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WENZHOU-KEAN UNIVERSITY

**Financial literacy among WKU undergraduate students**

In Partial Fulfillment of the Requirements  
for the Bachelor of Science in Finance

by

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May, 2020

## Table of Contents

Page Number

|   |           |
|---|-----------|
| <b>ABSTRACT</b> .....   | <b>1</b>  |
| <b>1. INTRODUCTION</b> .....  | <b>2</b>  |
| <b>2. LITERATURE REVIEW</b> .....   | <b>2</b>  |
| 2.1 (Gender and personal financial issues) .....                                | <b>4</b>  |
| 2.1.1 (Gender and credit cards) .....   | <b>4</b>  |
| 2.1.2 (Gender and financial planning behaviors) .....                           | <b>5</b>  |
| 2.2 (Gender and Financial literacy) .....                                       | <b>5</b>  |
| 2.3 (Internship experience and financial literacy) .....                        | <b>7</b>  |
| 2.4 (Academic standing and financial literacy) .....                            | <b>7</b>  |
| 2.4.1 (GPA and financial literacy) .....  | <b>7</b>  |
| 2.4.2 (Major & financial education and financial literacy) .....                | <b>8</b>  |
| 2.4.3 (Year level and financial literacy) .....                                 | <b>9</b>  |
| <b>3. METHODOLOGY &amp; DATA</b> .....  | <b>9</b>  |
| 3.1 (Discussion and explanation of dataset) .....                               | <b>9</b>  |
| 3.2 (Discussion of the sample) .....  | <b>10</b> |
| 3.3 (Discussion and explanation of methodology) .....                           | <b>10</b> |
| 3.4 (Discussion and explanation of the model and null hypotheses) .....         | <b>12</b> |
| <b>4. ANALYSIS &amp; FINDINGS</b> .....   | <b>13</b> |
| 4.1 (Gender differences in personal financial behavior) .....                   | <b>13</b> |
| 4.2 (Gender differences in financial literacy) .....                            | <b>15</b> |
| 4.3 (Relationship between internship experience and financial literacy) .....   | <b>16</b> |
| 4.4 (Relationship between academic standing and financial knowledge) .....      | <b>17</b> |
| <b>5. CONCLUSION</b> .....  | <b>19</b> |
| <b>6. REFERENCES</b> .....  | <b>21</b> |
| <b>7. TABLES AND FIGURES</b>  |           |
| Table 1 (Likert Scale) .....  |           |
| Table 2 (Measurement of financial literacy) .....                               |           |
| Table 3 (The results of applying different hypothesize mean difference) .....   |           |
| Table 4 (Measurement of financial literacy) .....                               |           |
| <b>8. APPENDIX</b>  |           |
| Appendix A (Questionnaire.) .....   |           |
| Appendix B (T-test results for gender differences in financial behaviors) ..... |           |
| Appendix C (T-test for gender differences in financial literacy) .....          |           |
| Appendix D (Single regression results) .....                                    |           |
| Appendix E (Multiple regression results) .....                                  |           |

## **Abstract**

This study examines to study financial literacy among WKU undergraduate students. It will further analyze the gender differences in financial behaviors and financial literacy, and try to figure out the relationship between internship experience and financial literacy, and the relationship between academic standing and financial literacy. Based on the data collected from our 166 respondents in WKU, including 88 females 78 males. Also, by using the t-test and regression models, we find that gender differences do not exist in financial behaviors and financial literacy. Specifically, in terms of financial behaviors, there are no gender differences in the usage of credit cards, but gender differences exist in financial planning behaviors. Additionally, females behave better than males. Also, there is a significant relationship between internship experience and financial literacy, but no relationship between academic standing and financial literacy.

Keywords: Financial Literacy; Gender Differences; Financial Behaviors; Academic Standing; Internship Experience

## 1. INTRODUCTION

Based on the definition provided by accounting dictionary, financial literacy is the education to understand how money is made, spent, saved, as well as the ability to use existing resources to make financial decisions, including how to generate, save, spend and invest money (MyAccountingCourse.com, 2018). Similarly, the president's advisory on financial literacy defines financial literacy as the ability to manage financial resources through using skills and knowledge for a lifetime of financial well-being (NationalFinancialEducatorsCouncil.com, 2018). Therefore, financial literacy highly relates to citizens' daily life.

In the last several generations, cash was the most popular method for citizens to pay for their goods. While, today, with the advent of the Age of the internet, cash is gradually replaced by more new forms of paying methods. Although these new paying methods greatly provide a lot of convenience to people's daily life, to some extent, these also bring several potential risks and create ample opportunities for the development of financial markets. Hence, people are required to have the proper financial knowledge to manage financial issues, otherwise, that is quite easy for people to be involved in financial troubles. For example, credit card companies, and some private financial institutions are inundating customers with the magic opportunities of credit cards, as people can use products first and pay the money next. For people who have little financial knowledge about how credit cards work, they are easily encountering financial problems and even live with financial stresses. Accordingly, financial literacy is served as an important role in helping the public to make good use of financial products and help them manage their financial issues effectively.

