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**Citation for published version:**

Jacobsen, B, Lee, J, Marquering, W & Zhang, CY 2014, 'Gender Differences in Optimism and Asset Allocation', *Journal of Economic Behavior & Organization*, vol. 107, pp. 630-651.  
<https://doi.org/10.1016/j.jebo.2014.03.007>

**Digital Object Identifier (DOI):**

[10.1016/j.jebo.2014.03.007](https://doi.org/10.1016/j.jebo.2014.03.007)

**Link:**

[Link to publication record in Edinburgh Research Explorer](#)

**Document Version:**

Peer reviewed version

**Published In:**

Journal of Economic Behavior & Organization

**Publisher Rights Statement:**

© Jacobsen, B., Lee, J., Marquering, W., & Zhang, C. Y. (2014). Gender Differences in Optimism and Asset Allocation. *Journal of Economic Behavior & Organization*, 107, 630-651. 10.1016/j.jebo.2014.03.007

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# Gender Differences in Optimism and Asset Allocation

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This version: November 2013

## **Acknowledgements:**

We would like to thank Henk Berkman, Jacqueline Wise, and seminar participants at the FMA 2008, Dallas and the New Zealand Finance Colloquium 2007 for their helpful comments. This paper has also benefitted from presentation at the Goethe University and Frankfurt School of Finance and Management in Frankfurt, Germany. The usual disclaimer applies.

## **Abstract**

We investigate two alternative explanations why men may hold more stocks than women. Apart from a gender difference in risk aversion, gender differences in either optimism or in perceived risk of financial markets might cause men to hold more risky assets. Our results show that men tend to be significantly more optimistic than women regarding a broad range of issues, including the economy and the stock market. After taking differences in optimism into account systematic gender differences in asset allocations disappear. Our evidence also suggests that women indeed perceive stock market risk to be significantly higher than men offering a second alternative explanation why women invest less in stocks. (JEL D1, D8, D9, G11, Z1)

**Keywords:** Optimism, Gender Difference, Consumer Confidence, Economic Indicators, Risk Aversion

## I. Introduction

There is a wealth of evidence that women on average hold less risky assets than men do. For example, Jianakoplos and Bernasek (1998) document that single men invest on average 46 percent while single women invest only 40 percent of their wealth in risky assets.<sup>1</sup> This gender gap in equity holdings is often attributed to women being more risk-averse than men regarding financial risk (Jianakoplos and Bernasek (1998); Olsen and Cox (2001); Croson and Gneezy (2009); Watson and McNaughton (2007); Eckel and Grossman (2007b); and Charness and Gneezy (2012)). Standard portfolio theory, however, provides two alternative explanations; differences in asset allocations can also occur if investors have different expectations about future returns and/or different perceptions about riskiness of financial markets. In this study we consider whether these two alternative explanations can also help to account for gender differences in asset allocations.

We first investigate whether there are gender differences in expectations about the future in general and economic and stock market outlook in particular. Our results – based on Gallup polls and University of Michigan Consumer Sentiment Index surveys - indicate that this is the case; men tend to be significantly more optimistic than women regarding the economy as well as many other aspects of life. Next, we consider how gender differences in optimism affect investment decisions. We confirm the gender difference in risky asset holdings documented in the literature; an average male invests 47.4 percent of his wealth in stocks while an average female only 43.0 percent (a statistically significant difference with a  $t$ -value of 4.50). However, when we take optimism into account we find that differences in optimism are related to differences in portfolio

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<sup>1</sup> Cohn et al. (1975) also find that non-professional female investors allocate less of their portfolios to risky assets. Sunden and Surette (1998) conclude, using household data over 1992 and 1995, that women tend to invest their retirement funds in less risky assets than men. Similarly, Agnew, Balduzzi, and Sunden (2003) find that male pension fund participants' equity allocation is higher at 42.5 percent compared to that of female participants at 33 percent.

holdings; optimists invest more in equity, 50 percent of their entire portfolio versus 35 percent for very pessimistic investors. Our results further indicate that a gender gap in risk holdings in large part stems from women being more pessimistic; after controlling for optimism and other personal traits, we do not find a statistically significant difference in risky holdings between male and female investors. Indeed, we find that very optimistic women invest almost 5% more in stocks than very optimistic men do. We also document evidence that women perceive stock market risk to be significantly higher than men, which could also potentially lead women to hold less stocks in their portfolios.

In short, our paper finds supporting evidence for the two alternative explanations for a gender gap in risky holdings; women expect worse future stock market performance and they also believe that the stocks are more risky than men do. These findings can help bridge the gap between field data and experimental evidence; while field studies based on difference in portfolio holdings claim that women are more risk-averse, evidence from laboratory experiments studying gender differences in risk aversion remains inconclusive. Our findings suggest that differences in the riskiness of actual portfolios may also be caused by gender differences in optimism and perceived risk and need not stem from differences in risk aversion alone.<sup>2</sup>

In all cases where data from other countries are available, empirical evidence corroborates the US results. With international Consumer Confidence data from all relevant questionnaires available from the Roper Center<sup>3</sup>, we find that males are on average more optimistic than females in all 17 European countries that we examine, and significantly so in 16 countries. Our results are also

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<sup>2</sup> Our alternative hypothesis would also explain the finding of Schubert et al. (1999) who find no difference in risk propensity when subjects face contextual decisions.

<sup>3</sup> The Roper Center is an archive—it preserves the data from polls conducted by many leading survey organizations for the use of researchers, students, and journalists (<http://www.ropercenter.uconn.edu>).

robust over different time periods. For instance, in the US there has only been one month (March 2000) since 1978 when consumer confidence of women was higher than consumer confidence of men based on the well-known University of Michigan Consumer Sentiment Index surveys of at least 500 respondents each month. The gender difference in optimism is not limited to the stock market alone but also applies to other aspects of economy such as economic growth, interest rates, and inflation. It also holds regardless of whether we consider questions about the respondent's personal future economic situation or the general state of the economy. To verify whether the observed gender difference in optimism holds beyond economic variables we search all surveys collected by the Roper Center for Public Opinion, for all questions with gender specific results and where respondents could express different degrees of optimism and pessimism. We find 24 additional questions in 33 different polls and surveys from mostly NBC News/*The Wall Street Journal* and ABC News/*The Washington Post* over the period 1999 to 2008.<sup>4</sup> The results suggest that with the exception of questions regarding government gender difference in optimism is persistent in general. As questions focus on the degree of optimism/pessimism, this also minimizes the probability that these differences are caused by participants underestimating the likelihood of different future scenarios. (see for instance Fehr-Duda, De Gennaro, Schubert, 2006). In short, we document pervasive gender difference in optimism across different countries, time periods, and dimensions. This gender difference after persists after we control for other personal traits such as income, employment, wealth, education, and marital status.<sup>5</sup>

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<sup>4</sup> While we realize this may lead some extent to a smorgasbord of questions, using many different questions from different sources based on questionnaires developed by professionals assures robustness and minimizes the likelihood that our overall results are affected by incorrect phrasing of questions.

<sup>5</sup> We also show that this is not a result of the so-called "white male" effect.

While academic studies in psychology offer support for the popular view that men and women “originate from different planets”<sup>6</sup> (Hyde, 2005, p. 581) gender differences in optimism have received relatively little attention. This is surprising as optimism may also be a critical component in various aspects of life. For instance, according to several health studies optimists, on average, have lower blood pressure, cope better with stress, show better recovery from cancer and coronary bypass surgery, and are less likely to become depressed.<sup>7</sup> Given the importance of optimism in other social sciences and the importance of optimism for health-related issues, our finding of a strong gender difference in optimism may have implications beyond economics. Moreover, in many instances, gender differences are attributed to differences in risk aversion – for example, the likelihood of nuclear war, dangers of alcohol and drugs, technology, radioactive waste, preferred US presidents, economic consumption, the labor market, and investment decisions. As with different equity holdings of men and women, differences in optimism or perceived risk may also play an important role in explaining these differences.

This study contributes to the growing literature on market participants’ heterogeneity in expectations. Carrol (2003), Vissing-Jorgensen (2003), Amormin and Sharpe (2009) demonstrate that market participants hold different expectations about stock market performance and broad macroeconomic variables such as unemployment and inflation. Several studies show that heterogeneous expectations play an important role in numerous economic decisions - corporate management financial decisions and entrepreneurs’ behavior (March and Shapira (1987); Gervais, Heaton, and Odean (2011); Hackbarth, 2007), asset management and asset pricing (Lee, Shleifer, and Thaler (1991); Barberis, Shleifer, and Vishny, (1998)), and consumer expenditures (Kacperczyk and Kominek, (2002)). Puri and Robinson (2007) show that their measure of

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<sup>6</sup> According to Hyde (2005), the well known book by John Gray, *Men Are From Mars, Women Are From Venus*, has sold over 30 million copies and has been translated into 40 languages.

<sup>7</sup> See for instance Felton, Gibson and Sanbonmatsu (2004) and the references within.

optimism based on self-reported life expectancy is related to numerous life and economic choices, such as work intensity, remarriage, retirement, savings decision, and among other things investment in individual stocks.<sup>8</sup> Our paper is closely related to Dominitz and Manski (2007) who document significant gender differences in beliefs about future stock returns and find that the heterogeneity in reported beliefs leads to differences in the probability of holding stocks. Our study differs in that we directly show that asset allocation varies with future expectations about the stock market and that we measure equity holding as a reported percentage of stocks in the portfolio rather than as binary variable whether or not people own stocks or not.

We define optimism as positive expectations about future events in question in line with the literature. For instance as Carver, Scheier, Segerstrom (2010) define it in their overview study: “Optimism is an individual difference variable that reflects the extent to which people hold generalized favorable expectancies for their future.” We do not take a stance on biases related to optimism or pessimism nor their wealth implications.<sup>9</sup> Instead, our interest is in general patterns in optimism and its effects on asset allocation. The optimism we refer to is different from “overconfidence” about skills or estimates (for example, see Barber and Odean (2001)) as we restrict our attention to expectations about outcomes beyond the control of individuals.<sup>10</sup> For example, a large part of the survey questions we examine are about general macroeconomic indicators such as economic growth and inflation about which individuals would not hold specific information.

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<sup>8</sup> Recently a number of papers study the effects of optimism and investments. These include Balasuriya, Muradoglu and Ayton (2013), Kaya (2012) and Patel (2012).

<sup>9</sup> There is a strand of literature in psychology and medicine that emphasizes positive impact of dispositional optimism while standard utility theory suggests any bias in expectations would lead to a sub-optimal choice. For a review see Puri and Robinson (2007).

<sup>10</sup> Some authors (for instance, Barone-Adesi, Mancini, Shefrin, 2013) refer to expected means as (over)optimism and to expected volatility as (over)confidence. In that sense one might interpret our findings on men perceiving lower stock market risk as men being more (over)confident. However, in our case this gender difference in perceived risk could be caused by other factors as well.



For clarity it may be good to separate risk aversion, optimism and (perceived) risk. When we talk about optimism and perceived risk we talk about the likelihood and possible variation in future states. This follows the convention in the finance literature where we distinguish between the (perceived) characteristics of the probability distribution—the (perceived) likelihood of states, (perceived) differences in mean and standard deviation—versus risk aversion (the willingness to take on risk). In other words, two people may have exactly the same perception of a probability distribution (same degree of optimism and risk perception), but still make a different asset allocation decision due to a difference in risk aversion. Vice versa, people may have the same level of risk aversion, but still make different decisions based on a difference perception of the likelihood of different states occurring, because they have different degrees of optimism or different perceptions of the variation in these possible states. Therefore, if men are more optimistic, if optimism about the stock market determines portfolio holdings, a gender difference in optimism rather than risk aversion may also explain why women invest less in stocks on average. This requires that optimism and risk aversion are not strongly correlated. But that does not seem too strong an assumption, given results we discuss below and evidence in Puri and Robinson (2007). They find that optimism and risk aversion are uncorrelated. Our results on perceived risk might in turn be related to optimism if both were strongly negatively correlated. However, while negative correlated (with a correlation coefficient of -0.3) this correlation does not seem high enough to conclude that both effects are essentially the same.

We also contribute to the literature documenting gender differences in optimism towards a wide range of issues. While there are studies on gender differences in optimism about various aspects in isolation, to our knowledge there is no comprehensive empirical evidence documenting gender gap in optimism in general. Gwartney-Gibbs and Lach (1991) for instance document that women are significantly more pessimistic in their nuclear war attitudes than men. Chaney, Alvarez, and

Nagler (1998) try to explain the gender gap in US elections and report some evidence for the US that women are significantly more pessimistic about the current state of the economy in general and their current personal finances. Females are also shown to be more pessimistic about online purchases (Garbarino and Strahilevitz (2004)), marriage (Lin and Raghuram (2005)), and predicted role strain in Parkinson's disease spouses (Lyons et al. (2009)).

