Universitetet i Stavanger

HANDELSHØGSKOLEN VED UIS
BACHELOROPPGAVE

STUDIUM:	OPPGAVEN ER SKREVET INNEN FØLGENDE TEMATISKE RETNING:
Økonomi og Administrasjon (BØKBAO)	Samfunnsøkonomi ER OPPGAVEN KONFIDENSIELL? Nei

TITTEL:
Generasjonell finansiell kunnskap: er det en korrelasjon mellom foreldres utdanning og om Generasjon X og Millennials investerer i verdipapirer?

ENGELSK TITTEL:
Generational financial literacy: Is there a correlation between parents' education and whether or not Generation X and Millennials invest in securities?

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Acknowledgements

The following thesis will conclude my bachelor's degree in economics and administration at UiS School of Business and Law. The last three years have been challenging but have also helped me develop into a more secure and well-rounded person. Writing this thesis has been particularly giving in terms of self-reflection, learning and development. I am grateful to the many wise and driven people around me, as well as all the opportunities I have had these last few years. I want to thank my family, friends and my skilled and knowledgeable supervisor Sara Helene Rønningstad for helping me through the process with useful tips and good advice. Sara Helene has given me quick feedback along the way helping me navigate the path ahead.

Caroline Risheim Kristiansen

Abstract

The aim of the thesis was to explore a possible correlation between social background and investment behaviour. To do so, register data from Statistics Norway was used in making multiple linear regressions with over 1 million observations each. Parent`s education when the individuals were 16 years old was used as an indication of social background. Key findings show that both Generation X and Millennials are more likely to be invested in securities if their parents have higher education. The effects of parents' education is slightly higher for Millennials. The explanatory power of the study is low at 5%, which is expected due to the many possible explanations on whether or not one invests in securities. Contrary to other studies on parents' education and financial literacy, this study did not find notable differences between mother and fathers' education.

Content

1. Introduction

To effectively introduce the thesis, the introduction will firstly go through my background and motivation for studying investment behaviour and social differences. Following will be a presentation of the research questions and hypothesises. Next, some clarifications and definitions that should be stated early on to help with the flow of the thesis will be explained. Lastly, a brief entry to the structure of the thesis will conclude the introduction.

1.1. Background and motivation.

For as long as I can remember, social differences and the advantages of having financial literate parents have been an interest of mine. Robert Kiyosaki wrote a book called "Rich Dad Poor Dad". In the book he explains how he had two fatherly figures with opposing attitudes on money: his biological father, the "poor dad" and his friend's father, the "rich dad" (Kiyosaki, 1997, p. 3). Through the book he explains different key lessons he learned from his "rich dad" and his "poor dad", the first lesson of the book being "The poor and the middle class work for money. The rich have money work for them." (Kiyosaki, 1997, p. 9). Robert explaining the lessons he learned from his rich dad helped me recognize the advantages one can gain from their environments.

Growing up I sat around various dinner tables with some of the richest families in my region and some less fortunate. One thing I noticed, was the difference in conversational topics. Around the wealthy dinner tables, monetary concepts were talked about in multiple dimensions. Banking systems, inflation, stocks, and funds being some of them. On the other side, around the less fortunate dinner tables, money was rarely a subject. The few times it was mentioned: "it is important to save money" was where it started and ended. Now, as an adult, I see a difference in how the people around me spend and save money. Although, some might inherit large sums of money it is easier to spend it than make it grow. Therefore, I found the financial literacy of the ones around me interesting and wanted to explore how the knowledge transferred from parents' effect children as adults in regard to investment behaviour.

In the last century the mother's role in families has changed drastically. The history of women's rights can be an interesting conversational topic in analysing results of the effects of parents' education on investment behaviour. After the second world war women were in large homebound (Lønnå, 2020). They were considered the core of the family and rarely had paid work. However, the 1960s marked a change in the family dynamic in Norwegian households. During the sixties it slowly became more common for women to get an education and for married women to also expand into the paid workforce. Intensifying the changes in family dynamics the seventies marked a radical start to the women's rights movement. Demand for equal pay, working conditions and political presence were there to stay. Further improvements were made in the eighties with more women in organised politics, more women than men in schooling and an increased presence of women in the workforce. However, many of the women were at large working jobs considered "in their nature" such as care takers for children, sick people and the elderly. Going into the research questions the women's rights movement has inspired this study to take on two different generations to see potential differences in their parents` impact on investment behaviour.

1.2. Research questions.

The research question explored in this study is: *Generational financial literacy; is there a correlation between parents' education and whether or not their children later invest in securities?* Securities is an umbrella term for documents representing the right of monetary claims. Common examples are stocks, bonds and contracts (Meinich, 2021). In this study securities will be used mostly in regard to stocks, funds and bonds. As this is a cohort study the research question was used in making two different sets of hypothesises:

1. *Is there a correlation between parents' education and whether or not Generation X invest in securities?*
    - $H_{0:}$ parents' education = 0 effect on whether Generation X invest in securities.
    - $H_{A:}$ parents' education ≠ 0 effect on whether Generation X invest in securities.

2. *Is there a correlation between parents' education and whether or not Millennials invest in securities?*
    - H_0: parents' education = 0 effect on whether Millennials invest in securities.
    - H_A: parents' education ≠ 0 effect on whether Millennials invest in securities.

1.3. Clarifications and definitions.

There is no one scientific definition of the word *generation*. Therefore, it is important to define what definition this study uses early on. Although different sources use different year spreads, most of them define generations based on the historic periods they grew up in being somewhat similar. Using Pew Research Centre's definitions people born between 1981 to 1996 are defined as Millennials, while people born between 1965 and 1980 are defined as Generation X (Dimock, 2019). Meaning Generation X were born and grew up around the uproar of the women`s rights movement, whilst Millennials were born when the initial dust had settled, the eighties. Based on the birth years, I find it reasonable to assume that Millennials are children of mainly boomers, born 1946-1964, and that Generation X are mainly children of the silent generation, born 1928-1945. There is an increase in both fathers and mothers with higher education between the generations. These differences will be further illustrated in chapter 4.3.

1.4. Structure.

The structure of this thesis consists of 6 chapters, including the introduction. Each chapter serves its own purpose in making a well-rounded thesis. Chapter 2 lays a knowledge basis for relevant theories and earlier research. Subchapters in chapter two are financial literacy, risk assessments and a historical example of yield using different saving methods. Chapter 3 clarifies what methods and design will be used in studying the thesis questions. Chapter 4 describes the different variables used in the regression models. Then, chapter 5 presents and discusses the results of the study. Lastly, the thesis is completed in chapter 6 with a conclusion. Sources and appendixes used in the thesis can be found at the end.

2. Theoretical framework

To provide a deeper understanding on the impact of social background on investment behaviour a theoretical framework is included. The theoretical framework includes an introduction to results of past studies relevant to this study, as well as relevant behavioural economic theories and risks assessment. Lastly the historical difference of saving in the market versus on a bank account will be illustrated and discussed.

2.1. Financial literacy

Financial literacy refers to the understanding and use of financial skills (Lusardi & Mitchell, 2014) People with high financial literacy can make informed decisions, causing them to have monetary stability and possibly an overall higher quality of life. As a member of modern society, it is impossible to not step foot in the financial landscape. Now a days in Norway banks are most commonly used to receive, borrow and spend money. From childhood, the majority is exposed to banks in some shape or form, therefore one could assume banks to be familiar. The limited knowledge from childhood can give a false sense of security, not being familiar with other saving methods can make them feel riskier than they really are. This can be considered as a form of familiarity heuristics (Ackert & Deaves, 2010, p. 87).

2.1.1. The role of education in financial literacy

To test for financial literacy Lusardi and Mitchell developed three questions (Lusardi & Mitchell, 2008). The questions have been used and expanded on in multiple research projects since first introduced. To test only basic knowledge the questions are kept simple. Should the subjects get the questions wrong they are less likely to understand complex aspects of economic systems (Lusardi & Mitchell, 2023). A directly quoted example being:

"[...] Suppose you had $100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account?

*More than $102. ***

Exactly $102.

Less than $102.

Do not know.

Refuse to answer. […]" (Lusardi & Mitchell, 2023, p. 139).

Using the questions Lusardi and Mitchell (2014) researched financial literacy based on different variables such as age, sex, and education. Concentrating on education, results show that people without a college education in the US, Netherlands, Germany, and Switzerland are less likely to know basic financial literacy concepts (Lusardi & Mitchell, 2014). These finding indicates that education level is an important factor in financial literacy. However, what the study does not explore is the transfer of financial literacy between generations.

2.1.2. The impact of social background on financial literacy

In examining the 1997 NLSY[1] to find answers on financial literacy in young people Lusardi, Mitchell and Curto (2010) found implications of social background. Overall, they found that the basic knowledge of interest rates, risk diversification and inflation was only demonstrated in 1/3 of the participants. They also found parents to be an important channel for young adults to acquire financial knowledge. Having financially sophisticated parents and mothers with high education was associated with the financial literate, particularly in regard to risk diversification (Lusardi et al., 2010). Furthermore, a qualitative study by Kardash et.al. (2023) sought to explore the role of parental education in financial socialization of children. The findings of the study suggests that children of middle- and upper-class families are at an advantage in the socialization process with institutions. This gives them an upper hand in navigating, thriving, and interacting in complex systems as adults. The study also found mothers education to be a significant variable in the financial socialization of children (Kardash et al., 2023). The findings of these studies imply that social background has an effect on future financial standing. They indicate that children of educated, and financially savvy parents could have a financial advantage later in life.

Furthermore, social background can affect other aspects of life that could have a secondarily effect on saving habits. Torvik et.al. (2020) sought to explore how parents' level of education affects Norwegian children's mental health. The study has two key

[1] The 1997 National Longitudinal Survey of Youth is a US national survey of people aged 12-16 in December 1996. US Bureau of Labour Statistics. (n.d.). *National Longitudinal Surveys*. U.S. Bureau of Labour Statistics. Retrieved 1st of May 2024 from https://www.bls.gov/nls/nlsy97.htm

findings after checking for genetic risk factors. First and foremost, the study discovered that 1/5 children of lower educated parents, not completed upper secondary school, reported high levels of ADHD symptoms. This is a concerning high number considering that results for children of college educated parents revealed a 1/20 result (Torvik et al., 2020). Some symptoms of ADHD are lack of impulse control, attention difficulties, difficulty in starting and finishing tasks and a lack of organization and planning (Helsedirektoratet, 2023). All these symptoms could affect spending habits leading to making subpar or even bad financial decisions. For example, a lack of organization and planning can affect budgeting, which in turn leaves more room for impulse purchases. Also, venturing into unknown saving forums can seem risky and scary in itself, combining that with a difficulty in starting and finishing tasks would likely cause further disadvantage. Likewise, the study revealed that more children of low educated parents than of parents with a high education had mathematical and reading problems in primary school (Torvik et al., 2020). Lusardi (2012) found that when making financial decisions mathematical skills are an effective tool (Lusardi, 2012). Based on these findings one could argue that children with lower mathematical literacy are at a disadvantage when making financial decisions. In conclusion the study shows ways that parents education affects children`s mental health and one could argue that these negative effects can further affect the children`s future financial decision making.

