
| 5                     | 9.4             | 14.6                | 2.1                  | 0.81            | 0.08          | -0.05         | -0.05         |
| 6                     | 9.1             | 14.0                | 1.9                  | 0.79            | 0.07          | -0.06         | -0.05         |
| 7                     | 8.9             | 13.6                | 1.9                  | 0.77            | 0.07          | -0.07         | -0.05         |
| 8                     | 8.7             | 13.2                | 1.8                  | 0.75            | 0.08          | -0.07         | -0.05         |
| 9                     | 8.8             | 13.0                | 1.8                  | 0.75            | 0.09          | -0.08         | -0.05         |
| Highest               | 9.7             | 14.1                | 2.0                  | 0.84            | 0.12          | -0.13         | -0.04         |

Table 10 reports the returns by age. Consistent with Betermier, Calvet, and Sodini (2017), investors' exposure to the value factor increases with age. Older investors, in general, have higher realized returns, likely driven by their greater exposure to direct equity investments reported earlier.

**Table 10**

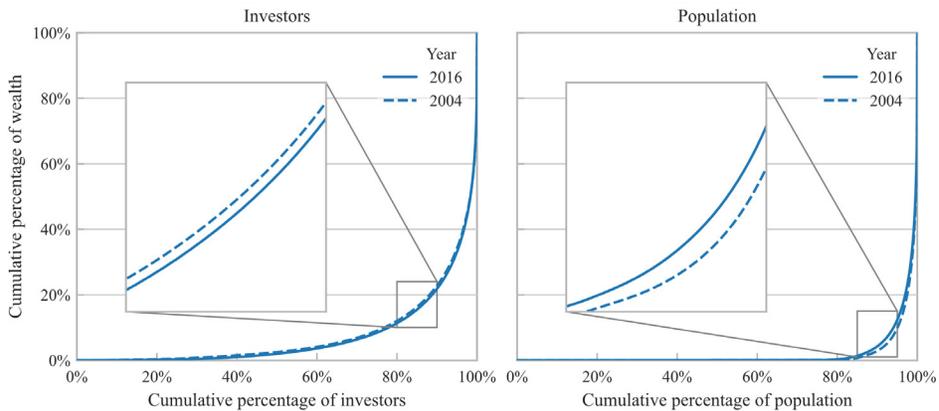
Performance and factor loadings by age

This table reports equally weighted averages of portfolio performance and factor loadings in 2005-2017 (using end-of-year holdings of the previous year to calculate returns for the next year), grouped by investors' age. See Table 8 for details.

