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# Financial decision-making under uncertainty: a study with undergraduate students in Accounting and Business Administration

*Tomada de decisão financeira sob condições de incerteza: estudo com alunos de graduação de contabilidade e administração de empresas*

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Uncertainty Effect.
Decision-Making.
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## Abstract

The purpose of this study is to verify the uncertainty effect on financial decision-making by undergraduate students in Accounting and Business Administration, analyzing the gender influence on the level of aversion to uncertainty. A questionnaire, based on the study of Gneezy, List e Wu (2006), was applied to 155 undergraduate students from Accounting and Business Administration courses of a Brazilian Northeast public university. Evidence indicates the presence of the uncertainty effect on decision-making behavior of students of the sample. However, there was no evidence that gender has considerable influence on the level of aversion to uncertainty. The research suggests there might be other effects which generally are not considered in similar surveys applied to undergraduate students.

*Palavras-chave*
*Efeito Incerteza.*
*Tomada de Decisão.*
*Finanças Comportamentais.*
*Ensino em Contabilidade*.

## *Resumo*

*Este estudo tem como objetivo verificar a presença do efeito incerteza nas decisões financeiras tomadas por alunos dos cursos de ciências contábeis e administração, analisando a influência do gênero no nível de aversão à incerteza. Foi aplicado questionário com base no estudo de Gneezy, List e Wu (2006) para 115 alunos dos cursos de contabilidade e administração de empresas em uma universidade pública do Nordeste do país. As evidências indicam a presença do efeito incerteza no comportamento da decisão dos estudantes da amostra. Contudo, não foram encontradas evidências de que o gênero exerce influência significativa no nível de aversão à incerteza. O estudo aponta que podem haver outros efeitos em geral não tratados nos testes que envolvem estudantes.*

## Article information

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## 1 INTRODUCTION

In the decision-making process, the cognitive factor is a preponderant element in choosing the best decision to be made (Bazerman & Moore, 2010), mainly because the most important decisions involve risk (Gneezy, List & Wu, 2006) and the market is formed by individuals who make mistakes of information processing (Barberis & Huang, 2001) and may act on little rational impulse (Kahneman & Tversky, 1979), interpreting information according to his/her beliefs and values (Santos & Santos, 2005).

Several aspects may influence the decision-making and they are not completely rational. However, the traditional modern finances are based on the idea of unlimited rationality, in which their agents make entirely rational decisions. Nevertheless, from the identification of the phenomenon of aversion to loss through study of Kahneman and Tversky (1979), which investigated the human behavior and the manner decisions are made in risk situation, several researchers started investigating the behavioral biases when making decisions (Melo & Silva, 2010).

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Kahneman and Tversky (1979) highlight that the uncertainty effect is one of the biases that may interfere with the decision-making process, tending to generate an opposite result to that desired.

According to the mentioned authors, this bias is present when the individual has preference for sure gains and, in situations in which these are probable, chooses the alternative whose gain has greater probability to occur. Similarly, Gneezy, List and Wu (2006) affirm that the uncertainty effect is a violation of the traditional rationality condition, as individuals tend to evaluate the participation in lottery for a value lower than the worst possible result for such lottery, that is, they are averse to gains risk and prefer a sure gain instead of risking themselves to have it. Accountants and administrators would not be free from such effects.

It is worth mentioning that the accounting information influences its users' behavior and beliefs. In general, accountants have formation to act as elaborators or auditors of this information, and administrators, to use such information when making a decision. However, both, due to behavioral biases, would not deal neutrally with data and information. Thus, this study seeks to answer the following questioning: are the students from Accounting and Business Administration courses averse to uncertainty in their financial decisions, and do age and gender influence this aversion?

Therefore, similar to the study of Kahneman and Tversky (1979), which analyzed the behavior of individuals that make decisions in environments marked by risk and uncertainty, the research retakes the discussion of decision biases in undergraduate students, already discussed in Melo and Silva (2010), and in other studies, in order to compare the aversion effect among students of Administration and Accounting. Still, if such effects would be subject to gender influence.

The results can contribute to the discussion of study of behavioral finances in Brazil, offering a case of a Brazilian region that has its cultural and regional specificities, and help composing a greater Brazil's portrait; besides, they can contribute to the literature of teaching in Accounting, from the perspective of the content taught and its effects on decision-making under risk.