## **II. Are men more optimistic?**

We first consider whether men may be more optimistic regarding the future in general and economic and stock markets in particular. We start with economic variables and stock markets.

### *II.A. Consumer sentiment*

To examine the difference in optimism between men and women, we start with one of the most important consumer sentiment indicators: the University of Michigan Consumer Sentiment Index.<sup>11</sup> Investors consider this a main indicator to gauge the state of the US economy.<sup>12</sup> The University of Michigan conducts surveys on a monthly basis since January 1978. The survey has a sample size of 500 and addresses how consumers view prospects for their own financial situation; how they view prospects for the general economy over the near term; their view of prospects for the economy over the long term; and their view on buying conditions (we report the exact questions in Appendix). One of the main objectives of the index is to measure the level of optimism/pessimism in the consumer's mind (relative to a base level of 100).

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<sup>11</sup> Their website contains the data and details: <http://www.sca.isr.umich.edu/main.php>.

<sup>12</sup> In our robustness section we consider the results for 17 other countries.

Figure 1a plots the Michigan Consumer Sentiment index but rather than considering the total index we separate the index based on answers by men and women in the US over the period January 1978–December 2005. Figure 1b plots the difference between the two. This gender difference in consumer sentiment is striking. With the exception of March 2000 men are always more optimistic than women. And even in that month average female consumer confidence index exceeds its male counterpart only marginally so ( $-0.3$ ). On average there is a 10 point gap, and this difference is statistically highly significant with a t-value of over 10.

[Figure 1a and 1b around here]

The US consumer confidence index is based on the respondent's perception of both current and future state of personal and general economic conditions. But men may be more optimistic (or less pessimistic) than women regarding their own private situation because they feel they have the ability to influence the outcome. Therefore, we separate the results into both personal and general questions about the economy. We report the gender differences in the overall results and the five main questions from the questionnaire in Table 1. These questions focus on the current personal situation, the future personal situation, the general short term future (12 months), the general longer term future (5 years) and whether it is currently a good time to invest in durables (We report the five questions in the appendix).

[Table 1 around here]

Men are less pessimistic (or more optimistic) in all dimensions—current, future, personal, and general economic conditions. If anything, differences tend to be larger when we consider general economic circumstances on which respondents have no direct influence.

To control for other characteristics we need to examine individual responses. These are not available from the consumer confidence data so we turn our attention to the US Gallup surveys.

### *IIB. Economic & Stock market data US Gallup polls*

The US Gallup Organization conducts telephone interviews with randomly chosen heads of US households or spouses with total savings and investments of \$10,000 or more. Data are available from November 1996 to December 2002, in quarterly intervals until February 1999 and in monthly intervals afterward. We source data from a total of 56 surveys with around 1,000 observations for each survey available from the Roper Center. Survey questions ask the subject's outlook for future general economic conditions and stock market performance. In addition to questions related to future stock market performance, the Gallup data contain personal information of the respondent, such as income, level of education, and age.

The questions we focus on ask about the respondent's outlook of macroeconomic factors, economic growth (US Gallup code 1523), unemployment rate (code 1524), inflation rate (code 1526), interest rate (code 1527), and outlook of stock market performance (code 1525):

A major advantage of these questions is that they ask how optimistic/pessimistic respondents are instead of asking the respondent to predict a direction of future changes or estimating the likelihood of possible scenarios. Thus, these questions capture optimism of a respondent regardless of the position of the respondent, e.g., how optimistic a respondent is about interest rates regardless of whether he is a net lender or a net borrower. For stock market outlook, we also

examine whether the respondent believes the stock market will go up or down in three months. (code 2332) and in one year (code 2485).<sup>13</sup> The exact survey questions are in the appendix A.

We treat answers indicating “Don’t Know” and “Refused” as missing and discard observations with obvious coding errors, such as an undefined value for gender. We exclude questions in the UBS/Gallup survey that ask specifically about expected returns on personal portfolios (which may differ due to portfolio composition) and on short- and long-term expected market returns as these are likely to be error prone.<sup>14</sup>

Table 2 presents summary statistics of the responses. The average numerical answers from both male and female respondents are greater than the mid-point of the scales. This data indicates that on average both men and women are optimists with respect to the economic future. However, in all questions related to optimism, the averages for female respondents are lower than for male respondents. The *t*-statistics for these gender differences are—as with our consumer confidence data—highly significant. The results in Table 2 confirm what we find in the consumer confidence data: men are more optimistic than women. We now verify whether we find similar results once we control for other confounding factors like wealth, education, age, income and employment.

[Table 2 around here]

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<sup>13</sup> We reverse the original coding scheme of question 2485, the greater the numeric response the more pessimistic the respondent, in order to make it in line with the other questions.

<sup>14</sup> As Campbell (2003) points out, the respondents need to understand the difference between annual and cumulative returns in those questions about expected returns. Moreover, the questionnaire did not allow for negative expected returns before 2000 (private correspondence with Terrance Odean) and answers have to be coded by interviewers in two steps afterward (separate codes for size and sign) that may result in a high error level. An evaluation of responses given suggest that these questions may have been too difficult to answer in a survey that involves telephoning people at home in the evening as also Campbell (2003) suggests. See McFadden et al. (2005) for detailed discussion about potential biases in survey responses.

Table 3 presents the results of ordered logit regressions of the survey questions responses on female dummy equal to 1 for females and other control variables<sup>15</sup> with month fixed effects.<sup>16</sup> The control variables are Worth, a dummy variable equal to 1 if the respondent's total amount of investment is greater than \$100,000; Edu, a categorical variable assuming the value of 1 for education level below undergraduate degree, 2 for undergraduate education, and 3 for postgraduate education; Inc, a categorical variable equal to 1 for an annual income below \$50,000, 2 for an annual income between \$50,000 and \$100,000, and 3 for an annual income above \$100,000; Retired, a dummy variable equal to 1 if the respondent is retired; Emp, a categorical variable taking a value of 1 if the respondent is unemployed, 2 if the respondent has a part-time job, and 3 if the respondent works full-time; and Age, the self-reported age of the respondent. If the gender difference in optimism we document in previous sections merely reflects differences in personal characteristics between genders, one would expect the coefficient of the dummy variable for females to be insignificant.

[Table 3 around here]

The ordered logit regression results confirm our earlier results. For all questions on macroeconomic and stock market outlook, the coefficient on the female dummy is significantly negative with *t*-statistics in all cases greater than 10 (in absolute values). The results are robust to the inclusion of control variables indicating that female respondents choose less optimistic alternatives also after taking personal differences into account.

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<sup>15</sup> We consider marital status as a control variable in Section VI.B.

<sup>16</sup> Results without month fixed effects are similar.

As we rely on reported optimism from surveys an inherent concern is that respondents do not mean what they say. In particular, respondents may unwittingly combine risk aversion and pessimism in their answers by overestimating probabilities of bad economic states to compensate for their risk aversion. Given that empirical evidence to date documents a negative (Guiso and Paiella (2008)) or no (Brunnermeier and Nagel (2008)) relation between wealth and risk aversion, the negative (positive) correlation between wealth (Worth) and optimism (pessimism) presented in Table 3 indirectly suggests that the responses about optimism are not solely driven by risk aversion.

The effects of the other control variables on optimism are less consistent in general. For instance, the coefficient on the level of education, Edu, is insignificant in several regressions and also flips sign.

### *IIC. General Survey Results*

Is the difference in optimism limited to economic and financial situations or does it hold more generally? As we mentioned in the introduction to date the literature has not established a firm gender difference in optimism. Clearly, given the importance of optimism in general it is important to consider whether this holds beyond just economic and financial variables. Apart from the broader implication, this is an interesting question for another reason as well. If knowledge of a topic is related to a person's evaluation of that topic, one could argue that women might in general be less knowledgeable about the economy and therefore more cautious in their assessments. Economic literacy differences would then be the root cause of the differences we observe. Finding significant differences beyond questions related to the economic situation also shows that differences in knowledge cannot explain our findings.

Using *all* surveys collected by the Roper Center for Public Opinion, we searched for all questions with gender specific results and where respondents could express different degrees of optimism and pessimism. We found 24 additional questions in 33 different polls and surveys from mostly NBC News/*The Wall Street Journal* and ABC News/*The Washington Post* over the period 1999 to 2008.<sup>17</sup>

The question with the smallest sample is based on 448 respondents, and the largest sample has 10,875 observations. The questions deal with personal issues like personal (family) future outlook, financial situation, retirement, and with more general issues, such as terrorist attacks, the moral climate, and the government system. In these surveys some questions relate to economic issues and we keep those as a robustness check of our previous results.

Table 4 provides summary statistics and gender difference tests for the 24 general survey questions.<sup>18</sup> Consistent with our findings in the Gallup survey, both male and female respondents are on average optimistic about the situations asked in the questions as means are frequently above the mid-point of the scale (1.5). Exceptions are, for female's responses on, the situation in Iraq, the moral climate in the country, the policies Bush will pursue, and being able to retire at a reasonable age, which are below 1.5. The *t*-statistics correspond to the test of different means for male and female responses. Average responses for women are less optimistic than men in 18 out of 24 questions with a significant level of 5 percent (one-sided test) or higher. Women are less optimistic than men about the country's future, the situation in Iraq, the country's ability to defend against terrorist attacks, the moral climate in the country, the country's ability to respond

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<sup>17</sup> A table with detailed information on each question is available upon request from the authors.

<sup>18</sup> As before, we find similar results if we control for other factors using ordered logit regressions. For brevity we do not report these results, but they are available upon request from the authors. Of these control variables, education, income levels, and age do not show a consistent relation with optimism. But married people tend to be frequently more optimistic than singles; the *t*-statistics are significant at the 5 percent level in 7 out of 24 questions.



to natural disasters, the policies Bush will pursue, the economy, personal situations, long-term optimism in general, and being able to retire at a reasonable age. We have insignificant results for the policies the Democrats in Congress will pursue over next 12 months, soundness of economic system in long run, optimism/pessimism about things in next year, and optimism/pessimism about the future in general. These are insignificant although the estimated signs are negative (more women answered less optimistic than men). There are only two questions where female respondents are on average more optimistic than male respondents, however only one of them is statistically significant.<sup>19</sup>

[Table 4 around here]

Summing up it seems that men tend to be more optimistic than women on many issues. We now consider gender differences in portfolio holdings.

### **III. Gender, Optimism and Asset Allocations**

Women hold on average less risky portfolios than men. For this reason it is often believed that women are more risk averse than men regarding financial risk. Using a standard formula in finance that relates the optimal weight in risky assets and risk aversion, it is easy to see why.<sup>20</sup> Consider a risky and risk-free asset. The mean-variance optimal weight for an investor in the risky asset is given by:<sup>21</sup>

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<sup>19</sup> Interestingly, both questions relate to government. A possible explanation is that women are generally more socially engaged, and government actions are often viewed as a social redistribution of wealth (see, e.g., Ruthig and Allery, 2008). Women may also benefit relatively more from this redistribution (Lott and Kenny, 1999). Studying systematic variations in gender gap in optimism is beyond the scope of this study and left to future research.

<sup>20</sup> Note that this simple one period model assumes risk aversion is constant. However, risk aversion might vary over time. Unless this change is perfectly correlated with our gender differences in optimism/risk variables, this should not explain our results.

<sup>21</sup> We assume a simple one period mean-variance optimization here for simplicity. However, our argument holds more generally.

$$w^{opt} = \frac{E[r] - r_f}{A\sigma^2},$$

where  $E[r]$  denotes the expected return on the risky asset;  $r_f$  the return on the risk-free asset;  $A$  the degree of risk aversion of an investor; and  $\sigma^2$  the variance of the risky assets.

If women hold on average less risky portfolios, it is tempting to conclude that they are more risk averse. However, there are at least two alternative possibilities that might explain this difference. From the formula it is easy to see why. In the formula the risk free rate is a given. However, both expectations about future returns and perceptions of risk of the stock market (variance) may differ from one person to the next. The higher expected returns, the more an investor is inclined to invest in these risky assets. If perceived risk is higher, this will lead to less investment in the risky assets. Therefore, ignoring perceived risk for the moment; if men are more optimistic, if optimism about the stock market determines portfolio holdings, and if optimism and risk aversion are uncorrelated (as Puri and Robinson, 2007, show), a gender difference in optimism rather than risk aversion may explain why women invest less in stocks on average.

