Evaluating a potential gender gap, disparities in residency, and factors affecting financial literacy in Norway

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Acknowledgements

Abstract

This paper analyses a questionnaire measuring the financial literacy of the Norwegian respondents. There is a consistent gender gap in investments, and as this paper concluded, in financial literacy as well. Variables such as education, income, gender, and risk aversion have significant impact on financial literacy. There are some significant impacts of where the respondent's resident, whether it is a central area, a specific county, or municipalities containing a large proportion of investors. The survey revealed how females are more risk averse, but also more affected by other factors such as environment and upbringing than males. Another interesting result is the distinctive difference in what the respondents consider a relevant investment product, and what they currently possess. Our recommendation to reduce the gender gap in financial literacy is by incorporate and evolve the school's curriculum within personal finance as well as encourage openness about the subject.

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1.0 Introduction

In this thesis, we examine a potential gender gap, and which factors impacting financial literacy in Norway. Further, the fundamental objective lays in the investigation of regional differences. These are categorized into the basis of counties, municipalities, and residence of centrality. In contemplation of investigating the potential gap, a survey has been conducted and further analysed. The data represents a selection of Norwegian respondents, both males and females, where the attempt is testing a variety of factors influencing the respondent's financial literacy. Overall, the aim is to provide an overview and determination of which factors provide the greatest influence on a potential gender gap.

International research has interpreted a widespread gap in financial literacy among parts of the population (Lusardi & Mitchell, 2014). The educational aspects play a substantial role in terms of financial literacy, where higher, - and lower education, in addition to basic financial education at a younger age is determinant to receive greater scores. The gender gap increased through the investigation of income, where females were especially affected in terms of obtaining lower income rates than males. Traditionally, females' scores could be negatively influenced by their role in the household, in opposition to males.

The terms "financial behaviour" and "investment behaviour" are factors being considered to provide understanding of gender gaps in financial literacy. The study is inspired by the significant gender gap detected from females' and males' abilities to provide accurate answer in light of financial literate questions (Cupák et al., 2018). Researchers have sought to determine the importance of the factors' influence to enclose the gap. Males tend to be more prone to overconfidence which is associated with investment behaviour. In addition, the number of working females has increased worldwide, although the gender gap in salary continues to maintain as relatively high. Providing financial education at a young age is found to be efficient later in life in terms of adapting financial literacy. This relates to retirement, whereas having greater financial literacy provides a robust relationship with planning for retirement shown in research provided by de Bassa Scheresberg (2013).

The population of Norway have shown a distinct increase in investments the last years due to the arising awareness from media and external factors (DNB, 2020). Females tend to have larger risk aversion than males, and therefore, the gender gap remains. Further, this relates to

a supplementary factor, risk aversion, which will be elaborated. Economic interactions usually involve risk aversion which is found to be highly connected to an individuals' characteristics, whether it being conscientiousness or having high emotional stability (Aumeboonsuke & Caplanova, 2021). Previous research has found females and elderly of being less risk averse than males, leading to a potential explanation of the existing gender gap in risk aversion and investment behaviour.

Based on previous research, the underlying aim is to continue developing an understanding of the existing gender gap in financial literacy. Expanding research towards the Norwegian population with a focus on potential regional differences is within interest. Determining which factors influencing the gender gap in financial literacy could be compelling to establish guidelines for females' knowledge. Consequently, this results in arising justification for making future changes to improve females' financial literacy and thereby decrease the gender gap. This subject is a fascinating study because of Norway's current development in terms of having high priority in gender equality. The thesis' findings might serve as a foundation for enhancing basic changes, making females less financially fragile and independent in society.

In the next chapter, relatable theory and previous research will be elaborated to create relevant hypothesis. Further, methodology represents the provided dataset and methods suited to enlighten the hypothesis. Additionally, the validity and reliability of the thesis will be reviewed. The following chapter will introduce the analysis of the results, followed by a discussion of the findings. Lastly, a conclusion will summarize the thesis' results in addition to provide suggestions for future research.

2.0 Theory

The gender gap in financial literacy, investment, - and financial behaviour has received more attention in recent years leading to various studies within these issues. However, there is a lack of studies focusing on gender gaps in specific regions of Norway, and the potential differences in between each region. In the following section, specified research will be presented where financial literacy and regional differences are emphasized with relatable theory.

2.1 Financial Literacy

Financial literacy can be defined as the degree to which an individual can receive and use information on their own economy (Huston, 2010). The term is a portion of the collectively agreed-upon financial forecast that is made up of several concepts, including financial behaviour, - ability, - and assumptions. Financial literacy is a frequent measure that appears in several studies due to the consideration of rent, renter's rent, inflation, risk and diversification (Lusardi & Mitchell, 2011). A high level of financial literacy correlates with wise and informative choices in terms of one's personal finance, in addition to long-term planning. The fundamental element of financial literacy consist of essential knowledge about financial issues, and the ability to apply this knowledge into a decision-making process (Nicolini, 2019).

The past 20 years, recent research indicates lack of financial literacy in many countries which led to increasing concern (Lusardi & Mitchell, 2014). The concern originates in the distrust of young adults and adults who are non-educated to function and maintain budgets, understanding credit, or taking advantage of their banking systems. Providing basic financial education is essential for the sake of allowing people to better navigate their personal finance and potential economic crisis (Lusardi & Mitchell, 2014). According to the study provided by Karakurum-Ozdemir et al. (2019), the findings indicates that females are less financial literate than males, with the justification of lower income levels. Another determinant finding is education, where individuals containing a primary education is having lower level of literacy, in opposition to the ones with a university degree who received higher scores. The overall lowest scores, however, went to the high school diplomates. In general, this study indicated that level of education plays a significant role in determining financial literacy.

2.1.1 Gender gap in financial literacy

Policymakers from across the world have expressed a great concern about the widespread lack of financial literacy in the wake of a global financial crisis. This led to the revelation of the existing gender gap in financial literacy where efforts are being made to fill these gaps with specific programs (Lusardi & Mitchell, 2014). For instance, Organisation for Economic Co-operation and Development (OECD) has been operating to highlight the lack of financial literacy across various nations (OECD, 2005). They documented extensive financial literacy across countries, especially among the younger generation.

A study outlined by Lusardi and Mitchell (2014) indicated older males of having distinctively greater financial literacy than older females in terms of both basic- and sophisticated financial literate questions. Across many countries, females were found to be strikingly consistent to respond 'do not know' to various questions than males. Due to these findings, researchers have sought to explain these persistent and widespread gender gaps in financial literacy. Hsu (2016), explained these differences of being rational, whereas specialization of labour within a household would lead married females to acquire financial literacy later in life. However, this study did not indicate why the financial literacy is lower among single females in command of their own finances. In addition, supplementary studies among high school,- and college students revealed considerable gender inequalities at an early age (Chen & Volpe, 2002). Other researchers are also seeking to explain the observed gender gap where Fonseca et al. (2012) concluded that traditional explanations cannot take fully responsibility for the gap in financial literacy. They suggested that females may acquire financial literacy in a different manner than males due to a possible mechanism in which gender gaps are produced in the household. Males specializes in making financial decisions and thereby require the relatable knowledge, while females specialize in other functions of the household. According to Bucher-Koenen et al. (2012), self-confidence vary by gender and may play a crucial role in gender gaps in financial literacy.

Norway also contributed in examining financial literacy using OECS's international study (Refvik & AksjeNorge, 2016). They proposed eight financial questions to both males and females to detect their literacy. The gender gap was detected in Norway where 85% of males answered correctly, in comparison to 57% for females. This result could be argued by Norwegian males' higher level of financial literacy in comparison to other countries (Atkinson et al., 2016).

The Nordic gender equality paradox may also play a superficial role in establishing gender gaps in financial literacy. Norway is renowned for doing well within gender equality due to its long history of female entrepreneurs, strong support for gender equality, and contemporary welfare states that enable females to continue working. This paradox has become a phenomenon that exist in the Nordic countries despite high rates of female labour participation, alongside with preponderance of females having secondary and tertiary education.

Several studies related to this paradox have been outlined, by instance Spangsdorf and Forsythe (2021) who found evidence supporting Nordic females connecting masculinity traits as perceived identity of a top managing position. The Nordic countries are highly rated on Hofstede (2011) individualism dimension, where the individualistic traits such as being dominant, self-reliant, assertive and forceful often are ascribed as a position of power, high status and influence. These could all relate to a top managing position, and thus be viewed as more suitable for males rather than females. In addition to the paradox, Norway is generally considered a homogenous country, which could be explained by its small sized country, scatter population speaking the same language, and sharing the same culture (Eriksen, 2002).

2.2 Financial behaviour

Financial behaviour plays a central role in an individuals' well-being, household, society and nation due to its constant influence. A suitable definition presented by Perry and Morris (2005), is that financial behaviour is the management of a person's expenditure, savings, and budget. Rahman et al. (2021) studied the impact of well-being by looking at the following factors: financial behaviour, financial literacy, and financial stress. They received significant effects from all three, however, financial behaviour was the most distinct result influencing financial well-being. Therefore, one can argue the underlying essentialness of having knowledge of financial behaviour is an important aspect.

Educators and policy makers have initiated a variety of programs in order to promote a responsible financial behaviour among the average household (Tang & Baker, 2016). In effort to provide financial literacy, the unintentional focus is "the more the better". Hadar et al. (2013) suggested to effectuate financial education with promoting higher levels of subjective financial literacy and not only relying on enhancing objective knowledge and imparting

relevant information. A study shown by de Bassa Scheresberg (2013), indicates that financial literacy is an important predictor of financial behaviours in the matter of young adults, where the financial literacy shows a robust relationship in driving the likelihood of planning for retirement and having precautionary savings. The overall conclusion in relation to improve financial behaviour at an older age is by providing financial education from an early stage (Hamdani, 2019).

2.2.1 Gender gap in financial behaviour

The proportion of working females has shown a distinct increase from 23% in 1996 to 33% in 2013 worldwide (Andarsari & Ningtyas, 2019). However, the gender gap in salary is still maintained where females receive 18% less than males. This has affected females of having trouble to save for retirement. The gender gap is thereby significant in the matter of investment, savings, and mortgage levels. Financial behaviour is associated with an individual's responsibility to how their money is managed, for instance handling budgets, prioritising needs, and assessing the importance in each purchase. The budget process includes to ensure the managing of financial obligations punctually by using it's received income (Ida & Dwinta, 2010). Financial behaviour could be measured by using 8 questions modified by OECD-INFE (*International Network of Financial Education*):

1. Focusing on money
2. Cautious in purchasing goods
3. Paying bills punctually
4. Making budget
5. Take risk on investments
6. Savings
7. Controlling spendings
8. Making long term financial plan

(Andarsari & Ningtyas, 2019, p. 26)

The empirical evidence related to financial behaviour involves females receiving benefit of having financial literacy to make wise decisions. However, the gender gap is difficult to measure because no single factors can explain the actual levelled difference in financial literacy among genders (Bucher-Koenen & Lusardi, 2011). A study provided by Barber and Odean (2001) suggest that rationality does not play a distinct role in behavioural finance. On the other hand, males are more prone to overconfidence than females, especially in male

dominated realms, such as finance. A rational investor would trade only if the expected gains were to exceed transactions cost, while overconfident investors would overestimate the precision of information leading to expected gains of trading. Overall, these findings explain how overconfidence males engage in higher levels of counterproductive trading in financial markets.

2.2.2 Pension savings

The Norwegian pension system consists of three elements (Pensjon, 2023):

- The National Insurance Scheme's retirement pension
- Employers' contractual early retirement pension, or occupational pension
- Private pension savings

All individuals living and working in Norway are entitled to retirement pension from the National Insurance Scheme (Regjeringen, 2023). Norwegians born later than 1962 accrues pension equivalent to 18.1% a year, up to approximately Norwegian Kroner (NOK) of 700,000. In 2022, the total amount of retirees in Norway with a minimum retirement level, was 22.3% for females and 4.3% for males (NAV, 2023). Individuals with low or no additional pension, depending on their marital status, are guaranteed a minimum retirement level which consists of a monthly payment of roughly NOK 16,000 a month. Females are highly represented at the minimum retirement level, illustrating the current gender gap in paid pension.

Most employers are required by law to save a percentage of employees' income for pension, called a mandatory occupational pension scheme (Regjeringen, 2023). The amount of pension paid depends on three factors, (1) income level, (2) when the retirement is started, and (3) what year the retiree is born. People born before 1962 will receive greater pension payments than people born later than 1962. A requirement to receive a full retirement pension is a minimum of 40 years of work in public sector. This leads the retirees to receive 66% of income (Nordnet, 2023b). In private sector, it is expected to receive 36 to 50% of income in addition to the National Insurance. Overall, individuals with a full retirement pension expects monthly paid pension of 45 to 65% of earlier income. Private pension savings is necessary if the retiree desires a higher level of income.

2.3 Investment behaviour

Generally, people are drawn to investing in a variety of assets, regardless of their profession, economic standing, level of education, or family history (Sarkar & Sahu, 2018). To become a potential investor, a requirement of possessing a surplus after current consumption, is necessary. Investment behaviour of individuals may be viewed differently due to the propensy of individuals to invest in non-tradable assets like real estate, hedge funds, or structured products. On the other hand, a mutual fund, pension fund, or philanthropic organisation are examples of institutions that invest on behalf of others and are referred to as institutional investors. An informal investor generally use external sources of information to identify potential investment opportunities (Fogg, 2000). Norwegian informal investors receive periodic financial status reports in addition to attending shareholders' meetings. However, they are not involved with additional activities, leading them to be comparatively inactive in their relationships with the companies in which they invest. In general, an agent's optimal investment behaviour can require investing in two alternative activities until the predicted returns is equal, when risk is taken into account (Eckel & Grossman, 2002).

In Norway, most individuals' investments are found in property and dwelling. Norwegians received profits in funds and stocks being relatively small compared to profitable success in mortgage and fixed investments in dwelling (Halvorsen, 2019). After putting profitability related to dwelling, property, and mortgage aside, the remaining total of 23% of Norwegians invests in stocks and mutual funds by the means of saving money. This fraction is quite unevenly distributed which reflects the extent of households not saving anything, while others save a substantial amount. However, Norwegians have significantly improved their saving habits in recent years, particularly young adults between the ages of 18 and 25, whose primary goal is saving for real estate and housing (Melkild, 2022). Additionally, the age group between 25 and 40 tend to save for vacations, while the remaining group above the age of 41 tend to save for a buffer in case of unforeseen emergencies. Out of Norwegian investors, 56% saves their money in the banking system.

2.3.1 Gender gap in investment behaviour

Hsu et al. (2021) discovered a variety of findings in their research on investigating gender gaps in behavioural biases and effect of financial literacy. The findings implies that gender plays a significant factor in prosperity of individuals to display behavioural biases. Females

tend to have stronger regret aversion, while males tend to show more self-attribution, illusion, control, and confirmation biases. Economic implications within investment behaviour appears to differ by males and females (Charness & Gneezy, 2012). Especially Norwegian females between the age of 18 and 25 stands out as being the greatest at depositing funds. However, they usually save through personal bank accounts as opposed to mutual funds or stocks (Melkild, 2022).

According to data retrieved from VVS (Verdipapirfondens forening), there was a total of 1,507,011 investment agreements in equity and combination funds in Norway (VVS, 2022). In total, that represents an increase of 21% from the previous year. Both genders have increased saving agreements the past year, however, females account for the largest increase with 144,644 new agreements compared to males' 116,391 in 2021. This holds an increase of one percentage for females' total share from the previous year (VVS, 2022). Given that males invest a greater amount, they receive higher profits each month. Males accounts for 59.5% of Norwegians' total through saving agreements, compared to females' 40.5%.

2.4 Risk Aversion

The term 'risk' holds many different interpretations. Risk measures can generally be referred to as the range of potential payoffs associated with a particular decision (Eckel & Grossman, 2002). Economic interactions usually involve some form of risk. Therefore, it is not surprising that a sizable corpus of research in social science has attempted to comprehend how decision makers consider risk in their choices (Charness & Gneezy, 2012). Factors affecting risk aversion is for instance conscientiousness and openness which leads individuals to be less risk averse, while individuals characterized as agreeableness and high emotional stability are significantly more risk averse (Aumeboonsuke & Caplanova, 2021). There is a correlation of elderly as well as females of being more risk averse, in opposition to males. Nonetheless, an interesting finding from research provided by Aumeboonsuke and Caplanova (2021), is the absence of significant effect on risk aversion from education and income.

2.4.1 Gender gap in risk aversion

According to Charness and Gneezy (2012), females appear to be more financially risk averse than males due to females' smaller investments within risky assets. However, this result does not imply that females always behave more risk averse than males. Previous research

investigated the allocation of portfolio assets where the findings imply gender as significantly related to asset allocation (Sundén & Surette, 1998). In addition, the gender gap is found in both risk tolerance and risk perceptions within different aspects than financial, such as technology, alcohol, recreational, and social activities (Eckel & Grossman, 2002). From an economic perspective, it is interesting to investigate which extent these patterns reflect females' financial decisions. Females have lower willingness to accept financial risk which could be explained by females' inherent preference of risk, as well as the investment advice they receive. Eckel and Grossman (2002) found a behavioural difference in males and females' attitudes towards investments. Females are more likely to experience aversion in situations involving potential losses.

Table 1 demonstrates that males are substantially more financial literate than females, in both actual and perceived terms (Bannier & Neubert, 2016). As shown in the table, the sample split into four literacy groups where there is a distinct disparity between males and females. These results show females being more numerous than males, implying the likeliness of females perceiving financial literacy as above average even though their realistic score is below average.

