

**Is the gender gap in finance influenced by a gap in familiarity?
The effect of a pink portfolio on investment decisions§**

Henriette Prast*
Mariacristina Rossi#
Costanza Torricelli†
Cristina Druta±

Abstract

We investigate whether lack of familiarity may contribute to an explanation of the gender gap in stock market participation and risk taking. We use ads in widely read women magazines to select companies that are most familiar to women and construct a “pink” portfolio. We ask members of the CentERpanel how they would allocate 100.000 euro of pension wealth. Half of respondents are given the choice between government bonds and a portfolio consisting of companies most traded at Amsterdam Exchanges, while the other half can choose between government bonds and our “pink” portfolio. We find that significantly more women than men choose not to respond after having seen the question and that respondents tend to allocate their hypothetical savings fifty-fifty over stocks and bonds. This could be interpreted either as going for the default choice or the 1/n heuristic. We find a pink portfolio effect among older women, and a significant of framing which is larger for women than for men. We also find that women who already own stocks allocate significantly more to the stock basket than women who do not, which may be interpreted as an effect of familiarity. We find no such effect among men. Our evidence does not show that lack of familiarity with the large companies most traded at the Amsterdam stock exchange explains the gender gap in participation and portfolio choice. What we do find, however, is that a pink portfolio reduces decision time for women, and results in women deciding quicker than men.

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*Corresponding author, Finance Department, Tilburg School of Economics and Management, Tilburg, the Netherlands, and Netspar. h.m.prast@uvt.nl.

Department of Economics and Finance, University of Turin and CeRP, Turin, Italy.

†Economics Department, University of Modena and Reggio Emilia and Cefin, Modena, Italy

± Master Student, Maastricht University. Part of the analysis in this paper is based on her Master Thesis Finance at Tilburg University

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1. Introduction

Women participate less in the stock market than men and if, they do they take less risk. Usually, this gender gap in investing is explained by lower financial literacy and risk tolerance of women compared to men. In this paper we investigate another hypothesis, namely whether the gender gap in financial decision making can be explained by differences in familiarity with investment products most traded in the stock market. Gender marketing of financial products is seldom found, something which can be explained by several factors: the household, not the individual, was traditionally the relevant unit for saving, investing and insurance decisions, and finance theory assumes a unitary financial consumer (Donni and Chiappori 2011; Chiappori 2013). Only recently there is attention for differences in financial planning preferences within the family (Chiappori 2013; Browning *et al*, 2014).

Most policy debates on the gender gap in economics focus on the gap in employment and pay, which persists even across most developed countries, despite increased labor market participation by women (Boeri, Del Boca and Pissarides, 2005). Behavioral science research stresses unconscious bias as one of the causes, and provides solutions to reduce its effects (Bohnet *et al*, 2014). The gender gap in the labor market results in itself in a pension gender gap, and the OECD has called for reducing the gender gap by creating financial inclusion of women, a plea which has been supported by the G20 Ministers of Finance and Central Bank Governors in July 2013, and the G20 leaders in September 2013 (OECD, 2013; G20, 2013).

Gender gaps have been consistently documented when it comes to financial behaviour, for example the allocation of assets in retirement plans (Sunden and Surette, 1998), the choice between DB and DC pension schemes, and the allocation of wealth to stocks after controlling for risk tolerance (e.g. Van Rooij *et al*, 2007). Gender gaps have also been found in financial literacy (e.g. Lusardi and Mitchell, 2008) and self-assessed and measured risk attitudes (e.g. Eckel and Grossman 2002, Van Rooij *et al* 2007, Arano *et al*. 2010). In fact, the gender gap in stock market participation and investing is usually explained by lower financial literacy and risk tolerance of women compared to men (e.g. Schubert *et al*. 1999, Lusardi and Mitchell 2008, Croson and Gneezy 2009, Dohmen *et al.*, 2011), or by a gap in numeracy (Almenberg and Dreber, 2012).

Explaining the gap is important in a world in which financial risk is shifted toward individuals, women (need to) rely more on themselves financially, worldwide women control more than 25% of wealth (Damisch *et al*, 2010), the financial industry is called upon to put customers central stage and have a care duty in helping people make adequate financial decisions. It is generally assumed that a reduction in the gap should result from a change in

women's characteristics and financial behaviour – towards more financial market participation and risk taking -, even though it cannot be excluded that men participate too much and take too much risk. In fact, Barber and Odean (2001) hypothesize that excessive trading in the stock market can be explained by overconfidence. Based on previous findings that men are on average more overconfident than women, they use gender as a proxy for overconfidence and indeed find that men trade more excessively than women, with the difference being even larger when couples are excluded from the sample.

Be that as it may, research in finance as well as other disciplines (notably psychology and behavioral economics) suggests that the gap in literacy and risk tolerance may be only a partial explanation (e.g. Fellner and Maciejovsky, 2007). In this paper we investigate whether a gender gap in familiarity with the companies traded in the stock market may contribute to explaining the gender gap in investing. We are inspired by the familiarity-breeds-investment explanation of the investor home bias (Huberman, 2001), which is based on a model by Merton (1986). We investigate whether *lack of familiarity* with firms traded in the stock market may contribute to an explanation of the gender gap in portfolio choice. We do so by asking people to allocate a hypothetical amount of 100,000 euro of pension savings over a risk free asset and a basket of stocks. Half of respondents are presented with a stock basket based on the index of the stocks most traded at Amsterdam Exchanges, and the other half with a portfolio consisting of companies that advertise in women magazines.

Our main findings are that significantly more women than men choose not to respond after having seen the question, that there is a pink portfolio effect among older women, and that there is a significant of framing which is larger for women than for men. We also find that women who already own stocks allocate significantly more to the stock basket than women who do not, which may be interpreted as an effect of familiarity. We find no such effect among men. Our evidence does not indicate, however, that lack of familiarity with the companies most traded at the Amsterdam stock exchange contributes to an explanation of the gender gap in stock market participation.

The paper is structured as follows. In the next section we provide an overview of empirical findings regarding gender differences in life cycle saving and investing as well as explanations traditionally given for these gaps. Section 3 discusses the concept of familiarity applied to investor behaviour. In section 4 we describe our methodology, data and present summary statistics. Section 5 presents some descriptive findings as well as a regression analysis on gender differences in the association between familiarity and stock investing. In Section 6 we discuss results on the association between the time needed to complete the

questionnaire by gender. Section 7 summarizes and makes suggestions for further research on the gender gap in finance.

2. The gender gap in finance

A gender gap in finance has been consistently documented when it comes to financial literacy (e.g. Lusardi and Mitchell, 2008), risk attitudes (e.g. Eckel and Grossman 2002, Arano *et al.* 2010) the choice between DB and DC pension schemes (e.g. Van Rooij *et al.*, 2007) and the allocation of assets in retirement plans (Sunden and Surette, 1998). Analysis of the interaction between gender and marital status in the allocation of assets in retirement savings plans using the Survey of Consumer Finances 1992-1995 in the US finds that single women take less risk (Sunden and Surette 1998). Bertocchi *et al.* (2011), using more recent data from the Bank of Italy Survey on Household and Wealth, arrive at a similar conclusion, although they find that the effect differs according to whether married women participate in the labor market. When it comes to stock market behavior, Barber and Odean (2001) use gender as a proxy for overconfidence and find that men trade more excessively than women, with the difference being even larger when couples are excluded from the sample.

Lower stock market participation and less risky portfolio choices by women are usually explained by a lower degree of financial literacy and/or a higher risk aversion of women as compared to men (e.g. Schubert *et al.* 1999, Lusardi and Mitchell 2008, Croson and Gneezy 2009, Dohmen *et al.*, 2011). However, research in finance as well as other disciplines (notably psychology and behavioral economics) suggests that this may be only a partial explanation (e.g. Fellner and Maciejovsky, 2007).

Interpreting the results of literacy tests

70% of women who answer “don’t know” to financial literacy questions give the correct answers if the “don’t know” option is not available, reducing (though not eliminating) the gender gap in literacy (Bucher-Koenen *et al.*, 2012). A possible explanation is a gender gap in confidence. Moreover, stereotype threat may play a role. If reminded of their gender, females have worse math scores (Good and Harder, 2008) and negotiation outcomes (Kray *et al.*, 2002), just as white males in sports perform worse after having been reminded that they are white (Stone *et al.*, 1999). Also, in more egalitarian societies, the gender gap in math scores disappears (Guiso *et al.*, 2008).

