VILNIUS GEDIMINAS TECHNICAL UNIVERSITY

FACULTY OF BUSINESS MANAGEMENT

DEPARTMENT OF FINANCIAL ENGINEERING

Mintautė Mikelionytė

RESEARCH ON LITHUANIAN FEMALE PERSONAL INVESTMENT STRATEGIES BASED ON AUSTRALIA'S CASE STUDY

Master's Graduation Thesis

Financial Engineering study programme, state code 6211LX060

Investment Management specialisation

Finance study field

Vilnius, 2021

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THE OBJECTIVES:

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4. To form the portfolio for each target groups in Lithuania based on Nasdaq Baltics best-performing investment instruments

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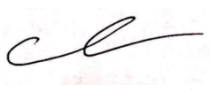
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Annotation

In this master's thesis, the peculiarities of personal investment strategies among Lithuanian and Australian females have been analyzed, and Australia's example as a good practice method in line with investment strategies based on age groups from literature sources has been applied to construct the investment portfolios as a personal investment strategy for Lithuanian females. In the research part, the distinctness among Australia's and Lithuania's current investor's profile has been analyzed, and the main differences among all investors were identified. After this achievement, the main distinctions between genders regarding personal investment management in Australia and Lithuania has been researched and analyzed, emphasizing females, and further investigating the peculiarities of women's personal investment strategies in both countries. The preparation of the comparative analysis with inclusion of financial literacy aspect and its possible impact on the investment choices has been performed, and the proposal of preliminary personal investment strategy for each target group in Lithuania using the investment strategies presented in literature sources and the good practice method of Australian female's investment examples the portfolio for each target groups in Lithuania based on Nasdaq Baltics best-performing investment instruments has been constructed.

Structure: introduction, theory, methodology, research, conclusions and suggestions, references, appendixes.

The thesis consists of: 79 p. text without appendixes, 26 pictures, 11 tables, 93 bibliographical entries.

Appendixes included.

Keywords: personal investment management, female investment, financial literacy, investor's profile, investing, investment options, investment instruments, investment portfolios, investment strategies

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Finansų inžinerijos studijų programos baigiamasis magistro darbas

Pavadinimas **Lietuvos moterų asmeninių investavimo strategijų tyrimas grindžiant Australijos atvejo analize**

Autorius **Mintautė Mikelionytė** Vadovas **dr. Aleksandra Lezgovko**

Kalba
[X] lietuvių
[ ] užsienio

Anotacija

Šiame magistro darbe buvo išanalizuotas dabartinio Australijos ir Lietuvos investuotojų paveikslas ir nustatyti pagrindiniai visų investuotojų skirtumai. Po bendro investuotojų tyrimo buvo išskirti ir analizuojami pagrindiniai skirtumai tarp vyrų ir moterų asmeninių investicijų valdymo Australijoje ir Lietuvoje išskiriant moterų investavimo ypatumus ir toliau tiriant moterų asmeninio investavimo strategijas abiejose šalyse. Parengta lyginamoji analizė, įtraukiant finansinio raštingumo aspektą ir jo galimą poveikį investavimo pasirinkimui, ir pasiūlymas dėl preliminarios asmeninės investavimo strategijos kiekvienai tikslinei moterų amžiaus grupei Lietuvoje, naudojant literatūros šaltiniuose pateiktas investavimo strategijas ir Australijos moterų investavimo pavyzdžius pritaikant kaip gerosios praktikos metodą. Remiantis šiais duomenimis buvo sudaryti investiciniai portfeliai pagal į „Nasdaq Baltics“įtrauktas investicines priemones ir buvo pritaikyti bei pateikti kiekvienai tikslinei moterų amžiaus grupei Lietuvoje kaip galimos investavimo strategijos.

Darbą sudaro 8 dalys: įvadas, teorinė, metodinė ir praktinė dalys, išvados ir siūlymai, literatūros sąrašas, priedai.

Darbo apimtis – 79 p. teksto be priedų, 26 iliustr., 11 lent., 93 bibliografiniai šaltiniai.

Atskirai pridedami darbo priedai.

Prasminiai žodžiai: asmeninių investicijų valdymas, moterų investicijos, finansinis raštingumas, investuotojo paveikslas, investavimas, investavimo galimybės, investavimo priemonės, investiciniai portfeliai, investavimo strategijos.

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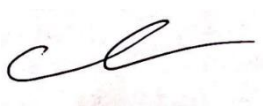
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SUTIKIMAS DĖL ASMENS DUOMENŲ NAUDOJIMO

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TABLE OF CONTENTS

INTRODUCTION 8

1. THEORETICAL ASPECTS OF PERSONAL INVESTMENT STRATEGIES 10

1.1. Analysis of personal investment instrument options 10

1.2. Analysis of macroeconomic indicators 14

1.3. Importance of financial literacy in the personal finance area 17

1.4. Differences between male and female investment decision-making process 20

1.5. Theoretical aspects of the portfolio as personal investment formation and management 22

1.6. Personal investment strategy management models 25

2. RESEARCH METHODOLOGY OF PERSONAL INVESTMENT STRATEGIES AMONG WOMEN 32

2.1. Research goal, strategy, and stages 32

2.2. Selection of the research sample and presentation of the questionnaire . 32

2.3. Portfolio creation methodology 35

3. ANALYSIS OF WOMEN PERSONAL INVESTMENT STRATEGIES IN AUSTRALIA AND LITHUANIA 41

3.1. Australia's and Lithuania's economic analysis 41

3.2. Investors profile in Australia and Lithuania 50

3.3. Comparison of financial literacy level and financial education accessibility in Australia and Lithuania 62

3.4. Personal investment strategies among women in Lithuania and Australia 65

3.5. Proposal of personal investment strategy for each target group in Lithuania 70

3.6. The portfolio formation for each target group in Lithuania based on Nasdaq Vilnius exchange investment options 72

CONCLUSIONS AND SUGGESTIONS 77

REFERENCES 80

APPENDICES 87

LIST OF FIGURES

Fig. 1. Public financial education plan of Lithuania for 2017–2021 18
Fig. 2. Public financial education plan of Australia for 2019 19
Fig. 3. Portfolio types by risk and return ratio 26
Fig. 4. Personal net worth fluctuation during the life cycle 28
Fig. 5. Portfolio types by age group 30
Fig. 6. Yearly GDP (%) changes in Australia and Lithuania 41
Fig. 7. Yearly CPI changes (%) in Australia and Lithuania 42
Fig. 8. Yearly inflation (%) changes in Australia and Lithuania 43
Fig. 9. Yearly currency exchange rate changes in Australia and Lithuania 44
Fig. 10. Yearly currency exchange rate changes in Australia and Lithuania 44
Fig. 11. S&P_ASX 200 and OMX Vilnius GI changes from 2012 January to 2020 October 45
Fig. 12. Lithuania's government bond yields (%) 2016-2020 46
Fig. 13. Australia's government bond yields (%) 2016-2020 47
Fig. 14. GVA by construction sector (%) in Australia and Lithuania 2015-2020 48
Fig. 15. Residential property price index changes (%) in Australia and Lithuania 2015-2020 49
Fig. 16. GVA by manufacturing (mln) in Australia and Lithuania 2018-2020 50
Fig. 17. Investment distribution in Lithuanian investors' portfolios 53
Fig. 18. Lithuanian investors investment return expectations in 2013 54
Fig. 19. Australian investors direct and indirect investment distribution 56
Fig. 20. The detailed view of respondents' investment preferences 57
Fig. 21. Self-evaluation of knowledge level in finance area by Lithuanian females 63
Fig. 22. Self-evaluation of knowledge level in finance area by Australian females 64
Fig. 23. The division between employment options among Australian and Lithuanian females 66
Fig. 24. Salary ranges among Australian and Lithuanian females 67
Fig. 25. Personal investment option selections among Australian and Lithuanian females 68
Fig. 26. Reasons for not investing among Lithuanian females 70

