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Gender Differences in Perception of Macroeconomic Indicators

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Abstract

This paper examines if there exist gender differences in macroeconomic expectations. Two surveys were implemented in Turkey's leading CEOs, CFOs, economists, portfolio managers, strategists and academics. One of the survey was conducted in 2013 while the other was in 2014. The survey points out if there are significant differences in expectations among women and men. The survey asks the participant's macroeconomic expectations. Mainly, inflation, exchange rate, loan interest rate, stock-exchange rate, export and sector-specific expectations are investigated. Response to expectation questions is given on an ordinal scale with three levels. In the survey, a 3-point Likert scale response was used for the questions of export and sector-specific expectations. Firstly, the normality of the observations was tested with the Kolmogorov-Smirnov test. Then, the differences in macroeconomic expectations of males and females were tested with the Chi-square test of independence. Although the empirical findings of each survey indicate different outputs, the general result mainly exhibits that women are more risk averse than men.

Keywords: Gender Difference; Macroeconomic Perceptions; Kolmogorov Smirnov Test; Chi-Square Test; Risk Aversion.

1. Introduction

Many researches in the literature indicate gender differences in different fields such as decision making in portfolio selections, career roadmaps, risk aversion, retirement plans etc. Some evidence significantly showed that there is a difference, while some conclude that there is no difference. The volatility in the financial markets affects the expectations of the macroeconomic ongoing and risk attitudes of the investors, managers and entrepreneurs. It is certain that financial stress changes people's consumer habits and social relations which lead individuals to save and consume less or even become more risk averse and get more interested in retirement plans. Beyond the stress in the financial markets; there are many other factors influencing individual investment decisions such as income level, age, number of family members and gender. Since, the business actions are closely related to future expectations on the macroeconomic situations; we try to figure out if differences in men and women's macroeconomic perceptions exist. We conducted two surveys, one in 2013 and the other in 2014. Both of the surveys ask the participant's macroeconomic expectations. Mainly, inflation, exchange rate, loan interest rate, stock-exchange rate, export and sector-specific expectations were investigated. Response to expectation questions is given on an ordinal scale with three levels. In the survey, a 3-point Likert scale response was used for the questions of export and sector-specific expectations. Firstly, the normality of the observations was tested with the Kolmogorov-Smirnov test. Then, the differences in macroeconomic expectations of males and females were tested with the Chi-square test of independence. Although much academic research exists on gender differences in risk-taking attitudes, there is a lack of literature about males' and females' economic expectations. This paper closes the gap in men and women's macroeconomic expectations. The remainder of this paper is organized as follows: the next section explains the related literature about how gender affects men and women's risk-taking behavior. Then the data and methodology is followed by the empirical findings and discussion. The concluding remarks are presented in the last section.

2. Literature Review

It is mainly accepted that demographic, socio-economic and personality aspects influence a person's level of financial risk taking (Morse, 1998). Women typically are thought to be more risk averse than men. Women engage in less risky or aggressive behavior and are more averse to risk in many aspects of their lives (Eckel and Grossman, 2002). Differences in behavior are marked in some societies than others, but across a wide variety of environments and social structures, women avoid risk (Flynn, Slovic, and Mertz, 1994; Jianakoplos and Bernasek, 1998; Levy, Elron, and Cohen, 1999; Powell and Ansic, 1997; Spigner, Hawkins, and Lorens, 1993). A number of studies have been conducted as an important step toward linking investment risk-taking, fund size, educational background, investment performance, financial performance, and over confidence to gender differences in the areas of portfolio management. However, there are still some important issues which require adequate information (Powell and Ansic 1997; Estes and Hosseini 1988; Jianakoplos and Bernasek 1998; Barber and Odean 2001; Bliss and Porter 2002; Colleen et al. 2004). Eckel and Grossman (2008) measured risk aversion differences between males and females, implementing their "gamble experiment" with 446 high school students in Houston. Their findings stated that females are more risk-averse than males. Gender differences regarding various factors are widely studied in the literature. Anselmi and Law (1998) explained gender-based differences in risk perception with various theories such as biological and social status. Buss (1989, 1994) examines human mate preferences across cultures and finds that males and females differ in reproductive strategies. In contrast, social and psychological theories outline predominantly sex-specific socialization as a reason for the observed behavioral differences between males and females. In order to stress the social and cultural basis of differences, sociological and psychological theories use the term "gender differences" for describing differences between men and women (Deaux 1985; Eagly and Steffen 1984).