According to the financial knowledge survey conducted by the legal department in Nanjing in 2017, the results indicated that college students were exposed to many non-bank

lenders, and over 90% of college students mentioned that they have ever received financial fraud calls or messages. Hence, they concluded that the financial conditions in college were not optimistic. Also, their survey showed majority college students were deficient in financial literacy, for example, most students just think the loan products for emergencies, and they were not concerned about the counter party's professional qualification, indirectly leading to some potential risks (Tencent, 2017). Besides, Cui defined college students as a group of impulse buyers who lacked social experience, and were easily deceived (Cui, 2016).

In the present situation, no matter from the exterior environment, or in the college, financial literacy is the important one that requires most people in the society to pay attention to. This study helps the public get to know more about financial literacy among WKU students.

In this paper, I aim to identify the gender differences in the management of personal financial issues and knowledge of financial literacy among WKU students by running the t-test. Also, I will examine the influences of internship experience on WKU undergraduate business students' financial literacy and find out the relationship between academic standing and financial literacy among undergraduate students by using the regression model. The next section is going to discuss literature reviews, which are relating to this field.

## 2. LITERATURE REVIEW

After finishing the introduction part, literature review section outlines literature references on financial literacy, in terms of gender in personal financial issues and financial literacy, the influences of internship and parents on financial literacy, and the relationship between academic standing and financial literacy, which have been studied and analyzed by researchers before.

## 2.1 Gender and personal financial issues

### 2.1.1 Gender and credit cards

Hayhoe et al. (2000) demonstrated that among all of the predictors, gender was the most significant one to exert the effects on financial practices. To be specific, compared with the male students, female students have more credit cards, but few cards have a maximum balance. (Hayloe, Leach, Turner, Bruin, & Lawrence, 2000). Also, considering the numbers of credit card owned, women appeared to have 23.5% more credit cards than men (Holmes, 2016). Besides, Hancock et al. have analyzed the data from the survey, and found out that making other factors unchanged in the regression model, female students were 2.4 times more likely than male students to have two or more credit cards (Hancock, Jorgensen, & Swanson, 2012). In contrast, Ucal, Lou and Çankaya conducted research focusing on the university students in Turkey, and they revealed the totally different results. They have learned that among the Turkey college students, men tended to poss more credit cards than women. To be specific, nearly 36% of male students held two credit cards, comparing to 20% of female students held. Also, more than twice as many males had four credit cards than female students (Ucal, Lou, & Çankaya, 2013).

Besides, Holmes had already mentioned that in comparison to men, women appeared to be more concerned about their credit card debts. Particularly, their survey showed around 35% of female people in 2014 ranked paying off the credit card debt as the major concern compared with 22% of men did so (Holmes, 2016). Additionally, Krawcheck suggested that women pay more for their credit card debt, and she inserted the reference from the FINRA Investor Education Foundation illustrated that women pay half a point higher annually on their debts (Krawcheck, 2018). However, in 2012, Sereetrakul, Wongveeravuti and Likitapiwat had found out that in terms of the attitudes of preference

for the use of credit cards, there was no difference between female and male students (Sereetrakul, Wongveeravuti, & Likitapiwat, 2012). Therefore, based on literature reviews, there is no conclusion about the gender differences in credit cards held by people.

### 2.1.2 Gender and financial planning behaviors

In 2011, based on the results of the survey, Falahati, Babaei and Paim concluded that considering the total financial management female students perform better than male students. Among the components of financial management, it was found that male students have significantly better financial management in saving than female students, while female students tended to have safer spending behaviors compared to male students (Falahati, Babaei, & Paim, 2011). Besides, their findings also suggest that male students are more concerned about financial planning such as investment and savings (Falahati, Babaei, & Paim, 2011). In contrast, Sabri and MacDonald examined the saving behaviors among female and male students, of 2,519 students who responded to the survey, more female students are likely to engage in the saving behaviors and male students (Sabri & MacDonald, 2010). However, by using the Fisher test by Sereetrakul, Wongveeravuti and Likitapiwat (2012), the differences in saving behaviors of male and female students also have been analyzed. The finding showed the different results that male and female college students had the same saving behaviors (Sereetrakul, Wongveeravuti, & Likitapiwat, 2012).

### 2.2 Gender and Financial literacy

According to the collected results from Volpe and Chen's survey contained several sections focusing on financial literacy, it showed that in the general knowledge section, male students received the higher average scores than the female by about 15 percentages.

Also, in terms of saving and borrowing, and investing section, males performed better than females. However, in the investing section, both genders perform worse (Volpe & Chen, 2002). Another similar research has been conducted by Falahati and Paim, but it showed completely different results, which revealed that female students were more knowledgeable to concern about saving items, while male students were more knowledgeable about the investment issue (Falahati & Paim, 2011). While, according to the study in 1998, Chen and Volpe reported that female students answered less correct questions not only in saving part, but also in investing part, and for the general financial knowledge, female students still performed worse than male students (Chen & Volpe, 1998). The research from Goldsmith also concludes that men possessed more knowledge in the investing parts, as they received a higher score on the real knowledge test (Goldsmith & Goldsmith, 1997). In 2016, Goldsmith mentioned that men behaved much more confident about their investing knowledge and they knew more about investing issues (Goldsmith, 2016). Besides, apart from the investing knowledge, Danes and Hira focused on the knowledge of insurance and personal loans, and they concluded that male students also have a better performance in these two sections (Danes & Hira, 1987). According to one online article, it tested current college students on the basic personal finance knowledge and analyzed the major reasons, and the results showed in the United States, both female and male students lack financial literacy, as in 2016, only 17 states require students to take personal finance courses (Rathmanner, 2016). Gender differences are existing in financial literacy in terms of general knowledge, saving knowledge, investing knowledge, personal loan knowledge, and even insurance knowledge, but how gender exerts the effects on these various types of knowledge is still needed to be studied more.

