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Contents

Editor's Letter

Research Papers

187

What Matters to Individual Investors in a Welfare State?

Matthijs Lof, Elias Rantapuska and Alexander Wirtz

233

Leadership Style and Management Control Systems in Creating an Ambidextrous Organizational Culture: A Case Study

Petrus Maasalo and Henri Teittinen

Editor's Letter

The current issue of the *Nordic Journal of Business* consists of two peer-reviewed articles. The first article by Matthijs Lof, Elias Rantapuska and Alexander Wirtz focuses on the factors that individual investors in Finland consider important when determining their equity portfolio share. In the second article, Petrus Maasalo and Henri Teittinen examine how leadership style and management control systems contribute to the creation of an ambidextrous organizational culture.

I hope you enjoy reading the interesting contributions featured in this issue of the *Nordic Journal of Business*.

Sami Vähämaa

Editor

Nordic Journal of Business

What Matters to Individual Investors in a Welfare State?

Matthijs Lof, Elias Rantapuska and Alexander Wirtz

Abstract

We survey Finnish individuals to rank the importance of 37 factors hypothesized to affect portfolio equity share and compare the results to a recent US survey (Choi and Robertson, 2020). Investors in both countries regard years until retirement, need to hold cash, and experience of living through returns as important. US investors put relatively more emphasis on hedging background risk and trusted financial market participants and advisors. Finnish investors put more weight on return beliefs, media, and personal experiences. Some of these contrasts in beliefs and preferences likely reflect cross-country differences in trust and real or perceived background risk.

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1. Introduction

Portfolio equity share is a crucial determinant of an investor's long-term investment returns. The household finance literature has recently made rapid progress in conceptualizing and empirically documenting heterogeneity in portfolio equity share across investors. Lifecycle effects (e.g., Fagereng et al., 2017), consumption commitments (Chetty and Szeidl, 2007), income risk (Fagereng et al., 2018), borrowing constraints (Cocco et al., 2005; Yao and Zhang, 2005), housing price risk (Heaton and Lucas, 2000; Chetty et al., 2017), human capital (Calvet and Sodini, 2014), health risk (Guiso et al., 1996), trust in financial markets (Guiso et al., 2008), ambiguity aversion (Dimmock et al., 2016), and return expectations (Malmendier and Nagel, 2011) all contribute to portfolio equity share.

Progress in the literature remains constrained by a lack of holistic evidence on factors hypothesized to affect portfolio equity share (*equity allocation factors*) and their relative importance for at least two reasons. First, no registry datasets, which are particularly helpful for studying household investment decisions, include all relevant variables of portfolio choice. Second, it is difficult to differentiate between competing models based on observational data only (Fama, 1970; Kozak et al., 2018; Liu et al., 2020).

A broad, structured survey is a useful tool to gain a comprehensive perspective on individual decision-making and to assess the relative importance of equity allocation factors. Although surveys are not free from methodological criticism, the approach has two benefits. First, surveys allow for a direct international comparison, and the use of a comprehensive variable set to capture heterogeneity in portfolio choice. Registry data and canned surveys such as the US Survey of Consumer Finances (SCF) and the Survey of Health, Ageing, and Retirement in Europe (SHARE) do not contain all variables of interest and are not perfectly comparable across countries with different institutions and cultures. Second, surveys in finance can also provide a new perspective on what may drive investors' actions and help to identify those empirical theories most consistent with investors' beliefs and motivations. The fact that beliefs and preferences elicited from the survey data predict portfolio choice (e.g., Deidda, 2013; Dimmock and Kouwenberg, 2010; Dimmock et al., 2016; Riedl and Smeets, 2017; Giglio et al., 2021) lends credence to the survey approach. As a result, the study of beliefs and preferences is increasingly benefiting from the survey approach (e.g., Bauer et al., 2021 and 2024; Giglio et al. 2023).

Contemporary US surveys on portfolio equity share (Choi and Robertson, 2020; Bender et al., 2022) are informative to assess the relative importance of equity allocation factors. The aim of our study is to assess (1) which factors are more likely to be universal, (2) which findings are specific to Finland (where the sample for this paper comes from) and to the US, and (3) what explains these differences. The empirical distinction between universal and country-specific idiosyncratic characteristics is imperative since an ideal model of portfolio choice should emphasize characteristics universal to human behavior rather than largely capture cultural or institutional features.

Cross-country evidence on equity allocation factors for stock market participants remains a gap in the literature.¹ Recent research has emphasized the need to differentiate between universal and idiosyncratic factors to explain household financial behavior. Badarinza et al. (2016) point out the "*persistent and somewhat mysterious differences across countries*," especially in stock

¹ An exception is Kaustia et al. (2023) who find that country-level fixed effects capture 30% of variation in stock market participation across 19 European countries using SHARE data.

market participation and the shares of assets and liabilities on household balance sheets. The authors call for more research in international comparative household finance to find reasons behind international differences in household financial behavior. Gomes et al. (2021) align with this view: “*future research is strongly encouraged to explore and explain the multiple sources of heterogeneity observed in the data.*”

We aim to cast light on these “mysterious differences” between countries and simultaneously explain multiple sources of heterogeneity in investor portfolio equity share by re-administering the survey of Choi and Robertson (2020) in a sample ($N = 765$) of Finnish investors. This allows us to simultaneously capture all previously documented contributors of individual investor portfolio heterogeneity by translating 37 equity allocation factors into survey questions. The survey asks for the importance of factors such as “*Advice from a friend, family member, or coworker*” and “*The amount of cash I need to have in hand to pay routine expenses*” in determining portfolio equity share. By using the same survey questions as Choi and Robertson (2020), we can make a direct comparison to their US sample. We also study separately a sample of wealthy investors (investable assets exceeding €100,000), which allows a more relevant comparison with the wealthy sample surveyed by Bender et al. (2022).

We employ four approaches to demonstrate that our results reflect systematic differences between Finland and the US, rather than merely demographic differences in our sample compared to the US sample by Choi and Robertson (2020). First, we control for demographic and socio-economic characteristics of the survey respondents in a regression. Second, we apply different matching schemes on various subsets of these observable characteristics. Third, we use sample weighting to increase the weight of underrepresented groups in our sample. Finally, we use the approach developed by Altonji et al. (2005) and Oster (2019) to examine potential bias stemming from selection on unobservables. All of these approaches clearly indicate that the unconditional differences between the US and Finnish samples are not driven by observable or unobservable characteristics of the survey respondents.

Our contribution is three-fold. First, we add to the literature on investor beliefs and preferences with survey data. While there are many recent empirical studies that use surveys to test individual investors’ beliefs (e.g., Greenwood and Shleifer, 2014; Kuhnen and Miu, 2017; Kuchler and Zafar, 2019; Das et al., 2020; Ke, 2021; Chincó et al., 2022), they tend to have a narrow scope and are focused on similar themes (e.g., expectations of future stock returns and influence of socioeconomic status on investment decisions). Broad survey-based evidence on individual investors’ beliefs and decision-making processes as in Choi and Robertson (2020) is still rare in the literature. In addition to guidance for future theory development, our results also speak in favor of surveys as an informative research method, especially for mapping out beliefs and preferences which are difficult to identify in observational data.

Second, our results highlight the importance of institutions and culture in shaping beliefs and preferences. We find that several equity allocation factors seem to be “institution-relevant.” Guided by theory on background risks (Heaton and Lucas, 2000; Viceira, 2001; Cocco, 2005; Edwards, 2008; Catherine, 2022; Shen, 2024), we learn that these risks seem to be especially relevant in explaining cross-country differences in portfolio choice. Specifically, equity allocation factors such as labor income risk, rare disaster risk, home value risk, and the risk of illness/injury are deemed more important determinants of the equity share by the US sample in Choi and Robertson (2020) compared to our sample of Finnish investors. We conjecture that equity investing as a means of insurance against background risks is relatively less important in a welfare state like Finland, where societal institutions provide more safety nets against background

risk. Social insurance covering the entire population, wage-related unemployment benefits, and a high home ownership rate are likely to crowd out equity market investment as a mechanism to insure against health, labor, and home value risks. Instead of background risk factors, the respondents in our Finnish sample place relatively greater importance on equity allocation factors related to experience and beliefs, such as personal experience in the stock market, historical stock market returns, the belief that stocks are an inflation hedge, and the belief that stock markets mean-revert. Reflecting cross-country differences in sources of information and trust (Guiso et al., 2008), advice from media is considered more important in Finland while advice from a professional financial advisor is more important in the US.

Third, we do not only corroborate many earlier findings from observational data, but also highlight factors relevant only in one country or across two very different surveyed geographies. Similar to evidence from observational data, we find that the retirement saving motive (e.g., Fagereng et al., 2017), precautionary motive for holding cash (e.g., Carroll and Samwick, 1997; Engen and Gruber, 2001), and cohort-specific and personal equity return experiences (Malmendier and Nagel, 2011; Bucher-Koenen and Ziegelmeyer, 2014) stand out as important in both countries. Our results speak for the importance of retirement and precautionary savings motives as well as experiences, as these factors stand the test of different research methods in both registry and survey data. Perhaps in future work these equity allocation factors would be prime candidates for building blocks for an “institution-agnostic” portfolio choice theory.

2. Methodology and data

Our survey approach closely follows Choi and Robertson (2020). This original survey was administered to a sample of 1013 US adults, via the RAND ALP panel, and was rigorously pilot-tested and revised using Amazon’s Mechanical Turk platform. The survey by Choi and Robertson (2020) includes the question: “*How important are the following factors in determining the percentage of your investable financial assets that is currently invested in stocks?*” followed by an extensive list of equity allocation factors. These factors are related to background risks and assets, social and personal factors, expected return beliefs, factors from neoclassical asset pricing models, nonstandard preferences, and miscellaneous factors. Participants were asked to score each of these factors on a Likert scale from (1) not important at all, (2) a little important, (3) moderately important, (4) very important, and (5) extremely important.

Our survey adopts the same question applied to a nearly identical list of 37 equity allocation factors. As an example, the list of factors related to background risks and assets includes the statement: “*Concern that I (or my spouse/partner, if applicable) might become unemployed, receive a pay cut, or not receive an expected pay increase.*” We label this factor, following Choi and Robertson (2020), as “Labor income risk.” The full list of factors and their labels is reported in Appendix A.1. The survey questions were translated into Finnish and survey participants were presented all questions in both English and Finnish to ensure comprehension. Some of the factors were also slightly adapted to the Finnish environment. For example, we changed “*Concern that [...] the U.S.’s material standard of living will change [...]*” to “*Concern that [...] the Finnish material standard of living will change [...]*” A comprehensive list of changes made to the survey is reported in Appendix A.1.²

² Choi and Robertson (2020) have 38 equity allocation factors in their baseline analysis. We drop “Risk of long-run aggregate consumption volatility” which was regarded as indistinguishable from “Risk of long-run aggregate consumption” in the survey pilot.

The adapted Finnish survey was finally pilot-tested by five master's students in finance at Aalto University, all native Finnish speakers with near-native English skills. The final version of the survey appeared in Webropol, an online analysis and survey tool. To mitigate respondents' concerns regarding privacy and their inclinations to present socially desirable responses rather than their true beliefs and motivations, the survey was anonymous, and respondents were reassured about the confidentiality of their responses. Furthermore, sensitive questions included the response option "Prefer not to disclose" to avoid respondents providing inaccurate responses.

We posted links to our online survey on several websites, forums, and discussion platforms along with a short description of the topic and the goal of the survey. We targeted general forums, but also specialized discussion groups on stock investments. We also distributed our survey through a market-research company, TGM Research. We stated clearly in the survey description that 1) the target group was only Finnish residents who are currently invested in stocks (directly or indirectly through mutual funds or ETFs), and 2) results would be handled confidentially and used only for this study. The online survey link was active during two periods, from June 16 to June 30 in 2021 and from December 13, 2021 to January 6, 2022.³ 842 individuals completed the full survey with a median response time of 9 minutes and a mean response time of 8.4 minutes. After cleaning the sample, applying standard survey filters, we obtain $N=765$ observations for our analysis.⁴

Because equity ownership, either directly or through mutual funds or ETFs, is substantially lower in Finland (28% in 2016 reported in Breitkopf et al., 2021) than in the US (53% reported in Cupák et al., 2022),⁵ we specifically targeted individuals who own equity. In the US survey by Choi and Robertson (2020), 34% of respondents reported an equity share of zero. To make results comparable, we contrast our sample with a subset of 664 US respondents who report a nonzero equity share by using data made available by Choi and Robertson on the website of the Journal of Finance. In Appendix Tables A.2 and A.3, we also compare our results to the full-sample US results as reported by Choi and Robertson (2020).

In addition to 37 questions on equity allocation factors, the survey solicits background information on demographics and socioeconomic characteristics. The exact questions are listed in Appendix A.1. Table 1 column (1) reports sample summary statistics for this information. Table 1 also compares our sample to the US sample reported by Choi and Robertson (2020) in column (2), to the Finnish population at the end of 2016 in column (3), and to Finnish population of equity market participants at the end of 2016 in column (4). For columns (3) and (4), we employ registry data from Statistics Finland and the Finnish Tax Administration as described in Breitkopf et al. (2021).

42.2% of respondents are male adults under the age of 40, and 95.8% are of Finnish nationality. The respondents are mostly working (60.0%) or retired (16.5%). They also appear to be highly educated: 74.2% have a bachelor's degree or higher. 67.6% are homeowners, almost identical to the national mean of 67.8% reported in column 3. The median annual gross house-

³ The US survey by Choi and Robertson was administered in December 2016. We discuss in Section 3.2 the potential impact of the timing of the survey on the results.

⁴ Appendix 1 provides further details on the survey design, data collection, and the filters applied.

⁵ The US definition of equity ownership in the Survey of Consumer Finances (Cupák et al., 2022) includes retirement savings accounts. Finland has a national-level (largely unfunded) defined-benefit pension system, and individuals cannot make decisions on the amount of equity in their pension savings. Hence, the individuals surveyed are unlikely to consider the nationally administered pension plan as a part of their portfolio.

hold income is between €50,000 and €74,999.⁶ The median value of investable financial assets in our sample is between €50,000 and €74,999, which is considerably higher than the median (€4,640) in the investor population in 2016 (equity market participants from the same population as in Breitkopf et al., 2021 using the same data as in column 4 of Table 1). 61.5% of individuals in our sample have more than half of their financial assets in stocks (directly or indirectly through mutual funds and ETFs), which compares quite closely with the Finnish equity market participant data in column 4 (58.3%).

⁶ Choi and Robertson (2020) collected data on household income and investable assets in USD rather than EUR. Their survey, with data available at <https://spinup-00odia-wp-offload-media.s3.amazonaws.com/faculty/wp-content/uploads/sites/27/2020/02/Horses-mouth-data-and-code.zip>, was administered between December 13 and 27 in 2016. Converting amounts from USD to EUR at the end of 2016 yields \$1 = €0.952. Adjusting €0.952 for inflation from the end of 2016 to the end of 2021 yields $0.952 \times (107.49/101.02) = €1.013$. The nominal income and asset values across the two samples are thus roughly comparable. Inflation data (CPI) are from Statistics Finland.

Table 1 Summary of Unweighted Sample Statistics

Column (1) shows summary statistics for the Finnish sample (N = 765). These respondents are residents of Finland and stock market participants (either directly or indirectly through mutual funds or ETFs). Column 2 shows summary statistics for a sample of US investors (N=664) with positive equity share obtained from the survey data of Choi and Robertson (2020). Column 3 shows statistics for the Finnish population (age>18, N=4,424,116) at the end of 2016 and column (4) for Finnish equity market participants (N=1,275,611). Column (3) and (4) gross household income is inflation-adjusted with the Statistics Finland CPI to end of 2021 from the 2016 base data. Since respondents can choose not to disclose gender, age, education etc., the survey sample percentages do not always add up to 100% within each category in columns 1 and 2.

	FINNISH SAMPLE (1)	US SAMPLE (2)	FINNISH POPULATION (3)	FINNISH EQUITY MARKET PARTICIPANTS (4)
Gender				
Female	22.4 %	48.5 %	51.2 %	47.8 %
Male	77.0 %	51.5 %	48.8 %	52.2 %
Age*				
18 – 29	29.9 %	2.0 %	18.0 %	12.6 %
30 – 39	20.4 %	8.6 %	15.9 %	15.0 %
40 – 49	9.8 %	13.3 %	15.0 %	15.4 %
50 – 59	18.2 %	26.8 %	16.7 %	17.7 %
60+	21.3 %	49.4 %	34.4 %	39.3 %
Education				
Primary school	2.6 %	1.5 %	25.9 %	16.4 %
High school diploma or equiv.	22.9 %	24.8 %	42.5 %	37.1 %
Bachelor’s degree	28.6 %	41.9 %	21.3 %	28.8 %
Graduate degree	45.6 %	31.8 %	10.4 %	17.7 %
Nationality				
Finnish	95.8 %	-	95.5 %	99.0 %
Other than Finnish	3.5 %	-	4.5 %	1.0 %
Homeowner				
Yes	67.6 %	82.7 %	67.8 %	82.4 %
No	1.9 %	17.3 %	32.2 %	17.6 %
Employment status				
Working	60.0 %	61.3 %	51.4 %	57.6 %
Unemployed/Looking for work	3.3 %	1.9 %	8.0 %	4.3 %
Temporarily laid off, long-term leave	2.1 %	0.8 %	-	-
Disabled	1.6 %	3.0 %	-	-
Retired	16.5 %	33.3 %	31.4 %	33.5 %
Homemaker	1.0 %	5.0 %	3.8 %	1.4 %
Full-time student	14.9 %	-	5.3 %	3.3 %
Number of years invested in stocks				
0 – 4	32.7 %	-	72.5 %	33.1 %
5 – 9	20.0 %	-	5.1 %	11.4 %
10 +	46.0 %	-	22.3 %	55.5 %
Annual gross household income**				
< €15,000	11.6 %	2.0 %	9.6 %	3.5 %
€25,000 – €49,999	21.0 %	20.3 %	26.8 %	24.4 %
€50,000 – €74,999	19.6 %	22.6 %	21.8 %	23.5 %
€75,000 – €99,999	15.3 %	15.5 %	14.3 %	17.4 %
€100,000 – €124,999	9.0 %	13.3 %	7.1 %	10.0 %
€125,000 – €199,999	7.3 %	14.9 %	6.0 %	9.8 %
€200,000+	5.6 %	7.0 %	4.2 %	4.6 %
Investable financial assets**				
Not investor	-	-	70.0 %	-
€1 – €999	2.2 %	0.6 %	7.5 %	24.6 %
€1,000 – €4,999	4.3 %	2.1 %	7.7 %	25.7 %
€5,000 – €9,999	5.5 %	2.9 %	3.9 %	12.8 %
€10,000 – €24,999	14.4 %	7.4 %	4.6 %	15.3 %
€25,000 – €49,999	15.4 %	7.7 %	2.7 %	9.0 %
€50,000 – €74,999	12.7 %	7.8 %	1.2 %	4.0 %
€75,000 – €99,999	7.6 %	6.0 %	0.6 %	2.1 %
€100,000+	36.2 %	64.9 %	1.9 %	6.6 %
Percentage of investable financial assets held in stocks***				
0% – 10%	7.5 %	-	71.4 %	0.7 %
11% – 25%	10.5 %	-	0.5 %	1.7 %
26% – 50%	20.5 %	-	11.6 %	40.4 %
51% – 75%	19.7 %	-	1.8 %	6.3 %
76% – 100%	41.8 %	-	14.7 %	51.0 %
Response distribution by channel				
TGM Research	28.1 %	-	-	-
Facebook	23.4 %	-	-	-
Reddit	14.5 %	-	-	-
Finnish blogs and forums	12.2 %	-	-	-
LinkedIn	7.5 %	-	-	-
Email	6.9 %	-	-	-
Shareville	4.6 %	-	-	-
Word of mouth	1.6 %	-	-	-
Prolific	0.9 %	-	-	-

*Finnish (US) adult population begins at 18 (21) years of age. **US sample statistics reported in USD. ***First category (0-10%) for population in column 3 includes nonparticipants.

Compared to the general Finnish population, Finnish equity market participants, and to the US sample of Choi and Robertson (2020), our sample is clearly skewed towards male respondents below the age of 40. Our survey respondents are also more educated, are more likely to be full-time students, and they have a higher household income and more investable assets than the Finnish population and Finnish equity market participants. To alleviate non-representativeness concerns in our sample, we perform four analyses in addition to simple baseline unweighted results. First, we perform a regression controlling for the observable characteristics of the survey participants. Second, we undertake a propensity score matching (PSM) exercise. Third, we apply a similar sample weighting scheme as used by Choi and Robertson (2020) to form a nationally representative sample, by underweighting the responses by male, young, highly educated, high-income, and high-portfolio-value survey participants to match their relative weight in the population of Finnish equity market participants. This weighted analysis is described in Appendix A.3 with results in Table A.4 and compared to the weighted analysis of the equity market participant sample of Choi and Robertson (2020). Fourth, we apply the approach developed by Altonji et al. (2005) and Oster (2019) to analyze the sensitivity of our baseline results to potential selection on unobservables. The results of these analyses clearly demonstrate that the (unweighted) differences between the US and Finnish survey responses cannot be attributed to differences in demographic characteristics including age, gender, education, income, or wealth.

3. Survey results

3.1. Baseline results for equity allocation factors

Table 2 reports simple unweighted survey results for the 37 equity allocation factors. Respondents were asked: “How important are the following factors in determining the percentage of your investable financial assets that is currently invested in stocks?” Columns (1) and (2) show the percentage of respondents in the Finnish and US samples who rated a factor as “very important” or “extremely important.” Column (3) reports the unconditional difference between (1) and (2), as our first measure intended to capture differences between the two geographies.

The results in Table 2 show that Finnish equity market participants assign the highest weight (41%) to precautionary motive for holding cash (“Need cash on hand for routine expenses”) and to “Personal experience investing in the stock market”. Furthermore, “Experience of living through stock market returns” is selected as very or extremely important by 38.2% of respondents. The retirement saving motive ranks fourth, with 34% marking “Years left until retirement” as very or extremely important. The precautionary need for cash, retirement saving, and experience factors also emerge as important factors for the portfolio equity share in the US sample by Choi and Robertson (2020) reported in column (2). Loss aversion (6%), external habit (6%), and religion (7%) are considered the least important determinants of portfolio equity share in our sample. The correlation between columns (1) and (2) is 0.38, suggesting that the order of importance of equity allocation factors has a common characteristic, but the exact ordering is not universal across the two geographies.

It is interesting to emphasize the differences that arise when we compare our unconditional results with the Choi and Robertson (2020) sample in column (3) of Table 2. We sort the factors based on this difference in column (3), so that the topmost row shows the factor relatively most important to Finnish and unimportant to US investors, while the bottommost

Table 2 Equity Allocation Factors – Finland vs. US (“Very or Extremely Important” response)

Columns (1) and (2) show the fraction of respondents in the two samples rating a factor as “very or extremely important” when determining the amount of financial assets allocated to equity investments, and column (3) shows their difference; the table is ordered by column (3). Column (4) shows the coefficient for the Finnish sample dummy when regressing the “very or extremely important” response (0/1) on the sample dummy and observables (category dummies including “not disclosed” dummies) in Table 1, with each row corresponding to one regression. Column (6) shows difference in means for “very or extremely important” responses (0/1) using nearest neighbor propensity score matching (PSM) with observables in Table 1. Columns (5) and (7) show t-statistics from columns (4, White-corrected standard errors) and (6), correspondingly. Sample statistics of US investors with a positive equity share are from the survey data of Choi and Robertson (2020). N = 765 (Finland) and 664 (US) for columns (1) to (5) and 197 (US) for columns (6) and (7).