LIST OF TABLES

Table 1. Portfolio strategy performance example 27
Table 2. Research samples in Australia and Lithuania 33
Table 3. Areas of survey questions 34
Table 4. Australian investors profile - financial goals, risk, return and portfolio structure 58
Table 5. Australian investors profile and financial advice. 60
Table 6. Other personal investment option selections among Australian and Lithuanian females 69
Table 7. Investment priority ranking among Lithuanian females 71
Table 8. Personal investment strategy for the portfolio construction 73
Table 10. Monthly stock performance during the last five years (2015-2020) 74
Table 11. Bonds and cash yearly historical returns 75

INTRODUCTION

Personal investment strategy creation is one of the most important personal finance topics discussed over the past years. It is the highest important decision in one's life to choose the right option to invest the available funds to increase wealth. The right decision might lead to future prosperity, financial safety, and broader opportunities. If the personal investment strategy has been created wisely, the investor would be able to get the benefits of high stable returns in the future, increasing his/her income without putting in additional work or effort. Besides, investment processes positively impact economic growth; thus, it is essential not only for the investor but also for the country's economic well-being that the money has been invested.

According to many authors (Tengler, 2014; Robin, Dominguez, & Tilford, 2018; Levine, 2019; Itkin, 2014), women tend to have less knowledge about finances in general and particularly investment processes; hence, it leads to their lack of interest into investment processes and the possibility of poor money management. This issue might be solved by researching why it appears first and suggesting how females could be motivated to invest more actively. This Master thesis aims to find out the answers to these questions, provide the conclusions, and suggest how to solve this issue.

Thesis topicality. The investing of the funds to gain additional earnings is a significant way to increase one's wealth. However, the available statistics distinguish a couple of interesting facts about the investing processes and some of them being that residents of the well-developed and economically more robust countries tend to choose to invest as wealth accumulation more often, males being more active investors than females, the financial education level having the major impact regarding choices of investing and the age tendency to correlate with risk perception directly. Since social inequality is one of the critical issues in today's world that needs to be solved and the personal investment topic is vital, this paperwork aims to research, analyze, evaluate, and answer the main questions observed above. To compare two countries with different investing levels and based on personal research and observations for this paperwork, Australia and Lithuania has been selected, and Australia's female investing example would be used as the good practice method.

Thesis problem. The major problem is that personal investing in Lithuania is overlooked. People tend to save rather than invest; in general, women tend to invest less than men; however, they live longer based on statistical numbers. Additionally, the financial education topic needs to be researched and evaluated to understand whether this is why the low level of

investing or is it related to the investment options accessibility or spare funds availability among residents.

Thesis goal. This paperwork's main goals were to use Australia's case as a good practice example and research the main differences between Lithuanians and Australians investing peculiarities with the main emphasis placed on female personal investing strategies. Also, to analyze the main traits of Lithuania's female investors' choices and requirements among non-investors to encourage them to choose this way of wealth accumulation in the future.

To determine the main age groups of women investors and, based on them, to construct the potential investment portfolios.

Thesis Tasks:

1. To analyze current investors' profile in Australia and Lithuania and distinguish the main differences between all investors and after the evaluation of this data delve more profound and research the distinction among genders regarding personal investment management.
2. To define personal investment strategies among women in Lithuania and Australia, prepare the comparative analysis to include the financial literacy aspect and its possible impact on the investment choices.
3. To prepare the proposal of preliminary personal investment strategy for each target group in Lithuania using the good practice method of Australian female's investment examples and investment strategies available in literature sources.
4. To form the portfolio for each target group in Lithuania based on Nasdaq Baltics best-performing investment instruments.

Research methods used: analysis of scientific literature, quantity research, questionnaire, secondary data analysis.

Portfolios' examples have been constructed based on female participants' needs, risk averseness level, and goals represented by the questionnaire's responses. The target groups have been established based on theory research and strategies available in literature sources, personal investment strategy created considering each target group, investment performance analyzed, and portfolios have been assembled using Modern Portfolio risk and return evaluation methods.

Limitations. There is no data on the personal investing topic available in Lithuania's statistical department.

1. THEORETICAL ASPECTS OF PERSONAL INVESTMENT STRATEGIES

1.1. Analysis of personal investment instrument options

Before choosing the right investment strategy, it is crucial to evaluate the current personal financial situation, set the goals, and create the investing plan (Tyson, 2019; Birtch, Au, Chiang, & Hofman, 2018; Gerrans, Moulang, Feng, & Strydom, 2018). While choosing the investment tool, it is essential to know what options are presented for selection in the financial market and the most applicable to the investor. As an example, such financial institutions can be taken as Nasdaq, Economic Watch, Westpac, and National Australia Bank summary of explanations on the investment strategies choices (Nasdaq, 2019; National Australian Bank Limited, 2018; Economy Watch, 2018; Westpac Banking Corporation, 2018). Based on these sources, the development of the personal investment strategy must involve such steps as:

- Specification of personal investment objective.
- Set the timeframe.
- Asset allocation, which involves diversification among asset classes that may protect the investments against underperformance in any asset class.
- The decision of the investment that will be made.
- A risk management plan in which identifying the risks for the chosen investment strategy and how to mitigate those risks should be presented.
- The information and assistance should be assessed; some of the tools available to do this are: company research and stock recommendations, charting and technical analysis, economic research, news services, watch lists and alerts, financial planners, or adviser's assistance.

In the current economic situation, people are becoming investors and invest their money to gain profit, get the additional income source, and secure their future. Every investor's main aim is to increase the income and value of the returns while minimizing the risk of loss. To achieve this goal, such authors as Swenson (2005) and Malkiel (2019) in their books stated that it is vital to create an investment strategy that would be based on investor's goals, resources, willingness to take risks, and the length of the growth objectives. The investment strategy is like a systematic plan to allocate investable assets among different investment options; however, to choose the most acceptable personal investment strategy, the individual has to have the additional amount of assets, preferably liquid funds, which would be dedicated to investing

purposes. In addition to this, the investable assets should be allocated among the investment options considering the investor's tolerance level to the risk, the age, and the determination of objectives, that the investor wishes to achieve. Consequently, to make the most para-mount decision in investment strategy alternative, a thorough analysis of the investment options has to be done, and the arguments for and against each of them have to be introduced.

Many authors share the same opinion that the most popular investment instruments (Liem & McInerney, 2018; Huang, 2018; Lei, 2018). could be distinguished as:

- Savings account.
- Shares and stocks.
- Bonds;
- Investment funds.
- Pension funds.
- Real estate.

