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Research Article

Determining Advanced and Basic Financial Literacy Relations and Overconfidence, and Informative Social Media Association of University Students in Turkey

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Abstract

The purposes of the paper are, first, to investigate financial literacy in university students and to determine the relationship between basic and advanced financial literacy; second, to present a positive association between social media usage and financial literacy; third, to examine demographic factors consistent with previous studies; and, fourth, to assess students' confidence in their knowledge. We surveyed 1,119 university students and found that advanced literacy and basic literacy are significantly related and some of advanced literacy can be explained by basic literacy. Following the pages or accounts of famous economists, benefiting from economics, and gaining exposure to finance course materials, and posting financial and economic issues increase advanced financial literacy. Financial literacy differs on the basis of age, class, and major areas of study. University students are overconfident in their ability to interpret financial and economic news and data.

Keywords

Financial literacy • Social media literacy • Social networks • Financial education • Advanced financial literacy

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University students inhabit an important transitional stage of development. After graduation, many take on significantly greater financial independence, including the need to make their own financial decisions. The financial knowledge that most students acquire during the university period affects their lives as acquired financial skills and knowledge likely persist for a lifetime. Individuals build their economic wellbeing, and their skills and sophistication levels shape their financial prosperity or suffering. Financial literacy is a prerequisite for acquiring the skills and sophistication required to make appropriate financial decisions. Financial literacy means having the minimum degree of financial knowledge and information; the use of this knowledge and information has an impact on individuals' macro and micro economic activities and decision-making processes. Literacy is a broad concept, which includes information pertinent to decision making and economic behavior (i.e., consumption, savings, and investments).

Lusardi (2008) classified financial literacy as either basic or advanced. The minimum degree of literacy required for all individuals from any type of background to navigate daily life is called basic level literacy. Basic financial literacy (hereafter BFL) involves issues such as numeracy, compound interest, inflation, time, the value of money, and the money illusion. Advanced financial literacy (hereafter AFL) involves stock markets, stocks, mutual funds, bonds, other types of securities, and the interest rate effect on securities, security prices, and risk-return relationship issues. Both literacy types fit under the term general financial literacy (hereafter GFL). It is logical and reasonable that advanced financial literacy is based on basic financial literacy, but it is not necessary for an individual to have a basic level of literacy in all areas before developing advanced knowledge in others. For instance, it is possible to know the risk diversification without having the knowledge of money illusion. In this paper, we investigate the relationship between basic and advanced literacy that is not determined before to our knowledge.

In the information era, Internet sources and Internet-based social media applications are new sources of information. University students accept the Internet as a source of knowledge and information (Lyons, Scherpf, & Roberts, 2006). According to the Turkish Statistical Institute (TUIK), Information and Communication Technology Usage in Households and by Individuals survey, 77% of young individuals in Turkey used the Internet and 78% used social networks in the last three months of 2015. The Internet offers a huge variety of information via social media and networks, including financial information. During the information acquisition process, individuals are passive but social media pages and accounts on networks allow users to be active in acquiring, commenting on, discussing, and sharing information and materials. This new information environment raises new questions about acquiring financial information via the Internet and social networks. As Lusardi and Mitchell (2014)

identified, there is a lack of research on how individuals acquire financial information and knowledge. We shed some light on this issue: information sources and social network activities are documented by their usage, and the impact of resources and social media activities on the development of financial literacy in university students is assessed.

Mere exposure to information might reinforce existing knowledge and influence decision making, but this a dangerous assumption to make. Social media, especially social networks, enable user contributions and comments to reach potentially millions of users, whether the contributions and comments are true or not. Intentionally or unintentionally, the original information might be manipulated over the course of successive comments and discussions. Therefore, potential or real investors should be able to make their own judgments on the information served, relying on their financial literacy to do so. In addition, overconfident individuals might lead others to make poor decisions that result in losses, thus diminishing wealth. Again, financial literacy helps individuals accurately assess information on its own merit. We documented the confidence levels of students when interpreting economic and financial data and news.

Financial Literacy

There are many definitions of financial literacy. The broadest is offered by the Organization for Economic Co-operation and Development (OECD, 2006): “Financial literacy is the combination of consumers’/investors’ understanding of financial products and concepts and their ability and confidence to appreciate financial risks and opportunities, to make informed choices, to know where to go for help, and to take other effective actions to improve their financial well-being.”

Financial literacy studies build upon the infrastructure of economics education, both theoretical and empirical, in terms of subjects like savings, consumption, consumer choice (risk aversion, discount rates), economic environment (investment risks), social security, etc. Financial literacy includes a wide variety of subjects, such as expenditure and saving patterns, personal finance, asset liquidity, estimating value, taxes, understanding annual interest rates, compound interest, consumer credit reports, insurance premiums, deposit account contract, loans and collaterals, credit card usage, insurance reasons, health insurances, insurance contracts, pension funds, mutual funds and returns, risky investments, dynamics of interests and bond prices, investment diversification, etc. Most financial literacy studies focus on financial knowledge, savings and investment behavior, and decisions (e.g., Delavande, Rohwedder, & Willis, 2008; Jappelli & Padula, 2013; Hsu, 2011; Lusardi, Michaud, & Mitchell, 2011).

Financial illiteracy is a common feature in both developed and developing countries, including the U.S. (Hogarth & Hilgert, 2002; Mandell, 2004; Moore, 2003), UK (Atkinson, McKay, Collard, & Kempson, 2010), EU countries, Japan (Lusardi & Mitchell, 2007), and Australia (Lusardi & Mitchell, 2007; Worthington, 2004). Xu and Zia (2012) analyzed comparable surveys and found that financial literacy is low everywhere, though lower in low-income countries.

It is stated in the study by van Rooij, Lusardi, and Alessie (2011) that individuals with basic financial knowledge, when dealing even with a small amount of money, invest in financial markets. Financial markets require sophisticated, rational investors who have advanced financial knowledge so that possession of BFL might explain possession of AFL. This study investigates whether use and frequency of use of social media/networks, as a resource for information, might account for differences in literacy levels.