Table 1: Actual and perceived financial literacy between genders.

	All	*Male*	*Female*
Actual financial literacy (mean)	5.587	6.081	5.159
Perceived financial literacy (mean)	4.578	4.756	4.425
Perceived low/actual low (I)	0.217	0.150	0.275
Perceived low/actual high (Riise)	0.222	0.227	0.219
Perceived low/actual low (III)	0.204	0.183	0.222
Perceived low/actual high (IV)	0.357	0.441	0.285
Risk tolerance	2.25	2.57	1.98
Above-average risk tolerance	0.34	0.40	0.29
Number of observations	2047	986	1061

Source: Retrieved from Bannier and Neubert (2016, p. 132)

2.5 Oslo Stock Exchange

Oslo Stock Exchange is Norway's exclusive regulated marketplace within stock exchange, and is currently a global leader within the sector of energy, shipping and seafood (Euronext, 2023). In 2019, the European stock exchange and market infrastructure, Euronext, acquired Oslo Stock Exchange, which had previously been a public traded corporation owned by financial actors in Oslo Stock Exchange VPS Holding (Euronext, 2023). Since 1980, Oslo Stock Exchange has showed a distinct growth, and played a huge role in acquiring equity. In 1980, 93 companies was listed with a total market value of NOK 16.6 billion, while in January 2021, 287 companies was listed on Oslo Stock Exchange with a combined market value of NOK 3,187 billion (EuroNext, 2021).

In 2022, private individuals possess 4.17% of the entire value on Oslo Stock Exchange. At the end of 2020, the estimated value was 4.7% which illustrates a decline of individual investors (AksjeNorge, 2022). Two possible approaches to explain the most likely causes are:

1. Equinor, an international energy company located in Norway, is ranged as the largest company on the stock exchange, which means that the pattern of gains inside the company will cause other stocks to lose value, which could result in a natural fall in private assets.

2. Foreign investors hold a total value of 40.4% of all stocks in Oslo Stock Exchange

External factors affecting stock prices include economic indicators, company performance, industry, global uncertainties, pandemic, and market speculations, all of which interconnect and influence each other in determining the fluctuations of stock prices (AksjeNorge, 2023b). Uncertainties in the stock market has a tendency of risk averse investors of selling their shares.

2.5.1 Gender gap in Oslo Stock Exchange

The current gender gap in the stock market is usually explained by females' lower numeracy, financial literacy, decreased risk tolerance, or the lack of familiarity in financial products (Bannier & Neubert, 2016). In 2005, a gender quota law was established in Norway, namely that 40% corporate board members are to be females (Wang & Kelan, 2013). The law has a goal where publicly listed companies on Oslo Stock Exchange shall have a board consisting of 60/40 % gender balance. According to Seierstad and Opsahl (2011, p. 52), there may be an

implicit purpose behind the gender quota law where an additional aim is to increase dispersion of power between directors. However, publicly listed companies on Oslo Stock Exchange are least likely to avoid the impact on the quota. Unlisted companies may convert into a private status in order to avoid the quota, while listed companies would overweigh the disadvantages due to the cost of delisting- and converting (Wang & Kelan, 2013). Publicly listed companies on Oslo Stock Exchange have therefore been able to achieve a proportion of female directors remaining over 40%.

According to Eckbo and Ødegaard (2019), evidence is shown in market response that female insider acquisitions has increased due to the dramatic growth in the network of female directors since Norway's 2005 law of a board gender balance. Additionally, female insider purchase increased after the 2008 market crash, both in absolute terms and in a comparison to male insiders, defying the stereotype that females are more risk averse than males.

Oslo stock exchange holds a total of 567,305 Norwegian shareholders with a total market capitalization of NOK 155.5 billion (AksjeNorge, 2022). The current percentage disparity between males and females is 70% against 30%. Although, the distribution of shareholders cannot accurately reflect the value derived from each investor. When focusing on the value in NOK invested, females account for 21% of the total value, while males account for 79%. All numbers are retrieved from Euronext Securities Oslo (2022). This could be argued by the fact that females earn less than males, and have higher risk aversion, leading males to generally investing higher amounts (Holden & Tilahun, 2022).

Several investors position themselves for unneeded high risk when their risk is not distributed across different companies. In the last couple of years, people have become slightly more aware of the risk associated with owning one single stock. However, 80% of all individual investors continues to own stocks in fewer companies than recommended. On the other hand, fund savings have grown significantly, which indicates the likeliness to retrain a widespread equity fund, possibly one that provides a portfolio with long-term diversification. Table 2 demonstrates the numerical disparities between males and females by providing an overview of various stock sizes.

Table 2: Gender differences within portfolios in the Norwegian stock exchange

Stocks	Female	Male	Total
1 stock	85 385	156 153	241 538
2-5 stocks	65 550	166 128	231 678
6-10 stocks	14 261	47 812	62 073
11+ stocks	6 301	26 715	33 016
Total	*171 497*	*396 808*	*568 305*

Source: Retrieved from AksjeNorge (2022)

Females are generally more risk averse than males, which contradicts with Table 2 where a large proportion owns one single stock. A diversified portfolio needs to have a variety of stocks from different industries, market capitalisation and geographic regions, hence, holding 11+ stocks.

At the beginning of 2019, "AksjeJentene" was established with the aim of enclosing the gender gap within investments. They created a Facebook page where the purpose was to share experiences, knowledge, and the opportunity to discuss stocks and funds with females (AksjeNorge, 2023a). This gave rise to further awareness where Den Norske Bank (DNB) presented an extensive campaign of SHE Invests which received a lot of attention and engagement with the following hashtag #huninvesterer (Riise, 2019). The underlying aim was to influence and inform females of the present gender gap in stock exchange, and further provide a motive and motivation to invest more. DNB (2020)'s reasoning for this campaign was the constant and recurring gender gap each year where males contained NOK 134 billion more in net wealth than females and held 80% of private stocks on Oslo Stock Exchange. The response has been positive, were data provided significant evidence of females investing more the following weeks after the campaign aired.

Figure 1: Number of shareholders in Norway

Number of shareholders in Norway 31.12
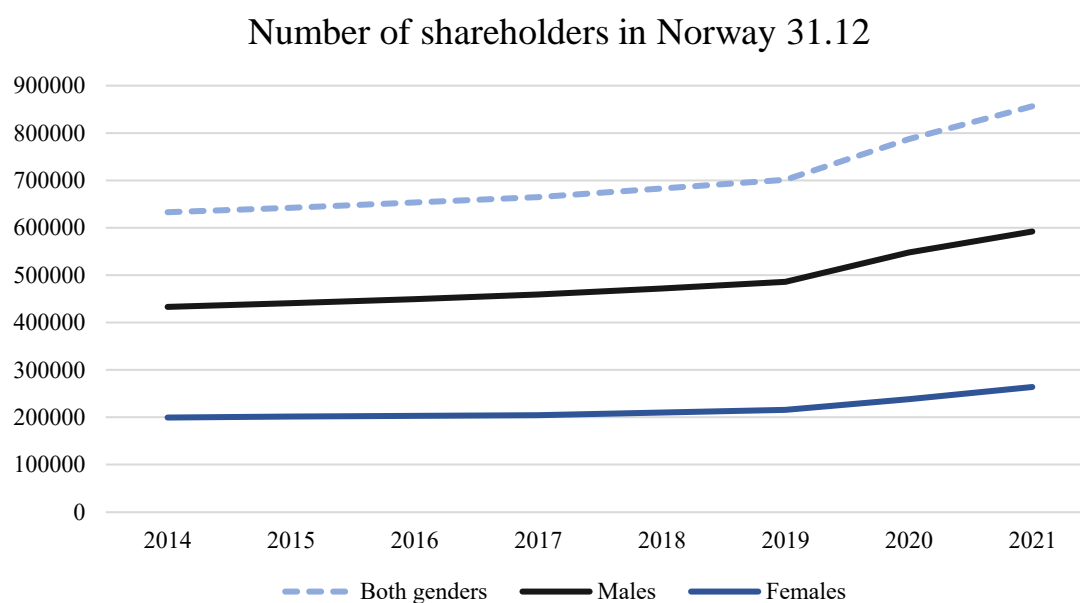
Source: Retrieved from SSB (2023).

Figure 1 is a representation of Norwegian males and females that owns stocks at the end of each year, ranging from 2014 to 2021 (SSB, 2023). There is an evident gender gap in the presentation, where both genders have increasingly bought more stocks over time. There is a modest increase the first years until 2019, where a kink is representing a more rapidly increase the last two years. It is significant to note that this figure reflects all stock markets where Norwegians hold stocks, and not only Oslo Stock Exchange. It does not include the value and amount of each stock, but rather provides an illustration of males and females who presently own stocks.

2.6 Regional differences

Regional differences within financial literacy in Norway has not received much attention in research, which provides a lack of previous literature. Certain researchers argues that Norway and the Nordic countries are homogeneous which could justify the limitation of previous research (Eriksen, 2002). However, the notion of regional differences in financial literacy, investment behaviour and risk aversion may be affected by several factors playing a significant role. Regions of Norway could be divided into counties, municipalities, and centrality in the interest of investigating regional differences.

Norway had 19 counties until the year of 2020 when the government decided on merging counties into a total of 11, namely, Viken, Oslo, Innlandet, Vestfolk & Telemark, Agder, Rogaland, Vestland, Møre & Romsdal, Troms & Finnmark, Trøndelag & Nordland (Aas, 2018). These counties are reflected in Figure 2.

Figure 2: Norway's current 11 counties.

Source: Retrieved from Regjeringen (2019).

Rogaland is a smaller county in terms of area, however, also one of the foremost historical counties in relation to its growth and use of resources. In 1969, oil was discovered in Ekofisk, which led to great increase in Rogaland's regular conditions. They began utilizing their natural resources such as oil, gas, hydropower and quarry (Blomgren et al., 2019). In 2014, 40% of all employment were related to petroleum, in addition to having a substantial amount of supplier activities in agriculture, seafood and renewable energy. The northern counties are known for their resourceful location in terms of coastline which provides great opportunities related to seafood, wind power and transportation due to their easy access to the Barents sea (Knutsen, 2022). The western counties are depending on their various weather with lots of precipitation, and mountains to produce electricity, in addition to offshore and seafood. Eastern counties hold most of the forests and agricultural areas in addition to playing a

substantial role in trading and industries. Norway's capital, Oslo, is located in the eastern region and counts for approximately 20% of Norway's population. Great companies and its leaders are mostly stationed in Oslo. Southern counties are known for their archipelagos which draws many tourists, both Norwegian-, and international travellers. Their resources also hold industries of battery, maritime wind and hydrogen (NHO, 2022). There are many coherences between the different parts of Norway, although, some factors may have greater influence on financial literacy, investment behaviour and risk aversion. The knowledge obtained from historical events and opportunities are some examples.

Table 3 signifies the regional variation of shareholders and its related values from each individual investor, where the numbers represent the change of value in 2022. Rogaland is the only county who managed to increase its value, whilst all remaining counties decreased.

Table 3: Regional differences in total value of individual investors

Counties	Number of shareholders	Total value in billions (NOK)	Individual value on average	Change in value 2022
Viken	132 101	36,20	274 343	-12,4 %
Rogaland	59 576	20,50	343 597	1,9 %
Oslo	92 382	32,00	345 856	-16,0 %
Vestland	72 304	17,70	244 656	-5,9 %
Trøndelag	45 945	11,30	245 360	-12,0 %
Møre & Romsdal	27 904	7,50	269 082	-9,3 %
Vestfold & Telemark	42 339	11,30	266 577	-7,2 %
Innlandet	29 682	6,30	212 082	-12,6 %
Agder	25 493	5,20	204 074	-15,4 %
Troms & Finnmark	20 195	4,40	216 619	-11,0 %
Nordland	1 992	3,20	160 492	-8,7 %

Source: Retrieved from Euonext Securities Oslo (2022)

2.6.1 Municipalities and centrality

Norway holds a total of 356 municipalities (Regjeringen, 2021). These municipalities differ in density, size, and centralisation. In terms of examining the effect of centrality, SSB (2020) outlined a centrality index shown in Appendix A presenting all municipalities within the range of 295 to 1,000. This index can thereby be adapted to investigate variations with the main focus on centrality. The municipalities with superior centrality represent higher scores

while municipalities with inferior centrality represents lower scores. For instance, Oslo contains the highest possible score of 1,000.

In light of investment behaviour, AksjeNorge (2022) illustrates eight municipalities with the highest numbers of private investors. Table 4 lists the eight municipalities namely, Oslo, Bergen, Trondheim, Stavanger, Bærum, Asker, Kristiansand, and Sandnes. The number of private investors ranges from 91,160 to 9,233.

Table 4: The municipalities with the highest number of private investors.

	Private investors
	2022
1. Oslo	91 160
2. Bergen	35 057
3. Trondheim	23 736
4. Stavanger	21 334
5. Bærum	20 747
6. Asker	12 492
7. Kristiansand	9 800
8. Sandnes	9 233

Source: Retrieved from AksjeNorge (2022)

2.7 Research questions

Based on previous literature and theory, the further aim of the thesis is to locate and research the gender gap in financial literacy and which factors affecting the differences among the population of Norway. Prior literature indicates minor reasoning behind the existing gender-gap, and the influence of various factors. Therefore, the research question is expressed as *"What is the present gender gap in financial literacy and risk aversion among the population of Norway, and does higher education, income, age, livelihood and residence play a significant role on financial literacy?"*.

2.7.1 Hypothesis

The research question will further be divided into hypotheses with the aim to answer and uncover relationships between financial literacy, risk aversion, regions, gender, education, age, and income. A hypothesis could be defined as a testable assertion of the relationship between variables (Sekaran & Bougie, 2016). Hypothesis can also examine whether there are

variations between two, or several groups, with respect to the provided variables. The hypothetico-deductive approach demand that hypothesis is falsifiable, meaning other researchers can demonstrate they are false. For this reason, the hypothesis is accompanied by a null, - and alternative hypothesis, where the null hypothesis H_0 is set up to be rejected to support an alternate hypothesis H_A. The null hypothesis is assumed to be true unless statistical evidence states otherwise. The alternative hypothesis, which is the antithesis of a null hypothesis, claims a relationship between two variables.

Figure 3 illustrates the research model used by expressing variables with a potential relationship to financial literacy as the dependent variable. The blue circles containing 'risk aversion' and 'regions' indicates the independent variables, while 'gender' represents the moderating variable. Lastly, the control variables are represented in the black circles, namely, 'age', 'education' and 'income'. The arrows illustrate an assumed relationship between the variables. In further research, four hypotheses have been outlined and represents the alternate hypotheses.

Figure 3: Research model

23
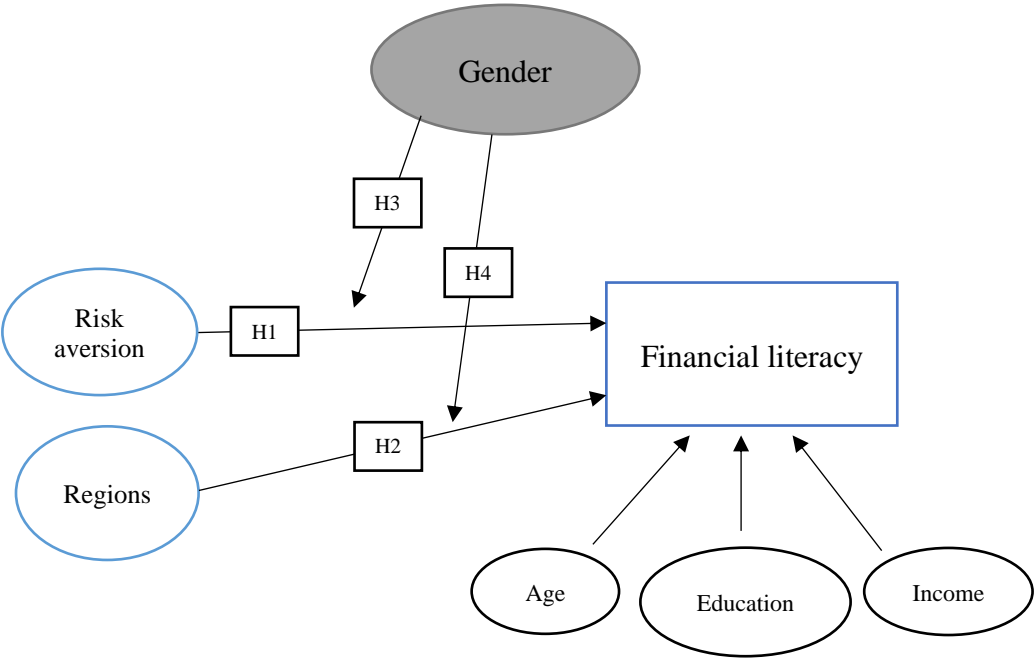
As illustrated in Figure 3, the first two hypotheses will test whether a relationship occurs among the independent variables and the dependent variable.

H1: An increasing level of risk aversion has a negative relationship with financial literacy.

H2: Centralised areas have a positive relationship with financial literacy.

The latter two hypotheses will test the effect by including the moderating variable. As mentioned, gender is the moderate variable due to the assumption of the variable's ability to impact the relationship among the dependent and independent variables.

H3: The effect of risk aversion provides a greater impact on financial literacy for females.

H4: The effect of centrality provides greater impact on financial literacy for females.

3.0 Methodology

This section will provide a description of the methodology used in the thesis, by outlining methods to analyse and determine variables affecting gender gap in financial literacy. The intention is to provide suitable methods to test the hypothesis regulated by the research question. Mainly, methodology aims to outline the thesis' procedure in collecting information, analysing, and interpreting the data (Sekaran & Bougie, 2016).