## 2 THEORETICAL FRAMEWORK

Opposing the Theory of Finance (Fama, 1970), which is based on a rational structure of decision-making that defends that human beings are perfectly rational creatures, Kahneman and Tversky (1979) developed a study questioning the agents' perfect rationality and investigating the existence of behavioral biases present in financial decision-making, which resulted in a theory nominated Modern Portfolio Theory. According to it, individuals, in the development of financial decision-making process, are averse to risk from the gain perspective and, on the other hand, prone to risk from the loss perspective. Thus, intuitive judgment may be influenced by heuristics, illusions and cognitive biases (Melo & Silva, 2010).

Over the past three decades, researchers in analysis in risk analysis, decision and economics, have consistently proven that decision makers employ different processes to evaluate losses and gains. Although the rational models generally prescribe a consistent answer, many times the decisions are inconsistent regarding the information provided for the decision makers (Keller & Wang, 2016; Wang, Feng & Keller, 2013). When making a decision, the individuals are not able to analyze all variables and not always the decisions are made rationally (Araújo & Silva, 2007), since important decisions are in context of pressure and uncertainty. Thus, decision makers commonly create mental shortcuts or the so-called heuristic decision-making in order to expedite the decision-making process, which interferes with their rationality.

Contrary to the classical approach, the uncertainty effect is strongly based on the Portfolio Theory developed by Kahneman and Tversky from the 1970s. For this theory, individuals would be averse to risk in gain dimension and prone to risk in loss dimension. Therefore, the uncertainty effect is underlying gain dimension, because, in this case, the individuals do not admit to take certain kinds or levels of risk. According to Kahneman and Tversky (1979), in situations of uncertainty where there are different levels of possible returns, the choice of the individual will depend on his/her disposition to risk to avoid losses, and aversion to loss is a factor that significantly influences the decision makers' choice of the decision.

To reduce the requirements of decision-making information processing, especially under uncertain conditions, decision makers use mental shortcuts to reduce time and effort in judgments (Lima Filho et al., 2012). Models of decision under risk, whether normative or descriptive, assume that individuals measure a perspective involving risk or lottery using some kind of weighted median scheme, thus evaluating the possibility both of achieving the best result and of obtaining the most unfavorable result (Benzion, Shahrabani & Shavit, 2013; Gneezy, List & Wu, 2006).

Thus, the uncertainty effect can be observed, as shown in Gneezy, List and Wu (2006), by the attribution of value made by individuals who participated in lotteries of various assets, when, in situations of uncertainty (lottery), these attribute lower value to the worst possible result in comparison with the lower value attributed in certain gain situations (certainty). Essentially, from the individual's rational perspective, the subjective value of participation in a lottery is the weighted median of the values of its possible results and, as such, should be between the value of the best and the worst possible result.

However, in spite of the existence of such theories, which have been proposed to explain aversion to risk , it is surprising the notion that individuals simply do not like the uncertainty factor presence, that is, uncertainty itself influences utility (Simonsohn, 2009). The studies have reexamined the uncertainty effect at different situations, besides the influence of the gender on the process of financial decision-making. Chart 1 summarizes some of these studies.

| Research | Sampling | Bias | Gender effect |
|---|---|---|---|
| Sonsino (2008) | 107 MBA students in Administration and Law, and students in Engineering | Evidence of uncertainty effect on study participants was verified | Not tested |
| Rydval *et al.* (2009) | 214 students from several courses of Charles University of Prague | Evidence of uncertainty effect was verified | Not tested |
| Simonsohn (2009) | 279 students from a University of Pennsylvania | Evidence of the existence of the uncertainty effect | Not tested |
| Lavarda and Gubiani (2011) | 239 graduate students in Accounting | Aversion to risk in gain area and tendency to risk in loss area were identified | Not tested |
| Yang, Vosgerau and Loewenstein (2013) | Amazon Mechanical Turk consumers and sellers | No evidence of the existence of the uncertainty effect | Not tested |
| Barreto, Macedo and Alves (2014) | 155 Accounting professionals graduate students from five universities | Presence of uncertainty effect and framing | Not tested |
| Mahmood *et al.* (2016) | 477 individual investors of Pakistan market | Negative relationship between the uncertainty effect and investors' performance | Not tested |
| Schubert *et al.* (1999) | 141 undergraduates from several knowledge fields in Switzerland | Aversion to loss | No differences between men and women regarding tendency to risk were verified |
| Araújo and Silva (2007) | 180 Administration students from UnB | Little influence of cognitive aspects on sampling decisions | Women more averse to risk and men extremely prone to risk |
| Silva *et al.* (2009) | 216 students of Accounting from three universities of Pernambuco | Evidence of uncertainty effect was verified | Women more averse to risk than men |
| Melo and Silva (2010) | 516 Accounting professionals and students | Evidence of uncertainty effect was verified | Female students more averse to risk and male students prone to gains risk |
| Santos and Barros (2011) | 641 Brazilians subscribers to a magazine of Editora Abril (Publishing Company) | Aversion to loss | Women more averse to risk than men |
| Vasconcelos, Antunes and Silva (2014) | 1,152 graduate students from several courses and institutions in the city of Caruaru/PE | Cognitive influence regarding gains and losses was verified | No significant quantitative alterations were verified |