Expected stock returns depend on expectations about future company cash flows that in turn depend on future economic conditions. Hence, the assumption that optimism about the stock market determines portfolio holdings does not seem unreasonable. If a difference in opinion between future economic conditions would imply for instance, a 1 percent lower expected return on stocks, this would—using reasonable parameter estimates—imply a 5–10 percent lower portfolio weight in stocks with no difference in risk aversion between men and women. For instance, using data for the S&P 500 including dividends and the short-term Treasury bill from 1920 gives an annual risk premium of 6 percent and a standard deviation of 20 percent. With a

risk aversion of three, this would imply a portfolio weight in stocks of 50 percent. A 1 percent lower expected return would result in a portfolio weight of 42 percent. Jianakoplos and Bernasek (1998) report that single women invested 40 percent of their wealth in risky assets and single men 46 percent.<sup>22</sup>

Can we establish this link between optimism, gender and portfolio holdings more directly using our survey data? Individual portfolio holding data are available in five UBS/Gallup surveys (November 1996, February 1997, August 1997, November 1997, and September 1998) with a total number of observations on these portfolio holdings of 4,343.

These data go a step further than those of Dominitz and Manski (2007) who consider whether or not investors hold stock, whereas here we have some information on portfolio composition. Of course, there are limitations to the data. We simply observe the equity percentage for males and females. We do not know the portfolio composition of the individual securities nor how often the portfolio weights are changed. Clearly, risks of individual portfolios may differ. It would be interesting to verify our results with actual portfolio data for single investors from a brokerage, but we do not have these in combination with self related statements regarding levels of optimism.

What is at least reassuring is that based on this sample our results match the results of Jianakoplos and Bernasek (1998). We find that average man invests 47.4 percent in stocks versus 43.0 percent for the average woman (a statistically significant difference with a  $t$ -value of 4.50). This difference is often attributed to risk aversion in the literature. When we examine portfolio

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<sup>22</sup> Only few studies in this fast growing strand of the literature (see, for instance, Bajtelsmit and Bernasek, 1996) do report actual differences in portfolio holdings.

holdings and respondents' optimism about future performance of the stock market (Question 1525), an alternative explanation emerges.<sup>23</sup> Figure 2 splits this gender difference in stock holdings using the five answer categories (from very pessimistic to very optimistic) based on the regression results in Table 5 (with and without controls).

[Table 5 around here]

[Figure 2a and 2b around here]

If only risk aversion determined portfolio holdings, we would expect a flat line in Figure 3 and a constant difference between the genders. However, the figures show that regardless of gender, respondents hold more stocks if they are more optimistic about the future performance of the stock market. Optimists invest more in equity, 50 percent of their portfolio versus 35 percent for the very pessimistic. On average, optimistic men invest 49.8 percent in stocks, and optimistic women 48.6 percent. These averages are considerably higher than those of pessimistic men and women, 41.3 percent and 38.9 percent, respectively. Moreover, when we examine very pessimistic and very optimistic men and women, there is no consistent difference between them. Strikingly, very optimistic women invest more in stocks (almost 5 percent after control variables) than very optimistic men.

To control for other potentially confounding factors, we regress stock holding on stock market outlook (see code 1525 in Section III.A), female dummy and other control variables, and report the results in Table 5.<sup>24</sup> If stock market outlook of respondents affect their stock holdings, one

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<sup>23</sup> Other questions regarding stock markets do not overlap with our portfolio holdings data.

<sup>24</sup> We report the results with raw percentage stock holdings as dependent variable because there are 785 observations with stock holding of either 0 or 100 percent, which is not defined under the logit transformation. The ordinary least square regression results with the logit-transformed stock holdings are similar to those reported, however.

would expect negative (positive) coefficients on dummy variables for pessimism (optimism). Female dummy would pick up the effects of gender differences other than optimism/pessimism, such as different risk aversion and perception of risk. The results in Table 5 support our conjecture that optimism or pessimism affects investor's stock holding. The dummy variables for pessimism (Pes1 for extreme pessimism and Pes2 for moderate pessimism), have negative coefficients and those for optimism (Opt4 for moderate optimism and Opt5 for extreme optimism), except for in one case, have positive coefficients. Out of 20, 13 of them are statistically significant at the conventional 5 percent significance level. Moreover, moderately pessimistic investors on average put a greater fraction of their wealth in stocks than extremely pessimistic investors as the differences in the coefficients on dummies, Pes2 and Pes1, are positive.<sup>25</sup> On the other hand, the results show that the degree of optimism from the survey in general is less important than the fact that the respondent is optimistic; the coefficients on the dummy for extreme optimism are not different from those on the dummy for moderate optimism.<sup>26</sup> The female dummy is negative indicating that female investors tend to invest less in stocks on average after their outlook about stock market is taken into account. However, the coefficient of the female dummy loses its statistical significance when other personal characteristics are controlled for. These result suggests that optimism is an important determinant of portfolio allocation and once we control for this gender difference in optimism we no longer find a significant gender difference in portfolio holdings.

#### **IV Perceived Risk and Gender**

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<sup>25</sup> The differences (not reported) are statistically significant in all cases.

<sup>26</sup> Puri and Robinson (2007) also find that moderate optimists and extreme optimists behave differently with regard to savings decision, repayment of credit card debts, and planning horizon.

As we pointed out in the previous section there is yet another reason why men might invest more in stocks on average. If women perceive the risk of the stock market to be higher they would optimally choose to invest less in stocks.<sup>27</sup> There is one question in the US Gallup polls that allows us to investigate whether this explanation might have some merit. It asks respondents to rate the current level of risk for investing in the stock market on a scale from 1 to 10.

UBS/Gallup made changes in questionnaire design throughout the sample period and thus, not all questions are present in all surveys; for instance, this question about stock market risk, code 2707, is present in only 10 surveys, March 2002 through December 2002.<sup>28</sup> This sample period for perceived risk do not overlap with that of stock holdings precluding an analysis of direct link between the two. Nonetheless, it would be interesting to see if there exist gender differences in perceived risk of stock market in a direction consistent with the observed differences in stock holdings.

[Table 6 around here]

The responses to the only question about the respondent's perception of stock risk presented in Table 6 show that genders differ in risk perception as well. Female respondents are more likely to predict a higher level of stock market risk than male respondents are. The *t*-statistics corresponding to the female dummy are close to 6 with and without the control variables. To the best of our knowledge it is a novel finding that women foresee a greater level of stock market risk. Thus, apart from a gender difference in the level of financial indicators, the data we have indicate a similar phenomenon in the perceived riskiness of financial investments.

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<sup>27</sup> As we noted in the introduction this might be a result of difference in (over)confidence but could also be a result of other factors.

<sup>28</sup> We cannot examine the direct link between perceived risk and stock holdings as the sample periods of the data do not overlap.

As with the difference in expected returns a marginal change in perceived riskiness can also have a strong effect on asset allocations. For instance in the example for the S&P 500 above, if we would increase the standard deviation 1 percent from 20 to 21 percent annually this would imply a 5 percent lower portfolio weight (from 50% to 45%) in stocks with no difference in risk aversion (or expected returns) between men and women.

Last but not least it may be good to consider the correlation between optimism and perceived risk. If optimists also have a lower perception of risk and these effects are highly negatively correlated, we might be measuring the same thing. However, this is not the case. If we correlate optimism with perceived risk (using answers to questions 1525 and 2707) we do find a negative correlation and significant correlation of -0.30 but that does not seem large enough to suggest that we are measuring the same effect.

## **V. Robustness Checks**

### *VA. International Consumer Confidence Survey Data*

To examine whether the difference in optimism between men and women is robust across countries and cultures, we now consider the monthly consumer confidence data for 17 additional countries.<sup>29</sup> Differences in formulations in different surveys further ensure more robust inference. We consider the following 17 countries for which we could obtain gender specific consumer data: Australia, Austria, Belgium, Czech Republic, Denmark, Germany, Finland, France, Greece, Hungary, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden and the UK. For Australia, the

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<sup>29</sup> We tried to obtain more gender specific confidence data from a broader range of non-Western countries. Unfortunately, these were not available.

Westpac Melbourne Institute of Applied Economics and Social Research publishes the consumer confidence index since January 1987 (based on survey data of 1200 households). For the European Union (EU) member states, we use the EU Consumer Confidence Survey data. The EU Commission conducts the EU Consumer Confidence Survey since May 1972 as part of the EU Consumer Survey to acquire information on consumer expenditure, saving intentions, and the factors affecting these figures. Separate research institutes in every country survey the data, based on uniform criteria, and send the results to the EU Commission, which in turn aggregates and seasonally adjusts the data. Sample sizes vary: 2,500 consumers in Germany; 2,000 in Spain, France, Italy, and the UK; and 1,500 in each of the remaining countries. The EU Commission calculates the consumer confidence index from the answers respondents give regarding their expectations of financial position, assessment of economic prospects, expectations of employment situation, and planned saving intentions.

For most European countries the gender specific time-series start in January 1990. Exceptions are Hungary starting in February 1993, Austria and Sweden starting in October 1995, Finland starting in November 1995, and the Czech Republic starting only in May 2001. Table 7 contains basic characteristics of the consumer confidence data.

[Table 7 around here]

Table 7 reports  $t$ -statistics for gender differences in the consumer confidence indices of all countries. Except for Germany, we find highly significant and consistent gender differences in all these countries as well. Again, women are more pessimistic about current and future economic conditions. Strikingly, for Europe on aggregate, women have never been more confident than men



in any month between January 1990 and December 2005 (although for individual countries there have been months where women have been more confident).

#### *VB European UBS/Gallup Data*

In some cases UBS/Gallup conducted similar surveys with a smaller number of questions in the UK, France, Germany, Italy, and Spain. When available we examine similar survey questions for some European countries to see whether the results of the US Gallup data are country specific. The surveys were run in each month with a sample size of approximately 200 in each country for 13 months from January 2002 to January 2003. The survey questions related to optimism in economic conditions are similar to the US ones.

Table 8 reports descriptive statistics and gender difference in optimism tests for the European UBS/Gallup survey data. The first four questions ask how optimistic the respondent is about economic growth, unemployment rate, inflation rate, and stock market performance in one year. The next two questions ask whether the respondent thinks that it is a good time to invest in financial markets and that stock market is over-valued. The next question is on optimism about the introduction of Euro and its effects on the European economy. The last question asks the respondent to indicate her perceived level of risk in the stock market. The results in Table 8 corroborate their US counterparts. In all countries, males are more optimistic about all economic and market outlook than females. The gender differences in optimism, except for those for economic growth and unemployment rate in UK, are statistically significant. The European surveys also show a similar pattern in perceived risk of the stock market. Across all the countries, female respondents indicate significantly higher perceived level of risk in the stock market than male respondents.

[Table 8 around here]

Controlling for other factors available in the European UBS/Gallup data does not affect the gender differences substantially.<sup>30</sup> In Table 11 we report the ordered logit results with and without country fixed effects. The female dummy is significantly negative for all the responses gauging optimism and significantly positive for perceived risk in the stock market. These results are also robust to the inclusion of country fixed effects. In sum, the results from the European UBS/Gallup data indicate that the gender differences documented in this study are not country specific.

[Table 9 around here]

#### *VC Marital Status*

What we attribute to gender difference may be (partly) due to different marital status. For instance, if disproportionately more female respondents are married and expressed the views on behalf of the family, what we capture would be the differences between singles and married couples. Moreover, Jianakoplos and Bernasek (1998), Sunden and Surette (1998), and Agnew, Balduzzi, and Sunden (2003) report different investment behavior within genders depending on marital status. Given the results in Table 5 that pessimism leads to less stock holdings, the different investment behavior may stem from marital status affecting optimism or pessimism about economic outlook. To address this concern, we re-run the first five sets of ordered logit regressions as in Table 3 (those with optimism about economic growth, unemployment rate, stock market performance, inflation rate, and interest rate as dependent variables) with marital status and interaction between marital status and gender included as independent variables.

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<sup>30</sup> The only control variables available in the European data are total investment (Worth) and age (Age).

We treat marital status separately because data for marital status are available in only four Gallup surveys, February 1997, May 1997, September 1998, and November 1998. The sample size for respondents with known marital status is 3,996.