3.1 Research design

A research design is considered a plan of collecting, measuring and analysing data, in order to create an answer for the research question (Sekaran & Bougie, 2016). Descriptive research design is the most suitable in relation to the research questions. The objective of a descriptive research design is to predict relationships among variables in a quantitative dataset, and thereby perform a quantitative analysis. Data is collected through a survey, which is the most common method in a quantitative approach. This includes a sizable number of observations to conduct one or several assumptions, in addition to generalising the results to the population. The focus of a quantitative method is the phenomena that can be counted and quantified, and relies on previous relatable studies to establish a testable research question and hypotheses (Drageset & Ellingsen, 2009). Consequently, quantitative methods have an obstruct in terms of providing in-depth analysis, resulting in lack of important information due to the implication of specific information not being able to quantify. Challenges may arise in relation to establish cause-and-effect of the gender gap in financial literacy given the adapted approach, meaning only variables connected to the phenomenon can be conducted. In this instance, the aim lays in investigating whether a correlation between financial literacy and various variables.

3.2 Data

The study uses secondary data to examine Norwegians financial literacy and risk aversion. The data is collected from a project titled "Finansiell kunnskap og mestringstro blant nordmenn 2022" (Project Bank, 2022). "Finansmarkedsfondet", a fund that supports new research, provides most of the project's financial support. This research is based on a survey developed by Gianni Nicolini and conducted by using GallupPanalet. Nicolini's focus has been to increase knowledge of financial topics in the population of different countries (Nicolini, 2019).

The survey was translated into Norwegian and adjusted to fit Norwegian circumstances before being carried out by TNS Kantar with Professor Ellen K. Nyhus as project leader. The questions from the questionnaire are presented in Appendix B. The questionnaire was distributed widely, resulting in 2,278 responses, of which 1,093 are females and 1,185 are males. All responses were answered between February 10th, 2022, and March 7th, 2022. Prior relatable surveys contained up to 101 questions, however, this survey only provided 25 questions in response to its earlier complaints that they were too extensive.

The survey's objective was to represent the Norwegian population where the representatives hold ages between 17 to 89. In addition, it is based on geography and gender, which makes it possible to generalise the concepts of the framework. The survey was conducted online, which makes it easier to reach out to more people at a lower cost. Disadvantages appear when the candidate has low electronic knowledge, consequently, results may not reflect the actual financial capability of the respondent. A potential vulnerability is the lack of ability to access information that cannot be found through the presented numbers; however, the collectors of the data have made it possible to include comments. This study demonstrates that females are more likely than males to respond, "do not know." The 25 questions may have been answered in one of two ways by the representatives. 1,121 of the representatives were offered the options "do not know" and "prefer not to answer," whereas the rest of the respondents did not. This led to the second group of 1,157 respondents being forced to offer responses even if they did not know the answer, causing them to guess.

The financial literacy questions included themes about rents, inflation, mortgage, investments, obligation, payments, pensions, loan, and debts. Most of them include a variety of questions with different degree of difficulty to measure the respondent's financial literacy. The result from the questionnaire is found by adding each correct answer with a total possible score of 25.

3.2.1 Data selection

The dataset contains a large number of observations from a probability sample, which indicates generalisability. It demonstrates the distribution of gender within age, education, main source of livelihood, income, and residence. Total number of observations is 2,278 with a relatively equal distribution of males (1,185) and females (1,093).

Table 5: Data selection

	Male	Female	Total
Population sample	1185	1093	2278
Age			
Under 30	131	161	
30-44	265	252	
45-59	401	316	
60+	388	364	
Education			
Primary School	52	54	
High School (yrkesfag)	121	107	
High School (allmenn)	154	137	
Vocational school (fagskole)	154	91	
Higher education (<4 years)	407	392	
Higher education (>4 years)	297	312	
Main source of livelihood			
Full-time work	658	486	
Part-time work	47	124	
Self-employed	48	20	
Retirees	269	226	
Unemployed	23	28	
Social security	71	113	
Student	57	74	
Homemaker	4	12	
Other	8	10	
Income in NOK			
Under 200 000	51	111	
200 000 - 299 999	73	118	
300 000 - 399 999	123	165	
400 000 - 499 999	178	214	
500 000 - 599 999	191	160	
600 000 - 699 999	148	96	
700 000 - 799 999	106	42	
800 000 - 999 999	121	44	
1 000 000 or more	87	21	
Prefer not to answer	107	122	
Region			
Viken	266	242	
Oslo	178	155	
Innlandet	80	82	
Vestfold &Telemark	92	90	
Agder	66	78	
Rogaland	113	77	
Vestland	150	131	
Møre & Romsdal	38	41	
Troms & Finnmark	51	61	
Trøndelag	97	98	
Nordland	54	38	

Table 5 illustrates the distribution of ages between four groups: respondents under 30 years, 30-44 years, 45-59 years, and above 60 years. In terms of education, there are more respondents with higher education within both genders. In comparison to females, more male respondents are in full-time jobs, self-employed and retirees. In contrast, more female respondents work part-time, are students, homemakers, unemployed or under social security. Within the different variables for income, females have most observations from under NOK 200,000 up until NOK 499,999. From there, more male respondents have earnings above NOK 500,000 in comparison to females. Females are highly represented in low-income payments, while males are highly represented in high-income payments. Most of the respondents are from Viken, Oslo and Vestland, but there is a somewhat equal distribution among the rest of the counties. In this study, the whole sample will be distributed, with the exception of No-Answers (N/A's).

In addition to the financial literacy questions, the dataset included questions retrieved from AksjeNorge containing, among else, what investment products that are relevant for the respondents, and what they currently possess. This paper extracted a few questions to provide a more applicable study, outlined in Appendix C and D.

3.3 Operationalising

In the following section, the analysis' relatable variables will be presented, in addition to the methods used to measure these variables.

3.3.1 Dependent variable

A dependent variable is the variable of primary interest of the thesis (Sekaran & Bougie, 2016). "Financial literacy" is therefore the main dependent variable throughout the analyses. Although, "risk aversion" is also considered a dependent variable in a certain analysis. The dependent variables will further determine which independent variables having a statistically significant parallel with the financial literacy scores. However, the total score cannot be used to classify respondents into those who have a well-established financial literacy or those who do not. However, they can be used to determine an indicator on positive or negative effects in these circumstances. The closer one gets to the maximum score of 25, the more financial literate they are. The following dependent variable is focusing on respondent's scores to categorize the potential gender-gap in financial literacy.

3.3.2 Independent variable

The independent variable is generally conjectured as a direct influence on the dependent variable, in either a positive or negative way (Sekaran & Bougie, 2016). Previous research has detected coherence between several factors and their influence on financial literacy. Conducted findings suggests statistically significance of risk aversion, while no significance among regional differences. Due to previous research, the subsequent analysis will test the selected data to further examine their relationships. Previous literature also found scientifically proof of a great gender gap in terms of financial literacy, where males hold higher levels (Refvik & AksjeNorge, 2016). However, no research has identified specific explanations of regional differences, which is why an evaluation of residency will be outlined. 'Gender' is an independent moderating variable used to investigate whether the relationships are reinforced or reduced by including the variable in the models.

3.3.3 Control variable

The term 'control variable' originally came from Kendall and Lazarsfeld (1950) and is referred to as the 'test' variable, implying a hypothesis being tested in light of theory. The purpose is not simply to eliminate the observed relationship, but rather determine whether it could be eliminated by controlling for a variable given it has been hypothesised to be conceptually distinct and potentially relevant within the theoretical framework (Shibata, 1981). In this context, a causal relationship between the dependent and independent variables may not be claimed. Nonetheless, research of statistically significant relationships between them is possible to achieve. In this matter, control variables must be specified to ensure the robustness of the analyses being performed. This reduces the possibility of detected relationships being spurious. Spurious relationships occur if a third variable is an underlying cause of the relationship between the dependent and independent variables. The analysis' control variables include age, income, and education. These control variables are being used due to previous findings in literature. Age is due to previous research indicating financial literacy varies in between ages. Income is also a control variable due to the numbers observed in Table 5 where males have greater income than females. Lastly, education is controlled due to previous findings on its influence on financial literacy.

3.4 The analysis' structure

3.4.1 Level of measurement

There are four different levels of measuring variables, namely, nominal, - ordinal, - interval, - and ratio scaling (Sekaran & Bougie, 2016). Each one of the four levels of measurement contains the capability of aiming at one specific level. Nominal scale's definition involves classifying subjects into specified categories or groups and is typically the main emphasis of this thesis. The nominal scale can be combined with the retrieved data to gather and measure data on frequencies and percentages. For instance, the persisting gender gap, which separates the respondents into two groups, male and female, is a crucial component of this thesis. Hence, nominal scaling will be used due to its function of finding accurate numbers and percentages. On the other hand, the main dependent variable, financial literacy, is scaled on an ordinal basis and is thereby the only variable not being measured as a nominal scale. This is done by focusing on the total score of the interval between 0 and 25. This results in 25 categories of nonoverlapping in order to be ranged. As an explanation, the gap remains the same between the score of three and four, as it is between the score 20 and 21. Meaning, the total score is measured as an internal and is a continuing variable (Sekaran & Bougie, 2016).

3.4.2 Linear Regression

A linear regression is a representation of the given matrix notation (Montgomery, Peck, & Vining, 2021). One of many popular statistical methods in examining the relationship between a single dependent variable, Y, and one or more independent variables, $X_1, X_2, ... X_i$ is found in the linear regression. Certain causations could be determined to establish whether one or more independent variables significantly affect financial literacy. The linear regression equation is shown below and represents a straight line.

$$Y_i = B_0 + \beta_1 X_{1i} + \varepsilon_i$$

Retrieved from Sekaran and Bougie (2016, p. 313)

3.4.2.1 Assumptions

Poole and O'Farrell (1971) developed six critical assumptions that must be satisfied in order to implement a linear regression analysis. (1) Each value of X_i and Y must be observed without measurement error. (2) Each distribution of the disturbance-term, ε, must have a mean of zero. (3) The disturbance-term ε must also be normally distributed. (4) The relationship between the independent variables X_1 and Y contains linear parameters. (5) The

homoscedasticity assumption of ε being constantly varied in the conditional distributions. (6) Each independent variable is linearly independent from each other, in the interest of avoiding multicollinearity. Multicollinearity exists if two or more independent variables in a multiple regression model are highly correlated (Sekaran & Bougie, 2016). High correlation was not to be found throughout the analysis between independent variables, however, a moderate correlation was established between the independent variables; education and income, which led to the use of separate linear regression models.

3.4.3 Multiple Linear Regression

A simple linear regression examines how an independent variable affect the dependent variable. There is often more than one variable affecting the dependent variable, and therefore a multiple linear regression is used. Multiple independent variables are analysed to determine their relationship with the testable object, for example how stock prices are affected by not only rates of return, but dividend yield, leverage ratio, etc (Lee et al., 2019).

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \cdots + \beta_k X_{ki} + \varepsilon_i$$

Retrieved from Sekaran and Bougie (2016, p. 313)

In the equation represented, Y is the dependent variable, and the intercept of the regression is presented by β_0. The partial regression coefficient of beta 1 measures how sensitive Y is to changes in X_1, assuming that X_2 is fixed. The partial regression coefficient of β_2 measures how sensitive Y is to changes in X_2, assuming that X_1 is fixed. ε is a parameter representing the error term, and *k* represents the number of independent variables.

The equations for the multiple linear regression will be performed in chapter 4.3, and the given model is:

$$Y_{\text{Financial literacy}} = \beta_0 + \beta_1 \text{Income} + \beta_2 \text{Age} + \beta_3 \text{Gender} + \beta_4 \text{Education} + \beta_5 \text{Regions}$$

In further analysis, separate regression analysis will be conducted, then comparing the coefficients by the usage of eyeballing. Eyeballing is a visual estimation and will be used due to its ability of being easy to perform (Gudmundsson et al., 2005).

3.4.3.1 Parameters

In further section, the estimated parameters used in the regression analyses are listed and explained in detail.

1. R^2 is a metric of how well the model's explanatory variables can account for the variance in the response variable. The measure of variance in the dependent variable that can be accounted for by the difference in the independent variable is known as the R^2 coefficient (Sekaran & Bougie, 2016). R^2 cannot fall if a new independent variable is added to the regression equation because SSR (sum of squares due to regression) never increase, and seldom decreases, as more independent variables are added.

2. Adjusted R^2 imposes a penalty for adding additional independent variables to a model. As opposed to regular R^2, the adjusted R^2 can include new explanatory variables to examine whether the parameters fall. If a fall is detected, this indicates that the new variable is unsuited to the model (Wooldridge, 2012, p. 202).

3. Degrees of freedom (df), denotes whether a significant relationship exists, and represents the most logically independent values that can fluctuate in the data sample. When calculating df, one is subtracted from the number of items in the data sample (Sekaran & Bougie, 2016).

4. Residual standard error is used to investigate how well the regression model fits the dataset, where a smaller residual standard error represents a greater fit of the dataset by the usage of the regression model.

5. P-value is the probability of receiving results that is equal to or more extreme than the observed result of a statistical hypothesis test. In this case, a possible assumption is that the null-hypothesis is accurate (Dahiru, 2011). The probability (p) can take any value between 0 and 1. A smaller p-value explains the lack of stronger evidence in favour of the alternative hypothesis.

6. Standard deviation is a commonly used measure of dispersion in interval- and ratio scaled data. The standard deviation, denoted Sd(X), of a random variable is a positive square root of the variance:

$$Sd\ (X) = +\sqrt{Var(X)}$$

Retrieved from Wooldridge (2012, p. 736)

3.4.3.2 T-test

T-test must be utilised to interpret linear regression to find coherence between the dependent variable Y and the independent variable X. A T-test is used to determine whether the model's regression coefficient is statistically significant to zero and if so, the null hypothesis will not be rejected. On the other hand, if β is equal to zero, the alternative hypothesis will be considered and supported, and one will be able to draw conclusion of coherence between the dependent- and independent variable (Sekaran & Bougie, 2016). In the sake of rejecting the null hypothesis, the p-value must be lower than the selected significance level.

3.4.3.3 Robust standard error

A standard error is an approximate standard deviation of a statistical sampled population used in order to detect the precision of the estimates (Sekaran & Bougie, 2016). The variability will be estimated by the sampling distribution of the sample mean, and this variability is referred to as standard error ($S_{\bar{X}}$) where S is referred to as the standard deviation.

$$S_{\bar{X}} = \frac{S}{\sqrt{n}}$$

Retrieved from Sekaran and Bougie (2016, p. 257)

The robust standard error, also known as the Huber-White standard errors, will adjust the model-based standard errors by using the model residual's empirical variability, which is the discrepancy between the observed outcome and the outcome projected by the statistical model (Wooldridge, 2012). It is viewed as a technique to obtain unbiased standard errors from the coefficients in the presence of heteroscedasticity. Heteroscedasticity refers to situations where the variance of the residuals is unequal across a variety of measured values.

3.4.3.4 The model's explanatory power

R^2 indicates the proportion of the variance in the dependent variable, which can be explained by the regression model. R^2 varies between 0 and 1, where the closer it gets to 1 the better the explanatory power of the model is. If R^2 is equal to 1, it will indicate that all variation is explained by the regression model. An important factor to consider is that R^2 will always increase when including several independent variables that could lead to an overoptimistic R^2. The adjusted R^2, on the other hand, takes increased degrees of freedom into account, by increasing the number of explanatory variables. In such case, it is more appropriate to use

adjusted R^2 as an indication of the model's explanatory power by the use of a multiple linear regression (Verbeek, 2008).

3.4.3.5 F-test

In order to investigate if two or more variables are jointly significant in a regression, F-test could be adapted. In contrast, t-test is useful in the sense of explaining a single variable's possibility of being statistically significant. The occasion could rise where two or more variables have statistically insignificant t-scores, yet, are jointly significant. In this matter, an F-test could be used. F-test is suitable in the matter of using a block function for the sake of testing whether the variations in R^2 are statistically significant. It controls and settles whether the model's explanatory power is statistically different from 0. The null-hypothesis will be rejected if the p-value found in the F-test is lower than the chosen significance level (Sekaran & Bougie, 2016).

3.4.3.6 Dummy variables

A dummy variable is a variable containing two or more distinct levels coded as 0 or 1 (Sekaran & Bougie, 2016). They allow the use of ordinal, - or nominal variables as independent variables to explain, comprehend or predict the dependent variable. The regression model will incorporate the dummy variables (D_0) into the regression model, depending on the number of used dummy variables. A formula including two dummy variables is viewed as follow:

$$Y_i = \beta_0 + \beta_1 D_{1i} + \beta_{2i} D_{2i} + \varepsilon_i$$

Retrieved from Sekaran and Bougie (2016, p. 315)

3.5 Potential bias

3.5.1 Missing observations

There are three different types of missing observations that needs to be taken into consideration, namely, coverage, - nonresponses,- and selection error (Sekaran & Bougie, 2016). Errors of coverage refers to the limitation of the target population not being adequately represented in the sample frame. As an example, errors of coverage may occur if an electronic survey is handed out, and some respondents contains lack of internet access. Furthermore, there are grounds for assuming this inaccuracy does not exist in the survey given that respondents had full access to internet. Even though the survey contains a high percentage of

responses, experiences of response errors may occur. In this case, respondents choose not to answer the questions leading to lack of observations from influential respondents, further represented as N/A. Given there is a great number of observations in the dataset, quite evenly distributed among males, females, and regions, it can be assumed that nonresponse error is absent. Lastly, selection errors occurs when respondents are self-selected, which in this case limits the errors due to the survey being served as a probability sampling, meaning the selection is based on the principle of randomisation.