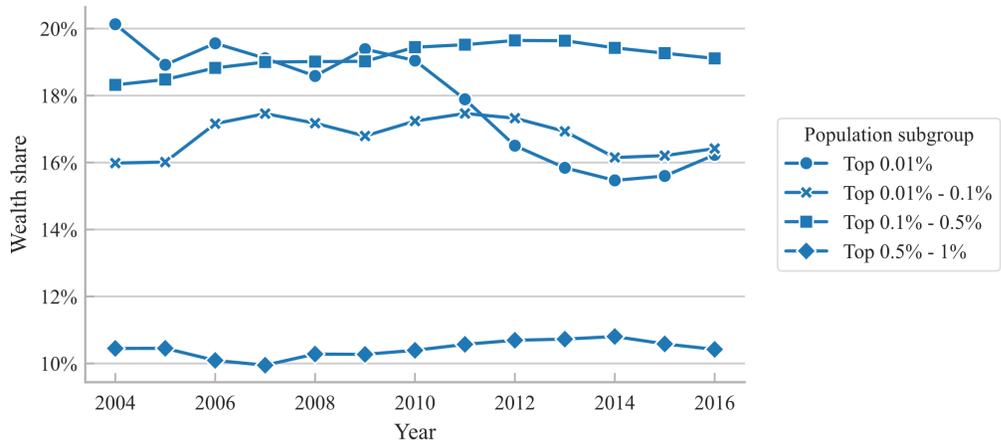
|             | Performance (%) |                     |                      | Factor loadings |               |               |               |
|-------------|-----------------|---------------------|----------------------|-----------------|---------------|---------------|---------------|
|             | Realized return | Realized volatility | Expected exc. return | $\beta_{RMRF}$  | $\beta_{SMB}$ | $\beta_{HML}$ | $\beta_{MOM}$ |
| <i>Age:</i> |                 |                     |                      |                 |               |               |               |
| 80-         | 9.3             | 14.4                | 1.7                  | 0.74            | 0.06          | 0.03          | -0.10         |
| 75-79       | 9.0             | 13.9                | 1.7                  | 0.73            | 0.07          | -0.01         | -0.09         |
| 70-74       | 9.1             | 14.1                | 1.7                  | 0.75            | 0.08          | -0.03         | -0.08         |
| 65-69       | 9.2             | 14.1                | 1.7                  | 0.76            | 0.09          | -0.05         | -0.08         |
| 60-64       | 9.1             | 14.2                | 1.8                  | 0.77            | 0.10          | -0.06         | -0.07         |
| 55-59       | 9.0             | 14.2                | 1.8                  | 0.77            | 0.11          | -0.08         | -0.07         |
| 50-54       | 9.1             | 14.5                | 1.8                  | 0.78            | 0.13          | -0.09         | -0.06         |
| 45-49       | 9.2             | 15.0                | 1.9                  | 0.80            | 0.13          | -0.10         | -0.06         |
| 40-44       | 9.2             | 15.6                | 2.0                  | 0.82            | 0.13          | -0.10         | -0.05         |
| 35-39       | 9.1             | 15.5                | 2.1                  | 0.82            | 0.13          | -0.10         | -0.05         |
| 30-34       | 8.8             | 14.9                | 2.1                  | 0.80            | 0.12          | -0.10         | -0.04         |
| 25-29       | 8.5             | 14.2                | 2.0                  | 0.76            | 0.10          | -0.08         | -0.04         |
| 20-24       | 8.4             | 14.0                | 2.0                  | 0.76            | 0.08          | -0.06         | -0.04         |
| 15-19       | 8.5             | 13.4                | 2.2                  | 0.78            | 0.08          | -0.07         | -0.02         |
| 10-14       | 8.2             | 12.7                | 2.3                  | 0.79            | 0.10          | -0.09         | -0.01         |
| 5-9         | 7.9             | 12.7                | 2.4                  | 0.81            | 0.12          | -0.10         | -0.00         |
| 0-4         | 8.2             | 13.1                | 2.3                  | 0.82            | 0.16          | -0.14         | -0.01         |

### 3.6. Concentration of wealth

How concentrated are holdings of stocks and mutual funds? Has this concentration changed over time? We report Lorenz curves in Figure 8. A straight line from the bottom-left to the top-right corner would indicate an equal distribution of wealth. The further the curve bends to the bottom-right corner, the more unequal the distribution. Among investors with some holdings of stocks or mutual funds, the Lorenz curve indicates wealth concentration has increased from 2004 to 2016. If the analysis includes individuals with no asset holdings, wealth concentration has decreased. This discrepancy likely reflects the increase in market participation and new investors typically holding small portfolios. However, these changes are small in magnitude and only visually detectable in the magnified versions of the Lorenz curves in Figure 8.



**Figure 8.** Lorenz curves in 2004 and 2016  
 This figure depicts Lorenz curves of the holdings of stocks and mutual funds in 2004 and 2016, reported for investors who hold stocks or mutual funds (left panel) and the entire population (right panel).



**Figure 9.** Top wealth shares over time  
 This figure decomposes the fraction of total stock and mutual fund holdings held by groups of individuals within the wealthiest 1% of the population. Circles show the top 0.01% of the population whereas crosses depict the top 0.1% individuals, excluding the top 0.01% individuals. Squares report the top 0.5% individuals excluding the top 0.1% individuals whereas diamonds depict the top 1% individuals excluding the top 0.5% individuals. The vertical axis is the fraction of total financial wealth held by each subgroup of individuals.

Figure 9 depicts the wealth shares owned by the wealthiest in the population. The fraction held by the top 0.01% has declined from 20% in 2004 to 16% in 2016.<sup>2</sup> Below this top group, no material changes emerge. For example, the group consisting of investors between the top 0.5% and the top 1% holds about 11% of wealth in both years.