The results in Table 10 suggest that the gender difference in optimism we observe in Table 3 is not due to marital status and its interaction with gender. The estimated coefficients on the female dummy are all negative after controlling for the effect of marital status and interaction. On the contrary, Married, a dummy for a married respondent and its interaction with the female dummy flip signs and the estimated impacts are statistically insignificant in all but one regression. In 5 out of 10 regressions, the estimated coefficient of the female dummy is statistically insignificant, possibly due to the small sample size. The estimated coefficients on total investments (Worth) and income (Inc), that are consistently significant in Table 4, also have the same signs as before but show a reduced level of statistical significance.

[Table 10 around here]

#### *VD. White Male Effect*

Our results are not related to the well-known “white male” effect. A strand of research in psychology (see Flynn, Slovic, and Mertz, 1994) shows that across a variety of scenarios, white men perceive risks as lower (worry less) than non-white men or women. We run a set of order logit regressions that use a male dummy, a white dummy, and an interaction term white x male as explanatory variables for the surveys in Section IV, where we have information on race. If the “white male” effect does exist in our sample, the interaction term white x male should be

significant and with positive sign. However, none of the  $t$ -statistics of the interaction terms are significant, and signs are often negative.<sup>31</sup>

### *VE Multinomial Logit*

One of the assumptions of the ordered logit models is that the effect on gender on log-odds is uniform across the categories. However, this may not be true. For example, females may be far less likely to exhibit extreme optimism compared to moderate optimism than men. In order to examine how gender affects the probability of the respondent answering individual categories, we run multinomial logit regressions. For brevity we report the results for only three survey questions, Question 1523 about economic growth, Question 1525 about stock market performance, and Question 2707 about stock market risk, in Table 9. The results for the other questions are similar and available upon request.

[Table 11 around here]

We set the neutral answer, 3, as the baseline category for the questions about optimism in economic growth and stock market performance. The effect of gender is clearly not uniform across the response categories. The pessimism of female respondents documented in Table 4 seems to stem from the fact that they are less likely to give optimistic answers compared to male respondents. The estimated coefficient on the female dummy is significantly negative for optimistic responses 4 and 5, with or without the control variables. Turning to prediction of stock market risk, the respondent can choose between 10 outcomes; from 1 (no risk) to 10 (high risk). The response indicating a moderate level of risk, 5, is set as the reference category, the gender difference is more striking in low risk categories suggesting that female respondents are less

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<sup>31</sup> Results are available upon request from the authors.

likely to predict low stock market risk. To summarize, the multinomial regression results suggest that men are more optimistic—rather than less pessimistic—and more likely to expect low stock market risk than women.

## **VI. Conclusion**

Our paper posits two alternative explanations for the empirical finding that women invest less in stocks. They are less optimistic than men about future stock market performance and they also believe the market may be more risky than men do. This gender difference persists after we control for income, employment, wealth, education, and marital status and is pervasive across countries. We argue that apart from risk aversion these two alternative explanations might also cause gender differences in asset allocation. In our direct analysis of stock holdings, we document that the gap between the genders disappear after we control for optimism and a host of other control variables. Our finding that men tend to be significantly more optimistic than women holds are not confined to economic or financial aspects. Men show greater degrees of optimism in many other aspects of life as well.

## References

- Agnew, Julie, Pierluigi Balduzzi, and Annika Sunden.** 2003. "Portfolio Choice and Trading in a Large 401(k) Plan." *American Economic Review*, 93(1): 193–215.
- Amromin, Gene, and Steven A. Sharpe.** 2009. "Expectations of Risk and Return Among Household Investors: Are Their Sharpe Ratios Countercyclical?" Working Paper (February), Federal Reserve Board, SSRN: <http://ssrn.com/abstract=1327134>.
- Bajtelsmit, Vickie L., and Alexandra Bernasek.** 1996. "Why Do Women Invest Differently Than Men." *Financial Counseling and Planning*, 7: 1–10.
- Balasuriya, Jiayi, Yaz Gulnur Muradoglu, and Peter Ayton.** 2010. Is it Better to be Optimistic? - Financial Optimism and Well-being. Available at SSRN: <http://ssrn.com/abstract=2307065>.
- Barber, Brad M., and Terrance Odean.** 2001. "Boys Will be Boys: Gender, Overconfidence and Common Stock Investment." *Quarterly Journal of Economics*, 116(1): 261–92.
- Barberis, Nicholas., Andrei Shleifer A., and Robert Vishny.** 1998. "A Model of Investor Sentiment." *Journal of Financial Economics* 49(3): 307-343.
- Barone-Adesi, Giovanni, Lorian Mancini and Hersh Shefrin.** 2013. A Tale of Two Investors: Estimating Optimism and Overconfidence. Swiss Finance Institute Research Paper No. 12-21. Available at SSRN: <http://ssrn.com/abstract=2060983>
- Brunnermeier, Markus K., and Stefan Nagel.** 2008. "Do Wealth Fluctuations Generate Time-Varying Risk Aversion? Micro-Evidence on Individuals' Asset Allocation." *American Economic Review*, 98(3): 713 – 736.
- Campbell, John Y.** 2003. "Comment on Annette Vissing-Jorgensen 'Perspective on Behavioral Finance: Does Irrationality Disappear with Wealth? Evidence from Expectations and Actions.'" In *National Bureau of Economic Research Macroeconomics Annual 2003*, ed. Mark Gertler and Kenneth Rogoff, 194–200. Cambridge, MA: MIT Press.

- Carroll, Christopher D.** 2003. "Macroeconomic Expectations of Households and Professional Forecasters." *Quarterly Journal of Economics*, 118: 269–298.
- Carver Charles S., Michael F. Scheier and Suzanne C Segestrom.** 2010, "Optimism" *Clinical Psychology Review*, 30, 879-889.
- Chaney, Carle Kennedy, R. Michael Alvarez, and Jonathan Nagler.** 1998. "Explaining the Gender GAP in US Presidential Elections 1980-1992." *Political Research Quarterly*, 51(2): 311–39.
- Charness, Gary, Uri Gneezy.** 2012, Strong Evidence for Gender Differences in Risk Taking, *Journal of Economic Behavior & Organization*, 83:50-58.
- Cohn, Richard A., Wilbur G. Lewellen, Ronald C. Lease, and Gay G. Schlarbaum.** 1975. "Individual Investor Risk Aversion and Investment Portfolio Composition." *Journal of Finance*, 30: 605–20.
- Croson, Rachel, and Uri Gneezy.** 2009. "Gender Differences in Preferences." *Journal of Economic Literature*, 47(2): 1 – 27.
- Dominitz, Jeff, and Charles F. Manski.** 2007. "Expected Equity Returns and Portfolio Choices: Evidence from the Health and Retirement Study." *Journal of the European Economic Association*, 5: 369–79.
- Eckel, Catherine C., and Philip J. Grossman.** 2007a. "Differences in the Economic Decisions of Men and Women: Experimental Evidence." In *Handbook of Experimental Economic Results*, ed. Charles R. Plott and Vernon L. Smith, 509–19. New York: Elsevier.
- Eckel, Catherine C., and Philip J. Grossman.** 2007b. "Men, Women and Risk Aversion: Experimental Evidence." In *Handbook of Experimental Economic Results*, ed. Charles R. Plott and Vernon L. Smith, 1061–72. New York: Elsevier.
- Fehr-Duda, Helga, Manuele De Gennaro and Renate Schubert.** 2006. Gender, Financial Risk and Probability Weights, *Theory and Decision*, 60, 283-313.

- Felton, James, Bryan Gibson, and David M. Sanbonmatsu.** 2004. "Preference for Risk in Investing as Function of Trait and Optimism and Gender." *Journal of Behavioral Finance*, 4(1): 33 – 40.
- Flynn, James, Paul Slovic, and C. K. Mertz.** 1994. "Gender, Race, and Perception of Environmental Health Risks." *Risk Analysis*, 14(6): 1101-1108.
- Garbarino, Ellen and Michael Strahilevitz.** 2004. "Gender Differences in the Perceived Risk of Buying Online and the Effects of Receiving a Site Recommendation." *Journal of Business Research*, 57(7): 768 – 775.
- Gervais, Simon., Heaton, J. B., and Odean, Terrence.** 2002. "Positive Role of Overconfidence and Optimism in Investment Policy." Wharton School Working Paper.
- Guiso, Luigi, and Monica Paiella.** 2008. "Risk Aversion, Wealth and Background Risk." *Journal of the European Economic Association*, 6(6): 1109 – 1150.
- Gwartney-Gibbs, Patricia A., and Denise H. Lach.** 1991. "Sex Differences in Attitudes toward Nuclear War." *Journal of Peace Research*, 28(2): 161–74.
- Hackbarth, Dirk.** 2008. "Managerial Traits and Capital Structure Decisions." *Journal of Financial and Quantitative Analysis*, 43(4): 843 – 882.
- Hyde, Janet Shibley.** 2005. "The Gender Similarities Hypothesis." *American Psychologist*, 60(6): 581–92.
- Jianakoplos, Nancy Ammon, and Alexandra Bernasek.** 1998. "Are Women More Risk Averse?" *Economic Inquiry*, 36: 620–30.
- Kacperczyk, Marcin and Zbigniew Kominek.** 2002. "Do Optimists Grow Faster and Invest More?" Working Paper: SSRN: <http://ssrn.com/abstract=301242>
- Kaya, Orcun.** 2012 Stock Market Optimism and Portfolio Allocation of American Households. Available at SSRN: <http://ssrn.com/abstract=2084273>



- Lee, Charles. M.C., Andrei Shleifer, and Robert H. Thaler.** 1991. "Investor Sentiment and the Closed-End Fund Puzzle." *The Journal of Finance* , 46 (1): 75 – 109.
- Lott, Jr., John R., and Lawrence W. Kenny.** 1999. "Did Women's Suffrage Change the Size and Scope of Government?" *Journal of Political Economy*, 107(6) Part 1: 1163-1198.
- Lin, Ying-Ching, and Priya Raghurir.** 2005, "Gender Differences in Unrealistic Optimism about Marriage and Divorce: Are Men More Optimistic and Women More Realistic?" *Personality and Social Psychology Bulletin*, 31(2): 198 – 207.
- Lyons, Karen S., Barbara J. Stewart, Patricia G. Archbold, Julie H. Carter.** 2009, "Optimism, Pessimism, Mutuality, and Gender: Predicting 10-Year Role Strain in Parkinson's Disease Spouses." *Gerontologist*, 49(3): 378 – 387.
- March, James G. and Zur Shapira.** 1987. "Managerial Perspectives on Risk and Risk Taking." *Management Science* , 33 (11): 1404 – 1418.
- McFadden, Daniel L., Albert C. Bemmaor, Francis G. Caro, Jeff Dominitz, Byung-Hill Jun, Arthur Lewbel, Rosa L. Matzkin, Francesca Molinari, Norbert Schwarz, Robert J. Willis, and Joachim K. Winter.** 2005. "Statistical Analysis of Choice Experiments and Surveys." *Marketing Letters*, 16(3): 183–96.
- Olsen, Robert A. and Constance M. Cox.** 2001, "The Influence of Gender on The Perception and Response to Investment Risk: The Case of Professional Investors." *Journal of Psychology and Financial Markets*, 2(1): 29 – 36.
- Patel, Saurin.** 2012. Economic Optimism, Information Uncertainty and Future Investment Decisions: Evidence from the Mutual Fund Industry. Available at SSRN: <http://ssrn.com/abstract=2021971>
- Puri, Manju, and David T. Robinson.** 2007. "Optimism and Economic Choice." *Journal of Financial Economics*, 86(1): 71–99.

- Ruthig, Joelle, and Alan Allery.** 2008. “Native American Elders' Health Congruence: The Role of Gender and Corresponding Functional Well-being.” *Journal of Health Psychology*, 13(8): 1072–81.
- Schubert, Renate, Martin Brown, Matthias Gysler, and Hans Wolfgang Brachinger.** 1999. “Financial Decision-Making: Are Women Really More Risk-Averse?” *American Economic Review*, 82(2): 381–85.
- Sunden, Annika, and Brian J. Surette.** 1998. “Gender Differences in the Allocation of Assets in Retirement Plans.” *American Economic Review*, 88: 207–21.
- Watson, John and Mark McNaughton.** 2007, “Gender Differences in Risk Aversion and Expected Retirement Benefits.” *Financial Analysts Journal*, 63(4): 52 – 61.
- Vissing-Jorgensen, Annette,** 2003, “Perspectives on Behavioral Finance: Does “Irrationality” Disappear with Wealth? Evidence from Expectations and Actions.” *NBER Macroeconomics Annual* 18, 139–194.

## Appendix

Here we report the exact questions as they appear in the questionnaires.