	FINNISH SAMPLE	US SAMPLE	VERY OR EXTR. IMPOR-TANT Δ	REG. COEFF	t-STAT	PSM Δ	t-STAT
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Stocks are an inflation hedge	0.34	0.15	0.19	0.14	5.14	0.17	5.19
Stock market returns mean-revert	0.29	0.14	0.15	0.17	6.48	0.16	5.00
Advice from media	0.22	0.07	0.15	0.10	4.64	0.05	3.66
Personal experience investing in stock market	0.41	0.30	0.11	0.11	3.67	0.20	3.29
Stock market returns before I was born	0.21	0.12	0.09	0.05	2.12	0.06	3.53
Need cash on hand for routine expenses	0.41	0.37	0.05	0.02	0.77	0.13	-0.12
Expected stock returns lower than usual right now	0.21	0.18	0.04	0.04	1.57	0.07	0.97
Experience of living through stock market returns	0.38	0.35	0.03	0.04	1.21	0.16	2.47
Non-financial assets cushion losses in financial assets	0.18	0.16	0.01	0.01	0.47	0.04	0.65
Advice from a friend, family member, or coworker	0.08	0.07	0.01	-0.01	-0.64	-0.03	-1.59
Rule of thumb	0.08	0.09	0.00	0.00	0.03	0.04	0.54
Human capital fraction of total wealth	0.24	0.26	-0.02	-0.07	-2.75	-0.02	-1.34
External habit	0.06	0.09	-0.02	-0.03	-2.03	-0.06	-2.48
Stock market returns have momentum	0.08	0.11	-0.03	-0.02	-1.29	0.00	-1.41
Time until significant non-retirement expense	0.24	0.29	-0.04	-0.12	-4.25	-0.14	-3.40
Lack of knowledge about how to invest	0.22	0.26	-0.04	-0.04	-1.55	-0.02	-2.05
Non-financial asset risk	0.10	0.15	-0.04	-0.03	-1.36	-0.05	-2.77
Expected stock returns higher than usual right now	0.13	0.17	-0.05	-0.06	-2.75	-0.01	-0.73
Consumption commitments	0.21	0.28	-0.07	-0.09	-3.33	-0.04	-3.04
Internal habit	0.11	0.19	-0.08	-0.09	-4.05	-0.08	-3.74
Ambiguity / Parameter uncertainty	0.13	0.22	-0.09	-0.07	-2.86	-0.15	-4.03
Stocks take too long to convert to cash in emergency	0.10	0.19	-0.09	-0.06	-2.81	-0.07	-3.51
Risk of aggregate consumption over next year	0.16	0.26	-0.11	-0.06	-2.17	-0.07	-3.87
Risk of long-run aggregate consumption	0.14	0.27	-0.12	-0.08	-3.25	-0.07	-3.36
Return covariance with marginal utility of consumption	0.12	0.24	-0.12	-0.09	-3.47	-0.08	-3.80
Loss aversion	0.06	0.17	-0.12	-0.12	-6.30	-0.14	-5.08
Lack of trustworthy advisor	0.14	0.27	-0.13	-0.07	-2.70	-0.03	-4.48
Home value risk **	0.10	0.25	-0.15	-0.14	-5.06	-0.08	-4.08
Consumption composition risk	0.08	0.23	-0.15	-0.13	-5.73	-0.12	-5.43
Return covariance with marginal utility of money	0.15	0.31	-0.16	-0.11	-3.96	-0.13	-5.36
Lack of trust in market participants	0.15	0.33	-0.18	-0.16	-6.17	-0.10	-6.14
Religious beliefs, values, and experiences	0.07	0.24	-0.18	-0.15	-6.74	-0.12	-4.83
Years left until retirement *	0.34	0.55	-0.21	-0.26	-6.97	-0.15	-7.05
Labor income risk *	0.13	0.36	-0.23	-0.24	-6.81	-0.17	-7.47
Rare disaster risk	0.19	0.46	-0.26	-0.21	-7.29	-0.18	-6.87
Advice from a professional financial advisor	0.09	0.35	-0.26	-0.22	-8.54	-0.12	-7.02
Risk of illness/injury	0.17	0.47	-0.30	-0.23	-7.84	-0.20	-7.59

*Among employed respondents only. **Among homeowners only.

row indicates the factor relatively most important to US investors. Finnish investors put relatively more emphasis (compared to US investors) on beliefs about returns, advice from the media, personal experiences, and the role of stocks as an inflation hedge. For US investors, background risks (labor income risk, being confronted with a rare disaster or an illness/injury) and advice from a professional advisor matter much more than for Finnish investors.

A natural question to ask is to what extent the results are explained by the differences in sample composition evident in Table 1. We tackle this question by pooling the Finnish and US samples and estimate parsimonious OLS regressions separately for each of the 37 equity allocation factors. The dependent variable is a binary variable equal to 1 for respondents who answer “very important or “extremely important” and 0 otherwise. Column (4) reports the coefficient for a Finnish sample dummy (1 for respondents in our sample, 0 for Choi and Robertson’s sample). Control variables comprise the demographic and socioeconomic variables of gender, age, education, nationality, whether one is a homeowner, employment status, household income, and investable assets, all using categorical dummy variables indicating each of the groups reported in Table 1 (including a “not-disclosed” dummy for each of the demographic variables). The coefficient for the Finnish dummy in column (4) with the corresponding t-statistic in column (5) captures the difference between the two countries in terms of relative factor importance, controlling for observable demographic and socioeconomic differences.

Controlling for observable characteristics changes the picture from univariate results only marginally, demonstrated by three facts. First, the mean signed (absolute) distance between the univariate difference (column 3 of Table 2) and regression coefficient (column 4) is 0.0 (0.03). Second, the correlation between the univariate difference and the regression coefficient is as high as 0.96 for Pearson’s correlation and 0.95 for Spearman’s rank correlation. Third, the composition of the top 5 and bottom 5 equity allocation factors does not change after controlling for observables.

The most significant differences between the unconditional mean difference and the regression coefficient are for “Time until significant non-retirement expense,” “Risk of illness/injury,” and “Lack of trustworthy advisor.” These changes can be well understood in the light of observables. Younger respondents in Finland underemphasize retirement and risk of illness and overemphasize lack of a trustworthy advisor, the first issue being generally less relevant at a young age, and the latter an issue which is often resolved over time. Also, for “Time until significant non-retirement expense,” some of the cross-country differences could emanate from relatively larger out of pocket non-retirement expenses, such as college education and healthcare costs, in the US. These types of expenses are also age-dependent and could explain the change in rank order after controlling for observables.

To further investigate whether univariate differences between samples are an artifact of selection on observables into the sample, we carry out nearest neighbor propensity score matching with replacement.⁷ Results for the difference in means are reported in column (6), and the t-values for the difference in means between Finnish and US matched samples are in column (7). The differences in column (6) are comparable to the regression coefficients with a Pearson’s correlation of 0.90. Based on the t-values reported in column (7), the composition of the top and bottom 5 factors does not change from the univariate ranking in column (3).

⁷ Given the similar sample sizes in Finland and the US, matching without replacement would be close to taking sample means already reported in columns (1) and (2) of Table 3. Replacement oversamples characteristics in the US sample overrepresented in the Finnish data, such as young age.

We next change the definition of the outcome variable from a binary (1 for “very important or “extremely important,” 0 otherwise) to a Likert-scale ordinal (1=“not important at all,” 2=“a little important,” 3=“moderately important,” 4=“very important,” and 5=“extremely important”). Since respondents may have disparate interpretations of the Likert scale, we follow Choi and Robertson (2020) and standardize these numerical outcomes at the respondent level. Columns (1) and (2) in Table 3 present these mean standard scores. We sort the factors based on column (3), which shows the difference between the two countries. We also report regression results controlling for observables in columns (4) and (5), and results for propensity score matching in columns (6) and (7), as in Table 2.

Table 3 Equity Allocation Factors – Finland vs. US (Mean Standard Score)

Columns (1) and (2) show the mean standard scores (MSS) for equity allocation factors when determining the amount of financial assets allocated to equity investments. MSS is calculated by subtracting the mean value of a participant’s numerical responses from the numerical value of each response for each equity allocation factor and dividing this by the standard deviation of that participant’s numerical responses. Column (3) shows the difference between the two samples, and the table is ordered by this column. Column (4) shows the coefficient for the Finnish sample dummy when regressing responses (integer 1 to 5) on the sample dummy and observables (category dummies including “not disclosed” dummies) in Table 1, with each row corresponding to one regression. Column (6) shows the difference in responses using nearest neighbor propensity score matching (PSM) with observables in Table 1. Columns (5) and (7) show *t*-statistics from columns (4), White-corrected standard errors) and (6), correspondingly. Sample statistics of US investors with a positive equity share are from the survey data of Choi and Robertson (2020). N = 765 (Finland) and 664 (US) for columns (1) to (5) and N = 765 (Finland) and 197 (US) for columns (6) and (7).

	FINNISH SAMPLE (1)	US SAMPLE (2)	MSS Δ (3)	REG. COEFF (4)	<i>t</i> -STAT (5)	PSM Δ (6)	<i>t</i> -STAT (7)
Advice from media	0.36	-0.55	0.91	0.71	12.19	0.61	11.82
Stock market returns mean-revert	0.53	-0.22	0.75	0.78	14.37	0.69	11.50
Stocks are an inflation hedge	0.66	-0.05	0.71	0.66	11.27	0.79	10.55
Personal experience investing in stock market	0.84	0.35	0.48	0.53	8.59	0.80	7.95
Stock market returns before I was born	0.12	-0.37	0.48	0.28	4.23	0.39	6.26
Need cash on hand for routine expenses	0.76	0.31	0.45	0.35	5.51	0.45	5.28
Expected stock returns lower than usual right now	0.25	-0.18	0.43	0.43	7.76	0.48	7.01
Non-financial assets cushion losses in financial assets	0.18	-0.08	0.26	0.29	4.67	0.40	4.33
Experience of living through stock market returns	0.75	0.50	0.25	0.28	4.60	0.51	5.39
Advice from a friend, family member, or coworker	-0.34	-0.58	0.24	0.10	1.80	-0.06	2.46
Human capital fraction of total wealth	0.31	0.08	0.23	0.06	0.99	-0.11	1.60
Non-financial asset risk	-0.34	-0.54	0.20	0.21	3.36	0.12	1.43
Time until significant non-retirement expense	0.27	0.08	0.19	-0.05	-0.84	-0.18	-0.28
External habit	-0.45	-0.60	0.15	0.03	0.76	-0.07	1.03
Expected stock returns higher than usual right now	-0.01	-0.13	0.12	0.06	1.04	0.29	3.42
Rule of thumb	-0.41	-0.51	0.10	0.13	2.33	0.17	2.27
Stock market returns have momentum	-0.27	-0.35	0.08	0.09	1.87	0.11	1.94
Lack of knowledge about how to invest	0.14	0.08	0.05	0.08	1.24	0.00	0.74
Consumption commitments	0.12	0.08	0.04	-0.12	-2.03	-0.18	-1.13
Internal habit	-0.25	-0.18	-0.06	-0.13	-2.64	-0.03	-2.54
Years left until retirement *	0.57	0.68	-0.11	-0.27	-3.15	0.08	-3.06
Risk of aggregate consumption over next year	0.04	0.19	-0.15	0.07	1.37	-0.17	-1.62
Stocks take too long to convert to cash in emergency	-0.31	-0.15	-0.16	-0.09	-1.70	-0.13	-2.73
Risk of long-run aggregate consumption	-0.03	0.19	-0.22	-0.08	-1.63	-0.26	-2.72
Lack of trustworthy advisor	-0.26	-0.03	-0.23	-0.08	-1.25	0.03	-3.29
Loss aversion	-0.56	-0.27	-0.28	-0.26	-5.32	-0.33	-4.48
Labor income risk *	-0.07	0.22	-0.29	-0.45	-5.48	-0.24	-3.84
Return covariance with marginal utility of consumption	-0.23	0.08	-0.30	-0.25	-4.90	-0.23	-3.96
Lack of trust in market participants	-0.17	0.15	-0.32	-0.28	-4.41	-0.25	-4.74
Ambiguity / Parameter uncertainty	-0.27	0.05	-0.33	-0.27	-4.45	-0.45	-4.29
Return covariance with marginal utility of money	-0.03	0.35	-0.38	-0.27	-4.73	-0.39	-5.21
Religious beliefs, values, and experiences	-0.67	-0.23	-0.44	-0.41	-5.53	-0.59	-3.57
Home value risk **	-0.32	0.14	-0.46	-0.50	-8.30	-0.30	-5.18
Consumption composition risk	-0.46	0.01	-0.47	-0.43	-8.86	-0.29	-6.81
Rare disaster risk	0.14	0.71	-0.58	-0.41	-6.78	-0.55	-7.15
Risk of illness/injury	0.09	0.75	-0.66	-0.45	-7.01	-0.66	-7.33
Advice from a professional financial advisor	-0.61	0.21	-0.81	-0.66	-9.31	-0.42	-7.06

*Among employed respondents only. **Among homeowners only.

The results change very little when we alter the independent variable from binary in Table 2 to ordinal in Table 3. Like Choi and Robertson (2020), we find a high correlation (0.96) between the percentage of respondents rating an equity allocation factor as “very or extremely important” and their mean standard score (MSS). The exact definition of the outcome variable thus seems to be of little importance to the overall results. The results in Table 3 are also qualitatively unchanged when considering the regression results (columns (4) and (5)) and nearest neighbor matching estimates (columns (6) and (7)).

We also tabulate correlation coefficients for columns (3), (4), and (6) from Tables 2 and 3 into Table 4. Furthermore, Table 4 reports results using two alternative matching algorithms. Both the Pearson’s correlations in Panel A and the Spearman’s rank correlations in Panel B are generally close to 1, with a lowest correlation of 0.82. This implies that changing the definition of the outcome variable or controlling for observables in a regression or matching exercise (irrespective of the matching algorithm) does not qualitatively change our main results. Detailed results using alternative matching methods are in Appendix A.3 Tables A.5 and A.6.

In addition to regression and matching to control for observables, we also apply a similar sample weighting scheme as Choi and Robertson (2020) to form a nationally representative weighted sample. The weighted results, reported in Appendix Table A.4, indicate that sample construction is not largely contributing to the reported cross-country differences. Out of the top-5 and bottom-5 factors, four are the same after applying weighting. Taking together the results using unconditional differences in means, regression after controlling for observables, matching, and equity market population-weighted results suggest that selection based on observables is not of first order of importance for understanding the differences in survey responses between the US sample of Choi and Robertson (2020) and our sample.⁸

⁸ In addition to selection on observables, selection on unobservables is a potential concern. We apply the approach developed by Altonji et al. (2005) and Oster (2019) to quantify the potential magnitude of selection bias. Tables A.7 and A.8 in the Appendix report Oster’s δ , which indicates how large the explanatory power of the unobservables should be relative to the observable control variables for the treatment (country) effect to reduce to zero. Across the 37 factors, we find a median absolute δ of 8.06 for the binary score and 6.94 for the Mean Standard Score, suggesting that the reported differences between the Finnish and US samples are unlikely to be driven by selection on unobservables.

Table 4 Correlation Matrices of Differences in the Importance of Equity Allocation Factors

Panel A shows the correlations for equity allocation factor differences between Finland and US using different estimation methods. Factors with “B” (“binary”) correspond to factors ranked as “very or extremely important,” and factors as in Table 2 with “MSS” correspond to mean standard scores as in Table 3. Panel B shows rank-order correlations. “Δ” refers to unconditional difference, or column (3) in Tables 3 and 4. “Reg” refers to regression coefficient, or column (4) in Tables 3 and 4. “PSM” refers to difference using propensity score matching with nearest neighbor (N=765 for Finnish, or FI, and N=197 for US sample) and replacement. “EM” refers to matching with exact match using gender, age, level of education, gross household income, and investable financial assets (all categorical as in Table 1, N=239 for FI, 372 for US). EM2 uses age and gender (N=757 for FI, N=664 for US), and EM3 education, household income, and investable financial assets (N=586 for FI, N=638 for US) for matching.

PANEL A: CORRELATION MATRIX BASED ON DIFFERENCES												
	Δ B	REG B	PSM B	EM B	EM2 B	EM3 B	Δ MSS	REG MSS	PSM MSS	EM MSS	EM2 MSS	EM3 MSS
Δ B	1											
Reg B	0.96	1										
PSM B	0.88	0.90	1									
EM B	0.94	0.96	0.86	1								
EM2 B	0.93	0.96	0.95	0.93	1							
EM3 B	0.98	0.95	0.91	0.93	0.92	1						
Δ MSS	0.95	0.87	0.82	0.87	0.84	0.93	1					
Reg MSS	0.94	0.94	0.88	0.92	0.90	0.94	0.96	1				
PSM MSS	0.88	0.85	0.92	0.84	0.85	0.91	0.90	0.92	1			
EM MSS	0.89	0.87	0.82	0.92	0.84	0.89	0.92	0.96	0.91	1		
EM2 MSS	0.94	0.91	0.91	0.90	0.92	0.93	0.94	0.97	0.94	0.94	1	
EM3 MSS	0.95	0.88	0.86	0.87	0.85	0.95	0.99	0.96	0.93	0.92	0.95	1

PANEL B: CORRELATION MATRIX BASED ON RANK ORDER OF IMPORTANCE OF EQUITY ALLOCATION FACTORS												
	Δ B	REG B	PSM B	EM B	EM2 B	EM3 B	Δ MSS	REG MSS	PSM MSS	EM MSS	EM2 MSS	EM3 MSS
Δ B	1											
Reg B	0.95	1										
PSM B	0.89	0.92	1									
EM B	0.94	0.98	0.92	1								
EM2 B	0.94	0.97	0.96	0.96	1							
EM3 B	0.98	0.95	0.90	0.95	0.94	1						
Δ MSS	0.95	0.88	0.85	0.87	0.88	0.93	1					
Reg MSS	0.94	0.95	0.90	0.95	0.94	0.93	0.95	1				
PSM MSS	0.86	0.85	0.89	0.86	0.86	0.87	0.91	0.90	1			
EM MSS	0.89	0.91	0.86	0.93	0.88	0.91	0.92	0.95	0.92	1		
EM2 MSS	0.94	0.93	0.91	0.92	0.94	0.93	0.95	0.97	0.93	0.95	1	
EM3 MSS	0.94	0.89	0.88	0.89	0.89	0.94	0.99	0.95	0.93	0.93	0.95	1

Figure 1 summarizes the relation between the Finnish sample and the US sample in Choi and Robertson (2020) visually. Observations above the diagonal are considered relatively important to US investors and include retirement saving, religious beliefs, professional advice, and various types of background factors. Observations below the diagonal indicate factors that are relatively important to Finnish investors, including experiences, return beliefs, and advice from the media, friends, and relatives.

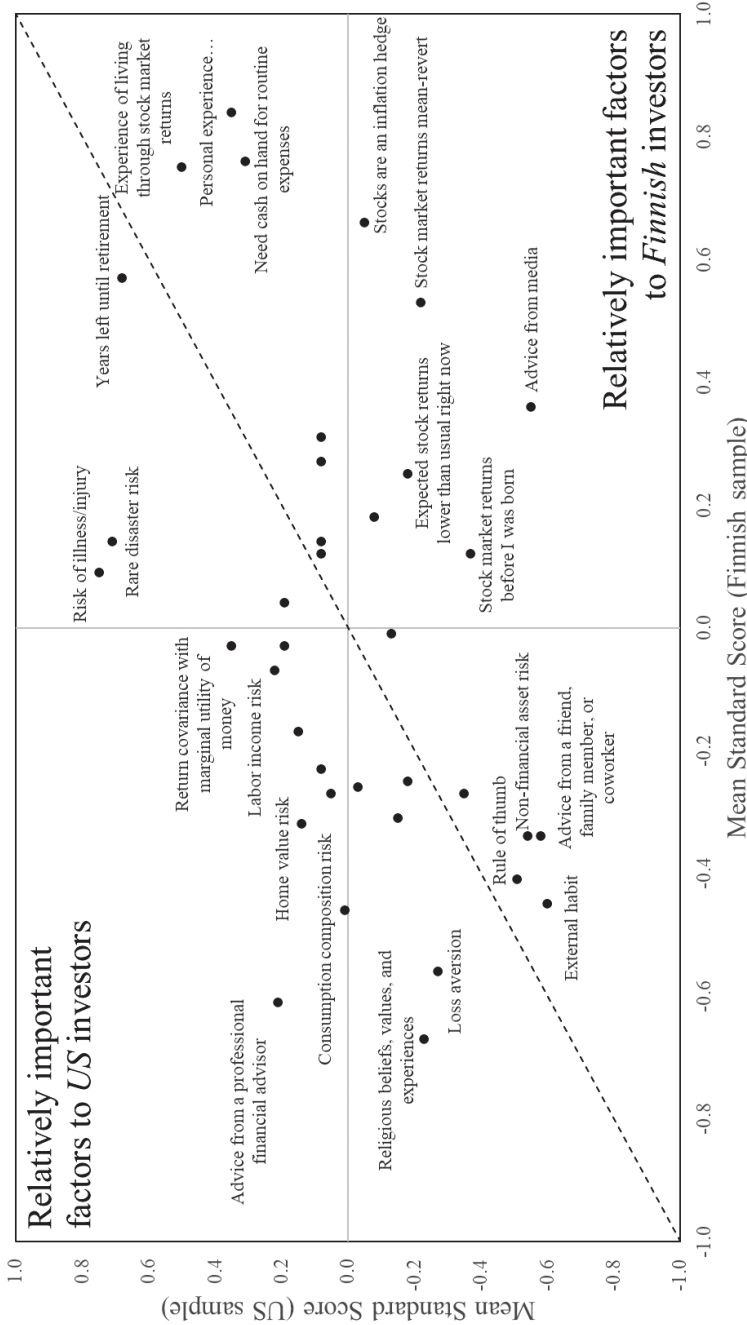


Figure 1: This figure plots for each of the 37 equity-allocation factors the Mean Standard Score from the Finnish (horizontal axis) and US (vertical axis) sample. See Table 3 columns (3) and (4) for data and details. The dashed line shows the 45% diagonal.

3.2. Discussion of baseline results

The household finance literature has formalized factors that contribute to portfolio equity share (see e.g., Gollier 2002; Guiso et al., 2002; Gomes, 2020), but no model simultaneously accounts for all of these factors. In the absence of such a model, a precise prediction on the relative importance of equity allocation factors (dubbed “rank order” or “ranking”) between two countries is not illuminated by theory.

Heiner’s hypothesis (1983) posits that when an individual is faced with genuine uncertainty and a complex problem exceeding her cognitive capability, the individual either restricts her choice set or the information processed using simplified decision rules. How to determine portfolio equity share qualifies as a complex task with both attribute (the choice set of factors which should enter the decision) and parameter (how to weigh the attributes) uncertainty. We would hence postulate that an individual would constrain the number of equity allocation factors when deciding how much to invest in equities. As a result, a limited set of equity allocation factors which an individual would consider “very important” or “extremely important” in the survey should appear in the list of most relevant equity allocation factors. The equity allocation factor rank order would not be stable across two geographies in which individuals are exposed to different choice attributes and parameters driven by culture, institutions, and information acquired during their lifetimes. It is therefore not surprising that the rank order of equity allocation factors is different in Finland and the US, consistent with the empirically documented pattern that economic preferences vary across countries (Rieger et al., 2015; Falk et al., 2018).

The results reported in Table 2 and 3 indeed indicate considerable differences in the relative importance of equity allocation factors in the two geographies, with the relatively low importance attributed by Finnish investors to factors related to background risks standing out: Four out of the five bottom factors in Table 2 (relatively low importance to Finnish investors compared to US investors), are related to background risks, while “Home value risk” ranks 28/37 in relative importance for Finnish investors. The classic Merton (1969) portfolio choice model predicts that agents with higher risk aversion allocate a lower proportion of their wealth in risky assets. The agent can additionally be exposed to uninsurable background risks, including labor income (Viceira, 2001), house price (Cocco, 2005), deteriorating health (Edwards, 2008), non-financial asset (Heaton and Lucas, 2000), rare disaster (Shen, 2024), and old age (Cocco et al, 2005) risks. Assuming uncorrelated financial and background (such as labor income) risk and a standard parametric utility function, investors with a higher exposure to background risk would allocate a smaller part of their wealth to risky assets (Eeckhoudt et al., 1996; Heaton and Lucas, 2000; Guiso and Paiella, 2008). Catherine (2022) further points out that cyclical skewness in labor income risk can cause young households in particular to shun the stock market; societal safety nets should also alleviate these concerns as also argued by Harenberg and Ludwig (2019).

Compared to the US, Finland has relatively generous societal-level safety nets that provide background risk insurance. Wage-related unemployment benefits provide up to 80% of an individual’s net labor income level for up to 500 days. Minimum pensions and wage-related pensions in addition to elder care are available to guarantee a minimum level of income for pensioners. Gormley et al. (2010) show that public social safety nets can affect household portfolio choices, while Breznau (2021) provides evidence that societal safety nets indeed may lower risk perceptions.⁹

⁹ It is important to note that differences in risk perceptions between countries can be real, perceived, or a combination of the two. Breznau (2021) documents that even if government failed to take swift measures during SARS-Cov-2 pandemic, those in welfare states reported lower risk perceptions. Welfare state can hence lower perceived risk without alleviating the actual risk.