**Table 11**  
Wealth shares in 2004 and 2016

This table reports the cumulative wealth and wealth percentiles at different points of the wealth distribution in 2004 and 2016. The left panel shows the proportion of individuals' investment wealth owned by the richest n% of individual investors and by the richest n% of the population. The right panel reports the corresponding portfolio values at each reported percentage point of the wealth distribution. Columns labeled *Investors* refer to the investment wealth distribution of individuals who hold any financial assets. Columns labeled *Population* refer to the investment wealth distribution of the entire population.

| Richest n% | Fraction of investment wealth (%) |       |            |       | Investment wealth at percentile (EUR) |            |            |           |
|------------|-----------------------------------|-------|------------|-------|---------------------------------------|------------|------------|-----------|
|            | Investors                         |       | Population |       | Investors                             |            | Population |           |
|            | 2004                              | 2016  | 2004       | 2016  | 2004                                  | 2016       | 2004       | 2016      |
| 0.01       | 13.0                              | 10.2  | 20.1       | 16.2  | 8,313,794                             | 14,363,689 | 2,319,277  | 5,005,092 |
| 0.1        | 24.4                              | 22.2  | 36.1       | 32.6  | 1,340,017                             | 2,376,316  | 418,983    | 896,297   |
| 0.5        | 36.7                              | 35.6  | 54.4       | 51.8  | 400,458                               | 728,143    | 128,011    | 267,711   |
| 1          | 43.7                              | 43.5  | 64.9       | 62.2  | 238,921                               | 438,659    | 72,774     | 149,070   |
| 5          | 65.8                              | 66.9  | 90.2       | 87.7  | 69,104                                | 113,844    | 11,858     | 26,590    |
| 10         | 77.2                              | 78.2  | 97.2       | 95.8  | 35,399                                | 56,374     | 3,060      | 8,481     |
| 20         | 88.0                              | 88.7  | 100.0      | 99.7  | 15,243                                | 23,968     | 141        | 992       |
| 30         | 93.1                              | 93.7  | 100.0      | 100.0 | 7,950                                 | 12,512     | 0          | 0         |
| 40         | 95.9                              | 96.4  | 100.0      | 100.0 | 4,441                                 | 7,226      | 0          | 0         |
| 50         | 97.5                              | 98.0  | 100.0      | 100.0 | 2,627                                 | 4,640      | 0          | 0         |
| 60         | 98.5                              | 99.0  | 100.0      | 100.0 | 1,779                                 | 2,657      | 0          | 0         |
| 70         | 99.3                              | 99.6  | 100.0      | 100.0 | 1,340                                 | 1,359      | 0          | 0         |
| 80         | 99.7                              | 99.9  | 100.0      | 100.0 | 683                                   | 613        | 0          | 0         |
| 90         | 99.9                              | 100.0 | 100.0      | 100.0 | 255                                   | 184        | 0          | 0         |
| 100        | 100.0                             | 100.0 | 100.0      | 100.0 | 0                                     | 0          | 0          | 0         |

Table 11 reports the cutoff points for an individual to enter the richest percentiles. In 2016, the top 10% cutoff is at 56,374 EUR for individuals holding some stocks or mutual funds whereas the corresponding numbers for the top 1% and 0.1% are at 438,659 EUR and 2,376,316 EUR, respectively. Because most individuals hold no stocks or mutual funds, the corresponding numbers are much lower for the whole population. For example, the top 10% cutoff equals 8,481 EUR in 2016.

Table 12 reports wealth concentration for each year. Consistent with the small changes documented above, the wealth share of the top 1% varies from 62% to 66% during our sample period. The corresponding range is 42% to 46% if we exclude individuals without holdings. Another metric to judge wealth concentration is the Gini coefficient, which takes the value of one if all wealth is held by one individual. This statistic equals 0.86 for investors and 0.96 for the entire population in 2016. Changes in the Gini coefficient over the sample period are small.

<sup>2</sup> We cannot investigate whether this decrease reflects transfers into holding companies or investment vehicles structured as insurance policies. Our data only includes assets held in the individual's own name.

**Table 12**

Top 1% wealth shares and Gini coefficients

This table reports the Gini coefficients in 2004-2016, constructed from the Lorenz curves of investment wealth. The table also reports the investment wealth of the wealthiest 1% of individuals and the corresponding fraction relative to the total investment wealth of the population. *Total holding value* is the aggregate EUR market value of stocks and mutual funds held by Finnish individuals at the end of a year. Columns labeled *Investors* refer to the investment wealth held by individuals who hold stocks or mutual funds. Columns labeled *Population* refer to the investment wealth of the entire population.