Financial Literacy and Demographics

Many researchers have studied financial literacy and sample demographics, with controversial and contradictory results: some researchers have found a relationship between demographics; some have not (see Table 1).

| Demographics | Related | Not Related |
|------------------|--|--|
| Sex | (Kılıç, Ata, & Seyrek, 2015; Lusardi & Mitchell, 2011; Fletschner & Mesbah, 2011) | (Adeleke, 2013; Thapa & Nepal, 2015; Agarwalla, Braua, Jakob, & Varma, 2013) |
| Age | (Thapa and Nepal, 2015; Lusardi and Mitchell, 2011) | |
| Country | (Agarwalla et al., 2013) | |
| Marital Status | (Agarwalla et al., 2013) | |
| Education | (Thapa & Nepal, 2015; Bayram, 2010; Satoğlu, 2014; Lusardi & Mitchell, 2011; Chen & Volpe, 2002) | |
| Etnicity | (Lusardi, Mitchell, & Curto, 2010; Mandell, 2008; Lusardi & Mitchell, 2007) | |
| Family Income | (Agarwalla et al., 2013; Lusardi et al., 2010) | (Homan, 2015) |
| Family Education | (Lusardi et al., 2010) | (Bayram, 2010; Homan, 2015; Ergün, Şahin, & Ergin, 2015) |
| Class | (Chen & Volpe, 2002; Homan, 2015) | Kılıç et al., 2015; Bayram, 2010; Ergün et al., 2015) |
| Major | (Er, Temizel, Özdemir, & Sönmez, 2014; Chen & Volpe, 1998) | |

Financial literacy research focuses on different groups, namely the young (e.g., Lusardi et al., 2010), young professionals (e.g., Gutnu & Cihangir 2015), retired persons (e.g., Lusardi, Mitchell, & Curto, 2014), investors (e.g., Satoğlu, 2014; Sevim, Temizel, & Sayılır, 2012), old investors (Korniotis & Kumar, 2011), high school students (e.g., Mandell, 2008), individuals (e.g., Agarwalla et al., 2012; Li, 2014), and university students (eg., Chen & Volpe, 1998, 2002; Çam & Barut, 2015; Kaur, Vohra, & Arora, 2015; Shim, Barber, Card, Xiao, & Serido, 2010; van Rooij et al., 2011).

Research on university students involves different demographic factors, including class, major areas of study, family education, and family income. There are contradictory results for class: financial literacy and class are related, and literacy increases by class (Chen & Volpe, 2002; Homan, 2015), or they are unrelated (Bayram, 2010; Ergün et al., 2015; Kılıç et al., 2015). Yetter and Suiter (2015) added a new education module to courses for beginners, testing attendees before and after the module. They found that high-scoring students obtained high scores in their further education. In general, students who took a financial literacy module scored 5 to 9 points higher in their overall education than those who did not. Financial literacy differs by major areas of study. Er et al. (2014) and Chen and Volpe (1998) find that business students obtain higher marks in the module than do students of other major areas of study. Family education levels are also related to individuals' financial literacy (Lusardi et al., 2010), but some studies contest this idea (Homan, 2015). Students' positive savings behaviors are derived from their families (Gutnu & Cihangir, 2015; Thapa & Nepal 2015). Financial literacy varies by family income level (Agarwalla et al., 2013; Lusardi et al., 2010); for instance, Thapa and Nepal (2015) found that financial literacy is high among high-income families. Family is important for financial literacy; for example, families serve as the primary source of university students' financial knowledge (Bayram, 2010; Sohn, Joo, Grable, Lee, & Kim, 2012).

Financial Knowledge and Information Sources

Although families are initial sources of financial knowledge regarding using money and savings behaviors, financial knowledge is ultimately derived mostly from formal and informal education. Informal education includes Internet features, such as social media and networks. Financial media channels provide news and educational information. Social media is a new source of information according to research conducted by Lyons et al. (2006): 33 percent of high school and university students see the Internet and financial media as a knowledge resource. Finance professionals, government authorities, and academics become financial knowledge resources via social networks and media (i.e., Berry, 2013; Fahy, O'Brian, & Poti, 2010; Shiffirin & Fagan, 2013). In addition, users' friends become an information source. In addition

to official media resources, voluntary pages and accounts also provide information to their followers.

In the finance literature, the relationship between finance and media is often expressed from a critical point of view, including finance professionals and journalists relations (e.g., Davis, 2000; Manning, 2013; Starkman 2012), stock prices and media news (e.g., Henry, 2008; Scheufele, Haas, & Brosius, 2011; Schuster, 2006), media stories and stock price reactions (e.g., Tetlock, 2007; Tetlock, Saar-Tsechansky, & MacSkassy, 2008; Peress, 2008), and financial media and corporate governance (Tambini, 2010).

Schiffirin (2011) and Tambini (2010) notes that financial news and information is not offered to the public; it is valuable only to a small group of people, such as businessmen. However, Gutnu and Cihangir (2015) found that television and the Internet are the most preferred media resource among university personnel by 91 percent, and 25 percent declared they use these sources “every day.” Shiffirin’s critique includes the observation that accurately interpreting financial information presented in the media requires sophistication, while the public lack the financial knowledge and ability to understand specific pieces of information.

Financial Literacy and Social Media

The relations between social media and finance can be classified as (a) corporate disclosures, (b) corporate monitoring and governance, and (c) social media accounts, all of which can affect stock prices. To our knowledge, social media and financial literacy relations are judged by Karaa and Sarier (2015) and found that following famous economists’ accounts, financial and economic information providing pages are related to financial literacy levels.

Sohn et al. (2012) determined that Korean adults’ primary financial socialization medium is media and that financial literacy is higher for those who choose media as their primary financial socialization medium. Loibl and Hira (2005) state that the Internet is one source of financial information and that there is a correlation between financial planning and usage frequency. Social media is a new source of information and the well-known social media site Wikipedia defines it as follows:

Computer-mediated tools that allow people to create, share, and exchange information, career interests, ideas, and pictures/videos in virtual communities and networks. Social media is defined as “a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0 and that allow the creation and exchange of user-generated content.”

According to Akar (2010, as cited in Öztürk & Talas, 2015), social media tools include blogs, microblogs, wikis, social networks, media sharing sites, and cyberworlds. Social media's important features are simultaneously spreading information and letting users communicate actively. These features are a double-edged sword: activities such as accessing, sharing, contributing, commenting, and following what others say are relatively easy and seemingly favorable but might be deceptive if the information cannot be properly understood or analyzed by individuals.

Improving individuals' financial literacy is important not only for the individuals themselves but also for governments to improve general welfare levels. It is expected that individual investors invest rationally, relying on their level of knowledge and ability to interpret news. Making rational investments means that individuals make unbiased decisions. Small investors are facing growing newly developed complex financial products and services at a time when accessing markets is becoming easier than before and investments can be made with increasing rapidity. Theoretically, individual traders, analysts, and activist stockholders might use social media for sharing information and attracting attention to the news (Enikolopov, Petrova, & Sonin, 2010); however, if their financial knowledge is poor, they interpret information inadequately, which might lead others to make poor decisions that diminish their own and others' wealth. A low level of financial literacy makes people vulnerable to intentionally misleading information that uses them to accelerate the unintentional spread of false information. Edmond (2013) claims that information might be manipulated strategically via social media, leading to loss of companies' reputation or damage to their brands, as a result of which the firm values could fall.