### 2.3 Internship experience and financial literacy

In 2002, Volpe and Chen had already concluded one of their research results that working experiences had some positive influences on people's financial literacy (Volpe & Chen, 2002). Chen and Volpe also revealed that participants who had more years of working experience appeared to be more financially knowledgeable than those with less working experience (Chen & Volpe, 1998). Even, Ranzetta studies the importance of internship for financial literacy and he described the internship as the heart of financial learning, as it helped students to make the connection between school and career, and even increased students' motivation level (Ranzetta , 2014). Ansong and Gyensare conducted further research on the reason of why work experience contributed to financial literacy. Their findings suggested if an employee is more acquainted with a specific job, he or she will become more familiar with financial issues, such as wages, salaries, savings, and investing. Accordingly, they tended to accumulate more financial literacy with the increase of working experience (Ansong & Gyensare, 2012).

### 2.4 Academic standing and financial literacy

#### 2.4.1 GPA and financial literacy

According to Goldsmith's study in 1997, the results showed that women always had a higher GPA than men, while that did not mean women appeared to have more financial knowledge. They concluded that GPA was unrelated to real financial knowledge (Goldsmith & Goldsmith, 1997). By contrast, Anderson, Conzelmann and Lacy revealed that students' grades were related to financial literacy, lower grades leading to the low score got on financial literacy (Anderson, Conzelmann, & Lacy, 2018).

#### 2.4.2 Major & financial education and financial literacy

In 1987, Danes and Hira showed the situation that most higher education institutions did not put much emphasis on students' financial education, and even in business school, students were not required to take any personal finance courses (Danes & Hira, 1987). Chen and Volpe concluded that this situation directly resulted in inadequate financial knowledge for college students. Besides, they surveyed to find out that business major undergraduates were more knowledgeable than non-business major undergraduates (Chen & Volpe, 1998). In 2016, Goldsmith examined the relationship between education and financial knowledge, and the results indicated that education could greatly improve both gender's subjective and real investing knowledge. Also, the deficiency in investing knowledge can be overcome by taking some related courses (Goldsmith, 2016). According to a study done by Kutin and Duah in 2014, they found that education background exerted effects on students' financial knowledge, which can be proved by the results of their survey. In the survey, it showed business students answered more correct financial knowledge questions than non-business students, over 12% correct questions (Kutin & Duah, 2014). Besides, Anderson et al. did further research on specific majors, and they concluded that students whose majors are in STEM fields (Science, Technology, Engineering, and Math) and business or economics have a higher score in financial literacy than those major in non-STEM or Social Science (Anderson, Conzelmann, & Lacy, 2018). Additionally, in 2015, Albeerdly and Gharlegghi had proved that education strongly influence the financial knowledge of college students, as it helped students shape the financial structure (Albeerdly & Gharlegghi, 2015).

### 2.4.3 Year level and financial literacy

In 2012, Ansong and Gyensare mentioned that with the ages increasing, knowledge tended to be accumulated, because of the practical experience increase. These would have a positive relationship with respondents' financial literacy levels (Ansong & Gyensare, 2012). Also, Danes and Hira found that class status was positively related to some knowledge indexes, and the highest correlation was the credit card knowledge index. To be specific, senior and graduate students knew more about credit card knowledge than freshmen. Also the older students had a higher level of financial knowledge towards insurance and personal loans, comparing to younger students (Danes & Hira, 1987). Chen and Volpe made a general conclusion that graduate students knew more than undergraduates, and junior and seniors tended to be more knowledgeable than those students from lower ranks (Chen & Volpe, 1998).

## 3. METHODOLOGY AND DATA

After reviewing the literature references, in this section, I am going to discuss the data collected by the online questionnaire and the sample which I mainly focus on.

### 3.1 Discussion and explanation of dataset

To begin with, the respondents' basic information related to the study, including gender, major, the current level of degree, GPA, and internship experience, has been collected to have further study. Financial literacy is measured by 8 true or false questions, concerning investment knowledge, security (stock, bond, and mutual fund) and security market (stock and bond market) knowledge. The total score for the financial literacy part is going to be computed by the number of the correct questions answered by the

respondents. Following that, personal financial behaviors categorized into financial planning behaviors and the usage of credit cards have been analyzed by adopting the Likert Scare model (shown in table 1), and gender differences are tended to be mainly discussed in the part of personal financial behaviors and financial literacy.