To further discuss the personal investment strategies, it is necessary to reveal the main differences and single out the investment tools' primary specifics.

The savings account can be defined as: "the most basic kind of account in the bank or credit union allowing you to deposit money, keep them safe and typically pays interest with the relatively low-interest rate" (Bain, 2016). Also, to elaborate on the opinion that this author expressed, the savings account is dedicated to keeping one money safe and, in return, get paid an additional amount on top of the interest earned. Hence, since the risk of this kind of investment is low, the profit generally tends to be not that high as well. Additionally, it should be noticed that not all countries have this kind of investment options available. As a result, there would be no savings account or deposit with interest rates services accessible in some of the financial bodies in specific countries. The savings account is used as both long- and short-term investment, to return small but guaranteed profit, shallow risk, possibility to invest at any time with any amount of money.

Shares and stocks in various literature sources, articles and dictionaries are explained, as "Stocks represent ownership or equity in a corporation. Stocks may or may not pay a dividend. If a stock pays a dividend, it may change in an amount from time to time and it is not guaranteed to continue. Like bonds, stocks may become worthless if a company fails. But unlike bonds, if the company prospers, there is no theoretical limit to the increase in value, and no redemption date. As owners of the corporation, stockholders are entitled to vote on the board of directors and may influence the operation of the company." (Armstrong, 1996). Additionally, Stayner explained in his book that the investment strategy should be built on the three main

pillars. "The first pillar is a financial theory – how financial markets can be expected to behave; the second is empirical evidence – how markets do behave, and the third is the investment environment – the current condition of financial markets" (Stanyer & Dimson, 2014). The main idea that the author presents is that the investment strategy must be prepared by researching, understanding, and evaluating the financial markets and deciding where and whether to invest based on the knowledge and understanding of stock market peculiarities. The share can be explained as a single unit of stock; however, they both often mean the same thing in a stock market world. Investment in stocks is considered high risk, can be a long- or short-term investment, offering ultimate flexibility and the possibility to withdraw the funds at any time investment option. It is also known for the highest possible returns in the shortest time frame and could be considered a most profitable investment; however, the high risk of possibility to lose the invested funds must be not forgotten.

Bonds are one of the safest investment options, and in literature, the definition could be found as follows: "A security represents the company's debt or government issuing it. When a company or government issues a bond, it borrows money from the bondholders; it then uses the money to invest in its operations. In exchange, the bondholder receives the principal amount back on a maturity date stated in the indenture, which is the agreement governing a bond's terms. Besides, the bondholder usually has the right to receive coupons or payments on the bond's interest. A bond is tradable though some, such as savings bonds, are not. Treasury securities' interest rates are considered a benchmark for interest rates on other debt in the United States. The higher the interest rate on a bond is, the riskier is likely to be" (Lim, Leong, & Choi, 2014). Additionally, the other author of the book on this topic – Hogue (2016), described: "bonds are critical to reaching your [investors] goals. No other investment provides the kind of safety and security you will get from bond and few other investments provide the kind of cash flow you will get from these fixed-income opportunities. <…> manage your bonds right and <…> you'll get stable returns for decades and won't have to worry about constant crashes in stock prices". Bonds as an investment option are shallow risk can return fixed, variable, or indexed interest rates, which usually is small, but the guaranteed amount, the investment time can vary between one to ten years, and the investment amount usually starts from €100.

Investment funds are an indirect investment option where assets have been placed in a securities collection and are managed by the professional investor. For instance, Pip-er (2018) divides investment funds into mutual and index funds and introduces the description: "a mutual fund is a collection of stocks, bonds, or other investments that have been chosen by a profes-

sional investor (known as a fund manager). Most mutual funds are known as "actively managed" funds because their fund managers are actively searching for investments that they believe will earn above-average returns. Index funds – are "passively man-aged" and designed to simply mimic the performance of a given index. <…> indexes are indicators that represent the value of a particular group of investors". In general, investment funds are a long-term investment option, which provides the possibility to earn a large profit, but with relatively high risk and the significant probability of losing the financial contribution. Moreover, the investment funds are less time-consuming than investment in the financial markets; on the other hand, they are not as flexible as pulling out the profit as withdrawal of funds is not straightforward and subject to fund's rules.

Pension funds are the type of funds that every employed and working person must consider as an investment option and have minimal knowledge of how it functions. The pension funds are formed with the finance collected from regular payments contributed by the working individuals, which is invested to pay pensions to the people when they retire. "Pension fund efficiency and investment returns are crucial for pensioners' welfare. Pension funds manage a huge amount of capital, constituting a major part of worldwide institutional investments. Pensions systems also have a significant impact on national economies, especially in countries where the pension funds' asset value exceeds that of the national product" (Bikker, 2018). The pension funds can be a long-term investment with low returns and almost no risk.

Real estate investment could be defined as investing the assets into real estate with the expectation to receive additional returns. (Dorkin & Turner, 2018) "It is also considered to be long term investment that produced high possible, but not guaranteed returns, small risk, requires quite high investment budget and is a passive income option" (Turner, 2016). Even though the most famous association with real estate investment is purchasing a house or a flat and selling it for a higher price or making it the rental property and acquire the profit from the lease, it is worth mentioning that this is not the only option to earn the profit than it comes to real estate investment. The great prospect of gathering additional income could be created by the decision to invest in land or commercial buildings (Walker & Walker, 2013).

It is significant to know the main peculiarities of the investment strategies before deciding which investment tool to select. A Seetharaman, Niranjan, Patwa, and Kejriwal (2017) mentioned in their article, the main difference between real investments and financial investments are: "Investment into the land, building, machinery, etc. i.e., tangible asset is termed as a real investment vs investment in stocks and bond as a financial investment." The investment options and their properties that have been previously discussed let the future investor select

the best option. For instance, the individuals who prepare to lose more assets to have a possibility to gain more and would like to achieve this in a short period would be considered to choose the riskier investments. Furthermore, as such was described investments in stocks, shares, and some investment funds; thus, the prediction could be made that to satisfy their financial needs, these investors would prefer the mentioned investment options. Moreover, the investors who would instead use safer personal investment strategies would lean towards the "real investments" – tangible assets.

1.2. Analysis of macroeconomic indicators

The main macroeconomics indicators that are essential to analyze for investors to evaluate countries' economies could be divided into future and past indexes. In literature sources such as Yamarone's handbook on the economic indicators (Yamarone, 2017), past macroeconomic statistics indicators have been stated to be:

- GDP
- The Consumer Price Index (CPI) and Inflation
- Currency strength and stability
- Labor market statistics, e.g., unemployment rate.

Also, future macroeconomic indicators are:

- The stock market and bond yields
- Housing and construction
- Production and manufacturing statistics

GDP has been used to measure the country's' market value of all the final goods and services produced in a specific time period and includes four main components: personal consumption, business investment, government spending, and net trade. The GDP growth rate reflects how quickly the country's economy is growing or shrinking (Yamarone, 2017). The economic difference between selected countries is compared, or their growth is forecasted based on GDP data. Investors are receiving the commonly consistent growth of GDP as a sign of a stable economy; nonetheless, the rapid growth of this economic index is being met with criticism; furthermore, negative GDP could mean that the country's economy will approach the recession or economic downturn. Based on GDP indicator growth or decline, investors could predict whether companies and businesses in a specific country will increase their earnings. Hence, if stocks will rise or fall and based on this information, choose to invest in the selected country's stock market.