Publicly traded companies are increasing their use of social media. Fortune 500 companies now have Twitter accounts, and 70% appear on Facebook, with almost as many placing videos on YouTube (Alexander & Gentry, 2014). Company accounts are used for public relations (PR) and investor relations (IR). Financial information is available after being published. SEC's Netflix investigation has further increased corporate responsibilities. SEC has confirmed that corporate social media sites might be a recognized channel for distributing investor information but warned that the personal social media sites of executives are unlikely to comply with Reg. FD (U.S. Securities & Exchange Commission, 2013). According to Alexander and Gentry (2014), with regard to "financial disclosures through social media, firms have good reasons to use these platforms to reach investors. Research shows that institutional investors use social media when analyzing and recommending investments. Firms will be disadvantageous if they ignore social media within the investment community. Also, investor relations professionals must migrate to social media platforms to reach their target audiences as traditional journalism continues its slow decline."

Bollen, Mao, and Zeng (2011) demonstrated the impact of social media on stock prices. The study examines the words used in tweets about company stock and found that user mood, as indicated by word choice such as positive, negative, calm, alert, sure, vital, kind, and happy, is associated with stock prices with 87% accuracy. Social media analyses are, thus, critical for companies to extend their strategies to media platforms. In another study, Carr (2013) shows how a famous activist investor uses social media to whip up interest in a company or to pressure management to change. After the said investor posted three tweets regarding Apple to his 90,000 followers, Apple's market capitalization increased by \$18 billion.

Financial Literacy and Overconfidence

Overconfidence is observed in many professional fields. Barber and Odean (2000) documented professionals such as clinical psychologists, physicians and nurses, investment bankers, engineers, entrepreneurs, lawyers, negotiators, and managers. Consumers tend to overestimate their financial skills and knowledge (World Bank Report, 2009). Though the data shows very low general levels of financial literacy, respondents often feel they know more about financial matters than they actually do (OECD, 2006).

Overconfident investors tend to overestimate their skill in evaluating financial assets, and in the evaluation process, they are confident in their probabilistic estimations (Barber & Odean, 2002). Many theoretical models have taken overconfidence into account (e.g., Benos, 1998; Daniel, Hirshleifer, & Subrahmanyam, 2001; De Long, Shleifer, Summers, & Waldmannet, 1991; Gervais & Odean, 2001; Kyle & Wang, 1997; Odean, 1998). Furthermore, overconfident investors tend to trade excessively and realize lower returns (Odean, 1998). In particular, the use of the Internet affects investor activity. Online transactions accelerate the transactions and investors become more speculative but lower their returns (Barber & Odean, 2002).

Young people tend to overestimate their knowledge, abilities, and skills. Young, single male investors trade more frequently (Barber & Odean, 2001), which lowers their returns on investments (Graham, Harvey, & Huang, 2005). Çam and Barut (2015) state that university students are overconfident in their ability to manage money and expenditure and that even their financial literacy levels are low.

Method

The first purpose of this paper is to investigate financial literacy in university students and to determine the relationship between basic and advanced financial literacy. The second purpose is to determine social media sources and social media usage for financial information purposes along with its relation to advanced financial literacy. The third purpose is to present a demographic factor examination to enable comparisons with the results of previous studies. The fourth purpose is to determine the confidence of students that leads to financial decision-making. Accordingly, five research questions are raised: (a) Does financial literacy differ by demographic factors? (b) Is there a relationship between financial literacy and financial media usage? (c) Is there a relationship between BFL and AFL? (d) Do BFL and social media usage partially account for AFL? (e) Are students overconfident in their financial knowledge?

Research Design

This study investigated financial literacy and social media usage using a survey with three modules: financial literacy, confidence, and social media usage. Other researchers have conducted a wide variety of financial literacy surveys for a range of purposes. Lusardi and Mitchell, who mainly studied financial literacy, developed a survey consisting of three questions for the American Health and Retirement Study (HRS) in 2004, which have become widely used. Other financial literacy surveys have been executed by the World Bank CPFL Program, OECD, and DNB. Two new modules were developed for the DNB survey by Lusardi, which have been used for many years in research (e.g., Lusardi, 2008; Lusardi et al., 2011; Lusardi & Mitchell, 2007, 2011, 2014; Lusardi et al., 2010; Lusardi, Mitchell, & Curto, 2014). The well-designed DNB financial literacy survey is preferred in this research for its measurement precision (see survey questionnaire; Appendix A, B)

Demographic factors, including age, major areas of study, GPA, family income, and family education level, were collected. In the first module, Lusardi's (2008) financial literacy survey (containing both basic and advanced) is used. In the second module, respondents are asked to reply how confident they are in their interpretations of financial and economic news and data (for example: "I can interpret economic data correctly" using a 5-point Likert Scale: Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree). The third module, Social Media Usage was designed by the researchers with some questions derived from Bayram (2010). The extended module tested for exploratory and confirmatory biases with covariance between terms estimated as (0.3413) and scales reliability coefficient estimated as (0.8187).

Universe and Sampling

Surveys were randomly distributed to 2000 university students attending different schools and having different major areas of study at a single state university. A total of 1119 completed surveys were returned (return rate: 55.95%), of which 916 were usable. The responding undergraduate students are affiliated to Business (Faculty of Business), Banking and Finance, International Trade (School of Applied Sciences-SAS), Food Engineering, Material Sciences (Faculty of Engineering), History, Turkish Literature (Faculty of Arts), Physics, and Mathematics (Faculty of Sciences). The graduate school students were in Accounting and Finance, and International Trade and Finance master's programs, while and Ph.D. students are in the Business programme.

Data Analysis

The survey data were coded and the dataset created by STATA 11.1SE, and then the data were analyzed. After some data manipulations, we obtained 54 variables. Basic financial literacy (BFL), advanced literature (AFL) and general financial literacy (GFL) variables are estimated from the valid responses.

Basic financial literacy (BFL) scores are estimated by the calculating simple average of first five questions for each observation and we obtained BFL scores. Advanced financial literacy (AFL) scores are estimated by gauging the simple average of eleven questions. The sum of two parts BFL and AFL average scores gives the General financial literacy score (GFL).

Demographic factors relating to financial literacy are hypothesized as follows: $H_{1,1}$ = Financial literacy differs by age, $H_{1,2}$ = Financial literacy differs by major, $H_{1,3}$ = Financial literacy differs by class, $H_{1,4}$ = Financial literacy differs by GPA, $H_{1,5}$ = Financial literacy differs by family education, $H_{1,6}$ = Financial literacy differs by family income. To test the hypotheses, we used nonparametric Kruskal-Wallis and Pearson chi-square tests, with posthoc tests. Then we performed two parametric tests: ANOVA and Bonferroni tests. In fact, applying parametric tests can be criticized due to ANOVA requirements such as normality of distribution, linearity, etc., however it worked sufficiently for comparing its results with those from the nonparametric tests.