Wang (1994) proposed that investment brokers perceive women as more risk-averse, and so offer them lower-risk/lower-return investments. Harrison et al. (2007) carried out an experiment in Denmark using a sample of 253 people. In the study, they estimated risk perceptions for individuals differentiated using socio-demographic characteristics and found that risk attitude varied significantly with respect to several important socio-demographic variables such as age and education. However, they did not find any effect of gender on risk perception. Kumar (2010) investigates whether or not there exist gender differences in forecasting the styles and abilities of analysts and market participants. He finds that female analysts issue bolder and more accurate forecasts, and that their accuracy is higher in market segments in which their concentration is lower.

Chen (2010) considered the extent to which gender difference contributes to managerial turnover in the mutual fund sector.The research shows that the survival time of female fund managers may be longer than that of male fund managers, while performance difference is not quite obvious. Bernasek and Shwiff (2001) indicate that women are more vulnerable than men to poverty in their old age. They earn less during the worklife and live longer years compared to men. Thus, they need higher amounts of funds to survive after retirement. Therefore, women are expected to be more risk averse to save more for the coming years. Arano, Parker and Terry (2010) examined potential differences in gender-based risk aversion using the retirement funds allocation of Kansas Regents university faculty aged 50 years and older. The initial finding is after controlling for demographic, wealth, and income heterogeneity, women faculty in the Kansas Regents university system do not significantly hold a smaller proportion of their retirement assets in stocks, and therefore do not show significant higher risk aversion than the male faculty. Although previous studies have shown mixed results, the majority have found that women tend to be more risk averse than men. In an earlier article by Rickman, Parker, and Terry (2003) using a 1996 survey of Kansas Regents university faculty aged 50 years and older, the finding was that women faculty holds a smaller percentage of their retirement assets in stocks. Furthermore, there are more evidences that women are more risk averse than men when their entire portfolio of assets is considered (Jianakoplos and Bernasek 1998, Palsson 1996). If women are on average less willing to take risks than men, they are also expected to accumulate less wealth on average, since lower risk is associated with lower returns on investment. Several studies have found that women invest their pension assets more conservatively than men. Women allocate a smaller part to stocks and mainly invest in bonds (Bajtelsmit and Vanderhei 1997; Hinz, McCarty and Turner 1997; Bajtelsmit, Bernasek, and Jianakoplos 1999).

Dwyer, Gilkeson and List (2002) used the data from a national survey of nearly 2000 mutual fund investors to investigate whether investor gender relates to risk taking as revealed in mutual fund investment decisions. Consonant with the received literature, they found that women exhibit less risk-taking than men in their most recent, largest, and riskiest mutual fund investment decisions.

Cifter and Teker (2013) examined if there exist similarities or differences in men and women's macroeconomic expectations. They conducted a survey of 365 which include economists, strategists, top managers from different industries. Their empirical findings showed that macroeconomic expectations of males and females are not statistically different for inflation, unemployment, and exports. On the other hand, macroeconomic expectations of males and females are statistically different only for economic growth at a 10% level. The results indicate that gender is not one of the main determinants for macroeconomic expectations.