Interpreting the gender gap in measured risk tolerance

Girls are more likely to choose risky outcomes when assigned to all-girl groups (Booth and Nolan, 2012) – suggesting that context plays a role; in fact, women’s financial choices are more context-specific and sensitive to social clues than men’s (Croson and Gneezy, 2009). Women exhibit lower risk tolerance than men in investing decisions, but not in gambling decisions, and they take more risk in *social* decision making (Weber *et al.* 2002, Harris and Jenkins 2006). The authors suggest that decision making with risk may reflect not only risk tolerance, but also confidence in the ability to manage certain risks. In fact, Barber and Odean (2001) find that men expect to outperform the stock market by a significantly greater margin than women. People may know that in gambling they cannot manage risk, whereas men may be more confident than women in their ability to manage investment risk, while women may feel more confident in their capacity to manage risk in the social domain (see also Heath and Tversky, 1991). According to Barber and Odean, overconfidence may be the key to understanding excessive trading and explain why men trade more excessively than women, with the difference being larger among singles. Another potential explanation of gender differences in risky decisions may be that women process information differently than men, with the result, *inter alia*, that they tend to be more cautious in decision making (Meyers-Levy, 1989).

Despite their assumed lower propensity to take risk, women have less access to credit, be it business loans or mortgages (Hertz, 2011) and are, after controlling for relevant background characteristics, charged higher interest rates for business credit (Alesina *et al.*, 2013). This may reflect less self-confidence on the part of the female client. It has been shown that anxiety results in worse negotiation outcomes especially when the belief in one's own ability is low (Wood Brooks and Schweizer, 2011). It may also be due to less explicit confidence on the part of the supplier in the ability of female clients to manage risk or set up a business. An implicit and unintended negative attitude towards women when it comes to business and finance may also play a role. Recent evidence for the labor market suggests that as soon as decision makers learn the sex of a person, gender biases are activated (Bohnet *et al.*, 2013). This bias – which can be detected through an implicit association test (Greenwald *et al.*, 1998)¹ leads to unintentional discrimination, not based on a rational expectation of future performance (Bertrand *et al.*, 2005).

The gender gap in risk taking of women in stock markets and that in access to credit are intriguing, but their combination is even more surprising and calls for further research into the determinants of the gender gap in finance. This is what the present research aims at by

¹ Readers can see examples of an implicit association test at <http://implicit.harvard.edu>

applying the concept of familiarity, where in this paper the focus is on (gender differences in) familiarity with the companies traded in the stock market.

3. Familiarity and finance

The role of familiarity in finance has been used as an explanation for some stylized facts in investment behaviour. For instance, investors hold much more stock from their home country than theory would predict, diversifying less than would be optimal according to finance theory (French and Poterba 1991, Tesar and Werner 1996). This so-called home bias has not disappeared with developments in ICT and with the removal of institutional barriers like capital controls. There is even an investor home bias within countries, with investors in US holding more stock from companies operating locally (Coval and Moskowitz, 1999). Moreover, employees hold a large fraction of their pension wealth in employer stock and Enron has not changed this (Laibson, 2005). And finally, even after excluding employer stock holdings, investors hold an excessive percentage (more than ten percent) of their portfolio in stocks of companies in the industry they work in (Doskeland and Hvide, 2011).

Merton (1987) was the pioneer of the role of familiarity in stock market investing, even he did not use the word. He constructs a model to explain why investors hold only a subset of all securities available even if they have perfect access to information and there are no regulatory barriers. He assumes that “*an investor uses security k in constructing his optimal portfolio only if the investor knows about security k* ”. Note that “knows about” does not mean “has access to knowledge about”. Rather, the key aspect of his model is that there exist subsets of investors that trade in a subset of all the securities available: the securities that they *are aware of*. Hence it is not that investors have no access to information about some securities, but that they do not seek access to that information because they are not ‘aware’ of the existence of the securities: “If an investor does not follow a particular firm, then an earnings or other specific announcement about that firm is not likely to cause that investor to take a position in the firm” (Merton, 1987).

Referring to Merton (1987), Huberman (2001) suggests that the investor home bias may be due to familiarity with companies that are close to “home”. Familiarity is also used by Heath and Tversky (1991), who explain why people “prefer to bet on their own judgment (as compared to a chance lottery) in a context where they consider themselves knowledgeable or competent... our feeling of competence is enhanced by general knowledge, familiarity, and experience...” Di Mauro (2008), referring to Heath and Tversky (1991), suggests that feeling knowledgeable may explain the investor home bias.

The fundamental hypothesis underlying the analysis in this paper is therefore that gender differences in *familiarity with the world of finance* may contribute to explaining the gender gap in stock market investing. The focus here is on familiarity with the *companies most traded* in the stock market, while in other research we study *inter alia* familiarity with financial language.

In order to test a potential gender gap in familiarity and its effect on risk taking, we perform a study on Dutch households. To this end, we use two portfolios. One is made of a basket based on the Amsterdam Exchange Index (AEX), which the 25 most traded companies at the Amsterdam Stock Exchange. Many of these companies could be ranked as typically “masculin” (steel, beer, oil and gas, oil equipment, semiconductors, heavy construction, chemicals and real estate), DSM (chemicals), while the remainder can be seen as fairly neutral (e.g. coffee, consumer electronics, delivery services, publishing, business training, food, banking and insurance, airlines). In what follows we will call a portfolio based on these companies “blue”, in contrast to a ‘pink’ portfolio, which we construct as made of companies advertising in women magazines. While this is the easiest way to test differences in familiarity, it may not be the key to understanding the gender gap, as this pink portfolio is a relatively anonymous way of investing. Nevertheless, we see it as a necessary step to increase our understanding of the gender gap in stock market investing in terms of a potential gender gap in familiarity. We ask respondents to allocate a hypothetical large amount of pension savings over government bonds and a basket of stocks, where the stock basket randomly varies between blue and pink.

4. Methodology and data

Our data have been collected through an internet survey in September 2013 among participants of the CentERpanel run by CentERdata at Tilburg University. CentERdata is a survey research institute that is specialized in data collection and internet surveys. The CentERpanel consists of about 2000 households representative of the Dutch-speaking population in the Netherlands. Within the household, all household members are invited to participate. Panel members fill out short questionnaires via the internet on a weekly basis. Annually, panel members provide information on individual income, household wealth, health, employment, pensions, savings attitudes, and savings behavior for the DNB Household Survey (DHS), providing researchers with a rich set of background information on the respondents. The availability of a computer or internet connection is not a prerequisite of the selection procedure, which is done by a combination of recruiting

randomly selected households over the phone and by house visits. After having agreed to participate, panel members receive explanation on survey administration, which is conducted via the internet. If necessary, either a computer with internet access or alternative equipment such as a set top box for communication through the television is provided to respondents. Data collected with internet surveys display higher validity and less social desirability response bias than those collected via telephone interviewing (Chiang and Krosnick, 2009). The panel has been used for numerous studies on household and individual behavior and attitudes, including pension attitudes (see for instance Van Rooij *et al*, 2007, and Prast *et al*, 2013) and financial literacy and retirement planning in the Netherlands (see Alessie *et al*, 2011). For more information on the panel see Teppa and Vis (2012).

In order to confront the survey respondents with two portfolios that might differ in familiarity to men and women, we first constructed what we call a “blue” and a “pink” basket of stocks. The blue portfolio consisted of a selection of the large companies most traded at the Amsterdam Exchanges (AEX). AEX companies. The pink portfolio was constructed as follows. We collected copies of the most popular women magazines in Italy, France, the Netherlands, the UK and the US over the period January 2011 – July 2013, taking one copy of each magazine for every season of the year. We then made an inventory of the advertisements in these magazines, and selected those of companies traded in the stock market, whether or not under a different name. Of the resulting 65 companies, 24 turn out to be listed on the New York Stock Exchange, eleven on Euronext (located in Amsterdam, various European countries, seven on the exchange of Frankfurt, nine at the London Stock Exchange, two on the OMX (Scandinavia and Baltic States Exchange), seven on the SCA (Hong Kong Stock Exchange), four at Borsa Italiana, and one on the BMad (Madrid Stock Exchange). (see Appendix).

As far as industries covered they are mostly apparel, followed by cosmetics and hygiene. Two thirds of the companies that are stock listed and advertised in the magazines belong to these industries. Moreover, we find home/family related products and services (food, pet food, Disney, home furnishing), ICT/social media, electronics, cars, and one financial. From the 65 companies, we qualify 14 as luxury (see Appendix). It came as no surprise that the advertisements in women magazines read by consumers are about retail products and services. This is one difference with the AEX index, which contains both raw materials/business to business, and retail producers.

In attempting to create portfolios that would be similar except in their degree of familiarity to men and women, we made several decisions. First, we removed from the pink sample

those companies that we² did not know. This left us with 49 companies, of which 14 fall in the luxury class. We then left out the products that we regarded as potentially not familiar to women of all ages (ict, social media).