Findings

This section presents the survey results, organized according to the following sections: (1) financial literacy scores are presented, (2) hypothesis tests' results for financial literacy by demographics (3) preferred financial media sources are

documented, (4) social media choices and activities for financial information is listed by frequency, (5) financial literacy and social media usage relations are examined, (6) advanced literature analyzed, and (7) overconfidence is examined.

Financial Literacy Scores

To enable comparison of our results with global scores, we estimated the selected topics seen in Table 2. Overall observations are as follows: The Compound Interest score is 51% ($\eta = 736$), Inflation is 52% ($\eta = 637$), and Risk Diversification is 53% ($\eta = 710$).

Table 2
Financial Literacy Scores (Overall)

| | Obs | Mean | Std. Dev. | Median |
|----------|-----|-------|-----------|--------|
| General | 916 | 36.95 | 0.191131 | 37.5 |
| Basic | 916 | 44.03 | 0.286195 | 40 |
| Advanced | 916 | 33.69 | 0.205906 | 27.27 |

Table 3
BFL and AFL Scores

| Questions | Basic Financial Literacy (BFL) | | | | Total (100%) |
|--|-----------------------------------|-------------|-------------|-------------|--------------|
| | frequency (percent) | False | True | Do not know | |
| Q1 <i>Numeracy</i> | | 174 (19.04) | 605 (66.34) | 133 (14.58) | 912 |
| Q2 <i>Compound Interest</i> | | 363 (40.24) | 373 (41.35) | 166 (18.40) | 902 |
| Q3 <i>Inflation</i> | | 317 (35.62) | 320 (35.96) | 253 (28.43) | 890 |
| Q4 <i>Time value of money</i> | | 498 (54.91) | 250 (27.56) | 159 (17.53) | 907 |
| Q5 <i>Money illusion</i> | | 300 (33.08) | 473 (52.15) | 134 (17.77) | 907 |
| Questions | Advanced Financial Literacy (AFL) | | | | Total (100%) |
| frequency (percent) | False | True | Do not know | | |
| Q6 <i>Stock Market</i> | | 346 (38.19) | 384 (42.38) | 176 (19.43) | 906 |
| Q7 <i>Stocks</i> | | 368 (40.40) | 443 (48.63) | 100 (10.98) | 911 |
| Q8 <i>Mutual funds</i> | | 374 (41.74) | 252 (28.13) | 270 (30.13) | 896 |
| Q9 <i>Bonds</i> | | 430 (47.78) | 233 (25.89) | 237 (26.33) | 900 |
| Q10 <i>Highest return</i> | | 465 (52.01) | 255 (28.52) | 174 (19.46) | 894 |
| Q11 <i>Fluctuation</i> | | 306 (34.15) | 367 (40.96) | 223 (24.89) | 896 |
| Q12 <i>Risk diversification</i> | | 335 (37.39) | 375 (41.85) | 186 (20.76) | 896 |
| Q13 <i>Bonds penalty</i> | | 282 (31.83) | 240 (27.09) | 364 (41.08) | 886 |
| Q14 <i>Asset risks</i> | | 182 (20.45) | 365 (41.01) | 343 (38.54) | 890 |
| Q15 <i>Stock vs. mutual fund returns</i> | | 301 (33.82) | 227 (25.31) | 362 (40.67) | 890 |
| Q16 <i>Bond prices by interest rates</i> | | 344 (38.10) | 254 (28.13) | 305 (33.78) | 903 |

Financial Literacy and Demographics

GFL, BFL, and AFL scores are estimated for categorical demographic variables, including major areas of study, class, and age, and presented in Appendix C. University students' financial literacy levels are relatively low, and those attending Graduate School have substantially higher scores. The distribution of general, basic, and advanced financial literacy levels by demographics are displayed using boxplots (Figure 1).

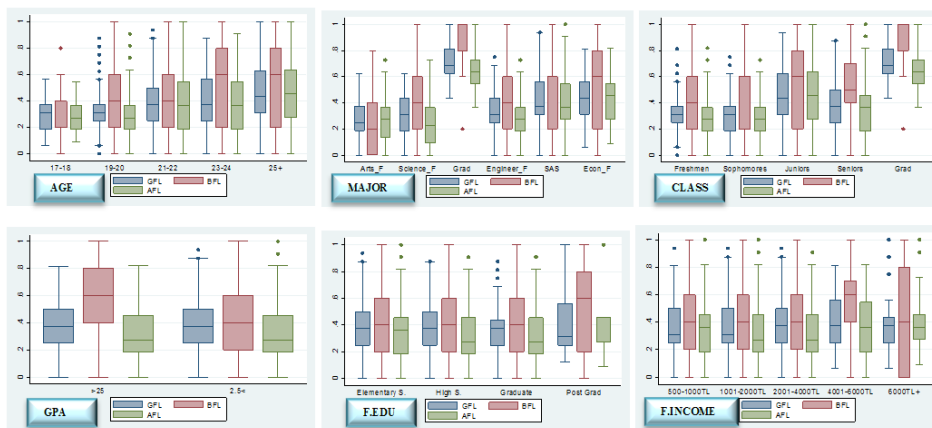


Figure 1. Financial literacy by age, major, class, GPA family education, and family income.

The relationship of demographic factors to financial literacy are hypothesized and tested to determine whether financial literacy differs by demographic factors. Summary results for tests on financial literacy differences by demographic factors are presented in Table 3.

FL differs by age, major, and class. $H_{1,1}$ = Financial literacy differs by age, $H_{1,2}$ = Financial literacy differs by major, $H_{1,3}$ = Financial literacy differs by class are tested and as test results shown in Table 4. According to the results, financial literacy is related to age, major areas of study, and class and the differences across factor groups are significant. In particular, GFL and AFL increases by age, as can be seen clearly in the figures. GFL, BFL and AFL are quite high in those attending the Graduate School. Thus, $H_{1,1}$, $H_{1,2}$, and $H_{1,3}$ are accepted, and the null hypothesis rejected.

FL scores differed significantly within groups. According to Bonferroni posthoc test results, the lowest difference within groups (and other groups have high degrees of difference) are as follows: GFL by age: (17–18 and 19–20), BFL by age: (17–18 and 19–20); (23–24 and 25+), AFL by age: (17–18 and 19–20); (21–22 and 23–24); (23–24 and 25+). GFL by major: (Engineering F. and Sciences F.); (Economics F. and SAS), BFL by major: (Engineering F. and Sciences F.); (SAS and Sciences F.); (Economics F. and Sciences F.); (SAS and Engineering F.); (Economics F. and

Engineering F.); (Economics F. and SAS), AFL by major: (Sciences F. and Arts F.); (Arts F. and Engineering F.); (Sciences F. and Engineering F.); Economics F. and SAS). GFL by class: (Freshmen and Sophomores), BFL by class: (Freshmen and Sophomores); (Juniors and Seniors), and AFL by class: (Freshmen and Sophomores)

Few differences were found between the 17–18 and 19–20 groups, because they are freshmen and sophomores, although some might take “Introduction to Economics” or similar courses, Finance courses are generally taken during the third year of study. The Faculty of Engineering offers economics courses but not finance ones, whereas the Faculty of Sciences and Faculty of Arts offer none.