3. Data and Methodology

The macroeconomic expectations of economists, portfolio managers and industry managers are obtained through the surveys entitled "Economic Expectations in Turkey for the last quarter of 2013" and "Economics Expectations in Turkey for the first quarter of 2014". Each survey has two parts and contains 16 questions. In the first part of the questionnaire, demographic characteristics of the participants are asked. In the second part, the questionnaire asks the participant's macroeconomic expectations. Mainly, inflation, exchange rate, loan interest rate, stock-exchange rate, export and sector-specific expectations are investigated. Response to the expectation questions is given on an ordinal scale with three levels. In the survey, a 3-point Likert scale response was used for the questions of export and sector-specific expectations. Tables 1-a and 1-b show the descriptive statistics of the responses. For the first survey, there are 217 respondents and 188 of them are male (86.6%). For the second survey, 271 respondents have answered the questions and 218 of them are male (80.4%).

Table 1-A Descriptive Statistics (2013-IV. Quarter)

	N	Mean	SD	Minimum	Maximum
Inflation (I_e)	217	0.84	0.626	0	2
Exchange Rate (Ex_e)	217	0.72	0.763	0	2
Stock Exchange Rate (S_e)	217	0.90	0.769	0	2
Interest Rate (In_e)	217	0.59	0.654	0	2
Export (Exp_e)	217	1.15	0.733	0	2
Sector-Specific (SS_e)	217	0.87	0.783	0	2
Male & Female					
Male	188				
Female	29				

Table 1-B Descriptive Statistics (2014-I. Quarter)

	N	Mean	SD	Minimum	Maximum
Inflation (I_e)	271	0.93	0.379	0	2
Exchange Rate (Ex_e)	271	0.86	0.540	0	2
Stock Exchange Rate (S_e)	271	1.32	0.859	0	2
Interest Rate (In_e)	271	0.89	0.437	0	2
Export (Exp_e)	271	1.18	0.778	0	2
Sector-Specific (SS_e)	271	1.15	0.918	0	2
Male & Female					
Male	218				
Female	53				

Tables 2-a and 2-b show the statistics of expectations of male and female respondents. For both surveys, the mean values of macroeconomic expectations are slightly different. The tables show that the standard deviations of the variables are also slightly different. These descriptive statistics indicate that gender has no effect on changing macroeconomic expectations, but show that each question should be tested with appropriate statistical analysis.

Table 2-A Descriptive Statistics Based on Gender (2013-IV. Quarter)

	Mean	SD
Inflation (I_e)		
Male	0.84	0.645
Female	0.90	0.489
Exchange Rate (Ex_e)		
Male	0.74	0.768
Female	0.59	0.733
Stock Exchange Rate (S_e)		
Male	0.88	0.765
Female	1.00	0.802
Interest Rate (In_e)		
Male	0.56	0.647
Female	0.79	0.675
Export (Exp_e)		
Male	1.17	0.704
Female	1.03	0.906
Sector-Specific (SS_e)		
Male	0.83	0.748
Female	1.14	0.953

Table 2-B Descriptive Statistics Based on Gender (2014-I. Quarter)		
	Mean	**SD**
Inflation (I_e)		
Male	0.91	0.385
Female	1.04	0.338
Exchange Rate (Ex_e)		
Male	0.84	0.554
Female	0.92	0.474
Stock Exchange Rate (S_e)		
Male	1.27	0.866
Female	1.55	0.798
Interest Rate (In_e)		
Male	0.88	0.438
Female	0.92	0.432
Export (Exp_e)		
Male	1.12	0.759
Female	1.42	0.819
Sector-Specific (SS_e)		
Male	1.16	0.907
Female	1.15	0.969

In addition to descriptive statistics, the distribution of responses needs to be tested. In this paper, the distribution of responses is analyzed by Kolmogorov–Smirnov statistics (Kolmogorov 1933; Smirnov 1948). We define the Kolmogorov–Smirnov statistics in equation (1) as follows:

$$D_n = sup_x|F_n(x) - F(x)| \quad (1)$$

where sup_x is the supremum of the set of distances, n is total number of data points and F(x) is the cummulative distribution function.

$$F_n(x) = \frac{1}{n}\sum_{i=1}^{n} I_{x_i \leq x} \quad (2)$$

where $I_{x_i \leq x}$ is the indicator function, equal to 1 if $xi \leq x$ and equal to 0 otherwise.