**Chart 1.** Previous studies on behavioral finances
Source: Elaborated by the authors, 2017.

It is verified, based on previous research on behavioral finances related above, that the uncertainty effect has already been evidenced in both national and international studies in several localities. However, it is observed that the gender effect is still a little investigated and controversial subject, once the results found diverge regarding the influence of this variable on the individuals' financial decision-making, although the studies that evidenced the influence of the gender indicate that females show a greater aversion to risk than males.

## 3 METHODOLOGICAL PROCEDURES

### 3.1 Sampling and data collection

The sample of this study is composed of 115 students from Accounting and Business Administration courses of the Federal University of Semi-Arid Region, located in the city of Mossoró, Western region of the state of Rio Grande do Norte. The city of Mossoró, considered the "Capital of Culture" of Rio Grande do Norte, is the second most populous municipality in the state, being beaten only by the capital Natal, and has as main economic segments irrigated fruit growing (exports oriented), saline and extractive industry, being the largest producer of sea salt and petroleum on land in the country.

The sampling is considered intentional and not probabilistic, since interviewees' choice was made due to researchers' convenience and availability, and the results are restricted to the sampling studied. It must be emphasized that due to the sample has been selected in a non-aleatory way, the results presented cannot be generalized, and they are thus restricted to the sample studied.

In this research, data were collected by means of a questionnaire, elaborated based on the study of Gneezy, List and Wu (2006), when the authors identified the uncertainty effect among more than 1,000 participants of their research. The questionnaire was divided into two sections.

The first section refers to the identification of participants' gender. The second section brought 13 questions divided into three situations related to the uncertainty bias, where in each situation two questions with certainty perspectives and others of uncertainty (lotteries) were presented. In each one of the questions the interviewees would have to analyze the proposals and attribute values in order to identify how the risk coming from uncertainty is incorporated in the financial decision-making process.

### 3.2 Descriptive statistics

Among the 115 questionnaires valid for the analysis, 61.74% of interviewees are students of the Accounting Sciences Course (71 interviewees) and 38.26% were taking the Administration course (44 interviewees). Table 1 shows the results of the descriptive statistics for each one of the situations proposed in the research questionnaire, as well as the maximum and minimum value expected for each one of the questions.

Situation 1 consists in attributing values for the acquisition of a Gift Card offered by a company. In question 1 and 2, the present gift card was R$ 50.00 and R$ 100.00, respectively, and questions 3-7 questioned how much the interviewees would be willing to pay to participate in lotteries competing for these gift cards, besides the participants' probabilities to win R$ 50 and R$ 100 in each one of the questions, where the probabilities of being chosen with the best prize (R$ 100) are 99%, 60%, 50%, 40%, 1%. However, in all lotteries, the participant would be chosen and win a Gift Card of at least R$ 50.

Situation 2 is related to a check that only can be cashed after one year. In question 8, the check is of R$ 100; in question 9, the check is of R$ 200, and question 10 questioned how much the interviewees were willing to pay to participate in a lottery, when they would win a check of R$ 100 and R$ 200. Thus, this situation has the same basic structure of Situation 1, but involved an intertemporal choice.

According to Table 1, in the total sample and in the sample excerpted by course, there are indicatives of the presence of uncertainty in Situations 1 and 2 (gift card and check drawn), since the medians found in the questions that involved lotteries (uncertainty) were lower than the minimum value in certainty situations for each question.