The five main questions from the University of Michigan Consumer Sentiment Index:

I. Personal Current

*“We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better or worse off financially than you were a year ago?”*

II. Personal Future

*“Now looking ahead—do you think that a year from now you (and your family living there) will be better off financially, worse off, or just about the same as now?”*

III. General Short Term

*“Now turning to business conditions in the country as a whole—do you think that during the next 12 months we'll have good times financially, or bad times, or what?”*

IV. General Long Term

*“Looking ahead, which would you say is more likely—that in the country as a whole we'll have continuous good times during the next 5 years or so, or that we will have periods of widespread unemployment or depression, or what?”*

V. Durables

*“About the big things people buy for their homes—such as furniture, a refrigerator, stove, television and things like that. Generally speaking, do you think now is a good or bad time for people to buy major household items?”*

Questions from the US Gallup Polls (The numbers correspond with the numbers in the text (and the original questionnaires):

Questions 1523–1527

*Now, I would like to ask you to think about the factors that could affect the overall investment environment OVER THE NEXT TWELVE MONTHS. On the same five-point scale, as far as the general condition of the economy is concerned, how would you rate (read and rotate A-D), OVER THE NEXT TWELVE MONTHS? (emphasis in original)*

*5 Very optimistic*

*4 Somewhat optimistic*

*3 Neither optimistic nor pessimistic*

*2 Somewhat pessimistic, OR*

*1 Very pessimistic*

*6 (Don't know)*

*7 (Refused)*

*A. Economic growth (1523)*

*B. The unemployment rate (1524)*

*C. Performance of the stock market (1525)*

*D. Inflation (1526)*

*E. Interest rates (1527)*

Question 2332

*Over the next THREE MONTHS, do you think the stock market will go up, go down, or remain about the same?*

- 3 Go up*
- 2 Remain about the same*
- 1 Go down*
- 4 (Don't know)*
- 5 (Refused)*

Question 2485

*A year from now, do you think the stock market will be higher than it is now, lower, or about the same? (Probe for "much higher" or "somewhat higher"; probe for "much lower" or "somewhat lower")*

- 1 Much higher*
- 2 Somewhat higher*
- 3 About the same*
- 4 Somewhat lower*
- 5 Much lower*
- 6 (Don't know)*
- 7 (Refused)*

The specific question on the investment portfolio: **DOES ANYONE KNOW THE NUMBER FOR THIS QUESTION?**

*What percent of your total investment portfolio is CURRENTLY in each of the following categories? Do NOT include the value of any homes you own. What percent of your investment portfolio is in (read and rotate A-D)? (Open ended and code actual percent) (NOTE: Total of A-D MUST equal 100%)*

- 000 None*
- LT Less than 1%*
- DK (DK)*
- RF (Refused)*

- A. Stocks, stock mutual funds*
- B. Bonds, bond mutual funds*
- C. Cash, CDs, money market funds*
- D. Real estate investments*

Rating the risk of the stock market:  
Question 2707

*Using a ten-point scale, where "1" means no risk and "10" means very high risk, how would you rate the CURRENT level of risk for investing in the stock market?*

- 10 Very high risk*
- 04*

09	03
08	02
07	01 No risk
06	11 (Don't know)
05	12 (Refused)

## Questions in the European Surveys

### DO THESE QUESTIONS HAVE NUMBERS?

*Now, I would like to ask you to think about the factors that could affect the overall investment environment OVER THE NEXT TWELVE MONTHS. On the same scale, as far as the general condition of the economy is concerned, how would you rate (read and rotate A-D), OVER THE NEXT TWELVE MONTHS?*

- 5 Very optimistic
- 4 Somewhat optimistic
- 3 Neither optimistic nor pessimistic
- 2 Somewhat pessimistic, OR
- 1 Very pessimistic
- 6 (Don't know)
- 7 (Refused)

- A. Economic growth
- B. The unemployment rate
- C. Performance of the stock market
- D. Inflation

Good Time to Invest:<sup>32</sup>

*Do you think now is a good time to invest in the financial markets, or not?*

- 1 Yes
- 2 No
- 3 (Don't know)
- 4 (Refused)

Risk:

*Using a ten-point scale, where 1 means no risk of loss and 10 means very high risk of loss, how would you rate the current level of risk for investing in the stock market?*

- 10 Very high risk
- 09
- 08
- 07
- 06
- 05
- 04
- 03
- 02
- 01 No risk
- 11 (Don't know)
- 12 (Refused)

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<sup>32</sup> For ease of comparison, we transformed the responses by assigning larger numbers to more optimistic answers for the questions.

Euro:

*How optimistic do you feel about the introduction of the Euro and its effects on the European economy?*  
*Do you feel (read 5-1)?*

*5 Very optimistic*

*4 Somewhat optimistic*

*3 Neither optimistic nor pessimistic*

*2 Somewhat pessimistic, OR*

*1 Very pessimistic*

*6 (Don't know)*

*7 (Refused)*

**Table 1.** Basic Characteristics for Overall Results and subquestions

This table presents the basic characteristics and a  $t$ -test of equal mean on the gender differences of the overall results and the results for the five subquestions in the questionnaire that are used to construct the US consumer confidence index. These questions are about the Personal Current situation (are you now better off financially?), the Personal Future (do you think that a year from now you will be better off financially?), the General Short Term (business conditions in the country as a whole, do you think that during the next 12 months we'll have good times financially?), the General Long Term (do you think it's likely that in the country as a whole we'll have continuous good times during the next 5 years?), and the Durables (about the big things people buy for their homes, do you think now is a good time for people to buy major household items?). The  $t$ -statistics correspond to the null hypothesis of equal average consumer confidence between men and women.

	Men	Women	Difference
<i>Overall</i>			
Mean	93.86	83.80	10.05
Median	96.80	86.30	10.00
Maximum	115.90	110.50	20.10
Minimum	57.00	46.20	-0.30
Std. Dev.	12.07	12.87	3.72
$t$ -test of equal mean: 10.37 ( $p$ -value: 0.00)			

These tables need to be merged: the results above are the overall results.

	Men	Women	Difference
<i>I. Personal Current</i>			
Mean	116.52	105.80	10.72
Median	118.10	107.30	10.55
Maximum	147.10	144.30	34.90
Minimum	79.80	65.60	-10.40
Std. Dev.	13.98	13.81	7.31
$t$ -test of equal mean: 10.00 ( $p$ -value: 0.00)			
<i>II. Personal Future (one year)</i>			
Mean	127.82	120.93	6.89
Median	130.10	122.50	7.25
Maximum	147.80	145.60	23.90
Minimum	93.00	87.00	-11.20
Std. Dev.	11.26	10.61	6.33
$t$ -test of equal mean: 8.16 ( $p$ -value: 0.00)			
<i>III. General Short Term (12 months)</i>			
Mean	116.41	99.62	16.79
Median	122.00	104.50	17.05
Maximum	167.40	167.30	46.00
Minimum	32.10	27.80	-7.40
Std. Dev.	29.58	29.55	9.56
$t$ -test of equal mean: 7.36 ( $p$ -value: 0.00)			
<i>IV. General Long Term ( five years)</i>			
Mean	116.41	105.85	22.93
Median	119.10	108.30	22.40
Maximum	167.40	167.30	55.20
Minimum	11.26	10.61	-7.60
Std. Dev.	18.67	18.06	9.65

*t*-test of equal mean: 14.89 (*p*-value: 0.00)

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*V. Durables*

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Mean	153.55	143.07	10.48
Median	157.55	149.25	10.40
Maximum	183.70	180.80	35.30
Minimum	96.80	63.90	-22.40
Std. Dev.	17.31	21.07	9.19

*t*-test of equal mean: 7.04 (*p*-value: 0.00)

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**Table 2.** Summary Statistics of the Gallup Survey Responses

This table presents the basic characteristics of the US Gallup economic outlook variables along with *t*-statistics on the gender differences (male – female). N refers to the number of non-missing values present in the data. The total number of surveys is 56. Each row presents results on responses regarding a specific aspect of economic conditions listed from male and female respondents separately. All questions except for the 3-month stock market outlook call for a response ranging from 1 (pessimistic) to 5 (optimistic). The last column indicates the number of surveys in which each item is available.

		Range	Mean	Std. Dev.	N	<i>t</i> -stat.	Availability
Economic growth (Q1523)	Male	1 - 5	3.53	1.04	31376	12.91	56 surveys
	Female		3.42	1.04	24647		1996:11 – 2002:12
Unemployment rate (Q1524)	Male	1 - 5	3.46	1.14	30965	11.99	56 surveys
	Female		3.35	1.15	24476		1996:11 – 2002:12
Stock market (Q1525)	Male	1 - 5	3.39	1.11	31103	9.59	56 surveys
	Female		3.30	1.08	24259		1996:11 – 2002:12
Inflation (Q1526)	Male	1 - 5	3.48	1.09	31045	32.48	56 surveys
	Female		3.19	1.05	24364		1996:11 – 2002:12
Interest rate (Q1527)	Male	1 - 5	3.49	1.08	24179	15.61	44 surveys
	Female		3.33	1.05	19446		1996:11 – 2001:12
1-yr stock outlook (Q2485)	Male	1 - 5	3.67	0.79	18540	20.50	34 surveys
	Female		3.49	0.77	14857		2000:03 – 2002:12
3-mth stock outlook (Q2332)	Male	1 - 3	2.19	0.73	11770	11.64	21 surveys
	Female		2.08	0.68	9173		1998:11 – 2000:09

**Table 3. Ordered Logit Regression Results for Optimism**

The table reports the results of ordered logit regressions of the categorical optimism responses on gender and other control variables with month fixed effects. The questionnaire questions for the response variables are in Appendix A. Responses indicating “Don’t Know” or “Refused” are treated as missing values. Fem is a dummy variable equal to 1 if the respondent is female. Worth is a dummy variable assuming a value of 1 if the total amount of investment is greater than \$100,000. Edu is a categorical variable that takes a value of 2 if the respondent has an undergraduate degree and 3 if the respondent holds a postgraduate degree. Inc is a categorical variable that is equal to 2 if the annual income is between \$50,000 and \$100,000 and 3 if the annual income is above \$100,000. Retired is a dummy variable equal to 1 if the respondent is retired. Emp is a categorical variable taking a value of 2 when the respondent works part-time and 3 when the respondent has a full-time job. Age is the age of the respondent. The *t*-statistics are reported in parentheses.

		Fem	Worth	Edu=2	Edu=3	Inc=2	Inc=3	Retired	Emp=2	Emp=3	Age*100
Q1523	(growth)	-0.21									
		(-13.58)									
		-0.20	-0.06	-0.04	-0.13	0.08	0.11	0.08	-0.06	0.02	0.31
		(-11.53)	(-3.10)	(-1.81)	(-6.10)	(3.52)	(4.12)	(2.38)	(-1.65)	(0.81)	(3.90)
Q1524	(unemployment)	-0.20									
		(-12.75)									
		-0.18	-0.07	0.01	-0.05	0.08	0.12	0.03	0.03	0.09	0.25
		(-10.22)	(-3.68)	(0.62)	(-2.16)	(3.76)	(4.62)	(0.91)	(0.82)	(3.26)	(3.21)
Q1525	(stock market)	-0.16									
		(-10.37)									
		-0.16	-0.15	-0.06	-0.18	0.08	0.05	0.16	-0.05	0.03	0.04
		(-9.13)	(-7.85)	(-2.78)	(-8.47)	(3.50)	(2.03)	(4.90)	(-1.53)	(0.95)	(0.47)
Q1526	(inflation)	-0.51									
		(-32.82)									
		-0.46	-0.18	0.07	0.13	0.11	0.27	-0.02	-0.04	0.04	0.61
		(-26.44)	(-9.80)	(3.62)	(6.24)	(5.14)	(10.02)	(-0.54)	(-1.23)	(1.61)	(7.84)
Q1527	(interest rate)	-0.29									
		(-16.28)									
		-0.24	-0.12	-0.04	-0.05	0.11	0.28	-0.02	-0.03	0.07	0.34
		(-12.09)	(-5.80)	(-1.58)	(-1.99)	(4.37)	(9.14)	(-0.65)	(-0.66)	(2.19)	(3.82)
Q2485	(stock outlook)	-0.49									
		(-22.71)									
		-0.44	-0.29	0.13	0.08	0.15	0.27	0.08	0.04	0.07	-0.53
		(-18.55)	(-11.45)	(4.79)	(2.76)	(5.07)	(7.61)	(1.85)	(0.88)	(1.77)	(-4.96)
Q2332	(stock outlook – short run 3 mths)	-0.32									
		(-12.12)									
		-0.30	-0.08	-0.03	-0.04	0.00	0.06	0.05	-0.03	-0.01	0.12
		(-10.23)	(-2.59)	(-0.78)	(-0.96)	(-0.03)	(1.46)	(0.93)	(-0.54)	(-0.11)	(0.89)

**Table 4. Summary Statistics of 24 Optimism-Related Questions**

This table shows the basic characteristics of the additional 24 questions related to optimism. The *t*-tests correspond to the null hypothesis of equal mean between male and female responds. The variable that measures the optimism level of the respondents is a categorical variable that is 1 for pessimistic, 2 for optimistic.