From the resulting 44 companies we removed automobiles, as they may be regarded as either gender neutral or more male oriented (cars). This left us with 41 companies to choose from. Because the AEX contains merely 25 companies, we had to further reduce the number of companies for the pink basket. Moreover, given the limited diversity of industries in both the AEX and the pink selection, we decided to limit the number of companies in both stock baskets to 15 in order to make the decision not too burdensome for respondents.

We then chose from the 41 remaining “pink” companies a selection that would mirror its industry composition: home (food, pet food, home decoration, furnishing, home electronics), hygiene, apparel and cosmetics, where some companies may be both (eg Dior). We took care to include both luxury and non-luxury brands. In our final selection, we decided to make one exception to the rule we applied for the advertisement selection. We added Ikea to reflect the industry “home”, even though it is not stock-listed, instead of choosing from Debenhams, Beter Bed and the various food companies. We did so because Ikea turned out to advertise in all but two Italian women magazines, while we thought that Debenhams and Beter Bed would not be familiar to most women.

For the blue portfolio we selected 15 companies from the Amsterdam Exchanges Index of large companies most traded: eight raw materials/heavy industry (steel, chemicals, oil, semiconductors), two financials, three food/non-food retail products, one electronics, and one airline company.

None of the companies were included in both the blue and the pink basket. And while the pink and blue basket contain companies producing goods or services that are used by both genders – eg Burberry, Dior, Ralph Lauren and Ikea in the pink portfolio, and DE, KLM, Philips and ING in the blue one - , we believe that the degree of femininity and masculinity of the respective baskets differs considerably.

We also felt that the stock baskets were similar in terms of diversification – something which was strictly speaking not necessary given that the question submitted to the panel members described identical risk/return expectations. It should be stressed that the pink portfolio contained not a single Dutch company, while the majority of the companies in the blue portfolio are Dutch (Shell being partly British, KLM/Air France partly French, and Corio

² We are all females, in age ranging from early twenties to late fifties

being originally Dutch (Hoogovens) but taken over several years ago by Tata Steel from India).

The resulting pink and blue portfolios are the following:

Table 1. Composition of the pink and blue stock basket

Pink		Blue	
<i>Company</i>	<i>Sector</i>	<i>Company</i>	<i>Sector</i>
1 Estee Lauder	Cosmetics L	1 Ahold	Food
2 Dior	Apparel/cosmetics L	2 AIR FRANCE –KLM	Airline
3 Ralph Lauren	Apparel L	3 AKZO NOBEL	Chemicals
4 Tiffany & Co	Apparel L	4 ARCELORMITTAL	Steel
5 L' Oreal	Cosmetics	5 ASML HOLDING	Semiconductors
6 Zara	Apparel	6 CORIO	Steel
7 Revlon	Cosmetics	7 DE Master Blenders	Food
8 Shiseido	Cosmetics L	8 DSM	Chemicals
9 Burberry	Apparel L	9 FUGRO	Oil equipment
10 Ikea	Home	10 ING	Financial
11 Douglas	Cosmetics	11 Philips	Electronics
12 Svenska Cellulosa	Hygiene	12 SBM OFFSHORE	Oil equipment
13 Esprit	Apparel	13 Shell	Oil
14 IFF	Cosmetics	14 UNIBAIL Rodamco	Real estate investment
15 Prada	Apparel L	15 Unilever	Food, hygiene

Panel members were given the following hypothetical situation:

Imagine you have 100.000 euro's available to put aside for retirement. You need to allocate it over government bonds with an interest rate of 4 percent, and a basket of stocks which is expected to yield a return of 8 percent. You cannot touch the money until retirement.

You do not invest in individual stock but in a "basket" of 15 different stocks, which reduces the risk without reducing the return, as bad outcomes of one firm may be compensated for by good outcomes of another.

Upon retirement you will receive with certainty the money that you put in the government bonds plus accumulated interest, hence it is similar to a savings account with a fixed interest rate. The money you put in the stock basket is expected to increase in value eight percent each year. However, this is not certain. It is possible that it grows with more than eight percent each year, but also with less.

A numerical example.

If you put the whole amount in government bonds, it will be worth 148.000 in ten years. If you put everything in stocks, it is expected to be worth 215.000 in ten years. However, it can also be more, for example 280.000, or less, for example 130.000. Assume that you have 100.000 euro available to set aside for retirement. You can choose between risk free government bonds with an interest rate of 4 percent, and a basket of stocks with an expected return of 8 percent. You cannot touch your savings until you retire

How would you allocate the money?

Half of respondents (chosen randomly) were given the blue basket, while the other half were provided with the pink basket of stocks selected on the basis of advertisements in the most

read women magazines. Hence respondents could NOT choose between different (baskets of) stocks. The question was formulated this way because we wanted to investigate the effect of pink versus blue on risk taking. Hence respondents were assigned to condition Blue or Pink.

;8

Moreover, we wanted to see whether there was a framing effect of the question. Van Rooij et al. (2011) find that the answer on financial literacy questions depends on the order of the words stock and bonds in the question. Moreover, questionnaire and advertising research has documented response order effects (e.g. Brunel and Nelson, 2003). We randomly assigned half of respondents to the following response ordering condition:

;2
Framing A. How would you allocate the money?

Bondseuro
Stockseuro

The other half was assigned to the following response order condition:

Framing B. How would you allocate the money?

Stockseuro
Bondseuro

After having answered the question, all participants were, as is always the case with questions submitted to the panel, asked about the perceived difficulty of the task, and about clarity, thought-provoking nature, interest, and enjoyability of the question. The survey participants could answer by picking a score from 1 to 5, on a Likert scale, 1 for being the least and 5 representing the most.

Did you find it difficult to answer the question?
Did you find the question clear?
Did you think the question was thought-provoking?
Did you find the topic interesting?
Did you find it enjoyable to answer the question?

The respondents were also allowed to provide comments, whereby the answer was coded as 1 if comments were given, and 2 otherwise.

Do you have any comments about this question?

Finally, the time it took an individual to complete the questionnaire was registered. Before turning to the answers to our main question – the allocation of pension wealth over the risk free asset and the stock basket – we present some general information and statistics.

The question was submitted in the first week of September 2013 (see Appendix II for the original Dutch version of the question) to respondents aged 18+ who are not retired (totaling 2138), and it was completely filled out by a total of 1319 respondents. Table 2 presents the summary statistics over the type of response obtained.

Table 2. Summary Statistics, general

Number of household members	2138	(100%)
Nonresponse	808	(37.80%)
Response incomplete	11	(0.50%)
Response complete	1319	(61.70%)

Source: authors based on CentERpanel data

The response rate was 61.7%, which is very low if compared to the usual level in the CentERpanel of around 80%. We have two main explanations for the low response. One is that our sample excluded pensioners, a category within the panel that usually, has a response rate that is above average (most likely because they have more time). The other is that the number of people opening the link and then closing it without answering the question was much higher than normal: 110 instead of around 20. A closer look reveals a major gender gap among the panel members who, after seeing the question, decided not to answer it: 69.1 % is female, 30.9 % male (Table 3). As the question did not allow for ‘don’t know’ as an answer, perhaps this non-response should be interpreted as don’t know/not for me. Evidence on financial questionnaires has shown that more women than men tend to say don’t know even if they know the answer. The gender difference we find therefore does not come at a surprise, but we should take into account that our sample has a “survivor bias” which differs between the genders. Our sample is also biased in terms of age: the average age of those who completed the questionnaire is 49, as compared to 47 among those who chose not to respond after having seen the question, and in terms of education, with the survivors being higher educated than those who closed the link after having seen the question.

Table 3. Characteristics of backing-outers (n=110) and survivors (n=1319)

	Backed out	Completed questionnaire
Gender composition		
; Women	69.1%	53%
Men	30.9%	47%
Total	100%	100%
Average age	47	49
% High educated	38;4%	44%

CenterData always registers, at the end of a questionnaire, the respondents judgment of the questions he had to answer. Moreover, it registers the time it took respondents to complete the questionnaire. Table 4 gives the evaluation by respondents of the decision task, as well as the measured time it took respondents to decide. We distinguish between the pink and blue condition and gender. Evaluation is the score on a scale of 1-5, decision time is in seconds. Note that respondents may take more time because they think longer and/or because they look up information that may help them to answer a question.