| Year | Total holding value | Investors |      |                      |       | Population |      |                      |       |
|------|---------------------|-----------|------|----------------------|-------|------------|------|----------------------|-------|
|      |                     |           |      | Wealth of richest 1% |       |            |      | Wealth of richest 1% |       |
|      |                     | N         | Gini | (EUR)                | (%)   | N          | Gini | (EUR)                | (%)   |
| 2004 | 23.9 bn             | 1,112,185 | 0.85 | 10.5 bn              | 43.7% | 5,236,611  | 0.97 | 15.5 bn              | 64.9% |
| 2005 | 30.6 bn             | 1,177,260 | 0.85 | 13.2 bn              | 43.2% | 5,255,580  | 0.97 | 19.6 bn              | 63.9% |
| 2006 | 38.7 bn             | 1,230,877 | 0.86 | 17.7 bn              | 45.8% | 5,276,955  | 0.97 | 25.4 bn              | 65.6% |
| 2007 | 39.2 bn             | 1,284,844 | 0.86 | 18.1 bn              | 46.3% | 5,300,484  | 0.97 | 25.7 bn              | 65.5% |
| 2008 | 22.0 bn             | 1,217,246 | 0.85 | 9.8 bn               | 44.7% | 5,326,314  | 0.97 | 14.3 bn              | 65.1% |
| 2009 | 32.7 bn             | 1,236,130 | 0.86 | 14.8 bn              | 45.2% | 5,351,427  | 0.97 | 21.4 bn              | 65.5% |
| 2010 | 39.4 bn             | 1,250,587 | 0.86 | 18.0 bn              | 45.6% | 5,375,276  | 0.97 | 26.1 bn              | 66.1% |
| 2011 | 30.0 bn             | 1,254,266 | 0.86 | 13.4 bn              | 44.6% | 5,401,267  | 0.97 | 19.6 bn              | 65.4% |
| 2012 | 34.8 bn             | 1,291,009 | 0.86 | 15.1 bn              | 43.4% | 5,426,674  | 0.97 | 22.3 bn              | 64.2% |
| 2013 | 41.0 bn             | 1,350,871 | 0.86 | 17.6 bn              | 42.9% | 5,451,270  | 0.96 | 25.9 bn              | 63.1% |
| 2014 | 43.1 bn             | 1,385,356 | 0.85 | 18.0 bn              | 41.8% | 5,471,753  | 0.96 | 26.7 bn              | 61.8% |
| 2015 | 47.4 bn             | 1,442,369 | 0.85 | 20.1 bn              | 42.4% | 5,487,308  | 0.96 | 29.2 bn              | 61.7% |
| 2016 | 52.0 bn             | 1,480,288 | 0.86 | 22.6 bn              | 43.5% | 5,503,297  | 0.96 | 32.4 bn              | 62.2% |

#### 4. Conclusion

We use a unique combination of data to document patterns in the ownership of stocks and mutual funds in the Finnish population during the period 2004-2016. Our principal findings are the following:

- The Finnish population owned stocks and mutual funds worth 23.9 billion EUR in 2004 and 52.0 billion EUR in 2016.
- The participation rate in stocks and mutual funds was 21% in 2004 and 27% in 2016. The rates are 13% and 12% for directly held stock whereas they are 12% and 20% for mutual funds.
- Participation rates vary over time. Fewer individuals enter and more investors exit stocks and mutual funds after low stock market returns. About one-third of the exiting investors re-enter within 5 years of their exit.
- Median portfolio values were 2,627 EUR in 2004 and 4,640 EUR in 2016. The average investor held 3.2 securities in 2016.
- Participation rates, portfolio values, and the number of securities are higher when individuals are aggregated to households. 40% of households have stocks or mutual funds with a median portfolio value of 5,969 EUR in 2016. The average investing household owns 4.0 securities.
- The largest asset classes are balanced mutual funds at 40% and direct stock holdings at 32% of total investments.
- Wealthy, male, Swedish-speaking, urban, university and business educated, and high-IQ individuals take more financial risk by investing more in directly held stocks and equity mutual funds.

- The average investor earns 9% per year on stocks and mutual funds. This return amounts to a cumulative return of 153% in 2004-2016.
- Socioeconomic differences in equity exposure and other dimensions of portfolio composition generate sizable return differentials that often exceed 1% per year.
- Older investors hold portfolios larger than those of younger investors. Inequality in financial wealth related to birth year has increased in 2004-2016.
- Holdings in stocks and mutual funds are highly concentrated. The top 1% of the population holds 62% and the top 1% of investors holds 44% of the total wealth. Changes in wealth concentration in 2004-2016 are small.

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