2.2. Assessing risks in long-term saving

Daniel Kahneman (2012) and the late Amos Tversky studied economic behaviour. Through their work we can further understand why humans behave the way they do in financial markets. Humans are usually more sensitive to losses than to gains, meaning that it hurts more to lose something than it pleasures to gain it (Kahneman, 2012, p. 283). Because of this asymmetrical psychological value, we also assess risk irrationally. When experiencing loss, humans tend to be risk seeking to gain what is lost, and when experiencing gain, we tend to be risk adverse in order to protect what we have (Ackert & Deaves, 2010, p. 42). As savings indicates a surplus in resources a risk adverse behaviour is expected by the majority in this example. Lastly, humans also prefer certainty over almost certainty even when the reward is higher, meaning we overweigh small probabilities of negative outcomes, this concept is called the *certainty effect* (Ackert & Deaves, 2010, p. 42). Certainty effect is relevant to this study in regard to the inherent risk

of losing capital invested in the market. Being risk adverse and preferring a certain outcome over an almost certain outcome could weigh decisions in favour of the "safe" bank savings account.

2.3. Risks associated with different long-term saving methods.

Before illustrating the historic differences in yield following OSEBX[2] and the policy rate some relevant aspects of the different saving methods should be addressed as well as their associated risks.

Bank accounts are used by the majority of adults. The basic functions of a bank account is spending, saving, and receiving payments (Nyhus, 2024). Money kept on a bank account grows according to the interest rate on the account. Interest rates differs from bank to bank and between account types (Nyhus, 2024). However, a common ground for all interest rates is that they are affected by the policy rate (Norges Bank, n.d.-b). In Norway the policy rate is the rate banks earn on their deposits in Norway's Bank. It is more complex, but this way Norway's central bank can influence the interest rates offered by banks to customers (Norges Bank, n.d.-b). In other words, if the policy rate changes the other interest rates in the market are most likely to follow. Although, banking is a central part of the economy and considered low risk there are still risks present. Mostly relevant to this study is the risk of inflation. The risk of inflation is relevant if the inflation level is greater than the interest rate (Norges Bank, n.d.-c). In such cases the money in the bank account loses purchasing power although the savings gain interest. Norway's central bank has a monetary policy target of 2% inflation over time (Norges Bank, 2021). Inflation is affected by the activity levels in the economy. If the activity is high inflation rises because demand surpasses supply and supply correspondingly rise (Jones, 2021, p. 369). If economic activity is low, prices fall as demand falls causing supply to decrease as well (Jones, 2021, p. 327). Short term, Norway's central bank can try to control inflation by adjusting the policy rate. In macroeconomic theory a high inflation can be lowered through raising the policy rate. Higher rates will cause prices and expenses to rise which will in turn affect consumer spending negatively. Correspondingly the policy rate is lowered when inflation is low to stimulate consumer spending (Jones, 2021, p. 323). Real examples of changes in

[2] The Oslo stock exchange benchmark index includes the largest and most actively traded stocks on Oslo stock exchange. Euronext. (n.d.). *Oslo Børs Benchmark Index_GI*. Euronext Live Markets. Retrieved 1st of May 2024 from http://live.euronext.com/en/product/indices/NO0007035327-XOSL

the policy rate is the recent high inflation, and correspondingly high interest rates, also the low inflation of the covid-19 era where interest rates were down towards zero (Norges Bank, n.d.-a).

Venturing into other long-term savings options can be scary. The stock market for example has an inherent risk of losing all capital due to the residual claim, meaning should the company go bankrupt shareholders are last in line when distributing the liquidated assets (Bodie et al., 2021, p. 43). If there are no assets left the shareholders are left with nothing. However, ordinary shareholders will never be in a position of owing money in the case of bankruptcy. Managing the risk of losing all capital in the stock market can be done through diversifying the portfolio (Peterson, 2012, p. 92). Diversification is achieved by having multiple investments in different markets and or different companies. To diversify is to not pull all eggs in one basket. That way, if a basket was to tip, not all eggs would crack (Peterson, 2012, p. 92). Furthermore, uninterested, and unexperienced day to day people can pay a small price and get an analytics team to invest for them through mutual funds. Mutual funds are collections of securities following defined mandates (DNB, n.d.-e). Due to mandates, it is clear what type of companies, for example tech, and values the fund invests in, for example sustainability. Mandates also define what type the fund is. There are many different mutual fund structures:

Fund type	Structure / description
Equity funds	Equity funds consist of minimum 80% stocks and can be actively managed by analysts or passively invested following an index; *index funds* (DNB, n.d.-c).
Fixed-income fund	Fixed-income funds consist of fixed-income securities making them less risky than equity funds (DNB, n.d.-d).
Combination funds	Combination funds consists of both equity and fixed-income securities, causing a more nuanced risk profile (DNB, n.d.-a).
Fund packs	Fund packs are collections of multiple different funds, reducing the need to make own decisions (DNB, n.d.-b).

Table 1 - Fund structures

Due to many options, decisions can be hard especially if there is already a sense of insecurity. Insecurity combined with loss aversion and the certainty effect should in theory cause the inexperienced investor to not venture into securities.

2.4. Historical differences between OSEBX and the policy rate

The following example will illustrate the historic results of investing 50kNOK following OSEBX opposed to keeping it on a savings account following the policy rate. OSEBX data was collected from the Bloomberg investment portal (n.d.) and shows the value at the end of the year. The policy rate data was collected from Norway`s central bank (n.d.-a). To simplify the policy rate at the end of the year was used for each year. After showing initial results, inflation will be included to illustrate the risk of inflation. Inflation data was collected from Statistics Norway (n.d.-b). All calculations used in this sub chapter can be found in Appendix.

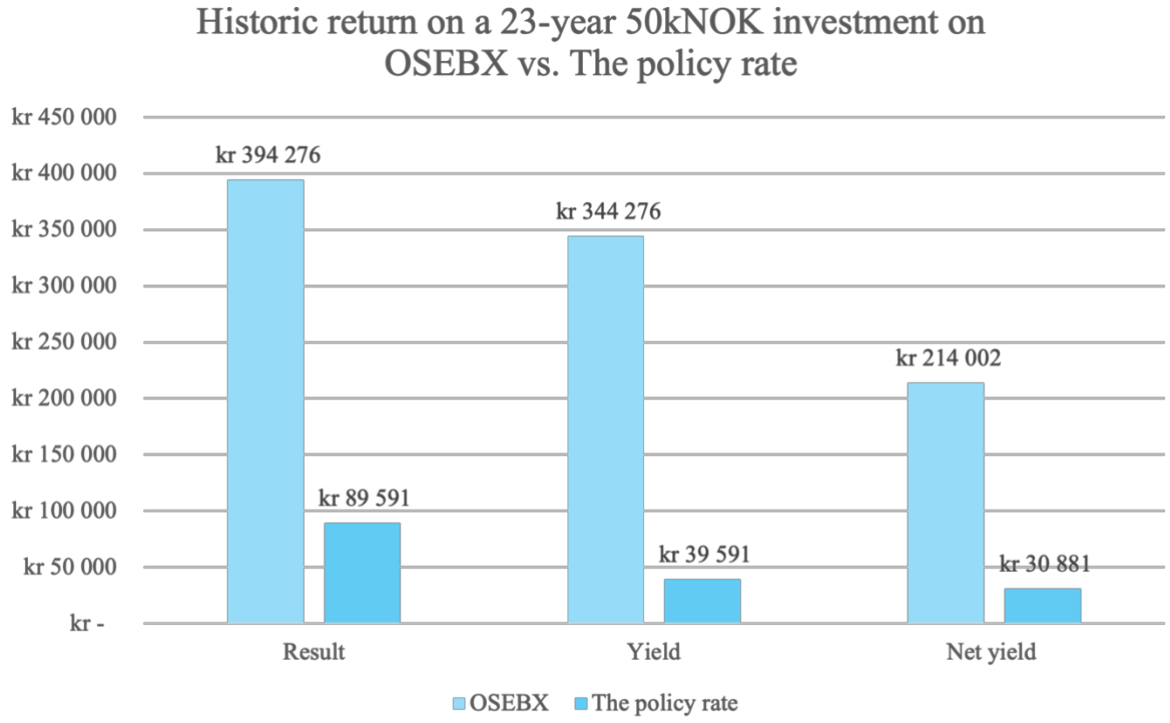

Figure 1 - Historic return on a 23-year 50kNOK investment: OSEBX vs. The policy rate.

If a millennial born in 1980 invested 50kNOK in an index fund following OSEBX at the age of 20 (January 1st, 2000), she would have 394kNOK at the end of 2023, 214kNOK being the net yield after a tax of 37,84%. If the same amount was kept in a bank account, it would be affected by the policy rate. Following the policy rate, she would have 90kNOK at

the end of 2023, 30kNOK being the net yield after a 22% tax. These absurd differences in yield illustrates how understanding simple financial concepts is important in making a financially secure future. Also, keep in mind that this timespan includes the financial crisis of 2008 where the stock market plummeted and OSEBX did not recover until approximately 2013 as shown in Figure 2.

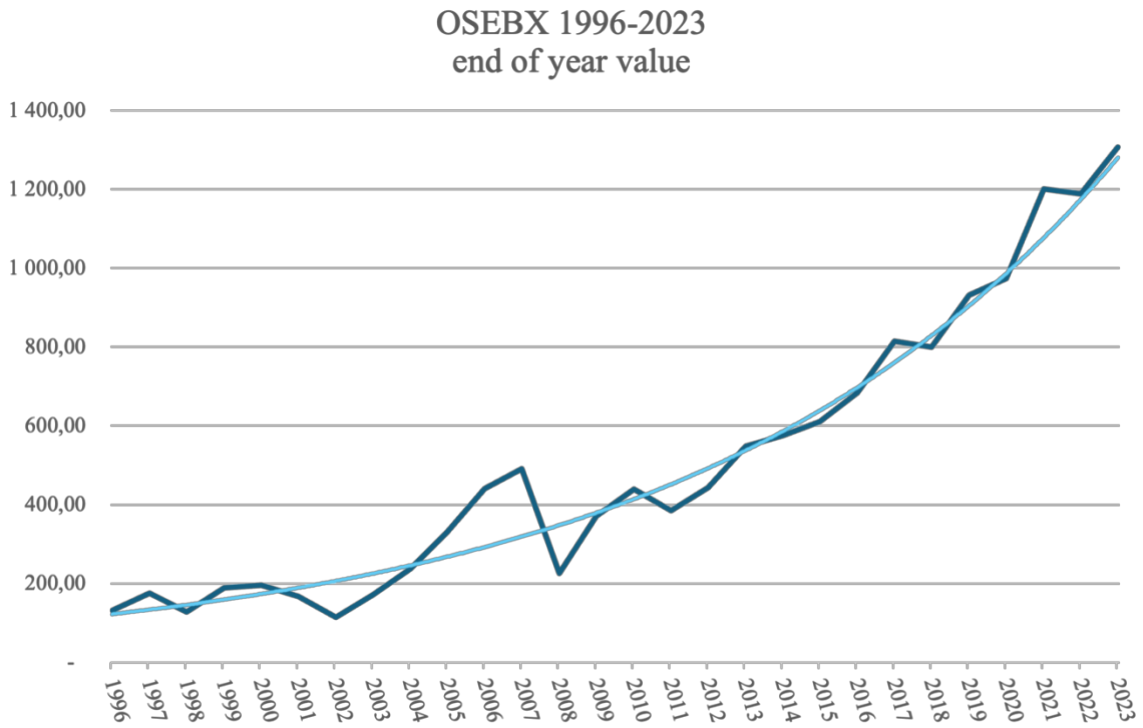

Figure 2 - OSEBX historic value and trend line.