Table 4. Respondents' questionnaire evaluation and decision time

	Respondents who were assigned to Pink portfolio			Respondents who were assigned to AEX portfolio			All types together		
	Male	Female	All	Male	Female	All	Male	Female	All
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Difficulty of task	2.01	2.45	2.24	2.05	2.54	2.32	2.03	2.50	2.28
Clearness of task	4.09	4.05	4.07	4.15	4.10	4.13	4.12	4.08	4.10
Thought-provoking	2.77	2.61	2.69	2.69	2.82	2.76	2.73	2.72	2.73
Interest in the task	3.34	2.90	3.11	3.27	3.04	3.14	3.30	2.97	3.13
Pleasure of completing the task	3.52	3.26	3.38	3.57	3.36	3.46	3.54	3.31	3.42
Decision time (secs)	4051	3060	3534	4309	8758	6739	4179	6018	5162
Observations	310	339	649	304	366	670	614	705	1319

Source: authors based on CentERpanel data

From Table 4 one thing stands out especially, and that is the pink-blue gap in decision time. On average, respondents took 5162 seconds (8.5 minutes) to decide. However, average decision time differed considerably across the pink and blue condition. Deciding on pension wealth allocation took respondents on average less than 6 minutes in the pink condition, and more than 11 minutes in the blue condition. This difference across the conditions is due almost exclusively to the different decision time among women: it takes women in the blue condition more than twice as long to decide as women in the pink condition (8758 vs 3060 seconds). For men, the decision time hardly differs across conditions (4309 vs 4051). As a result, the gender difference in decision time is much more pronounced (and has a different sign) in the blue than in the pink condition. While women in the pink condition decide quicker than men (an average gender difference of around 1000 seconds) it takes women in the blue condition more than twice as long to decide than men (8758 vs 4309 seconds). These differences are statistically significant and we interpret them as reflecting gender differences in familiarity with (some of the) companies in the pink vs blue portfolio, respectively. We further analyse this in Subsection 5.4 below.

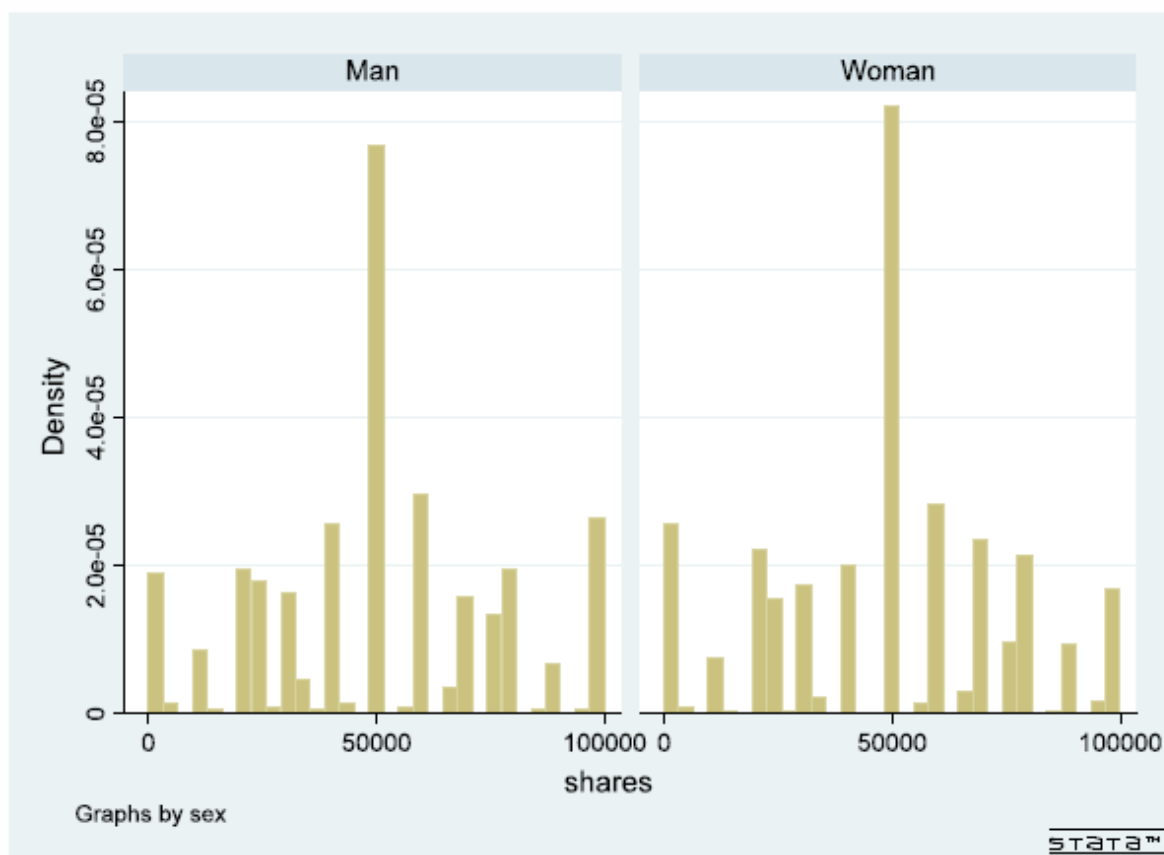
5. Wealth allocation decisions: a further analysis

In this section we first provide some descriptive analyses of the answers obtained which highlight some noteworthy feature, then we analyse by means of regression analysis of the data the association between familiarity in portfolio choices and household demographic and economic characteristics.

5.1 Descriptives and aggregate findings

We first look at differences in portfolio allocation across gender only. Figure 1 gives the distribution of the percentages allocated to the stock portfolio by gender. For both men and women the distribution shows a peak at a choice of fifty percent risk free assets, fifty percent stock basket.

Figure 1. Distribution of percentage allocated to stock basket according to gender (pink and blue taken together)



This is in line with evidence of a $1/n$ heuristic used by employees in the US when allocating their pension savings among the different investment opportunities offered by the employer: if the employer offers five possibilities, workers tend to allocate 20% of their savings to each of them, if he offers ten possibilities they allocate ten percent to each one, etcetera (Huberman and Jiang, 2006). This suggests that when deciding on how to save for retirement, people are biased towards dividing their pension wealth equally over the number of investment options available. There are various ways to interpret this result. One is that those who have no idea how to allocate, tend to divide the amount equally, because they perceive it as “not choosing”. In this interpretation, the fifty-fifty choice is a way of saying “don’t know” (don’t know was not an answer category). Another is that respondents see this as the obvious way to apply the “not all eggs in one basket” rule, or as close as they can get to the default. Be that as it may, it is clear that a larger fraction of women than men chooses fifty-fifty, but further analysis shows that this difference is not significant.

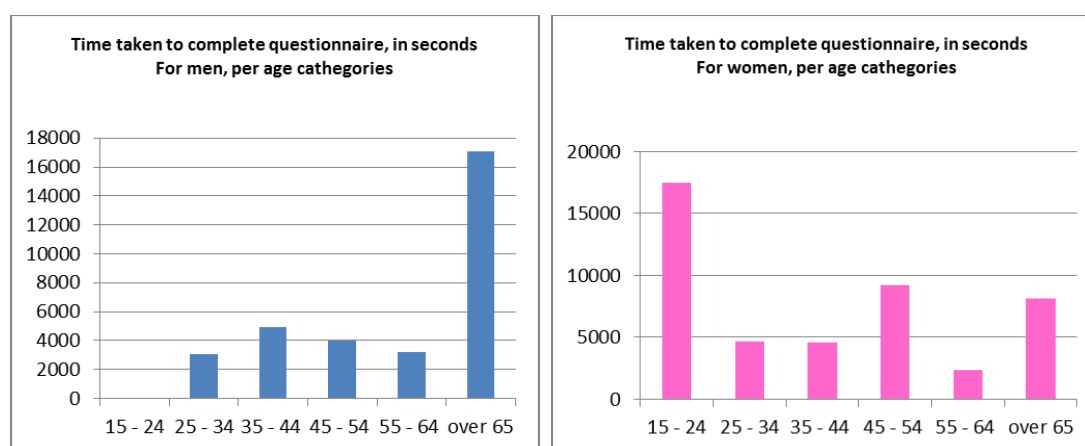
Respondents had the possibility to distribute their wealth over stocks and bonds, but could also choose to put all their (hypothetical) savings to either bonds or the stock portfolio. As it turns out, a mere Table 4 provides the percentage of respondents who do allocate (part of) the hypothetical pension savings to the stock basket, differentiating between gender and between condition (pink or blue).

Table 5. Respondents allocating part or all of money to stock basket (%)

	Blue	Pink	Color Gap (B-P)
Men	95.7%	92.9%	2.8
Women	92.6%	91%	1.6
Gender gap (M-W)	3.1	1.9	

Source: authors based on CentERpaneldata

As Table 5 shows, an overwhelming majority of respondents allocate some or all of the hypothetical pension savings to the stock basket. More respondents in the blue than in the pink condition allocate some or all savings to the stock portfolio, and this holds true for men and women. More men than women allocate some wealth to stocks, and this holds true for the pink and the blue condition. The gender gap is higher in the blue than in the pink condition (3.1 vs 1.9). There is also a color gap: in the blue condition more respondents allocate some or all to the stock basket than in the pink condition.

Figure 2. Decision time, gender, age

Source: authors based on CentER panel data

Note: male 15-24 to be changed!