3.5.2 Type I and type II error

Hypothesis testing is used with the aim of precisely determine if the null hypothesis (H_0) could be rejected in favour of the alternative hypothesis (H_A) (Sekaran & Bougie, 2016). The alternative hypothesis can be accepted with some degree of confidence based on the data sample and further reject the null hypothesis. However, there is an underlying risk on the drawn inference being incorrect in representing the population. P-value determines the decision of keeping or rejecting H_0, meaning one may reject H_0 if the p-value is lower than the level of significance. There are two types of errors, classified as type I and type II error. Type I error could be referred to as alfa (α) which is the probability of rejecting the null hypothesis, when it is in fact true. The likeliness of type I errors will be reduced using a significance level of 1%. Type II error is explained as beta (β) and is the probability of failing to reject the null hypothesis, whereas the alternative hypothesis is in fact true. The possibility of type II errors will increase using a significance level between 5% and 10%. Consequently, a significance level of 5% will be utilised in order to be in balance between type I and type II errors.

3.5.3 Measurement error

As mentioned, the dataset is retrieved from an electronic survey, which lead to the possibility of measurement errors. This is due to the uncertainty of respondents completing all questions themselves, or with assistance. In addition, due to limitations of obtaining feedback and clarification through an electronic survey, respondents may have misunderstood some questions. Given that the questions included information about their financial situations, they might have been perceived as personal, which could have prevented some respondents from contributing to some questions. The timing and surroundings of each respondent at the time

the survey was administrated are other unsettling elements that could cause measurement errors (Sekaran & Bougie, 2016).

3.6 Validity and reliability

Validity is defined as the degree to which a concept in accurately measured in quantitative research (Heale & Twycross, 2015). Reliability, or the accuracy of an instrument, is the second criteria for evaluating the quality of a quantitative study. In other words, this explains the degree to which a study's instrument consistently produces the same outcome when applied to the same circumstance repeatedly. The results need to be examined for validity, whilst the survey must be reliable in favour of drawing conclusion. To do so, one can divide validity into three groups, namely, content, - criterion-related, - and construct validity.

Content validity refers to the insurance of measures comprising a sufficient and representative set of items to tap the concept. The higher the scaled items represent the domain of the concept being measured, the greater the content validity becomes. As an explanation, the quality of a concept's dimensions and constituent parts determines the content validity of the given concept (Sekaran & Bougie, 2016). The data sample is derived from a questionnaire where the importance of measuring the variables correctly arise. The survey's aim is to navigate Norwegian's financial literacy and risk aversion in relation to financial subjects. Considering the self-evaluation is not included in locating financial literacy, however content validity is high due the fact of all measurements being based upon correct, - and incorrect answers. Therefore, content validity may be impaired to some extent.

Criterion-related validity is established when measures distinguish individuals based on a criterion it is meant to predict. This can be done by establishing predictive, - or concurrent validity. Predictive validity refers to the ability of measuring instruments in order to differ between individuals and predict a futuristic outcome. Concurrent validity provides the extent of an agreement between two measures taken at the same time.

Construct validity testifies to which the obtained result of using the measure fits with theories associated which the test is based upon. This could be evaluated through convergent- and discriminant validity. Convergent validity demonstrates the weak correlation between an instrument, and other instruments used to measure other variables. Therefore, convergent

validity will increase if multiple questions measure the same variable (Sekaran & Bougie, 2016). The survey provides multiple questions to uncover each respondent's financial literacy with several questions within each field. However, previous surveys within the same category contained four times as many questions related to financial literacy, which may have affected the thesis' convergent validity. Although, the questions should represent a wide range of financial literacy even though the number of questions diminished, meaning the motivation of answering correctly have increased. Discriminant validity refers to the instrument's ability to accurately predict future criteria. In other words, it demonstrates how accurately a test captures the idea it was intended to capture. Particularly, discriminant validity assesses the reality of relationships between constructs that should not be connected to one another. The survey provides a variety of questions to uncover financial literacy among respondents, in addition to the questions being divided into subcategories. Overall, the thesis contains convergent validity to an extent.

Reliability explains the degree to which a measure is reliable, i.e., error-free (Sekaran & Bougie, 2016). It determines how accurate it is measured, in addition to over time and across the instrument's various components. In other words, a measure's reliability determines how consistently and steadily the instruments measure the topic and helps to evaluate the greatness of a measure. Thereby, if the biased numbers are large, the lower the reliability is. Reliability is divided into the measure's stability, - and internal consistency. Stability of measures is explained as the measures ability to remain the same despite the respondent's state and uncontrolled conditions. Internal consistency of measures is explained as the capability of independent measuring within the same concept. Meaning, if the survey is not repeated with updated data, it would be inconceivable to state the reliability of the results. Although, the dataset is a part of a project across several countries, thereby the reliability is acceptable. In addition, the chosen methods of the analyses are provided to evaluate the different variables, which will increase the strength of the reliability.

4.0 Results

This chapter is dedicated to present the results from the analyses of the 25 questions used to evaluate the financial literacy of the respondents. As mentioned, the questionnaire included different financial themes, whereas the dataset in addition included data retrieved from AksjeNorge. The results are acquired by the descriptive statistics of the data, analyses, and interpretations through multiple regression models, and lastly a review the investment development.

4.1 Descriptive statistics

Throughout this section, the descriptive statistics will be presented. All statistics are gathered from the mentioned survey with a total of 2,278 respondents. Firstly, the descriptive statistics shown in Figure 4 represents relevant financial investments among females and males as shown below. An extended table of all responses are represented in Appendix C.

Figure 4: Relevant investment products
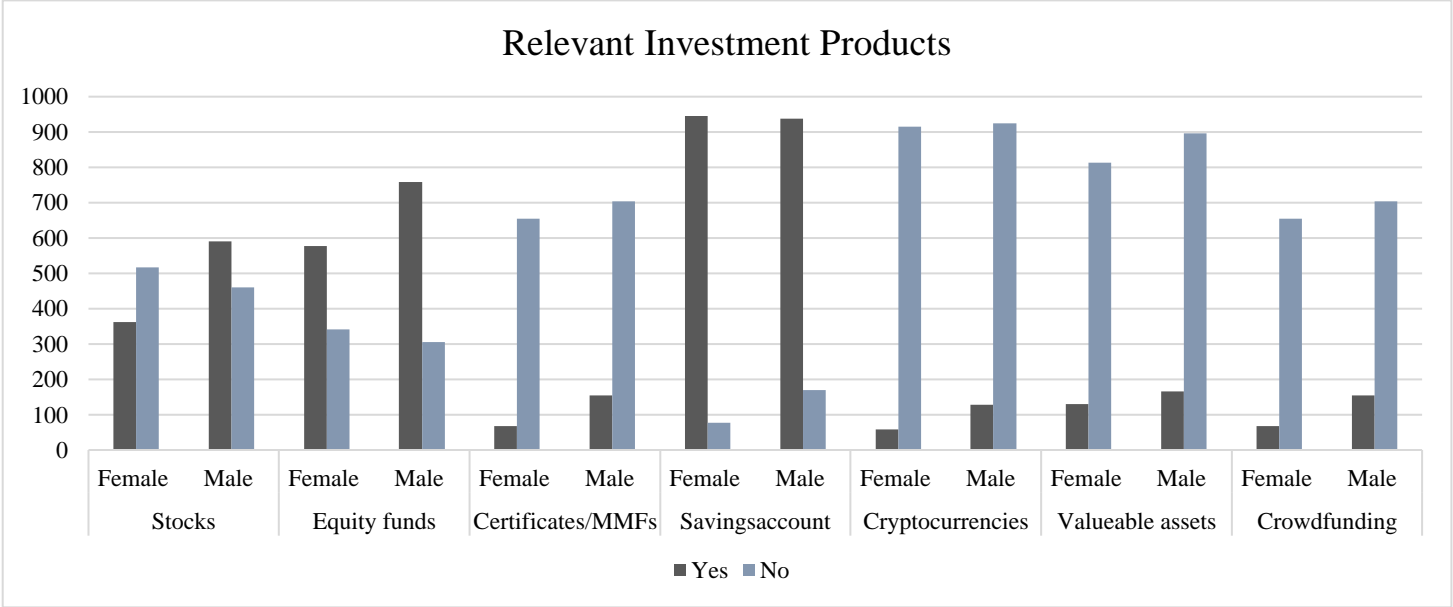
All respondents provided answers in what they consider a relevant investment product where the difference in gender is outlined. To assess whether risk aversion is evident in the findings, a products inherent risk should be considered. As an example, 'savings account' is considered a low-risk investment, while 'cryptocurrencies' and 'stocks' are considered as high-risk investments. Correspondingly, the only parameter were females hold a higher percentage is savings accounts, while males hold higher percentages in the remaining parameters. Based on

observations from the distribution of relevant investment products among male and female respondents, females exhibit a more risk averse respond based on investment products.

Figure 5: Relevant vs. Actual investment products
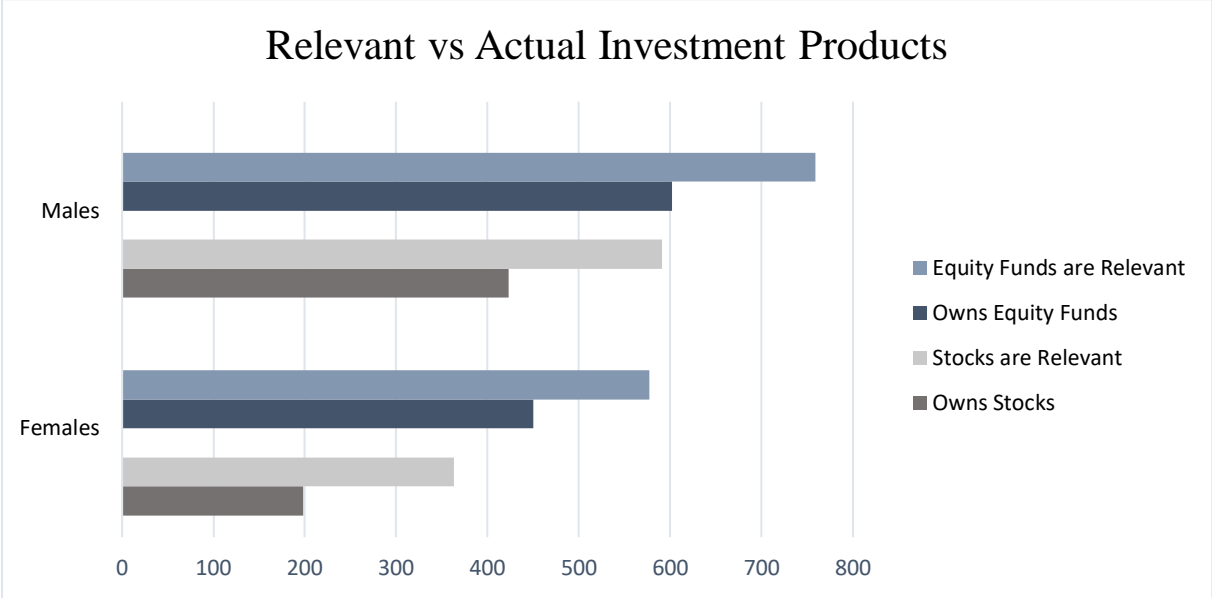
Secondly, the questionnaire asked the respondents whether they currently own stocks on Oslo Stock Exchange or an international stock exchange. Outlined in Appendix D, 33.2% of females answered that stocks are a relevant investment product, however, only 18.12% currently own stocks. Approximately 50% of males considered stocks as relevant, while 35.7% owns stocks. Figure 5 illustrates a difference between relevant vs. actual investments ranging from 55-70%, revealing a significant amount of potential investors.

Following, Table 6 outlines an examination of the descriptive statistics related to the received scores from the survey with a focus on gender gaps. Financial literacy and risk aversion are both considered as the dependent variables, while the control variables are income, education, and age.

Table 6: Descriptive statistics

Variable	Gender	N	Minimum	Maximum	Mean	Standard deviation
Financial	Male	1185	0	25	18.25	4.34
Literacy score	Female	1093	0	24	15.49	5.04
Risk Aversion / Risk Willingness	Male	1146	1	7	3.71	1.6
	Female	1046	1	7	2.98	1.46
Income	Male	1078	1	9	5.21	2.19
	Female	971	1	9	4.03	1.98
Education	Male	1185	1	6	4.38	1.46
	Female	1093	1	6	4.46	1.5
Age	Male	1185	17	89	52.27	16.34
	Female	1093	18	89	50.7	16.64

The descriptive statistics reveal the allocation of minimum, maximum, mean, and standard deviation of different variables. The results of the financial literate questions obtained from the survey ranges from the minimum of 0 to the maximum of 25. Males received a significantly higher average score than females, accordingly, 18.25 and 15.49 points. The standard deviation is somewhat larger for females, although, females received scores ranging from 0 to their best score of 24 while males received the minimum and the absolute maximum scores. Risk aversion ranges from 1 to 7, from very risk averse to very risk willing. Corresponding to Table 6, females are more risk averse than males with a difference of 10.42%. This calculation is derived by dividing the mean with the maximum number of risk aversion, further calculating the percentual difference in risk aversion, or risk willingness, for males and females.

Table 6 also presents a variable of 'income'. As shown in the table, the number of respondents are lower than the other variables due to the inclusion of "prefer not to answer" in the survey. This answer is excluded from the descriptive statistics which consequently provide fewer observations than the other variables. Income ranges from 1 to 9, where the minimum represents NOK 200,000 or lower, while the maximum represents NOK 1 million (MNOK) or above. On average, there is a distinct gender difference of NOK 100,000 – 200,000 indicating that males have significantly higher income than females. The standard deviation of income is greater for males due to larger variations in earnings.

Ages are well represented ranging from 17 to 89 years and have a roughly equal standard deviation for both genders. A present preponderance of elderly appears in the mean of 51.49.

From an educational aspect, the minimum level represents "primary school", whereas the maximum level represents "higher education level, above 4 years". Table 6 present a marginal higher education level for females, whereas males have greater averages for the other variables of income, risk aversion, and financial literacy.

4.1.1 Pension Savings

The survey provided a section of pension-related questions, and the response is represented as percentages in Table 7.

Table 7: Gender results of questionnaire about pension savings

Questions	Gender	Yes	No	Other
Have you ever tried to find out how much you should save for retirement?	Female	44 %	52 %	4 %
	Male	48 %	47 %	5 %
Are you saving for pension on your own initiative?	Female	39 %	56 %	5 %
	Male	41 %	53 %	6 %
Do you have an employment pension with your employer?	Female	80 %	8 %	11 %
	Male	79 %	11 %	10 %

The first question in Table 7 outlined subtle gender gaps where approximately 45% responded their attempt to determine what they should save for retirement. Secondly, essentially 40% of the respondents are currently saving for pension on their own initiative. Lastly, 80% responded that they acquire employment pension with their employer. Another pension-related question, which is not included in the table, questioned respondents about their lack of private pension savings. If relevant, most of the respondents indicated their intention to save for pension in other ways, for instance savings accounts, stocks, real estate, etc. About 28% of females' explanation was related to their intention of saving for retirement, however, they were not financially capable. When questioned about whether they had considered pension savings, 24.9% of respondents answered they had not, or were too young.

4.1.2 Financial Literacy results based on gender and regions.

Table 8 represents the mean of the financial literacy scores within Norwegian counties, based on gender.

Table 8: Financial literacy results in the different counties of Norway

Region results	Gender	Respondents	Avg. financial literacy score
Viken	Female	242	15.429
	Male	266	18.395
Oslo	Female	155	15.852
	Male	178	18.399
Innlandet	Female	82	15.000
	Male	80	17.913
Vestfold & Telemark	Female	90	15.511
	Male	92	17.869
Agder	Female	78	15.667
	Male	66	19.197
Rogaland	Female	77	15.948
	Male	113	18.425
Vestland	Female	131	15.786
	Male	150	18.167
Møre & Romsdal	Female	41	14.122
	Male	38	17.421
Troms & Finnmark	Female	61	14.590
	Male	51	17.060
Trøndelag	Female	98	15.760
	Male	97	18.103
Nordland	Female	38	15.316
	Male	54	18.778
Total N	Female	1093	15.489
	Male	1185	18.246

Agder is the county where males perform the greatest, which also produces the greatest overall score for both males and females. In Rogaland, females obtained the highest overall score, 0.24 points behind Agder. Møre & Romsdal received the lowest overall score for females in addition to lowest total score among both genders. Troms & Finnmark received the lowest overall score for males at 17.06, however it still outperformed females' average scores in every county. The variations of the mean results for males and females are correspondingly 2.14 and 1.83.

4.2 Financial Literacy

The results demonstrate significant difference in financial literacy between males and females. Based on the study with a total of 25 points, females have an average financial

literacy score of 15.49 while males obtained 18.25. There is an average difference of 2.76 points, where male's results are 11.04% superior.

4.3 Multiple Linear Regression Analysis

The following section of the paper contains eight tables for multiple linear regression analyses. The first analysis measures the effect on risk aversion as the dependent variable, while the remaining analyses measure financial literacy as the dependent variable. In the financial literate analyses, income, risk aversion, and residence of centrality all represents linear variables. Gender, age, education, livelihood, counties, and municipalities are dummy variables. As for all regression analyses, the variable "gender" excludes males, "age" excludes respondents under 30 years of age, "education" excludes primary school, "livelihood" excludes unemployed respondents.