	Men	Women	Difference		Men	Women	Difference
The way things are going in this country (next 12 mths)				Soundness of economic system in the long run			
Mean	1.65	1.58	-0.07	Mean	1.59	1.57	-0.02
Median	2.00	2.00		Median	2.00	2.00	
Std. Dev.	0.478	0.49	0.01	Std. Dev.	0.49	0.50	0.03
<i>t</i> -test of equal mean	-6.40			<i>t</i> -test of equal mean	-0.91		
Optimism about the country's future in general				Optimism about economy in general			
Mean	1.69	1.65	-0.04	Mean	1.75	1.71	-0.04
Median	2.00	2.00		Median	2.00	2.00	
Std. Dev.	0.46	0.48	0.01	Std. Dev.	0.43	0.45	0.02
<i>t</i> -test of equal mean	-3.36			<i>t</i> -test of equal mean	-1.82		
Do you feel optimistic (or worried) that the US's best years are still ahead (behind) us?				Are you optimistic or pessimistic about how the federal government will serve the people over the next year?			
Mean	1.70	1.61	-0.09	Mean	1.63	1.67	0.03
Median	2.00	2.00		Median	2.00	2.00	
Std. Dev.	0.465	0.49	0.04	Std. Dev.	0.48	0.47	0.02
<i>t</i> -test of equal mean	-2.22			<i>t</i> -test of equal mean	1.50		
The situation in Iraq (next 12 mths)				As you look forward to 2003 are you optimistic or pessimistic about your personal situation?			
Mean	1.52	1.46	-0.06	Mean	1.73	1.65	-0.08
Median	2.00	2.00		Median	2.00	2.00	
Std. Dev.	0.46	0.49	0.01	Std. Dev.	0.48	0.47	0.04
<i>t</i> -test of equal mean	-5.67			<i>t</i> -test of equal mean	-1.85		
Based on what you have seen happening in Iraq over the course of the past month, are you more optimistic or less optimistic about the situation?				I'd like to ask you to rate the degree of hope and optimism you have about the next four years			
Mean	1.57	1.45	-0.12	Mean	1.66	1.55	-0.11
Median	2.00	1.00		Median	2.00	2.00	
Std. Dev.	0.50	0.50	0.05	Std. Dev.	0.50	0.49	0.04
<i>t</i> -test of equal mean	-2.48			<i>t</i> -test of equal mean	-3.07		
The country's ability to defend itself against terrorist attacks (next 12 mths)				The state of the national economy (next 12 mths)			
Mean	1.73	1.67	-0.06	Mean	1.58	1.50	-0.08
Median	2.00	2.00		Median	2.00	2.00	
Std. Dev.	0.45	0.47	0.01	Std. Dev.	0.49	0.50	-0.08
<i>t</i> -test of equal mean	-4.98			<i>t</i> -test of equal mean	-8.47		
Optimism about war on terrorism in general				The state of your local economy (next 12 mths)			
Mean	1.77	1.70	-0.07	Mean	1.69	1.62	-0.07
Median	2.00	2.00		Median	2.00	2.00	
Std. Dev.	0.42	0.46	0.02	Std. Dev.	0.46	0.49	0.02
<i>t</i> -test of equal mean	-3.57			<i>t</i> -test of equal mean	-3.62		
The moral climate in the country (next 12 mths)				Optimistic or pessimistic about things in the next year			
Mean	1.52	1.39	-0.14	Mean	1.92	1.91	-0.01
Median	2.00	1.00		Median	2.00	2.00	
Std. Dev.	0.50	0.49	0.03	Std. Dev.	0.27	0.29	0.02
<i>t</i> -test of equal mean	-4.38			<i>t</i> -test of equal mean	-0.77		

The country's ability to respond to natural disasters (next 12 mths)				Your personal (your own family's) financial situation (next 12 mths)			
Mean	1.65	1.54	-0.12	Mean	1.71	1.63	-0.08
Median	2.00	2.00		Median	2.00	2.00	
Std. Dev.	0.48	0.50	0.04	Std. Dev.	0.46	0.48	0.01
<i>t</i> -test of equal mean	-2.68			<i>t</i> -test of equal mean	-7.86		
The policies Bush will pursue (next 12 mths)				Your own personal future			
Mean	1.53	1.47	-0.06	Mean	1.91	1.88	-0.03
Median	2.00	1.00		Median	2.00	2.00	
Std. Dev.	0.50	0.50	0.02	Std. Dev.	0.28	0.33	0.02
<i>t</i> -test of equal mean	-3.22			<i>t</i> -test of equal mean	-1.74		
The policies the Democrats in Congress will pursue (next 12 mths)				In general, do you feel optimistic or pessimistic about the future?			
Mean	1.67	1.67	-0.00	Mean	1.84	1.83	-0.02
Median	2.00	2.00		Median	2.00	2.00	
Std. Dev.	0.47	0.47	0.04	Std. Dev.	0.37	0.38	0.02
<i>t</i> -test of equal mean	-0.07			<i>t</i> -test of equal mean	-0.89		
Our system of government and how well it works in the long run				Being able to retire at a reasonable age			
Mean	1.64	1.69	0.05	Mean	1.56	1.32	-0.24
Median	2.00	2.00		Median	2.00	2.00	
Std. Dev.	0.48	0.46	0.03	Std. Dev.	0.50	0.47	0.04
<i>t</i> -test of equal mean	2.06			<i>t</i> -test of equal mean	-5.60		

**Table 5. Ordinary Least Square Regression Results for Stock Holding**

The table reports the results of ordinary least square regressions of stock holding in percentage on stock market outlook, gender, interaction between economic outlook, and gender and other control variables. The original responses about stock market outlook, 1 to 5, are used. Pes1 is a dummy variable equal to 1 if the stock market outlook (Q1523) equals 1, Pes2 if the stock market outlook = 2, Opt4 if the stock market outlook = 4, and Opt5 if the stock market outlook = 5. Fem is a dummy variable equal to 1 if the respondent is female. Worth is a dummy variable assuming a value of 1 if the total amount of investment is greater than \$100,000. Edu is a categorical variable that takes a value of 2 if the respondent has an undergraduate degree and 3 if the respondent holds a postgraduate degree. Inc is a categorical variable that is equal to 2 if the annual income is between \$50,000 and \$100,000 and 3 if the annual income is above \$100,000. Retired is a dummy variable equal to 1 if the respondent is retired. Emp is a categorical variable taking a value of 2 when the respondent works part-time and 3 when the respondent has a full-time job. Age is the age of the respondent. In all regressions, month dummies, whose coefficients are not shown to conserve space, are included as independent variables. *t*-statistics are shown in parentheses. Individual stock holding data are available only in five Gallup surveys in November 1996, February 1997, August 1997, November 1997, and September 1998.

Intercept	Pes1	Pes2	Opt4	Opt5	Fem	Pes1Fem	Pes2Fem	Opt4Fem	Opt5Fem	Worth	Edu=2	Edu=3	Inc=2	Inc=3	Retired	Emp=2	Emp=3	Age
45.05	-7.68	-1.58	4.03	4.24														
(31.34)	(-2.55)	(-0.95)	(3.17)	(2.69)														
46.65	-8.04	-1.74	3.95	3.97	-3.78													
(31.22)	(-2.67)	(-1.05)	(3.11)	(2.52)	(-3.83)													
48.17	-9.47	-4.29	3.23	-0.04	-7.12	3.28	6.19	1.57	10.40									
(28.30)	(-2.54)	(-1.99)	(1.93)	(-0.02)	(-3.39)	(0.52)	(1.83)	(0.61)	(3.22)									
51.55	-8.58	-2.51	3.84	4.14	-1.56					-3.98	4.01	4.89	1.48	-0.08	-5.03	0.95	4.17	-0.12
(11.30)	(-2.51)	(-1.34)	(2.69)	(2.31)	(-1.35)					(-3.16)	(3.01)	(3.45)	(0.91)	(-0.04)	(-2.79)	(0.40)	(2.34)	(-2.45)
52.67	-9.30	-5.17	3.45	0.56	-4.36	1.33	6.48	0.85	9.12	-3.86	4.06	4.90	1.48	-0.06	-4.88	1.01	4.18	-0.13
(11.33)	(-2.20)	(-2.12)	(1.84)	(0.24)	(-1.82)	(0.18)	(1.71)	(0.30)	(2.51)	(-3.07)	(3.05)	(3.46)	(0.91)	(-0.03)	(-2.71)	(0.42)	(2.35)	(-2.52)

**Table 6: Ordered Logit Regression for Perceived Riskiness**

The table reports the results of ordered logit regressions of the categorical responses about perceived riskiness of stock market on gender and other control variables with month fixed effects. The questionnaire questions for the response variables are in Appendix A. Responses indicating “Don’t Know” or “Refused” are treated as missing values. Fem is a dummy variable equal to 1 if the respondent is female. Worth is a dummy variable assuming a value of 1 if the total amount of investment is greater than \$100,000. Edu is a categorical variable that takes a value of 2 if the respondent has an undergraduate degree and 3 if the respondent holds a postgraduate degree. Inc is a categorical variable that is equal to 2 if the annual income is between \$50,000 and \$100,000 and 3 if the annual income is above \$100,000. Retired is a dummy variable equal to 1 if the respondent is retired. Emp is a categorical variable taking a value of 2 when the respondent works part-time and 3 when the respondent has a full-time job. Age is the age of the respondent. The *t*-statistics are reported in parentheses.

Fem	Worth	Edu=2	Edu=3	Inc=2	Inc=3	Retired	Emp=2	Emp=3	Age*100
0.21 (5.76)									
0.23 (5.90)	0.10 (2.39)	-0.02 (-0.49)	-0.04 (-0.89)	0.04 (0.74)	0.05 (0.90)	-0.02 (-0.22)	-0.12 (-1.55)	-0.02 (-0.38)	-0.53 (-3.02)

**Table 7.** Summary Statistics of Consumer Confidence Data

This table gives descriptive statistics for the difference in consumer confidence for men and women for 18 countries and for Europe. The starting date for each country is given in the second column and the ending date for all series is December 2005. Std. Dev. denotes standard deviation. N represents the number of observations in the sample for the corresponding country. The final column presents the  $t$ -statistics corresponding to the null hypothesis whether the average consumer confidence between men and women is equal.

Country	Starting date	Maximu						N	$t$ -stat.
		Mean	m	Minimum	Std. Dev.	Skewness	Kurtosis		
Australia	January 1978	8.86	20.30	-1.70	3.83	0.01	3.00	332	9.18
Austria	October 1995	6.16	12.55	-2.83	2.66	-0.24	3.46	123	7.36
Belgium	January 1990	6.00	14.28	-3.22	3.01	0.07	3.20	192	5.96
Czech Republic	May 2001	6.42	12.42	0.31	2.87	-0.13	2.42	56	5.38
Denmark	January 1990	6.09	13.51	-14.24	3.65	-1.63	9.16	192	7.89
Spain	January 1990	3.26	7.89	-4.16	2.15	-0.79	4.19	192	3.35
Finland	November 1995	4.25	8.32	-2.19	1.71	-0.71	4.39	122	8.57
France	January 1990	3.74	9.60	-0.88	2.34	0.17	2.41	192	4.13
Germany	January 1990	1.32	7.32	-3.45	1.99	0.08	3.05	192	1.51
Greece	January 1990	5.79	16.13	-3.01	3.31	0.17	3.02	192	7.38
Hungary	February 1993	4.98	10.25	-0.39	2.09	-0.05	2.95	119	2.82
Ireland	January 1990	3.16	11.24	-6.16	3.06	-0.28	2.75	192	2.33
Italy	January 1990	4.15	9.68	-1.43	1.93	0.09	3.37	192	5.00
the Netherlands	January 1990	6.41	16.96	-0.96	3.61	0.13	2.49	192	4.83
Portugal	January 1990	5.04	11.06	-7.77	2.32	-0.79	7.25	192	4.41
Sweden	October 1995	7.87	16.60	-11.05	3.41	-1.37	9.76	123	8.23
UK	January 1990	3.79	10.06	-7.07	2.53	-0.50	4.10	192	4.64

Europe	January 1990	3.46	6.13	0.87	1.08	-0.23	2.79	192	4.83
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**Table 8.** Descriptive Statistics for European Gallup Data

The table reports descriptive statistics for the European UBS/Gallup survey data in each country. The first four questions ask how optimistic the respondent is about economic growth, unemployment rate, inflation rate, and stock market performance in one year. The next two questions ask whether the respondent thinks that it is a good time to invest in financial markets and that stock market is over-valued. The next question is on optimism about the introduction of Euro and its effects on the European economy. The last question asks the respondent to indicate her perceived level of risk in the stock market. Responses indicating “Don’t Know” or “Refused” are treated as missing.  $p$ -values reported are for Wilcoxon rank sum tests for gender difference.