Table 6 gives the average amount of pension savings allocated to stocks. It shows that on average respondents allocate a little over 50% of savings to stocks. This holds for both genders and across conditions. The differences between genders and across conditions are not significant.

Table 6. Average amount allocated to stocks, by portfolio colour and gender

	Blue	Pink	Colour Gap (P-B)
Men	52,196	54,753	2,557
Women	53,150	53,762	0,612
Gender gap (M-W)	-954	991	

Source: authors based on CentERpanel data

Note: would like to see what happens to average amount by color and gender if we eliminate all fifty/fifty, ie Table 7 for those not fifty fifty

Figure 2. Percentage allocated to stocks according to age

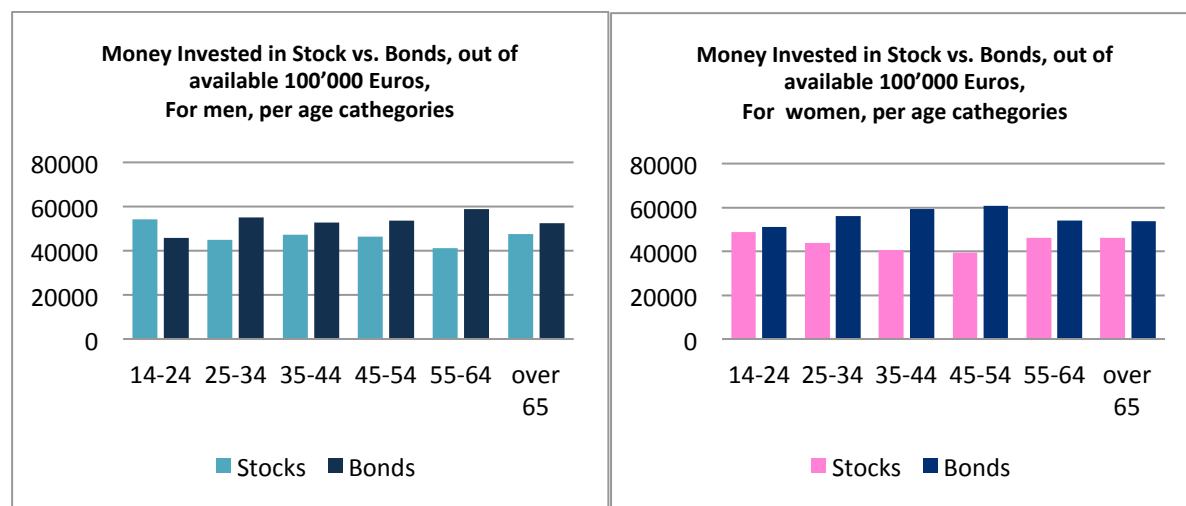


Figure 2 shows the percentage allocated to stocks, for men and women separately (not distinguishing between portfolio colour). We see that young respondents of both genders on average allocate the most to the stock basket. What stands out is that women in their thirties and forties invest *less* in stocks than women in their twenties and fifties, whereas for men the opposite is true. Speculating on an explanation for this difference, we note that women in their thirties and forties have children living at home which increases the probability that they combine work with caring for the family (through part-time), or choose to be a full-time home maker. This may imply that they are more home-and-family oriented, and more inclined to caring and sharing. It may also be, on top of this, that the world of investing is less familiar to them for this reason. For men, the stereotype of having to provide financially for the family might have the opposite effect during this period in life. No doubt these effects, if they play a role, are subtle and most likely unconscious.³

Finally, we focus on the effect of the response ordering. Within both decision conditions (pink and blue), respondents were randomly allocated to a question where the first line was the amount to allocate to bonds, with the remainder going to stocks, or first stocks, and the remainder going to bonds. It was NOT that after having filled in the amount to bonds

³ Fathers of boys tend to make more career than fathers of girls.

;8(stocks) the amount to stocks (bonds) was automatically calculated: respondents had to do that themselves. Neither were they forced to fill in the first line first. Rationally, the order should not affect the decision by the respondent. However, we find a significant framing (or response ordering) effect: respondents allocate more of the hypothetical savings to the investment opportunity that is presented first (see Table 6). The difference is larger and significant, and it is considerably and significantly larger for women than for men. If stocks come first, women allocate around 24,000 € more to stocks than if bonds come first. For men the difference is smaller, both absolutely (10,000 €) and in percentage terms.

Table 7. Response ordering effect: % allocated to stocks

	Men	Women
Stock basket first	56,670	60,851
Bonds first	46,623	36,866
Primacy effect (in €)	10,047*	23,985*

Source: authors based on CentER data panel outcomes

*significant effect

There are various possible (not mutually exclusive) explanations for this framing (response ordering) effect, as well as for the finding that it is much (and significantly) larger among women.

First, response order effects have been well documented in psychological and survey research, and they are found to be more likely for abstract questions (Dilman, 2001), to which our question definitely belongs. Both primacy and recency effects have been found in the literature. The primacy (recency) effect occurs if the first (last) option is more likely to be chosen, whatever it is (see eg Krosnick *et al*, 1996). The primacy effect has been explained by satisficing (Simon, ; Schwartz,) and tends to be more pronounced among women (Brunel and Nelson, 2003). Second, framing/ordering effects have been found when it comes to the domain of financial decisions involving risk. Van Rooij *et al* (2011), for example, find that a slight variation in the order of alternatives in a financial literacy questions has a large and significant effect on what people respond⁴. Their interpretation is that some respondents tend to guess the answer – even though this does not explain in itself why guessing would lead to a response order effect.

Note that in our case respondents do not need to choose between mutually exclusive alternatives, but instead can allocate over alternatives – with choosing fifty fifty coming

⁴ Their question was: Buying a company stock usually provides a safer return than a stock mutual fund (frame A) or Buying a stock mutual fund usually provides a safer return than a company stock (frame b).

closest to “guessing”. A possible explanation for our primacy effect is that the first alternative, whatever it is, may be regarded as the default.⁵ The default effect can be due to an interpretation that it is the choice recommended by experts, or the choice made by most people (Bodie and Prast, 2012). It has also been shown that default effects are larger if decisions are perceived as more difficult, and if cognitive capacity is low. Finally, the fact that we find a larger effect among women than among men is in line with findings in other domains that decision making by women is more context dependent, especially when women feel less secure (Croson and Gneezy, 2009).

5.2 Regression analysis of the allocation decision: log analysis, by gender, pink as dummy

We now turn to multivariate regression analysis of the results. In order to be able to relate the allocation decision to, and explain it by, various objective and subjective background characteristics, we mix our data obtained in September, 2013, with those of the most recent DNB Household Survey wave, that of 2012 which was published in March 2013.⁶ As not all respondents participating in our questionnaire did participate in the DNB Household Survey, 2012 wave, we lose some observations, ending up with 1290 panel members who took part in both. Moreover, some respondents that took part in both questionnaires did not answer all questions on the explanatories that we use. This leaves us in the regression analysis with a number of respondents that is lower, and differs according to the number of explanatories in the regression.

5.2.1 Log as dependent, dummy for stock basket

Allowing for a nonlinear relation, the dependent variable could be defined as the log of the amount allocated to the stock basket. The problem is that in that case we lose quite some observations (those who allocate zero to stocks) and that the number (percentage) of observations we lose differ according to gender and according to condition (pink/blue), while detecting a gender gap in relation to condition (pink, blue) is our main focus. This should be kept in mind when interpreting the first part of our regression analysis.

In order to be able to detect any gender differences in the determinants of stock allocation, we have chosen to analyse men and women separately. The control variable Pink is meant to represent familiarity for women so that we would expect a positive and significant sign. As other potentially relevant determinants we have used a quite standard objective and subjective background characteristics. As for the former, we have taken a look at the

⁵ Most research on ordering effects of responses alternatives focus on questions where respondents need to choose between earlier and later alternatives, instead of allocating over alternatives as in our study

⁶ http://cdata3.uvt.nl/dhs/files/SpaarOnderzoekCodebook_2012_en_1.2.pdf

standard variables age, education, income, amount of savings, whether the respondent has a job, lives in an urban area (taken as a proxy for familiarity with the financial world-stock listed companies eg through the higher probability of working in those industries), has a partner, and holds individual stocks or invests in mutual funds. The latter might have a positive or a negative effect. Positive, because it could be that investing in stocks is more familiar those who already own stocks, and negative because of diversification concerns. As to the latter, this should be the case less in the pink than in the blue condition. As subjective controls we have used self-assessed risk tolerance, as measured standard every year in the DHS. Note that on average men tend to overestimate their financial expertise, and that self assessed risk tolerance may also reflect ones perception of financial risk management ability, as mentioned in Section 2..

Recall that retirees are not in our sample, because we asked people about the allocation of savings for retirement.