The high relative importance of “Risk of illness/injury” in the US shown at the bottom of Table 2 corroborates the findings of Atella et al. (2012), who document in the cross-country SHARE database that health risk affects portfolio choice only in countries with less protective health care systems. Secondary healthcare in Finland, including some of the most expensive forms of healthcare (e.g., cancer treatment and maternal care), is practically free for beneficiaries

Besides background risks, our results in Table 2 also reveal different attitudes towards equity allocation factors broadly related to trust: Finnish investors rank “Lack of trustworthy advisor” (27/37) and “Lack of trust in market participants” (31/37) low in their absolute importance and lower than the US respondents. “Advice from the media” (3/37) and “Advice from friend, family, or coworker” (10/37) rank higher in our Finnish sample than in the US sample.

Guiso et al. (2008) argue that only individuals with high enough trust in the stock market and financial intermediaries will invest in stocks and that a higher level of trust implies a higher portfolio equity share. Trust can either be generalized or personalized relevant to a specific individual or institution. From the World Values Survey wave 7, we learn that Finnish residents exhibit a greater degree of generalized trust (Q57), and they trust their family, neighbors, and personal acquaintances more (Q58, Q59, Q60) than the US residents surveyed. In wave 5 of the Survey, Finnish residents also report a higher confidence in the press and television (V133, V144), a pattern also identified in Kalogeropoulos et al. (2019). Finnish individuals follow daily newspapers, news and reports on the radio or TV, and magazines more than their US counterparts (V223, V224, V225, V226). Those surveyed in Finland also learn more frequently from their friends and colleagues about what is going on in their country and the world (V229). The ordering of trust-related equity allocation factors in Table 2 are consistent with these differences in values and also line up consistently with Bucciol et al. (2019), documenting in the SHARE database that higher trust predicts increased propensity to buy risky assets.

“Advice from professional financial advisor” has very little relative importance in Finland (36/37 in Table 2), since the concept of financial advice in general is a recent phenomenon in Finland compared to the US,¹⁰ and independent financial advisors are virtually nonexistent in Finland. In the US, employees have a say on how to invest their retirement savings under a defined contribution system, whereas Finland employs a public defined benefit pension system on a national level. According to the Finnish Financial Supervisory Authority, only 20% of the working age population resort to private pension insurance to supplement public pension and those who seek professional financial advice typically resort to retail bank-affiliated advisors. In a country with a national-level pension system, the working population may simply have less incentives for seeking financial advice.¹¹

The factor “Religious beliefs, values, and experiences” is also ranked relatively low by Finnish investors compared to their US peers (32/37 in Table 2). Across the two countries, religion could have a different place in the rank order because of the importance of religion in daily life. In the World Values Survey wave 7, 37% of US respondents and 11% of Finnish respondents rated religion as very important in their life in 2017. Halek and Eisenhauer (2001) and Kumar et al. (2011) discuss how religion may be relevant for the propensity to invest in equities. Given that religion plays a role in investment decisions and the lower importance of religion in Finland, it is not surprising that religion is not considered an important equity allocation factor by Finnish investors.

¹⁰ The New York Society of Security Analysts (now CFA Society New York) was founded in 1937 while CFA Society Finland was established in 2002.

¹¹ The findings that both lack of trust and professional financial advice play a smaller role in Finland are consistent with the model by Gennaioli et al. (2015), in which trust plays a crucial role for investors to delegate investment decisions to financial advisors.

Timing of the two surveys is a potential concern when interpreting differences between the two samples. The US survey by Choi and Robertson (2020) was administered in December 2016, while our Finnish survey was conducted between June 2021 and January 2022. Differences between the two samples could thus reflect changing attitudes over time, especially since our Finnish survey was conducted during the COVID pandemic and the onset of a global inflationary period. It is possible that the factor “Stocks are an inflation hedge” scores high in the Finnish survey because it was administered during a period of heightened inflation concerns, rather than it being an idiosyncratic Finnish factor. For several other factors, the potential timing effect actually works against finding differences between the two countries. For example, “Rare disaster risk” and “Risk of illness/injury” have likely gained importance during the pandemic. However, these factors are considered significantly more important in the 2016 US sample than in our 2021-2022 Finnish sample.

3.3. Subsamples

Table 5 reports the Finnish results for subsamples of Wealthy and Non-wealthy respondents. The Wealthy subsample includes 36.2% of the respondents, those who reported investable financial assets in excess of €100,000. The Non-wealthy subsample includes 62.4% of the sample, those with assets below €100,000. The remaining 1.4% of the sample either selected “Prefer not to disclose” or did not select an answer to the question regarding investable financial assets. Columns (1) and (2) report the fraction of respondents citing a factor as very or extremely important for the Wealthy and Non-wealthy subsamples, with the difference between subsamples in column (3). Columns (4) and (5) report the mean standard score for each factor. The table is ordered by the difference in mean standard scores between the subsamples in reported column (6) reports and orders by the difference between the mean standard score of the. The top (bottom) of Table 5 refers to the factors that are relatively most important to the Wealthy (Non-wealthy) subsample.

Table 5 Unconditional Equity Allocation Factors – Finnish Wealthy vs. Non-Wealthy Population (Unweighted)

Columns (1) and (2) show the fraction of Finnish respondents stating a factor as very or extremely important when determining the amount of financial assets allocated to equity investments, (3) their difference. Columns (4) and (5) show the mean standard scores of each factor. The rows are ordered by the difference in mean standard scores between Wealthy and Non-wealthy investor samples, reported in column (6). The Wealthy (Non-wealthy) sample includes all respondents reporting investable assets exceeding (below) €100,000. N = 277 (Wealthy Sample) and 475 (Non-wealthy Sample).

	VERY OR EXTREMELY IMPORTANT		Δ – VERY OR EXTR. IMPOR-TANT	MEAN STANDARD SCORE		Δ – MEAN STAN-DARD SCORE
	WEALTHY SAMPLE	NON WEALTHY SAMPLE		WEALTHY SAMPLE	NON-WEALTHY SAMPLE	
	(1)	(2)	(3)	(4)	(5)	(6)
Personal experience investing in stock market	0.45	0.39	0.06	1.04	0.72	0.32
Experience of living through stock market returns	0.42	0.36	0.06	0.94	0.65	0.29
Expected stock returns higher than usual right now	0.16	0.11	0.05	0.16	-0.11	0.27
Non-financial assets cushion losses in financial assets	0.17	0.18	-0.01	0.31	0.10	0.22
Stock market returns before I was born	0.24	0.19	0.04	0.23	0.05	0.18
Years left until retirement *	0.34	0.34	0.01	0.77	0.60	0.16
Stocks are an inflation hedge	0.34	0.35	-0.01	0.67	0.51	0.16
Stock market returns mean-revert	0.31	0.29	0.02	0.58	0.50	0.08
Rare disaster risk	0.16	0.22	-0.06	0.18	0.11	0.07
Advice from media	0.12	0.17	-0.05	0.07	0.02	0.05
Risk of aggregate consumption over next year	0.18	0.24	-0.05	0.39	0.35	0.04
Religious beliefs, values, and experiences	0.05	0.07	-0.02	-0.65	-0.68	0.03
Return covariance with marginal utility of money	0.07	0.09	-0.02	-0.26	-0.28	0.02
Stock market returns have momentum	0.12	0.16	-0.04	-0.24	-0.26	0.02
Lack of trustworthy advisor	0.12	0.17	-0.05	-0.02	-0.04	0.02
Advice from a professional financial advisor	0.06	0.11	-0.05	-0.60	-0.61	0.01
Non-financial asset risk	0.03	0.07	-0.04	-0.56	-0.56	0.01
Loss aversion	0.08	0.09	-0.01	-0.41	-0.41	0.00
Risk of illness/injury	0.08	0.12	-0.05	-0.34	-0.34	0.00
Rule of thumb	0.13	0.20	-0.07	0.09	0.09	0.00
Labor income risk *	0.11	0.14	-0.03	-0.08	-0.06	-0.01
Time until significant non-retirement expense	0.05	0.09	-0.04	-0.35	-0.33	-0.02
Advice from a friend, family member, or coworker	0.21	0.26	-0.05	0.26	0.28	-0.02
Risk of long-run aggregate consumption	0.10	0.17	-0.06	-0.05	-0.01	-0.03
Consumption composition risk	0.20	0.26	-0.06	0.27	0.34	-0.07
Return covariance with marginal utility of consumption	0.11	0.13	-0.02	-0.27	-0.20	-0.07
Human capital fraction of total wealth	0.03	0.08	-0.05	-0.50	-0.42	-0.08
External habit	0.04	0.10	-0.05	-0.50	-0.43	-0.08
Lack of trust in market participants	0.09	0.18	-0.09	-0.23	-0.13	-0.10
Internal habit	0.07	0.13	-0.06	-0.32	-0.21	-0.11
Ambiguity / Parameter uncertainty	0.11	0.14	-0.03	-0.35	-0.23	-0.11
Expected stock returns lower than usual right now	0.18	0.24	-0.06	0.16	0.30	-0.14
Lack of knowledge about how to invest	0.14	0.27	-0.13	0.03	0.20	-0.17
Consumption commitments	0.15	0.25	-0.10	0.01	0.19	-0.18
Stocks take too long to convert to cash in emergency	0.35	0.45	-0.09	0.63	0.83	-0.20
Need cash on hand for routine expenses	0.05	0.13	-0.07	-0.44	-0.23	-0.21
Home value risk **	0.04	0.15	-0.11	-0.47	-0.19	-0.28

*Among employed respondents only. **Among homeowners only.

Overall, the Finnish Wealthy investor’s beliefs are surprisingly similar to those of the Non-wealthy investors. The correlation of responses ranked “very or extremely important” between the Wealthy and Non-wealthy samples in columns (1) and (2) is 0.92, and this correlation for the mean standard scores in columns (3) and (4) is even higher at 0.95. Experiences and expected returns are *relatively* more important for the Wealthy subsample, while “Need cash on hand for routine expenses”, “Stocks take too long to convert to cash in emergency” and “Home value risk” are cited by the Non-wealthy Finnish respondents as relatively important determinants of equity share.

The differences between Finnish Wealthy and Non-wealthy investors are clearly less significant than the cross-country differences between the US and Finland. Bender et al. (2022) also make a comparison between non-wealthy and wealthy US investors, using the same methodology as Choi and Robertson (2020). Bender et al. (2022) find that wealthy investors in the US respond surprisingly similarly to the average US household.¹² Similar to our results, they also find that financial constraints and discomfort with markets (lack of financial literacy, trust, and parameter certainty) are less important to wealthy investors.

In the Appendix A.5, we also report the differences across factors between subsamples divided on gender (Table A.9), age (Table A.10), and education (Table A.11). These demographic groups exhibit minor differences. For example, experiences and beliefs are relatively important equity allocation factors to male investors, and female investors are more concerned about risks. These within-country differences between subsamples are, however, much smaller than the between-country differences reported in Tables 2 and 3.

3.4. Principal component analysis

As our final empirical analysis, we perform principal component analysis (PCA), following Choi and Robertson (2020). This analysis identifies whether individuals tend to attribute similar importance to related equity allocation factors, by grouping the equity allocation factors. We use the same merged dataset as before, combining the subset of 664 respondents in Choi and Robertson (2020) reporting a strictly positive equity share with our Finnish sample of 765 respondents. Following Choi and Robertson (2020), we only consider those equity allocation factors inquired from all respondents in the sample and therefore exclude “Labor income risk,” “Years left until retirement,” and “Home value risk,” which are relevant only for subsets of individuals. We obtain the principal components of the remaining 34 factors, expressed by the binary variables indicating whether the respondent rated each factor as “very important” or “extremely important.”

Following Choi and Robertson (2020), we only retain the principal components (PCs) with an eigenvalue over 1 and apply a varimax rotation of the retained PCs. We retain seven PCs, explaining 46.8% of the variation across the 34 factors. The PCs and the most important equity allocation factors loading on each PC are listed in Table 6. As is common in the literature, and following Choi and Robertson (2020), we report for each PC only those factors with a loading greater than 0.2. We label the first PC as “Neoclassical asset pricing factors” since its loadings contain factors that are related to classical consumption-based asset pricing models. This result does not say anything about the importance of these neoclassical factors as such; the result implies that individuals who find, say, “Return covariance with the marginal utility of money” an important determinant of the equity share, are likely to also consider “Risk of long-run aggregate consumption” an important factor – since both these factors load strongly on the same PC.

¹² Bender et al. (2022) employ a cutoff at 1,000,000 USD. In the Finnish context, investors with a portfolio value greater than €100,000 are considered wealthy. In comparison with population portfolio values at the end of 2016, an investor with a portfolio value of €100,000 would be wealthier than 93% of all individual investors and wealthier than 98% of the population (Breitkopf et al., 2021).

Table 6 Principal Components Analysis
 This table shows loadings on the first seven principal components over the equity share factors that every respondent was asked about in Table 2. a indicates factors with loading above 0.32.

NEOCLASSICAL ASSET PRICING FACTORS	PERSONAL EXPERIENCE	STOCK MARKET AVERSION	HABITS AND HEURISTICS	CASH BUFFERS	RETURN BELIEFS	OTHER
Return covariance with marginal utility of consumption	0.45a Experience of living through stock market returns	0.65a Lack of trustworthy advisor	0.49a External habit	0.46a Time until significant non-retirement expense	0.54a Stock market returns mean-revert	0.58a Advice from media
Risk of long-run aggregate consumption	0.44a Personal experience investing in stock market	0.63a Lack of knowledge about how to invest	0.47a Internal habit	0.39a Need cash on hand for routine expenses	0.51a Stock market returns have momentum	0.33a Stocks are an inflation hedge
Return covariance with marginal utility of money	0.43a	Lack of trust in market participants	0.38a Rule of thumb	0.32a Consumption commitments	0.45a Expected stock returns higher than usual right now	0.27 Stock market returns before I was born
Risk of aggregate consumption over next year	0.43a	Ambiguity / Parameter uncertainty	0.35a Non-financial assets cushion losses in financial assets	0.31 Human capital fraction of total wealth	0.26 Expected stock returns lower than usual right now	0.40a
Rare disaster risk	0.24	Stocks take too long to convert to cash in emergency	0.25 Advice from a friend, family member, or coworker	0.27 Stocks take too long to convert to cash in emergency	0.22 Stocks are an inflation hedge	0.21
Consumption composition risk	0.24					

The second PC, “Personal experience,” has only two factors with a loading greater than 0.2, both related to personal experience in the stock market. The third PC, “Stock market aversion,” primarily captures factors related to lack of trust in and lack of knowledge about investing. Several factors related to rules of thumb and habits load on the fourth PC, “Habits and heuristics.” The fifth PC, “Cash buffers,” picks up factors related to the need for cash. The sixth PC, “Return beliefs,” contains factors related to momentum, reversal, beliefs on current expected returns, and the relation between stock returns and inflation. Finally, the seventh PC implies that the reported importance of “Advice from media,” “Stocks are an inflation hedge” and “Stock market returns before I was born” are highly correlated across the sample. Due to lack of an obvious common denominator for these three factors, we label the final PC “Other.”

Apart from the seventh “Other” PC, the remaining six PCs are distinctly interpretable, with similar themed factors loading on the same PCs. This is evidence of consistency in the responses by the survey participants. For example, individuals that consider “Consumption composition risk” important are also likely to consider “Risk of long run aggregate consumption” important. Overall, the results from our principal component analysis are fairly consistent with Choi and Robertson (2020), who retain 6 PCs with an eigenvalue over 1, labelled: “Neoclassical Asset Pricing Factors,” “Return Predictability and Defaults,” “Consumption Needs, Habit, and Human Capital,” “Discomfort with Market,” “Advice,” and “Personal Experience” (see Choi and Robertson, 2020, Table XIII).

Next, we construct for all respondents in the Finnish and US samples the score for each of the seven PCs, by multiplying their responses by the factor loadings and summing across all factors within each PC. We then regress the equity share reported by survey participants on the seven scores, to test whether the individual importance of each of these PCs matters for the equity share. A similar analysis is reported in Table XIV of Choi and Robertson (2020).¹³ Our results are reported in Table 7. To facilitate comparison across countries, we report the results for the Finnish and US samples separately.

¹³ Our US results in Table 7 are not identical to the results in Table XIV of Choi and Robertson (2020), because we obtain the principal components from the full pooled sample of Finnish and US responses.

Table 7 Regression of Equity Share on Principal Component Scores

The table below shows coefficients from regressions of the fraction of each respondent’s investable financial assets held in equities on the respondent’s first seven principal component scores normalized by their standard deviations. Observations are unweighted. Columns (1) and (3) use the Finnish sample and (2) and (4) the US sample. The regressions in columns (3) and (4) control for respondent demographics: dummies for age, gender, education, gross household income, and investable assets. All columns are estimated using OLS on unweighted data. White-corrected standard errors are reported in parentheses. The regressions exclude 4 respondents in US sample who reported equity share greater than 100%. *Significant at the 10% level. **Significant at the 5% level. *** Significant at the 1% level.

	NO CONTROLS OLS		CONTROLS OLS	
	FINNISH SAMPLE	US SAMPLE	FINNISH SAMPLE	US SAMPLE
	(1)	(2)	(3)	(4)
Neoclassical asset pricing factors	-3.984 (1.711)	-3.264 (1.319)	-1.857 (1.725)	-2.701** (1.335)
Personal experience	2.886** (1.194)	2.146* (1.197)	2.189* (1.212)	1.255 (1.239)
Stock market aversion	-3.308** (1.493)	-3.036** (1.373)	-1.447 (1.578)	-2.161 (1.416)
Habits and heuristics	-0.890 (1.495)	0.875 (1.429)	-1.042 (1.508)	0.278 (1.476)
Cash buffers	-0.700 (1.278)	0.039 (1.341)	-0.850 (1.309)	0.419 (1.394)
Return beliefs	0.863 (1.300)	1.441 (1.449)	-0.001 (1.307)	1.768 (1.466)
Other	5.709*** (1.205)	-0.436 (1.549)	4.193*** (1.245)	-0.111 (1.580)
Demographic controls	No	No	Yes	Yes
Observations	765	660	765	660
R ²	0.075	0.027	0.149	0.079
Adjusted R ²	0.066	0.017	0.106	0.032

The first two columns report the regression results without control variables. In both the US and the Finnish samples, we see that the score for “Neoclassical asset pricing factors” has a negative coefficient. This implies that investors who consider these neoclassical factors very or extremely important have a lower equity share in their portfolio on average. The coefficient for the “Personal experience” score is also positive: investors in both Finland and the US who consider personal experience important have on average higher equity shares. The effect of “Stock Market Aversion” is negative: investors who consider lack of knowledge and lack of trust important determinants of their equity share tend to have a lower equity share. These results are consistent with Choi and Robertson (2020), who also find positive effects for the PCs “Neoclassical asset pricing factors” and “Personal experience” and a negative effect for “Discomfort with market.” The “Other” PC leads to a discrepancy between the Finnish and US samples: its score has a positive effect on the equity share in the Finnish sample, but no significant effect in the US sample. The scores of the PCs “Habits and heuristics,” “Cash buffers,” and “Return beliefs” have an insignificant effect on the surveyed equity share in both samples.

In the final two columns of Table 7, columns 3 and 4, we control for demographic covariates including gender, age, education, gross household income, and investable financial assets, using the same category dummies as in Table 2. The results largely align with the regressions without controls, as all coefficients have the same sign as without controls. Some of the PC scores are however no longer statistically significant after controlling for demographics. Specifically, the score of the “Personal experience” PC remains significant in the Finnish sample but not in the US sample. This is reversed for the “Neoclassical factor” PC, where the effect is more robust in the US sample. “Other” is significant in the Finnish sample even after controls, but not in the US sample. Finally, the “Stock market aversion” PC score is insignificant in both samples after controlling for demographics. All in all, we learn from Table 7 that equity allocation factor PCs predict portfolio choice similarly in both samples, although the evidence is somewhat weaker after inclusion of control variables. This is unsurprising as many determinants of equity market participation are more strongly correlated with an extensive (like the results in Table XIV of Choi and Robertson, 2020) than intensive margin (e.g., Giannetti and Wang, 2016; Knüpfer et al., 2023).

As a whole, we learn from the PCA analysis in Table 6 that equity allocation factors stack into logical groups lending support to internal validity in both samples – respondents give similar responses to questions intended to capture a particular category of equity allocation factors. In addition, the results in Table 7 are loosely consistent with the findings for differences in the importance of equity allocation factors across the two countries. Experiences matter more in the Finnish sample for the rank order of equity allocation factors and they predict portfolio choice while neoclassical asset pricing factors are more important in the US sample.

4. Conclusion

Individual investors’ behavior, motivation, and beliefs have become an important line of inquiry in recent years (e.g., Gomes et al., 2021). We compare Finnish and US equity market participants to better understand which surveyed beliefs and motivations are shared between the two countries and which are more idiosyncratic, perhaps explainable by institutional and cultural factors.

Overall, the responses show evidence of both shared and idiosyncratic factors, which contribute to portfolio equity share. Retirement saving, precautionary savings motive to hold cash, and cohort-specific return experiences are shared between respondents in the two countries. Finnish investors put relatively more weight on advice from the media, return beliefs, and personal experiences. US investors stress the importance of financial advisors and background risk. In a country with fewer societal-level safety nets, the need to insure against a decline in home value, consumption composition, rare disasters, and illness or injury seems plausible when individuals decide on their portfolio equity share. Also, wealthy Finnish investors (portfolio in excess of €100,000) are more similar to non-wealthy Finnish investors than to US-dollar-millionaires surveyed in Bender et al. (2022). We apply various approaches to control for individual characteristics and find that these capture very little variation compared with cross-country differences.

Overall, we find the most significant cross-country differences in attitudes towards background risk and trust. Investors’ exposure to background risk, either real or perceived, is higher in the US than in Finland, and therefore surveyed background risk factors show up higher in the list of relatively important equity allocation factors for US investors. Similarly, investors

place greater emphasis on the advice received from parties they frequently engage with and trust—such as family, friends, and colleagues—in Finland and financial advisors in the US.

Our study responds to the call by Badarinza et al. (2016) for more research in international comparative household finance. The demonstrated differences between the two countries in beliefs and preferences for investing highlight the importance of external validity concerns in household finance research. Labor economists have also recently completed such comparative studies (Bertheau et al., 2023), which enable quantification of the role of national-level institutions and are informative for theory development.

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A.1 Survey Design and Data Collection

A.1.1 Survey design

The text below shows the exact wording of the sample statistics we collect and display in Table 1 in the main paper.

Sample Statistics

1. Gender / Sukupuoli

- Male / *Mies*
- Female / *Nainen*

2. Age / Ikä

- 18–29
- 30–39
- 40–49
- 50–59
- 60+

3. Education / Koulutus

- Primary school / *Peruskoulu*
- High school diploma/vocational school diploma / *Ylioppilastutkinto tai ammatillinen tutkinto*
- Bachelor's degree (university or university of applied sciences) / *Kandidaatin tutkinto tai ammattikorkeakoulututkinto*
- Master's degree (university or university of applied sciences) / *Maisterin tutkinto tai ylempi ammattikorkeakoulututkinto*
- PhD / *Tohtorin tutkinto*

4. Nationality / Kansalaisuus

- Finnish / *Suomalainen*
- Other than Finnish / *Muu kuin suomalainen*

5. Home owner / Oletko kodinomistaja?

- Yes / *Kyllä*
- No / *Ei*

6. Employment status / Työllisyystilanne

- Working / *Työssä*
- Unemployed/Looking for work / *Työtön/Työnhakija*
- Temporarily laid off, on sick or other leave / *Tilapäisesti lomautettu, sairaus- tai muulla lomalla*
- Disabled / *Työkyvyttömyyseläkkeellä*
- Retired / *Eläkkeellä*
- Homemaker / *Kotiäiti tai koti-isä*
- Full-time student / *Päätoiminen opiskelija*

7. Gross household income (per year) / Kotitalouden bruttotulot (vuodessa)

- < €15,000
- €15,000 to €24,999
- €25,000 to €49,999
- €50,000 to €74,999
- €75,000 to €99,999
- €100,000 to €124,999
- €125,000 to €199,999
- €200,000+
- Prefer not to disclose / *En halua sanoa*

8. Investable financial assets (All of your household's savings and investments, including deposit accounts, cash, mutual funds, stocks, bonds and personal pension accounts. EXCLUDING real estate and any private business assets.) / Kotitalouden sijoitettavat rahoitusvarat (kaikki kotitaloutesi säästöt ja sijoitukset, mukaan lukien talletustilit, käteinen, sijoitusrahastot, osakkeet, joukkovelkakirjat ja henkilökohtaiset eläketilit. POIS LUKIEN kiinteistöt ja yksityisen yrityksen varat.)