### 3.2 Discussion of sample

The simple random sampling method is proposed to use in this study. All of the respondents are independent and chosen with no purpose, also each of them has an equal probability to be questioned from the sample. The study will be conducted at Wenzhou-Kean University, a Chinese-American jointly established university in Wenzhou City, China, during the third week in November in Fall term 2019. The sample size is about 5% of the total amount of WKU students which contains freshman, sophomore, junior and senior among all female and male students and majors in all business and nonbusiness.

The online questionnaire will be applied in this study. Survey software is used to set up the questionnaire and then I will provide the link of the questionnaire to my potential respondents to assess it and respond through QQ and Wechat. Ultimately, the survey software will collect the data information for me, and also provide me simple ways to analyze the data.

### 3.3 Discussion and explanation of the methodology

First, Descriptive and inferential statistics will be used in this study to provide a clear and in-depth data analysis.

Personal financial behavior will be measured by using the Likert Scale shown in table 1, and the higher mean score represents the better personal financial behavior, including

good financial planning behavior, and good habit of using the credit cards. Besides, to determine the gender differences in personal financial behaviors, the t-test is conducted between male and female respondents.

Among eight true or false questions, each question will be scored at one point. The scores are grouped into three categories, the first one (0.00-3.00) indicates the respondents have a low level of knowledge, the second category (4.00-6.00) tells that the respondents have a moderate level of knowledge, and the last one (7.00-10.00) indicates the respondents have a relatively high level of knowledge. After measuring the financial literacy, the regression model will be run to analyze the relationship between independent variables (current degree of level, GPA and major) and dependent variable (financial literacy). Also, the t-test method will be used to analyze whether gender differences in WKU undergraduates' financial behaviors and financial literacy.

| Response Scale | Measurement of Personal Financial Behavior | Mean Interval |
|----------------|--|---------------|
| 1              | Never                                      | 0.00-1.00     |
| 2              | Rarely                                     | 1.01-2.00     |
| 3              | Sometimes                                  | 2.01-3.00     |
| 4              | Usually                                    | 3.01-4.00     |
| 5              | Always                                     | 4.01-5.00     |

Table 1. Likert

| Total Score | Indication of financial literacy   |
|-------------|------------------------------------|
| 0.00-3.00   | Low level of knowledge             |
| 4.00-6.00   | Moderate level of knowledge        |
| 7.00-10.00  | Relatively high level of knowledge |

Scale

Table 2. Measurement of financial literacy

### 3.4 Discussion and explanation of the model and null hypotheses

A series of linear regressions will be performed to further analyze the relationship with the independent variable (internship experience) and dependent variable (financial literacy), and the independent variables (the current level of degree, GPA and major) and dependent variable (financial literacy). Additionally, for the convenience of analyzing the year level, current level of degree is coded as "1" to "4", representing freshmen to seniors respectively. Also, the non-business major is coded as "0", the business major is coded as "1".

The regression model takes on the following function form:

$$Y_{Financial\ Literacy} = \beta_1 + \beta_2 X_{Internship\ experience} + e_1$$

$$Y_{Financial\ Literacy} = \beta_1 + \beta_2 X_{Current\ Degree\ of\ Level} + \beta_3 X_{GPA} + \beta_4 X_{Major} + e_1$$

I expect the following hypothesis:

*H<sub>0</sub>: There is no statistically significant difference between the personal financial behavior of female students and male students.*

*H<sub>0</sub>: There is no statistically significant difference between the personal financial knowledge of female students and male students.*

*H<sub>0</sub>: There is no relationship between Internship experience financial knowledge among WKU students.*

*H<sub>0</sub>: There is no relationship between academic standing and financial knowledge among WKU students*

#### 4. **ANALYSIS AND FINDINGS**

My research topic is financial literacy among WKU business students. I mainly conduct the online questionnaire from Wenjuanxing, a professional platform helps to collect the data. My questionnaire includes three parts, basic information, test in financial behavior and small quiz in financial literacy. Besides, I collected my data from 166 respondents in total, including 79 males and 87 females. Also, 55.42% of my respondents are business major and the rest are non-business. There are 7.23% freshmen, 24.1% sophomores, 23.49% juniors and 45.18% senior college students.

The T-test will be used in analyzing the gender differences in financial behaviors and financial literacy. Also, single regression model will be used to discuss the relationship between working experience and financial literacy, and multiple regression model is expected to study the relationship between academic standing (current degree of level, GPA and major) and financial literacy.

I have assumed four null hypotheses as follows:

*H<sub>0</sub>: There is no statistically significant difference between the personal financial behavior of female students and male students.*

*H<sub>0</sub>: There is no statistically significant difference between the personal financial knowledge of female students and male students.*

*H<sub>0</sub>: There is no relationship between Internship experience financial knowledge among WKU students.*

*H<sub>0</sub>: There is no relationship between academic standing and financial knowledge*

*among WKU students.*

#### 4.1 Gender differences in personal financial behavior

Before, I assumed that there is no statistically significant difference between the personal financial behavior of female and male WKU students. Here, in the part of financial behavior, I design the small test including seven questions relating their behaviors in financial planning and the usage of the credit cards. After the t-test, the results show two tails P-value for the gender difference in financial behaviors is 0.065, which is higher than 0.05. Hence, based on the p-value, the first null hypothesis will not be rejected. Namely, the collected data shows that it is true that there is no statistically significant difference between the personal financial behavior of female and male WKU students. While my results are inconsistent with those of Hayhoe et al. (2000) who demonstrated that gender was the most important one to exert effects on financial practices among all factors.