Table 8. Regression results, by gender

Dependent variable = log of savings allocated to stock basket; basket = dummy					
	All	Female	Male	Female	Male
	(1)	(2)	(3)	(4)	(5)
	b/se	b/se	b/se	b/se	b/se
Pink	-0.3308* (0.1807)	-0.4209 (0.2582)	-0.2379 (0.2368)	-0.3407 (0.3087)	-0.3293 (0.2812)
Over 60	-0.1235 (0.3914)	-0.6872 (0.5541)	0.7354 (0.4963)	-0.6699 (0.5543)	1.1407** (0.5222)
Pink*Over60	0.8684** (0.3870)	1.6157*** (0.4349)	-0.1245 (0.6148)	1.4636*** (0.4611)	-0.1411 (0.6785)
Paidjob	0.0302 (0.175;89)	0.1446 (0.2388)	-0.1311 (0.2449)	0.2125 (0.2999)	-0.2277 (0.2913)
Age	0.0069 (0.0456)	-0.0459 (0.0491)	0.1034 (0.0900)	-0.0230 (0.0579)	0.1334 (0.0914)
age2	-0.0001 (0.0005)	0.0005 (0.0005)	-0.0014 (0.0011)	0.0004 (0.0006)	-0.0019* (0.0011)
Log of hh income	-0.2400 (0.2361)	-0.7188* (0.3683)	0.2108 (0.2853)	-0.4669 (0.4830)	0.1291 (0.4163)
Urban	0.2310 (0.1701)	0.0815 (0.2450)	0.3770* (0.2265)	-0.2115 (0.2922)	0.4076 (0.2656)
Control	0.3585* (0.2004)	0.4403 (0.2823)	0.2542 (0.2715)	0.4895 (0.4146)	0.1788 (0.3551)
Partner present	0.2223 (0.2791)	0.4831 (0.4490)	0.0184 (0.3745)	0.2451 (0.6425)	0.2073 (0.4833)
High education	0.0807 (0.1776)	0.1340 (0.2760)	0.0413 (0.2307)	-0.1161 (0.3250)	-0.2171 (0.2996)
Risk aversion				0.5263 (0.3490)	0.1473 (0.2932)
Total amount savings				0.0305 (0.0411)	-0.0165 (0.0284)
Having stocks				0.9430*** (0.2379)	0.3627 (0.2887)
Constant	11.5274*** (2.0316)	15.9104*** (2.6916)	6.5913** (2.8245)	12.9135*** (3.4947)	7.1677* (3.8513)
N	1290	690	600	445	424
R2+_p					
P	0.293	0.000	0.521	0.001	0.428

Source: authors' calculation based on Sept 2013 questionnaire and DHS wave 2012 published in March 2013; as not all questionnaire respondents were in that wave, the n of observations in columns

In this analysis, we find a pink portfolio effect among older women, and a significant effect of framing which is larger for women than for men. We also find that women who already own stocks allocate significantly more to the stock basket than women who don not, which may be interpreted as an effect of familiarity. We find no such effect among men. For men, we find a significant affect of age, once self assessed risk tolerance, having stocks and amount of savings is controlled for: the negative coefficient of age squared indicates that allocation to stock is higher for middle-aged men, which may (see next Subsection) have to do with household size, men with more children feeling pressed to take more risk in order to be able to provide for them. For women, we find a large and significant positive effect of already owning stocks, which could indicate familiarity, though not necessarily through the pink channel. Our analysis thus far does not indicate, however, that lack of familiarity with the companies most traded at the Amsterdam stock exchange explains the gender gap in

portfolio choice. **Note why didn t we include self assessed financial expertise as subjective explanatory?**

5.2.2 Share to stocks as dependent; stock baskets analyzed separately

Because of the potential bias of the above analysis due to the fact that the percentage of respondents who allocate nothing to stocks is not negligible *and* differs according to both gender and color, we have also done regressions taking the amount allocated to stocks (and not its log) as the dependent variable. Moreover, we also varied several other aspects. Thus, instead by representing the condition (pink or blue) through a dummy, we analyzed effects separately for both conditions. Within each condition, we did regressions for both genders as well as for men and women separately. Moreover, having found an affect of urban already, we were curious to see whether this might have to do with the industry respondents work in. Therefore we have added industry as explanatory. The results are given in Table 9.

FINDINGS

Table 9: Regression of the Amount invested in Stocks, relative to Familiarity and Status Factors

	(1)	All		(4)	(5)	Women		(8)	Men		(10)
Familiarity Factors:											
Pink Portfolio	10953.82*** (1388.86)		10598.46*** (1392.43)		13022*** (1863.41)		12596.71*** (1891.36)				
Index Portfolio				10598.46*** (1392.43)				8709.17*** (2076.39)		7855.92*** (2070.68)	
Status Factors :											
Gender		-3617.23** (1610.93)	-3724.85** (1576.78)	-3724.85** (1576.78)		(omitted)	(omitted)		(omitted)	(omitted)	
Age		-9.44 (66.06)	-9.47 (64.66)	-9.47 (64.66)		89.42 (91.14)	80.09 (88.40)		-99.94 (99.04)	-88.80 (97.99)	
Education		-286.66 (605.47)	-307.88 (592.62)	-307.88 (592.62)		653.28 (820.22)	469.15 (795.95)		-995.30 (922.45)	-863.23 (912.90)	
Main Occupation		512.58 (420.92)	396.67 (412.26)	396.67 (412.26)		489.43 (578.70)	181.01 (563.14)		347.67 (633.37)	381.37 (626.43)	
Household Position		2367.31*** (899.17)	2166.81** (880.47)	2166.81** (880.47)		3764.91*** (1249.04)	3308.14*** (1213.29)		-39.14 (1419.79)	-15.68 (1404.09)	
Partner		-4646.71 (2931.43)	-4614.50 (2869.19)	-4614.50 (2869.19)		-6922.84 (3919.63)	-6995.27 (3801.36)		3961.97 (4984.51)	2489.31 (4929.55)	
Household Size		-2161.16 (2159.40)	-2332.48 (2113.67)	-2332.48 (2113.67)		2170.90 (2538.87)	1857.37 (2462.70)		15013.74*** (4197.30)	14771.58*** (4151.33)	
Children		1424.91 (2242.82)	1868.01 (2195.96)	1868.01 (2195.96)		-3510.15 (2668.83)	-2698.35 (2591.16)		15083.12*** (4286.43)	14969.23*** (4239.05)	

*, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

FINDINGS

Table 9: Regression of the Amount invested in Stocks, relative to Familiarity and Status Factors (continued)

	(1)	All			Women			Men		
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
Familiarity Factors:										
Pink Portfolio	10953.82*** (1388.86)		10598.46*** (1392.43)		13022*** (1863.41)		12596.71*** (1891.36)			
Index Portfolio				10598.46*** 1392.43				8709.17*** (2076.39)		7855.92*** (2070.68)
Status Factors :										
Net Personal Income		0.54 (0.87)	0.40 (0.85)	0.40 (0.85)		-0.37 (1.67)	-0.46 (1.62)		-2.05 (1.69)	-2.32 (1.67)
Net Household Income		-0.33 (0.43)	-0.23 (0.42)	-0.23 (0.42)		-0.58 (0.47)	-0.49 (0.45)		2.23 (1.24)	2.43 (1.23)
Income Category Household		1252.70 (1022.64)	1325.93 (1000.97)	1325.93 (1000.97)		1228.12 (1412.57)	1249.16 (1369.94)		619.32 (1535.55)	713.86 (1518.76)
Urban Residence		1734.74*** (594.14)	1645.46*** (581.64)	1645.46*** (581.64)		1472.21 (801.00)	1625.95* (777.17)		2182.50** (886.72)	1929.72* (879.44)
Region Of residence		-569.86 (540.90)	-502.53 (529.49)	-502.53 (529.49)		-1018.43 (732.58)	-1081.17 (710.54)		-312.78 (800.61)	-152.25 (792.87)
Social Class		107.85 (700.41)	51.34 (685.58)	51.34 (685.58)		-169.07 (922.99)	-392.18 (895.76)		649.57 (1092.15)	778.13 (1080.59)
Religion		-189.45 (448.51)	-211.16 (439.04)	-211.16 (439.04)		-191.91 (591.73)	-336.13 (574.28)		-338.44 (689.70)	-291.23 (682.18)
Industry of work		113.91 (118.28)	86.81 (115.83)	86.81 (115.83)		156.40 (155.50)	71.03 (151.35)		36.64 (199.86)	59.19 (197.74)
Working status		-545.67 (2550.11)	-1614.76 (2499.91)	-1614.76 (2499.91)		-1377.57 (3348.52)	-3383.27 (3261.40)		792.83 (4221.50)	620.20 (4175.03)
Housing arrangement		-320.18 (1989.94)	-91.72 (1947.91)	-91.72 (1947.91)		1435.77 (2657.82)	1648.76 (2577.81)		-2184.30 (3026.41)	-2049.95 (2993.72)
Observations	1328	1317	1317	1317	710	704	704	618	613	613
R-squared	0.0448	0.0239	0.0656	0.0656	0.0645	0.035	0.0937	0.0278	0.0533	0.0757

From Table 9 we can see that living in an urban residence and household size/number of children increase the allocation by men, not women, of savings to stocks. Moreover, household position affects the allocation of savings to stocks by women, not men.