- €1–€999
- €1,000–€4,999
- €5,000–€9,999
- €10,000–€24,999
- €25,000–€49,999
- €50,000–€74,999
- €75,000–€99,999
- €100,000+
- Prefer not to disclose / *En halua sanoa*

9. Percentage of investable financial assets invested in stocks (including equity mutual funds and ETFs)? / Kuinka suuri osuus rahoitusvaroista on osakkeissa (mukaan lukien osakerahastot ja ETF-rahastot)? Ilmoita vastaus prosentteina.

Pages 4–6 of this Appendix report the full list of 37 surveyed equity allocation factors. The first column shows the short name (label) of each factor used for reporting. The second column shows the full survey text of the factor as shown to survey participants in English. The third column shows the Finnish translation. Survey participants are asked to rate the importance of each of the equity allocation factors by answering the following question:

How important are the following factors in determining the percentage of your investable financial assets that is currently invested in stocks? / Kuinka tärkeitä seuraavat tekijät ovat, kun määritätte tällä hetkellä osakkeiden osuutta kokonaisrahoitusvaroista?

1 = Not important at all; 2 = A little important; 3 = Moderately important; 4 = Very important; 5 = Extremely important / (1) Ei lainkaan tärkeä, (2) vähän tärkeä, (3) melko tärkeä, (4) hyvin tärkeä, ja (5) erittäin tärkeä

A.1.2 Differences to Choi and Robertson (2020)

While we closely follow the survey by Choi and Robertson (2020), we deviate on some details:

- The survey is translated into Finnish and participants are shown both the English and Finnish text.
- If necessary, questions are localized to the Finnish context. Specifically, the term “U.S.” is replaced by “Finland” in the survey text of each factor. In the survey text of the “Rare disaster risk” factor, we refer to “the recession of the 1990s” (a major recession in Finland) instead of “the Great Depression.” We asked about gross household income and investable financial assets in euros, instead of USD.
- To keep the survey as short as possible and thereby increase participation, we excluded the second part of the survey by Choi and Robertson (2020), which asks investors for their motives for purchasing actively managed mutual funds.
- Choi and Robertson (2020) ask several follow-up questions regarding the equity allocation factors “when the direction in which a particular factor should push the equity share does not seem self-evident” (Choi and Robertson, 2020, p.1972). We have excluded these follow-up questions from our survey.
- The survey by Choi and Robertson (2020) contains two distinct factors: “Risk of long-run aggregate consumption” and “Risk of long-run aggregate consumption volatility,” with the survey text “Concern that when bad news arrives about how the U.S. material standard of living will change over the five-year period starting one year in the future, the stock market will tend to drop” and “Concern that when uncertainty increases about how the U.S.’s material standard of living will change over the 10 year period starting one year in the future, the stock market will tend to drop,” respectively. Following feedback from the students test-piloting our survey, we omitted the second factor (consumption volatility) and adjusted the survey text to “Concern that when bad news or uncertainty arrives about how Finland’s material standard of living will change over the five-year period starting one year in the future, the stock market will tend to drop.”
- To avoid question-order bias, we presented survey questions to participants in randomized order.

Table A.1 Factors and Survey Text

FACTOR	SURVEY TEXT (ENGLISH)	SURVEY TEXT (FINNISH)
Advice from a friend, family member, or coworker	Advice from a friend, family member, or coworker	Ystävän, perheenjäsenen tai työkollegan neuvo
Advice from media	Advice from a book or an article I read, or from somebody on TV, radio, or the Internet	Neuvot lukemastani kirjasta tai artikkeleista, tai neuvot televisiossa, radiossa tai internetissä
Advice from a professional financial advisor	Advice from a professional financial adviser I hired	Palkkaamani (ammattimaisen) neuvonantajan neuvot
Ambiguity / Parameter uncertainty	I don't have a good sense of the average returns and risks of investing in stocks	Minulla ei ole hyvää käsitystä osakkeisiin sijoittamisen keskimääräisestä tuotosta ja riskeistä
Consumption commitments	My fixed expenses (like mortgage payments, rent, car payments, utility bills, etc.) that are difficult to adjust in the short run	Kiinteät kuluni (kuten asuntolainamaksut, vuokra, automaksut, yleishyödylliset laskut jne.), joita on vaikea sopeuttaa lyhyellä aikavälillä
Consumption composition risk	Concern that when the quality of my physical living situation (how nice my housing is, the safety of my neighborhood, etc.) is dropping faster than the rest of my material quality of life, the stock market will tend to drop	Huoli siitä, että kun asumisen laatu (kuinka mukava asuintilanteeni on, naapuruston turvallisuus jne.) putoaa nopeammin kuin muu aineellinen elämälaatu, osakemarkkinoilla on taipumus laskea
Expected stock returns higher than usual right now	A belief that the returns I can expect to earn from investing in stocks right now are lower than usual	Uskomus, että osakkeiden odotusarvoinen tuotto on tällä hetkellä tavallista pienempi
Expected stock returns lower than usual right now	A belief that the returns I can expect to earn from investing in stocks right now are higher than usual	Uskomus, että osakkeiden odotusarvoinen tuotto on tällä hetkellä tavallista korkeampi
Experience of living through stock market returns	The feelings, attitudes, and beliefs about the stock market I've gotten from living through stock market ups and downs (whether or not I was invested in stocks at the time)	Tunteet, asenteet ja uskomukset osakemarkkinoista, jotka olen omaksunut menneiden kokemukseni kautta osakemarkkinoiden ylä- ja alamaista (riippumatta siitä, olinko itse sijoittanut osakkeisiin tuolloin)
External habit	The difference between my current material standard of living and the level everybody else around me has experienced recently	Ero nykyisen aineellisen elintasoni ja sen elintason välillä, millainen ympärilläni olevilla ihmisillä on viime aikoina ollut
Home value risk **	Concern that my home value might fall	Huoli siitä, että kotini arvo saattaa laskea
Human capital fraction of total wealth	The difference between how much money I have available to invest right now and all the money I (and my spouse/partner, if applicable) expect to earn in wages over the rest of my life	Ero tällä hetkellä sijoittamiseen käytettävissä olevan rahamäärän ja kaiken sen rahan välillä, mitä odotan ansaitsevani palkkoina loppuelämäni aikana (ja puolisoni/kumppanini)
Internal habit	The difference between my current material standard of living and the level I am used to	Ero nykyisen aineellisen elintason ja sen elintason välillä, johon olen totunut
Labor income risk *	Concern that I (or my spouse/partner, if applicable) might become unemployed, receive a pay cut, or not receive an expected pay increase	Huoli siitä, että minä (tai puolisoni/kumppanini) saatan jäädä työttömäksi, saada palkanlennuksen tai että en saisi odotettua palkan-korotusta
Lack of knowledge about how to invest	My lack of knowledge about how to invest	Tiedonpuutteeni siitä miten sijoittaa
Lack of trustworthy advisor	Difficulty in finding a trustworthy adviser	Vaikeus löytää luotettava neuvonantaja
Loss aversion	The possibility of even small losses on my stock investments makes me worry	Mahdollisuus jopa pieniin tappioihin osakesijoituksistani saa minut huolestumaan
Lack of trust in market participants	Concern that companies, managers, brokers, or other market participants might cheat me out of my investments	Huoli siitä, että yritykset, johtajat, osakevälittäjät tai muut markkina-osaajat saattavat huijata minua
Need cash on hand for routine expenses	The amount of cash I need to have in hand to pay routine expenses	Käteismäärä, joka minulla on oltava juoksevien kustannusten maksamiseen

FACTOR	SURVEY TEXT (ENGLISH)	SURVEY TEXT (FINNISH)
Non-financial asset risk	Concern my nonfinancial assets other than my home—such as my small business—might lose value	Huoli siitä, että muu ei-rahallinen omaisuuteni kuin kotini – kuten pien-yritykseni – saattaa menettää arvonsa
Non-financial assets cushion losses in financial assets	A belief that I can afford to take more risks in my financial portfolio because my nonfinancial assets (such as my home or small business) will cushion me against losses in my financial portfolio	Usko, että minulla on varaa ottaa enemmän riskejä rahoitusportfoliossani, koska ei-rahallinen omaisuuteni (kuten kotini tai pien-yritykseni) suojaavat minua rahoitusportfolion tappioilta
Personal experience investing in stock market	The feelings, attitudes, and beliefs about the stock market I've gotten from my personal experiences of investing in the stock market	Tunteet, asenteet ja uskomukset osakemarkkinoista, jotka olen saanut henkilökohtaisista kokemuksistani osakemarkkinoilla sijoittamisesta
Rare disaster risk	Concern that in an economic disaster where Finland's annual GDP would shrink by more than 10% in a year—like the recession of the 1990s—a euro I invested in stocks would lose more value than a euro I put in a bank savings account	Huoli siitä, että taloudellisessa katastrofissa, jossa Suomen vuotuinen bruttokansantuote kuitistuisi yli 10% – kuten 1990-luvun laman aikana – osakkeisiin sijoittamani euro menettäisi enemmän arvoa kuin pankki-säästötilille laittamani euro
Religious beliefs, values, and experiences	My religious beliefs, values, and experiences	Uskonnolliset vakaumukseni, arvoni ja kokemukseni
Return covariance with marginal utility of consumption	Concern that when I have to cut my spending, the stock market will tend to drop	Huoli siitä, että silloin, kun minun on leikattava menojaani, osakemarkkinoilla on taipumus laskea
Return covariance with marginal utility of money	Concern that when I especially need the money, the stock market will tend to drop	Huoli siitä, että silloin, kun tarvitsen erityisesti rahaa, osakemarkkinoilla on taipumus laskea
Risk of aggregate consumption over next year	Concern that when bad news or uncertainty arrives about how Finland's material standard of living will change over the next year, the stock market will tend to drop	Huoli siitä, että kun tulee huonoja uutisia tai epävarmuutta, joiden mukaan Suomen aineellinen elintaso muuttuu ensi vuoden aikana, osakemarkkinoilla on taipumus laskea
Risk of illness/injury	The risk of expenses due to illness or injury to me or someone else in my family	Riski minun tai muun perheenjäsenen sairastumisesta tai loukkaantumisesta ja siitä aiheutuvista kuluista
Risk of long-run aggregate consumption	Concern that when bad news or uncertainty arrives about how Finland's material standard of living will change over the five-year period starting one year in the future, the stock market will tend to drop	Huoli siitä, että kun tulee huonoja uutisia tai epävarmuutta sen suhteen, kuinka Suomen aineellinen elintaso muuttuu viiden vuoden aikana alkaen vuoden päästä, osakemarkkinoilla on taipumus laskea
Rule of thumb	A rule of thumb (for example, "The percentage you invest in stocks should be 100 minus your age" or "Invest one-third in stocks, one-third in bonds, and one-third in real estate")	Nyrkkisääntö (esimerkiksi "Osakkeisiin sijoittamasi prosenttiosuuden tulisi olla 100 miinus ikäsi" tai "Sijoita kolmasosa osakkeisiin, kolmasosa joukkovelkakirjoihin ja kolmasosa kiinteistöihin")
Stock market returns before I was born	What I know about the stock market's returns during the decades before I was born	Se, mitä tiedän osakemarkkinoiden historiallisista tuotoista syntymääni edeltäviltä vuosikymmeniltä
Stock market returns have momentum	A belief that low stock market returns tend to be followed by low stock market returns	Uskomus, että osakemarkkinoiden alhaisen tuoton jälkeen seuraa yleensä alhaista osakemarkkinoiden tuottoa
Stock market returns mean-revert	A belief that low stock market returns tend to be followed by high stock market returns	Uskomus, että osakemarkkinoiden alhaisen tuoton jälkeen seuraa yleensä korkeaa osakemarkkinoiden tuottoa
Stocks are an inflation hedge	A belief that stocks are attractive because when my living expenses increase unexpectedly, the stock market will tend to rise as well	Usko osakkeiden houkuttelevuudesta, koska vaikka elinkustannukseni kasvaisivat odottamatta, myös osakemarkkinoilla on taipumus nousta
Stocks take too long to convert to cash in emergency	Concern that stock investments will take too long to convert into spendable cash in an emergency	Huoli siitä, että osakesijoitusten muuntaminen kulutettaviksi käteis-varoiksi kestäisi hätätilanteessa liian kauan
Time until significant non-retirement expense	How soon I will have significant expenses (like a car purchase, a down payment on a home, etc.)	Kuinka pian minulla on tiedossa merkittäviä kuluja (kuten auton osto, kodin käsiraha jne.)
Years left until retirement *	The number of years I (and my spouse/partner, if applicable) have left until retirement	Niden vuosien lukumäärä, jotka minulla (tai puolisoillani/kumppanillani) on jäljellä eläkkeelle jäämiseen

*Among employed respondents only. **Among homeowners only.

A.1.3 Data collection

The online survey was active during two periods, from June 16 to June 30 in 2021 and from December 13, 2021 to January 6, 2022. We posted the survey link on several websites, social media, forums, and discussion platforms. To mitigate sample selection bias, and economize on costs of data collection, we used several online channels to reach survey participants geographically across Finland, across employment status, and age cohorts (e.g., LinkedIn heavily biases on those currently employed, Reddit is skewed towards the younger generation, and the local daily business newspaper website Kauppalehti towards middle-aged and older users). To mitigate non-response bias, during the first round (June 16 to June 30, 2021) we incentivized participants who completed the survey to choose to enter a lottery for a chance to win one of 10 movie ticket vouchers, and they were offered the opportunity to receive the final survey results. During the second round (December 13, 2021 to January 6, 2022), we also distributed our survey through a market-research company, TGM Research. The number of responses by channel is reported in Table 1 of the main paper.

We perform several checks to address potential data quality issues and biased answers. First, response time is an effective indicator to identify low-quality data (Malhotra 2008; Callegaro et al. 2009). We had 48 questions in total. A total response time of 5 minutes would leave 6.25 seconds per question, which is very unlikely to yield a thoughtful response. We exclude 55 responses with response time less than 5 minutes.

Second, we also exclude another 18 responses with 0% equity share, a pre-condition for taking the survey. Finally, we omit one response that did not provide answers to any of the equity allocation factor questions, and 3 responses because of evidence of straightlining (same response to all equity allocation factor questions). After these exclusions, we have a sample size of $842-55-18-3-1=765$ observations.

Third, only 212 questions had missing data out of a total of 26,010 (34×765) questions targeted to all survey participants. This equates to a missing rate of 0.8%. According to Schafer (1999) and Dong and Peng (2013), a missing rate of 5% or less in surveys is inconsequential for statistical analysis. Bennet (2001) applies a 10% threshold.

Fourth, Singer and Ye (2013) show that incentives help to reduce non-response bias if they can be targeted at sample participants who would otherwise fail to respond, but poorly calibrated incentives can also be a source of bias. Too small incentives will not affect non-response bias, and too high incentives can nudge participants unmotivated by participation, but by the incentive itself, to participate in the study (Baumgartner and Rathbun, 1997). During the first survey period (June 2021, $N=427$), 312 respondents opted in for the movie ticket lottery, while 242 respondents opted in to receive the results of the survey. In January 2022, we collected 28.1% ($N=215$) of our sample through TGM research, which paid participants a small fixed fee for their participation.

A.2 Comparison with full Sample of Choi and Robertson (2020)

Table A.2 Equity Allocation Factors – Finland vs. US Full Sample (“Very or Extremely Important” response)

Columns (1) and (2) show the fraction of respondents rating a factor as “very or extremely important” when determining the amount of financial assets allocated to equity investments, and column (3) shows the difference between the two samples; the table is ordered by column (3). Column (4) shows the coefficient for the Finnish sample dummy when regressing the “very or extremely important” response (0/1) on the sample dummy and observables (category dummies) in Table 1, with each row corresponding to one regression. Column (6) shows the difference in means for “very or extremely important” responses (0/1) using nearest neighbor propensity score matching with observables in Table 1. Columns (5) and (7) show *t*-statistics from columns (4), White-corrected standard errors) and (6), correspondingly. Number of observations is 765 for Finland in columns (1) and (4). The US sample in columns (2) and (4) includes all 1,013 observations, as in Choi and Robertson (2020, Table II). N = 765 (FI) in all columns and 234 (US) in columns (6) and (7).

	FINNISH SAMPLE	US SAMPLE	VERY OR EXTR. IMPOR-TANT Δ	REG. COEFF	t-STAT	PSM Δ	t-STAT
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Personal experience investing in stock market	0.41	0.26	0.15	0.12	4.22	0.23	4.28
Stocks are an inflation hedge	0.34	0.20	0.14	0.14	5.14	0.29	8.74
Stock market returns mean-revert	0.29	0.17	0.12	0.18	7.38	0.22	6.85
Experience of living through stock market returns	0.38	0.27	0.11	0.04	1.58	0.16	3.27
Advice from media	0.22	0.12	0.10	0.10	4.80	0.09	3.95
Stock market returns before I was born	0.21	0.16	0.05	0.03	1.33	0.12	2.97
Non-financial assets cushion losses in financial assets	0.18	0.20	-0.02	0.01	0.47	0.11	2.64
Expected stock returns lower than usual right now	0.21	0.25	-0.04	0.03	1.17	0.06	2.30
Rule of thumb	0.08	0.13	-0.05	0.00	0.12	0.03	1.49
Need cash on hand for routine expenses	0.41	0.47	-0.06	0.01	0.24	0.05	-0.22
Advice from a friend, family member, or coworker	0.08	0.15	-0.07	-0.02	-1.22	0.00	-0.79
Non-financial asset risk	0.10	0.19	-0.09	-0.03	-1.27	-0.08	-2.32
External habit	0.06	0.16	-0.10	-0.04	-2.28	0.00	-1.60
Stock market returns have momentum	0.08	0.19	-0.11	-0.04	-2.14	0.01	-1.33
Expected stock returns higher than usual right now	0.13	0.24	-0.11	-0.06	-2.75	0.08	1.89
Time until significant non-retirement expense	0.24	0.36	-0.12	-0.10	-4.06	-0.17	-2.53
Human capital fraction of total wealth	0.24	0.36	-0.12	-0.09	-3.56	-0.01	-1.12
Years left until retirement *	0.34	0.48	-0.14	-0.19	-5.52	-0.13	-4.55
Ambiguity / Parameter uncertainty	0.13	0.27	-0.14	-0.09	-3.73	-0.09	-4.01
Lack of knowledge about how to invest	0.22	0.36	-0.14	-0.06	-2.41	-0.05	-2.57
Risk of aggregate consumption over next year	0.16	0.30	-0.14	-0.07	-2.98	-0.02	-4.08
Consumption commitments	0.21	0.36	-0.15	-0.10	-3.98	-0.07	-2.33
Risk of long-run aggregate consumption	0.14	0.30	-0.16	-0.08	-3.47	-0.08	-3.69
Internal habit	0.11	0.27	-0.16	-0.09	-4.58	-0.01	-3.74
Lack of trustworthy advisor	0.14	0.31	-0.17	-0.09	-3.69	-0.12	-4.70
Return covariance with marginal utility of consumption	0.12	0.29	-0.17	-0.09	-4.04	-0.03	-3.59
Advice from a professional financial advisor	0.09	0.27	-0.18	-0.16	-7.17	-0.08	-5.67
Home value risk **	0.10	0.29	-0.19	-0.13	-5.27	-0.06	-4.66
Religious beliefs, values, and experiences	0.07	0.26	-0.19	-0.14	-7.05	-0.12	-4.40
Stocks take too long to convert to cash in emergency	0.10	0.29	-0.19	-0.07	-3.51	-0.06	-3.45
Return covariance with marginal utility of money	0.15	0.35	-0.20	-0.11	-4.54	-0.07	-4.90
Consumption composition risk	0.08	0.29	-0.21	-0.14	-6.74	-0.11	-6.39
Loss aversion	0.06	0.28	-0.22	-0.15	-8.08	-0.13	-5.88
Lack of trust in market participants	0.15	0.38	-0.23	-0.15	-6.20	-0.13	-5.51
Rare disaster risk	0.19	0.46	-0.27	-0.19	-7.21	-0.12	-7.17
Labor income risk *	0.13	0.42	-0.29	-0.23	-7.17	-0.19	-7.26
Risk of illness/injury	0.17	0.47	-0.30	-0.20	-7.50	-0.24	-7.24

*Among employed respondents only. **Among homeowners only.

Table A.3 Equity Allocation Factors – Finland vs. US Full Sample (Mean Standard Score)

Columns (1) and (2) show the mean standard scores (MSS) for equity allocation factors when determining the amount of financial assets allocated to equity investments. MSS is calculated by subtracting the mean value of a participant's numerical responses from the numerical value of each response for each equity allocation factor and dividing this by the standard deviation of that participant's numerical responses. Column (3) shows the difference between the two samples, and the table is ordered by this column. Column (4) shows the coefficient for the Finnish sample dummy when regressing responses (integer 1 to 5) on the sample dummy and observables (category dummies including "not disclosed" dummies) in Table 1, with each row corresponding to one regression. Column (6) shows the difference in responses using nearest neighbor propensity score matching (PSM) with observables in Table 1. Columns (5) and (7) show t-statistics from columns (4, White-corrected standard errors) and (6), correspondingly. Number of observations is 765 for Finland in columns (1) and (4). The US sample in columns (2) and (4) includes all 1,013 observations, as in Choi and Robertson (2020, Table II). N = 765 (FI) in all columns and 234 (US) in columns (6) and (7).

	FINNISH SAMPLE	US SAMPLE	MSS Δ	REG. COEFF	t-STAT	PSM Δ	t-STAT
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Advice from media	0.36	-0.51	0.87	0.71	13.04	0.73	12.27
Personal experience investing in stock market	0.84	0.01	0.83	0.60	10.53	0.88	8.93
Stock market returns mean-revert	0.53	-0.26	0.79	0.83	16.61	0.89	13.75
Stocks are an inflation hedge	0.66	-0.04	0.70	0.66	11.27	0.77	11.26
Experience of living through stock market returns	0.75	0.1	0.65	0.34	5.96	0.58	6.65
Stock market returns before I was born	0.12	-0.41	0.53	0.24	4.07	0.38	6.04
Expected stock returns lower than usual right now	0.25	-0.13	0.38	0.42	8.30	0.49	8.66
Non-financial assets cushion losses in financial assets	0.18	-0.14	0.32	0.29	4.67	0.25	3.17
Need cash on hand for routine expenses	0.76	0.48	0.28	0.28	4.58	0.24	4.47
Years left until retirement *	0.57	0.42	0.15	-0.12	-1.48	0.02	-0.59
Time until significant non-retirement expense	0.27	0.17	0.10	-0.06	-0.98	-0.28	0.72
Non-financial asset risk	-0.34	-0.43	0.09	0.19	3.22	0.09	1.13
Rule of thumb	-0.41	-0.46	0.05	0.12	2.38	0.06	2.57
Advice from a friend, family member, or coworker	-0.34	-0.39	0.05	0.08	1.60	-0.04	2.14
Expected stock returns higher than usual right now	-0.01	-0.05	0.04	0.06	1.04	0.20	2.32
Human capital fraction of total wealth	0.31	0.28	0.03	0.01	0.29	-0.06	1.71
Stock market returns have momentum	-0.27	-0.29	0.02	0.08	1.73	0.11	1.45
Lack of knowledge about how to invest	0.14	0.19	-0.05	0.04	0.71	-0.11	-0.39
Risk of aggregate consumption over next year	0.04	0.09	-0.05	0.06	1.39	-0.07	-2.73
External habit	-0.45	-0.38	-0.07	0.01	0.32	0.08	1.19
Risk of long-run aggregate consumption	-0.03	0.05	-0.08	-0.06	-1.42	-0.27	-3.03
Consumption commitments	0.12	0.24	-0.12	-0.14	-2.66	-0.22	-0.56
Internal habit	-0.25	-0.03	-0.22	-0.15	-3.33	0.07	-2.04
Return covariance with marginal utility of money	-0.03	0.20	-0.23	-0.26	-4.97	-0.29	-4.33
Lack of trustworthy advisor	-0.26	-0.01	-0.25	-0.12	-1.95	-0.24	-3.83
Ambiguity / Parameter uncertainty	-0.27	-0.02	-0.25	-0.27	-4.78	-0.30	-4.92
Return covariance with marginal utility of consumption	-0.23	0.05	-0.28	-0.27	-5.66	-0.25	-4.82
Stocks take too long to convert to cash in emergency	-0.31	0.00	-0.31	-0.12	-2.51	-0.23	-3.68
Lack of trust in market participants	-0.17	0.21	-0.38	-0.27	-4.73	-0.24	-4.45
Rare disaster risk	0.14	0.53	-0.39	-0.34	-6.39	-0.31	-7.35
Labor income risk *	-0.07	0.36	-0.43	-0.44	-5.90	-0.27	-4.70
Religious beliefs, values, and experiences	-0.67	-0.24	-0.43	-0.39	-5.79	-0.49	-3.58
Advice from a professional financial advisor	-0.61	-0.13	-0.48	-0.51	-8.11	-0.31	-6.25
Consumption composition risk	-0.46	0.03	-0.49	-0.44	-9.84	-0.36	-9.06
Loss aversion	-0.56	-0.06	-0.50	-0.35	-7.38	-0.34	-6.49
Risk of illness/injury	0.09	0.65	-0.56	-0.37	-6.42	-0.83	-6.94
Home value risk **	-0.32	0.24	-0.56	-0.48	-8.57	-0.34	-6.67

*Among employed respondents only. **Among homeowners only.