Further investigating the gender differences in financial planning behaviors and the usage of the credit cards. By using the t-test to analyze the data, the two tails p-value in financial planning behaviors is 0.00012 and that in the usage of the credit cards is 0.255. Therefore, the results indicate that gender difference exists in financial planning behaviors but not in the usage of the credit cards, which is partially similar to the findings from Likitapiwat who states that for the use of credit cards, there was no difference between female and male students (Sereetrakul, Wongveeravuti, & Likitapiwat, 2012).

Additionally, in order to learn whether females perform better in the financial planning behaviors than males or not, I established four hypotheses, including females' financial planning behaviors are 5%, 10%, 20% and 40% better than males'. Based on the results shown in table 1, we could get the conclusion that the hypothesis, females' financial

planning behaviors are 40% better than males' has been proved. This finding agrees with that shown by Sabri and MacDonald who examined the saving behaviors among female and male students, of 2,519 students who responded to the survey, more female students are likely to engage in the saving behaviors and male students (Sabri & MacDonald, 2010).

| Hypothesized Mean Difference | 5%          | 10%         | 20%         | 40%           |
|------------------------------|-------------|-------------|-------------|---------------|
| P(T<=t) one-tail             | 0.000307716 | 0.000950509 | 0.007001331 | 0.128698989   |
| Results                      | Reject      | Reject      | Reject      | Do not reject |

Table3. the results of applying different hypothesize mean difference

Besides, in the part of numbers of credit cards held by females and males, female students own more credit cards, compared with males. Also, half of the respondents, 83 students, expressed that they do not have any credit cards. In terms of two credits cards owned, females and males constitute 5.42% and 7.83% of the total number of respondents. It is worth to mention that these figures are much lower than those in one Turkey universities, where nearly 36% of male students held two credit cards, comparing to 20% female students held (Ucal, Lou, & Çankaya, 2013).

#### 4.2 Gender differences in financial literacy

At the beginning of the research, I suppose that there is no statistically significant difference between the personal financial knowledge of female students and male students. Also, I want to mention that in the part of financial literacy, true or false questions are set to test respondents' financial knowledge in investment knowledge, security (stock, bond, and mutual fund) and security market (stock and bond market) knowledge. After running the t-

test, the two tails p-value is around 0.52, largely higher than 0.05, so we do not reject the hypothesis, showing gender differences do not exist in financial literacy. These results are somewhat different from other experts' findings. For instance, the research from Goldsmith concludes that men possessed more knowledge in the investing parts (Goldsmith & Goldsmith, 1997). Also, Volpe and Chen's survey indicated that in terms of saving and borrowing, and investing section, males performed better than females. For general financial knowledge, female students still performed worse than male students (Chen & Volpe, 1998).

Based on table 2 and also combined the data collected from the respondents, only 0.18 of the total respondents have a relatively high level of knowledge, constituting 60% females and 40% males. Besides, 51.2% of respondents show a moderate level of knowledge, 54.1% females and 45.9% males. Lastly, in the rest of the respondents who have a low level of knowledge, both males and females are half and half.

| Total Score | Indication of financial literacy   |
|-------------|------------------------------------|
| 0.00-3.00   | Low level of knowledge             |
| 4.00-6.00   | Moderate level of knowledge        |
| 7.00-10.00  | Relatively high level of knowledge |

Table 4. Measurement of financial literacy

#### 4.3 Relationship between internship experience and financial literacy

I have presumed that internship experience will not result in any changes in the financial literacy of WKU students. However, after using the multiple regression model to deeper analyze the data, the two tails p-value is 0.038, less than 0.05. Accordingly, we reject the hypothesis and indicate that there is an actual relationship between internship

experience and the level of financial knowledge among WKU students. Also, based on the coefficient given, 0.51, we can reveal that among WKU respondents, there is a moderate relationship between internship experience and financial literacy, and higher internship lead to a higher level of financial knowledge. This finding is the same as the conclusion revealed by Volpe and Chen in 2002, which is working experiences had some positive influences on people's financial literacy (Volpe & Chen, 2002).

#### 4.4 Relationship between academic standing and financial knowledge

The regression model is expected to be applied to analyze the relationship between academic standing and financial knowledge, and the multiple regression takes the following function form:

$$Y_{Financial\ Literacy} = \beta_1 + \beta_2 X_{Current\ Degree\ of\ Level} + \beta_3 X_{GPA} + \beta_4 X_{Major} + e_1.$$

Here, the current degree of level, GPA and major have been used as the independent variables, and financial literacy is the dependent variable. I firstly predict that there is no relationship between academic standing (current degree of level, GPA and major) and financial literacy. After finally running the multiple regression model, the results show that the two tails p-value for current degree of level, GPA and major are 0.2317, 0.8536 and 0.1971 respectively, and all of these figures larger than 0.05, which show that academic standing (current degree of level, GPA and major) does not affect the respondents' level of financial literacy.