5.3 Time-to-decide on pension savings allocation

We can exploit a feature of the dataset which is very seldom available in survey data, i.e. the time taken to the questionnaire completion. Obviously, a longer decision time reflects that the respondent finds it more difficult to decide. This may be either because he has less knowledge, feels less confident, or the decision domain is less familiar, but also because he considers the problem is more important and aims at making the optimal choice. We have found that those who think longer choose more often fifty/fifty, and therefore we interpret a longer decision time as reflecting less confidence and familiarity. Note also that respondents are at home and could decide to take time to look up information on the internet that might be relevant to the allocation decision. The data show (see Table 4 in Subsection 4) that in the blue condition men decide quicker than women, whereas the opposite is true in the pink condition. This reversal of the gender gap in decision time results from the fact that women decide much quicker in the pink than in the blue condition, while men decide only a little bit quicker in pink than in blue. For a more thorough analysis, we study time-to-decide in a

multivariate context, adding several other explanatories to explain decision time. Taking time-t-decide as the dependent variable, and pink/blue condition as well as several perceived aspects of the decision as explanatories, we find that i) the effect of the pink portfolio on decision time by women remains large and highly significant, ii) that women who find the allocation decision thought provoking spend less time on the decision, whereas for men the opposite holds true (more thought provoking, more time spent) and iii) for men decision time is affected negatively by how difficult they consider the decision to be.

In order to test whether familiarity matters in determining the time to portfolio allocation, we regress it on familiarity as represented by the type of portfolio given (pink or blue) accounting for the perceived difficulty of the task, and the self assessed clarity, thought-provoking nature, interest, and pleasure in answering the question (Table 9). We find that the pink dummy is significant with a negative sign for women, indicating that the “familiarity” effect on decision time by women remains after controlling for other aspects of the question, as judged by respondents. We find no significant effect of pink for men. Another interesting finding is that finding the allocation decision thought provoking is significant among both genders, but with a different sign.

Table 9. Regression results decision time

	(1316.6)	(992.4)
Interest in the task	2769.61	-2615.88
	(1763.1)	(1355.8)
Pleasure of completing the task	-1838.69	1184.387
	(1688)	(1457.2)
Comments on the task	-10032.9	-8761.79
	(7512.7)	(5947.1)
Observations	705	614
R-squared	0.0192	0.0236
	Women	Men
	(2)	(3)
Pink Portfolio	-6132.05***	-416.052
	(2666.6)	(2078.8)
Difficulty of task	666.1979	-1856.66**
	(1018)	(930.8)
Clearness of task	31.46901	-1736.69
	(1446.8)	(1216)
Thought-provoking	-3043.38***	2940***

	Women	Men
	(2)	(3)
Pink Portfolio	-6132.05*** (2666.6)	-416.052 (2078.8)
Difficulty of task	666.1979 (1018)	-1856.66** (930.8)
Clearness of task	31.46901 (1446.8)	-1736.69 (1216)
Thought-provoking	-3043.38***	2940***

6. Discussion

How can our findings be interpreted in the light of other research and related work on the subject of (gender differences in) decision making?

We find that the average percentage allocated to stocks does not differ significantly between men and women and across the blue and pink condition. It is much higher than the percentage found by Van Rooij *et al* (2007) for the hypothetical allocation of pension wealth of the Dutch population as assessed through the CentERpanel. This difference may be due to

the fact that the sample by Van Rooij *et al* (2007) did contain retirees and ours did not. Moreover, the framing of the question and the examples of stock market outcomes differed.

Our finding in both the blue and pink condition, and among both men and women, that many respondents allocate the 100.000 fifty-fifty over bonds and stocks is in line with the $1/n$ heuristic found in previous empirical research on the allocation of pension savings (Huberman and Yang, 2008). This choice may be interpreted in various ways: it may be felt as the closest to not choosing or it is perceived as the recommended choice (default effect), or it reflects people's interpretation of optimal diversification. It should be noted that respondents choosing fifty fifty have taken a longer time to decide, indicating that fifty fifty is NOT an indication of indifference.

We find a large response ordering/framing effect, which differs significantly according to gender. Respondents tend to allocate more pension savings to the first asset mentioned, whether bonds or stock basket, a phenomenon which in questionnaire research is called the "primacy effect" (Brunel *et al.*, 2003). The effect is much larger among women than among men, a result which continues to hold in a multivariate regression analysis and is in line with previous research (eg Krosnick and Smith, 1997). This might reflect less confidence, less knowledge, or less familiarity (Croson and Gneezy, 2009). Finally, and perhaps this is our most important finding, we find a huge pink portfolio effect on the time it takes women, but not men, to decide on the pension wealth allocation. This cannot be explained by differences in financial literacy, as the trade of between risk and return did not differ across the pink and blue condition. Even though pink does not affect risk taking in our sample, it might affect stock market participation by women in the real world and therefore contribute to an explanation of the gender gap in the domain of life cycle saving and investing. Our finding that women, but not men, allocate more to the stock basket if they already own stocks, may also be due to familiarity.

However, we find no effect of the pink portfolio on risk taking by women (other than women over 60). There are various potential explanations. The first is that familiarity as such is irrelevant in explaining the gender gap in stock market participation and portfolio choice. The second is that familiarity with companies traded in the stock market is irrelevant. Both are however contradicted by the significant and large effect of pink on decision time by women. The third is that our pink portfolio is not a good measure of familiarity, for example because we should have used only Dutch magazines, should have used different pink portfolios for women of different ages, should have made sure that both the pink and the blue portfolio contained only Dutch companies/companies listed at Euronext/Amsterdam Exchanges. In fact, our pink portfolio did not contain a single Dutch company or company

listed at Euronext Amsterdam. It could also be that we should have familiarity not through companies advertisements in women s magazines, but according to the frequemcy with which women buy the consumption goods and services from companies, in line with the approach taken by Barbra Streisand: “We go to Starbucks every day, so I buy Starbucks stock” (cited by Druta, 2013).

Further research using stock baskets that take account of these flaws may shed light on which of these interpretation(s) hold(s). Moreover, our results may be biased because of the exceptionally high number of CentER panel members who chose not to respond after having seen the question, among which significantly more women. Perhaps this is due to the fact that our question did not allow for a “don’t know” answer (Bucker Koenen et al, 2012). We do not know whether a) more women would have participated if don t know was an option, and b) whether the percentage of don’t knows would have been different in the pink vs blue condition.

7. Summary and conclusions

Purpose of this paper was to add to our understanding of the gender gap in finance by using the concept of familiarity (Merton 1987, Huberman, 2001). We have used a very simple measure of familiarity: stocks whose companies advertise in women magazines were assumed to be more familiar to women, whereas stocks trade in the AEX were thought to be more familiar to men.

We do not find support for the hypothesis that a gender difference in familiarity with stock listed companies contributes to explaining the gender gap in risk taking. However, we find an effect of familiarity on decision time by women, which might in the real world lead to less participation – in our study, there was no possibility not to allocate wealth (other than by quitting the questionnaire, which was done by more women than men). From our finding that the primacy effect is both huge and significantly larger among women we conclude that the financial industry in general and the life cycle savings and insurance industry in particular should pay careful attention to gender in their communication and marketing. More research is needed to see whether does no permit us to conclude that a gender difference in familiarity is irrelevant, as constructing a pink portfolio based on advertisements in women’s magazines is just one way of creating familiarity to women.

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Appendix I Women magazine selection

We selected most popular women's magazines edited in USA, UK, France, Netherlands and Italy from 2010 through the summer of 2013. For each magazine we took one copy per season. We selected an international mix of magazines rather than a mere Dutch one for several reasons. First, the Dutch are well known for the large number of international magazines they read and that are found in bookshops. Second, with Internet people watch and read magazines online, and those may be Dutch as well as international. We did not base our selection merely on number of sales for the same reason, and because women, at least in the Netherlands, have a tendency to leave through several magazines before deciding to buy one of them.