This is where the common saying, often credited Ken Fisher, “time in the market beats timing the market” comes in. It is based on the idea that even though the stock market is volatile it is best to just ride the waves (Fisher, 2018). Figure 2 illustrates the volatile OSEBX in the dark blue line and the trend with the light blue line. To further emphasize the difference in yield, have a look at the risk of inflation. Purchasing power goes down each year. When checking inflation from January 2000 to December 2023 prices have increased with 77%. Meaning that the purchasing power of 50kNOK in 2000 is equal to the purchasing power of 89kNOK in 2023 (Statistics Norway, n.d.-b). Have a look at Figure 3 to see how this affects the results of the two different investments.

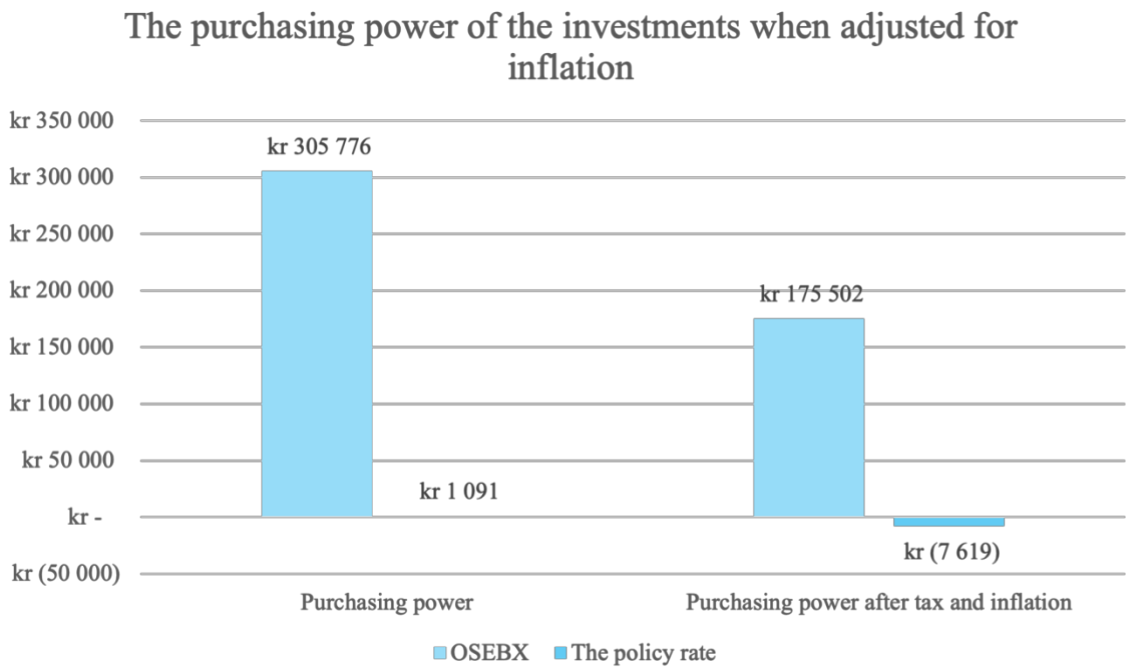

Figure 3 - The purchasing power of the investments when adjusted for inflation.

The graph above clearly shows the inflation risks of saving long term on a bank account. After inflation and tax, the total purchasing power of the 50kNOK investment in OSEBX is 175kNOK. In other words, following OSEBX gave an increased purchasing power of 125kNOK despite inflation and taxes. On the other hand, the remaining purchasing power after tax and inflation following the policy rate is negative. Meaning that the 50kNOK saved in 2000 only will provide the resources equal to 42kNOK in 2023. In simpler terms, a loss of 8kNOK.

Seeing these drastically different results of the same 50kNOK investment also highlights how knowledge is power. Obviously, this thesis is in no way recommending any type of saving over another as every individual is in their own monetary situation. However, learning from history, being aware of simple economic concepts such as inflation and diversification of savings is arguably tremendously important.

3. Method

The point of researching is to document reality trough data or empiricism (Johannessen et al., 2020, p. 21). In order to produce a well-rounded study, it is important to set a specific path, the method. Researching a topic is commonly divided into four phases: preparation, data collection, data analysis and reporting. Each filled with decision making (Johannessen et al., 2020, p. 23). The purpose of this chapter is to ensure a transparent process and help the reader understand the results of the research.

3.1. Preparation

Turning curiosity to research can have several different paths. Deciding whether to use a qualitative or quantitative research method is an important decision. Due to the wish and curiosity of exploring a potential correlation between social background and investment behaviour on a broad spectrum a quantitative method was chosen. A quantitative approach is characterized by having a large number of data often collected through questioners or databanks (Johannessen et al., 2020, p. 23).

3.2. Data collection

The decisions made when collecting data is a central part in how well the research reflects reality (Johannessen et al., 2020, p. 24). At this stage population, sample and the data source are all determined. Due to the potential impact of historical differences on social background a cohort study was deemed appropriate.

3.3. Data analysis

Analysing quantitative data is done through counting observations, with the use of statistical methods (Johannessen et al., 2020, p. 24). Key aspects of data analysis include reduction, analysing and modelling with the use of different statistical programmes to interpreting the data. Also, doing quality control of the analyses is an important part of data analysis. Statistics Norway has made data analysis simpler trough collaborating with Sikt in making Microdata.no. Microdata is a coding program where selected institutions such as universities get access to detailed anonymous register data easily (Microdata, n.d.-a). Through microdata`s analysing program “rose” it is easy to import variables and do

statistical analyses directly from Statistics Norway's databank. The main form of statistical analysis in this study is linear regression analysis.

3.3.1. Linear regression analysis

The purpose of a regression analysis is to see what impact one or more independent variables have on the average value of a dependent variable (Johannessen et al., 2020, p. 333). This study seeks to determine if there is a correlation between social background and investment behaviour. Using a linear regression analysis can help determine the character and strength of the relationship. There are multiple different types of linear regression analyses.

A simple linear regression analysis aims to explore if there is a linear correlation between two variables, one dependent and one independent. With the use of a simple linear regression only the influence of one independent variable on the dependent variable is explored (Johannessen et al., 2020, p. 341). The formula for this type of regression is:

$$Y = b_0 + b_1 X$$

Equation 1 - Simple linear regression (Johannessen et al., 2020, p. 341)

where b_0 is the value of the dependent variable when the independent variable has a value of 0. Coefficients, the amount the dependent variable increases when the independent variable increases with X, is determined as b_1 (Johannessen et al., 2020, p. 341). Furthermore, controlling for other variables can help get a clearer picture of reality (Johannessen et al., 2020, p. 357). For example, can saving methods be affected by income level. Therefore, controlling for income might be useful in examining the impact of social background on saving methods. To have more than one independent variable against one dependent variable is called a multiple linear regression (Johannessen et al., 2020, p. 357). A multiple linear regression is used to see whether the effect of one variable is consistent when controlling for more. The dependent variable is what we`re interested in explaining, whilst the independent variables are what we think the explanation can be (Johannessen et al., 2020, p. 339). To analyse the relationship, multiple linear regression uses the following formula:

$$Y_i = b_0 + b_1X_{1i} + b_2X_{2i} + \ldots + b_kX_{ki}$$

Equation 2 - Multiple linear regression (Johannessen et al., 2020, p. 359)

The equation works the same way as the simple linear regression where b_0 is the expected value of Y, the dependent variable, when all independent variables hold the value of 0. The difference in a multiple regression analysis is that there are more independent variables and corresponding coefficients. The coefficients are assessed independently with all else held constant (Johannessen et al., 2020, p. 359).

3.3.2. The explanatory power

When a simple or multiple linear regression analysis is done it is not realistic to have a perfect linear relationship, but rather a cloud of data on a scatterplot. The explanation power (R^2) of the analysis is determined by how linear the dots on the scatter plots are. The more linear the higher the value of R^2 (Ubøe, 2017, p. 252).

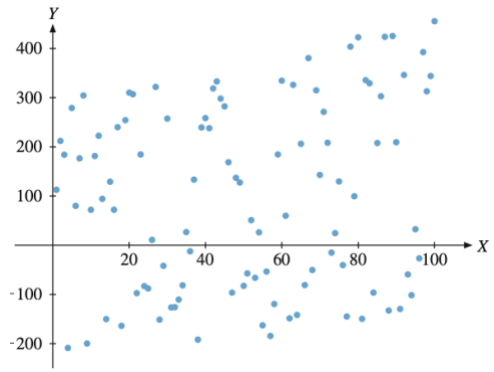

Figure 4 - Small explanatory power (Ubøe, 2017, p. 252).

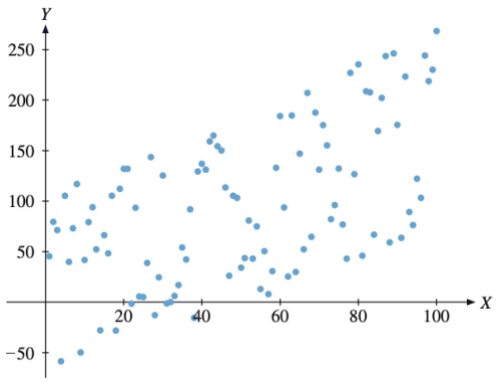

Figure 5 - Some explanatory power (Ubøe, 2017, p. 253).

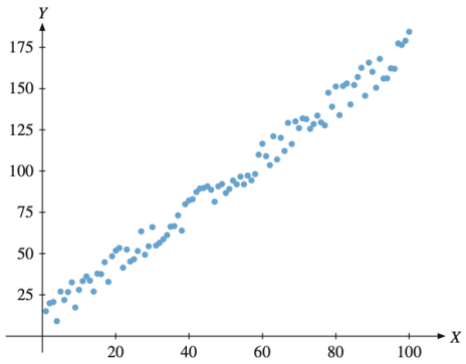

Figure 6 - Large explanatory power (Ubøe, 2017, p. 253).

R^2 ranges between zero and one. One being that changes in the dependent variable is 100% explained by the changes in the independent variable. Figure 4 shows a low explanatory power of only 2,3% (Ubøe, 2017, p. 252). Meaning only 2,3% of changes in the dependent variable can be contributed the independent variable. In Figure 5 the dots are closer together and therefore have a higher explanatory power than Figure 4. The explanatory power of Figure 5 is 30,7% (Ubøe, 2017, p. 252). Lastly, Figure 6 has a large explanatory power of 98,3% (Ubøe, 2017, p. 252). Figures 4 till 6 combined, illustrates how the linear tendency of observations becomes clearer with a larger explanatory power.

However, due to R^2 increasing with the number of independent variables it is not well fit to determine the explanatory power of a multiple linear regression. Adjusted R^2 is more fit as it evaluates the contribution of new independent variables and decreases if the contribution is not significant enough (Johannessen et al., 2020, p. 361). Another difference between the adjusted and regular R^2 is that the adjusted does not have an intuitive interpretation. Therefore, R^2 is used to determine the variance explanation of a model and adjusted R^2 is used to compare models with the same dependent variable and sample (Johannessen et al., 2020, p. 361).