Some of these finds are consistent with the literature articles. In 1997, the results from Goldsmith's study also showed that even women had a higher GPA than men, while women did not appear to know more about financial knowledge. However, other groups of experts revealed that lower grades leading to the low score got on financial literacy

(Anderson, Conzelmann, & Lacy, 2018). Hence, my finding is consistent with Goldsmith's, while inconsistent with Anderson et.al's. Besides, the results of the relationship between the current degree of level and level of financial literacy are contradictory to the conclusions led by several researchers, as all of them Ansong & Gyensare, Chen & Volpe, and Danes & Hira have mentioned that higher year level leads to a higher level of financial literacy.

To conclude, my findings limit the research scope to WKU, which is a new area to conduct financial literacy among college students, adding some extra information into the study of financial literacy. Also, the results shown in my study are partially different from other experts' conclusions. For instance, I find that among WKU college students, there are no relationships between academic standing and level of financial knowledge, while others almost all stated that these two had relationships.

While there are some limitations in my research. Time is the major one in this study, as the time given to us to conduct this research is quite limited. Also because of the limited time to collect the data, the sample size is a little small. Also, the questionnaire has been collected on several online platforms, resulting in less control of the responses from the target respondents. The distribution of the current level of degree and major is also one of the limitations. As in WKU, in WKU, over 80% of students are business major and also all of the freshmen have not taken any finance-related courses, leading to some inaccurate responses given by them.

Besides, most of the participants come from a convenient group, who are senior students in WKU. This limitation could be part of the reason why the majority of respondents could have a high level of financial literacy and good financial behaviors.

For the small quiz about the test in respondents' financial literacy, three choices are given to them, "true", "false" and "don't know". When the data is analyzed, it is difficult to

tell the reason why people choose “don’t know” is for convenience or is they do not have any ideas about the answers. Also, the true or false questions included in the financial literacy part are not so elementary, and even some of them are related to specialized courses in the financial field, resulting in a low average score in this part.

In the future, I hope I could include more independent variables which could exert impacts on the respondents’ financial literacy when I am conducting the regression model. Also, I wish I could increase my sample size and do not limited to WKU, but collect more responses from other different types of universities in China.

## 5. CONCLUSION

My current research aims to further examine the financial literacy among 166 WKU students in 2019, which is going to provide more literature resources for the public about the financial knowledge of the undergraduate students. The t-test and regression model has been applied to discuss the gender differences and relationship between two variables respectively. The findings of my research indicate that gender differences do not exist in personal financial behaviors among male and female WKU students. While, further studying financial planning behavior and the habit of using the credit cards which are belonged to the personal financial behaviors, the results indicate that females perform better than males in financial planning, but there is no significant gender difference in the habit of using the credit cards.

Besides, after the t-test results being shown, it indicates that there is no statistically significant difference between the personal financial knowledge of female WKU students and male WKU students. These results are somewhat inconsistent with the findings of other experts who state that men possessed more knowledge in the investing parts, and for the

general financial knowledge, female students still performed worse than male students (Goldsmith & Goldsmith, 1997; Chen & Volpe, 1998).

Additionally, after running the regression model, the findings show that there is a relationship between internship experience and financial literacy of WKU students, with an internship leading a high level of financial knowledge. Also, I have learned that academic standing, including the current degree of level, GPA and major, does not affect the respondents' financial literacy.

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## Appendix A Questionnaire

### **Financial Literacy among WKU undergraduate students**

I am a senior student at WKU and am currently doing a research to find out the situation of financial literacy among WKU undergraduate students. Your active participation by means of answering the questionnaire is highly appreciated. All of the answers and responses will be strictly kept secret. If you have any questions while answering our questionnaire, please feel free to contact me (zhouying@kean.edu). Thanks for your support and cooperation.

#### Part I Basic Personal Information

1. Gender

- Male
- Female

2. Major

- Non-business Majors
- Business Majors

3. Current level of degree

- Freshman
- Sophomore
- Junior
- Senior

4. GPA

- 3.80-4.00
- 3.60-3.79
- 3.40-3.59

Below 3.40

5. Have you ever done any financial related internship?

No

Yes

6. How many credit cards do you have owned?

None

one

two

three

over three

Part II Rate your personal financial behaviors from 1 to 5

7. Personal Financial Behavior

|   | 1.Never               | 2.Rarely              | 3.Sometimes           | 4.Usually             | 5.Always              |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I always keep track of my daily expenses.   | <input type="radio"/> |
| I plan a part of my money with the purposes of savings, future spending or in case of emergencies | <input type="radio"/> |
| I make a plan for how to spend my money monthly   | <input type="radio"/> |

|   |                       |                       |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I repay my credit card bills on time and I will never forget to do it.  | <input type="radio"/> |
| I feel pretty secure and satisfied with my current financial situation. | <input type="radio"/> |