		Economic Growth		Unemployment		Inflation		Stock Market		Good Time to Invest		Euro		Risk	
		Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
UK	Mean	3.00	2.91	2.96	2.93	3.38	3.07	2.84	2.65	1.48	1.34	3.02	2.87	5.60	5.90
	Std. Dev	1.08	1.06	1.13	1.11	1.09	1.08	1.16	1.09	0.50	0.47	1.31	1.28	1.85	1.86
	N	1348	1179	1338	1194	1352	1185	1327	1122	1331	1191	1356	1234	1357	1216
	$p$ -value	0.05		0.60		0.00		0.00		0.00		0.00		0.00	
Germany	Mean	2.76	2.56	2.26	2.08	2.79	2.47	2.89	2.67	1.50	1.36	3.48	3.07	5.28	5.69
	Std. Dev	1.08	1.06	1.00	1.00	1.04	0.98	1.09	1.05	0.50	0.48	1.15	1.20	1.83	1.84
	N	1308	1309	1305	1313	1300	1287	1283	1234	1260	1254	1310	1316	1276	1273
	$p$ -value	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
France	Mean	2.97	2.79	2.52	2.40	3.15	2.69	2.90	2.62	1.49	1.33	3.86	3.60	4.91	5.35
	Std. Dev	1.03	0.94	0.99	0.96	1.04	0.97	1.06	0.98	0.50	0.47	0.87	0.90	1.96	2.03
	N	1597	989	1597	985	1585	977	1579	962	1559	951	1605	1003	1590	986
	$p$ -value	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Spain	Mean	3.05	2.90	2.81	2.59	2.66	2.49	2.72	2.46	1.51	1.36	3.98	3.59	5.90	6.35
	Std. Dev	1.04	1.05	1.06	1.05	1.05	1.02	1.11	1.13	0.50	0.48	0.97	1.10	1.97	2.01
	N	1192	1352	1161	1336	1150	1224	1083	1147	1098	1224	1199	1375	1168	1330
	$p$ -value	0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Italy	Mean	3.12	2.87	2.97	2.71	2.83	2.46	2.83	2.58	1.46	1.29	3.91	3.46	5.86	6.46
	Std. Dev	1.06	1.06	1.06	1.10	1.03	0.98	1.08	1.03	0.50	0.46	1.01	1.13	2.02	2.10
	N	1434	1173	1431	1163	1438	1169	1414	1143	1380	1108	1437	1176	1424	1175
	$p$ -value	0.00		0.00		0.00		0.00		0.00		0.00		0.00	

**Table 9. Order Logit Regression Results for European Gallup Data**

The table reports the results of ordered logit regressions of the categorical responses on gender and other control variables with (Panel B) and without (Panel A) country fixed effects for the European UBS/Gallup data. The questionnaire questions for the response variables are in Section III.A. Responses indicating “Don’t Know” or “Refused” are treated as missing values. Fem is a dummy variable equal to 1 if the respondent is female. Worth is a dummy variable assuming a value of 1 if the total amount of investment is greater than €100,000. Age is the age of the respondent. The *t*-statistics are reported in parentheses.

Panel A: Without Country Fixed Effects			
Dependent Variable	Fem	Worth	Age
Economic Growth	-0.33 (-10.03)	0.09 (2.22)	-0.51 (-4.15)
Unemployment	-0.27 (-8.20)	0.18 (4.35)	0.12 (1.02)
Inflation	-0.59 (-17.33)	0.22 (5.29)	0.21 (1.74)
Stock Market	-0.42 (-12.43)	0.13 (3.13)	-0.62 (-4.96)
Good Time to Invest	-0.63 (-16.20)	0.25 (5.35)	-0.72 (-5.11)
Euro	-0.57 (-17.03)	-0.03 (-0.68)	-0.18 (-1.45)
Risk	0.42 (12.91)	0.00 (0.11)	-0.51 (-4.26)
Panel B: With Country Fixed Effects			
Economic Growth	-0.34 (-9.99)	0.07 (1.62)	-0.56 (-4.54)
Unemployment	-0.29 (-8.68)	0.10 (2.42)	0.04 (0.36)
Inflation	-0.58 (-16.99)	0.16 (3.78)	0.19 (1.54)
Stock Market	-0.42 (-12.24)	0.13 (3.10)	-0.61 (-4.90)
Good Time to Invest	-0.64 (-16.34)	0.27 (5.60)	-0.72 (-5.10)
Euro	-0.58 (-17.02)	0.04 (0.94)	-0.23 (-1.86)
Risk	0.39 (11.99)	-0.01 (-0.32)	-0.49 (-4.13)

**Table 10. Ordered Logit Regression Results with Marital Status Dummy**

The table reports the results of ordered logit regressions of the categorical responses on gender, marital status, and other control variables with month fixed effects. The questionnaire questions for the response variables are in Section III.A. Responses indicating “Don’t Know” or “Refused” are treated as missing values. Fem is a dummy variable equal to 1 if the respondent is female. Married is a dummy variable equal to 1 if the respondent is currently married. Worth is a dummy variable assuming a value of 1 if the total amount of investment is greater than \$100,000. Edu is a categorical variable that takes a value of 2 if the respondent has an undergraduate degree and 3 if the respondent holds a postgraduate degree. Inc is a categorical variable that is equal to 2 if the annual income is between \$50,000 and \$100,000 and 3 if the annual income is above \$100,000. Retired is a dummy variable equal to 1 if the respondent is not retired. Emp is a categorical variable taking a value of 2 when the respondent works part-time and 3 when the respondent has a full-time job. Age is the age of the respondent. The *t*-statistics are reported in parentheses.

	Fem	Married	FemMarried	Worth	Edu=2	Edu=3	Inc=2	Inc=3	Retired	Emp=2	Emp=3	Age*100
Q1523 (growth)	-0.24	-0.13	0.02									
	(-1.98)	(-1.35)	(0.12)									
	-0.30	-0.18	0.13	-0.12	-0.08	-0.11	0.11	0.16	-0.01	0.02	0.09	1.01
Q1524 (unemployment)	(-2.31)	(-1.70)	(0.84)	(-1.75)	(-1.00)	(-1.30)	(1.21)	(1.43)	(-0.05)	(0.12)	(0.81)	(3.40)
	-0.15	0.08	-0.14									
	(-1.26)	(0.80)	(-1.01)									
Q1525 (stock market)	-0.16	0.06	-0.08	0.08	0.15	0.10	0.17	0.19	0.11	-0.03	0.12	0.00
	(-1.31)	(0.55)	(-0.53)	(1.10)	(2.06)	(1.25)	(1.84)	(1.69)	(0.98)	(-0.21)	(1.12)	(1.69)
	-0.12	-0.14	-0.06									
Q1526 (inflation)	(-0.97)	(-1.39)	(-0.40)									
	-0.16	-0.19	0.01	-0.15	-0.10	-0.19	0.22	0.19	0.16	0.09	0.12	0.00
	(-1.25)	(-1.84)	(0.09)	(-2.15)	(-1.27)	(-2.38)	(2.39)	(1.71)	(1.42)	(0.66)	(1.10)	(1.26)
Q1527 (interest rate)	-0.34	0.28	-0.36									
	(-2.84)	(2.90)	(-2.64)									
	-0.35	0.19	-0.26	-0.17	0.09	0.29	0.20	0.41	0.04	0.04	0.17	0.01
	(-2.76)	(1.87)	(-1.77)	(-2.49)	(1.23)	(3.67)	(2.23)	(3.71)	(0.35)	(0.30)	(1.59)	(3.65)
	-0.29	0.14	-0.14									
	(-2.40)	(1.49)	(-1.00)									
	-0.30	0.05	-0.07	-0.09	-0.02	0.06	0.26	0.40	0.01	0.10	0.13	0.01
	(-2.40)	(0.51)	(-0.46)	(-1.29)	(-0.31)	(0.71)	(2.78)	(3.65)	(0.10)	(0.71)	(1.27)	(1.99)

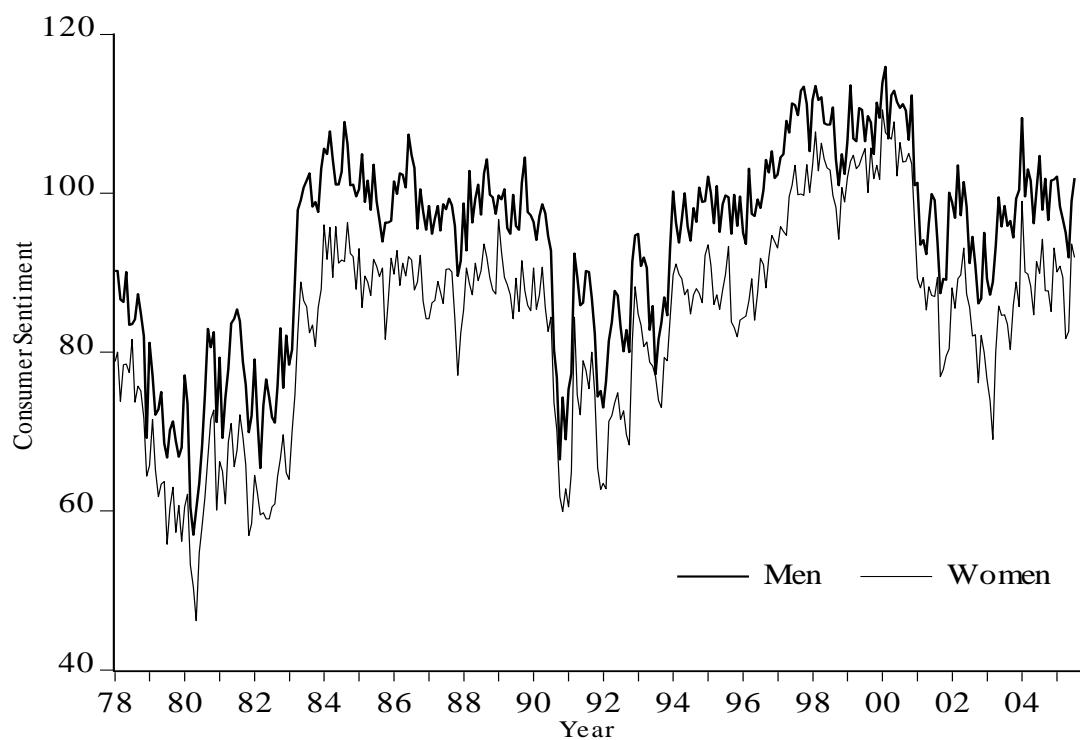
**Table 11. Multinomial Logit Regression Results**

The table reports the results of multinomial logit regressions of the categorical questionnaire responses on gender and other control variables in each panel with and without month fixed effects. The baseline category for each categorical variable is the mid-point of the range (arbitrarily chosen). The questionnaire questions for the response variables are in Section III.A. Responses indicating “Don’t Know” or “Refused” are treated as missing values. Fem is a dummy variable equal to 1 if the respondent is female. Worth is a dummy variable assuming a value of 1 if the total amount of investment is greater than \$100,000. Edu is a categorical variable that takes a value of 2 if the respondent has an undergraduate degree and 3 if the respondent holds a postgraduate degree. Inc is a categorical variable that is equal to 2 if the annual income is between \$50,000 and \$100,000 and 3 if the annual income is above \$100,000. Retired is a dummy variable equal to 1 if the respondent is retired. Emp is a categorical variable taking a value of 2 when the respondent works part-time and 3 when the respondent has a full-time job. Age is the age of the respondent. The *t*-statistics are reported in parentheses.