3.3.3. Hypothesis testing

A research question is built to investigate something particular; hypothesis testing helps investigate and determine whether there is a statistical significance (Ubøe, 2017, p. 181). In this study that would be the impact of parent's education on investment behaviour. What the test wishes to uncover is formed as the alternative hypothesis (H_A). To accept the alternative hypothesis the test must reject the null hypothesis (H_0), which represents all other outcomes (Ubøe, 2017, p. 181). In practice the test only examines the null

hypothesis. If the null hypothesis is rejected the alternative hypothesis is automatically accepted. However, if H_0 is not rejected that does not necessarily mean that H_0 is true but rather that the data does not hold sufficient evidence to reject it. The hypothesises of this study are as follows:

H_A: Parents education when the child is 16 does increase the likelihood of investing in securities in the future.
H_0: Parents education when the child is 16 *does not* increase the likelihood of investing in securities in the future.

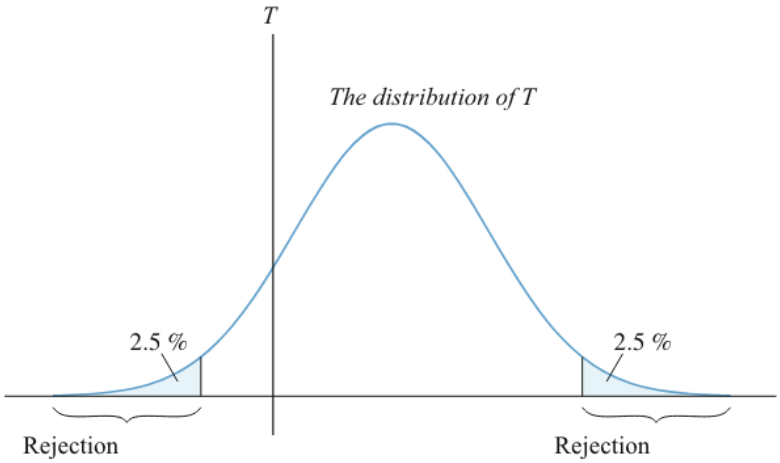

Figure 7 - A normal distribution of observations (Ubøe, 2017, p. 182).

When executing a hypothesis test the observations are assumed to be normally distributed. The normal distribution of observations, as shown in Figure 7, is a symmetrical distribution where the middle is the mean of observations, and each side of the mean contributes to 50% of observations. In practice a hypothesis test is dependent on two concepts: the rejection regions and the test statistic (T) (Ubøe, 2017, p. 178). The rejection regions are the outskirts of the confidence interval. The size of the regions is the significance level, the alfa, which is a standard combined 5% with a confidence interval of 95%. If the T-statistic falls within the significance level the test is confident in rejecting the null hypothesis. However, there are chances of rejecting a true null hypothesis. With a significance level of 5% the study accepts rejecting a null hypothesis 5% of the time. Additionally, the probability value (p-value) is used to determine the probability of observing the results of the study if the null hypothesis is true. The smaller the p-value the less likely it is that the study rejects a true null hypothesis (Ubøe, 2017, p. 179). As a rule

of thumb, the null hypothesis is rejected if the p-value is less or equal to the significance level. Meaning than the p-value in this study should be 0,05 or smaller as a significance level of 5% is used.

4. Data

Collecting data that correctly reflects the reality of what the study wants to research can be hard. This chapter will define and in depth explain the population, sample and variables used in this study. All variables included will be defined and discussed in regard to limitations and adjustments. Lastly, the datasets will be presented with some descriptive statistics relevant for the study.

4.1. Population and sample

This study can be considered a cohort study. The two populations studied are Norwegian Generation X and Millennials, definitions in chapter 1.3. An interesting part of studying different generation is that differences in results may be discussed against historical differences. For clarity before defining the sample, the data source is register data from Statistics Norway. Statistics Norway ensures quality in their databank through following requirements described in the statistics act, section 5 (Statistics Norway, n.d.-a). Therefore, the sample of the study will be all available individuals from Generation X and Millennials in the databank "no.ssb.fdb:23" in microdata. Both samples of this study covered over one million observations.

4.2. Variables

In using microdata there are multiple different variable types. Therefore, it is important to choose what variables to include with care and intention. The dependent variable is constructed as a dummy variable. Whilst there are three variables that are coded into five different independent variables. Every variable considered and used will be explained and discussed in this subchapter. The definition of all variables can be found in microdata's variable overview (Microdata, n.d.-b).

4.2.1. Dependent variable

The goal of the dependent variable in this study is to define whether or not individuals have holdings in securities, not how much they have. To clearly define whether or not the individuals had any investments in securities a dummy was made. The dummy labelled "Securities" was given the value of 1 if ASK + funds + investments > 0. Due to the limited

scope of this study, the study assumes potential savings not kept in securities to be kept in a bank savings account. Following is an in-debt explanation of each variable included in the making of the dummy.

ASK is an acronym for the Norwegian shares savings account. (The Norwegian Tax Administration, n.d.). On the account Norwegian taxpayers can hold equity funds, and shares of companies within EEA[3]. A perk of using an ASK compared to other accounts is that yield is not taxed until withdrawn from the account. Also, deposits are always withdrawn first causing the investors to be able to withdraw their deposits tax free. Withdrawals from the account are taxed according to the Norwegian tax rate on share gains and dividends which is 37,84%. Another perk of having an ASK is that it is possible to sell holdings to "cash" on the account. The cash cannot be used for spending and does not generate any interest. However, it makes it possible to exit the market for a small period and then reinvest without triggering tax. Although the opportunity to hold cash on an ASK is present, it seems reasonable to assume that most of the money kept on ASK is invested. According to Norwegian tax statistics, 546k Norwegians had at least one share savings account in 2019. Therefore, the variable "INNTEKT_ASK_MARK" (ASK) is considered an important contributor to this study.

Another important note to the variable is that both values of zero and missing data are excluded in the original data. Excluding individuals with zero value on an ASK from this analysis would present problems as it eliminates a lot of the sample. Also, not having any value on ASK is relevant to this study and could alter the effects of parents' education. Therefore, all individuals with missing data were included as having 0NOK invested in an ASK, based on the assumption that this will be true for most individuals with missing data. Initially a limitation to the variable was microdata stating it did not include funds on ASK. However, further dialogue with microdata and Statistics Norway confirmed that funds in fact were included. Therefore, it is no longer considered a limitation.

Funds are the variable "INNTEKT_FOND". Funds include holdings on equity-, bond- and money market funds. It is an important variable to include in the study as there are multiple

[3] Being a part of the European Economic Area (EEA) allows Norway, Iceland and Liechtenstein to be a part of the EU`s single market. Government of United Kingdom. (n.d.). *Countries in the EU and EEA*. Retrieved 3rd of May 2024 from https://www.gov.uk/eu-eea

different account types to hold funds on, not just ASK. The values in the variable does not include market value which is okey as this study only takes account for whether or not individuals are invested. Like ASK missing data and no value are excluded from the original variable and was therefore coded in to have a value of 0NOK.

Investments is the variable "INNTEKT_VERDIPAPIR" which include the estimated market value of Norwegian bonds, options, certificates, and shares at the end of the year. Both registered and not registered in the central securities depository. Even though bonds are considered quite risk free, there is a high entry value if not invested through funds. In this thesis the aim is to explore a link between social background and whether one saves in securities or not. Therefore, it is considered to be an important variable to this study. Like the others, excluded in investments were the ones with no value and missing data, which were included to hold 0NOK value.

It is not clearly stated if the data in the variables overlap. However, it would not alter the results of this study. If any investments were to be counted twice the individual would have a value of 1, just like all others with security investments, regardless of the amount invested. Also, due to securities being a dummy with a value of 0 or 1 it was not transformed into a natural logarithm despite the tendency of the variables included to have high variances between observations.

Generation X			
Variables	**Average**	**Standard error**	**Observations**
Securities	0,231	0,421	1976361

Table 2 - Summary of the dummy variable securities Generation X

Millennials			
Variables	**Average**	**Standard error**	**Observations**
Securities	0,206	0,405	2169666

Table 3 - Summary of the dummy variable securities Millennials.

When performing a summary of the dummy it is clear that only approximately 20% of both samples have some value in securities. This indicates high differences where only approximately 1/5th take advantage of investing in securities. Seeing whether or not parents' education increases the chances of saving in securities, will therefore be

interesting when remembering the historic yield differences illustrated in chapter 2.4. As this historically this would pose some advantages financially.

4.2.2. Independent variables

Households' income is the variable "INNTEKT_HUSH_IES_EU" which include the households net income divided by each consumption unit in the household. The division is done according to the EU equivalence scale where a household consisting of a child and two adults equal 1,8 consumption units. Keynes defined savings as what is left of income after consumption (Keynes & Krugman, 2007, p. 63). The way the variable adjusts the income to the amount of consumption units in the household therefore seems highly relevant to what possibilities the household have to save. In determining the control variable, gross assets were also considered as some don't need to work due to a surplus of assets and others might be students living with flat mates having a low income. However, as only a small fraction of people have that kind of surplus and the variable corrects for low-income, households' income was deemed the most appropriate variable.

Furthermore, due to income level often growing exponentially and having a strong variance between individuals there can be an asymmetrical distribution of data. Hypothesis testing assumes the data to be normally distributed this can be problematic. Therefore, households' income was transformed into the natural logarithm of households' income to adjust the ones with higher income closer to the average. Individuals with missing income data was not included with the value of 0NOK as this seems unreasonable to assume and would only drag the distribution closer to a lower value. This change left the distribution more symmetrical towards high income and is illustrated in Figure 8 and Figure 9 below.

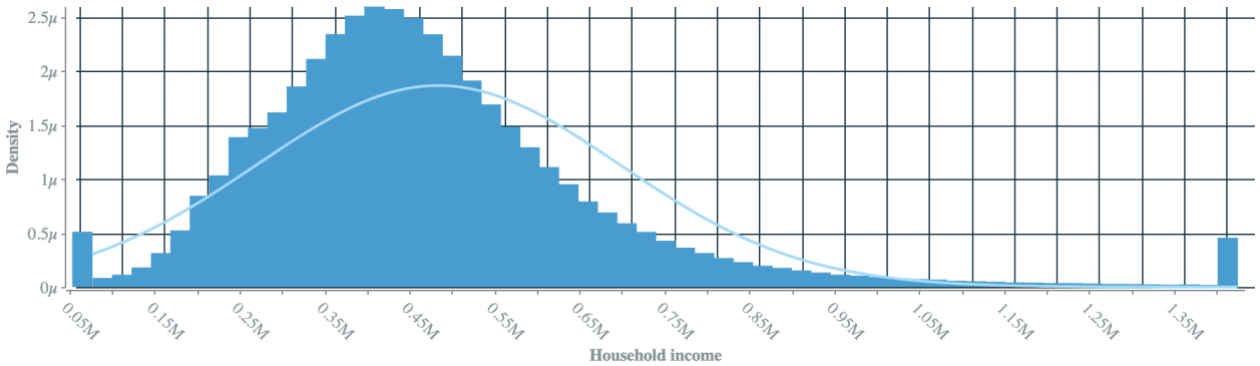

Figure 8 - The normal distribution of households' income.