The differences in macroeconomic expectations between males and females are tested by the Chi-square test of independence. This test is used to determine whether there is a statistical difference between two variables (Cifter and Teker 2013). The Chi-square statistics are computed as follows:

$$x^2 = \sum_{i=1}^{n} \frac{(f_{oi} - f_{ei})}{f_{ei}} \quad (3)$$

where x^2 is the Pearson's cumulative test statistic, which asymptotically approaches χ^2 distribution, f_{oi} is the observed frequency, f_{ei} is the expected (theoretical) frequency and n is the number of cells in the contingency table. The statistical program IBM SPSS Statistics 20 was used to estimate the Chi-square test of independence.

4. Results and Discussions

This section examines whether the men and women's macroeconomic expectations differs or not. Firstly, the normality of the observations was tested with the Kolmogorov-Smirnov test. Secondly, the differences in macroeconomic expectations of males and females were tested using the Chi-square test of independence. Tables 3-a and 3–b summarize the Kolmogorov-Smirnov test statistics results. For the first survey, the Kolmogorov-Smirnov test statistics on inflation, exchange rate, loan interest rate, stock-exchange rate, export and sector-specific expectations are given as 4.612, 4.374, 3.372, 4.657, 3.406 and 3.608, respectively with p-values of 0.000. For the second one, similar test results were obtained. We can conclude from these test results that none of the macroeconomic expectations are normally distributed.

Table 3-A One-Sample Kolmogorov–Smirnov Test (2013-IV. Quarter)

		Inflation (I_e)	Exchange Rate (Ex_e)	Stock Exchange Rate (S_e)	Interest Rate (In_e)	Export (Exp_e)	Sector-Specific (SS_e)
Most extreme differences	Absolute	0.313	0.297	0.229	0.316	0.231	0.245
	Positive	0.272	0.297	0.229	0.316	0.227	0.245
	Negative	-0.313	-0.174	-0.202	-0.235	-0.231	-0.188
Kolmogorov–Smirnov Z[a]		4.612	4.374	3.372	4.657	3.406	3.608
Asymp. sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000	0.000

[a] H_0 = Test Distribution is Normal

Table 3-B One-Sample Kolmogorov–Smirnov Test (2014-I. Quarter)

		Inflation (I_e)	Exchange Rate (Ex_e)	Stock Exchange Rate (S_e)	Interest Rate (In_e)	Export (Exp_e)	Sector-Specific (SS_e)
Most extreme differences	Absolute	0.463	0.377	0.365	0.445	0.261	0.331
	Positive	0.390	0.313	0.215	0.352	0.184	0.250
	Negative	-0.463	-0.377	-0.365	-0.445	-0.261	-0.331
Kolmogorov–Smirnov Z[a]		7.614	6.213	6.005	7.320	4.293	5.442
Asymp. sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000	0.000

[a] H_0 = Test Distribution is Normal

Tables 4-a and 4-b show the Chi-square test of independence comparing macroeconomic expectations of males and females. For the first survey, we found a significant difference in export (Chi-square test: 9.670 with a p-value of 0.008) and sector-specific (Chi-square test: 16.219 with a p-value of 0.000) expectations of males and females at 5% level. For the second survey, likewise a noticeable difference was determined at a stock exchange rate (Chi-square test: 7.086 with a p-value of 0.029) and export (Chi-square test: 14.648 with a p-value of 0.001) expectations of males and females at 5% level. These results are consistent with the findings of Jianakoplos and Bernasek (2007) which reports that women

exhibit relatively more risk aversion than men. For the second survey, the Chi-square statistics is statistically significant at the 8% level of inflation expectations (Chi-square test: 5.021 with a p-value of 0.081).