The Consumer Price Index (CPI) indicates the average change in prices over time that consumers pay for a basket of goods and services and is the best statistic to measure inflation. In general, inflation is used to measure a rise in price level relative to the available goods basket and services selection. Over a period of time, it could result in a substantial and continuing drop in purchasing power. The main effects of inflation are the decrease in the purchasing of currency power due to increase in prices, and it increases spending and investment rather than saving, hence, boosts the growth of the economy, also by measuring the inflation index and keeping it at the most optimum level, Central Bank can stabilize the prices and maximize the employment level. On the other hand, the general decline in prices and services are measured by deflation. Inflation and deflation have a major impact on investment strategy and portfolio as if during inflation the money buying power decreases the investor's holdings depreciate; on the contrary, during deflation, the money buying power increases and it could be a positive aspect; however, deflation might be associated with the economic and financial crisis. To hedge investments from inflation, the professionals (Taghizadegan, Stöferle, Valek, & Blasnik, 2016) suggest investing in growth stocks, gold, and other commodities. In contrast, in the case of deflation dividends paying stocks, bonds, and cash, attempting to protect investment portfolio from both of these economic factors' portfolio diversification as the most common strategy is being used.

The currency strength index reflects the currency value, which economists use to calculate the money's purchasing power; however, investors could use this indicator to analyze overall economic performance, interest rates, or fundamental economy data (Donnelly, 2019). Continuing Donnelly's (Donnelly, 2019) thought trail currency is getting stronger or weaker based on its value compared with other countries' currency. The primary factors to influence the currency's strength are interest rates, economic policy, and stability. Eco-nomic policies such as growth monetary policy or fiscal disciplines implemented by the government would strengthen the currency, and for example, government debt and higher inflation would weaken it. Furthermore, National interest rates are one of the major currency strength and stability impacting factors, and in general higher interest rates increase the value of countries currency. Also, strong currency reflects the country's stable and well-established government and its policies. Hence, investors prefer to invest in countries with a strong currency, especially if it is a currency exchange type of investment.

The other indicator that investors could use to evaluate the country's current economic state is Labor market statistics. The main indicator is the unemployment rate that shows the country's current economic situation (Yamarone, 2017).

If the unemployment rate is low, the assumption could be made that the economic situation is in great shape as well as there are jobs available and the population has spare assets and money to use for investing purposes. To analyze the investor's profile in the selected country and reveal the possible capability to have funds for investing purposes, especially while comparing the labor situation in different regions, minimum wage, average wage, and retirement age should be considered.

The next economic indexes are future-oriented or called in various literature sources - leading indicators (Yamarone, 2017; Taghizadegan, Stöferle, Valek, & Blasnik, 2016).

The first two indicators are stock market performance and bond yield, and they could be used as the indexes that show tendencies of the country's economy based because changes in stock or bond prices reflect investors' expectations for the forthcoming of the economy and its prospective interest rates (Malkiel, 2019). Many other factors influence the share market as well as bond yield so, itself solely, exchange market and bonds should not be taken as the single source of truth taking into consideration the fact that stock market and bond yield products' prices might be based on speculation or they can experience some bubbles as it happened before the major economic crisis. However, analyzing the big picture, based on this indicator, the predictions could be made that the rise in the stock market would indicate investors' confidence in the future of businesses in a particular country, which could lead to economic growth. On the other hand, a decline in the share market could mean that investors are taking their money out of shares and reinvesting it to safer options or saving for better times, which could lead to the assumption that the economic downturn is being predicted. Regarding the bond yield performance curve, it should be divided into short- and long-term bonds. Shorter-term bonds, particularly with maturities of up to two years, are directly impacted by central bank decisions as well as investors' expectations for interest rate changes. In contrast, the performance of longer-term bonds, it includes of longer than two years maturities, would be impacted by interest rate fluctuation, additionally, also by such factors like economic growth and inflation, which could take longer time to come into effect; hence, to be noticed and predicted.

The second indicator from the leading economic index group is housing and construction statistics in the country. The construction industry represents a significant part of a country's economy, directly affecting GDP through construction, maintenance, and renovation input. In many countries, booming building and construction activities point to economic growth and reflect economic development (Olga & Antonios, 2019). For the investor, this measurement could assist in analyzing the statistics of the country's economy by providing critical insights about the health of the broad economy since construction activity plays a key role in the overall

economic performance; hence, if the construction and housing market are prosperous the country's economy ten to be growing.

The third aspect is production and manufacturing statistics, which also reflects the economy's health as well as could be described as one of the quickest and easiest ways to get the information and statistical data on this topic (Yamarone, 2017). This is under the connection between production and manufacturing processes outcome and tendency to affect GDP indicator positively. For instance, if the first index would generate positive results, it would be seen as a sign of increased consumption and accordingly higher employment rates, the main economic indicator, gross domestic product, would reflect these changes and as a part of the scheme would show growth in the country's economy.

To summarize, all the main macroeconomics indicators that should be used to analyze the country's economic situation could be broken down into two main groups - leading and lagging. The indexes from the first group such as the Stock market and Bond yields, Housing and Construction as well as Production and Manufacturing statistics indicators are dedicated to forecasting the future economic state of the country, and the indexes from the second group - GDP, The Consumer Price Index (CPI) and Inflation, Currency strength and stability and Labor market statistics, to observe and evaluate the past performances and current economic situation. The investors could all use these indicators to analyze and compare the economy's stability, growth, and overall situation in different countries.

1.3. Importance of financial literacy in the personal finance area

Financial literacy leads to an understanding of how money is made, spent, and saved and helps develop the skills and ability to use financial resources to make decisions. Additionally, this financial knowledge helps people make the right decisions regarding money management: taking a housing loan, ensuring life or property, saving for retirement, investing, etc. (Swiecka, Grzesiuk, Korczak, & Wyszkowska-Kaniewska, 2019; Worthington, 2016). It is important to have as much information on this topic as possible to choose wisely and to be able to manage personal finance in the right way.

Nowadays, in our complex and continuously developing world, it might be difficult to comprehend the importance of financial literacy and its impact on one's financial decisions; sometimes, lack of it is not highlighted enough; hence people are not aware of how they could improve financial decision making. (Kaiser & Menkhoff, 2017; Lusardi & Mitchell, 2017) The government's support and financial education plans could improve its citizens' financial literacy states (Amoah, 2016; Sherraden & Ansong, 2016).

Since this master's thesis is based on Lithuania's and Australia's finance market research, these countries' financial education plans have been presented in figures 1 and 2. below. The first graph presents Lithuania's financial literacy education improvement programs and areas that the special attention has to be concentrated on in 2017 to 2021. The second graph represents Australian financial literacy education plans and important areas where improvements are needed and were implemented in 2019.