In SAS and the Faculty of Economics, students are offered finance courses after the second year. SAS juniors and seniors performed better than Faculty of Economics juniors and seniors (mean scores: SAS GFL: 57, BFL: 60 and AFL: 55.8), Faculty of Economics (GFL: 42, BFL: 47, AFL: 39.56). Median scores are as follows (for SAS; GFL: 62.5, BFL: 60, AFL: 63.6) and (for Faculty of Economics; GFL: 43.75, BFL: 60, AFL: 36.3)

Table 4
Financial Literacy Hypothesis Test Results

| H-Tests | Nonparametric | | | | Parametric | | | | | | |
|---------|---------------|---------|--------|------------|------------|---------------------|---------|------------|------------|------|--------|
| | K-Wallis | Pearson | F | Bartlett's | H-Tests | Nonparametric | | Parametric | | | |
| | Chi2 | Chi2 | Value | Chi2 | | K-Wallis | Pearson | F | Bartlett's | | |
| | | | | | | Chi2 | Chi2 | Value | Chi2 | | |
| Age* | GFL | 38.92 | 47.02 | 10.7 | 27 | GPA | GFL | 0.2 | 0.02 | 0.19 | 1.63 |
| | BFL | 20.7 | 17.37 | 5.83 | 8.21 | | BFL | 3.24 | 1.67 | 3.7 | 0.09 |
| | AFL | 31.7 | 33.25 | 8.5 | 22.67 | | AFL | 0.16 | 0.01 | 0.35 | 2.26 |
| Major* | GFL | 168.98 | 121.14 | 50.13 | 46.04 | Family Education | GFL | 2.68 | 0.36 | 1.35 | 7.88 |
| | BFL | 137.29 | 111.1 | 34.82 | 21.45 | | BFL | 1.08 | 0.88 | 0.4 | 1.97 |
| | AFL | 145.99 | 102.57 | 40.85 | 53.99 | | AFL | 4.39 | 5 | 1.7 | 5.61 |
| Class* | GFL | 110.49 | 60.08 | 43.44 | 46.77 | Family Income | GFL | 5,976 | 59,409 | 1.61 | 10,826 |
| | BFL | 78.25 | 60.04 | 24.66 | 12.01 | | BFL | 9.7 | 7,852 | 2.77 | 40,329 |
| | AFL | 89.42 | 59.76 | 33.68 | 45.87 | | AFL | 1,984 | 0.7494 | 0.69 | 21,379 |

* Significant: Kruskal-Wallis, Pearson, F Value, Bartlett: $p < .01$. Kruskal-Wallis, Pearson, F Value, Bartlett: $p > .01$.

FL does not differ by GPA, family education, and family income. $H_{1,4}$ = Financial literacy differs by GPA, $H_{1,5}$ = Financial literacy differs by family education, and $H_{1,6}$ = Financial literacy differs by family income are tested. The distribution of general, basic, and advanced financial literacy levels by GPA, family education and family income are given in boxplots (Figure 2). Financial literacy has no relation to GPA, family education, and income. In addition, there is no significant

difference among factor groups according to the results of nonparametric and parametric test results as shown in Table 4. Thus, $H_{1,4}$, $H_{1,5}$, and $H_{1,6}$ are rejected, and the null hypothesis is accepted.

FL scores did not differ significantly within groups. Bonferroni posthoc tests the results and determines lowest difference within groups (and other groups have a high degree of difference) except for GPA due to binary data reasons. Test results show that GFL by family education (all groups are similar except elementary school and high school), BFL by family education (all groups are similar), AFL by family education (all groups are similar except elementary school and high school). GFL by family income (all groups are similar except (1) 500–1000TL and 4001–6000TL; and (2) 1001–2000 and 4000–6000), BFL by family income (all groups are similar except (1) 500–1000TL and 4000–6000TL; (2) 1001–2000TL and 2001–4000; and (3) 1001–2000 and 4000–6000), and AFL by income (all groups are similar)

Social Media Choices and Activities for Financial Information

The survey asked respondents to “Please indicate your information sources by frequency of usage from 1 (most) to 5 (least).” Respondents were asked to indicate their choice of news in the same way. The results and order of information and news preferences are same across the different populations and means; (1) Internet, (2) television, (3) newspapers, (4) books, and (5) journals. The results are similar to those of [Gutnu and Cihangir \(2015\)](#), which shows the Internet and television having the highest frequencies.

Table 5

| <i>Social Media Choices and Activities for Financial Information and Frequency of Usage</i> | | | | | |
|---|-------|--------|-------------------|----------|-----|
| Media Choices for Financial Information | Never | Seldom | Once/Twice a week | Everyday | n |
| Financial Media Press & TV’s Accounts | 12.75 | 33.53 | 34.00 | 19.72 | 847 |
| Financial and Economic News Sites | 16.35 | 39.65 | 31.29 | 12.71 | 850 |
| Accounts of Financial Analysts | 35.66 | 37.20 | 19.79 | 7.35 | 844 |
| Accounts of Famous Economists | 33.10 | 36.17 | 22.10 | 8.63 | 846 |
| <i>Activities on Financial Media</i> | | | | | |
| Sharing news | 27.01 | 40.40 | 23.34 | 9.24 | 844 |
| Commenting on news | 36.01 | 38.61 | 15.47 | 9.92 | 847 |

Students are asked whether they follow economic and financial news via social media ($n = 474$), as well as about their preferences, which are as follows: Facebook, Twitter, Facebook and Twitter, and other social media, respectively. Social media usage regarding financial and economic information is 66.3 ($n = 787$). Social media preferences are, respectively, Facebook (40.70), Twitter (30.06), Facebook and Twitter (17.79), other (11.45), ($n = 489$). Table 4 shows students’ preferences for economic and financial information and their frequency of usage of social media

(every day, once or twice a week, seldom, or never), as well as their activities related to usage (commenting, sharing).

To reveal whether their learning mode is switched on or off; we first asked students whether they expand their financial knowledge through social media, excluding mainstream press or television pages and accounts: 57.74% agreed, 24.36% were neutral, and 16.9% disagreed. Second, we asked whether they expand their knowledge through economic and financial pages other than news; 56.38% agreed, 25.3% were neutral, and 18.6% disagreed.