Magazines	UK	USA	Italy	Netherlands
1	Elle	Elle	Anna	Libelle
2	Vogue	Vogue	Amica	Flair
3	Good Housekeeping	Good Housekeeping US	Donna Moderna	Viva
4	Cosmopolitan	Glamour	Gioia	Linda

Based on these magazine copies, we worked made a list of those companies that advertised at least once in these magazines and were stocklisted,/could be traced down to a listed parent, i.e. to a company whose stocks are traded on the exchange. These totaled 65. The non-listed companies and their small sub-firms were excluded from the sample, as there is no actual possibility to purchase their stocks. This resulted in the following list of advertising companies:;2

No.	Company	Stock Exchange	Product/industry	Heard of?
1	Apple	NYSE	ict	Y
2	Diamond Pet Food	NYSE	home/family	N
3	Expedia	NYSE	travel/socialmedia	Y
4	Facebook	NYSE	ICT/socialmedia	Y
5	Fossil	NYSE	apparel	Y
6	Kraft Foods	NYSE	home/family	Y
7	Steve Madden	NYSE	apparel	N
8	Johnson and Johnson	NYSE	hygiene	Y
9	Colgate-Palmolive	NYSE	hygiene	Y
10	Disney	NYSE	home/family	Y
11	Estee Lauder	NYSE	cosmetics L	Y
12	General Motors	NYSE	automobile	Y
13	Heinz	NYSE	home/family	Y
14	KKR	NYSE	financial	N

15	Kimberly Clark	NYSE	hygiene	N
16	Coca Cola	NYSE	home/family	Y
17	L.Brands	NYSE	apparel	N
18	Nike	NYSE	apparel/sports	Y
19	Procter and Gamble	NYSE	cosmetics/hygiene	Y
20	Philips	NYSE	electronics	Y
21	Revlon	NYSE	cosmetics	Y
22	Ralph Lauren	NYSE	apparel L	Y
23	Tiffany & Co	NYSE	apparel L	Y
24	IFF	NYSE	cosmetics	Y
25	Louis Vuitton	Euronext (Amsterdam)	apparel L	Y
26	PPR Group (Kering)	Euronext	apparel	N
27	Beter Bed	Euronext	home/family	Y
28	Danone	Euronext	home/family	Y
29	Dior	Euronext	apparel/cosmetics L	Y
30	Omega Pharma	Euronext	care/hygiene	N
31	Hermes	Euronext	apparel L	Y
32	SEB SA	Euronext L	electronics	N
33	Van de Velde	Euronext	apparel	N
34	Nestle	Euronext	home/family	Y
35	L'Oreal	Euronext	cosmetics	Y
36	Adidas	FWB (Frankfurt)	apparel/sports	Y
37	Beiersdorf	FWB	hygiene	N
38	BMW	FWB	automobiles L	Y
39	Douglas	FWB	cosmetics	Y
40	Henkel	FWB	hygiene	N
41	Porsche	FWB	automobiles L	Y
42	L'Occitane	FWB	hygiene	Y
43	Associated British Foods	LSE (London)	home/family	N
44	ASOS	LSE	apparel	Y
45	Burberry	LS;2E	apparel	Y
46	Britvic	LSE	home/family	N
47	Debenhams	LSE	apparel/home	Y
48	LG Electronics	LSE	electronics	Y
49	Marks and Spencer	LSE	apparel/food	Y
50	Mulberry Group	LSE	apparel L	Y
51	Reckitt Benckiser	LSE	hygiene	Y
52	H&M	OMX	apparel	Y
53	Sanoma	OMX	magazines	Y
54	Svenska Cellulosa	SCA	hygiene	Y
55	PRADA	SCA	apparel L	Y
56	Hutchinson Whampoa	SCA	miscall BtB	N
57	Esprit	SCA	apparel	Y
58	Richemont	SCA;2	apparel L	N
59	Shiseido	SCA	cosmetics L	Y

60		Wolford	SCA	apparel L	Y
61	\	Benetton	Borsa Italiana	apparel	Y
62;2		Luxottica	Borsa Italiana	apparel	Y
63		YOOX	Borsa Italiana	apparel/social media	Y
64	\	TOD'S	Borsa Italiana	apparel L	Y
65		Inditex	BMAD	apparel	N

From these companies, we selected 15 companies for further us. In making this selection, we tried to prevent

Appendix II Companies in the Pink and in the Blue portfolios

<i>Pink</i>	<i>blue</i>
1 Estee Lauder	1 Ahold
2 Dior	2 AIR FRANCE – KLM
3 Ralph Lauren	3 AKZO NOBEL
4 Tiffany & Co	4 ARCELORMITTAL
5 L' Oreal	5 ASML HOLDING
6 Zara	6 CORIO
7 Revlon	7 DE Master Blenders
8 Shiseido	8 RODAMCO DSM
9 Burberry	9 FUGRO
10 Ikea	10 ING
11 Douglas	11 Philips
12 Svenska Cellulosa	12 SBM OFFSHORE
13 Esprit	13 Shell
14 International Flavors and Fragrances	14 UNIBAIL
15 Prada	15 Unilever

Appendix III Questionnaire (Dutch, and English translation)

Pension savings allocation question.

Original version in Dutch

Stel u hebt honderdduizend euro ter beschikking om te sparen voor uw pensioen. ;8U moet dit verdelen over staatsobligaties met een rente van 4 procent en een mandje aandelen waarvan de opbrengst naar verwachting 8 procent zal zijn. U kunt pas aan uw geld komen als u de pensioenleeftijd hebt bereikt.

U belegt niet in individuele aandelen maar in een "mandje" van 15 verschillende aandelen, wat het risico vermindert zonder dat de opbrengst daardoor lager wordt. Immers, tegenvallers bij het ene bedrijf kunnen worden gecompenseerd door meevallers bij het andere.

Het geld dat u in de staatsobligaties stopt krijgt u te zijner tijd zeker terug, plus de rente die er elk jaar is bijgekomen. Het lijkt dus op een spaarrekening met een vaste rente. Het geld dat u in de aandelen stopt wordt naar verwachting gemiddeld acht procent meer waard per jaar. Maar dat is, anders dan de vier procent rente op de staatsobligaties, niet zeker. Er is een kans dat u er meer dan 8 procent bij krijgt per jaar en een kans dat u minder krijgt.

Een getallenvoorbeeld:

Als u alles in de staatsobligaties stopt is het bedrag over tien jaar zeker gegroeid tot ruim 148.000.

Stopt u alles in aandelen, dan is het over tien jaar naar verwachting ruim 215.000. Maar het kan ook meer zijn, bijvoorbeeld 280.000 euro, of minder, bijvoorbeeld 130.000.

Het mandje bestaat uit de volgende aandelen:

<i>if arandom=1</i>	<i>if arandom=2</i>
1 Estee Lauder	1 Ahold
2 Dior	2 AIR FRANCE -KLM
3 Ralph Lauren	3 AKZO NOBEL
4 Tiffany & Co	4 ARCELORMITTAL
5 L' Oreal	5 ASML HOLDING
6 Zara	6 CORIO
7 Revlon	7 DE Master Blenders
8 Shiseido	8 RODAMCO DSM
9 Burberry	9 FUGRO
10 Ikea	10 ING
11 Douglas	11 Philips
12 Svenska Cellulosa	12 SBM OFFSHORE
13 Esprit	13 Shell
14 International Flavors and Fragrances	14 UNIBAIL
15 Prada	15 Unilever

English translation

Imagine you have 100.00 euro's available to put aside for retirement. You need to allocate it over government bonds with an interest rate of 4 percent, and a basket of stocks which is expected to yield a return of 8 percent. You cannot touch the money until retirement.

You do not invest in individual stock but in a 'basket' of 15 different stocks, which reduces the risk without reducing the return, as bad outcomes of one firm may be compensated for by good outcomes of another.

Upon retirement you will receive with certainty the money that you put in the government bonds plus accumulated interest. Hence it is similar to a savings account with a fixed interest rate.

The money that you put in the stock basket is expected to increase in value eight percent each year. However, this is not sure. It is possible that it grows with more than eight percent each year, but also with less.

A numerical example.

If you put the whole amount in government bonds, it will be worth 148.000 in ten years. If you put everything in stocks, it is expected to be worth 215.000 in ten years. However, it can also be more, for example 280.000, or less, for example 130.000.

The basket of stocks consists of

<i>if arandom=1</i>	<i>if arandom=2</i>
1 Estee Lauder	1 Ahold
2 Dior	2 AIR FRANCE -KLM
3 Ralph Lauren	3 AKZO NOBEL
4 Tiffany & Co	4 ARCELORMITTAL
5 L' Oreal	5 ASML HOLDING
6 Zara	6 CORIO
7 Revlon	7 DE Master Blenders
8 Shiseido	8 RODAMCO DSM
9 Burberry	9 FUGRO
10 Ikea	10 ING
11 Douglas	11 Philips
12 Svenska Cellulosa	12 SBM OFFSHORE
13 Esprit	13 Shell
14 International Flavors and Fragrances	14 UNIBAIL
15 Prada	15 Unilever

How much would you put in government bonds and how much in the basket of stocks?