Table 4-A Chi-Square Tests (2013-IV. Quarter)

		Pearson Chi-Square	Likelihood Ratio	Linear-By-Linear Association	No. of Valid Cases
Inflation (I_e)	Value	4.159	4.412	0.242	217
	df	2	2	1	
	Asymp. sig. (2-sided)	0.125	0.110	0.623	
Exchange Rate (Ex_e)	Value	1.028	1.050	1.011	217
	df	2	2	1	
	Asymp. sig. (2-sided)	0.598	0.591	0.315	
Stock Exchange Rate (S_e)	Value	0.700	0.674	0.582	217
	df	2	2	1	
	Asymp. sig. (2-sided)	0.705	0.714	0.446	
Interest Rate (In_e)	Value	3.269	3.285	3.090	217
	df	2	2	1	
	Asymp. sig. (2-sided)	0.195	0.194	0.079	
Export (Exp_e)	Value	9.670	9.659	0.862	217
	df	2	2	1	
	Asymp. sig. (2-sided)	0.008	0.008	0.353	
Sector-Specific (SS_e)	Value	16.219	16.549	3.892	217
	df	2	2	1	
	Asymp. sig. (2-sided)	0.000	0.000	0.049	

Table 4-B Chi-Square Tests (2014-I. Quarter)					
		Pearson Chi-Square	**Likelihood Ratio**	**Linear-By-Linear Association**	**No. Of Valid Cases**
Inflation (I_e)	Value	5.021	5.495	4.973	271
	df	2	2	1	
	Asymp. sig. (2-sided)	0.081	0.081	0.026	
Exchange Rate (Ex_e)	Value	2.344	2.491	0.948	271
	df	2	2	1	
	Asymp. sig. (2-sided)	0.310	0.288	0.330	
Stock Exchange Rate (S_e)	Value	7.086	7.612	4.570	271
	df	2	2	1	
	Asymp. sig. (2-sided)	0.029	0.022	0.033	
Interest Rate (In_e)	Value	0.537	0.536	0.524	271
	df	2	2	1	
	Asymp. sig. (2-sided)	0.765	0.765	0.469	
Export (Exp_e)	Value	14.648	15.185	6.162	271
	df	2	2	1	
	Asymp. sig. (2-sided)	0.001	0.001	0.013	
Sector-Specific (SS_e)	Value	3.597	4.267	0.001	271
	df	2	2	1	
	Asymp. sig. (2-sided)	0.166	0.118	0.972	

5. Conclusions

There are lots of research in the literature that indicates the relevance of gender differences on many topics such as investment decisions, risk aversion, retirement plans and macroeconomic perceptions. Nowadays, women's participation in business life is increasing rapidly. Women have started to perform a crucial role in more sophisticated ideas and have become one of the decision-makers. The future business plans are closely influenced from the macroeconomic expectations of the decision makers. Thus, the economic ongoing affects the project management and investment decisions of the firms. There are many studies indicate that if there is a significant difference among the managers' future decisions based on gender. Although many researches have concluded that women are more risk averse than men; some of the outputs do not find strong evidence. This paper examines if there are gender differences in macroeconomic expectations in Turkey. Two surveys were implemented in Turkey's leading CEOs, CFOs, economists, portfolio managers, strategists and academics. One of the survey was conducted in 2013 while the other was in 2014. The survey points out if there are significant differences in expectations among women and men. The survey asks the participant's macroeconomic expectations. Mainly, inflation, exchange rate, loan interest rate, stock-exchange rate, export and sector-specific expectations were investigated. Response to the expectation questions is given on an ordinal scale with three levels. In the survey, a 3-point Likert scale response was used for the questions of export and sector-specific expectations. Firstly, the normality of the observations was tested with the Kolmogorov-Smirnov test. Then, the differences in macroeconomic expectations of males and females were tested using the Chi-square test of independence. The test results of each survey indicate that the macroeconomic expectations of males and females are different. The results show that there are different expectations of stock-exchange rate, export and sector-specific between men and women. Although the empirical findings of each survey indicate different outputs, the general result mainly exhibits that the level of aversion to risk among women are different than that of men.

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