**III For each of the following statements, circle the correct answer from the available choices.**

**8. Financial Literacy**

|   | True                  | False                 | Don't know            |
|---|-----------------------|-----------------------|-----------------------|
| When an investor diversifies his investments, the risk of losing money decreases. If the interest rate rises, the bond prices fall. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| If the interest rate rises, the bond prices will also increase.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| If you buy a company's bond, you own part of the company  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Common stocks always provide higher returns than bonds or money market investments.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| The closing price is the final price at which it trades during regular market hours on any given day.                               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Beta measures how responsive or sensitive a stock is to market movements.   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

|   |                       |                       |                       |
|---|-----------------------|-----------------------|-----------------------|
| If earning per share increases, the PE ratio is expected to increase as well              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Buying a single company's stock usually provides a safer return than a stock mutual fund. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Appendix B T-test results for gender differences in financial behaviors

| t-Test: Two-Sample Assuming Unequal Variances | (financial behavior) |               |
|---|----------------------|---------------|
|   | <i>Male</i>          | <i>Female</i> |
| Mean  | 2.939240506          | 3.174419      |
| Variance                                      | 0.65164557           | 0.670867      |
| Observations                                  | 79                   | 86            |
| Hypothesized Mean Difference                  | 0                    |               |
| df  | 162                  |               |
| t Stat  | -1.856379023         |               |
| P(T<=t) one-tail                              | 0.032607879          |               |
| t Critical one-tail                           | 1.654313957          |               |
| P(T<=t) two-tail                              | 0.065215759          |               |
| t Critical two-tail                           | 1.974715786          |               |

| t-Test: Two-Sample Assuming Unequal Variances | (spending&saving behavior) |               |
|---|----------------------------|---------------|
|   | <i>Male</i>                | <i>Female</i> |
| Mean  | 2.629746835                | 3.2151        |
| Variance                                      | 1.065481986                | 0.7223        |
| Observations                                  | 79                         | 86            |
| Hypothesized Mean Difference                  | 0                          |               |
| df  | 151                        |               |
| t Stat  | -3.956831375               |               |
| P(T<=t) one-tail                              | 5.82635E-05                |               |
| t Critical one-tail                           | 1.655007387                |               |
| P(T<=t) two-tail                              | 0.000116527                |               |
| t Critical two-tail                           | 1.975798924                |               |

| t-Test: Two-Sample Assuming Unequal Variances |               |             |
|---|---------------|-------------|
|   | <i>Female</i> | <i>Male</i> |
| Mean  | 3.19828       | 2.62975     |
| Variance                                      | 0.73857       | 1.06548     |
| Observations                                  | 87            | 79          |
| Hypothesized Mean Difference                  | 0.05          |             |
| df  | 152           |             |
| t Stat  | 3.49779       |             |
| P(T<=t) one-tail                              | 0.00031       |             |
| t Critical one-tail                           | 1.28715       |             |
| P(T<=t) two-tail                              | 0.00062       |             |
| t Critical two-tail                           | 1.65494       |             |

| t-Test: Two-Sample Assuming Unequal Variances |               |             |
|---|---------------|-------------|
|   | <i>Female</i> | <i>Male</i> |
| Mean  | 3.1983        | 2.6297      |
| Variance                                      | 0.7386        | 1.0655      |
| Observations                                  | 87            | 79          |
| Hypothesized Mean Difference                  | 0.1           |             |
| df  | 152           |             |
| t Stat  | 3.1605        |             |
| P(T<=t) one-tail                              | 0.001         |             |
| t Critical one-tail                           | 1.2871        |             |
| P(T<=t) two-tail                              | 0.0019        |             |
| t Critical two-tail                           | 1.6549        |             |

| t-Test: Two-Sample Assuming Unequal Variances |               |             |
|---|---------------|-------------|
|   | <i>Female</i> | <i>Male</i> |
| Mean  | 3.1983        | 2.6297      |
| Variance                                      | 0.7386        | 1.0655      |
| Observations                                  | 87            | 79          |
| Hypothesized Mean Difference                  | 0.2           |             |
| df  | 152           |             |
| t Stat  | 2.486         |             |
| P(T<=t) one-tail                              | 0.007         |             |
| t Critical one-tail                           | 1.2871        |             |
| P(T<=t) two-tail                              | 0.014         |             |
| t Critical two-tail                           | 1.6549        |             |

| t-Test: Two-Sample Assuming Unequal Variances |               |             |
|---|---------------|-------------|
|   | <i>Female</i> | <i>Male</i> |
| Mean  | 3.1983        | 2.6297      |
| Variance                                      | 0.7386        | 1.0655      |
| Observations                                  | 87            | 79          |
| Hypothesized Mean Difference                  | 0.4           |             |
| df  | 152           |             |
| t Stat  | 1.1368        |             |
| P(T<=t) one-tail                              | 0.1287        |             |
| t Critical one-tail                           | 1.2871        |             |
| P(T<=t) two-tail                              | 0.2574        |             |
| t Critical two-tail                           | 1.6549        |             |

| t-Test: Two-Sample Assuming Unequal Variances (the usage of credit cards) |             |               |
|---|-------------|---------------|
|   | <i>Male</i> | <i>Female</i> |
| Mean  | 3.670886076 | 3.3837        |
| Variance  | 2.35183382  | 2.8746        |
| Observations  | 79          | 86            |
| Hypothesized Mean Difference  | 0           |               |
| df  | 163         |               |
| t Stat  | 1.1423258   |               |
| P(T<=t) one-tail  | 0.127496909 |               |
| t Critical one-tail   | 1.286766884 |               |
| P(T<=t) two-tail  | 0.254993819 |               |
| t Critical two-tail   | 1.654255585 |               |