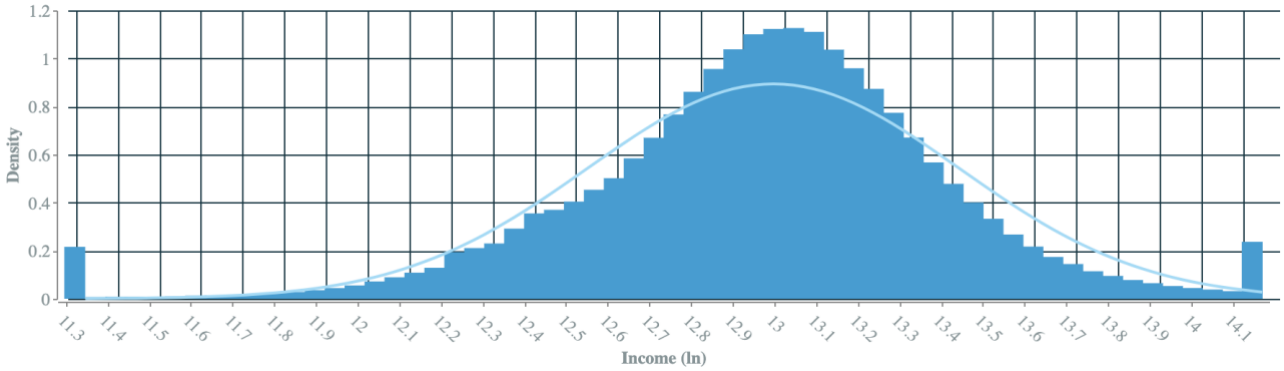

Figure 9 - The normal distribution of households' income (ln).

Furthermore, as a measurement of social background this study uses parents' highest education. Microdata divides parents' education in two variables: mothers' education and fathers' education. The variables are "NUDB_NUS2000_MOR_16" imported as "Mother16" and "NUDB_NUS2000_FAR_16" imported as "Father16". The reason these variables are convenient indications of social background is that they state the highest education when their child, the individuals in Generation X and Millennials, were 16 years old. Thus, leaving only the education of their parents from their childhood, indicating their social background.

Furthermore, as this study only wants to look at the effects of higher education the variables were made in to separate dummies according to Norwegian standard (Statistics Norway, n.d.-c). Group six, bachelor's education, was made into the variables "Bachelor mother" and "Bachelor father", while seven and eight, master and PhD, were combined into the variables "Master mother" and "Master father". The two groups were combined as very few have PhDs. A limitation of this study is that it does not separate between higher education that directly addresses economics and the ones who do not. Unlike the variables included in the dependent variable, the study could not justify assuming the individuals with missing data to not have higher education. Therefore, they were not included in the dataset.

4.3. Datasets

The study consists of two datasets: Generation X and Millennials. Following are important notes on each dataset as well as descriptive statistics for each. To specify the generations in the dataset birthyear was imported and kept if within the range of the generation. All

variables in both datasets were imported with data collected at the end of 2020. This was done to align all the variables timewise.

The sample of Generation X ended up being approximately 1,15million where 62% are men and 38% are women. The sample of Millennials ended up being approximately 1,16million where 58% are men and 42% are women. The lower representation of women is either due to a lack of data, or simply due to a higher rate of men in the generations.

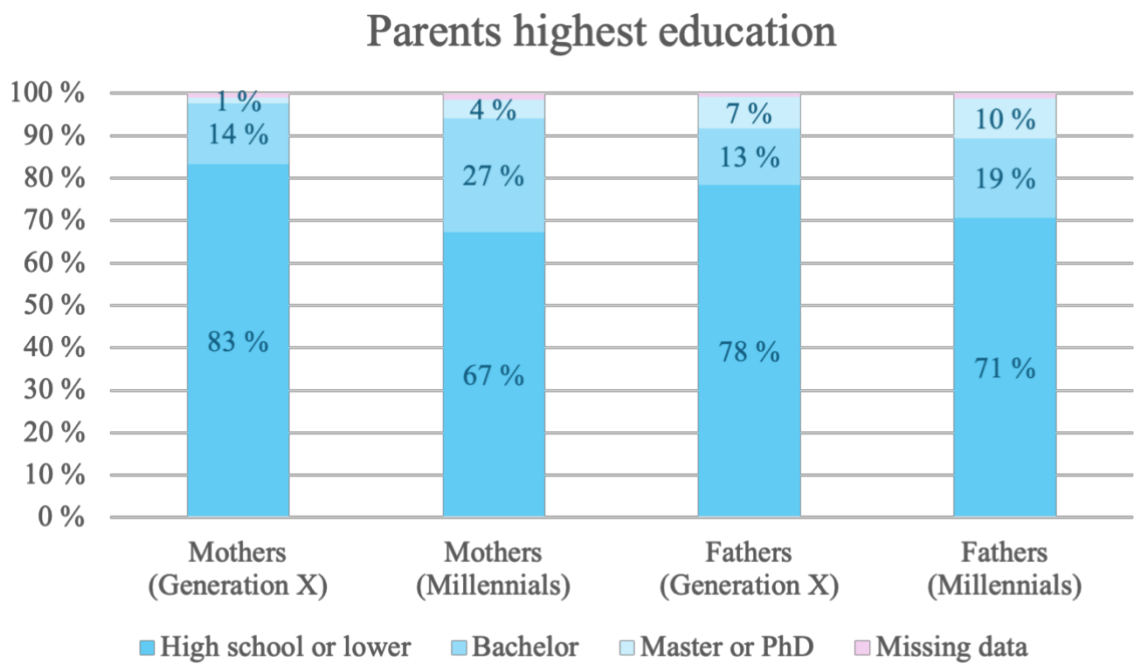

Figure 10 - Higher education: comparing parents of Generation X and Millennials

When comparing the parents of the two generations in Figure 10 it is clear that a higher percentage of mothers and fathers of Millennials have higher education than mothers and fathers of Generation X. However, the growth rate of education between mothers and fathers are skewed. While the percentage of mothers with higher education have doubled from 15% to 31%, the percentage of fathers with higher education has only increased from 20% to 29%. The steeper increase of mothers' education was expected due to the women's rights movement mentioned in the introduction.

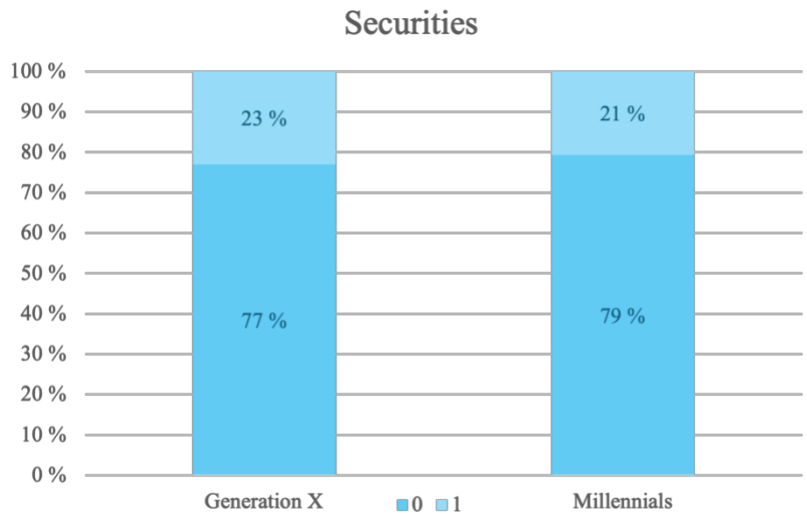

Figure 11 - Distribution: Securities dummy.

Relevant to this study is the percentage of the samples with and without securities. In both generations only ≈ 20% have some value in securities. Leaving ≈ 80% without. As mentioned, this study will assume those 80% to hold savings in a bank account if they have any. Some explanations for Millennials being less invested in securities could be the economic environment they grew up in as well as their current age. Growing up Millennials were exposed to a quite unstable economic environment. One of them being the 2008 financial crisis where the oldest were 27 and the youngest were 12. As illustrated in Figure 2, chapter 2, OSEBX spent approximately five years recovering from the financial crisis of 2008. It seems fairly reasonable to consider experiencing such economic uncertainties at a young age to have an impact on attitudes toward more volatile saving methods. Furthermore, it is important to consider their age now. Millennials in 2020 were between 39 and 24 years old. A period often characterized by studies, establishing a home and expecting children; all requiring spending capital reducing the opportunity to save capital.

5. Results & Discussion

The aim of this study was to examine a possible correlation between parents' education and future investment behaviour. Following are the results and discussions of the regression analyses. Firstly, the results are illustrated in the form of tables, then the results will be discussed in subchapter 5.3

5.1. Multiple linear regressions Generation X

Generation X									
	Securities	**Std. error**	**t**	**P-value**	**[95% Conf.**	**interval]**		Observations:	1159092
Income (ln)	0,119	0,001	212,638	0	0,118	0,12		F(3, 1088445):	21813,39
Bachelor father	0,134	0,001	91,594	0	0,131	0,137		R^2:	0,053
Master father	0,165	0,002	85,061	0	0,162	0,169		Adjusted R^2:	0,053
Constant	-1,151	0,007	-158,611	0	-1,165	-1,136		Root MSE:	0,48

Table 4 - Multiple linear regression: Generation X, fathers' education

Generation X									
	Securities	**Std. error**	**t**	**P-value**	**[95% Conf.**	**interval]**		Observations:	1159092
Income (ln)	0,121	0,001	216,639	0	0,12	0,123		F(3, 1088445):	20479,401
Bachelor mother	0,137	0,001	97,172	0	0,134	0,14		R^2:	0,05
Master mother	0,163	0,004	36,591	0	0,154	0,172		Adjusted R^2:	0,05
Constant	-1,173	0,007	-161,636	0	-1,187	-1,159		Root MSE:	0,48

Table 5 - Multiple linear regression: Generation X, mothers' education.

5.2. Multiple linear regressions Millennials

Millennials									
	Securities	**Std. error**	**t**	**P-value**	**[95% Conf.**	**interval]**		Observations:	1165282
Income (ln)	0,084	0	181,594	0	0,083	0,085		F(3, 1235919):	19577,865
Bachelor father	0,143	0,001	114,912	0	0,141	0,146		R^2:	0,048
Master father	0,177	0,002	104,859	0	0,174	0,18		Adjusted R^2:	0,048
Constant	-0,744	0,006	-126,239	0	-0,756	-0,733		Root MSE:	0,468

Table 6 - Multiple linear regression: Millennials, fathers' education

Millennials									
	Securities	**Std. error**	**t**	**P-value**	**[95% Conf.**	**interval]**		Observations:	1165282
Income (ln)	0,084	0	181,207	0	0,083	0,085		F(3, 1235919):	19904,322
Bachelor mother	0,147	0,001	137,815	0	0,145	0,149		R^2:	0,049
Master mother	0,178	0,002	73,563	0	0,174	0,183		Adjusted R^2:	0,049
Constant	-0,746	0,006	-126,539	0	-0,757	-0,734		Root MSE:	0,468

Table 7 - Multiple linear regression: Millennials, mothers' education

5.3. Discussion

The alternative hypothesis is automatically accepted across all models as the p-values are close to zero. In other words, parents' education level is correlated with whether or not their children later invest in securities. The effects of parents' education on whether or not Generation X and Millennials invest in securities is presented in Table 8.Table 8 - Coefficients of the regressions

Higher education	Generation X	Millennials
Bachelor father	13,4 %	14,3 %
Master father	16,5 %	17,7 %
Bachelor mother	13,7 %	14,7 %
Master mother	16,3 %	17,8 %

Table 8 - Coefficients of the regressions

In Generation X the effect of a father's bachelor is 13,4%, while the effect of a mother's bachelor is slightly higher at 13,7%. The effects of a master or PhD on Generation X is also quite similar between the parents, where fathers have an effect of 16,5%, and mothers have an effect of 16,3%. Overall, the data suggests that Generation X are 13,4-16,5% more likely to invest in securities if their parents had higher education when they were 16 years old. Although they were born at the start of and during the change in family dynamic, the effects of mother`s and father`s education is unexpectedly quite alike.