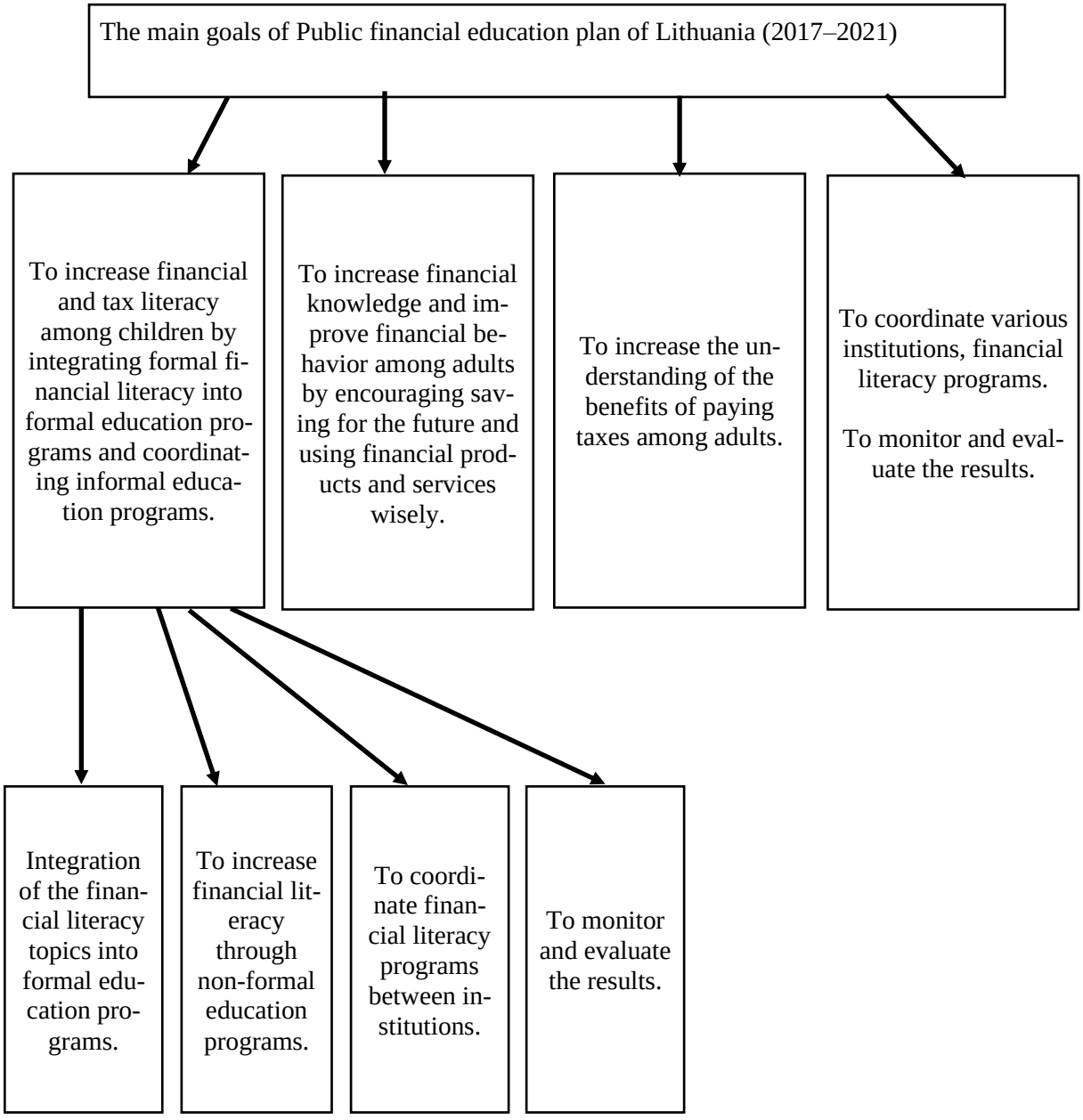


Fig. 1. Public financial education plan of Lithuania for 2017–2021

Source: prepared by author based on Bank of Lithuania (2017)

The main financial education goals presented by the Bank of Lithuania were concentrated on children education by financial literacy topics integration into formal and non-formal education programs, adult education by encouraging to save and wisely use available financial products and services, to increase understanding of tax-paying benefits and to track the and evaluate the results after these strategies implementation. This could lead to the conclusion that there is a need to improve the current financial literacy situation among adults and children in Lithuania. The program has been created to concentrate on education processes regarding financial products, services, and taxes.

As specified in the previous section, the Australian government has also created a program to encourage financial education and provide easily accessible and equal opportunities to obtain financial knowledge. Australian official bodies indicated three main goals of financial literacy improvement among citizens' programs: supporting, informing, and educating.