**Table 1.** Descriptive statistics

| Situation | Questions | Max.-Min.1 Expected (E) | All (n = 115) | | Accounting (n = 71) | | Administration (n = 44) | |
|---|---|---|---|---|---|---|---|---|
| | | | Median | Bias* (6) | Median | Bias* (6) | Median | Bias* (6) |
| Gift Card (in R$) | Q1 (C) | $50^2/50$ | 32.73 | -34.54 | 35.83 | -28.34 | 27.73 | -44.55 |
| | Q2 (C) | $100^2/100$ | 65.40 | -34.60 | 70.06 | -29.94 | 57.89 | -42.11 |
| | Q3 (S) | $99{,}5^3/50$ | 37.57 | -62.23 | 41.49 | -58.30 | 31.26 | -68.58 |
| | Q4 (S) | $80^3/50$ | 29.52 | -63.10 | 32.06 | -59.93 | 25.43 | -68.21 |
| | Q5 (S) | $75^3/50$ | 28.16 | -62.45 | 30.79 | -58.95 | 23.92 | -68.11 |
| | Q6 (S) | $70^3/50$ | 25.75 | -63.21 | 28.48 | -59.32 | 21.36 | -69.48 |
| | Q7 (S) | $50{,}5^3/50$ | 24.71 | -51.06 | 27.33 | -45.89 | 20.49 | -59.42 |
| Check drawn (In R$) | Q8 (C) | $100^2/100$ | 44.64 | -55.36 | 48.59 | -51.41 | 38.27 | -61.73 |
| | Q9 (C) | $200^2/200$ | 83.49 | -58.26 | 94.72 | -52.64 | 65.36 | -67.32 |
| | Q10 (S) | $150^3/100$ | 38.83 | -74.11 | 43.07 | -71.29 | 32.00 | -78.67 |
| Time dedicated (in min) | Q11 (C) | $50^2/50^4$ | 49.80 | -0.40 | 55.38 | 10.76 | 40.80 | -18.41 |
| | Q12 (C) | $100^2/100^4$ | 78.35 | -21.65 | 83.38 | -16.62 | 70.23 | -29.77 |
| | Q13 (S) | $75^3/50^5$ | 54.63 | -27.16 | 57.80 | -22.93 | 49.51 | -33.98 |

Source: Research Data (2017).

C - Certainty situation S - Uncertainty situation (lottery) 1 - Minimum value expected = minimum value assured in the lottery in case it occurs in most unfavorable alternative possible. 2 - Maximum value expected (favorable chance* prize). In case Q1 R$ 50 - 100% (favorable chance)*R$ 50 (prize). 3 - Maximum value expected (favorable chance* prize) + (unfavorable chance*premium). In Q3 Maximum value R$ 99.50 = 99% (favorable chance)*R$ 50 (prize) +1% *R$ 50. 4 - Maximum and minimum prize for the permanence in the presentation. 5 - Maximum and minimum premium obtained by lottery for the permanence in the presentation. 6 - Median distortion in relation to rational calculation: (Observed answer - maximum value expected)/ maximum value expected. This distortion shows how the interviewees are more optimist (positive values) and pessimist (negative values) when distancing from the rational value expected.

As the respondents attribute values lower than the minimum possible for the lottery, evidence of presence of the uncertainty effect is evident regarding both Accounting and Business Administration students. These results suggest that students in both courses are averse to risk in the area of gains and prone to risk in the area of losses, where the majority of interviewees in the decision-making did not analyze the available information logically, as advocated by Fame (1970). This indicates the propensity for sure gains and aversion to risk in line with the uncertainty effect, also identified in the study of Barreto, Macedo and Alves (2014).

In Situation 3, interviewees would have to say how long they were willing to stay listening to the presentation of a company that sells travel packages, in which, according to question 11, they would receive R$ 50.00 for the participation; in question 12, they would receive R$ 100.00; and in question 13, they would participate in a lottery, where they would win the value of R$ 50.00 or R$ 100.00. In this situation, it was expected that the interviewees would remain watching the presentation at least 1 minute for each R$ 1.00 of prize.

Thus, for question 13, the students of the course of Administration presented the uncertainty effect, in spite of the average of the values attributed by these students (49.5 min) being very close to the sure minimum value of 50 minutes. It is observed, however, that Accounting students do not present the same effect, since the median (57.80 min) is greater than 50, indicating aversion to uncertainty. In the case of Accounting students, this result is similar to that found by Rydval et al. (2009) and Yang, Vosgerau and Loewenstein (2013), who did not find evidence of the uncertainty effect in situations involving lotteries either.