For Millennials, the effects are slightly higher than Generation X. The effect of a father and mother with a bachelor increases the probability of investing in securities by 14,3% and 14,7%. The data determines the effect of a master or PhD for fathers and mothers in the generation to be 17,7% and 17,8%. Overall, mothers' education had a slightly larger effect than fathers' education. However, like with Generation X, there is no drastic difference between the mother and fathers' education. Lusardi et.al. (2010) and Kardash et.al. (2023) highlighted mothers' education to be a significant contributor to the financial socialization of children or young adults. Although this study, except for Generation X masters, found mothers education to have a slightly larger effect than fathers' education, it does not significantly stand out.

When compared to Generation X less Millennials hold securities, more of their parents have higher education and the likelihood of them holding securities is slightly more

affected by their parents' education. These findings could indicate increased social differences in saving methods. Which is somewhat unexpected due to the digitalisation of investing. Although, this study cannot conclude on increased social differences, it could be an interesting path for future studies. Also, the smaller percentage of millennials investing in securities compared to Generation X could be attributed to the period of their life, as mentioned in chapter 4.3.

Furthermore, a larger income increases the probability of investing in securities. However, the impact is greater for Generation X than Millennials. Overall, this indicates economic status to be less important for Millennials in whether or not they invest in securities, whilst social background is indicated to have a greater impact for Millennials.

There are some limitations to the study. Firstly, the study does not decipher between education types. Lusardi`s (2012) research on numeracy, financial literacy, and financial decision-making could be a base for future studies where one could focus on the impact of parents with mathematical heavy educations such as engineers and economics. The result of this study showed statistically significant results when looking at all higher educations. Therefore, it would be interesting to see whether the effects increase when parents have relevant education. Furthermore, the study only shows whether or not the individuals have any value invested in securities. A future study could include savings in a bank account to find the weight of savings invested in securities and then study how this relationship is affected by parents' education. Lastly, this study had a low explanatory power. A study of a larger scope could add more variables such as their own education, geographic location, ethnicity and sex to get a better reflection of reality. Also, in a study with a larger scope, Torvik et.al. (2020) could be a base for research on the effects of mental health on saving habits.

6. Conclusion

The research question explored in this cohort study was "*Is there a correlation between parents' education and whether or not Generation X and Millennials invest in securities*?" To answer the research question microdata was used in performing different multiple linear regressions. The method was effective in acquiring a large sample of approximately 1million individuals for both cohorts. However, the explanatory power of the models were quite low with values of ≈ 5%. In both cohorts the analysis found there to be statistically significant proof of a correlation between their parents' education and whether or not they invest in securities. If parents had higher education when Millennials were 16 years old, they are 14,3-17,8% more likely to invest in securities as adults. Generation X are 13,4-16,5% more likely to invest in securities if their parent had higher education when they were 16 years old. These results indicates there to be somewhat social differences between children born of academic parents and children of non-academic parents. Therefore, one could argue increased focus on financial knowledge in school curriculums to be beneficial in smoothing out differences.

With this study illustrating parents' education as a factor in whether or not Generation X and Millennials invest in securities, it also raises questions of how relevant other variables are. To better reflect reality future studies could include other variables, such as parents' education field and the samples own education. Assuming there to be differences from the type of educations held by parents and themselves it would be interesting to do more detailed studies. Based on Lusardi's study (2012) on numeracy and financial literacy one could examine the impact of children of parents with mathematical and financial educations opposed to other educations. Expanding on that it would be interesting to see the weight of savings invested in securities opposed to in a bank account and how different factors such as education, sex, ethnicity and geographical area effects the relationship. Lastly, due to the slightly increase in effect of parents' education between the generations it could be interesting to later study the impact on future generations to see if they are more or less effected by parents' education.

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Illustrations

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Equations

Tables

Appendix

Excel results

	A	B	C	D	E	F
1						
2	Inflation 2000-2023	77 %		1		
3						
4	***Calculations***			***Graphs***		
5		OSEBX	The policy rate	Figure 1	OSEBX	The policy rate
6	Deposit	kr 50 000	kr 50 000	Result	kr 394 276	kr 89 591
7	Return	689 %	79 %	Yield	kr 344 276	kr 39 591
8	**Result**	**kr 394 276**	**kr 89 591**	Net yield	kr 214 002	kr 30 881
9	**Yield**	**kr 344 276**	**kr 39 591**			
10	Tax	37,84 %	22 %	Figure 3	OSEBX	The policy rate
11	**Net yield**	**kr 214 002**	**kr 30 881**	Purchasing p.	kr 305 776	kr 1 091
12	Inflation	kr 88 500	kr 88 500	PP - tax and inflation	kr 175 502	kr (7 619)
13	**Purchasing power**	**kr 305 776**	**kr 1 091**			
14	**Purchasing power**	**kr 175 502**	**kr (7 619)**			
15	**after tax and**					
16						
17	***The policy rate***			***Bloomberg data***		
18	Year	Rate	Result	Security	OSEBX Index	
19	2000	7,00 %	kr 53 500	Start Date	31.12.1996	
20	2001	6,50 %	kr 56 978	End Date	29.12.2023	
21	2002	6,50 %	kr 60 681	Period	Y	
22	2003	2,25 %	kr 62 046	Currency	NOK	
23	2004	1,75 %	kr 63 132	Date	PX_LAST	
24	2005	2,25 %	kr 64 553	29.12.2023	1 306,61	
25	2006	3,50 %	kr 66 812	30.12.2022	1 189,00	
26	2007	5,25 %	kr 70 320	31.12.2021	1 201,43	
27	2008	3,00 %	kr 72 429	31.12.2020	973,97	
28	2009	1,75 %	kr 73 697	31.12.2019	931,45	
29	2010	2,00 %	kr 75 171	31.12.2018	799,46	
30	2011	1,75 %	kr 76 486	29.12.2017	814,45	
31	2012	1,50 %	kr 77 633	30.12.2016	683,87	
32	2013	1,50 %	kr 78 798	31.12.2015	610,26	
33	2014	1,25 %	kr 79 783	31.12.2014	576,04	
34	2015	0,75 %	kr 80 381	31.12.2013	548,86	
35	2016	0,50 %	kr 80 783	31.12.2012	444,09	
36	2017	0,50 %	kr 81 187	30.12.2011	384,95	
37	2018	0,75 %	kr 81 796	31.12.2010	439,72	
38	2019	1,50 %	kr 83 023	31.12.2009	371,56	
39	2020	0,00 %	kr 83 023	31.12.2008	225,48	
40	2021	0,50 %	kr 83 438	31.12.2007	490,81	
41	2022	2,75 %	kr 85 733	29.12.2006	440,36	
42	**2023**	**4,50 %**	**kr 89 591**	30.12.2005	332,51	
43				31.12.2004	236,70	
44				31.12.2003	170,97	
45				31.12.2002	115,21	
46				31.12.2001	167,18	
47				29.12.2000	195,79	
48				31.12.1999	189,76	
49				31.12.1998	127,83	
50				31.12.1997	175,07	
51				31.12.1996	132,43	

Excel calculations

	A	B	C	D	E	F
1						
2	Inflation 2000-2023	0,77	1			
3						
4		***Calculations***			***Graphs***	
5		OSEBX	The policy rate	Figure 1	OSEBX	The policy rate
6	Deposit	50000	50000	=A8	=B8	=C8
7	Return	=E24/E48	=C8/C6-C2	=A9	=B9	=C9
8	**Result**	**=B6*(C2+B7)**	**=C42**	=A11	=B11	=C11
9	**Yield**	**=B8-B6**	**=C8-C6**			
10	Tax	0,3784	0,22	Figure 3	OSEBX	The policy rate
11	**Net yield**	**=B9*(C2-B10)**	**=C9*(C2-C10)**	Purchasing p.	=B13	=C13
12	Inflation	=B6*(C2+B2)	=C6*(C2+B2)	PP - tax and infl	=B14	=C14
13	**Purchasing power**	**=B8-B12**	**=C8-C12**			
14	**Purchasing power**					
15	**after tax and**	**=(B11+B6)-B12**	**=(C11+C6)-C12**			
16						
17		***The policy rate***		***Bloomberg data***		
18	Year	Rate	Result	Security	OSEBX Index	
19	2000	0,07	=C6*(B19+C2)	Start Date	35430	
20	2001	0,065	=C19*(C2+B20)	End Date	45289	
21	2002	0,065	=C20*(C2+B21)	Period	Y	
22	2003	0,0225	=C21*(C2+B22)	Currency	NOK	
23	2004	0,0175	=C22*(C2+B23)	Date	PX_LAST	
24	2005	0,0225	=C23*(C2+B24)	45289	1306,61	
25	2006	0,035	=C24*(C2+B25)	44925	1189	
26	2007	0,0525	=C25*(C2+B26)	44561	1201,43	
27	2008	0,03	=C26*(C2+B27)	44196	973,97	
28	2009	0,0175	=C27*(C2+B28)	43830	931,45	
29	2010	0,02	=C28*(C2+B29)	43465	799,46	
30	2011	0,0175	=C29*(C2+B30)	43098	814,45	
31	2012	0,015	=C30*(C2+B31)	42734	683,87	
32	2013	0,015	=C31*(C2+B32)	42369	610,26	
33	2014	0,0125	=C32*(C2+B33)	42004	576,04	
34	2015	0,0075	=C33*(C2+B34)	41639	548,86	
35	2016	0,005	=C34*(C2+B35)	41274	444,09	
36	2017	0,005	=C35*(C2+B36)	40907	384,95	
37	2018	0,0075	=C36*(C2+B37)	40543	439,72	
38	2019	0,015	=C37*(C2+B38)	40178	371,556	
39	2020	0	=C38*(C2+B39)	39813	225,481	
40	2021	0,005	=C39*(C2+B40)	39447	490,808	
41	2022	0,0275	=C40*(C2+B41)	39080	440,358	
42	**2023**	**0,045**	**=C41*(C2+B42)**	38716	332,509	
43				38352	236,703	
44				37986	170,971	
45				37621	115,21	
46				37256	167,18	
47				36889	195,791	
48				36525	189,762	
49				36160	127,827	
50				35795	175,07	
51				35430	132,428	

Bachelor appendix

```
GenerationX» create-dataset GenerationX
```

Et tomt dataset, ***GenerationX*** ble opprettet og valgt

```
GenerationX» require no.ssb.fdb:23 as db
```

Opprettet en kobling fra ***no.ssb.fdb:23*** til ***db***

```
GenerationX» import db/BEFOLKNING_FOEDSELS_AAR_MND as birthyear
```

Importerte ***BEFOLKNING_FOEDSELS_AAR_MND*** som ***birthyear*** til ***GenerationX*** med 11 089 163 enheter