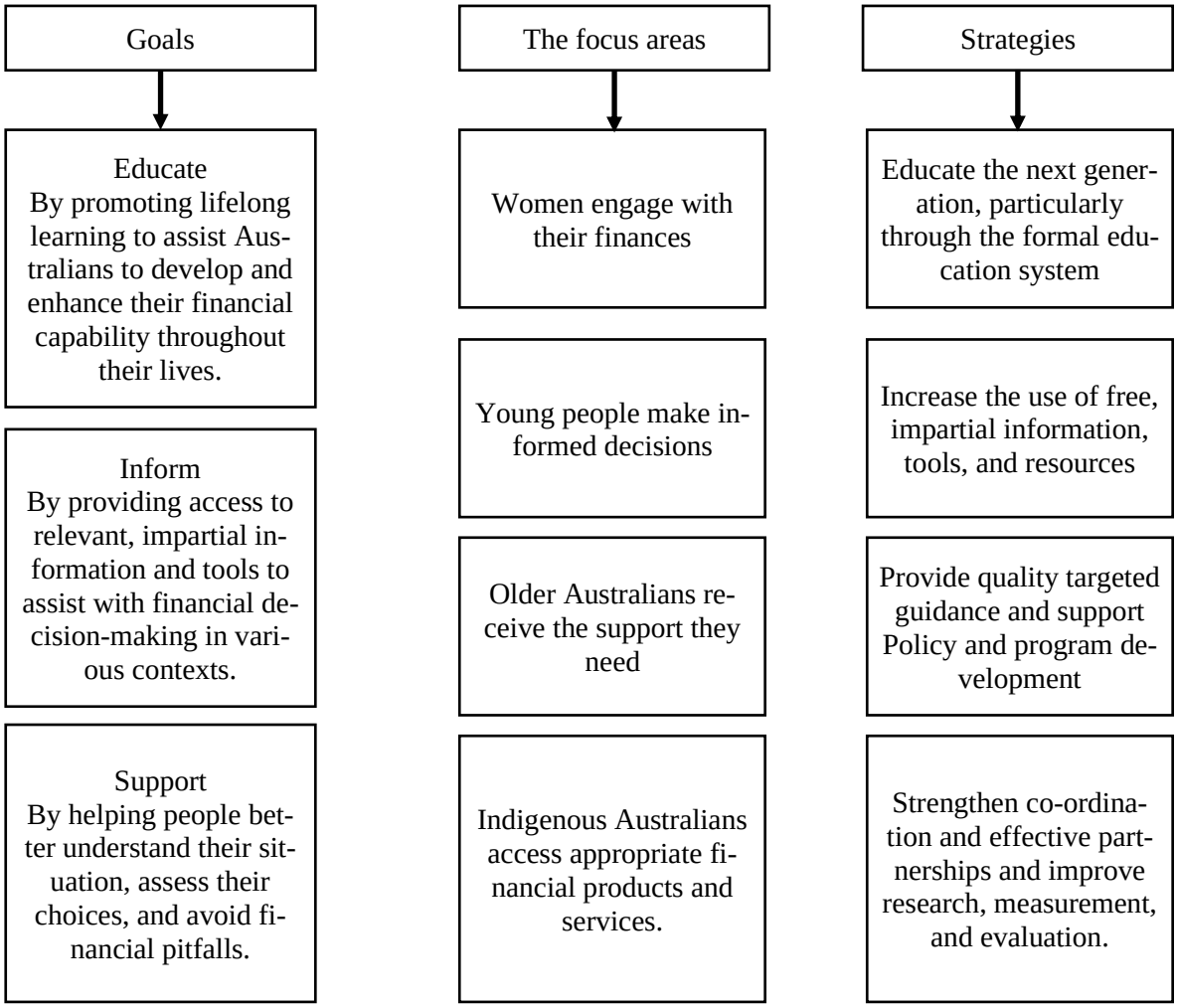


Fig. 2. Public financial education plan of Australia for 2019

Source: prepared by author, based on Securities and Investments Commission (2018)

The groups that were specified and the particular areas were women and their encouragement to more actively engage with their financial matters, young people having full information disclosure to make financial decisions, indigenous residents having an ability to access appropriate financial services and products, and older residents accessing all necessary support and assistance in the finance field.

As it is noticeable from the scheme above, both countries have similar aims; however, Australia has set the broader and more specific target groups: women, young people, older people, and indigenous Australians. In comparison, Lithuania's focus is mainly divided between the younger age community and the adults.

1.4. Differences between male and female investment decision-making process

To look into the investment decision-making process more deeply, the differences between male and female investors could be studied as a part of the topic. Is it a known fact that man tends to invest more often than women do, but it not necessarily makes them better investors? For years, the stereotype was that male investors are doing better than females; however, many research types that have nowadays been done revealed that the only prediction that could be made is that women and men tend to invest differently.

Gender differences in relation to investment processes were studied in much different paperwork (Hussain, at al. 2015, Pilz 2018, Lee, at al. 2013), and, for example, based on Dickason, Nel and Ferreira (2017) "<…>*A thorough analysis of the data collected through structured interviews shows with total clarity and no degree of doubt that investors are not playing the investment game scientifically. There is a high degree of behavioral influence in their investment decisions, which may lead to sub-optimum results, scientifically speaking. However, it is interesting to note that investors are largely satisfied with the way things are. This seems to suggest that investors are not machines and that they are content with their un-scientific fizzy logic and emotional decisions, even though many of them are aware of their sub-optimum investment performance."*

Based on these authors' research and conclusions, the first statement could be made that people overall, despite their gender, are investing under the influence of their emotions and behavioral biases. To add to this, both groups of investors, male, and female would invest based on their emotional selection, whether it would be the risk aversion level, the mood, the wish to get as high a return as possible or playing safe because you have to take care of the family.

These authors' key idea is that the individual is not a machine, and logic and calculation-based investing could not be considered a possibility; the emotions always come away.

It is a known fact that women and men are different in many ways, and there is no exception for emotions. The literature research of prior studies that have noted the importance of the major male and female behavioral diversity has been conducted and the results presented for the broader situation explanation. The main differences that occurred where:

- Females in the context of participation in financial markets were perceived to, in general, have lower levels of confidence than males.
- The key points that explained that the main differences in risk were:
- First, there is a difference in the underlying attitude towards risk; males seem to be willing to bear more risk than females.
- Secondly, the risk aptitude between genders might be influenced by economic status.
- Thirdly; it is pointed out that females have a longer life expectancy than males. Therefore, the probability of outliving a spouse exists; the latter seems to cause a hesitance to accept financial risk.
- Finally, it is indicated that financial knowledge may be a contributing factor that causes the willingness to assume risk to differ between males and females. Males tend to be more confident and have greater knowledge regarding investments than females (Low, 2018; Ohlund, 2017; Jaiswal & Kamil, 2012; Firestone, 2019).

The other research has been done, which is related mostly to the female investment decision-making process, by Husain (Hussain, et al. 2015) and authors state in their article that after the correlation analysis was done, the outcome was: "The research hypothesis proved that financial risk level has positive impact on the women financial decision making, confident level has a negative impact on the women financial decision making, Personality traits have positive impact on the women financial decision making." Based on this analysis, the assumption could be made that women lack confidence than it comes to investment; however, they tend to accept the risk and women's' personality traits such as the ability to adverse uncertainty, research the information, and be more careful and prepare more before investing and the combination of these behavioral patterns could positively impact women's investment decisions.

The main idea presented based on the theoretical gender differences research is that males and females select their investments differently, which is due to various behavioral biases, emotions, and life factors. This master thesis will be concentrated on female investing choices and the reasons behind them in two countries – Lithuania and Australia.

1.5. Theoretical aspects of the portfolio as personal investment formation and management

The investment is spending your money or other resources to get beneficial financial returns in the future. According to Chandra (Chandra, 2017), the two key aspects of investing are time and risk. For example, in some investments, such as government bonds the time is the dominant aspect; in others, such as stock options, the risk is the main attribute. Based on these author's ideas, the assumption is that time and risk management are one of the major parts of the investment process. Furthermore, it is important to manage the investments, and the practice of financial investment management could be defined as the specialty area within finance dealing with the management of individual or institutional funds. (Kim, Maurer, & Mitchell, 2013) As the main aspects of the investments have already been presented, the questions arise naturally: What are the key attributes of the financial management process? To sum up various author's opinions (Fabozzi & Drake, 2009; Brown & Reilly, 2015; Reilly, Brown, & Leeds, 2019), the fundamental financial investment management aspects are

- setting investment objectives,
- establishing an investment policy,
- selecting an investment strategy,
- selecting the specific assets, and
- measuring and evaluating investment performance.

First and foremost, an attribute in financial investment management is to set the investment objectives; in other words, the investor needs to decide the key goal that he/she is planning to achieve by investing. Without the aim, any actions lose their essence. The investment objective can be considered growth, but it may also be income or preservation if the investor is retired or some combination or variation of those types (Malkiel & Ellis, 2013).

The second step is establishing an investment policy, and it begins with the asset allocation decision. The main question the decision answers is how the funds that will be invested should be distributed among the major asset classes, and this policy determines how to allocate available funds across different countries, asset classes, and securities. Additionally, the asset allocation takes into consideration any investment constraints or restrictions. In developing an

investment policy, the following factors must be considered: client constraints, regulatory constraints, and tax considerations (Idzorek & Kowara, 2013).

Going forward, the major decision should be made on what investment strategy to apply. The wildly know investment strategies are active, passive, forecast-based, forecast free.

The investment strategies could be created based on four major questions that could be seen in various author's (Guo, Lou, & Pérez-Castrillo, 2015; Arora & Rahman, 2016) works:

- What asset classes should be considered for investment?
- What policy weights should be assigned to each eligible asset class?
- What are the allowable allocation ranges based on policy weights?
- What specific securities or funds should be purchased for the portfolio?