A.3 Equity Market Participant Population-Weighted Results and Alternative Matching Methods

A.3.1 Equity market participant population-weighting

As reported in Table 1, our survey sample is tilted especially towards the young (50.3% in the sample are 18-39 years old vs. 27.6% in the general Finnish equity market participant population) and males (77.0% vs. 52.2%).

Following Choi and Robertson (2020), we supplement our simple unweighted results reported in the main paper. We calculate weighted percentages and weighted mean standard scores by adjusting the sample weights of each age-gender-level of education-gross household income-investable financial assets group reported in Table 1, column 1 to match the group's weight in the Finnish equity market participant population in column 4. For example, instead of uniform weights $1/N$, the responses from male/age cohort 18-29/master's degree or higher/household income between €25,000-€49,999/investable assets between €25,000 and €49,999 are weighted by a factor $0.0001372/0.00700 = 0.02$ (this cell represents 0.7% of our sample and 0.01372% of equity market participant population). The equity market participant population weights for all permutations of gender/age/level of education/household income/investable financial asset bins are retrieved from the same data as in Breitkopf et al. (2021). Responses with missing data have a weight of zero in the weighted analysis. Gross household income measured in 2016 in column (4) of Table 1 is inflation-adjusted to 2021 as the base year using the Finnish CPI from Statistics Finland.

A.3.2 Weighted results

Table A.4 reports the weighted importance of equity allocation factors in the Finnish sample, compared to the weighted US results also reported by Choi and Robertson (2020). The reported differences between the Finnish and the US sample are consistent with the unweighted results (column 3 in Tables 3 and 4 of the main paper). For example, 4 out of the top 5 factors relatively most important to Finnish investors in Table 3 also appear in the top 5 factor list of Table A.4. Only "Stock market returns before I was born," which ranks 5th in the unweighted Table 3, ranks 15th for MSS in the weighted Table A.4. Similarly, "Need cash on hand for routine expenses" ranks 3rd in Table A.4. and 6th in Table 3.

At the bottom of Table 3 and A.4 (factors relatively most important to US investors), we see that 3 out of the bottom 5 factors overlap in the weighted and unweighted table. "Home value risk" and "Consumption composition risk" are among the bottom 5 factors of Table 3, while these factors rank 6th and 9th in Table A.4. "Labor income risk" and "Years until retirement" appear in the bottom 5 factors of the weighted results in Table A.4 (8th and 9th in Table 3). Overall, the results in Tables 3, 4, and A.4 are strikingly similar, suggesting that the skewness in the demographic composition of our sample does not drive the differences between US and Finnish investors after weighting on observables.

Table A.4 Equity Allocation Factors – Finland vs. US (Weighted)

Columns (1) and (2) show the weighted fraction of respondents rating a factor as “very or extremely important” when determining the amount of financial assets allocated to equity investments in the Finnish and US samples, and column (3) shows their difference. Columns (4) and (5) show the weighted mean standard scores (MSS) for equity allocation factors when determining the amount of financial assets allocated to equity investments. MSS is calculated by subtracting the mean value of a participant’s numerical responses from the numerical value of each response for each equity allocation factor and dividing this by the standard deviation of that participant’s numerical responses. Column (6) shows their weighted difference in the two samples. The rows are ordered by column (6). Weighting is based on equity market participant population weights in the age-gender-level of education-gross household income-investable financial assets group with the same data as in Breitkopf et al. (2021). Number of observations is 765 for Finland and 664 for the US.

	FRACTION OF “VERY OR EXTREMELY IMPORTANT”			MEAN STANDARD SCORE		
	FI	US	Δ	FI	US	Δ MSS
	(1)	(2)	(3)	(4)	(5)	(6)
Stock market returns mean-revert	0.31	0.20	0.11	0.47	-0.14	0.61
Advice from media	0.21	0.12	0.09	0.01	-0.50	0.51
Need cash on hand for routine expenses	0.51	0.39	0.12	0.76	0.31	0.45
Personal experience investing in stock market	0.39	0.29	0.10	0.52	0.23	0.29
Stocks are an inflation hedge	0.21	0.20	0.01	0.23	-0.04	0.27
Expected stock returns lower than usual right now	0.24	0.26	-0.01	0.17	-0.10	0.27
Rule of thumb	0.13	0.11	0.02	-0.28	-0.50	0.22
Risk of aggregate consumption over next year	0.26	0.26	0.00	0.24	0.06	0.18
Stocks take too long to convert to cash in emergency	0.25	0.24	0.01	0.04	-0.11	0.15
Lack of knowledge about how to invest	0.36	0.33	0.02	0.29	0.14	0.15
External habit	0.18	0.12	0.06	-0.34	-0.49	0.15
Non-financial assets cushion losses in financial assets	0.18	0.20	-0.02	-0.01	-0.14	0.13
Lack of trustworthy advisor	0.24	0.29	-0.05	0.01	-0.05	0.07
Consumption commitments	0.30	0.30	0.00	0.14	0.09	0.06
Stock market returns before I was born	0.15	0.14	0.01	-0.32	-0.37	0.05
Stock market returns have momentum	0.13	0.16	-0.04	-0.28	-0.33	0.04
Experience of living through stock market returns	0.33	0.31	0.03	0.37	0.33	0.04
Expected stock returns higher than usual right now	0.16	0.24	-0.08	-0.04	-0.05	0.01
Risk of long-run aggregate consumption	0.24	0.26	-0.01	0.07	0.08	-0.01
Non-financial asset risk	0.14	0.16	-0.02	-0.54	-0.52	-0.02
Advice from a friend, family member, or coworker	0.12	0.12	0.00	-0.52	-0.49	-0.03
Return covariance with marginal utility of money	0.26	0.31	-0.05	0.17	0.20	-0.03
Return covariance with marginal utility of consumption	0.26	0.25	0.01	-0.05	-0.01	-0.03
Ambiguity / Parameter uncertainty	0.25	0.24	0.02	-0.03	0.04	-0.06
Internal habit	0.18	0.25	-0.07	-0.15	-0.08	-0.07
Time until significant non-retirement expense	0.27	0.36	-0.09	0.04	0.16	-0.11
Human capital fraction of total wealth	0.22	0.32	-0.09	0.08	0.20	-0.13
Loss aversion	0.19	0.22	-0.03	-0.37	-0.19	-0.18
Consumption composition risk	0.21	0.24	-0.04	-0.23	-0.02	-0.21
Religious beliefs, values, and experiences	0.17	0.24	-0.07	-0.56	-0.31	-0.26
Lack of trust in market participants	0.28	0.34	-0.07	-0.11	0.15	-0.26
Home value risk **	0.25	0.27	-0.02	-0.07	0.23	-0.30
Rare disaster risk	0.32	0.47	-0.15	0.29	0.62	-0.33
Risk of illness/injury	0.34	0.48	-0.14	0.35	0.69	-0.34
Labor income risk *	0.20	0.40	-0.19	0.04	0.38	-0.34
Years left until retirement *	0.31	0.59	-0.28	0.34	0.73	-0.39
Advice from a professional financial advisor	0.16	0.34	-0.18	-0.57	0.07	-0.63

*Among employed respondents only. **Among homeowners only.

A.3.3 Alternative matching methods

We also use alternative matching methods, and their results are reported in Table A.5 and Table A.6. We perform three exact match scenarios for the fraction of “very or extremely important” responses and the mean standard score (MSS). In column (1) we require an exact match on gender, age bin, education bin, gross household income bin and investable financial assets bin, and column (2) reports the t-statistic for difference. Columns (3) and (4) are based on an exact match based on gender and age bin. Columns (5) and (6) are based on an exact match based on the education bin, gross household income bin and investable financial assets bin.

Table A.5 Alternative Matching Methods (“Very or Extremely Important” response)

Columns (1), (3), and (5) show the difference in fraction of respondents between the samples in the two countries rating a factor as “very or extremely important” when determining the amount of financial assets allocated to equity investments. Column (1) requires an exact match (EM) on the gender/age/level of education/gross household income/investable financial assets bin (N=239 for FI, N=372 for US). Column (2) shows t-statistics for the difference. EM2 in columns (3) and (4) consists of an exact match on the gender/age bin (N=757 for FI and N=664 for US), and EM3 in columns (5) and (6) requires an exact match on the level of education/gross household income/investable financial assets bin (N=586 for FI and N=638 for the US). The table is ordered by column (1).

MATCHING ALGORITHM	EXACT MATCHING (EM)					
	EM	EM	EM2	EM2	EM3	EM3
	Δ MSS	t-value	Δ MSS	t-value	Δ MSS	t-value
	(1)	(2)	(3)	(4)	(5)	(6)
Stocks are an inflation hedge	0.23	5.77	0.19	8.48	0.22	8.52
Stock market returns mean-revert	0.16	4.48	0.15	6.95	0.17	6.21
Advice from media	0.13	4.93	0.09	8.44	0.16	8.33
Personal experience investing in stock market	0.11	2.42	0.17	4.43	0.16	4.59
Expected stock returns lower than usual right now	0.09	2.23	0.09	1.86	0.07	1.81
Non-financial assets cushion losses in financial assets	0.08	1.66	0.01	0.64	0.05	0.98
Rule of thumb	0.06	1.95	0.03	-0.28	0.02	0.14
Stock market returns before I was born	0.04	1.50	0.03	4.41	0.13	4.58
Need cash on hand for routine expenses	0.04	0.14	0.13	1.69	0.03	1.58
Experience of living through stock market returns	0.04	-0.42	0.12	1.44	0.11	1.30
Advice from a friend, family member, or coworker	0.02	0.50	0.01	0.42	0.00	0.96
Stock market returns have momentum	0.00	-0.72	0.00	-1.96	-0.02	-1.47
Non-financial asset risk	0.00	-0.10	-0.02	-2.28	-0.03	-2.62
Lack of knowledge about how to invest	0.00	-1.34	0.03	-1.82	-0.03	-1.74
Human capital fraction of total wealth	-0.01	-0.80	-0.03	-0.73	0.02	-0.50
Expected stock returns higher than usual right now	-0.01	-1.24	-0.04	-2.44	-0.03	-2.47
Lack of trustworthy advisor	-0.01	-1.90	-0.04	-5.86	-0.10	-5.27
External habit	-0.02	-1.78	-0.05	-1.50	-0.02	-2.11
Ambiguity / Parameter uncertainty	-0.02	-2.45	-0.08	-4.41	-0.08	-4.34
Risk of aggregate consumption over next year	-0.02	-1.94	-0.05	-4.98	-0.13	-4.26
Risk of long-run aggregate consumption	-0.03	-2.43	-0.07	-5.73	-0.09	-4.97
Stocks take too long to convert to cash in emergency	-0.05	-3.06	-0.05	-4.91	-0.09	-4.76
Return covariance with marginal utility of consumption	-0.05	-2.77	-0.07	-5.77	-0.13	-5.22
Internal habit	-0.06	-3.06	-0.08	-4.00	-0.06	-4.15
Loss aversion	-0.07	-4.85	-0.08	-7.07	-0.12	-7.10
Consumption commitments	-0.08	-2.29	-0.03	-3.13	-0.11	-2.87
Home value risk **	-0.09	-4.76	-0.10	-7.51	-0.14	-7.15
Return covariance with marginal utility of money	-0.09	-3.76	-0.08	-7.20	-0.17	-6.69
Time until significant non-retirement expense	-0.11	-1.86	-0.09	-1.71	-0.08	-1.63
Consumption composition risk	-0.11	-5.58	-0.11	-7.81	-0.16	-7.83
Religious beliefs, values, and experiences	-0.11	-5.77	-0.11	-9.38	-0.17	-8.68
Lack of trust in market participants	-0.12	-4.45	-0.12	-7.94	-0.20	-7.90
Labor income risk *	-0.13	-4.71	-0.19	-10.02	-0.21	-9.31
Risk of illness/injury	-0.17	-6.77	-0.19	-12.30	-0.33	-11.54
Years left until retirement *	-0.21	-3.93	-0.25	-8.68	-0.19	-7.68
Rare disaster risk	-0.24	-7.82	-0.19	-10.81	-0.23	-10.88
Advice from a professional financial advisor	-0.25	-9.00	-0.15	-12.43	-0.25	-13.05

*Among employed respondents only. **Among homeowners only.

Table A.6 Alternative Matching Methods (Mean Standard Score)

Columns (1) shows the difference in (unconditional and unweighted) mean standard score (MSS) between the samples in the two countries when requiring an exact match (EM) on the gender/age/level of education/gross household income/investable financial assets bin (N=239 for FI, N=372 for US). Column (2) shows t-statistics for the difference. EM2 in columns (3) and (4) consists of an exact match on the gender/age bin (N=757 for FI and N=664 for US), and EM3 in columns (5) and (6) requires an exact match on the level of education/gross household income/investable financial assets bin (N=586 for FI and N=638 for the US). The table is ordered by column (1).

MATCHING ALGORITHM	EXACT MATCHING (EM)					
	EM		EM2		EM3	
	Δ MSS	t-value	Δ MSS	t-value	Δ MSS	t-value
	(1)	(2)	(3)	(4)	(5)	(6)
Stocks are an inflation hedge	0.92	10.23	0.77	14.26	0.78	13.84
Advice from media	0.72	10.45	0.68	18.81	0.95	17.99
Stock market returns mean-revert	0.67	10.46	0.65	16.60	0.79	14.91
Personal experience investing in stock market	0.55	5.24	0.57	9.22	0.62	9.66
Expected stock returns lower than usual right now	0.53	6.80	0.50	9.55	0.45	8.74
Non-financial assets cushion losses in financial assets	0.35	3.75	0.28	4.82	0.41	4.96
Need cash on hand for routine expenses	0.31	4.18	0.51	8.09	0.39	7.38
Non-financial asset risk	0.30	3.95	0.19	3.87	0.21	3.21
Stock market returns have momentum	0.22	2.56	0.13	2.15	0.07	1.98
Experience of living through stock market returns	0.21	1.63	0.46	4.94	0.42	5.01
Rule of thumb	0.19	2.41	0.09	2.20	0.15	2.20
Expected stock returns higher than usual right now	0.17	1.44	0.09	2.60	0.13	2.23
Stock market returns before I was born	0.14	2.91	0.13	8.40	0.60	8.07
Risk of aggregate consumption over next year	0.12	-0.12	-0.02	-3.56	-0.17	-2.65
Advice from a friend, family member, or coworker	0.06	1.84	0.01	5.35	0.19	5.11
External habit	0.02	1.14	-0.02	3.78	0.06	2.47
Human capital fraction of total wealth	-0.02	2.07	0.02	4.62	0.28	4.49
Lack of trustworthy advisor	-0.05	-0.74	-0.07	-4.19	-0.18	-3.64
Lack of knowledge about how to invest	-0.06	-0.27	0.13	1.03	0.00	0.80
Internal habit	-0.06	-0.77	-0.16	-1.56	-0.08	-1.64
Risk of long-run aggregate consumption	-0.09	-2.12	-0.13	-5.20	-0.17	-4.61
Loss aversion	-0.12	-3.43	-0.19	-7.01	-0.43	-7.39
Stocks take too long to convert to cash in emergency	-0.14	-2.30	-0.06	-3.58	-0.19	-3.89
Years left until retirement *	-0.14	0.92	-0.31	-3.19	-0.12	-2.43
Time until significant non-retirement expense	-0.17	0.52	-0.03	3.40	0.06	2.85
Ambiguity / Parameter uncertainty	-0.19	-4.35	-0.34	-6.94	-0.39	-7.12
Labor income risk *	-0.20	-1.50	-0.25	-4.72	-0.25	-4.23
Lack of trust in market participants	-0.21	-3.09	-0.21	-6.21	-0.35	-6.09
Consumption commitments	-0.26	-1.22	-0.04	0.78	-0.11	0.26
Return covariance with marginal utility of consumption	-0.30	-5.40	-0.22	-7.38	-0.34	-6.53
Return covariance with marginal utility of money	-0.35	-5.52	-0.31	-8.79	-0.40	-7.98
Risk of illness/injury	-0.36	-7.16	-0.72	-13.33	-0.73	-12.14
Home value risk **	-0.39	-6.96	-0.36	-8.16	-0.46	-8.41
Religious beliefs, values, and experiences	-0.47	-5.63	-0.42	-7.08	-0.42	-6.49
Consumption composition risk	-0.50	-8.20	-0.32	-11.42	-0.50	-10.96
Rare disaster risk	-0.55	-7.36	-0.39	-11.86	-0.51	-11.46
Advice from a professional financial advisor	-0.85	-9.00	-0.62	-13.77	-0.77	-13.92

*Among employed respondents only. **Among homeowners only.

A.4 Selection on unobservables

The previous regression analysis, sample weighting, matching, and subsample analysis all serve the purpose of addressing potential selection on observable characteristics. Selection on unobservables is a potential concern as well. Altonji et al. (2005) and Oster (2019) develop an approach to assess the potential magnitude of this selection bias. As shown by Oster (2019), the true treatment effect, free of selection bias, approximates:

$$\beta^* \approx \tilde{\beta} - \delta[\beta^0 - \tilde{\beta}] \frac{R_{max} - \tilde{R}}{\tilde{R} - R^0},$$

where β^0 is the estimated treatment effect without any controls (i.e. the coefficient of a factor's score regressed on a Finland dummy, resulting in the unconditional mean difference between the Finnish and US sample, as in column (3) of Table 2), and $\tilde{\beta}$ is the treatment effect after controlling for observables (i.e. the coefficient of a factor's score regressed on a Finland dummy, after controlling for observable characteristics, as in column (4) of Table 2). R^0 and \tilde{R} are the R^2 s of these regressions excluding and including controls, respectively. R_{max} refers to the potential maximum R^2 and is set equal to $R_{max} = \min(1.3\tilde{R}, 1)$, (following Oster (2019)). δ is the coefficient of proportionality, indicating the explanatory power of the unobservable characteristics relative to the observable control variables.

Given estimated values of β^0 , R^0 , $\tilde{\beta}$, and \tilde{R} , and the assumption that $R_{max} = \min(1.3\tilde{R}, 1)$, it is straightforward to obtain the implied value of δ , such that β^* . In other words, this estimate of Oster's δ indicates how large the explanatory power of the unobservables needs to be relative to the explanatory power of the control variables in order to reduce the treatment effect to zero.

In Table A.7, we report estimates of β^0 , R^0 , $\tilde{\beta}$, and \tilde{R} , for each of the 37 equity allocation factors. I.e.: β^0 and $\tilde{\beta}$ refer to the coefficient from regressing a binary variable indicating whether a respondent considers each factor Very or Extremely important, on a dummy indicating that the respondent belongs to the Finnish sample, excluding and including demographic controls, as reported in column (3) and (4) of Table 2, R^0 and \tilde{R} refer to the R^2 s of these regressions. Given these estimates, the implied value of δ is reported in Column (5). The estimated δ s are mostly large in magnitude. The median δ in absolute value is 8.06, implying that the selection bias from excluding the unobservables needs to be 8.06 times larger than the effect of the control variables, to drive the treatment effect to zero. The coefficient of proportionality δ is smaller than one for only one factor ("Rule of thumb"), which is not a factor for which we find a significant difference between the US and Finland. For several factors, δ is very large in magnitude, which reflects that the estimates β^0 and $\tilde{\beta}$ are very close, making it unlikely that controlling for additional variables would overturn the estimated effect.

Table A.8 reports the same analysis, using the mean standardized scores for each equity allocation factor. Again, the estimated δ s are relatively large in magnitude, with a median $|\delta|$ of 6.94. There are 4 factors for which $|\delta| < 1$, but these do not include the factors for which we find large differences between the US and Finland. Overall, the results in Table A.7 and A.8 suggests that it is unlikely that the differences that we document between the US and Finnish samples are significantly affected by selection on unobservables.

Table A.7 Selection on unobservables (“Very or Extremely Important” response)

β^0 and $\tilde{\beta}$ in columns (1) and (2) refer to the coefficient from regressing a binary variable indicating whether a respondent considers each factor Very or Extremely important, on a dummy indicating that the respondent belongs to the Finnish sample, excluding and including demographic controls (as reported in column (3) and (4) of Table 2). R^0 and \tilde{R} in columns (3) and (4) refer to the R^2 s of these regressions. The coefficient of proportionality δ is reported in column (5). The bottom row reports the median of the absolute value of δ .

	β^0 (1)	$\tilde{\beta}$ (2)	R^0 (3)	\tilde{R} (4)	δ (5)
Advice from a friend, family member, or coworker	0.01	-0.01	0.00	0.07	-2.11
Advice from a professional financial advisor	-0.26	-0.22	0.10	0.14	3.76
Advice from media	0.15	0.10	0.05	0.09	3.35
Ambiguity / Parameter uncertainty	-0.09	-0.07	0.01	0.07	13.22
Consumption commitments	-0.07	-0.09	0.01	0.08	-18.13
Consumption composition risk	-0.15	-0.13	0.04	0.08	9.65
Expected stock returns higher than usual right now	-0.05	-0.06	0.00	0.04	-11.71
Expected stock returns lower than usual right now	0.04	0.04	0.00	0.05	-45.95
Experience of living through stock market returns	0.03	0.04	0.00	0.04	-40.55
External habit	-0.02	-0.03	0.00	0.06	-9.89
Home value risk **	-0.15	-0.14	0.04	0.10	32.17
Human capital fraction of total wealth	-0.02	-0.07	0.00	0.07	-4.41
Internal habit	-0.08	-0.09	0.01	0.07	-19.91
Labor income risk *	-0.23	-0.24	0.07	0.14	-199.35
Lack of knowledge about how to invest	-0.04	-0.04	0.00	0.08	-1546.97
Lack of trust in market participants	-0.18	-0.16	0.04	0.11	24.37
Lack of trustworthy advisor	-0.13	-0.07	0.02	0.08	3.17
Loss aversion	-0.12	-0.12	0.04	0.11	-67.92
Need cash on hand for routine expenses	0.05	0.02	0.00	0.06	3.38
Non-financial asset risk	-0.04	-0.03	0.00	0.07	10.17
Non-financial assets cushion losses in financial assets	0.01	0.01	0.00	0.03	42.14
Personal experience investing in stock market	0.11	0.11	0.01	0.04	-65.88
Rare disaster risk	-0.26	-0.21	0.08	0.12	4.98
Religious beliefs, values, and experiences	-0.18	-0.15	0.06	0.11	6.66
Return covariance with marginal utility of consumption	-0.12	-0.09	0.02	0.08	6.83
Return covariance with marginal utility of money	-0.16	-0.11	0.04	0.09	4.48
Risk of aggregate consumption over next year	-0.11	-0.06	0.02	0.08	2.99
Risk of illness/injury	-0.30	-0.23	0.10	0.16	4.49
Risk of long-run aggregate consumption	-0.12	-0.08	0.02	0.09	5.22
Rule of thumb	0.00	0.00	0.00	0.05	-0.34
Stock market returns before I was born	0.09	0.05	0.01	0.06	2.95
Stock market returns have momentum	-0.03	-0.02	0.00	0.05	10.14
Stock market returns mean-revert	0.15	0.17	0.03	0.07	-12.99
Stocks are an inflation hedge	0.19	0.14	0.05	0.08	3.92
Stocks take too long to convert to cash in emergency	-0.09	-0.06	0.02	0.10	5.93
Time until significant non-retirement expense	-0.04	-0.12	0.00	0.09	-5.19
Years left until retirement *	-0.21	-0.26	0.04	0.09	-8.06
Median(δ)					8.06

*Among employed respondents only. **Among homeowners only.