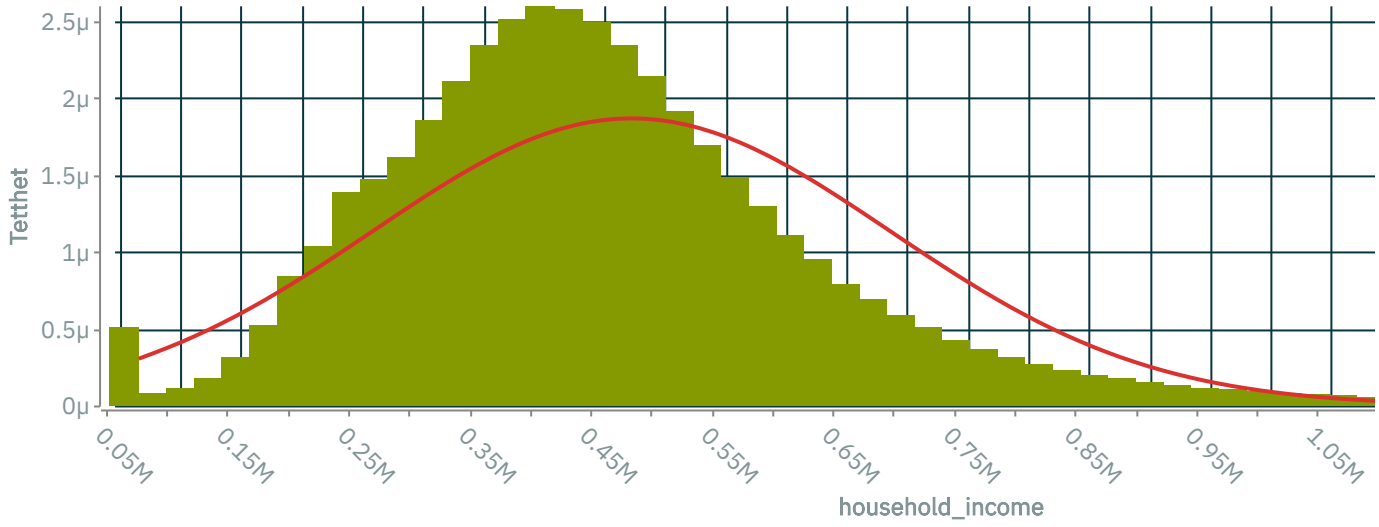
```
GenerationX» keep if birthyear > 196412 & birthyear < 198101
```

8 978 386 enheter ble fjernet fra datasettet.

```
GenerationX» import db/INNTEKT_HUSH_IES_EU 2020-12-31 as household_income
```

Importerte ***INNTEKT_HUSH_IES_EU*** på datoen ***2020-12-31*** som ***household_income*** til ***GenerationX*** med 2 110 777 enheter, hvorav 949 443 missingverdier

```
GenerationX» histogram household_income, normal
```



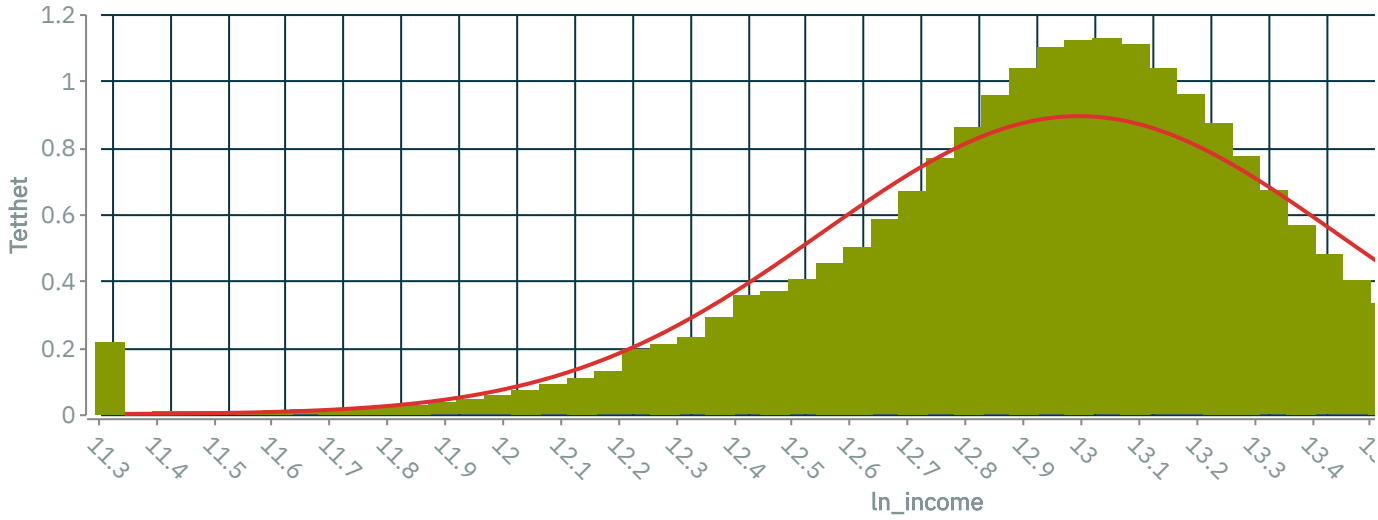

```
GenerationX» generate ln_income =0
```

Genererte ***ln_income*** med 2 110 777 enheter

```
GenerationX» replace ln_income = ln(household_income)
```

Byttet ut verdier i ***ln_income*** med 2 110 777 enheter

```
GenerationX» histogram ln_income, normal
```




```
GenerationX» import db/INNTEKT_ASK_MARK 2020-12-31 as ASK
```

Importerte ***INNTEKT_ASK_MARK*** på datoen ***2020-12-31*** som ***ASK*** til ***GenerationX*** med 2 110 777 enheter, hvorav 1 899 069 missingverdier

```
GenerationX» replace ASK = 0 if sysmiss(ASK)
```

Byttet ut verdier i ***ASK*** med 2 110 777 enheter

```
GenerationX» import db/INNTEKT_FOND 2020-12-31as funds
```

Importerte ***INNTEKT_FOND*** på datoen ***2020-12-31*** som ***funds*** til ***GenerationX*** med 2 110 777 enheter, hvorav 1 838 374 missingverdier

```
GenerationX» replace funds = 0 if sysmiss(funds)
```

Byttet ut verdier i ***funds*** med 2 110 777 enheter

```
GenerationX» import db/INNTEKT_VERDIPAPIR 2020-12-31as investments
```

Importerte ***INNTEKT_VERDIPAPIR*** på datoen ***2020-12-31*** som ***investments*** til ***GenerationX*** med 2 110 777 enheter, hvorav 1 909 440 missingverdier

```
GenerationX» replace investments = 0 if sysmiss(investments)
```

Byttet ut verdier i ***investments*** med 2 110 777 enheter

```
GenerationX» import db/NUDB_NUS2000_MOR_16 as Mother16
```

Importerte ***NUDB_NUS2000_MOR_16*** som ***Mother16*** til ***GenerationX*** med 2 110 777 enheter, hvorav 1 131 016 missingverdier

```
GenerationX» import db/NUDB_NUS2000_FAR_16 as Father16
```

Importerte ***NUDB_NUS2000_FAR_16*** som ***Father16*** til ***GenerationX*** med 2 110 777 enheter, hvorav 1 144 103 missingverdier

```
GenerationX» generate bachelor_mother = 0
```

Genererte ***bachelor_mother*** med 2 110 777 enheter

```
GenerationX» generate bachelor_father = 0
```

Genererte ***bachelor_father*** med 2 110 777 enheter

```
GenerationX» replace bachelor_mother = 1 if inrange(Mother16,'601199','699999')
```

Byttet ut verdier i ***bachelor_mother*** med 2 110 777 enheter

```
GenerationX» replace bachelor_father = 1 if inrange(Father16,'601199','699999')
```

Byttet ut verdier i ***bachelor_father*** med 2 110 777 enheter

```
GenerationX» generate master_mother = 0
```

Genererte ***master_mother*** med 2 110 777 enheter

```
GenerationX» generate master_father = 0
```

Genererte ***master_father*** med 2 110 777 enheter

```
GenerationX» replace master_mother = 1 if inrange(Mother16,'701199','899999')
```

Byttet ut verdier i ***master_mother*** med 2 110 777 enheter

```
GenerationX» replace master_father = 1 if inrange(Father16,'701199','899999')
```

Byttet ut verdier i ***master_father*** med 2 110 777 enheter

```
GenerationX» import db/BEFOLKNING_KJOENN as gender
```

Importerte ***BEFOLKNING_KJOENN*** som ***gender*** til ***GenerationX*** med 2 110 777 enheter

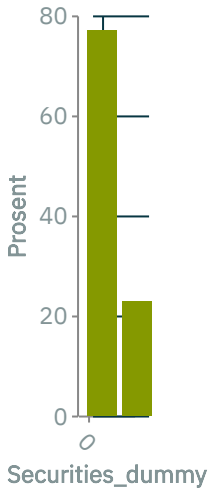
```
GenerationX» generate Securities_dummy = 0
```

Genererte ***Securities_dummy*** med 2 110 777 enheter

```
GenerationX» replace Securities_dummy = 1 if ASK + funds + investments > 0
```

Byttet ut verdier i ***Securities_dummy*** med 2 110 777 enheter

```
GenerationX» histogram Securities_dummy, percent
```




```
GenerationX» summarize Securities_dummy, gini
```

Variabel	Gj.snitt	Std.avvik	Antall	1%	25%	50%	75%	99%	Gini
Securities_dummy	0.2293	0.4204	2110777	0	0	0	0	1	0.7707

```
GenerationX» summarize ln_income, gini
```

Variabel	Gj.snitt	Std.avvik	Antall	1%	25%	50%	75%	99%	Gini
ln_income	12.9735	0.4455	1159090	11.3	12.7	13	13.2	14.2	0.0186

```
GenerationX» tabulate gender, cellpct
```

gender	
1 - Mann	61.54
2 - Kvinne	38.46
Total	*100*

```
GenerationX» generate education_level_mother=substr(Mother16, 1,1)
```

Genererte ***education_level_mother*** med 2 110 777 enheter, hvorav 1 131 016 missingverdier

```
GenerationX» generate education_level_father=substr(Father16, 1,1)
```

Genererte ***education_level_father*** med 2 110 777 enheter, hvorav 1 144 103 missingverdier

```
GenerationX» destring education_level_mother
```

Konverterte ***education_level_mother*** til tallverdier i ny variabel

```
GenerationX» destring education_level_father
```

Konverterte ***education_level_father*** til tallverdier i ny variabel

```
GenerationX» define-labels utdlabel 0"Ingen" 1"Elementary school" 2"Secondary school" 3"Highschool"
4"Finished school" 5"Påbygg til videregående" 6"Higher education - lower" 7"Higher education - upper"
8"PHD" 9"Missing"
```

Opprettet kodelisten ***utdlabel*** med 10 etiketter

```
GenerationX» assign-labels education_level_mother utdlabel
```

Tilegnet kodelisten ***utdlabel*** til variabelen ***education_level_mother***

```
GenerationX» assign-labels education_level_father utdlabel
```