We can see that the last question dedicated to applying the investment strategy is closely related to the further step in our previously specified key elements on financial investment strategy management. In this part, selecting the specific assets that will be included in the portfolio and will be expected to generate the profit on our investment must be done.

The four major asset classes that have been proposed by Fabozzi and Markowitz (Fabozzi & Markowitz, 2011) are common stocks, bonds, cash equivalents, and real estate. It is important to add one of the alternative assets to the investment strategy creation – commodities not just because it is are one of the most popular investment options nowadays, but also, greatest diversification potential due to their very low correlation with stock and bond returns (Garcia-Feijoo, Jensen, & Johnson, 2012). However, it is important to know that commodities are the real assets in their true nature, as their primary purpose is to be consumed and not invested. Furthermore, this investment's second important trait is its limitation of the supplies as commodities have only limited availability.

Moreover, the last but not least - evaluation of investment performance must be specified. In this section, the measuring of portfolio returns, and risk has been introduced. The process requires the estimation and evaluation of the expected risk-return trade-offs for the alternative investments available.

To start with, it is important to compute mean historical returns to explore wider information of the returns over the years. Since the investment might have had significant downfalls or profit during some time (as an example, 10 years), it is important to do deeper research to get all the possible information before deciding whether to invest. It could be done by using different evaluation or measuring methods before the beginning of the investing process, and they are: the measure of the historical returns, the measure of the expected returns, a measure

of the risk of the expected returns and rates, risk measure for the historical returns (Brown & Reilly, 2015, Greenwood & Shleifer, 2014)

Main historical returns measures that will be used in this paperwork:

- arithmetical mean.
- geometrical mean.

Main data that will be found by using these measure methods:

- annual holding period return
- annual holding period yield

The main return calculation would be done by exploring the expected return concept and by using its formula. To measure the risk of the expected rates of returns, Brown and Reilly are using two options: variance and standard deviation. To measure the risk of expected returns, these methods will be used:

- variance
- standard deviation

After evaluating the selected investment instruments separately by applying the return, risk, and expected return methods above, the need to evaluate all the portfolio returns and risk arises. One of the most popular and accurate ways to do so is to use one of the theories dedicated to solving this kind of problem.

Harry Markowitz introduced Modern Portfolio Theory. According to Modern Portfolio Theory, while designing a portfolio, each asset's ratio must be chosen and combined carefully in a portfolio for maximum returns and minimum risks. In Modern Portfolio Theory, the emphasis is not laid on a single asset in a portfolio, but how each asset changes concerning the other asset in the portfolio regarding fluctuations in the price. The main assumptions of the modern portfolio theory are (Krishnamurti, 2015; Jiang & Liang, 2017; Qian, 2018):

Investors are rational and concentrate on maximizing the profits of the profit with the limitation of their income.

Investors are entitled to free, accurate, and fair access to the risk and return information.

- The markets are efficient.
- Investors tend to be risk-averse and are concentrating on minimizing the risk and maximizing the return.
- Investors base decisions on expected returns and variance or standard deviation of these returns from the mean.

- Investors choose higher returns to lower returns for a given level of risk.

Modern Portfolio theory proposes that a portfolio manager must carefully choose various assets while designing a portfolio for maximum guaranteed returns in the future (Kaplan, 2017; Chen, 2016).

In summary, the main aspects to consider before starting to invest are setting investment goals that would be achieved during a specific period; the second most important step is selecting and properly polishing an investment strategy, the third step for successful personal investment strategy would be selecting the specific assets and the last section in investment procedure is measuring and evaluating investment performance and making appropriate amendment decision if needed. Above all, the investment period length, appropriate risk level, and the expected amount of returns must be considered before starting to invest. Modern Portfolio Theory allows constructing the investment portfolios by which risk-averse investors can maximize expected returns based on a given market risk level. This theory consists of the importance of portfolio diversification, risk, and the affiliation between different kinds of securities.

1.6. Personal investment strategy management models

The two main types of investment management strategy models are active and passive portfolio management. An active portfolio strategy has an expectation that influences and is attributed to a certain asset class, making actively managed portfolios not just broadly diversified but also accessed by using forecasting and available information to achieve the best performance. The passive portfolio strategy mainly relies on comprehensive diversification and matching certain market indexes instead of analyzing and estimating future returns and investment performance (Fabozzi & Markowitz, 2011). Furthermore, the main distinction between passive and active portfolio management strategies is that passive strategy, and their calculations dedicated to future investment performance projection, would hold and be profitable in the market that is believed to be efficient. On the contrary, the active strategy is being used by the investors who disagrees and thinks that exchange cannot be efficient; therefore, by pursuing the new information and stock market updates, investing their time and money into active research, and keep changing their investment selections frequently, they assume to be able to identify undervalued securities and outperform the market.

Moreover, portfolio types by nature of the investment options and asset allocation could be divided into risky, medium-risk, and non-risky. For instance, a portfolio created only from shares would be considered extremely risky; the diversification would reduce the risk; however, adding bonds would reduce the risk and volatility to the next level. In fact, one of the

leading international financial services company Fidelity has presented the research and an example of how the portfolios could be constructed based on the investor's risk perception and asset allocation (Fidelity, 2020). The main portfolio types that were mentioned - conservative, balanced, growth, and aggressive growth. The structure of each type of the portfolio has been presented in figure 3.