Financial Literacy and Social Media Relations

Table 6

Financial Literacy and Social Media Usage Correlations

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|--|------|-------|------|------|------|------|------|--------|---|
| 1 GFL | 1 | | | | | | | | |
| 2 BFL | 0.72 | 1 | | | | | | | |
| 3 AFL | 0.90 | 0.34 | 1 | | | | | | |
| 4 Financial Media Press & TV Accounts | 0.13 | 0.05 | 0.15 | 1 | | | | | |
| 5 Financial and Economic News Sites | 0.20 | 0.08 | 0.21 | 0.64 | 1 | | | | |
| 6 Following Accounts of Financial Analysts | 0.06 | -0.07 | 0.12 | 0.51 | 0.59 | 1 | | | |
| 7 Following Accounts of Famous Economists | 0.17 | 0.01 | 0.23 | 0.48 | 0.58 | 0.73 | 1 | | |
| 8 Sharing News | 0.13 | 0.02 | 0.16 | 0.45 | 0.55 | 0.62 | 0.65 | 1 | |
| 9 Commenting on News | 0.07 | -0.04 | 0.12 | 0.42 | 0.53 | 0.63 | 0.60 | 0.6889 | 1 |

We tested FL and social media news-related sources usage frequencies by correlation, with the results presented in Table 5. The highest correlation is found between AFL and frequency of accessing accounts of famous economists (0.2261), and GFL and financial and economic news site pages (0.1961).

Table 7

Financial Literacy and Social Media Activities Correlations

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|------|------|------|------|------|------|------|------|------|------|----|
| 1 GFL | 1 | | | | | | | | | | |
| 2 BFL | 0.72 | 1 | | | | | | | | | |
| 3 AFL | 0.90 | 0.34 | 1 | | | | | | | | |
| 6 Following F&E Informative Page/Accounts | 0.21 | 0.09 | 0.22 | 0.44 | 0.44 | 1 | | | | | |
| 7 Benefiting F&E Course Materials | 0.31 | 0.17 | 0.31 | 0.37 | 0.32 | 0.65 | 1 | | | | |
| 8 Following F&E Pages | 0.23 | 0.10 | 0.25 | 0.44 | 0.39 | 0.70 | 0.62 | 1 | | | |
| 9 Sharing F&E topics | 0.09 | 0.06 | 0.08 | 0.42 | 0.37 | 0.45 | 0.37 | 0.49 | 1 | | |
| 10 Writing F&E posts | 0.05 | 0.02 | 0.07 | 0.45 | 0.48 | 0.50 | 0.43 | 0.52 | 0.50 | 1 | |
| 11 Sharing F&E Course Materials | 0.17 | 0.06 | 0.18 | 0.36 | 0.36 | 0.51 | 0.55 | 0.53 | 0.39 | 0.51 | 1 |

FL and social network activity relations were tested; the results are provided in Table 6. For all financial literacy variables, benefit from Financial and Economics courses materials demonstrated the highest correlation coefficients: (GFL: 0.3057; BFL: 0.1691; and AFL: 0.3068).

Advanced Financial Literacy

The relationships within financial literacy are also concerned, and we tested these relations using regression models. In addition, we looked for relations between and within financial literacy and social media usage as suggested in literature (Lyons et al., 2006) and expressed the details of financial literacy and social media relations (ie. Sohn et al., 2012). We tested the interrelations between BFL and AFL first with correlations, then with regression models.

$$\text{Model (1): } \widehat{Y}_{AFL} = b_0 + b_1x_{BFL} + \varepsilon_i$$

Then, we added all financial information usage frequencies and activities (x_{2-13}) to Model (1) and obtained Model (2) as follows:

$$\text{Model (2): } \widehat{Y}_{AFL} = b_0 + b_1x_{BFL} + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + b_9x_9 + b_{10}x_{10} + b_{11}x_{11} + b_{12}x_{12} + b_{13}x_{13} + \varepsilon_i$$

In Model (3), we added confidence related variables (x_{14-17}) that might explain advanced literacy;

$$\text{Model (3): } \widehat{Y}_{AFL} = b_0 + b_1x_{BFL} + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + b_9x_9 + b_{10}x_{10} + b_{11}x_{11} + b_{12}x_{12} + b_{13}x_{13} + b_{14}x_{14} + b_{15}x_{15} + b_{16}x_{16} + b_{17}x_{17} + \varepsilon_i$$

We omitted the relation between GFL and the others because GFL scores are derived from adding BFL to AFL scores. Thus, only the relationship between BFL and AFL can be considered. As shown in Table 7, a strong correlation exists between advanced and basic literature (34%). Thus, we modeled and regressed BFL scores on AFL scores to determine whether BFL can partially account for AFL.

Table 8

AFL Regressions Output

| Advanced Financial Literature (AFL) | Model 1 | | Model 2 | | Model 3 | |
|--|---------|-----------|---------|----------|---------|----------|
| x_{BFL} Basic Financial Literature | 0.243 | (10.87)** | 0.207 | (8.61)** | 0.209 | (8.38)** |
| x_2 Financial Media Press & TV Accounts | | | 0 | -0.03 | 0.002 | -0.22 |
| x_3 Financial and Economic News Sites | | | 0.008 | -0.73 | 0.008 | -0.65 |
| x_4 Accounts of Financial Analysts | | | -0.012 | -1.02 | -0.012 | -1.01 |
| x_5 Accounts of famous Economists | | | 0.036 | (3.06)** | 0.032 | (2.67)** |
| x_6 Sharing News | | | 0.004 | -0.34 | 0.005 | -0.44 |
| x_7 Commenting on News | | | -0.001 | -0.06 | -0.003 | -0.28 |
| x_8 Following F&E Informative P/A | | | -0.004 | -0.38 | -0.005 | -0.53 |
| x_9 Benefiting F&E Course Materials | | | 0.037 | (4.01)** | 0.037 | (3.93)** |
| x_{10} Following F&E Pages | | | 0.018 | -1.81 | 0.016 | -1.66 |
| x_{11} Sharing F&E from own account | | | -0.01 | -1.28 | -0.01 | -1.25 |
| x_{12} Writing F&E posts | | | -0.018 | (2.25)* | -0.019 | (2.25)* |
| x_{13} Sharing F&E Course Materials | | | 0.006 | -0.81 | 0.007 | -0.85 |
| x_{14} Confidence on Interpreting Economic Data | | | | | 0.001 | -0.05 |
| x_{15} Confidence on Interpreting Financial Data | | | | | 0.003 | -0.2 |
| x_{16} Confidence on Interpreting Economic News | | | | | -0.002 | -0.14 |
| x_{17} Confidence on Interpreting Economic News | | | | | 0.009 | -0.72 |
| Constant | 0.23 | (19.54)** | 0.106 | (3.74)** | 0.085 | (2.54)* |
| Observations | 916 | | 772 | | 875 | |
| R-squared | 0.11 | | 0.21 | | 0.04 | |
| Absolute value of t statistics in parentheses | | | | | | |
| * significant at 5; ** significant at 1 | | | | | | |