The analyses are all executed in R Studio. In addition to the lm function, a robust covariance matrix estimators' function, vcovHC with HC0 for a linear regression analysis, is used to retrieve more robust estimations. For Table 14 and 16 this robust function has not been retrieved, and therefore represents "SE" as standard error in comparison to "robust SE". The predictors explain the different variable names, representing the betas, followed by a robust standard error, T-value, p-value and lastly, a significance code.

4.3.1 Risk Aversion Multiple Linear Regression

The regression analysis represented in Table 9 examines the variables that influence levels of risk aversion. Respondents' investments are related to their risk aversion, and the multiple regression reveal several statistically significant estimations.

Table 9: Risk aversion regression analysis

Predictors	Beta	Robust SE	T	P	
(Intercept)	3.264	0.216	15.108	<0.001	***
Income	0.196	0.018	10.845	<0.001	***
Female	-0.544	0.068	-8.043	<0.001	***
Ages 30 to 44	-0.62	0.121	-5.137	<0.001	***
Ages 45 to 59	-1.031	0.119	-8.625	<0.001	***
Ages over 60	-1.506	0.113	-13.274	<0.001	***
High School (allmenn)	0.383	0.193	1.985	0.0472	*
High School (yrkesfag)	0.159	0.187	0.854	0.393	
Vocational Education (fagskole)	0.344	0.192	1.795	0.0729	.
Higher Education (<4 years)	0.25	0.174	1.432	0.1524	
Higher Education (>4 years)	0.187	0.18	1.037	0.3001	
Viken	0.063	0.139	0.453	0.6509	
Oslo	0.251	0.148	1.693	0.0906	.
Møre & Romsdal	0.128	0.21	0.609	0.5425	
Vestfold & Telemark	0.162	0.165	0.98	0.3271	
Agder	0.310	0.177	1.755	0.0795	.
Rogaland	0.198	0.163	1.212	0.2255	
Vestland	0.300	0.15	1.995	0.0462	*
Troms & Finnmark	0.217	0.187	1.16	0.2463	
Trøndelag	0.408	0.163	2.5	0.0125	*
Nordland	-0.004	0.203	-0.019	0.9852	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1, obs.: 1961

Residual standard error: 1.414 on 1940 degrees of freedom.

Multiple R-squared / Adjusted R-squared: 0.2038 / 0.1956

F-statistic: 24.83 on 20 and 1940 DF, p-value <0.001 ***

Income has a positive beta, implicating the higher their income level, the more risk tolerant the respondent is. Risk aversion increases with age, and female respondents are more risk averse than males. High school (allmenn) is the only significant variable within education, with an estimate of 0.383. The omitted county is Innlandet because of its lowest average risk aversion. Counties which are significantly more risk tolerant are Trøndelag and Vestland. In addition, Agder and Oslo are more risk tolerant at a 90% confidence level.

Overall, the meaningful estimates for risk aversion are age, income, and gender. As for the adjusted R-square of 0.1956, there are other factors affecting respondents risk tolerance which is not considered in this analysis. However, it provides interesting indicators, leading risk aversion to be carried out as an independent variable throughout the financial literacy analyses.

4.3.2 Financial Literacy in Multiple Linear Regression

As previously mentioned, the financial literacy results from the questionnaire are represented as the dependent variable in the next multiple linear regressions. The independent variable varies and as previously mentioned, respondents have decreased to 1,961 observations due to the exclusion of N/As.

The residual standard error ranges from 3.860 to 3.895 for tables 10 to 15, which represents the predicted average deviation. Multiple R-squared and adjusted R-squared ranges from 0.2038 to 0.2343, and 0.1956 to 0.2260. The F-statistics retrieved large values, reflecting jointly significance amongst several variables. Risk aversion is now represented as a linear independent variable, leading scores to increase alongside with increasing risk tolerance.

Table 10 represents results in financial literacy, control variables, moderating variable, and risk aversion as the independent variable.

Table 10: Financial literacy regression analysis

Predictors	Beta	Robust SE	T	P	
(Intercept)	12.57	0.689	18.51	<0.001	***
Income	0.28	0.050	5.58	<0.001	***
Female	-2.19	0.196	-11.21	<0.001	***
Ages 30 to 44	0.28	0.377	0.74	0.460	
Ages 45 to 59	1.08	0.364	2.96	0.003	**
Ages over 60	1.51	0.352	4.29	<0.001	***
High School (allmenn)	1.92	0.623	3.09	0.002	**
High School (yrkesfag)	0.68	0.601	1.14	0.255	
Vocational Education (fagskole)	1.97	0.606	3.25	0.001	**
Higher Education (<4 years)	2.80	0.563	4.97	<0.001	***
Higher Education (>4 years)	3.32	0.572	5.81	<0.001	***
Risk Aversion	0.382	0.067	5.73	<0.001	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1, obs.: 1961

Residual standard error: 3.875 on 1949 degrees of freedom.
Multiple R-squared / Adjusted R-squared: 0.2246 / 0.2202
F-statistic: 51.31 on 11 and 1949 DF, p-value <0.001 ***

Table 10 aims to explain the effect of variables onto the financial literacy score, ranging from 0 to 25. Some variables may be affected by a subsequent score. For example, income will be a linear value, where levels range from below NOK 200,000 to above MNOK 1, which will be a multiplier effect on the financial literacy score. The intercept contains a value of 12.57. If a

respondent has the highest level of income, above MNOK 1, the score increases with 2.52 points. For a female respondent, the results will decrease with 2.19 points. Financial literacy increases with age, especially respondents over 60 years of age with 1.51 points. Results are significantly influenced by education, where higher education have the greatest effect. In terms of having the highest level of risk aversion, results increase by 2.3 points.

4.3.2.1 Financial literacy regression analysis with regions

The following three tables, 11 - 13, use the same control, - and independent variables as in Table 10, but different measurements for respondent's residence to provide a robust analysis. To establish possible regional differences, these are categorized into counties, municipalities containing a large proportion of investors, and a centrality index retrieved from SSB (2020). Table 11 represents the first regional analysis using Norwegian counties as independent dummy variables.

Table 11: Financial literacy regression analysis with counties

Predictors	Beta	Robust SE	T	P	
(Intercept)	11.88	0.771	15.39	<0.001	***
Income	0.28	0.050	5.69	<0.001	***
Female	-2.18	0.195	-11.1863	<0.001	***
Ages 30 to 44	0.28	0.376	0.73	0.463	
Ages 45 to 59	1.09	0.366	2.97	0.003	**
Ages over 60	1.52	0.351	4.34	<0.001	***
High School (allmenn)	1.78	0.623	2.87	0.004	**
High School (yrkesfag)	0.53	0.600	0.89	0.376	
Vocational Education (fagskole)	1.80	0.605	2.97	0.003	**
Higher Education under 4 years	2.61	0.564	4.62	<0.001	***
Higher Education over 4 years	3.12	0.572	5.45	<0.001	***
Risk Aversion	0.38	0.067	5.62	<0.001	***
Viken	0.81	0.465	1.74	0.082	.
Oslo	0.94	0.479	1.95	0.051	.
Innlandet	0.64	0.555	1.16	0.247	
Vestfold & Telemark	0.75	0.533	1.41	0.159	
Agder	1.49	0.533	2.80	0.005	**
Rogaland	0.86	0.511	1.68	0.094	.
Vestland	0.96	0.485	1.98	0.048	*
Troms & Finnmark	-0.11	0.588	-0.19	0.848	
Trøndelag	1.18	0.518	2.28	0.023	*
Nordland	1.32	0.555	2.38	0.017	*

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1, obs.: 1961

Residual standard error: 3.869 on 1939 degrees of freedom

Multiple R-squared / Adjusted R-squared: 0.2307 / 0.2224

F-statistic: 27.69 on 21 and 1939 DF, p-value <0.001 ***

As seen in Table 11, each county are measured towards the financial literacy of Møre & Romsdal, which Table 10 revealed had the lowest overall score. The counties with a significant beta are Agder, Oslo, Trøndelag and Vestland, from the highest order, respectively. Furthermore, the remaining counties' results were of low to no substantial meaning. The following table 12 presents the municipalities with the largest proportion of investors, previously listed in Table 4.

Table 12: Regression analysis with municipalities

Predictors	Estimates	Robust SE	T	P	
(Intercept)	12.48	0.679	18.37	<0.001	***
Income	0.28	0.050	5.55	<0.001	***
Female	-2.20	0.196	-11.26	<0.001	***
Ages 30 to 44	0.31	0.376	0.81	0.417	
Ages 45 to 59	1.13	0.365	3.09	0.002	**
Ages over 60	1.56	0.352	4.44	<0.001	***
High School (allmenn)	1.89	0.622	3.04	0.002	**
High School (yrkesfag)	0.68	0.601	1.13	0.259	
Vocational Education (fagskole)	1.94	0.605	3.21	0.001	**
Higher Education under 4 years	2.74	0.563	4.86	<0.001	***
Higher Education over 4 years	3.24	0.572	5.66	<0.001	***
Risk Aversion	0.37	0.067	5.59	<0.001	***
Municipalities	0.38	0.174	2.04	0.041	*

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1, obs.:1961

Residual standard error: 3.872 on 1948 degrees of freedom
Multiple R-squared / Adjusted R-squared: 0.2262 / 0.2214

F-statistic: 47.25 on 12 and 1948 DF, p-value <2.2e-16 ***

Table 12 reflects the difference in respondent's residence in municipalities containing larger proportion of investors, compared to those who do not. The municipalities receive a statistically significant estimate of 0.38 at a 95% confidence interval. Financial literacy results are impacted whether respondents live in these municipalities, however the estimate is not of substantial impact on total score. The final table examining regional differences, is presented in Table 13, with the use of the centrality index.

Table 13: Financial literacy regression analysis with centrality index

Predictors	Beta	Robust SE	T	P	
(Intercept)	11.76	0.857	13.73	<0.001	***
Income	0.27	0.050	5.49	<0.001	***
Female	-2.20	0.195	-11.24	<0.001	***
Ages 30 to 44	0.29	0.377	0.77	0.439	
Ages 45 to 59	1.11	0.366	3.03	0.002	**
Ages over 60	1.53	0.352	4.35	<0.001	***
High School (allmenn)	1.87	0.625	2.99	0.003	**
High School (yrkesfag)	0.66	0.602	1.11	0.269	
Vocational Education (fagskole)	1.95	0.605	3.22	0.001	**
Higher Education under 4 years	2.73	0.566	4.83	<0.001	***
Higher Education over 4 years	3.24	0.576	5.63	<0.001	***
Risk Aversion	0.38	0.067	5.68	<0.001	***
Centrality index	0.00105	0.0007	1.50	0.133	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1, obs.:1961

Residual standard error: 3.874 on 1948 degrees of freedom

Multiple R-squared / Adjusted R-squared: 0.2254 / 0.2206

F-statistic: 47.24 on 12 and 1948 DF, p-value <0.001 ***

The centrality index from SSB is represented in Table 13 which considers the most representative measurement for how respondents' residence impacts their financial literate results. The index interval from SSB ranges from 295 to 1,000, however this dataset ranges from 350 to 1,000 due to limitations of representatives from uncentralised areas. By this linear centrality index, the large range reflects a difference in 0.683 points if a respondent resides in a central area. In this analysis, there is lacking significant effect of centrality. To summarise the three previous region-based analyses, minor differences on financial literacy results emerge based on respondent's residence.

4.3.2.2 Financial literacy regression analysis continued

Table 14 includes all variables in this study combined with the centrality index in order to investigate influence on financial literacy.

Table 14: Financial literacy regression analysis including all variables.

Predictors	Beta	SE	T	P	
(Intercept)	10.13	1.000	10.12	<0.001	***
Income	0.37	0.061	6.01	<0.001	***
Female	-2.21	0.190	-11.63	<0.001	***
Ages 30 to 44	0.57	0.358	1.59	0.112	
Ages 45 to 59	1.30	0.360	3.60	<0.001	***
Ages over 60	1.47	0.427	3.44	<0.001	***
Financial Job	0.42	0.295	1.44	0.151	
High School (allmenn)	1.78	0.526	3.38	<0.001	***
High School (yrkesfag)	0.64	0.507	1.25	0.210	
Vocational Education (fagskole)	1.95	0.521	3.74	<0.001	***
Higher Education under 4 years	2.64	0.474	5.57	<0.001	***
Higher Education over 4 years	3.16	0.490	6.43	<0.001	***
Full Time Employee	0.81	0.676	1.20	0.229	
Part Time Employee	1.73	0.720	2.41	0.016	*
Self Employed	0.31	0.825	0.38	0.704	
Student	2.14	0.761	2.82	0.005	**
Retiree	1.45	0.717	2.02	0.044	*
Homemaker	2.42	1.384	1.75	0.080	.
Social Security	1.53	0.717	2.14	0.033	*
Other	2.23	1.381	1.62	0.106	
Risk Aversion	0.37	0.063	5.91	<0.001	***
Centrality index	0.0011	0.001	1.49	0.137	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1, obs.: 1961

Residual standard error: 3.86 on 1939 degrees of freedom

Multiple R-squared / Adjusted R-squared: 0.2343 / 0.2260

F-statistic: 28.25 on 21 and 1939 DF, p-value <0.001 ***

In addition to the variables presented in prior tables, dummies for livelihood, and whether or not the respondent has a financial job is included. The intercept has now changed to 10.13 and the variable with largest effect on financial literacy are higher education over four years, risk aversion, student, income, and gender. Estimations for education is based on primary school and it is evident that greater education provides greater results. The source of livelihood with statistically significant estimations are students, part-time employees, retirees, and social securities, all based on unemployment. As previously mentioned, results increase with age, and if the respondent is female, the results are negatively impacted by 2.21 points.

Critically, there is a correlation between income and education consisting of 0.3504, which may cause noise in the estimations of Table 14. This leads to the following Table 15 where income is excluded, and estimations differ to some degree. It should be mentioned that respondents may fall under multiple variables represented in each category. A student may

work part-time and have a registered address different from where the respondent reside. Based on previous analysis, Table 15 reflects greater significance among the variables.

Table 15: Financial literacy regression analysis

Predictors	Beta	Robust SE	T	P	
(Intercept)	10.10	1.257	8.04	<0.001	***
Female	-2.49	0.191	-12.99	<0.001	***
Ages 30 to 44	0.95	0.389	2.44	0.015	*
Ages 45 to 59	1.92	0.375	5.13	<0.001	***
Ages over 60	2.19	0.427	5.13	<0.001	***
Financial Job	0.55	0.316	1.75	0.081	.
High School (allmenn)	1.88	0.633	2.97	<0.001	**
High School (yrkesfag)	0.70	0.604	1.16	0.244	
Vocational Education (fagskole)	2.18	0.609	3.57	<0.001	***
Higher Education under 4 years	2.99	0.569	5.27	<0.001	***
Higher Education over 4 years	3.72	0.575	6.47	<0.001	***
Full Time Employee	1.83	0.946	1.94	0.053	.
Part Time Employee	2.07	1.004	2.06	0.039	*
Self Employed	0.99	1.091	0.91	0.365	
Student	2.06	1.073	1.92	0.055	.
Retiree	1.65	0.993	1.67	0.096	.
Homemaker	2.23	1.465	1.52	0.129	
Social Security	1.71	0.999	1.72	0.086	.
Other	2.26	1.209	1.87	0.061	.
Risk Aversion	0.44	0.065	6.72	<0.001	***
Centrality index	0.001	0.001	1.81	0.071	.

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1, obs.:1961

Residual standard error: 3.895 on 1940 degrees of freedom

Multiple R-squared / Adjusted R-squared: 0.2200 / 0.2120

F-statistic: 27.36 on 20 and 1940 DF, p-value <0.001 ***

Although it has been established that income significantly affects results, Table 15 illustrates the impacts of other variables. As previous tables established, females have a considerably lower result at negative 2.49, approximately 10% of total score. Estimations reflect increased results with increased age, where respondents over 60 years of age score roughly 2.19 points greater than ages under 30. This table clearly reflect the difference in level of education, with 3.72 points for the highest level of education. In terms of source of livelihood, some are statistically significant at a 90% confidence level. The same applies for having a financial job where results are improved by 0.55 points.

4.3.2.3 Financial literacy regression analysis with datasets for females and males

The last multiple regression analysis uses separate dataset for females and males, demonstrated in Table 16. The first noteworthy observation is how males have a larger portion of significant values. Secondly, the difference between coefficients in intercept value

is 2.18 lower for females. This is consistent with earlier estimations but visualizes how females have an inferior starting point. Income has a marginally larger effect on females. For males, becoming older has a considerable impact on results; however, only female respondents older than 60 years are of significant value. Other evident parameters contain how education has a greater impact on males than females. Risk aversion results in greater impact on females. Overall, males are more likely to receive greater results in financial literacy tests, although females experience more variations.

Table 16: Regression analysis based on dataset for females versus males.