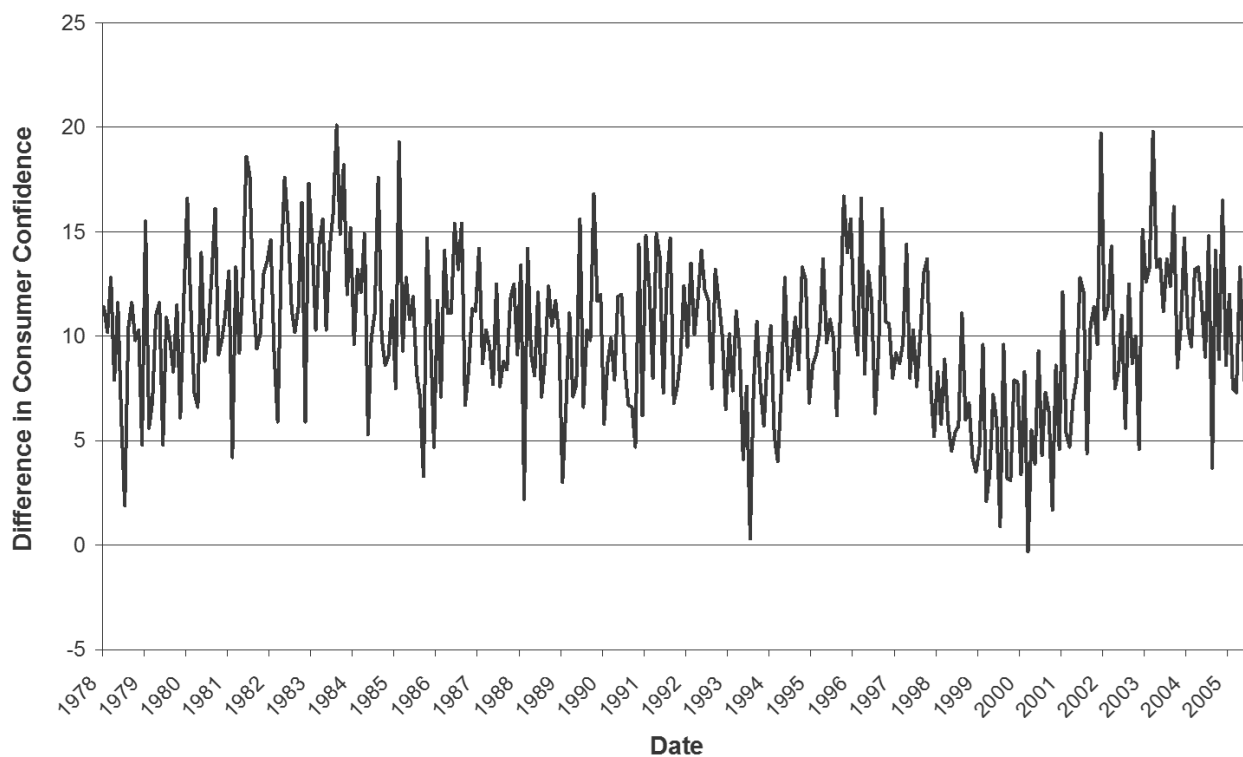
Panel A: Q1523 – Economic Growth											
	Intercept	Fem	Worth	Edu=2	Edu=3	Inc=2	Inc=3	Retired	Emp=2	Emp=3	Age
1 Pessimistic	-1.51 (-9.40)	0.03 (0.53)									
2	-0.28 (-2.71)	0.05 (1.75)									
4	0.74 (8.81)	-0.12 (-5.28)									
5 Optimistic	-0.53 (-4.51)	-0.37 (-11.87)									
1 Pessimistic	-1.67 (-9.27)	-0.01 (-0.26)	0.16 (2.71)	-0.40 (-6.53)	-0.48 (-7.12)	-0.20 (-3.03)	-0.18 (-2.21)	-0.12 (-1.29)	-0.23 (-2.13)	-0.06 (-0.68)	0.01 (2.28)
2	-0.46 (-3.69)	0.03 (0.80)	0.04 (1.09)	-0.13 (-3.38)	-0.10 (-2.49)	-0.11 (-2.60)	-0.10 (-1.95)	0.04 (0.75)	0.00 (0.07)	0.00 (-0.04)	0.00 (1.47)
4	0.67 (3.83)	-0.13 (-4.98)	-0.03 (-1.18)	-0.03 (-1.04)	-0.12 (-3.59)	0.01 (0.35)	-0.01 (-0.20)	0.03 (0.55)	-0.07 (-1.26)	-0.06 (-1.45)	0.01 (5.27)
5 Optimistic	-0.52 (-4.15)	-0.38 (-10.72)	-0.03 (-0.72)	-0.33 (-8.16)	-0.48 (-10.98)	0.01 (0.20)	0.13 (2.46)	-0.21 (-3.34)	-0.19 (-2.58)	0.12 (2.06)	0.01 (4.08)
Panel B: Q1525 – Stock Market Performance											
	Intercept	Fem	Worth	Edu=2	Edu=3	Inc=2	Inc=3	Retired	Emp=2	Emp=3	Age
1 Pessimistic	-1.94 (-9.48)	-0.08 (-2.05)									
2	-0.49 (-4.19)	0.01 (0.26)									
4	0.75 (8.60)	-0.09 (-3.92)									
5 Optimistic	0.05 (0.51)	-0.39 (-12.10)									
1 Pessimistic	-2.09 (-13.15)	-0.13 (-2.83)	0.15 (3.04)	-0.38 (-7.02)	-0.40 (-6.88)	-0.18 (-3.15)	-0.14 (-2.01)	0.08 (0.95)	-0.20 (-2.14)	-0.05 (-0.72)	0.01 (3.67)
2	-0.39 (-3.66)	0.02 (0.74)	0.05 (1.66)	-0.04 (-1.05)	-0.01 (-0.30)	-0.08 (-1.98)	-0.06 (-1.33)	-0.08 (-1.44)	0.04 (0.65)	0.09 (1.87)	0.00 (0.73)
4	0.86	-0.09	-0.10	-0.08	-0.17	0.02	0.00	-0.10	-0.08	0.02	0.00

5 Optimistic	(5.41)	(-3.36)	(-3.70)	(-2.58)	(-5.33)	(0.58)	(-0.12)	(-2.04)	(-1.60)	(0.36)	(3.73)
	0.75	-0.40	-0.15	-0.30	-0.55	0.00	0.01	-0.37	-0.12	0.16	0.00
	(5.10)	(-11.03)	(-3.83)	(-7.40)	(-12.26)	(0.10)	(0.17)	(-5.88)	(-1.59)	(2.69)	(0.80)
Panel C: Q2707 – Stock Market Risk											
	Intercept	Fem	Worth	Edu=2	Edu=3	Inc=2	Inc=3	Retired	Emp=2	Emp=3	Age
1 No Risk	-2.49	-0.43									
	(-23.79)	(-2.23)									
2	-2.26	-0.46									
	(-24.30)	(-2.66)									
3	-1.10	-0.39									
	(-20.45)	(-4.03)									
4	-0.81	-0.37									
	(-16.93)	(-4.37)									
6	-0.42	-0.29									
	(-10.21)	(-4.05)									
7	-0.12	-0.20									
	(-3.18)	(-3.21)									
8	-0.35	0.05									
	(-8.62)	(0.83)									
9	-1.75	0.16									
	(-24.04)	(1.45)									
10 High Risk	-1.07	0.14									
	(-20.05)	(1.64)									
1 No Risk	-0.96	-0.47	-0.26	-0.10	-0.37	-0.46	-0.39	-0.27	-1.22	-0.19	-0.02
	(-1.46)	(-2.20)	(-1.19)	(-0.41)	(-1.32)	(-1.86)	(-1.28)	(-0.73)	(-1.95)	(-0.58)	(-1.57)
2	-1.32	-0.51	0.06	0.17	0.14	-0.41	-0.52	-0.36	0.13	-0.05	-0.01
	(-2.29)	(-2.78)	(0.31)	(0.82)	(0.61)	(-1.96)	(-1.94)	(-1.16)	(0.39)	(-0.18)	(-1.21)
3	-0.82	-0.35	-0.15	0.12	0.08	-0.04	0.14	0.06	0.18	0.02	-0.01
	(-2.41)	(-3.35)	(-1.39)	(1.02)	(0.63)	(-0.30)	(0.89)	(0.30)	(0.86)	(0.13)	(-1.57)
4	-0.73	-0.42	0.05	0.26	0.17	0.10	0.29	0.12	-0.08	-0.21	-0.01
	(-2.42)	(-4.53)	(0.50)	(2.47)	(1.52)	(0.83)	(2.08)	(0.76)	(-0.46)	(-1.45)	(-1.34)
6	0.15	-0.23	0.07	0.32	0.34	0.14	0.10	-0.19	0.20	0.17	-0.02
	(0.57)	(-2.97)	(0.81)	(3.60)	(3.51)	(1.41)	(0.81)	(-1.35)	(1.24)	(1.31)	(-5.25)
7	0.65	-0.14	0.05	0.22	0.29	0.16	0.16	0.02	-0.05	-0.06	-0.02
	(2.80)	(-2.06)	(0.65)	(2.73)	(3.34)	(1.71)	(1.48)	(0.14)	(-0.32)	(-0.54)	(-6.95)
8	-0.10	0.09	0.18	0.17	0.10	0.08	0.19	0.06	-0.23	-0.04	-0.01
	(-0.41)	(1.24)	(2.35)	(2.06)	(1.09)	(0.91)	(1.70)	(0.45)	(-1.53)	(-0.32)	(-3.30)
9	-1.25	0.17	-0.10	0.05	0.06	-0.10	-0.11	-0.02	0.24	0.04	-0.01
	(-3.10)	(1.43)	(-0.76)	(0.39)	(0.37)	(-0.63)	(-0.57)	(-0.10)	(1.05)	(0.19)	(-1.62)
10 High Risk	-0.62	0.10	0.13	-0.16	-0.37	-0.10	0.13	-0.08	-0.30	-0.19	0.00
	(-2.03)	(1.15)	(1.35)	(-1.48)	(-3.04)	(-0.88)	(0.91)	(-0.48)	(-1.58)	(-1.31)	(-1.00)

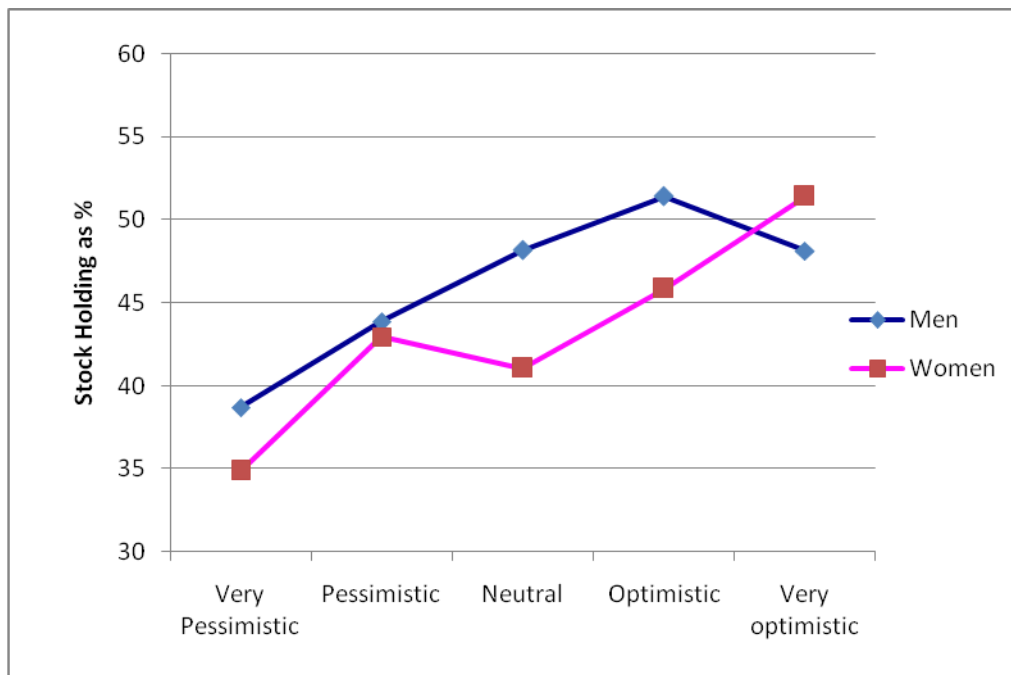
**Figure 1a.** Monthly consumer confidence levels for men and women in the US over the period January 1978–December 2005.



**Figure 1b.** Difference in consumer confidence between man and women in the US over the period January 1978–July 2005.



**Figure 2a. Optimism and Male and Female Stock Holdings: Without Control Variables**



**Figure 2b. Optimism and Male and Female Stock Holdings: After Adjusting for Control Variables**