Based on the results of question 11, it turns out that, in general, future Accounting professionals were willing to spend more time watching the presentation, almost an hour (55.38 minutes), to win R $ 50.00, than the Administration course for a sure gain, since Administrators seem to be willing to stay for approximately 41 minutes, on average.

Thus, there are indications that Accounting students, in financial decision-making, valorize more strongly a sure gain and tend to be less influenced by uncertainties even in situations of risk, when the resource involved is time itself.

The results indicate that Administrators are more pessimistic than Accounting students, considering that when they consider the value of the sure gain and the time dedicated to decision-making, they decouple more from the expected value (rational calculation) than the future Accounting professionals, who were less pessimistic.

Analyzing the mean distortion in relation to the expected maximum value in each one of the questions, a large discount is realized (negative values in the 'deviation' column for all questions, except for question 11, both by Accounting students and by Administrators, are large, to the point where they expect less than the minimum value of the sure gain). Such discount means that they expect to receive less than the minimum possible value proposed by the test. But, negative deviations (pessimistic, averse to risk) are always greater in the case of Business Administration students.

In general, it is observed that Administration students are more pessimistic and averse to risk than Accounting students, since the discounts attributed by the future accountants are smaller, indicating that Accounting students are more prone to risk in situations involving losses, having a lower aversion to risk in financial decision-making that involves sure gains, as defended by Kahneman and Tversky (1979), than future Business Administration professionals.

## 4 RESULTS AND ANALYSES

### 4.1 Identification of uncertainty effect

In Table 1, a simple comparison between the medians of the answers and the expected minimum rational value for each question could be previously observed. Then, an alternative comparison is performed; Student's t test compared the medians of the lowest value attributed by the interviewees in the questions of sure gain (the first two questions of each situation) with those of lottery, as suggested by Gneezy, List and Wu (2006). To identify the presence of uncertainty bias, the medians of questions 1 and 11 were multiplied by 2 and the median of question 9 was divided by 2, so as to leave the questions on the same base (R$ 100), enabling the comparison.

Table 2 shows the difference of medians in situations 1, 2 and 3, thus demonstrating the presence of the uncertainty effect among Accounting and Business Administration students. The results indicate a greater appreciation of sure gain, and, as consequence, the presence of aversion to risk.

It is verified that the result found is in line with that observed by Gneezy, List and Wu (2006), Sonsino (2008), Simonsohn (2009), Lavarda and Gubiani (2011) and Mahmood et al. (2016). Such results indicate that individuals are averse to risk from the gain perspective, that is, they prefer a sure gain, which may cause, as indicated by Mahmood et al. (2016), smaller performance of the investments made by these individuals.

The presence of the uncertainty effect evidenced in the three proposed situations may be related to the fact that in a decision under risk, as reported by Lavarda and Gubiani (2011), individuals are averse to risk in gain dimension, and prone to risk in losses dimension. Still, due to what was defended by Vasconcelos, Antunes and Silva (2014), students' decisions tend to be influenced by the emotional component of losses and gains.

It should be mentioned that the difference of medians found in Student's t test for situation 3 (time dedicated) may be associated with a change in the basis of uncertainty bias identification.

Mann-Whitney U test was used to analyze if there were significant differences between the decisions of Accounting and Business Administration students. Table 2 shows that the students of these two groups process the available information differently when evaluating the gains and losses, as defended by Wang, Feng and Keller (2013), since the students of the two groups present similar behavior when exposed to situations of uncertainty.

This result corroborates the evidence in Table 1, where it was found that the Administration students are more sensitive to uncertainty and more pessimistic than Accountant students, and even under certainty, the Administration students remain pessimistic, attributing values more distant from the sure gain than Accounting students, which may be associated with the curricular structure and the training profile of each course.

**Table 2.** Teste t de *Student* e Mann-Whitney para Incerteza

| Situation | Questions | Student's T Test Comparison of answers with certainty values (sample gathering all students) | | Mann-Whitney Comparison between the medians of Accounting and Administration students' answers | |
|---|---|---|---|---|---|
| | | t | p-valor | z | p-valor |
| Gift Card (in R$) | Q1 | - | - | 2.303 | 0.021** |
| | Q2 | - | - | 1.850 | 0.064** |
| | Q3 | -7.992 | 0.000* | 1.722 | 0.085*** |
| | Q4 | -11.085 | 0.000* | 1.575 | 0.115 |
| | Q5 | -11.309 | 0.000* | 1.560 | 0.119 |
| | Q6 | -12.488 | 0.000* | 1.76 | 0.115 |
| | Q7 | -12.995 | 0.000* | 1.676 | 0.094*** |
| Check drawn (in R$) | Q8 | - | - | 1.998 | 0.046*** |
| | Q9 | - | - | 2.618 | 0.009** |
| | Q10 | -5.888 | 0.000* | 0.984 | 0.325 |
| Time dedicated (in min) | Q11 | - | - | 1.236 | 0.216 |
| | Q12 | - | - | 0.346 | 0.729 |
| | Q13 | -5.892 | 0.000* | 0.440 | 0660 |