Table A.8 Selection on unobservables (Mean Standard Score)

β^0 and $\tilde{\beta}$ in columns (1) and (2) refer to the coefficient from regressing Mean Standard Score on a dummy indicating that the respondent belongs to the Finnish sample, excluding and including demographic controls (as reported in column (3) and (4) of Table 3). R^0 and \bar{R} in columns (3) and (4) refer to the R^2 s of these regressions. The coefficient of proportionality δ is reported in column (5). The bottom row reports the median of the absolute value of δ .

	β^0 (1)	$\tilde{\beta}$ (2)	R^0 (3)	\bar{R} (4)	δ (5)
Advice from a friend, family member, or coworker	0.24	0.10	0.02	0.09	1.88
Advice from a professional financial advisor	-0.81	-0.66	0.13	0.16	3.25
Advice from media	0.91	0.71	0.20	0.27	2.99
Ambiguity / Parameter uncertainty	-0.33	-0.27	0.03	0.10	10.63
Consumption commitments	0.04	-0.12	0.00	0.07	-2.48
Consumption composition risk	-0.47	-0.43	0.09	0.11	7.47
Expected stock returns higher than usual right now	0.12	0.06	0.00	0.06	2.87
Expected stock returns lower than usual right now	0.43	0.43	0.06	0.09	-1746.55
Experience of living through stock market returns	0.25	0.28	0.02	0.14	-31.51
External habit	0.15	0.03	0.01	0.05	0.79
Home value risk **	-0.46	-0.50	0.07	0.11	-18.53
Human capital fraction of total wealth	0.23	0.06	0.01	0.14	0.97
Internal habit	-0.06	-0.13	0.00	0.04	-6.22
Labor income risk *	-0.29	-0.45	0.02	0.09	-7.30
Lack of knowledge about how to invest	0.05	0.08	0.00	0.06	-9.90
Lack of trust in market participants	-0.32	-0.28	0.03	0.08	12.96
Lack of trustworthy advisor	-0.23	-0.08	0.01	0.06	1.45
Loss aversion	-0.28	-0.26	0.03	0.12	28.08
Need cash on hand for routine expenses	0.45	0.35	0.05	0.10	6.94
Non-financial asset risk	0.20	0.21	0.01	0.03	-27.69
Non-financial assets cushion losses in financial assets	0.26	0.29	0.02	0.09	-23.85
Personal experience investing in stock market	0.48	0.53	0.06	0.14	-22.10
Rare disaster risk	-0.58	-0.41	0.09	0.12	2.11
Religious beliefs, values, and experiences	-0.44	-0.41	0.04	0.07	25.17
Return covariance with marginal utility of consumption	-0.30	-0.25	0.04	0.07	7.71
Return covariance with marginal utility of money	-0.38	-0.27	0.05	0.09	3.64
Risk of aggregate consumption over next year	-0.15	0.07	0.01	0.10	-0.93
Risk of illness/injury	-0.66	-0.45	0.11	0.18	2.57
Risk of long-run aggregate consumption	-0.22	-0.08	0.02	0.09	1.47
Rule of thumb	0.10	0.13	0.00	0.04	-13.77
Stock market returns before I was born	0.48	0.28	0.05	0.16	3.18
Stock market returns have momentum	0.08	0.09	0.00	0.03	-23.17
Stock market returns mean-revert	0.75	0.78	0.16	0.19	-12.67
Stocks are an inflation hedge	0.71	0.66	0.12	0.16	10.14
Stocks take too long to convert to cash in emergency	-0.16	-0.09	0.01	0.07	3.54
Time until significant non-retirement expense	0.19	-0.05	0.01	0.12	-0.69
Years left until retirement *	-0.11	-0.27	0.00	0.09	-5.36
Median(δ)					6.94

*Among employed respondents only. **Among homeowners only.

A.5 Subsample Results

Table A.9 reports the results for subsamples based on the reported gender of survey participants, all unweighted. This table is ordered on the difference in mean standard score between these two subsamples reported in column (6), revealing gender differences in the importance of equity allocation factors. The differences within Finland between gender are however small compared to the cross-country differences: the correlation between the Mean Standard Score for male and female respondents is 0.91. Similarly, Table A.10 reports the result by age group, dividing the sample into individuals below and above the age of 40. The correlation between the Mean Standard Score for “old” and “young” respondents is 0.84. Finally, Table A.11 reports the results for respondents with a higher education degree (bachelor’s or graduate degree) and for respondents who have completed only basic education (primary education, high school, or vocational diploma). The correlation between the mean standard scores of these two groups is 0.92. Across all these three dimensions, the within-country variation between subgroups is thus clearly smaller than the between-country variation between the US and Finland. The correlation between the mean standard scores in the US and Finland reported in Table 3 is 0.43.

Table A.9 Equity Allocation Factors by Gender (Unweighted)

Columns (1) and (2) show the fraction of Finnish respondents rating a factor as “very or extremely important” when determining the amount of financial assets allocated to equity investments in the Male and Female samples, and column (3) shows their difference. Columns (4) and (5) show the mean standard scores (MSS) for equity allocation factors when determining the amount of financial assets allocated to equity investments. MSS is calculated by subtracting the mean value of a participant’s numerical responses from the numerical value of each response for each equity allocation factor and dividing this by the standard deviation of that participant’s numerical responses. Column (6) shows the difference between the two samples. The rows are ordered by column (6). Number of observations is 589 (Male) and 171 (Female).

	FRACTION OF “VERY OR EXTREMELY IMPORTANT”			MEAN STANDARD SCORE		
	MALE	FEMALE	Δ	MALE	FEMALE	Δ MSS
	(1)	(2)	(3)	(4)	(5)	(6)
Stock market returns before I was born	0.23	0.12	0.11	0.23	-0.26	0.49
Expected stock returns higher than usual right now	0.14	0.10	0.04	0.06	-0.27	0.33
Stock market returns mean-revert	0.29	0.31	-0.02	0.57	0.37	0.20
Advice from media	0.23	0.18	0.05	0.41	0.20	0.20
Expected stock returns lower than usual right now	0.22	0.21	0.01	0.29	0.11	0.18
Stock market returns have momentum	0.08	0.06	0.02	-0.23	-0.41	0.17
Stocks are an inflation hedge	0.34	0.33	0.02	0.70	0.54	0.16
Experience of living through stock market returns	0.39	0.36	0.03	0.79	0.64	0.15
Non-financial assets cushion losses in financial assets	0.18	0.16	0.02	0.21	0.05	0.15
Years left until retirement *	0.35	0.33	0.02	0.61	0.46	0.15
Human capital fraction of total wealth	0.24	0.23	0.02	0.33	0.24	0.09
External habit	0.06	0.09	-0.03	-0.44	-0.49	0.06
Rule of thumb	0.08	0.10	-0.02	-0.39	-0.45	0.05
Internal habit	0.11	0.12	-0.01	-0.24	-0.29	0.05
Consumption composition risk	0.07	0.11	-0.04	-0.45	-0.48	0.03
Personal experience investing in stock market	0.41	0.41	-0.01	0.84	0.83	0.02
Lack of trust in market participants	0.14	0.19	-0.05	-0.17	-0.19	0.02
Advice from a professional financial advisor	0.08	0.12	-0.04	-0.61	-0.60	0.00
Labor income risk *	0.12	0.16	-0.05	-0.08	-0.08	0.00
Non-financial asset risk	0.08	0.20	-0.12	-0.35	-0.31	-0.03
Time until significant non-retirement expense	0.23	0.29	-0.06	0.26	0.29	-0.03
Religious beliefs, values, and experiences	0.06	0.09	-0.04	-0.68	-0.63	-0.06
Consumption commitments	0.20	0.26	-0.07	0.11	0.17	-0.06
Lack of trustworthy advisor	0.13	0.21	-0.09	-0.28	-0.19	-0.09
Home value risk **	0.09	0.14	-0.06	-0.34	-0.25	-0.10
Lack of knowledge about how to invest	0.21	0.26	-0.05	0.11	0.22	-0.11
Advice from a friend, family member, or coworker	0.07	0.11	-0.04	-0.37	-0.24	-0.13
Need cash on hand for routine expenses	0.40	0.47	-0.08	0.73	0.86	-0.13
Risk of long-run aggregate consumption	0.12	0.20	-0.08	-0.06	0.09	-0.14
Rare disaster risk	0.18	0.26	-0.08	0.11	0.26	-0.15
Stocks take too long to convert to cash in emergency	0.08	0.17	-0.08	-0.34	-0.19	-0.15
Return covariance with marginal utility of money	0.12	0.26	-0.14	-0.08	0.11	-0.19
Return covariance with marginal utility of consumption	0.10	0.22	-0.12	-0.27	-0.08	-0.19
Ambiguity / Parameter uncertainty	0.11	0.21	-0.10	-0.32	-0.13	-0.19
Risk of illness/injury	0.15	0.26	-0.11	0.04	0.26	-0.23
Loss aversion	0.04	0.10	-0.06	-0.61	-0.36	-0.25
Risk of aggregate consumption over next year	0.12	0.27	-0.15	-0.02	0.26	-0.28

*Among employed respondents only. **Among homeowners only.

Table A.10 Equity Allocation Factors by Age (Unweighted)

Columns (1) and (2) show the fraction of Finnish respondents rating a factor as “very or extremely important” when determining the amount of financial assets allocated to equity investments in the Young and Old samples, and column (3) shows their difference. Columns (4) and (5) show the mean standard scores (MSS) for equity allocation factors when determining the amount of financial assets allocated to equity investments. MSS is calculated by subtracting the mean value of a participant’s numerical responses from the numerical value of each response for each equity allocation factor and dividing this by the standard deviation of that participant’s numerical responses. Column (6) shows the difference between the two samples. The “Young” sample includes all respondents reporting age between 18-39, and the “Old” sample includes all respondents reporting an age of 40 years or above. Number of observations is 385 (Young) and 377 (Old).

	FRACTION OF “VERY OR EXTREMELY IMPORTANT”			MEAN STANDARD SCORE		
	YOUNG	OLD	Δ	YOUNG	OLD	Δ MSS
	(1)	(2)	(3)	(4)	(5)	(6)
Stock market returns before I was born	0.28	0.14	0.14	0.41	-0.18	0.60
Time until significant non-retirement expense	0.31	0.17	0.14	0.53	0.01	0.52
Advice from media	0.28	0.16	0.12	0.58	0.14	0.44
Consumption commitments	0.23	0.19	0.04	0.28	-0.04	0.32
Advice from a friend, family member, or coworker	0.09	0.07	0.02	-0.18	-0.50	0.32
Human capital fraction of total wealth	0.29	0.18	0.11	0.47	0.16	0.31
External habit	0.06	0.07	0.00	-0.36	-0.55	0.19
Religious beliefs, values, and experiences	0.06	0.07	-0.02	-0.59	-0.76	0.18
Need cash on hand for routine expenses	0.43	0.39	0.04	0.84	0.68	0.16
Stocks are an inflation hedge	0.39	0.29	0.10	0.72	0.60	0.12
Expected stock returns higher than usual right now	0.15	0.10	0.05	0.05	-0.07	0.11
Labor income risk *	0.10	0.16	-0.06	-0.02	-0.12	0.10
Personal experience investing in stock market	0.41	0.41	0.00	0.87	0.80	0.07
Experience of living through stock market returns	0.39	0.38	0.01	0.78	0.72	0.06
Internal habit	0.11	0.11	-0.01	-0.23	-0.27	0.04
Non-financial assets cushion losses in financial assets	0.20	0.16	0.04	0.18	0.18	0.00
Home value risk **	0.04	0.13	-0.09	-0.33	-0.32	-0.02
Lack of knowledge about how to invest	0.21	0.23	-0.02	0.12	0.16	-0.04
Expected stock returns lower than usual right now	0.22	0.21	0.01	0.21	0.28	-0.07
Years left until retirement *	0.37	0.30	0.07	0.54	0.61	-0.07
Loss aversion	0.05	0.06	-0.01	-0.60	-0.52	-0.08
Consumption composition risk	0.05	0.11	-0.06	-0.50	-0.41	-0.09
Stock market returns have momentum	0.06	0.10	-0.04	-0.33	-0.22	-0.11
Non-financial asset risk	0.07	0.14	-0.06	-0.40	-0.29	-0.11
Return covariance with marginal utility of money	0.13	0.17	-0.04	-0.08	0.02	-0.11
Return covariance with marginal utility of consumption	0.10	0.15	-0.05	-0.28	-0.17	-0.11
Rule of thumb	0.08	0.09	-0.01	-0.47	-0.34	-0.13
Ambiguity / Parameter uncertainty	0.10	0.16	-0.06	-0.36	-0.18	-0.18
Lack of trust in market participants	0.12	0.18	-0.06	-0.27	-0.07	-0.20
Stock market returns mean-revert	0.25	0.34	-0.09	0.41	0.65	-0.23
Stocks take too long to convert to cash in emergency	0.07	0.13	-0.05	-0.43	-0.19	-0.24
Risk of long-run aggregate consumption	0.11	0.17	-0.06	-0.15	0.10	-0.25
Advice from a professional financial advisor	0.05	0.13	-0.09	-0.73	-0.47	-0.26
Rare disaster risk	0.15	0.24	-0.09	-0.03	0.31	-0.33
Lack of trustworthy advisor	0.09	0.20	-0.10	-0.42	-0.08	-0.34
Risk of aggregate consumption over next year	0.13	0.18	-0.06	-0.13	0.22	-0.35
Risk of illness/injury	0.11	0.23	-0.12	-0.13	0.31	-0.44

*Among employed respondents only. **Among homeowners only.

Table A.11 Equity Allocation Factors by Education (Unweighted)

Columns (1) and (2) show the fraction of Finnish respondents rating a factor as “very or extremely important” when determining the amount of financial assets allocated to equity investments in the Higher and Basic Education samples, and column (3) shows their difference. Columns (4) and (5) show the mean standard scores (MSS) for equity allocation factors when determining the amount of financial assets allocated to equity investments. MSS is calculated by subtracting the mean value of a participant’s numerical responses from the numerical value of each response for each equity allocation factor and dividing this by the standard deviation of that participant’s numerical responses. Column (6) shows the difference between the two samples. The “Higher Education” sample includes all respondents reporting a bachelor’s or graduate degree, while the “Basic Education” sample includes all respondents reporting primary education or a high school degree (or equivalent) as the highest degree obtained. Number of observations is 568 (Higher Education) and 195 (Basic Education).

	FRACTION OF “VERY OR EXTREMELY IMPORTANT”			MEAN STANDARD SCORE		
	HIGHER EDU-CATION	BASIC EDU-CATION	Δ	HIGHER EDU-CATION	BASIC EDU-CATION	Δ MSS
	(1)	(2)	(3)	(4)	(5)	(6)
Time until significant non-retirement expense	0.28	0.15	0.13	0.38	-0.03	0.41
Years left until retirement *	0.36	0.25	0.12	0.64	0.29	0.35
Experience of living through stock market returns	0.41	0.29	0.12	0.83	0.51	0.32
Non-financial assets cushion losses in financial assets	0.19	0.14	0.04	0.24	-0.02	0.26
Personal experience investing in stock market	0.42	0.36	0.06	0.89	0.66	0.23
Stock market returns before I was born	0.22	0.19	0.03	0.18	-0.06	0.23
Stocks are an inflation hedge	0.36	0.28	0.07	0.70	0.53	0.17
Advice from a friend, family member, or coworker	0.07	0.10	-0.03	-0.31	-0.43	0.12
Labor income risk *	0.13	0.14	-0.01	-0.05	-0.14	0.09
Advice from media	0.21	0.23	-0.02	0.38	0.30	0.07
Consumption commitments	0.21	0.22	-0.01	0.14	0.08	0.06
Loss aversion	0.04	0.09	-0.04	-0.55	-0.58	0.03
Human capital fraction of total wealth	0.23	0.24	-0.01	0.32	0.29	0.03
Return covariance with marginal utility of money	0.15	0.16	-0.02	-0.02	-0.04	0.02
Stock market returns mean-revert	0.29	0.30	-0.01	0.53	0.52	0.01
Stocks take too long to convert to cash in emergency	0.09	0.13	-0.04	-0.32	-0.29	-0.02
Rule of thumb	0.08	0.09	-0.01	-0.41	-0.39	-0.02
Non-financial asset risk	0.10	0.12	-0.02	-0.34	-0.33	-0.02
Expected stock returns lower than usual right now	0.21	0.24	-0.03	0.24	0.27	-0.03
Advice from a professional financial advisor	0.07	0.14	-0.07	-0.62	-0.58	-0.04
Risk of long-run aggregate consumption	0.14	0.14	0.00	-0.04	0.02	-0.05
Risk of aggregate consumption over next year	0.16	0.16	0.00	0.02	0.09	-0.06
Stock market returns have momentum	0.07	0.09	-0.01	-0.29	-0.23	-0.06
Return covariance with marginal utility of consumption	0.12	0.15	-0.03	-0.24	-0.18	-0.06
Rare disaster risk	0.19	0.22	-0.04	0.12	0.19	-0.07
Religious beliefs, values, and experiences	0.06	0.10	-0.04	-0.69	-0.62	-0.07
External habit	0.06	0.09	-0.04	-0.47	-0.39	-0.08
Expected stock returns higher than usual right now	0.12	0.14	-0.02	-0.04	0.06	-0.10
Risk of illness/injury	0.15	0.24	-0.09	0.06	0.18	-0.12
Home value risk **	0.09	0.14	-0.05	-0.35	-0.23	-0.12
Need cash on hand for routine expenses	0.40	0.46	-0.07	0.73	0.86	-0.14
Internal habit	0.10	0.14	-0.05	-0.29	-0.13	-0.16
Lack of trust in market participants	0.14	0.18	-0.03	-0.22	-0.03	-0.19
Lack of trustworthy advisor	0.13	0.18	-0.05	-0.31	-0.11	-0.20
Consumption composition risk	0.06	0.12	-0.05	-0.51	-0.31	-0.20
Lack of knowledge about how to invest	0.21	0.27	-0.07	0.07	0.33	-0.26
Ambiguity / Parameter uncertainty	0.11	0.18	-0.06	-0.34	-0.07	-0.28

*Among employed respondents only. **Among homeowners only.

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Leadership Style and Management Control Systems in Creating an Ambidextrous Organizational Culture: A Case Study

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Abstract

This study examines how leadership style and management control systems contribute to the formation of an ambidextrous organizational culture. Drawing on a qualitative case study, this study explores how transformational and transactional leadership styles are enacted through enabling and constraining controls. Particular attention was paid to how employees perceived these control elements as enabling or constraining. The findings indicate that enabling controls, associated with transformational leadership, fostered the culture of exploration, while constraining controls, associated with transactional leadership, contributed to efficiency. When the controls were system-embedded and impersonally framed, implemented through routines rather than personal intervention, they were less likely to be interpreted negatively. This framing helped sustain positive employee perceptions even in an efficiency-oriented environment. Overall, the findings offer a more nuanced understanding of how leadership, management control system design, and employee perception jointly shape an ambidextrous organizational culture.

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1 Introduction

Achieving sustained organizational performance requires efficiency during periods of incremental change (exploitation) as well as the ability to innovate in response to more radical environmental shifts (exploration). This dual imperative, central to ambidextrous organizations, demands managing both evolutionary and revolutionary changes for long-term viability (Tushman & O'Reilly, 1996). This view is supported by empirical studies that have linked ambidexterity to improved performance over time (Gibson & Birkinshaw, 2004; He & Wong, 2004; O'Reilly & Tushman, 2008).

This study addresses a less-explored dimension of ambidexterity: the interplay between leadership style and management control systems in shaping an organizational culture conducive to ambidexterity. While leadership has been connected to ambidextrous behavior (e.g., Baškarada et al., 2016; Zacher & Rosing, 2015) and management control systems have similarly been linked to exploration and exploitation (e.g., Bedford, 2015; Gschwantner & Hiebl, 2016), an integrated perspective on their joint influence is still lacking.

Leadership style is a key enabler of ambidexterity, with numerous studies showing that an ambidextrous leadership approach, one that integrates the transactional style, characterized by clear goals and rewards, with the transformational style, which emphasizes engagement through vision and purpose, is essential for fostering ambidextrous behavior (Baškarada et al., 2016; Princes, 2019; Zacher & Rosing, 2015). Moreover, leadership style plays a critical role in shaping management control systems, particularly in their implementation (Abernethy et al., 2010).

To understand how leadership style supports ambidexterity in practice, how it is enacted through management control systems needs to be examined. These systems function as key mechanisms through which leadership intentions are operationalized and translated into organizational behaviors (e.g., Abernethy et al., 2010). In line with the established definitions, this study defined management control as comprising the various tools and systems managers use to align employee actions and decisions with organizational goals and excluded the systems used solely for decision support (Malmi & Brown, 2008). Management control systems thus represent a central means by which leadership becomes visible and influential in daily organizational life.

Beyond leadership, management control systems themselves are instrumental in promoting ambidextrous behavior: They can encourage both exploitative and exploratory activities (Gschwantner & Hiebl, 2016). Bedford (2015) examined the roles of diagnostic and interactive controls in ambidextrous organizations and found that a balanced use of both was critical for achieving simultaneous exploration and exploitation. While diagnostic controls are often associated with constraining uses and interactive controls with enabling ones, Bisbe et al. (2019) emphasize that these associations are not conceptually fixed. Rather, as Bisbe et al. (2019) emphasize, the value of balance arises from how design-oriented (coercive or enabling) features and styles of use (diagnostic or interactive) are combined in practice.

Comprehensive management control systems and nonfinancial metrics have also been linked to transformational leadership styles (Nguyen et al., 2017), further highlighting the interdependence between leadership style and management control systems.

While management control systems and leadership interact in shaping organizational behavior, the cultural consequences of this interaction remain underexplored. This study defined organizational culture as a socially constructed pattern of shared assumptions, values,

and practices that develop over time through employee experiences and interactions. Rather than treating culture as a preexisting filter that shapes how leadership and management control systems are interpreted, this study views culture as being shaped and reinforced through how people perceive and respond to these practices. While the literature acknowledges that culture is influenced by leadership behavior (Sarros et al., 2002) and that management control systems carry cultural implications (Andersen & Lueg, 2017; Mitter et al., 2024), the process through which these forces jointly contribute to the emergence of an ambidextrous culture has received limited attention.

According to recent research, different cultural types are associated with specific management control mechanisms (Einhorn et al., 2024). However, how leadership-driven control systems may actively shape culture over time and how leadership style is enacted through management control systems and interpreted by employees in ways that shape the development of an ambidextrous organizational culture, particularly in industries facing both strategic transformation and institutional constraints, remains largely underexplored.

While prior studies have linked leadership, management controls, and ambidexterity, little is known about how an ambidextrous leadership style shapes the interaction between enabling and constraining controls and how employees interpret these dynamics to form ambidextrous cultural norms in highly regulated settings.

This paper contributes by showing how leadership style and management control systems jointly shape an ambidextrous organizational culture. It advances the literature by illustrating how system-embedded and impersonally framed constraining controls can support efficiency without undermining innovation. Practically, the study highlights how leaders in highly regulated, asset-intensive contexts can frame control systems to support both exploitative efficiency and exploratory innovation.

This study, therefore, investigates how leadership style, enacted through management control systems, contributes to the emergence of an ambidextrous organizational culture in a regulated energy-sector company facing strategic transformation due to the green transition. It provides context-sensitive insights into how an ambidextrous leadership style shapes the interaction between enabling and constraining controls and how employees interpret these controls in their daily work, thereby influencing the formation of shared cultural orientations that balance efficiency and innovation. Building on prior research on organizational ambidexterity, this study focuses on its cultural dimension, the emergence of an ambidextrous organizational culture. Accordingly, this study addresses the following research question: How does leadership style, enacted through management control systems, shape employees' perceptions of control elements as enabling or constraining, and how do these perceptions contribute to an ambidextrous organizational culture?