#### Appendix C T-test for gender differences in financial literacy

| t-Test: Two-Sample Assuming Unequal Variances |             |               |
|---|-------------|---------------|
|   | <i>Male</i> | <i>Female</i> |
| Mean  | 3.772       | 3.93          |
| Variance                                      | 2.665       | 2.23          |
| Observations                                  | 79          | 86            |
| Hypothesized Mean Difference                  | 0           |               |
| df  | 158         |               |
| t Stat  | -0.65       |               |
| P(T<=t) one-tail                              | 0.259       |               |
| t Critical one-tail                           | 1.655       |               |
| P(T<=t) two-tail                              | 0.518       |               |
| t Critical two-tail                           | 1.975       |               |

### Appendix D Single regression results

| SUMMARY OUTPUT               |                     |                       |               |                |                       |                  |                    |                    |
|------------------------------|---------------------|-----------------------|---------------|----------------|-----------------------|------------------|--------------------|--------------------|
| <b>Regression Statistics</b> |                     |                       |               |                |                       |                  |                    |                    |
| Multiple R                   | 0.1609              |                       |               |                |                       |                  |                    |                    |
| R Square                     | 0.0259              |                       |               |                |                       |                  |                    |                    |
| Adjusted R Square            | 0.0199              |                       |               |                |                       |                  |                    |                    |
| Standard Error               | 1.5668              |                       |               |                |                       |                  |                    |                    |
| Observations                 | 166                 |                       |               |                |                       |                  |                    |                    |
| <b>ANOVA</b>                 |                     |                       |               |                |                       |                  |                    |                    |
|                              | <i>df</i>           | <i>SS</i>             | <i>MS</i>     | <i>F</i>       | <i>Significance F</i> |                  |                    |                    |
| Regression                   | 1                   | 10.695                | 10.695        | 4.3567         | 0.0384                |                  |                    |                    |
| Residual                     | 164                 | 402.58                | 2.4548        |                |                       |                  |                    |                    |
| Total                        | 165                 | 413.28                |               |                |                       |                  |                    |                    |
|                              | <i>Coefficients</i> | <i>Standard Error</i> | <i>t Stat</i> | <i>P-value</i> | <i>Lower 95%</i>      | <i>Upper 95%</i> | <i>Lower 90.0%</i> | <i>Upper 90.0%</i> |
| Intercept                    | 3.6146              | 0.1599                | 22.604        | 3E-52          | 3.2988                | 3.9303           | 3.3501             | 3.8791             |
| Internship                   | 0.514               | 0.2462                | 2.0873        | 0.0384         | 0.0278                | 1.0002           | 0.1066             | 0.9213             |

### Appendix E Multiple regression results

| SUMMARY OUTPUT               |                     |                       |               |                |                       |                  |                    |                    |
|------------------------------|---------------------|-----------------------|---------------|----------------|-----------------------|------------------|--------------------|--------------------|
| <b>Regression Statistics</b> |                     |                       |               |                |                       |                  |                    |                    |
| Multiple R                   | 0.168006            |                       |               |                |                       |                  |                    |                    |
| R Square                     | 0.028226            |                       |               |                |                       |                  |                    |                    |
| Adjusted R Square            | 0.01023             |                       |               |                |                       |                  |                    |                    |
| Standard Error               | 1.574511            |                       |               |                |                       |                  |                    |                    |
| Observations                 | 166                 |                       |               |                |                       |                  |                    |                    |
| <b>ANOVA</b>                 |                     |                       |               |                |                       |                  |                    |                    |
|                              | <i>df</i>           | <i>SS</i>             | <i>MS</i>     | <i>F</i>       | <i>Significance F</i> |                  |                    |                    |
| Regression                   | 3                   | 11.6652               | 3.88841       | 1.56848416     | 0.19907               |                  |                    |                    |
| Residual                     | 162                 | 401.612               | 2.47909       |                |                       |                  |                    |                    |
| Total                        | 165                 | 413.277               |               |                |                       |                  |                    |                    |
|                              | <i>Coefficients</i> | <i>Standard Error</i> | <i>t Stat</i> | <i>P-value</i> | <i>Lower 95%</i>      | <i>Upper 95%</i> | <i>Lower 90.0%</i> | <i>Upper 90.0%</i> |
| Intercept                    | 2.997503            | 0.60054               | 4.99133       | 1.5352E-06     | 1.8116                | 4.1834           | 2.00402            | 3.99099            |
| MAJOR                        | 0.374423            | 0.31192               | 1.20038       | 0.23174389     | -0.2415               | 0.99038          | -0.1416            | 0.89044            |
| CURRENT LEVEL OF DEGREE      | 0.028938            | 0.15661               | 0.18478       | 0.85363335     | -0.2803               | 0.33819          | -0.2301            | 0.28802            |
| GPA                          | 0.168374            | 0.12999               | 1.29526       | 0.19707451     | -0.0883               | 0.42507          | -0.0467            | 0.38342            |