	Females					Males				
Predictors	Beta	SE	T	P		Beta	SE	T	P	
(Intercept)	9.65	1.246	7.75	<0.001	***	11.83	0.974	12.15	<0.001	***
Income	0.30	0.089	3.34	<0.001	***	0.24	0.058	4.11	<0.001	***
Ages 30 to 44	-0.44	0.516	-0.85	0.396		1.06	0.420	2.52	0.012	*
Ages 45 to 59	0.70	0.519	1.35	0.176		1.57	0.418	3.75	<0.001	***
Ages over 60	1.29	0.500	2.58	0.009	**	1.81	0.409	4.44	<0.001	***
Financial Job	0.60	0.494	1.22	0.222		0.38	0.351	1.08	0.279	
High School (allmenn)	0.74	0.855	0.87	0.384		2.84	0.638	4.46	<0.001	***
High School (yrkesfag)	0.26	0.822	0.31	0.754		1.05	0.617	1.70	0.090	.
Vocational Education	1.33	0.877	1.52	0.129		2.47	0.621	3.97	<0.001	***
Higher Education (<4 years)	1.94	0.763	2.54	0.011	*	3.44	0.579	5.94	<0.001	***
Higher Education (>4 years)	2.74	0.788	3.48	0.001	***	3.74	0.598	6.25	<0.001	***
Risk Aversion	0.43	0.107	3.99	<0.001	***	0.31	0.072	4.31	<0.001	***
Centrality index	0.002	0.001	1.49	0.137		0.0002	0.001	0.28	0.782	

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1, obs.: 926 / 1035

Residual standard error: 4.367 on 913 degrees of freedom / 3.365 on 1022 degrees of freedom
Multiple R-squared and Adjusted R-squared: 0.1245 and 0.113 / 0.1749 and 0.1652

F-statistic: 10.82 on 12 and 913 DF, p-value <0001 *** / 18.05 on 12 and 1022 DF, p-value <0001 ***

It should be noted that Table 16's R-squared is smaller compared to previous tables. Observations have decreased by approximately 50% for each subset, and variations have increased, reducing the explanatory power. The decreasing significance levels for females indicates how they are more affected by external factors compared to males. However, the lower intercept level for females confirms prior analyses of retaining a lower starting point than males.

4.4 Investment development

In relation to financial literacy, this chapter will introduce differences in investment behaviour by gender and regions in Norway. The distribution of stock owners is presented using data retrieved from SSB (2023). A slow increase is detected over the last years, however, there has been a spike more recently.

Table 17: Distribution of males and females' investment development.

	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Males	1.92 %	1.93 %	2.07 %	2.84 %	2.78 %	12.96 %	7.98 %
Females	0.82 %	1.07 %	0.74 %	2.51 %	2.43 %	10.94 %	10.62 %
Both genders	1.57 %	1.66 %	1.66 %	2.74 %	2.67 %	12.34 %	8.78 %

Retrieved from SSB (2023)

The annual percentage change in stocks for both genders ranging from 2015 to 2021 is presented in Table 17. There is a tremendous increase from 2019 to 2020. Moreover, females maintained their great investment development until 2021, while males experienced a lower increase. The mentioned year experienced uncertainties in the environment, such as the pandemic, disturbances in Europe, rents and inflation which could be factors explaining this outcome. In comparison to chapter 2.3.1, males have a considerably greater investment value in 2015, which causes the gender gap to persist despite the fact of increasing investment value for females.

Appendix E represents the total number of shareholders in each region from 2014 to 2021. The shareholders are represented as a percentage of the population in each county. As of the last day of 2021, Troms & Finnmark contained the lowest number of shareholders with 13.08%, while Oslo had the greatest amount of shareholders with 19.07%.

As previously mentioned, 2019 received attention in relation to closing the existing gender gap by encouraging females to invest their savings (DNB, 2020). For all counties, there is a significantly greater increase in shareholders after 2019 compared to previous years. Since then, Viken has the greatest increase of shareholders, while Innlandet had the lowest. Norway had an increase in shareholders by 2.74% from 2019 to 2021. Prior years had an increase ranging from 0.05% to 0.26% which is substantially lower than the previous two years. Overall, both genders show great increase in investment development the later years.

4.5 Review of hypothesis

In relation to previous research, four hypotheses were formed in light of determining factors affecting financial literacy and the gender gap. A validation or rejecting of the hypotheses will further be examined.

H1: An increasing level of risk aversion has a negative relationship with financial literacy.
As shown in Table 10, considering financial literacy, risk aversion has a beta of 0.382 and a p-value of <0.001, corresponding with a confidence interval of 99%. The first hypothesis has shown a statistically significance where an increasing level of risk aversion has a negative relationship with financial literacy. In conclusion, the first hypothesis will be kept.

H2: Centralised areas have a positive relationship with financial literacy.
By the usage of a centrality index shown in Table 13, the beta shows a lower score of 0.00105, and accordingly, the p-value estimation is at 0.133 which reflects a lack of significance. Table 15 reveals a significant relationship with a confidence interval of 90%. In this study, the conclusion constitutes a relationship between the centrality of residence and financial literacy to an extent. To eliminate type I and type II error, the hypothesis will be rejected.

H3: The effect of risk aversion provides a greater impact on financial literacy for females.
The descriptive statistics revealed an overall lower average risk aversion for females. However, Table 16 examines a subset dataset divided by gender where risk aversion consists of 0.43 and 0.31 for females and males, respectively. With a confidence interval of 99%, the effect of risk aversion provides a greater impact on financial literacy for females. In conclusion, the hypothesis will be kept.

H4: The effect of centrality provides greater impact on financial literacy for females.
Despite previous findings of the centrality index, Table 16 represents lack of statistically significant impact on either gender in relation to financial literacy. The final hypothesis will therefore be rejected.

5.0 Discussion

In this section, results and its related implications will be discussed along with ideas for future research. In pursuance of previous research and the interpreted results, the aim is to discuss factors influencing the gender gap in financial literacy considering regional differences.

The descriptive statistics from Table 6 reveals considerable impact of the standard deviation and indicates great diversity among the respondents. Education has the greatest impact on financial literacy score, as demonstrated in the statistics. The tables provide an evident finding on how each degree of education affects literacy, which is not an unexpected assertion.

Prior to this research, there was an underlying assumption that the financial literate levels among the Norwegian respondents would differ among regions. Certain significant values were detected in the analyses of regional differences. Counties of significant impact was Agder, Vestland, Trøndelag and Nordland. Further, Viken, Oslo and Rogaland achieved significance at a 90% confidence level. The municipalities with a large proportion of investors revealed significant values, however, not of substantial meaning. Lastly, the centrality index provided modest increase on scores containing both significance and insignificance results. This study suggests that the level of financial literacy is not greatly influenced by the respondents' place of residence in Norway, which could reflect Norway as a homogenous nation.

In the introduction of the results there is a representation of females being more risk averse in terms of investment products. Risk aversion is often associated with return. Males are generally willing to take on more risk in exchange for a higher return, whereas females prefer a guaranteed lower return. There is an interesting result in Table 16 where females' risk aversion has a greater impact on financial literacy. This means if two respondents of both genders have a risk aversion of four, there is a greater increase in females' scores than of males' scores. However, males are often associated with being able to take higher risk, not only in investments, but life in general. This strategy does not necessarily pay off, where resent studies have found females receiving greater returns for being more diverse and remaining committed to their long-term investments (Hargreaves Landsdown, 2018).

Throughout the results there is an increasing score with an increase in age. Respondents over 60 years of age have the greatest financial literacy score, as probable, due to most life experience. Many respondents in this age category are retirees and has therefore started their pension payments. In terms of pension savings, nearly 25% responded they were either too young to think about it or had never thought about it. Due to the government's changes in pension plans, it is of greater importance for the younger generation to be aware of their need for private pension savings. From descriptive statistics there was overweight of "older" compared to "younger" respondents. Seems like the respondents, or the Norwegian population, has not been well enough informed about pension savings and the importance of being accountable of its own pension.

The gender gap in financial literacy is already stated in the descriptive statistics, with an average difference of 11.04%. Table 16 interpreted males as being more affected by the control variables than females. Additionally, the descriptive statistics reflects a higher standard deviation for females. This indicates how the control variables provide a greater explanatory power for males, meaning females are more affected by their environment and upbringing. Personal finance is perceived as personal and difficult to discuss; nonetheless, engaging openly about it and sharing one's own experiences can be beneficial and may increase financial literacy.

The Nordic gender equality paradox is an existing phenomenon in Norway, despite its high rates of female labour and complementary reputation of Norway doing well in gender equality (Cuddy et al., 2015). This paradox arose because Norway is one of the most gender equal countries in the world, in addition to having one of the most gender-segregated labour markets. Overall, an explanation to the existing gender gap found in several sectors through this thesis, might be explained by this paradox.

In 2019, DNB aired a campaign with the aim of encouraging females to invest and thereby an underlying attempt on enclosing the large gender gap within investments. There was a significant amount of marketing, which undoubtedly encouraged females to invest, and they did. According to Table 17, males was probably influenced as much as females due to their correspondent increase in investments.

5.1 Implications and limitations

Prior research indicated financial job as a significant factor in increased financial literacy. According to the results, having a financial job were not statistically significant, which could be seen as a limitation. The logic of holding a financial job should reflect an increased knowledge within the comparable field. Research has revealed a significant discrepancy in the gender representation of those holding a financial job, where males are highly represented.

Despite the difficulties associated with measuring upbringing and parental influence, these factors may certainly affect financial literacy. To which extent parents impart on their children with financial literacy depends on their own financial situation, employment, education, and other factors. There is a parental responsibility in teaching their children the necessary knowledge due to the absence of personal finance in the school's curriculum. Schools currently place a greater emphasis on this subject compared to previous generations, yet the need for improvement is still present. It is also critical to consider the impact a partner may have on this problem. If primarily one person in a household manages the finances, it may result in an increasing gap of financial literacy within the household. Traditionally, males worked, - and naturally managed finances while females were homemakers. This might still be prevalent, causing a traditional gender gap that could be passed on to on their children.

A relatable limitation in terms of detecting regional differences, is the selection of respondents. The respondents represented a various range of regions; however, they were not evenly distributed and could therefore create an inaccurate representation of each region. The centrality index included all 356 municipalities, yet respondents did not represent all municipalities which creates a limitation on providing an accurate illustration of the regional differences.

As stated in the data section, the results are conducted by adding each correct answer. However, approximately one half of the respondents had the option of responding "do not know" or "prefer not to answer", while the remaining respondents did not. Considering there are only three options, this restriction may push genuinely uncertain responders to guess, giving them a probability of one in three in providing correct answers. As for the other half, they might respond "do not know" out of boredom or failing to even attempt.

5.2 Suggestions for future research

Due to the observation of a present gender gap, it would be valuable to compare the scores of financial literacy over time. It could be an intriguing approach to distribute the exact same survey annually. This could provide a more comprehensive understanding of how the gender gap in financial literacy evolves over time, in addition to which factors that has the greatest impact.

Additionally, to provide a more reliable result from the questionnaire, the respondents who answered "do not know" should receive an additional third of a point for not being forced to guess. By doing this, the disparity between the two datasets would statistically balance out. A suggestion for future research, would be either providing the possibility of answering "do not know" to all respondents, or no one at all.

6.0 Conclusion

The analyses of financial literacy revealed a range of variables influencing the results. Respectively, the greatest effects observed were higher education, income, risk aversion, and gender. Regional differences were of low substantial meaning within various measurements of residency. In terms of financial literacy, females performed insufficiently, consequently leading to a gender gap. A possible approach to reduce the gender gap is by incorporate and evolve the school's curriculum within personal finance, in addition to greater openness surrounding the subject. In the same way that efforts are being made to close the gender gap in financial investments, efforts should also be made to close the gender gap in financial literacy.

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8.0 Appendix

Appendix A: Centrality Index

Municipality number	Municipality	Index 2020	Category	Interval
0301	Oslo	1000	01	925-1000
3029	Lørenskog	976	01	925-1000
3024	Bærum	971	01	925-1000
3027	Rælingen	939	01	925-1000
3030	Lillestrøm	938	01	925-1000
3020	Nordre Follo	929	01	925-1000
3005	Drammen	916	02	870-924
3033	Ullensaker	915	02	870-924
3025	Asker	914	02	870-924
3002	Moss	909	02	870-924
3022	Frogn	903	02	870-924
3021	Ås	903	02	870-924
4601	Bergen	895	02	870-924
5001	Trondheim	891	02	870-924
3049	Lier	890	02	870-924
3031	Nittedal	890	02	870-924
1103	Stavanger	890	02	870-924
3032	Gjerdrum	885	02	870-924
3019	Vestby	879	02	870-924
1108	Sandnes	878	02	870-924
3803	Tønsberg	877	02	870-924
3003	Sarpsborg	877	02	870-924
3801	Horten	875	02	870-924
3004	Fredrikstad	872	02	870-924
3403	Hamar	871	02	870-924
1127	Randaberg	866	03	775-869
3014	Indre Østfold	860	03	775-869
3804	Sandefjord	859	03	775-869
1124	Sola	857	03	775-869
3806	Porsgrunn	851	03	775-869
3048	Øvre Eiker	849	03	775-869
3805	Larvik	848	03	775-869
3023	Nesodden	848	03	775-869
3807	Skien	847	03	775-869
3001	Halden	847	03	775-869
3006	Kongsberg	846	03	775-869
1120	Klepp	846	03	775-869
3802	Holmestrand	845	03	775-869
3035	Eidsvoll	845	03	775-869
3811	Færder	844	03	775-869
3017	Råde	841	03	775-869
3007	Ringerike	836	03	775-869
3036	Nannestad	835	03	775-869
4204	Kristiansand	833	03	775-869
3038	Hole	833	03	775-869
1121	Time	833	03	775-869
1106	Haugesund	832	03	775-869
3028	Enebakk	825	03	775-869
3405	Lillehammer	820	03	775-869

3034	Nes		820	03	775-869
3018	Våler (Viken)		819	03	775-869
3413	Stange		817	03	775-869
5031	Malvik		811	03	775-869
4627	Askøy		811	03	775-869
3047	Modum		810	03	775-869
3407	Gjøvik		808	03	775-869
4202	Grimstad		806	03	775-869
5401	Tromsø		804	03	775-869
5035	Stjørdal		801	03	775-869
1122	Gjesdal		801	03	775-869
4203	Arendal		796	03	775-869
3446	Gran		796	03	775-869
3401	Kongsvinger		794	03	775-869
3053	Jevnaker		794	03	775-869
3016	Rakkestad		794	03	775-869
3015	Skiptvet		794	03	775-869
3026	Aurskog-Høland		793	03	775-869
3412	Løten		792	03	775-869
1804	Bodø		792	03	775-869
3054	Lunner		787	03	775-869
3443	Vestre Toten		782	03	775-869
3813	Bamble		781	03	775-869
4215	Lillesand		780	03	775-869
3411	Ringsaker		780	03	775-869
1507	Ålesund		779	03	775-869
3420	Elverum		776	03	775-869
3415	Sør-Odal		774	04	670-774
4626	Øygarden		773	04	670-774
1119	Hå		771	04	670-774
5028	Melhus		770	04	670-774
3808	Notodden		769	04	670-774
4624	Bjørnafjorden		762	04	670-774
4223	Vennesla		759	04	670-774
1149	Karmøy		756	04	670-774
5037	Levanger		755	04	670-774
1505	Kristiansund		755	04	670-774
1101	Eigersund		754	04	670-774
5038	Verdal		749	04	670-774
4614	Stord		743	04	670-774
3442	Østre Toten		742	04	670-774
3013	Marker		741	04	670-774
4205	Lindesnes		740	04	670-774
3814	Kragerø		740	04	670-774
5402	Harstad - Hárstták		737	04	670-774
5029	Skaun		736	04	670-774
3812	Siljan		735	04	670-774
4631	Alver		734	04	670-774
1531	Sula		734	04	670-774
1506	Molde		731	04	670-774
3037	Hurdal		729	04	670-774
3011	Hvaler		724	04	670-774
5059	Orkland		722	04	670-774
1146	Tysvær		722	04	670-774
4621	Voss		721	04	670-774
3817	Midt-Telemark		721	04	670-774
4214	Froland		720	04	670-774
5006	Steinkjer		719	04	670-774
3414	Nord-Odal		716	04	670-774

1516	Ulstein	714	04	670-774
1520	Ørsta	712	04	670-774
5403	Alta	709	04	670-774
1833	Rana	708	04	670-774
1532	Giske	708	04	670-774
1130	Strand	708	04	670-774
3816	Nome	706	04	670-774
4630	Osterøy	704	04	670-774
4213	Tvedestrand	703	04	670-774
4216	Birkenes	700	04	670-774
3416	Eidskog	700	04	670-774
3440	Øyer	699	04	670-774
1577	Volda	699	04	670-774
3050	Flesberg	695	04	670-774
3447	Søndre Land	694	04	670-774
5007	Namsos	693	04	670-774
4219	Evje og Hornnes	691	04	670-774
1114	Bjerkreim	691	04	670-774
4207	Flekkefjord	689	04	670-774
4206	Farsund	688	04	670-774
3448	Nordre Land	688	04	670-774
1824	Vefsn	688	04	670-774
1517	Hareid	688	04	670-774
4201	Risør	687	04	670-774
4623	Samnanger	686	04	670-774
4225	Lyngdal	686	04	670-774
3441	Gausdal	686	04	670-774
1528	Sykkylven	682	04	670-774
3451	Nord-Aurdal	681	04	670-774
3041	Gol	679	04	670-774
1806	Narvik	679	04	670-774
5053	Inderøy	678	04	670-774
4647	Sunnfjord	678	04	670-774
5406	Hammerfest	676	04	670-774
4622	Kvam	675	04	670-774
4612	Sveio	673	04	670-774
1870	Sortland	673	04	670-774
1841	Fauske-Fuossko	671	04	670-774
5036	Frosta	670	04	670-774
4602	Kinn	663	05	565-669
3419	Våler (Innlandet)	662	05	565-669
1515	Herøy (M. og R.)	659	05	565-669
5032	Selbu	657	05	565-669
3418	Åsnes	657	05	565-669
3417	Grue	657	05	565-669
3045	Sigdal	656	05	565-669
3012	Aremark	654	05	565-669
1820	Alstahaug	653	05	565-669
1111	Sokndal	653	05	565-669
5027	Midtre Gauldal	652	05	565-669
4211	Gjerstad	652	05	565-669
1865	Vågan	652	05	565-669
3043	Ål	651	05	565-669
5025	Røros	650	05	565-669
5021	Oppdal	650	05	565-669
4640	Sogndal	649	05	565-669
3439	Ringebu	649	05	565-669
4227	Kvinesdal	648	05	565-669
4212	Vegårshei	648	05	565-669