Source: Research Data (2017)
*, ** and *** denote significance of 1%, 5% and 10%.

### 4.2 Identification of gender influence on uncertainty effect

To verify gender influence on the financial decision-making of students per course, the Mann-Whitney U test was also performed for each question. Table 3 and 4 present the results obtained, as well as the descriptive statistics of the results by gender.

Analyzing the maximum and minimum value attributed by the Accounting students, it is observed the existence of participants averse to risk from gain perspective, and prone to risk from loss perspective. It is also verified that future accountants did not incorporate all the available information when making their financial-decisions, opposing thus what is defended by Fama (1970), since, with the exception of question 13, Accounting students of both genders assigned the issues a value lower than the value of sure gain, that is, the worst possible performance in each one of the situations.

It can be seen in Table 3 that the p-value calculated is above 0.05 in all questions. Thus, it is concluded with 95% confidence that the medians of the values attributed by the Accounting female and male students are not statistically different, that is, gender did not influence the financial decision-making of these students and, consequently, it is observed that students of both genders have the same level of aversion to uncertainty and valuation of sure gain.

Table 4 shows the same effect for Business Administration students. The values attributed to the questions of each proposed situation are below the value of its worst possible performance (lower than the value of sure gain), signaling that the interviewees, in the financial decision-making, were not guided exclusively by the financial result and by the probabilities of sure gain, being also influenced by cognitive biases, as indicated by Kahneman and Tversky (1979). The results indicate that the students did not incorporate all the available information when making their decisions, thus opposing what is defended by Fama (1970), and aligned with what was found by Kahneman and Tversky (1979).

**Table 3.** Accounting course, Mann-Whitney U test for gender

| Situations | | Female (n = 23) | | | Male (n = 48) | | | Mann-Whitney | |
|---|---|---|---|---|---|---|---|---|---|
| | | Median | Standard deviation | Máx.-Mín. | Median | Standard deviation | Máx.-Mín. | Z | p-value |
| Gift Card (in R$) | Q1 | 36.96 | 16.97 | 50-5 | 35.29 | 17.33 | 50-0 | -0.528 | 0.463 |
| | Q2 | 70.00 | 31.80 | 100-10 | 70.08 | 33.74 | 100-4 | 0.026 | 0.502 |
| | Q3 | 35.09 | 28.54 | 100-0 | 44.56 | 33.10 | 100-0 | 1.043 | 0.576 |
| | Q4 | 25.87 | 22.19 | 70-0 | 35.02 | 27.05 | 100-0 | 1.168 | 0.585 |
| | Q5 | 29.15 | 26.05 | 100-0 | 31.57 | 25.02 | 100-0 | 0.403 | 0.529 |
| | Q6 | 28.13 | 25.54 | 100-0 | 28.64 | 22.90 | 100-0 | 0.075 | 0.505 |
| | Q7 | 28.39 | 25.20 | 100-1 | 26.82 | 22.07 | 100-0 | -0.423 | 0.469 |
| Check drawn (in R$) | Q8 | 45.65 | 35.81 | 100-0 | 50.00 | 27.09 | 100-0 | 0.466 | 0.534 |
| | Q9 | 87.39 | 68.77 | 200-0 | 98.23 | 54.46 | 200-0 | 0.712 | 0.552 |
| | Q10 | 40.52 | 44.86 | 150-0 | 44.29 | 41.23 | 150-0 | 0.593 | 0.543 |
| Time dedicated (in min) | Q11 | 55.30 | 50.79 | 180-2 | 55.42 | 47.62 | 240-10 | 0.081 | 0.506 |
| | Q12 | 80.43 | 73.87 | 300-5 | 84.79 | 74.83 | 360-5 | 0.446 | 0.533 |
| | Q13 | 58.13 | 52.57 | 180-2 | 57.65 | 55.83 | 240-8 | 0.190 | 0.501 |

Source: Research Data (2017).
*, ** and *** denote significance of 1%, 5% and 10%.