This paper is structured as follows: Section 1 introduces the study, while Section 2 presents the relevant literature on management control systems and organizational ambidexterity. Section 3 explains the research design and methodology, Section 4 presents and analyzes the study findings, Section 5 compares the findings with those of prior research, and finally, Section 6 presents the findings, limitations, and suggestions for further studies.

2 Literature review

2.1 Ambidexterity as an organizational goal

Organizational ambidexterity, referred to in the literature as the simultaneous pursuit of exploitation and exploration, has been associated with organizational survival (O'Reilly & Tushman, 2013) as well as improved organizational performance and competitiveness (Cao et al., 2009). Following March (1991), exploration includes activities such as search, variation, risk taking, experimentation, play, flexibility, discovery, and innovation, whereas exploitation includes refinement, choice, production, efficiency, selection, implementation, and execution.

Organizational ambidexterity is divided into two types: structural ambidexterity and contextual ambidexterity. Structural ambidexterity refers to a situation in which exploration and exploitation are allocated to different parts of an organization (Gibson & Birkinshaw, 2004). Contextual ambidexterity refers to the simultaneous pursuit of explorative and exploitative activities within the same business unit (Gibson & Birkinshaw, 2004). A key advantage of contextual ambidexterity is that the organizational activities remain integrated, mitigating the risk of isolation (Gibson & Birkinshaw, 2004). Achieving ambidexterity in the long term demands the application of both structural and contextual ambidexterity (Raisch et al., 2009).

The inability to innovate and renew is detrimental to an organization's long-term success and can lead to its collapse. Innovation is critical for organizational success; it is one of the most important determinants of organizational performance (Crossan & Apaydin, 2010). A specific challenge in achieving ambidexterity is that organizations tend to favor short-term exploitation due to the higher likelihood of short-term success; in contrast, exploration, by its nature, is less efficient, as the inevitable presence of unviable ideas is inherent in it (Tushman & O'Reilly, 1996).

An organization's ability to balance explorative (discontinuous) and exploitative (incremental) innovation is critical for its performance. In their study on organizational ambidexterity and performance, Junni et al. (2013) analyzed 69 studies and identified a significant relationship between organizational ambidexterity and performance. Kafetzopoulos (2021) observed a particularly significant correlation between ambidexterity and performance in the context of an unpredictable environment, as ambidexterity provides the foundational background an organization requires to enhance its performance. According to Luger et al. (2018), the speed of environmental change significantly influences whether it is optimal for organizations to maintain a balance between exploration and exploitation or to continuously emphasize either exploration or exploitation.

Organizational ambidexterity can be understood as a paradoxical leadership challenge, where the simultaneous pursuit of efficiency intersects with innovation (Papachroni et al., 2015). This leadership paradox demands a delicate balancing act from the perspective of management control systems, navigating between enabling and coercive types of controls. In the context of enabling and constraining controls, the terminology of positive and negative controls is also used, reflecting their complementary roles in the control system (Tessier & Otley, 2012). Enabling controls foster employee autonomy and engagement, while coercive controls are designed to constrain behavior and minimize deviations from established procedures (Adler & Borys, 1996). Gibson and Birkinshaw (2004) highlight a leadership challenge, noting that extensively focusing on discipline and high expectations can cause employee burnout and dissatisfaction, but conversely, placing extensive emphasis on support and trust can create a relaxed environment in which productivity suffers.

Farjoun's (2010) conceptualization of exploration and exploitation as mutually complementary forces (duality) offers a valuable framework for understanding the leadership paradox. He suggests that established routines and processes (exploitation) not only contribute to organizational stability but also create the necessary foundation that frees up resources for exploration. Conversely, innovations emerging from exploration can further enhance exploitation by improving organizational efficiency and flexibility, thereby reinforcing established routines and enabling more efficient processes. This dynamic balance is essential for achieving both efficiency and adaptability.

2.2 Leadership style conducive for ambidexterity

The transactional leadership style, emphasizing efficiency through clear objectives and reward mechanisms, is closely associated with exploitation-focused activities that prioritize control, structure, and short-term operational goals (Carter & Greer, 2013). In contrast, the transformational leadership style, which fosters innovation by engaging employees through mission and vision communication, aligns with exploration by promoting the employees' autonomy, intrinsic motivation, and long-term development (Carter & Greer, 2013). Rosing et al. (2011) introduced the concept of ambidextrous leadership, describing it as the leader's ability to alternate between opening and closing behaviors to balance exploration and exploitation. Conceptually, opening behaviors align with transformational leadership that fosters exploration, whereas closing behaviors correspond to transactional leadership that supports exploitation. This distinction provides a concise bridge between leadership theory and the ambidextrous use of management controls discussed later.

The literature highlights that an ambidextrous leadership style, which combines transactional and transformational elements, supports organizational ambidexterity. Baškarada et al. (2016) emphasize that leaders must alternate between or balance the transactional style, which supports exploitation, and the transformational style, which supports exploration, to achieve an ambidextrous leadership style and thus foster organizational ambidexterity.

Kassotaki (2019), in turn, argues that in addition to balancing these styles, leaders must dynamically adjust their leadership behaviors depending on contextual demands, emphasizing either exploitation or exploration as needed. This situational and practice-oriented perspective aligns with the view that organizational phenomena, including leadership, are continuously enacted and shaped through everyday practices (Jarzabkowski et al., 2012). Princes (2019) places significant emphasis on the transformational leadership dimension, particularly the role of articulating and communicating a clear vision, in fostering ambidexterity. Similarly, Zacher and Rosing (2015) underline the importance of leadership flexibility, where leaders adjust their behaviors depending on whether exploration or exploitation needs greater support at a given time. Despite their different emphasis, these studies share the view that achieving organizational ambidexterity requires a balance between transactional and transformational leadership behaviors.

Leadership style is inherently reflected in management control systems. An ambidextrous leadership style, capable of balancing the support for both innovation and efficiency (e.g., Kassotaki, 2019), is reflected in a versatile design and use of a management control system that incorporates both diagnostic and interactive control mechanisms (e.g., Abernethy et al., 2010; Nguyen et al., 2017). Complementing this distinction in use, management control systems also differ in their intended design purpose. Controls may be designed to enable innovation by

supporting autonomy and participation, or to constrain behavior by enforcing compliance through standardization and monitoring (Adler and Borys, 1996; Baird et al., 2019).

Gschwantner and Hiebl (2016) synthesized the literature on how various control mechanisms affect organizational ambidexterity. For instance, planning controls can support both exploitation and exploration by balancing interactive planning and cybernetic elements. Similarly, harmonizing feedforward and feedback mechanisms within cybernetic controls facilitates this balance, although prior research emphasizes the importance of maintaining sufficient employee autonomy (Gibson and Birkinshaw, 2004). Cultural controls also contribute to both aims but are particularly conducive to fostering exploration. Reward systems function in a comparable way, although scholars advise their careful application. Administrative controls provide the structural foundation required for both exploitation and exploration: The former benefits from tight, standardized processes, while the latter demands structures that enable opportunity-seeking behavior (Gschwantner & Hiebl, 2016).

Moreover, previous research has noted that organizational structure itself can be adapted to achieve ambidexterity, which will be complemented by organic controls, such as open communication, flexible arrangements, and tolerance for mistakes, which will help reconcile the tensions between efficiency and innovation (Wabnegg, 2024). Empirical evidence from over 400 Australian firms further supports these insights, demonstrating that diagnostic controls are beneficial for exploitation, interactive controls for exploration, and that a balanced use of both is especially effective in ambidextrous organizations (Bedford, 2015). This perspective is reinforced by the role of interactive and belief systems (McCarthy & Gordon, 2011).

According to Malmi and Brown (2008), management control systems (MCS) should be studied as a package, since an important objective of MCS research is to understand how different types of controls can be effectively combined. They propose a framework comprising five interrelated categories of controls: cultural controls, planning, cybernetic controls, reward and compensation, and administrative controls. Their framework provides a comprehensive synthesis of the various control elements that together constitute an organization's overall control system. While Malmi and Brown (2008) emphasize the complementarity among these elements, subsequent research has shown that their interconnections may vary depending on contextual and temporal factors (see Mouritsen et al., 2022). The package perspective highlights how different control elements interact to guide organizational behavior and facilitate strategy implementation. Moreover, prior research has demonstrated that whether a specific control element is perceived as coercive or enabling depends on its relationship with other elements within the broader control package (see Goretzki et al., 2018).

In summary, the literature suggests that a transactional leadership style, which supports efficiency, is typically associated with clearly defined objectives, reward mechanisms, tight cybernetic controls, and a diagnostic use of management control systems. In contrast, a transformational leadership style, which fosters exploration, is linked to non-financial metrics, cultural controls, and the interactive use of control systems. These theoretical associations imply that an ambidextrous leadership style would be reflected in a versatile management control system design that simultaneously incorporates both diagnostic and interactive modes of use.

2.3 Organizational culture and ambidexterity

According to Lee et al. (2019), organizational culture plays a crucial role in the formation of an ambidextrous organization. The authors further highlight that an ambidextrous organiza-

tional culture, which supports both exploitation and exploration, is a key factor in the emergence of such an organization. Moreover, they found that an ambidextrous organizational culture is associated with improved organizational performance; this effect, however, occurs due to employee performance.

Contextual ambidexterity, in which individuals are given the freedom and incentives to balance exploration and exploitation in their own work, can enable organizations to achieve ambidexterity without establishing separate structural units (Gibson & Birkinshaw, 2004). This approach is particularly relevant for small and resource-constrained organizations that may lack the capacity to implement structural separation. According to Cao et al. (2009), smaller firms benefit more from achieving a balance between exploration and exploitation than from pursuing both at high absolute levels. This supports the conclusion that for small firms relying on contextual ambidexterity, an ambidextrous organizational culture is critical for their sustained performance.

Khazanchi et al. (2007) investigated 271 manufacturing companies, finding that a flexible culture was positively correlated with innovation, whereas the values of control supported execution. Caniëls et al. (2017) argue that a culture of empowerment experienced by personnel supports ambidexterity and that it is critically important for employees to perceive that upper management is supportive. Moreover, this support should be manifested through the provision of fair and constructive evaluations of new ideas, the absence of severe penalties in the event of failure, and the recognition and rewarding of creative work.

Quinn and Rohrbaugh's (1983) competing values framework has been widely used to analyze organizational culture (see Yu, 2009) and applied to examine how different cultural types relate to organizational ambidexterity (Lee et al., 2019). The framework classifies organizational cultures into four types, clan, adhocracy, market, and hierarchy, based on two underlying value dimensions: An orientation toward internal versus external focus, and a preference for stability versus flexibility. The latter dimension is particularly relevant for distinguishing between exploitative and explorative orientations. Cultures emphasizing stability and control (e.g., hierarchy and market) tend to support exploitation through efficiency and structured processes, while cultures oriented toward flexibility (e.g., clan and adhocracy) foster exploration through adaptability and innovation (Yu, 2009).

Hartnell et al. (2011) examined this framework to understand how different cultural types contribute to organizational efficiency, innovativeness, or ambidexterity. Clan culture assumes human affiliation and emphasizes trust, loyalty, and membership, fostering values such as attachment, collaboration, and support. This is reflected in behaviors such as teamwork, employee involvement, and open communication, with their effectiveness measured by employee satisfaction and commitment. Adhocracy culture builds on the assumption of change, encourages appropriate behavior through an understanding of task importance and impact, and promotes the values of growth, autonomy, and creativity. Risk-taking, adaptability, and innovation are behaviors characteristic of this culture, with innovation serving as the primary effectiveness criterion. Market culture assumes that achievement drives behavior. It values competition, goal orientation, and competence, encouraging behaviors such as planning, task focus, and aggressiveness. Organizational effectiveness is assessed through increased market share, profitability, and productivity. Finally, hierarchy culture rests on the assumption of stability. It emphasizes clear roles, rules, and procedures, promoting values of consistency, formalization, and order. Behaviors such as conformity and predictability dominate, and effectiveness is measured through employee efficiency, timeliness, and smooth operations. Together, these

culture types emphasize either exploration, exploitation, or a combination of both, offering a valuable lens for understanding how organizational culture can support ambidexterity.

Cultural controls have often been associated with explorativeness by supporting the flow of information and flexibility in responding to task uncertainty (Ylinen & Gullkvist, 2012), and by emphasizing the strategic priorities of an organization (Mundy, 2010). Additionally, the creation of a culture that tolerates mistakes has been seen as important for explorativeness, as efforts toward explorativeness can lead to errors (Jørgensen & Messner, 2009). In addition to supporting explorativeness, cultural controls within management control systems can also facilitate exploitation (McCarthy & Gordon, 2011).

Culture is an essential part of management control systems (see Busco & Scapens, 2011; Einhorn et al., 2024; Henri, 2006; Malmi & Brown, 2008) and can serve as a more effective mediator than formal controls in transmitting the commitment-enhancing impact of leadership style to employees (Kleine & Weißenberger, 2014).

2.4 Summary of theoretical framework

Essential to an organization's long-term success, organizational ambidexterity presents a paradoxical leadership challenge in which the simultaneous pursuit of efficiency and innovation, despite appearing contradictory, can be effectively managed to cultivate an ambidextrous organizational culture. A key mechanism through which leaders manage this paradox lies in balancing enabling and constraining controls. Enabling controls facilitate innovation by providing flexibility and autonomy, whereas constraining controls enhance efficiency by standardizing processes and optimizing resource utilization (Baird et al., 2018). Enabling controls are associated with fostering innovation, whereas coercive controls may support efficiency. However, it is important to recognize that coercive controls are particularly suited for supporting efficiency in highly routinized and standardized environments. Excessive reliance on coercive controls may lead to negative perceptions among employees, which, in turn, can undermine both efficiency and innovation (Adler & Borys, 1996; Wouters & Wilderom, 2008). According to Väisänen et al. (2021), whether employees perceive a control as coercive or enabling largely depends on the extent to which they feel trusted by management. When employees interpret controls as expressions of managerial trust, they are more likely to perceive them as enabling and supportive rather than as monitoring mechanisms signaling distrust. Moreover, Väisänen et al. (2021) emphasize that such perceptions are not static but may evolve over time depending on the organizational context.

In summary, one useful way to conceptualize management control systems is to distinguish between two principal dimensions: their underlying design intent and their manner of use. From a design intent perspective, controls may be structured to enable innovation by promoting autonomy, participation, and learning, such as through employee involvement in strategic planning with genuine influence over direction, or to constrain behavior through standardization and compliance mechanisms, for example, via cost ceilings or formal approval procedures (Adler & Borys, 1996; Baird et al., 2018). With respect to their manner of use, control systems may be applied diagnostically to monitor performance against predefined targets, for instance, by reviewing cost reports to identify budget deviations, or interactively to foster strategic dialogue, organizational learning, and adaptability (Mundy, 2010; Tessier & Otley, 2012; Widener, 2007). These two dimensions, design and use, are not independent but are shaped by the prevailing leadership style. Transformational leaders are generally associated

with enabling control design and a more interactive style of use, whereas transactional leaders tend to favour constraining design features and a more diagnostic approach (de Oliveira & Klein, 2024). For conceptual precision, it is important to note that these associations are not inherently fixed: diagnostic controls can also be enabling, and interactive controls may become coercive depending on how they are designed and enacted (Bisbe, Kruis & Madini, 2019). Nevertheless, these tendencies remain theoretically grounded, as leadership influences both an organization's strategic priorities and the way control systems are designed and operationalized in pursuit of those aims.

Leadership style is reflected in management control systems (Abernethy et al., 2010), which, in turn, influence and reinforce the organizational culture alongside other shaping factors (Gong & Subramaniam, 2020). Additionally, leadership style directly influences organizational culture, with a leader's example playing a significant role in shaping the culture (Sarros et al., 2002); however, organizational culture also dictates which leadership style is appropriate (Waldman & Yammarino, 1999). Ultimately, the resulting organizational culture can support innovation, efficiency, or ambidexterity (Lee et al., 2019).

To further operationalize the assessment of how organizational culture supports ambidexterity, the framework developed by Quinn and Rohrbaugh (1983) offers a valuable analytical lens (see Einhorn et al., 2024) for the empirical associations between culture types, management control systems, and leadership style.

Jarzabkowski et al. (2012) emphasize that organizational phenomena, including leadership and management controls, should not be understood as static structures but as dynamic and continuously evolving processes. As organizational actors interpret situations and engage in everyday activities, these practices are constantly enacted and re-enacted in ways that do not repeat identically. Consequently, both leadership and control systems are shaped through ongoing interaction, interpretation, and adaptation in practice.

In summary, organizational culture, with leadership style and management control systems, plays a crucial role in achieving ambidexterity (Gibson & Birkinshaw, 2004; O'Reilly & Tushman, 2013; Raisch & Birkinshaw, 2008). The conceptualization presented above provides a foundation for analyzing how leadership style and management control systems contribute to the development of an ambidextrous organizational culture.

3 Method

This study is based on an in-depth qualitative case study. We adopted a qualitative methodology (Ahrens & Dent, 1998) and a systematic combining approach relying on abductive reasoning and an iterative interplay between theory and data (Dubois & Gadde, 2002). Our theorizing followed a contextual explanation logic (Welch et al., 2011).

The case organization, a regulated monopoly in the energy sector, was chosen because it faces strong efficiency pressures from regulation while simultaneously pursuing innovation through the green transition. These dual demands make it an exemplary context for studying ambidexterity.

Fieldwork was conducted between September and November 2023 as a cross-sectional study. A purposeful sampling strategy was used: interview invitations were sent to about 30 of the company's 40 employees, and 18 were interviewed. Participants represented all hierarchical levels and functions, executives, managers, and specialists, covering both corporate and operational units. This variation enabled triangulation between leadership intentions and employee perceptions.

In addition to the interviews, preliminary findings were discussed in three interactive sessions with the executive team, all employees, and the board. Each session provided opportunities to ask questions, validate interpretations, and reflect on the emerging findings. Most interviews were conducted by two researchers, further enhancing reliability and reflexivity. Data collection continued until thematic saturation was reached.

The study followed the principles of good scientific practice. Participation was voluntary, and both individual and organizational identifiers were anonymized to ensure confidentiality. All interviews were conducted via Microsoft Teams, recorded, transcribed, and coded in Atlas.ti. The software supported systematic coding and maintained an audit trail for transparency. A total of 36 codes were used, covering the core constructs of exploitation, exploration, diagnostic and interactive control use, and organizational culture.

The analysis was guided by two interrelated frameworks. Drawing on Tessier and Otley (2012), the data were coded to distinguish between management intentions and employee perceptions of control systems. For both dimensions, management intentions and employee perceptions, we applied the categorization of management control systems proposed by Malmi and Brown (2008).

This enabled systematic examination of how different control elements contributed to the balance between efficiency and innovation.

Finally, the coded data were analyzed through the broader themes of exploration and exploitation, tracing how ambidextrous capabilities were enacted through leadership actions and control system use, following the contextual explanation logic described earlier.

4 Case

We focused on an energy organization with a conglomerate structure, boasting a history spanning more than a century. Its core business activities involve managing the regional power grid and overseeing the production and distribution of district heating. Employing fewer than 50 individuals, the organization reports an annual turnover of approximately 120 million euros.

The organization offered an excellent context for studying ambidexterity for the following reasons. First, it operates under the energy efficiency agreement, which necessitates both efficiency and innovation and mandates the continuous improvement of energy efficiency, the adoption of new technologies, the establishment of energy-saving targets, and annual reporting. Furthermore, the organization is required to offer innovative energy services to its customers, such as energy efficiency communication and consultancy, and to integrate energy efficiency considerations into its planning and procurement processes.

Second, the organization was recently acquired by a private equity investor, whose profit-driven ownership structure imposes significant efficiency requirements on the organization's operations. To meet stakeholders' expectations, it must operate efficiently while pursuing innovative solutions both in its production processes and in the value-added services provided to its customers.

Third, the green transition constitutes one of the organization's principal strategic objectives, requiring the development of new and innovative production methods and operational practices. More broadly, the energy sector is facing a profound transformation driven by the green transition, a shift comparable to the evolutionary change phase, which demands a capacity for innovation.

In this context, management control systems must not only ensure operational efficiency but also actively support innovative behavior, enabling the organization to adapt to rapidly

changing environmental demands. The dual pressure to enhance operational efficiency while fostering innovation makes the case organization a compelling subject for examining organizational ambidexterity. An expert working with the power grid described the orientation toward innovation as follows:

The challenges have somewhat compelled us to be innovative and dedicated to development. In a way, they have inspired and perhaps even necessitated our commitment to continuous improvement. (Lead Power Grid Specialist)

The rapidly changing operating environment was also emphasized in the company's annual communications, which highlighted the need to develop new operating models, technologies, and service concepts to sustain value creation.

Understanding both managerial intentions and employee perceptions is essential for analyzing how a management control system's design and use, which reflects an organization's leadership style, influences the development of an ambidextrous organizational culture. Tessier and Otley (2012) emphasize that employees' perceptions of control systems may diverge from the management's intentions. For example, employees may perceive the controls designed to be enabling as constraining. Recognizing such discrepancies is particularly important, as the effectiveness of leadership depends on the alignment between intended control and perceived control.

Moreover, employees' understanding of an organization's strategic objectives is a critical factor for successful strategic leadership and is associated with higher levels of organizational commitment (Boswell, 2006). In this section, we analyze both the managerial intentions and the employee perceptions related to the key elements of the management control system, drawing on the framework developed by Malmi and Brown (2008). By integrating these two perspectives, we aimed to evaluate how leadership style is embedded within management control systems and how this, in turn, contributes to the emergence of an ambidextrous organizational culture through employees' perceptions.

4.1 Top management's intentions toward an ambidextrous culture

4.1.1 Promotion of explorative culture through management control systems

The transformational aspects of the case organization CEO's leadership style, including the articulation of objectives, employee engagement, and the cultivation of an innovative culture, were prominently reflected in the cultural controls of the management control system. The CEO aimed to create a culture that was immediate, open, and psychologically safe; he consistently communicated the importance of a growth strategy and cost efficiency to his staff. Additionally, he encouraged innovation and the practice of raising issues. He described the sharing of ideas across business unit boundaries as follows:

Everyone is encouraged to speak up and discuss matters beyond their own business units. The idea is that if good ideas emerge, we should try to nurture them, even if you're not working in this business unit. If you have good ideas, please share them. It has been communicated openly to the staff that growth is not easy and that we need everyone's ideas and contributions. Otherwise, we won't achieve our goals. (CEO)

The CEO also considered communicating the strategy to be the most important management tool, which emphasizes the transformative aspect of leadership style and is implemented through cultural controls.

The organization's formal communications also reflect this emphasis on innovation. In its annual report, the company describes innovation as a key element of responsible business practices, highlighting participation in government-funded and academic research projects aimed at developing new energy technologies and predictive applications. (Company Annual Report, 2025)

Additionally, employee well-being was elevated as one of the strategic priorities. Our findings highlight the importance of genuinely listening to and valuing employees, clarifying roles, ensuring fair compensation, empowering employees, and fostering a leadership culture that enables genuinely positive work experience. Employee well-being was monitored, among other methods, through Great Place to Work surveys.

4.1.2 Promotion of exploitative culture through management control systems

In the budgeting process, the CEO aimed to ensure continuity and the consideration of long-term objectives. Modeling the business for the electrical grid was extended up to 25 years into the future. The strategy emphasized profitable growth and cost efficiency, but achieving zero emissions was also an important goal.

The business unit manager described the emphasis on long-term planning:

Long-term planning is a major part of the work... alongside annual planning and our innovation forum where we explore new tools. (Business Unit Manager 1)

According to the CEO, extending the budgeting period beyond a single year was meant to secure continuity in project monitoring and performance evaluation. Monthly reports and key indicators enabled systematic tracking of cost efficiency, supported by controllers in each business unit.

A compensation model linked half of the bonus to company-level EBITDA and half to individual or team goals. As the CEO noted:

Everyone gets rewarded for what they are supposed to do and achieve, both on a personal level and as a team. (CEO)

Delegating profit responsibility to business units reinforced the orientation toward profitable growth:

Each business unit should grow profitably within its own area. (CEO)

The organization also revised its corporate governance policy, precisely defining the approval thresholds for acquisitions and investments of varying scales.