Model (1) results show that as BFL increases by 1, there is an associated increase in AFL, while holding all other predictors fixed. Model (2) results indicate that some variables are endogenous and as BFL, defined as following pages/accounts of famous economists, benefiting from finance and economics course materials, writing and posting financial and economic issues (significant at .05), increases by 1, there is an associated increase in AFL, while holding all other predictors fixed. The confidence variables added in Model (3) are not significant at any level. We tested heterocadasticity by Breush-Pagan / Cook- Weisenberg and found constant variances ($\chi^2(1) = 11.82$ and $\text{Prob} > \chi^2 = .0006$), then we run Cameron & Trivedi's decomposition of IM-test and found heterocadasticity levels ($p = .4147$) that shows no heterocadasticity. Also we checked multicollinearity and found any problem (VIF levels are quite high and between; 0.25-0.91).

Financial Literacy and Confidence

Students who are confident in their ability to interpret economic data, financial data, economic news, and financial news have GFL, BFL, and AFL mean scores higher than university means (36.95%; 44.03%; and 33.69%) and their median scores are equal or higher than the university median score. The students who had had economics and finance courses performed better than those who had not, as expected; however, scores were relatively low in general. Approximately half of the students can be considered overconfident. These overconfidence results are similar to those found by [Çam and Barut \(2015\)](#).

Table 9

Confidence Table for Financial Literacy

| Variables | Confident | | | Very Confident | | | Total | | |
|------------------------------------|-----------|--------|-------|----------------|--------|-------|-------|--------|-------|
| | Mean | Median | Freq. | Mean | Median | Freq. | Mean | Median | Freq. |
| Interpreting Economic Data | | | | | | | | | |
| GFL | 40.29 | 37.50 | 311 | 37.88 | 37.50 | 100 | 39.70 | 37.50 | 411 |
| BFL | 47.01 | 40.00 | 311 | 42.00 | 40.00 | 100 | 45.79 | 40.00 | 411 |
| AFL | 37.18 | 36.36 | 311 | 36.00 | 36.36 | 100 | 36.89 | 36.36 | 411 |
| Interpreting Financial Data | | | | | | | | | |
| GFL | 40.33 | 37.50 | 261 | 41.92 | 37.50 | 65 | 40.64 | 37.50 | 326 |
| BFL | 47.66 | 40.00 | 261 | 45.85 | 40.00 | 65 | 47.30 | 40.00 | 326 |
| AFL | 36.92 | 36.36 | 261 | 40.00 | 36.36 | 65 | 37.53 | 36.36 | 326 |
| Interpreting Economic News | | | | | | | | | |
| GFL | 41.25 | 37.50 | 355 | 39.06 | 37.50 | 72 | 40.88 | 37.50 | 427 |
| BFL | 49.35 | 60.00 | 355 | 45.83 | 40.00 | 72 | 48.76 | 60.00 | 427 |
| AFL | 37.57 | 36.36 | 355 | 35.86 | 36.36 | 72 | 37.28 | 36.36 | 427 |
| Interpreting Financial News | | | | | | | | | |
| GFL | 42.36 | 37.50 | 297 | 37.82 | 37.50 | 79 | 41.41 | 37.50 | 376 |
| BFL | 50.10 | 60.00 | 297 | 39.75 | 40.00 | 79 | 47.93 | 40.00 | 376 |
| AFL | 38.87 | 36.36 | 297 | 36.71 | 36.36 | 79 | 38.42 | 36.36 | 376 |

Discussion

General financial literacy scores including basic and advanced levels are low in students in the sample university. It was anticipated that a relationship exists between basic and financial literacy, and it is not surprising but we investigated and documented the existence of a significant relationship. An increase in basic financial literacy increases advanced financial literacy; in other words, some areas of advanced financial literacy can be accounted for by the existence of basic financial literacy.

The frequency of following pages or accounts of famous economists and benefiting from finance, and economics course materials, and writing and posting economic and financial issues also have positive effects on advanced financial literacy. Specifically, an increase in usage as mentioned above increases advanced literacy; to put it differently, some advanced literacy can be explained by social media usage.

Encouraging students to follow famous economists and share more course materials support acquisition of advanced financial literacy. As a source of information in the modern era, the use of the Internet and Internet-based social networks is growing rapidly. Students widely accept the Internet as a source of knowledge, with television ranking second. Facebook and Twitter are the most preferred social networks. There are many information sources on social networks, such as financial media accounts and voluntarily managed pages/sites, that supply information and news to followers although most students believe that only some of these pages/accounts expand their knowledge. Social media allows users not only to passively acquire information but also to actively express, communicate, and share information and material.

Our results further indicate that demographics matter. Financial literacy levels vary significantly based on age, class, and major areas of study. Higher ages and classes were correlated with higher financial literacy levels. Juniors and seniors had better results than did freshmen and sophomores. In addition, financial literacy differed greatly within major areas of study, a difference probably linked to differences in exposure to financial and/or economics courses. For example, Faculty of Arts and Sciences students do not take any economics or finance courses. Faculty of Engineering students only take Introduction to Economics, but students in the Faculty of Economics and Administrative Sciences as well as School of Applied Sciences have financial and economics courses, especially juniors and seniors.

Further, we found that students overestimate their ability to interpret economic and financial news and data. Even though the literacy scores of confident students are slightly higher than others, their financial literacy scores are relatively low nonetheless. These confidence levels do not account for changes in advanced literacy scores. Further financial literacy research need to focus on basic and advanced level relations to overlap the findings and the research aimed at social media to promote as an integral part of a programme to improve financial literacy levels need to focus more on the use of social networks.

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Appendix A

Box 1. Basic Literacy Questions

1) Numeracy

Suppose you had €100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? (i) More than €102; (ii) Exactly €102; (iii) Less than €102; (iv) Do not know; (v) Refusal.

2) Interest compounding

Suppose you had €100 in a savings account and the interest rate is 20% per year and you never withdraw money or interest payments. After 5 years, how much would you have on this account in total? (i) More than €200; (ii) Exactly €200; (iii) Less than €200; (iv) Do not know; (v) Refusal.

3) Inflation

Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account? (i) More than today; (ii) Exactly the same; (iii) Less than today; (iv) Do not know; (v) Refusal.

4) Time value of money

Assume a friend inherits €10,000 today and his sibling inherits €10,000 3 years from now. Who is richer because of the inheritance? (i) My friend; (ii) His sibling; (iii) They are equally rich; (iv) Do not know; (v) Refusal.