3815	Drangedal	648	05	565-669
1579	Hustadvika	646	05	565-669
4628	Vaksdal	645	05	565-669
1160	Vindafjord	644	05	565-669
4632	Austrheim	643	05	565-669
1535	Vestnes	642	05	565-669
3427	Tynset	641	05	565-669
4613	Bømlo	640	05	565-669
3436	Nord-Fron	638	05	565-669
3040	Nesbyen	636	05	565-669
3422	Åmot	634	05	565-669
3046	Krødsherad	633	05	565-669
5405	Vadsø	632	05	565-669
5444	Sør-Varanger	630	05	565-669
3820	Seljord	630	05	565-669
3437	Sel	630	05	565-669
1563	Sunndal	630	05	565-669
1860	Vestvågøy	629	05	565-669
1112	Lund	629	05	565-669
1525	Stranda	628	05	565-669
1145	Bokn	624	05	565-669
4218	Iveland	623	05	565-669
3438	Sør-Fron	622	05	565-669
3044	Hol	622	05	565-669
4650	Gloppen	620	05	565-669
1135	Sauda	620	05	565-669
1554	Averøy	619	05	565-669
5034	Meråker	618	05	565-669
5054	Indre Fosen	615	05	565-669
1539	Rauma	615	05	565-669
5047	Overhalla	614	05	565-669
5419	Sørreisa	613	05	565-669
3039	Flå	613	05	565-669
3042	Hemsedal	611	05	565-669
3435	Vågå	610	05	565-669
1813	Brønnøy	608	05	565-669
3421	Trysil	607	05	565-669
1547	Aukra	607	05	565-669
4615	Fitjar	606	05	565-669
5057	Ørland	604	05	565-669
4651	Stryn	603	05	565-669
5421	Senja	600	05	565-669
3453	Øystre Slidre	599	05	565-669
1866	Hadsel	599	05	565-669
3818	Tinn	598	05	565-669
4649	Stad	597	05	565-669
1840	Saltdal	597	05	565-669
5055	Heim	596	05	565-669
1566	Surnadal	596	05	565-669
5022	Rennebu	595	05	565-669
4643	Årdal	595	05	565-669
3821	Kviteseid	593	05	565-669
3452	Vestre Slidre	593	05	565-669
5061	Rindal	592	05	565-669
4611	Etne	592	05	565-669
4228	Sirdal	588	05	565-669
1868	Øksnes	588	05	565-669
4618	Ullensvang	587	05	565-669
3450	Etnedal	587	05	565-669

5411	Kvæfjord	586	05	565-669
4226	Hægebostad	583	05	565-669
3819	Hjartdal	583	05	565-669
5416	Bardu	581	05	565-669
4617	Kvinnherad	581	05	565-669
4625	Austevoll	580	05	565-669
5045	Grong	579	05	565-669
3449	Sør-Aurdal	578	05	565-669
3051	Rollag	578	05	565-669
1557	Gjemnes	578	05	565-669
5418	Målselv	577	05	565-669
3428	Alvdal	575	05	565-669
5428	Nordreisa	573	05	565-669
4217	Åmli	570	05	565-669
1560	Tingvoll	567	05	565-669
5437	Kárášjohka-Karasjok	565	05	565-669
3430	Os	565	05	565-669
5427	Skjervøy	564	06	295-564
3431	Dovre	564	06	295-564
5060	Nærøysund	563	06	295-564
4644	Luster	562	06	295-564
4646	Fjaler	561	06	295-564
1832	Hemnes	561	06	295-564
5422	Balsfjord	560	06	295-564
1578	Fjord	560	06	295-564
4616	Tysnes	557	06	295-564
1822	Leirfjord	557	06	295-564
5417	Salangen	554	06	295-564
4220	Bygland	554	06	295-564
1514	Sande	554	06	295-564
4642	Lærdal	552	06	295-564
3434	Lom	551	06	295-564
3822	Nissedal	548	06	295-564
1845	Sørfold	547	06	295-564
1851	Lødingen	545	06	295-564
4224	Åseral	544	06	295-564
5443	Båtsfjord	543	06	295-564
5041	Snåase-Snåsa	541	06	295-564
4638	Høyanger	541	06	295-564
4620	Ulvik	541	06	295-564
3433	Skjåk	541	06	295-564
3423	Stor-Elvdal	540	06	295-564
5436	Porsanger-Porsáŋgu-Porsanki	539	06	295-564
3825	Vinje	539	06	295-564
5412	Tjeldsund	538	06	295-564
3426	Tolga	538	06	295-564
4619	Eidfjord	537	06	295-564
3454	Vang	537	06	295-564
5056	Hitra	535	06	295-564
4634	Masfjorden	535	06	295-564
1853	Evenes	535	06	295-564
5435	Nordkapp	533	06	295-564
5014	Frøya	533	06	295-564
4639	Vik	533	06	295-564
3052	Nore og Uvdal	532	06	295-564
3824	Tokke	529	06	295-564

4629	Modalen	528	06	295-564
4641	Aurland	526	06	295-564
1511	Vanylven	526	06	295-564
5026	Holtålen	520	06	295-564
1859	Flakstad	520	06	295-564
3432	Lesja	518	06	295-564
1133	Hjelmeland	518	06	295-564
1871	Andøy	514	06	295-564
5046	Høylandet	513	06	295-564
5404	Vardø	509	06	295-564
1134	Suldal	509	06	295-564
1867	Bø	508	06	295-564
5425	Storfjord-Omasvuotna-Omasvuono	505	06	295-564
4645	Askvoll	505	06	295-564
5415	Loabák - Lavangen	504	06	295-564
5058	Åfjord	502	06	295-564
1144	Kvitsøy	502	06	295-564
1812	Sømna	499	06	295-564
3429	Folldal	498	06	295-564
3823	Fyresdal	497	06	295-564
5414	Gratangen	496	06	295-564
5420	Dyrøy	495	06	295-564
5033	Tydal	493	06	295-564
1828	Nesna	492	06	295-564
1576	Aure	488	06	295-564
4637	Hyllestad	487	06	295-564
1837	Meløy	487	06	295-564
5441	Deatnu-Tana	484	06	295-564
3424	Rendalen	482	06	295-564
5430	Guovdageaidnu-Kautokeino	481	06	295-564
1825	Grane	478	06	295-564
1838	Gildeskål	475	06	295-564
5424	Lyngen	472	06	295-564
5442	Unjárga-Nesseby	471	06	295-564
4648	Bremanger	471	06	295-564
4221	Valle	465	06	295-564
5049	Flatanger	464	06	295-564
4635	Gulen	464	06	295-564
1818	Herøy (Nordl.)	464	06	295-564
5020	Osen	462	06	295-564
4222	Bykle	457	06	295-564
1826	Hattfjelldal	450	06	295-564
1573	Smøla	450	06	295-564
5423	Karlsøy	441	06	295-564
1874	Moskenes	440	06	295-564
5413	Ibestad	438	06	295-564
1839	Beiarn	438	06	295-564
5429	Kvænangen	437	06	295-564
5438	Lebesby	435	06	295-564
5440	Berlevåg	432	06	295-564
5426	Gáivuotna-Kåfjord-Kaivuono	431	06	295-564
5044	Namsskogan	428	06	295-564
3425	Engerdal	428	06	295-564
1827	Dønna	420	06	295-564

1811	Bindal		417	06	295-564
4633	Fedje		410	06	295-564
5439	Gamvik		408	06	295-564
5434	Måsøy		402	06	295-564
5042	Lierne		400	06	295-564
1848	Steigen		398	06	295-564
1875	Hamarøy - Hábmer		393	06	295-564
5052	Leka		392	06	295-564
1857	Værøy		385	06	295-564
5043	Raarvihke - Røyrvik		383	06	295-564
1815	Vega		383	06	295-564
1856	Røst		369	06	295-564
5432	Loppa		368	06	295-564
1816	Vevelstad		368	06	295-564
5433	Hasvik		351	06	295-564
4636	Solund		350	06	295-564
1834	Lurøy		350	06	295-564
1836	Rødøy		330	06	295-564
1835	Træna		315	06	295-564
1151	Utsira		295	06	295-564

Appendix B: Survey

Questionnaire

Name of survey:

University of Agder – Questionnaire of financial literacy and financial issues 2022.

Rent

Q1: If you have NOK 100 in your savings account, and the rent is 2% a year. How much do you have on your bank account after 5 years, with the proviso that you do not withdraw or deposit anything.

Q2: Imagine loaning NOK 200 from a bank for two years. The rent is 2% a year. If you must refund the loan + rent, how much do you have to pay in total?

Q3: Imaging having NOK 100 saved up on a savings account with a rent of 10% a year. How much do you think you'll have after 2 years if you do not withdraw any money?

Q4: What is the yearly effect of a loan's rent, if the lenders provided NOK 1,000, and you must repay a total of NOK 1,100 after one month?

Inflation

Q5: Imagine your personal saving account's rent is 1% a year, while the yearly inflation is 2%. How much could you purchase with the money in your savings account after one year?

Q6: Imagine your personal saving account's rent is 4% a year, and the yearly inflation is also at 4% a year. How much are you capable of purchasing with the money in your savings account after one year?

Q7: Imagine you have saved NOK 1,000 in a savings account, and your balance is at NOK 1040 after one year. Inflation in this period was at 5%. How much could you purchase for your savings in relation to the previous year?

Q8: If the bank provides a 4% increase on rent a year through your savings account, and you have deposited NOK 1,000, how much must the inflation rate be for you to maintain your purchasing power after 2 years?

Mortgage

Q9: A mortgage with a heat of 15 year has higher monthly payment than the same loan with a heat of 30 years, however, the total rent payment for the loan with a heat of 30 years will be lower than the one with a heat of 15 years.

Q10: Presume you have a mortgage with a heat of 15 years. If you aim to reduce the total of interest for the entire heat, what should you choose?

Q11: Presume you have a mortgage with a heat of 15 years with semi-annual payments. If you aim to change the loan with an outcome that the amount you must pay each time should be at the lowest possible, which of the following options is the most suitable to choose?

Investments

Q12: Purchasing a single stock usually provides less risk than investing in an equity fund?

Q13: Compared to investment in single stocks, the risk associated with investing in equity funds are...?

Q14: Which of the following investment products suits an investor who's aiming for doubling his, - or hers investment amount in a short term perspective?

Q15: Imaging investing NOK 10,000 one year ago in a widely diversified equity fund. If the market's index of which the fund invests had increased by 5% the latter year, how much profits could you expect on your investment?

Obligations

Q16: If the rent increased, what is likely to happen with the price of the obligation?

Payments

Q17: Which card will let you purchase an item now, and let you pay for it later?

Q18: If you fully pay your used credit in total within the due date, do you need to pay rent?

Q19: Can you withdraw cash from an ATM with the use of a credit card?

Loan and Debt

Q20: If all things remain and the heat of a mortgage gets extended, the down payments will…

Q21: Imaging loaning NOK 1,000, and you could choose from two options. Bank A offers a down payment of NOK 100 a month for 12 months. Bank B offers a down payment of NOK 1,200 after 12 months. Which one has the highest annual percentage rent?

Q22: When having mortgage, the increased deductibles will…

Q23: Which of the following repayments of a loan of NOK 100 will provide the highest annual percentage rent?

Pension and Planning

Q24: Taxes on disbursement from the National insurance scheme and mandatory occupational pensions is…

Q25: Is the following statement correct: Development within the financial market affects the overall development of value in pension funds?

Appendix C: Relevant investment products based on gender

Financial investments	Gender	Yes	No	Do not know	No answer	Prefer not to answer	Total
Stocks	Female	33.2 %	47.2 %	17.4 %	0.5 %	1.7 %	1
	Male	49.9 %	38.9 %	9.7 %	0.2 %	1.4 %	1
Equity funds	Female	52.8 %	31.2 %	13.4 %	0.9 %	1.7 %	1
	Male	64.1 %	25.8 %	7.8 %	0.7 %	1.6 %	1
Certificates/ Money market funds	Female	6.1 %	59.8 %	31.7 %	0.7 %	1.6 %	1
	Male	13.1 %	59.3 %	25.5 %	0.8 %	1.3 %	1
Savings account	Female	86.5 %	7.1 %	3.9 %	0.8 %	1.6 %	1
	Male	79.2 %	14.3 %	4.3 %	1.0 %	1.3 %	1
Cryptocurrencies	Female	5.4 %	83.8 %	9.1 %	0.8 %	0.8 %	1
	Male	10.8 %	78.1 %	9.8 %	0.3 %	1.0 %	1
Valuable assets	Female	11.9 %	74.4 %	11.9 %	0.6 %	1.2 %	1
	Male	13.9 %	75.6 %	8.9 %	0.4 %	1.2 %	1
Crowdfunding	Female	6.1 %	59.8 %	31.7 %	0.7 %	1.6 %	1
	Male	13.1 %	59.3 %	25.5 %	0.8 %	1.3 %	1

Appendix D: Actual stock owners based on gender

Own stocks	Gender	Yes	No	Total
Private	Female	18.12 %	81.88 %	1
	Male	35.70 %	64.30 %	1
Business	Female	2.65 %	97.35 %	1
	Male	3.46 %	96.54 %	1

Appendix E: Change in shareholder for each county

Region		2014	2015	2016	2017	2018	2019	2020	2021
Viken	N	1 154 995	1 169 037	1 184 361	1 199 404	1 213 729	1 227 305	1 241 165	1 252 384
	Stock owners	141 694	144 039	146 367	149 179	153 158	156 641	180 496	196 526
	%	12.27 %	12.32 %	12.36 %	12.44 %	12.62 %	12.76 %	14.54 %	15.69 %
Oslo	N	634 463	647 676	658 390	666 759	673 469	681 071	693 494	697 010
	Stock owners	87 971	90 601	93 174	95 868	99 511	104 647	120 461	132 895
	%	13.87 %	13.99 %	14.15 %	14.38 %	14.78 %	15.37 %	17.37 %	19.07 %
Innlandet	N	366 785	368 358	368 636	369 893	370 994	371 054	371 385	370 603
	Stock owners	42 627	42 680	43 030	44 036	44 654	44 774	47 610	51 198
	%	11.62 %	11.59 %	11.67 %	11.91 %	12.04 %	12.07 %	12.82 %	13.81 %
Vestfold & Telemark	N	405 749	408 014	410 857	413 702	415 777	417 711	419 396	421 882
	Stock owners	50 543	50 707	51 192	51 654	52 814	53 787	59 306	64 651
	%	12.46 %	12.43 %	12.46 %	12.49 %	12.70 %	12.88 %	14.14 %	15.32 %
Agder	N	292 225	295 644	298 486	300 789	303 754	305 244	307 231	308 843
	Stock owners	31 666	32 187	32 787	33 393	34 170	34 973	38 680	42 116
	%	10.84 %	10.89 %	10.98 %	11.10 %	11.25 %	11.46 %	12.59 %	13.64 %
Rogaland	N	459 625	466 302	470 175	472 024	473 526	475 654	479 892	482 645
	Stock owners	62 031	62 173	62 814	63 762	65 317	67 325	75 333	80 620
	%	13.50 %	13.33 %	13.36 %	13.51 %	13.79 %	14.15 %	15.70 %	16.70 %
Vestland	N	612 988	619 306	624 827	629 031	631 594	633 117	636 531	638 821
	Stock owners	82 751	83 851	84 895	85 268	88 592	91 745	101 934	109 434
	%	13.50 %	13.54 %	13.59 %	13.56 %	14.03 %	14.49 %	16.01 %	17.13 %
Møre & Romsdal	N	261 530	263 719	265 290	266 274	266 856	265 392	265 238	265 544
	Stock owners	31 657	32 133	32 764	33 682	33 245	33 864	36 956	40 229
	%	12.10 %	12.18 %	12.35 %	12.65 %	12.46 %	12.76 %	13.93 %	15.15 %
Troms & Finnmark	N	238 513	240 338	241 371	243 033	243 925	244 326	243 311	242 168
	Stock owners	22 707	23 181	23 480	23 894	24 740	25 562	28 965	31 681
	%	9.52 %	9.65 %	9.73 %	9.83 %	10.14 %	10.46 %	11.90 %	13.08 %
Trøndelag	N	444 966	449 386	453 352	458 221	462 354	465 634	468 702	471 124
	Stock owners	52 590	53 746	55 137	55 447	57 702	58 187	65 252	71 658
	%	11.82 %	11.96 %	12.16 %	12.10 %	12.48 %	12.50 %	13.92 %	15.21 %
Nordland	N	240 877	241 682	241 906	242 866	243 335	243 385	241 235	240 345
	Stock owners	26 702	27 577	27 893	28 196	28 687	29 310	32 298	35 433
	%	11.09 %	11.41 %	11.53 %	11.61 %	11.79 %	12.04 %	13.39 %	14.74 %
Total	N	5 109 056	5 165 802	5 213 985	5 258 317	5 295 619	5 328 212	5 367 580	5 391 369
	Stock owners	632 939	642 875	653 533	664 379	682 590	700 815	787 291	856 441
	%	12.39 %	12.44 %	12.53 %	12.63 %	12.89 %	13.15 %	14.67 %	15.89 %

Source: Retrieved from SSB (2023)

Appendix F: Discussion Paper – Vilde Driveklepp

Master's Programme in Business Administration

Competency goal: RESPONSIBLE

Introduction

The following discussion paper is based upon the term "responsible" and will be outlined in light of our master thesis: "Evaluating a potential gender gap, disparities in residency, and determinants affecting financial literacy in Norway". Throughout our analysis, we have examined a survey with the aim of determining the gender gap in financial literacy with focus on regional differences. To do so, we have investigated this topic using relevant theory, literature, and previous research. Further, we investigated the gender gap by the usage of relevant methodology in order to find gender gap within financial literacy, risk aversion and education. Several variables were analysed to determine what factors influencing the financial literacy the most. An important aim was investigating the regional differences in terms of gender gap in all variables in terms of dividing the respondents into their counties, then municipalities and lastly, into a centrality index. Most of our analysis is retrieved from the survey, however, we also used public information in light of drawing lines to investigate their relationship. The public, - and external information could lead to ethical issues in terms of manipulation of information related to GDPR.