Tilegnet kodelisten ***utdlabel*** til variabelen ***education_level_father***

```
GenerationX» tabulate education_level_mother, cellpct
```

education_level_mother	
0 - Ingen	0.22
1 - Elementary school	0.3
2 - Secondary school	33.84
3 - Highschool	40.79
4 - Finished school	6.57
5 - Påbygg til videregående	1.51
6 - Higher education - lower	14.41
7 - Higher education - upper	1.26
8 - PHD	0.07
9 - Missing	1.03
Total	*100*

```
GenerationX» tabulate education_level_father, cellpct
```

education_level_father	
0 - Ingen	0.14
1 - Elementary school	0.22
2 - Secondary school	28.66
3 - Highschool	30.19
4 - Finished school	16.42
5 - Påbygg til videregående	2.8
6 - Higher education - lower	13.32
7 - Higher education - upper	6.75
8 - PHD	0.55
9 - Missing	0.95
Total	*100*

```
GenerationX» regress Securities_dummy ln_income bachelor_father master_father
```

Kilde	SS	df	MS
Modell	15048.3	3	5016.11
Residual	2.6653919×10^{5}	1.15909×10^{6}	0.22995
Total	2.8158752×10^{5}	1.159093×10^{6}	0.24293

Antall Obs:	1159092
F(3, 1159090):	21813.38973
R²:	0.05344
Justert R²:	0.05343
Root MSE:	0.47953

Securities_dummy	Coef.	Std.feil	t	P>|t|	[95% Konf.	intervall]
ln_income	0.11925	0.00056	212.638	0	0.11815	0.12035
bachelor_father	0.13428	0.00146	91.5941	0	0.1314	0.13715
master_father	0.16541	0.00194	85.061	0	0.1616	0.16922
Konst	-1.15051	0.00725	-158.61	0	-1.16472	-1.13629

```
GenerationX» regress Securities_dummy ln_income bachelor_mother master_mother
```

Kilde	SS	df	MS
Modell	14174.3	3	4724.79
Residual	2.6741314×10^{5}	1.15909×10^{6}	0.23071
Total	2.8158752×10^{5}	1.159093×10^{6}	0.24293

Antall Obs:	1159092
F(3, 1159090):	20479.401436
R²:	0.05033
Justert R²:	0.05033
Root MSE:	0.48032

Securities_dummy	Coef.	Std.feil	t	P>|t|	[95% Konf.	intervall]
ln_income	0.12146	0.00056	216.639	0	0.12036	0.12255
bachelor_mother	0.13685	0.0014	97.1723	0	0.13409	0.13961
master_mother	0.16314	0.00445	36.5905	0	0.1544	0.17188
Konst	-1.17299	0.00725	-161.636	0	-1.18721	-1.15877

```
Millennials» create-dataset Millennials
```

Et tomt dataset, ***Millennials*** ble opprettet og valgt

```
Millennials» require no.ssb.fdb:23 as db
```

Opprettet en kobling fra ***no.ssb.fdb:23*** til ***db***

```
Millennials» import db/BEFOLKNING_FOEDSELS_AAR_MND as birthyear
```

Importerte ***BEFOLKNING_FOEDSELS_AAR_MND*** som ***birthyear*** til ***Millennials*** med 11 089 163 enheter

```
Millennials» keep if birthyear > 198012 & birthyear < 199701
```

9 053 912 enheter ble fjernet fra datasettet.

```
Millennials» import db/INNTEKT_HUSH_IES_EU 2020-12-31 as household_income
```

Importerte ***INNTEKT_HUSH_IES_EU*** på datoen ***2020-12-31*** som ***household_income*** til ***Millennials*** med 2 035 251 enheter, hvorav 868 549 missingverdier

```
Millennials» generate ln_income =0
```

Genererte ***ln_income*** med 2 035 251 enheter

```
Millennials» replace ln_income = ln(household_income)
```

Byttet ut verdier i ***ln_income*** med 2 035 251 enheter

```
Millennials» import db/INNTEKT_ASK_MARK 2020-12-31 as ASK
```

Importerte ***INNTEKT_ASK_MARK*** på datoen ***2020-12-31*** som ***ASK*** til ***Millennials*** med 2 035 251 enheter, hvorav 1 805 505 missingverdier

```
Millennials» replace ASK = 0 if sysmiss(ASK)
```

Byttet ut verdier i ***ASK*** med 2 035 251 enheter

```
Millennials» import db/INNTEKT_FOND 2020-12-31as funds
```

Importerte ***INNTEKT_FOND*** på datoen ***2020-12-31*** som ***funds*** til ***Millennials*** med 2 035 251 enheter, hvorav 1 820 237 missingverdier

```
Millennials» replace funds = 0 if sysmiss(funds)
```

Byttet ut verdier i ***funds*** med 2 035 251 enheter

```
Millennials» import db/INNTEKT_VERDIPAPIR 2020-12-31as investments
```

Importerte ***INNTEKT_VERDIPAPIR*** på datoen ***2020-12-31*** som ***investments*** til ***Millennials*** med 2 035 251 enheter, hvorav 1 908 127 missingverdier

```
Millennials» replace investments = 0 if sysmiss(investments)
```

Byttet ut verdier i ***investments*** med 2 035 251 enheter

```
Millennials» import db/NUDB_NUS2000_MOR_16 as Mother16
```

Importerte ***NUDB_NUS2000_MOR_16*** som ***Mother16*** til ***Millennials*** med 2 035 251 enheter, hvorav 1 082 533 missingverdier

```
Millennials» import db/NUDB_NUS2000_FAR_16 as Father16
```

Importerte ***NUDB_NUS2000_FAR_16*** som ***Father16*** til ***Millennials*** med 2 035 251 enheter, hvorav 1 101 967 missingverdier

```
Millennials» generate bachelor_mother = 0
```

Genererte ***bachelor_mother*** med 2 035 251 enheter

```
Millennials» generate bachelor_father = 0
```

Genererte ***bachelor_father*** med 2 035 251 enheter

```
Millennials» replace bachelor_mother = 1 if inrange(Mother16,'601199','699999')
```

Byttet ut verdier i ***bachelor_mother*** med 2 035 251 enheter

```
Millennials» replace bachelor_father = 1 if inrange(Father16,'601199','699999')
```

Byttet ut verdier i ***bachelor_father*** med 2 035 251 enheter

```
Millennials» generate master_mother = 0
```

Genererte ***master_mother*** med 2 035 251 enheter

```
Millennials» generate master_father = 0
```

Genererte ***master_father*** med 2 035 251 enheter

```
Millennials» replace master_mother = 1 if inrange(Mother16,'701199','899999')
```

Byttet ut verdier i ***master_mother*** med 2 035 251 enheter

```
Millennials» replace master_father = 1 if inrange(Father16,'701199','899999')
```

Byttet ut verdier i ***master_father*** med 2 035 251 enheter

```
Millennials» import db/BEFOLKNING_KJOENN as gender
```

Importerte ***BEFOLKNING_KJOENN*** som ***gender*** til ***Millennials*** med 2 035 251 enheter

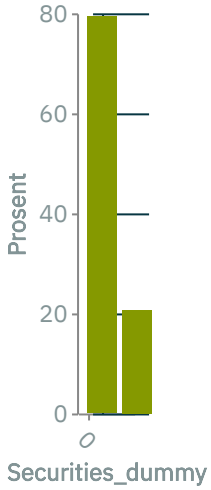
```
Millennials» generate Securities_dummy = 0
```

Genererte ***Securities_dummy*** med 2 035 251 enheter

```
Millennials» replace Securities_dummy = 1 if ASK + funds + investments >0
```

Byttet ut verdier i ***Securities_dummy*** med 2 035 251 enheter

```
Millennials» histogram Securities_dummy, percent
```




```
Millennials» summarize Securities_dummy, gini
```

Variabel	Gj.snitt	Std.avvik	Antall	1%	25%	50%	75%	99%	Gini
Securities_dummy	0.2064	0.4047	2035251	0	0	0	0	1	0.7936

```
Millennials» summarize ln_income, gini
```

Variabel	Gj.snitt	Std.avvik	Antall	1%	25%	50%	75%	99%	Gini
ln_income	12.7925	0.56	1165273	9.98	12.6	12.9	13.1	13.8	0.0217

```
Millennials» tabulate gender, cellpct
```

gender	
1 - Mann	57.75
2 - Kvinne	42.25
Total	*100*

```
Millennials» generate education_level_mother=substr(Mother16, 1,1)
```

Genererte ***education_level_mother*** med 2 035 251 enheter, hvorav 1 082 533 missingverdier

```
Millennials» generate education_level_father=substr(Father16, 1,1)
```

Genererte ***education_level_father*** med 2 035 251 enheter, hvorav 1 101 967 missingverdier

```
Millennials» destring education_level_mother
```

Konverterte ***education_level_mother*** til tallverdier i ny variabel

```
Millennials» destring education_level_father
```

Konverterte ***education_level_father*** til tallverdier i ny variabel

```
Millennials» assign-labels education_level_mother utdlabel
```

Tilegnet kodelisten ***utdlabel*** til variabelen ***education_level_mother***

```
Millennials» assign-labels education_level_father utdlabel
```

Tilegnet kodelisten ***utdlabel*** til variabelen ***education_level_father***

```
Millennials» tabulate education_level_mother, cellpct
```

education_level_mother	
0 - Ingen	0.61
1 - Elementary school	0.87
2 - Secondary school	25.16
3 - Highschool	15.7
4 - Finished school	22.3
5 - Påbygg til videregående	2.59
6 - Higher education - lower	27.16
7 - Higher education - upper	3.95
8 - PHD	0.4
9 - Missing	1.26
Total	*100*

```
Millennials» tabulate education_level_father, cellpct
```

education_level_father	
0 - Ingen	0.3
1 - Elementary school	0.58
2 - Secondary school	21.29
3 - Highschool	14.29
4 - Finished school	29.49
5 - Påbygg til videregående	4.75
6 - Higher education - lower	18.69
7 - Higher education - upper	8.49
8 - PHD	1.04
9 - Missing	1.08
Total	*100*

```
Millennials» regress Securities_dummy ln_income bachelor_father master_father
```

Kilde	SS	df	MS	Antall Obs: 1165282
Modell	12867.3	3	4289.13	F(3, 1165274): 19577.865026

Kilde	SS	df	MS
Residual	2.5528894×10^{5}	1.165274×10^{6}	0.21908
Total	2.6815633×10^{5}	1.165277×10^{6}	0.23012

R²: 0.04798
Justert R²: 0.04798
Root MSE: 0.46806

Securities_dummy	Coef.	Std.feil	t	P>|t|	[95% Konf.	intervall]
ln_income	0.08391	0.00046	181.593	0	0.083	0.08481
bachelor_father	0.14322	0.00124	114.912	0	0.14077	0.14566
master_father	0.17706	0.00168	104.858	0	0.17375	0.18037
Konst	-0.74442	0.00589	-126.238	0	-0.75598	-0.73287

Millennials» regress Securities_dummy ln_income bachelor_mother master_mother

Kilde	SS	df	MS
Modell	13071.4	3	4357.16
Residual	2.5508484×10^{5}	1.165274×10^{6}	0.2189
Total	2.6815633×10^{5}	1.165277×10^{6}	0.23012

Antall Obs: 1165282
F(3, 1165274): 19904.321976
R²: 0.04874
Justert R²: 0.04874
Root MSE: 0.46787

Securities_dummy	Coef.	Std.feil	t	P>|t|	[95% Konf.	intervall]
ln_income	0.08371	0.00046	181.207	0	0.08281	0.08462
bachelor_mother	0.14683	0.00106	137.814	0	0.14474	0.14892
master_mother	0.17842	0.00242	73.5625	0	0.17367	0.18318
Konst	-0.7459	0.00589	-126.538	0	-0.75745	-0.73434