4.1.3 Balancing explorative and exploitative cultures within management control systems

Supporting innovativeness and employee autonomy was among the key objectives of top management. This was evident not only in the characteristics of the CEO's transformational leadership style but also in the cultural controls of the management control system, namely, the emphasis on autonomy, trust, innovativeness, and the importance of personnel. These values were conveyed through managerial discourse and explicitly articulated organizational principles, further reinforced by low power distance and open information flow. The CEO consciously aimed to be approachable and accessible, and his leadership style served to strengthen the influence of these cultural controls.

Although leadership at multiple levels may influence organizational culture, the CEO's role is essential. Our findings highlight that a CEO's leadership style is in a strategic position, supporting values for innovation (Sarros et al., 2011). Prior research emphasizes that transformational CEOs, leaders who articulate a clear vision, empower employees, and promote learning, play a decisive role in fostering a culture characterized by creativity, trust, and the willingness to take risks (Gumusluoglu & Ilsev, 2009; Jung et al., 2008; Moriano et al., 2014). The transformational leadership style is also associated with an innovative organizational culture (Sattayaraksa & Boon-itt, 2018).

While striving to foster innovation, the management also placed great importance on operational efficiency and engaging employees with the organization's overall profitability. For example, performance-based bonuses were linked to EBITDA. Efficiency was supported by comprehensive planning as well as by cybernetic controls, such as budgeting and reporting, used in a diagnostic manner.

The top management did not perceive the explorative and exploitative dimensions of ambidexterity as contradictory. Their simultaneous manifestation was instead regarded as natural, with equal emphasis placed on the importance of both objectives.

4.2 Employee perceptions of an ambidextrous culture

To strengthen credibility and mitigate potential impression management, particular attention was paid to triangulating managerial and employee perspectives. Interviews were conducted across hierarchical levels, including non-executive employees who were asked to provide concrete examples of managerial practices they perceived as supportive or constraining. When employees confirmed or elaborated on positive practices described by management, this cross-level consistency increased confidence in the findings. Furthermore, critical viewpoints were included to ensure that both favorable and dissenting perceptions were represented in the analysis.

4.2.1 Employee perceptions of the promotion of explorative culture

From the perspective of employees, the management's efforts to reinforce core organizational values, openness and low power distance, innovativeness, and employee well-being, through cultural controls were perceived positively. These values were strengthened through practices such as the CEO working in an open-plan office, reward systems that encouraged innovation, and a visible emphasis on employee well-being. Employees perceived these practices as meaningful, which enhanced their commitment and sense of empowerment to their work, which may have supported the conditions favorable to exploration and the emergence of new ideas.

And then also, since the CEO, who's also my boss, actually works in the same room as us, that's a cultural difference as well. Before, the CEO used to have their own office. (Group Business Controller)

Employees perceived the management's efforts to promote innovativeness as being in line with managerial intentions. The organization was commonly described as innovative by the interviewees. A key factor underlying this perception was the experienced atmosphere of acceptance and appreciation. The emergence of an explorative culture, considered vital for fostering innovativeness, was described as one shaped through cultural controls intentionally reinforced by the management.

The key thing is to bravely try out new models and methods, to develop them courageously. If it doesn't work, we are not afraid to admit that, okay, it went wrong and go back to the old way of doing things. In other words, we are not afraid of losing face (...) There are some critical roles there, and people's well-being is genuinely cared about. (Power Grid Technical Specialist, Maintenance and Protection)

I think, regarding innovativeness, you know, how we can be like bringing ideas and stuff, I believe it's about having an accepting atmosphere. Where no one gets shot down even if it's a crazy idea. Instead, we should encourage putting all ideas on the table and then think about whether they are feasible or not, you know. (Financial Planner)

Although most employees described the organizational culture as open and participatory, one interviewee with prior experience in large corporations offered a more critical view. According to this perspective, participation and the solicitation of ideas were at times perceived as formalities that did not genuinely influence decision-making.

4.2.2 Employee perceptions of the promotion of exploitative culture

In the case organization, operative and budgeting processes extended far into the future, tightly coupling technical and financial planning. Long-term planning was embedded in everyday work, linking strategic foresight with practical modeling and control.

We have our network development up until the year 2048 described in Excel, showing how our network should evolve. (Power Grid Manager)

Employees across roles appeared to have internalized efficiency control as part of their daily routines. The business controller described herself as a vigilant gatekeeper of cost discipline:

I'm quite the watchdog, I am, but you know, I always have an eye out for things. Of course, we can handle it. We've got another controller too, and they also notice things, but when there's pressure and costs are rising, that's when we really start to investigate. (Business Controller)

Several interviewees confirmed this close attention to financial performance.

The cost issues are really closely watched. (Project Coordinator)

Everyone has their metrics and reports, and any deviations are quickly identified and analyzed. (HR and Communications Manager)

We really keep an eye on the numbers and go through them monthly with staff... if there are any deviations, we immediately address them. (Service Manager)

These practices were generally regarded as legitimate and necessary rather than restrictive. The link between performance-based pay and company results was seen to motivate employees, though the limited influence on strategic outcomes somewhat diluted engagement.

Administrative controls were viewed as enhancing order and predictability by defining decision boundaries and approval limits.

The processes need to function properly. They must be well-defined and measured. (Lead Power Grid Specialist)

It brings transparency, operation, and openness, that's how I would put it. (Business Unit Manager 2)

It's very strictly regulated, like our procurement policy and who can make what types of contracts. It's been crafted with great detail. (Account Manager)

Such clarity was mostly welcomed, as it reduced uncertainty and supported a sense of operational transparency across levels. However, one interviewee offered a more critical reflection, noting that efficiency remained partly illusory due to underdeveloped indicators and limited follow-up of strategic objectives. Drawing on experience from larger corporations, this participant suggested that the organization's processes appeared less mature by comparison, even though employees were working diligently toward efficiency.

4.2.3. Employee perceptions of explorative and exploitative cultures within management control systems

The findings also highlight the dynamic nature of control use and employee perceptions. In the case organization, the diagnostically used two-year budgeting system functioned as an enabling control by clarifying slack for projects and allowing their continuity. Conversely, interactive budget meetings occasionally acted as constraining controls by narrowing the frame of discussion. Thus, diagnostic use may also contribute to an explorative culture, while interactive use may reinforce exploitative tendencies.

The organization's culture prominently featured artifacts that simultaneously supported both innovation (e.g., participation, employee involvement, open communications, and risk-taking) and efficiency (e.g., goal setting, planning, and task focus). Despite the presence of strong constraining cybernetic diagnostic control mechanisms used to promote efficiency, the interviews did not reveal any negative perceptions of these mechanisms. Instead, the employees emphasized an empowering and innovation-supportive culture. For example, employees perceived budget monitoring as a necessary mechanism for achieving organizational objec-

tives, likely because the CEO had effectively communicated and justified the importance of financial targets.

Väisänen et al. (2021) posit that when employees feel trusted by management, it mitigates the negative perception of constraining controls. This was also observed in our case organization. The formation of an ambidextrous culture was significantly influenced by the cultural controls of the management control system, which dominated the employees' perceptions and facilitated the development of an ambidextrous culture, thereby mitigating the impact of constraining controls.

Several cultural controls supported innovativeness through employees' perceptions of the management control system, such as communication between management and employees, the innovations in managerial discourse, the use of rewards to recognize innovative contributions, and the dedicated innovation forum that aimed to enhance innovativeness.

These cultural controls, which supported an innovative organizational culture, together with diagnostically used cybernetic controls emphasizing efficiency, contributed to a culture that simultaneously emphasized efficiency and innovation. The emphasis on low power distance and open communication, through the CEO's leadership style, highlighted the values associated with a clan culture that supports innovation. Among the cultural controls, the prioritization of employee well-being, demonstrated by elevating it to a strategic focus and conducting regular well-being assessments, further reinforced the clan culture values. The cultural controls also supported the values associated with an adhocracy culture, particularly through the emphasis on innovation, which was promoted by means such as innovation-related rewards and regular references to innovation in managerial discourse. In addition, the values linked to a market culture, which emphasizes efficiency, were supported not only by diagnostically used cybernetic controls but also by reward systems tied to EBITDA performance.

The same interviewee further reflected that although the organizational culture was generally positive and supportive, it was at times inefficient and placed insufficient emphasis on measurable outcomes and accountability. This contrasted with the more performance-oriented environments of larger corporations, where management processes were more mature. The interviewee suggested that their comparatively critical perspective might stem from previous experience in such organizations, emphasizing how employees' backgrounds and interpretive lenses shape their perceptions of control systems.

Table 1 summarizes the case findings by linking observed leadership behaviors and control practices to their theoretical manifestations in management control systems and associated cultural orientations. The CVF typology (Competing Values Framework) is used to classify the cultural orientations reflected in the case (Hartnell et al., 2011).

LEADERSHIP STYLE	MANIFESTATION IN MCS	ASSOCIATED ORGANIZATIONAL CULTURE (CVF TYPOLOGY)	PRIMARY CONTRIBUTION TO EXPLORATION OR EXPLOITATION
Transactional leadership			
Transactional	Rewards based on EBITDA	Market Culture	Exploitation
	Cybernetic controls used diagnostically	Market Culture	Exploitation
	Administrative Controls Corporate Governance	Hierarchy Culture	Exploitation
Transformational leadership			
Transformational	Cultural controls that foster autonomy, humor, open communication, reduced power distance, and trust.	Clan Culture	Exploration
	Planning Controls: Positioning employee well-being as a central strategic priority.	Clan Culture	Exploration
	Administrative Controls (corporate governance/ approval limits). Prioritizing strategy communication as a primary managerial task.	Adhocracy Culture	Exploration

Table 1. Integrative summary linking ambidextrous leadership, management control systems, and organizational culture in supporting exploration and exploitation.

The table illustrates the primary pathway by which leadership style shapes how controls are enacted and perceived (transactional → exploitation; transformational → exploration). Together, these orientations form the basis of an ambidextrous culture, where efficiency-oriented market and hierarchy values coexist with trust- and innovation-oriented clan and adhocracy values. Control effects are dynamic: diagnostic use can enable exploration when clarifying slack, whereas interactive routines may constrain when frames narrow. Cross-over is possible—transformational leadership can bolster efficiency, and transactional leadership can support innovation under specific design-and-use conditions and contexts.

5 Discussion

Our findings illustrate how leadership style, management control systems, and organizational culture dynamically interact to support ambidexterity. Transformational leadership promotes exploration, while transactional leadership ensures efficiency. Together, these elements highlight the pathways of influence through which an ambidextrous organizational culture can be fostered.

Without the visionary aspect of transformational leadership and its communication, as well as its manifestation through interactively used, innovation-supporting cultural controls, the values that promote exploration would not be reinforced within an organization. Moreover, the implementation of transactional leadership through diagnostically used cybernetic

and constraining controls is crucial for ensuring efficiency. The key challenge lies in applying these controls with appropriate scope and execution. Innovativeness is a fundamental prerequisite for achieving strategic objectives, such as the company's commitment to the green transition.

In the case organization, the integration of constraining controls into control structures, such as budgeting, reporting, and corporate policy, combined with the interactive nature of positive transformational leadership, enabled the simultaneous implementation of constraining and enabling controls while maintaining positive employee experience. This approach allowed for a balance between constraining and enabling controls and prevented the negative impact of constraining controls on how employees perceived the control system, and, consequently, on efficiency and innovation (Adler & Borys, 1996; Wouters & Wilderom, 2008).

The contextual characteristics of the case organization, a small, regulated monopoly with high asset intensity, create a dual imperative for efficiency and innovation, making ambidexterity essential for its success. Regulation and capital intensity impose strong efficiency pressures, while the green transition demands forward-looking and innovative approaches. The limited size and close managerial proximity likely facilitated openness, low power distance, and trust, which may have amplified the enabling effects of leadership and control practices. These boundary conditions suggest that similar mechanisms could operate differently in larger or more competitive organizations, where structural distance and market pressures might require more formalized processes to achieve comparable outcomes.

Our findings can be interpreted through the lens of Hartnell et al.'s (2011) cultural typology, which differentiates cultures based on flexibility versus control and internal versus external focus. Cultures that emphasize flexibility and discretion, clan and adhocracy cultures, are associated with exploration, while the cultures that emphasize control and stability, hierarchy and market cultures, are associated with exploitation. Considering this framework, the enabling controls in the case organization appear to support clan and adhocracy elements, fostering innovation. Conversely, the constraining controls aligned more closely with the hierarchy and market culture traits, supporting efficiency and formalization. The coexistence of these control types contributed to an organizational culture capable of balancing exploration and exploitation, the hallmarks of ambidextrous organizations.

Our study offers a complementary perspective to prior research by demonstrating how leadership style influences the design and use of management control systems, which, in turn, influence the formation of specific cultural orientations. According to Einhorn et al. (2024), organizational culture as a contextual factor shapes the emphasis and use of management control systems. Their large-scale survey showed that the CVF cultural types are associated with distinct emphases in the use of management control systems. These findings suggest that organizations tend to align their management control configurations with the prevailing cultural values. Our study contributes to the literature by highlighting leadership's role in combining the enabling and constraining elements of controls, simultaneously supporting different cultural orientations (e.g., enabling controls reinforce clan and adhocracy traits, while constraining controls are aligned with market and hierarchy values).

Our findings align with the observations of Einhorn et al. (2024) that link specific management control configurations to distinct cultural orientations. We extend this perspective by showing that leadership plays a central role in shaping how controls are framed and, consequently, how they are interpreted and perceived by employees. Whereas prior studies have examined how balancing different types of controls can support organizational ambidexterity

(e.g., Bedford, 2015; Gschwantner & Hiebl, 2016), our findings highlight a leadership-driven framing mechanism that influences employees' perceptions of control. Through this mechanism, ambidextrous leadership enables enabling and constraining controls to coexist without negative employee reactions, fostering an organizational culture that integrates efficiency and innovation (cf. Rosing et al., 2011).

Our findings support the literature on the relationship between management control systems and organizational ambidexterity (e.g., Bedford, 2015; Gschwantner & Hiebl, 2016) and leadership's role in enabling ambidextrous cultures (Baškarada et al., 2016; Zacher & Rosing, 2015). In the case organization, transactional leadership manifested through financially oriented and constraining control systems, such as EBITDA-based bonuses and hierarchical authorization limits. These controls were typically associated with efficiency-oriented cultures. Transformational leadership, on the other hand, was reflected in enabling cultural and planning controls that prioritized trust, openness, and employee well-being, the characteristics linked to exploration-oriented cultures.

Our study's key contribution lies in highlighting employees' perceptions of enabling and constraining controls (adjusted and presented by the top management). Specifically, the system-embedded and impersonally framed nature of constraining controls, implemented through formal processes such as budgeting and reporting, emerged as a critical factor in how employees perceived them. Since these controls were decoupled from direct managerial interaction and presented as routine organizational practices, they were not interpreted as personal expressions of distrust. This impersonal and system-based framing allowed employees to maintain high levels of empowerment, even in the presence of performance-driven constraints. In this way, the delivery and framing of controls, not only their design, played a vital role in reinforcing exploration-supporting cultural characteristics alongside exploitation-enabling structures.

This dynamic suggests a process through which an ambidextrous leadership style combining transactional and transformational elements may shape organizational culture both directly through leadership behavior and indirectly through the form and framing of management control systems. To further illustrate this dual influence, two pathways can be inferred from the data. Leadership behavior appears to shape both the type and use of control systems; for example, a predominantly transactional leadership style tends to emphasize cybernetic controls used diagnostically, which in turn fosters market-oriented cultural traits such as performance focus and accountability. In contrast, a transformational leadership orientation that highlights individualized consideration may enhance employees' sense of managerial trust, serving as a softening lens that mitigates the perceived restrictiveness of controls. When such trust is present, controls are not perceived as personal interventions or expressions of distrust but rather as system-based mechanisms that support collective goals. These pathways together indicate how the structural and interpretive elements of control use may interact to enable the coexistence of constraining and enabling mechanisms within an ambidextrous culture.

The findings of this study yield several managerial implications. Managers should ensure that efficiency is supported by well-designed planning and monitoring systems that allow timely responses to operational deviations, which requires selecting appropriate KPIs and continuously implementing improvement actions. To prevent employees from interpreting efficiency-oriented measures as signals of distrust, leaders should communicate the strategic importance of efficiency goals at the organizational level and frame diagnostic controls as impersonal, system-embedded mechanisms rather than instruments of personal supervision.

In parallel, transformational behaviors—such as individualized consideration and avoiding micromanagement—are essential for sustaining trust and appreciation. Crucially, minimizing perceived power distance while maintaining shared, structurally embedded efficiency controls aligns managers and employees on the same side of the performance agenda: properly framed, diagnostic controls become a common reference system that binds both parties to joint efficiency objectives instead of driving a wedge between them.

6 Conclusion

To understand how leadership style, enacted through management control systems, contributes to the emergence of an ambidextrous organizational culture, this study examined the leadership style of top management in terms of its intentions with management control systems and the employees' perceptions of the management control systems within the ambidextrous organizational context.

Transformational leadership was found to be associated with enabling controls, especially cultural and planning mechanisms that emphasized trust, autonomy, and employee well-being. Transactional leadership, in contrast, was linked to financially oriented and diagnostically used controls, such as cybernetic and administrative systems designed to ensure efficiency. These insights clarify how management control systems can be intentionally used to enact leadership styles and strategic priorities.

Concerning employee perceptions, enabling controls were generally perceived positively, whereas constraining controls were more likely to evoke negative reactions. This, however, was not always the case: When the constraining controls were system-embedded and impersonally framed—implemented through formal routines rather than direct managerial intervention—they were less likely to be interpreted as expressions of distrust. This perception helped preserve positive employee experiences, even in the presence of performance-oriented constraints.

Overall, our findings suggest that leadership style influences not only the structural design of control systems but also how employees perceive them. These dual effects contribute to the emergence of different cultural orientations within an organization. The positive perceptions regarding enabling controls and the perceived managerial trust fostered a clan-oriented culture conducive to exploration, while the constraining controls reinforced a market-oriented culture emphasizing efficiency. These cultural patterns illustrate how leadership, management control systems, and employee perceptions interact to shape ambidextrous outcomes.

Our findings contribute to the literature that links organizational culture with management control systems, which demonstrates that different cultural types—clan, adhocracy, market, and hierarchy—are associated with specific control mechanisms, suggesting that organizations tend to align their management control practices with their existing cultural values. Our study complements and extends this view by illustrating how leadership-driven changes in management control system design and use can actively shape cultural orientations. Rather than treating culture solely as a contextual factor, our study highlights the management control system as a potential mechanism through which leadership can initiate and reinforce cultural changes.

Our study contributes to the literature by showing how leadership style and management control systems jointly shape an ambidextrous organizational culture. It emphasizes the role of system-embedded and impersonally framed constraining controls as a mechanism that

enables efficiency without undermining innovation. As with any single-case study, the findings are contextually bound and not directly generalizable. Moreover, the case organization's regulated industry context, small size, and high asset intensity may have influenced both the design and the framing of its control systems, as well as how these controls were perceived. Future research could examine how the leadership-driven framing of control systems operates across different sectors, organizational sizes, and institutional contexts. In addition, future studies could further explore how leadership style interacts with management control systems in diverse settings and investigate, with broader empirical data, how leadership influences employee perceptions of constraining controls.

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Appendix A. List of interviewees

Interviews

No.	Date	Interviewee position	Duration
1	September 4, 2023	Lead Power Grid Specialist	56 min
2	September 6, 2023	Financial Planner	1 h 17 min
3	September 6, 2023	Chief Information Officer	58 min
4	September 13, 2023	Power Grid Manager	57 min
5	September 13, 2023	Business Unit Manager 1	1 h 2 min
6	September 14, 2023	Account Manager	57 min
7	September 15, 2023	Chief Executive Officer	1 h 5 min
8	September 18, 2023	Construction Manager	59 min
9	September 20, 2023	Group Business Controller	1 h 8 min
10	September 21, 2023	Power Grid Technical Specialist, Maintenance and Protection	1 h 12 min
11	September 22, 2023	Business Unit Manager 2	1 h
12	September 22, 2023	Project Coordinator	58 min
13	September 25, 2023	Human Resources and Communications Manager	1 h
14	September 27, 2023	ESG Controller	57 min
15	September 29, 2023	Service Manager	1 h
16	September 29, 2023	Construction and Procurement Manager	55 min
17	October 5, 2023	Construction Manager	59 min
18	October 9, 2023	Procurement Manager	59 min
19	October 13, 2023	Development Manager	59 min

Interactive discussion sessions of research findings

No.	Date	Sessions	Duration
1	November 8, 2023	Interactive discussion session with the corporate executive team	approx. 25 min
2	November 15, 2023	Interactive discussion session with the personnel	approx. 25 min
3	November 28, 2023	Interactive discussion session with the board of directors	approx. 25 min



Lahjoittaminen on tulevaisuuteen sijoittamista – Liikesivistysrahasto tukee apurahoin liikkeenjohtoa palvelevaa tutkimusta, koulutusta ja julkaisutoimintaa.

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The Nordic Journal of Business is a scholarly journal that publishes original scientific research in all fields of business studies. Different aspects of business theory and practice related, among others, to accounting, corporate governance, entrepreneurship, finance, information systems, international business, management, and marketing are within the scope of the Journal.

The Nordic Journal of Business welcomes submissions of high-quality empirical and theoretical papers that contribute to knowledge of business theory and practice. The Journal is primarily interested in contributions based on the foundational disciplines of business studies, but we also encourage creative approaches and multidisciplinary research that reflects the intricate real-life relationships between functional areas of business. While the Journal provides an international forum for business research, submissions that focus on Nordic research problems or use data from Denmark, Finland, Iceland, Norway, and Sweden are particularly encouraged.

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- Empirical and theoretical research articles
- Survey and review articles
- Research notes

The core of the Journal comprises empirical and theoretical research articles. Comprehensive survey and review articles as well as short research notes will also be considered for publication. The Journal regularly publishes special issues that focus on specific research topics. All submissions are subject to initial editorial screening and are subsequently double-blind refereed by two reviewers who are recognized experts in the field of the manuscript.

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The Nordic Journal of Business is an open access journal published four times a year by the Association of Business Schools Finland. The Journal was founded in 1952 and was formerly known as the Finnish Journal of Business Economics. Its audience includes scholars and researchers at universities and business schools, as well as executives and other practitioners interested in the application of research to practical business decisions.

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The Nordic Journal of Business (NJB) is a scholarly journal that publishes original scientific research in all fields of business studies. The Journal welcomes submissions of empirical and theoretical papers that contribute to knowledge of business theory and practice. All submissions are subject to initial editorial screening and are subsequently double-blind refereed by two reviewers who are experts in the field of the manuscript.

NJB publishes (i) empirical and theoretical research articles, (ii) survey and review articles, and (iii) research notes.

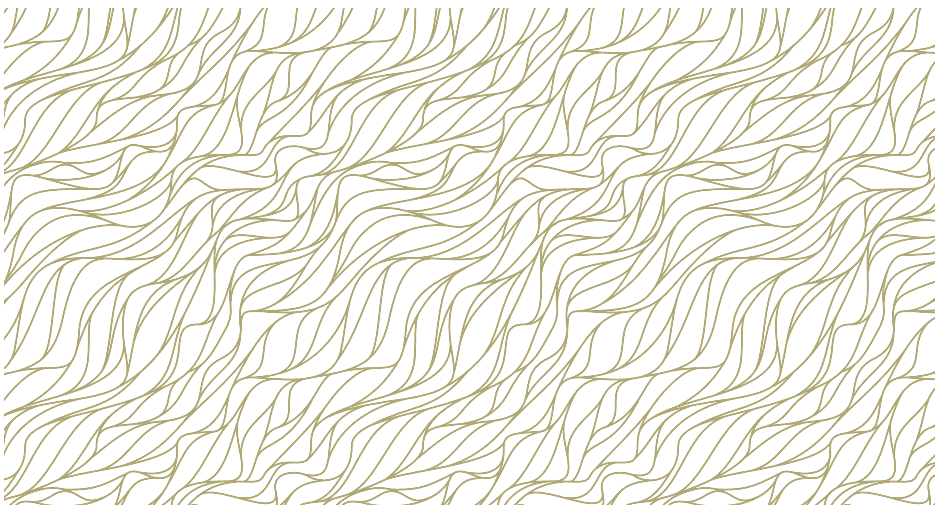
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