Gender does not influence uncertainty perception, whether for Accounting or Administration students. These results are similar to those of Vasconcelos, Antunes and Silva (2014) and Schubert et al. (1999). However, they are contrary to what was verified by Santos and Barros (2011), Melo and Silva (2010) and Silva et al. (2009), which noticed that the females are more averse to risk than males.

This divergence may be associated with the fact that the research instrument approaches situations and comparison bases different from the studies of Melo and Silva (2010) and Silva et al. (2009), and also may be associated with the fact that sample individuals here investigated are inserted in a reality different from the sample of these studies, because decision-making process is influenced by environmental factors, since individuals' preference, because it is a human activity, depends on the training, experience, and beliefs and values of each one.

**Table 4.** Administration course, Mann-Whitney U test for gender

| Situations | | **Female** (n = 19) | | | **Male** (n = 25) | | | **Mann-Whitney** | |
|---|---|---|---|---|---|---|---|---|---|
| | | Median | Standard deviation | Máx.-Mín. | Median | Standard deviation | Máx.-Mín. | Z | p-valor |
| Gift Card (in R$) | Q1 | 28.26 | 20.95 | 50-0 | 27.32 | 18.31 | 50-0 | -0.085 | 0.493 |
| | Q2 | 60.63 | 37.72 | 100-2 | 55.80 | 35.96 | 100-0 | -0.542 | 0.453 |
| | Q3 | 37.00 | 35.31 | 100-0 | 26.90 | 23.60 | 80-0 | -0.466 | 0.459 |
| | Q4 | 31.39 | 33.07 | 100-0 | 20.90 | 17.25 | 60-0 | -0.369 | 0.467 |
| | Q5 | 28.21 | 28.66 | 100-0 | 20.66 | 16.91 | 60-0 | -0.310 | 0.473 |
| | Q6 | 23.74 | 22.59 | 70-0 | 19.56 | 17.33 | 60-0 | -0.286 | 0.475 |
| | Q7 | 21.25 | 20.72 | 50-0 | 19.92 | 16.83 | 50-0 | 0.024 | 0.502 |
| Check drawn (In R$) | Q8 | 30.58 | 30.76 | 100-0 | 44.12 | 34.46 | 100-0 | 1.484 | 0.629 |
| | Q9 | 58.63 | 62.62 | 200-0 | 70.48 | 60.82 | 200-0 | 0.897 | 0.579 |
| | Q10 | 29.68 | 34.93 | 100-0 | 33.76 | 32.64 | 100-0 | 0.945 | 0.583 |
| Time dedicated (in min) | Q11 | 44.21 | 38.31 | 120-0 | 38.20 | 23.89 | 100-0 | -0.048 | 0.496 |
| | Q12 | 72.37 | 63.21 | 240-0 | 68.60 | 40.58 | 150-0 | 0.388 | 0.534 |
| | Q13 | 53.74 | 48.75 | 160-1 | 46.30 | 30.80 | 120-0 | -0.024 | 0.498 |

Source: Research Data (2017)
*, ** and *** denote significance of 1%, 5% and 10%.

## 5 FINAL CONSIDERATIONS

The presence of the uncertainty effect was verified, both for Accounting students and for Administration students. It was observed preference for perspective of lower risk (gains) in comparison with the most unfavorable value expected. Individuals did not admit to take certain kinds or levels of risk. In the tests, gender did not influence the decision-making under conditions of uncertainty.

The results found suggest that there is an important background effect, even when the sample involves students. Although the students are individuals in professional training stage, the cognitive effects in financial decision-making under conditions of uncertainty can already be evidenced. However, it does not necessarily mean that the course (sequence and content of subjects, didactics, etc.) is exerting an isolated effect on risk and uncertainty propensity, but previous characteristics (as personality traits) of those that are candidates for Accounting and Administration courses may be important.

The limitation of the research is the use of a questionnaire rather than an experiment. In addition, interviewees exposed to situations involving disbursements of real money values make decisions differently from those made in this study based on hypothetical situations.

It is suggested future research on other behavioral biases, with the objective of verifying how the variables investigated here, and also other variables, may interfere with financial decision-making, such as: course, age, area, conservatism, finance knowledge degree, among others.

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