Discussion

Responsibility is a key factor in research papers. In this thesis, the aim is to investigate the gender gap in financial literacy. The requirement of responsibility is at a high level, due to the fact of ensuring the research is being accurate, reliable, and unbiased. Additionally, responsibility is relevant when conducting and designing research, as well as collecting, analysing, and interpreting data. However, potential ethical concerns, or biases, may occur and impact the study, leading to the importance of addressing them accordingly.

Potential ethical concerns related to the thesis, could be elaborated by the use of five potential concerns (Slade & Prinsloo, 2013). Firstly, informed consent is crucial due to the

essentialness of obtaining consent from the given participants before collecting any data. The participants should be informed about the nature and aim of the research. Secondly, gender bias is a great concern in this context when investigating gender gaps. The researchers must be fully aware of their own biases and therefore strive to minimalize personal impact on the research. Consequently, the awareness of avoiding generalization and assumptions about females and males to ensure the research is being valid and unbiased. Thirdly, confidentiality plays a distinct role in terms of ethical responsibility. Ensuring the data from participants is kept confidential, leading to a protection among their privacy and avoidance of any breaches of the confidentiality. Fourthly, the awareness of questions related to finance having a possibility of being sensitive in nature and may cause harm or distress to the participants. Minimalizing potential harm could be done by providing appropriate support and using appropriate research methods. Lastly, findings could lead to stigmatisation, or stereotypes, in relation to males and females. Meaning, being mindful of the potential negative consequences is needed and therefore take steps to avoid or minimalize these risks.

The survey provides respondents being anonymous. Therefore, I believe the ethical concerns are covered to an extent by using our provided survey. However, it is important to process the public data with a focus on ethical implications. Our thesis has a great focus on financial literacy where financial investments play a significant role. An ethical concern lays in the influential of investment behaviour where females tend to be less active than males. It is necessary to outline the impact this could have on female readers. Even though the gender gap remains distinct within several areas of financial investment, risk aversion and pension savings, it is important to be informative of the risks associated with investment and which area to invest in. Investments involve risk if you enter a market that is volatile and unsecure. It is essential to investigate and get informative of which companies and markets an individual would like to invest in. Through our thesis, one may be influenced to invest in Oslo Stock Exchange and its popular companies. By looking into Oslo Stock Exchange's most attractive companies who are the most traded today, we find Equinor and Norsk Hydro, both being within the oil sector (Nordnet, 2023a). Ethical concerns follow in terms of sustainability and awareness. As an investor, it is seen as crucial to be aware of relations in terms of risk, savings and amount of investments. It is highly recommended to only invest as much as one is willing and able to lose. A company with lots of debt, and additionally being heavily affected by a low oil price, will be more exposed to the risk of bankruptcy than a company without debt. Therefore, it important to highlight that a company with this existing risk are related to

potential bankruptcy can cause the value of investments to lapse or be diluted by large issues where more shares are available and price per share is significantly reduced. To manage this risk, it is important to highlight the reader of the thesis that one must increase their fundamental knowledge and technical analysis before investing. The reader must also be aware of the positive effect by spreading out the risk across several investments and that greatly historical returns do not provide guarantee for future returns.

Corporate Social Responsibility (CSR) is about taking environmental and social considerations into account, beyond the state's laws and regulations (Lindgreen & Swaen, 2010). CSR is an important aspect of business operations and additionally essential when addressing gender gaps in financial literacy. The study shows females of having lower levels of financial literacy than males. Consequently, this could lead to negative effects such as lower retirement funds and savings, less overall financial stability, and greater debts. In the initiative of CSR, companies and the state could address these gender gaps by offering official programs related to financial education that are specifically tailored to females. These programs could for instance include different concepts of savings, budgeting, investment in addition to more advanced concepts related to tax strategies, retirement planning and estate planning. Another suggestion related to companies, are the promotion of inclusion and gender diversity within organisations. This could involve a creation of opportunities for females to take on roles associated with leadership of a company or providing networking programs with the aim of helping females to advance their careers. Mentoring, and supporting work-life balance and flexible work are additional arrangements that could have a positive effect on enclosing the gender gap. In light of prioritizing CSR initiatives that aims to address gender gaps in financial literacy, companies or the government could help by promoting greater financial stability and empowerment for females, which will ultimately benefit both society as a whole and the individuals.

If the gender gap in financial literacy remains, it could have major consequences for both individuals and society. Poor financial literacy can lead to an increase in the proportion of personal debt and a decrease in savings and investments. As a result, this could affect the quality of life among the Norwegian population. Females and young adults are especially vulnerable in being negatively financially affected, due to their lack of financial literacy which was determined throughout the thesis. The financial literate scores enclose slightly when having higher education. This relates to previous research where being introduced to

financial literacy at a younger age have created greater awareness and following a greater financial literacy (de Bassa Scheresberg, 2013). Therefore, one may urge the politicians into introducing finance and personal finance at a younger age, in elementary, - or middle school.

Today, schools and politics are not 100% agreed upon whose responsibility it is to educate. Parents are increasingly pushing the schools to educate the financial aspects, while the schools suggest the parents to take action in education and training their children. Politicians make plans for the schools to follow. As mentioned, our results show a problematically lower level of financial literacy among Norwegian females. This could possibly be solved by changing the curriculum, or by education the parent. There is no accurate answer to making the right decisions in terms of investments. On one hand, some may be content to lose some money on investments, while on the other hand, some individuals have higher willingness and acceptance in terms of risk. Regardless of the situation, each individual investor must be educated in terms of having the related information and knowledge to make an informed decision. This leads to the challenges of marketing products to individuals who is not educated at this level to understand what their choices consists of. For instance, credit cards and defer payments.

Pension savings is also highlighted through our thesis which revealed a large gender gap in which males saves and interprets the minimum pension as being too low. Several employers are required by law to save a set percentage of their employee's income, which is the so-called mandatory occupational pension scheme (Regjeringen, 2023). Although, Norwegians born before 1962 will receive greater pension payments of approximately 66% of their income. In later years, this has been rearranged, meaning one must account for personal pension savings. Females tend to save less than males, which is a crucial responsibility of one's personal future.

Conclusion

With the usage of a survey containing more than 2000 participants, responsibility follows. The term 'responsible', in this manner, lays in obtaining informed consent, protection of their confidentiality and privacy, alongside with minimalizing harm, avoiding discrimination and biases. This could be outlined by accurately representing the findings and thereby ensure the data is analysed, - and interpreted objectively. Any conclusion needs to be supported by reliable evidence, and a survey whom external researchers can review and interpret

themselves to receive the same results. There is also a need of justification considering the limitations and implications. There are several factors who may have influenced the participant, leading to the implication of the validity, and therefore a lack of generalizing the results to the Norwegian population. This is one of many studies, and more will most likely follow to determine the development within this context. However, the findings are clear in terms of a quite distinct current gender gap in financial literacy within many different aspects such as pension, investment, and income. These are alarming results, leading to the need of policy makers, government, and schools to take action. Meaning responsibility, and ethics are highly important in this thesis within a field many could view as sensitive, however, findings show the responsibility also lays within the regulators and schools.

Overall, responsibility is highly connected to this research, where conducting the data in an ethical and responsible manner is highly important. Considering the thesis also focuses on determining the regional differences, we are responsible in terms of ensuring that the research is ethically conducted and accurately representing the findings. The communication is relevant due to the effectively relevance to stakeholders. By fulfilling the given responsibilities, external researchers can contribute to develop the evidence-based practices and policies to promote financial inclusion and gender equality.

In conclusion, our master thesis fronts many dilemmas associated with responsibility. The gender gap in financial literacy is a debated aspect in terms of who's responsible to educate young adults, whether it being regulations from the government, school' curriculum, or the parents. In this research, the responsibility lies with the researchers due to the expectations of performing independently and objectively. Throughout our thesis, we have experienced the necessity of responsibility in decision-making due to the striving of remaining objective. By the usage of prior research from several researchers, and the provided survey, we believe the objectively and individual aspects has been maintained to great extent. Bias and limitations cannot fully be written off, however, I believe 'responsibility' has been presented and maintained through our actions of the analysis.

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Appendix G: Discussion Paper – Hanne Våge Skårdal

Master's Programme in Analytical Finance

Competency goal: INTERNATIONAL

In this discussion paper, I will discuss the concept "International" in the light of this master thesis problem "Evaluating a potential gender gap, disparities in residency, and determinants affecting financial literacy in Norway". Throughout the master thesis analyses, there is an existing gender gap in financial literacy.

Financial literacy has gained considerable attention in recent years due to its potential impact on individuals, communities, and economies. This discussion paper aims to explore the intersection between financial literacy and the concept of "international." The paper begins with a brief overview of the thesis, followed by an analysis of international trends and forces that influence financial literacy. It further examines how financial literacy research, findings, and relevant units of analysis can be influenced by these international factors and how actors may react to them. The paper draws on relevant theory and research to provide a comprehensive understanding of the subject matter.

The central focus of this thesis is to examine the relationship of financial literacy not only in Norway but in a more international sense. By investigating the determinants of financial literacy, exploring its impact on personal financial behaviour, and assessing the effectiveness of financial education programs, the thesis aims to provide insights into improving financial well-being and economic stability. Financial literacy is subject to various international trends and forces that can significantly shape its relevance and effectiveness. The following sections discuss some pertinent examples.

The concept of "international" is highly relevant to financial literacy research. Financial decisions are increasingly influenced by international factors, and understanding these dynamics is essential for effective financial literacy interventions. The international dimension expands the scope of research and necessitates collaboration among stakeholders from different countries, considering cultural, regulatory, and socioeconomic differences.

This discussion paper highlighted the relationship between financial literacy and the concept of "international." It underscored the relevance of international trends and forces, such as globalization, migration, and international financial regulation, in shaping the landscape of financial literacy research. By considering these international dimensions, researchers can better understand the challenges and opportunities in promoting financial literacy and improving financial decision-making on a global scale. It is crucial to continue exploring ways to enhance financial literacy education, develop tailored interventions, and foster international cooperation to address the complex financial needs of individuals in an interconnected world.

From our master thesis we represent the gender gap in financial literacy and considering regional differences in Norway. The descriptive statistics highlight the diversity among respondents, with education having the greatest impact on financial literacy scores. The tables demonstrate how different levels of education affect knowledge, which is expected. Contrary to the assumption that financial literacy levels would differ among regions, the study finds only minor differences in the total scores of respondents from different areas in Norway. This suggests that the level of financial literacy is not significantly influenced by the respondents' place of residence, indicating Norway as a homogenous nation.

It discusses the gender differences in risk aversion, with females being more risk-averse when it comes to investment products. Females' risk aversion has a greater impact on financial literacy, resulting in a larger increase in their scores compared to males. However, it is worth noting that males are often associated with taking higher risks in general, not just in investments. This is not only to be considered in Norway but has a way of being the case internationally.

A study reveals the findings that highly educated females display significantly higher levels of risk aversion compared to males (Hibbert et al., 2013). However, when both genders attain a high level of financial education, they are equally inclined to invest a substantial portion of their portfolio in risky assets. This indicates that financial education helps reduce the gender disparity in financial risk aversion. Recent studies have found that females, by being more diverse and committed to their long-term investments, can achieve greater returns.

The Nordic gender equality paradox, where countries like Norway have high gender equality rates but also gender-segregated labour markets, may provide an explanation for the existing gender gap in various sectors, including financial literacy.

In 2019, DNB launched a campaign aimed at encouraging females to invest, which likely contributed to reducing the gender gap in investments. Our master thesis reveals that males were also influenced by the campaign, resulting in an increase in their investments.

There a study that examines the gender gap in financial literacy using international OECD/INFE microdata from 12 countries (Cupák et al., 2018). The authors find that the gender gap in financial literacy is highest in more developed countries. While some of the gap can be explained by personal characteristics, the rest may be attributed to the economic and social environment. Previous research has shown gender gaps in financial literacy in the U.S., Germany, and the Netherlands, but this study contributes by using a larger set of financial literacy questions and internationally comparable data. The results reveal a significant gap in financial literacy between males and females in most countries studied, with the gap ranging from 3% to over 20%. Interestingly, the gender gap is lowest in Eastern European countries, potentially due to social and economic norms stemming from the communist era. These findings underscore the need to address the gender gap in financial literacy and consider the influence of the broader social and economic context.

Another study is reflecting the concerning of the persistent of an existing gender gap in a world where financial knowledge is increasingly crucial (Tinghög et al., 2021). This gap has implications for financial decision-making and opportunities for financial prosperity. Despite female's educational and professional achievements, the gender gap remains prominent, even in more developed countries. This study explores the underlying mechanisms contributing to this gap and finds evidence that stereotype threat plays a role in explaining female's lower financial literacy performance. The threat of negative stereotypes affects female's confidence and may influence their educational and occupational choices, leading to differences in financial knowledge. Removing the option to respond with "do not know" did not significantly impact the gender gap, contrary to another study's findings, suggesting variations across different samples. While the economic relevance of the gender gap in financial literacy is not explicitly addressed, financial literacy has been shown to promote good financial practices and overall financial well-being. Considering other factors such as risk-tolerance, competition, gender wage gap, and life expectancy differences, the combined effect of these

factors and financial literacy may significantly impact financial outcomes and wealth inequality. Further research is needed to explore the specific pathways through which stereotype threat and confidence influence the gender gap in financial literacy.

Globalization has led to increased international trade, investment flows, and cross-border transactions. These developments necessitate a greater understanding of financial concepts, such as exchange rates, international taxation, and risk management, to ensure informed decision-making in an interconnected world. Research indicates that individuals with higher financial literacy are better equipped to navigate these complexities. The rise in global migration has resulted in the need for transnational financial management. Migrants often face unique financial challenges, including remittance management, currency exchange, and cross-border investments. Financial literacy plays a vital role in empowering individuals to make informed decisions about their finances, effectively manage their resources, and mitigate potential risks.

The next study examines the international aspect of financial literacy by investigating the relationship between education and financial literacy in China (Zhou et al., 2022). The study utilizes urban household data from the CFPS 2018 survey to construct a financial literacy score based on three key questions. By using the implementation of the Compulsory School Law (CSL) as an instrument for educational attainment, the paper establishes a causal relationship between education and financial literacy. The findings highlight the significant impact of education on financial literacy, with each additional year of schooling resulting in a considerable increase in the financial literacy score. This has important implications for addressing the widespread lack of financial knowledge, which is a concern for policymakers internationally. The study also explores various channels through which education influences financial literacy, such as improved math skills and increased social interaction for knowledge acquisition. These findings underscore the importance of incorporating financial education into the general education system, particularly in financially less-developed countries like China, where many individuals lack even basic financial knowledge. While the study acknowledges the potential effectiveness of specific financial education courses for enhancing advanced financial knowledge, it emphasizes that improving access to basic compulsory schooling can be a cost-effective method to enhance financial literacy on a larger scale. The study's insights contribute to the international efforts to promote financial education and

highlight the need for tailored approaches to address the diverse needs of individuals in different countries.

International financial regulations and consumer protection measures impact the financial literacy landscape. Policies and frameworks designed to enhance consumer rights and financial well-being require individuals to possess a certain level of financial knowledge. Research can focus on evaluating the effectiveness of such regulations and exploring ways to improve financial literacy in alignment with evolving international standards.

In the context of an international discussion paper, the examination of financial literacy uncovered several variables that impact the outcomes in our master thesis. Notably, higher education, income, risk aversion, and gender were found to have significant effects. While regional differences were not found to be substantially influential in terms of residency in Norway, gender emerged as a key factor contributing to a gender gap in financial literacy, with females exhibiting lower levels of proficiency. To address this gap, one potential strategy is to incorporate and enhance personal finance education within school curricula, accompanied by a more open and inclusive dialogue on the subject. Similar efforts aimed at reducing the gender gap in financial investments should also be directed towards closing the gender gap in financial literacy. This is what we found in Norway, and through the findings of the different resources, it seems like gender gap in financial literacy is an international problem. Norway is a developed country which should increase the gender gap due to research stated above, however, eastern Europe had a reduced gender gap than other regions. It can be concluded that there are limited differences between regions in Norway, but internationally there are greater differences.

In conclusion, integrating the international perspective into financial literacy research provides a broader understanding of the subject matter and its implications. Future studies should continue to examine the influence of international trends and forces on financial literacy and explore innovative strategies to enhance financial education programs in an international context.

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