5) Money illusion

Suppose that in the year 2010, your income has doubled and prices of all goods have doubled too. In 2010, how much will you be able to buy with your income? (i) More than today; (ii) The same; (iii) Less than today; (iv) Do not know; (v) Refusal.

Appendix B

Box 2. Advanced Financial Literacy Questions

6) *Which of the following statements describes the main function of the stock market?* (i) The stock market helps to predict stock earnings; (ii) The stock market results in an increase in the price of stocks; (iii) The stock market brings people who want to buy stocks together with those who want to sell stocks; (iv) None of the above; (v) Do not know; (vi) Refusal.

7) *Which of the following statements is correct? If somebody buys the stock of firm B in the stock market:* (i) He owns a part of firm B; (ii) He has lent money to firm B; (iii) He is liable for firm B's debts; (iv) None of the above; (v) Do not know; (vi) Refusal.

8) *Which of the following statements is correct?* (i) Once one invests in a mutual fund, one cannot withdraw the money in the first year; (ii) Mutual funds can invest in several assets, for example invest in both stocks and bonds; (iii) Mutual funds pay a guaranteed rate of return which depends on their past performance; (iv) None of the above; (v) Do not know; (vi) Refusal.

9) *Which of the following statements is correct? If somebody buys a bond of firm B:* (i) He owns a part of firm B; (ii) He has lent money to firm B; (iii) He is liable for firm B's debts; (iv) None of the above; (v) Do not know; (vi) Refusal.

10) *Considering a long time period (for example 10 or 20 years), which asset normally gives the highest return?* (i) Savings accounts; (ii) Bonds; (iii) Stocks; (iv) Do not know; (v) Refusal.

11) *Normally, which asset displays the highest fluctuations over time?* (i) Savings accounts; (ii) Bonds; (iii) Stocks; (iv) Do not know; (v) Refusal.

12) *When an investor spreads his money among different assets, does the risk of losing money:* (i) Increase; (ii) Decrease; (iii) Stay the same; (iv) Do not know; (v) Refusal.

13) *If you buy a 10-year bond, it means you cannot sell it after 5 years without incurring a major penalty. True or false?* (i) True; (ii) False; (iii) Do not know; (iv) Refusal.

(14) *Stocks are normally riskier than bonds. True or false?* (i) True; (ii) False; (iii) Do not know; (iv) Refusal.

(15) *Buying a company stock usually provides a safer return than a stock mutual fund. True or false?* (i) True; (ii) False; (iii) Do not know; (iv) Refusal.

(16) *If the interest rate falls, what should happen to bond prices?* (i) Rise; (ii) Fall; (iii) Stay the same; (iv) None of the above; (v) Do not know; (vi) Refusal.

Box 3. Social Media Usage

| | <i>Strongly Agree</i> | <i>Agree</i> | <i>Neutral</i> | <i>Disagree</i> | <i>Strongly Disagree</i> |
|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| I follow financially and economically informative pages/accounts (Her gün 1 finansal terim(account name), etc.) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| I benefit from shared course materials (slides, etc.) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| I follow Ffinance and economics related pages (Ekonomik vorumlar(account name), etc.) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| I share important finance and economics topics of pages | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| I write posts about finance and economics | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| I share finance and economics course materials with friends | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Appendix C

| Age | Freq. | Percent | Parents Education | Freq. | Percent | Major | Freq. | Percent |
|-------|-------|---------|-------------------|-------|---------|--|-------|---------|
| 17–18 | 23 | 3.39 | Elementary School | 330 | 39.66 | Faculty of Arts | 200 | 21.83 |
| 19–20 | 167 | 24.63 | High School | 306 | 36.78 | Faculty of Sciences | 140 | 15.28 |
| 21–22 | 264 | 38.94 | Graduate | 186 | 22.36 | Graduate School | 21 | 2.29 |
| 23–24 | 178 | 26.25 | Post Graduate | 10 | 1.2 | Faculty of Engineering | 157 | 17.14 |
| 25+ | 46 | 6.78 | | | | School of Applied Sciences | 272 | 29.69 |
| | | | | | | Faculty of Economics & Administrative Sciences | 126 | 13.76 |
| Total | 678 | 100 | | 832 | 100 | | 916 | 100 |

| Class | Freq. | Percent | Parents Income | Freq. | Percent | GPA | Freq. | Percent |
|------------|-------|---------|----------------|-------|---------|------|-------|---------|
| Freshmen | 253 | 28.72 | 500–1000 | 89 | 11.5 | <2.5 | 31.78 | 31.78 |
| Sophomores | 194 | 22.02 | 1001–2000 | 278 | 35.92 | >2.5 | 68.22 | 68.22 |
| Juniors | 161 | 18.27 | 2001–4000 | 312 | 40.31 | | | |
| Seniors | 252 | 28.6 | 4001–6000 | 68 | 8.79 | | | |
| Graduate | 21 | 2.38 | 6000 + | 27 | 3.49 | | | |
| Total | 881 | 100 | | 774 | 100 | | 365 | 100 |

Financial Literacy Scores by Categories

| Major | General | | | Basic | | Advanced | |
|----------------------------|---------|------|--------|-------|--------|----------|--------|
| | Obs | Mean | Median | Mean | Median | Mean | Median |
| Faculty of Arts | 200 | 26.4 | 25 | 25.2 | 20 | 27 | 27 |
| Faculty of Sciences | 140 | 30.9 | 31 | 45 | 40 | 24.4 | 22.7 |
| Graduate School | 21 | 70.8 | 69 | 84.7 | 100 | 64.5 | 63.6 |
| Faculty of Engineering | 157 | 33.6 | 31 | 47.9 | 40 | 27 | 27 |
| School of Applied Sciences | 272 | 44 | 43.7 | 48.9 | 60 | 41.6 | 36.4 |
| Faculty of Economics | 126 | 43.7 | 44 | 50.6 | 60 | 40.5 | 45.5 |
| Class | | | | | | | |
| Freshmen | 253 | 31 | 31 | 37 | 40 | 28.5 | 27 |
| Sophomores | 194 | 29 | 31 | 35 | 20 | 27 | 27 |
| Juniors | 161 | 44.9 | 43.7 | 48 | 60 | 43.5 | 45 |
| Seniors | 252 | 39 | 37.5 | 49 | 50 | 34 | 36 |
| Grads | 21 | 70.8 | 69 | 85 | 100 | 64.5 | 64 |
| Age | | | | | | | |
| 17–18 yrs. | 23 | 31 | 31 | 37 | 40 | 28 | 27 |
| 19–20 yrs. | 167 | 29 | 31 | 35 | 20 | 28 | 27 |
| 21–22 yrs. | 264 | 44.9 | 43.7 | 48 | 60 | 37.5 | 36 |
| 23–24 yrs. | 178 | 39 | 37.5 | 49 | 50 | 37 | 36 |