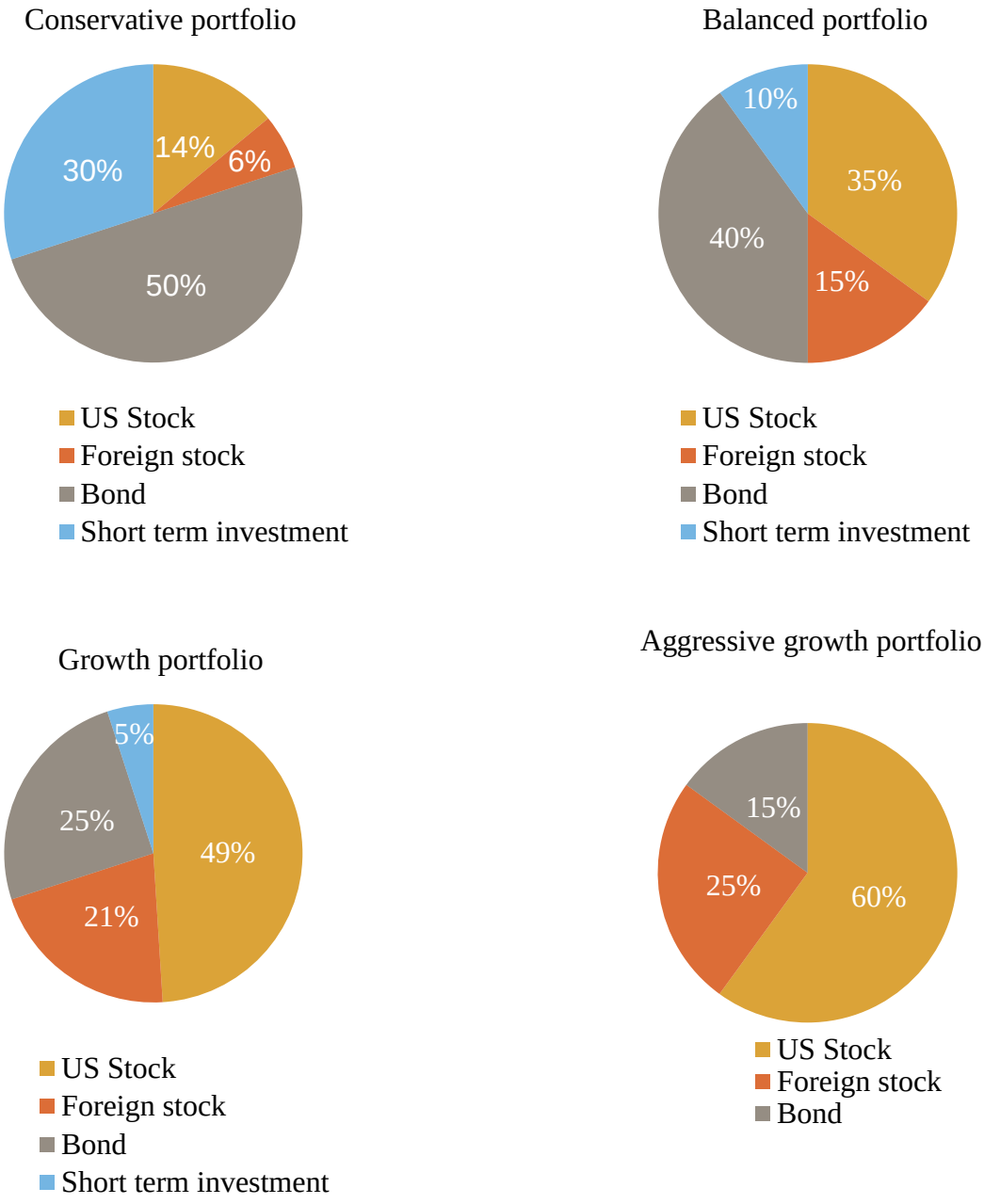


Fig. 3. Portfolio types by risk and return ratio

Source: prepared by author based on Fidelity (2020)

Conservative portfolio example contains 50 % of bonds, 30 % short term investments such as certificates of deposit (CDs), money or cash market and high yield savings accounts,

government bonds or treasury bills and others, 6 % of foreign stocks, 14 % of US stocks. For example, the Balanced portfolio type consists of 40 % bonds, 10 % of short-term investments, 15 % of foreign stocks, 35 local or, in the case presented in this example - US stocks. The next portfolio type, the Growth portfolio, has been constructed with the main concentration and as a major investment block selecting US stocks with 49 % of overall portfolio proportion, 21 % of foreign stocks, 25 % bonds, and 5 % short-term investment. Furthermore, the fourth portfolio type has been introduced as the Aggressive growth portfolio, which for the most part contains risky; however, if well-performing possibly earning the highest returns, investment options, such as US stocks and foreign stocks that substituted for 60 % and 25 % of portfolio accordingly. In the matter of hedging, the portfolio bonds' risk and diversification were included as well; nevertheless, it made up only a 15 % share of all the portfolios. Consequently, it should be the case that various stocks should be assessed as risky and bonds with short term investments as safer investment options, the combination of these assets not only creates a diversified portfolio but also, based on the amount of each investment option, placed in the portfolio, can perpetuate it towards more or less risky type.

In support of this idea, the company has presented historical data performance calculations throughout the years for each portfolio type. Data evaluation provided by Fidelity (Fidelity, 2020) has been presented in table 1.

Table 1. Portfolio strategy performance example

	Conservative	Balanced	Growth	Aggressive growth
Average annual return	5,96 %	7,96 %	8,97 %	9,65 %
Best 12-month return	31,06 %	76,57 %	109,55 %	136,07 %
Worst 12-month return	-17,67 %	-40,64 %	-52,92 %	-60,78 %
Best 20-year return (annualized)	10,98 %	13,83 %	15,34 %	16,49 %
Worst 20-year return (annualized)	2,92 %	3,43 %	3,10 %	2,66 %

Source: Fidelity (2020)

This study suggests that taken the average result of the year, the returns were highest for the Aggressive growth portfolio investments and the best 12 months returns. On the other hand, the worst returns were as well showed by the Aggressive growth type portfolio; for this

reason, the presented data clearly proves the previously created assumption that the riskiest, although possibly providing the highest returns, is the portfolio the highest consistency of stocks in it. Based on short term losses and gains ratios, the second most profitable and riskier would be the Growth type portfolio, and the third and the fourth Balanced and Conservative accordingly. Considering a long time, based on the example, 20 years, earnings and falls, best performing portfolio and experienced the worst dives once more has been the Aggressive growth. However, in the longer period, the changes could be seen in the other three types of portfolios performances; the Conservative type portfolio provided the low profit in both best and worst return scenarios with 10,98 % and 2,92 %, respectively. Compared with one-year earnings, Balanced and Growth type portfolios in a long-term period performed quite similarly - Balanced had provided a little bit lower returns as the best performing percentage amount; however, the worst interest indicator was higher than Growth type portfolio. It would seem that the Balanced type portfolio is the best option for the investors with medium risk perception as it is less risky compared to the Growth or Aggressive growth type, but also could provide relatively high gains. Alternatively, a Conservative type of portfolio should choose investors with a very low-risk acceptance level, but they should not expect high profits. On the contrary, Growth and Aggressive growth portfolios should be appealing to investors who have medium to very high-risk tolerance, and they could anticipate earning high beneficial value from the investments.

Another example, presented by Reilly and Brown (Reilly & Brown, 2015) states that portfolio formation, risk tolerance, and investment goals are directly related to the investor's age. Authors are dividing the groups into accumulation, consolidation, spending, and gifting phases as per figure 4 below.

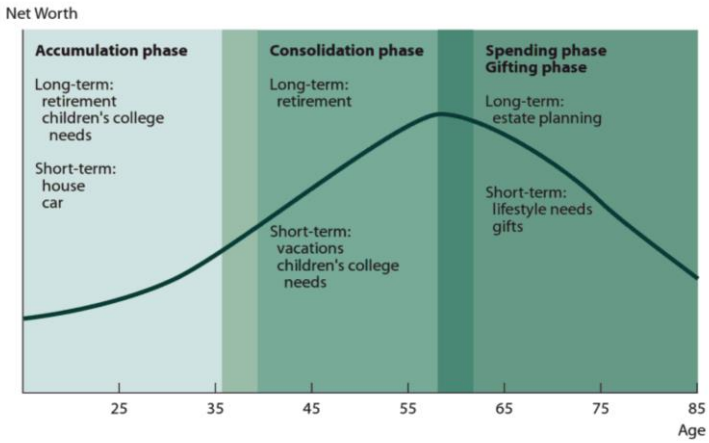


Fig. 4. Personal net worth fluctuation during the life cycle

Source: Reilly & Brown (2015)

According to the authors' idea, people in their early and middle age and working career should be attributed to the accumulation phase during which they concentrate on accumulating wealth and setting major short- or long-term goals such as house payment kids' education. Individuals in the accumulation phase might be having a loan or debt burden and because of their higher investment as well as earning future period should be willing to tolerate higher risk to gain possibly above-average returns from their investments over time. The average age of people going through this phase is between the beginning of their career through mid-30.

The second phase that has been distinguished is the consolidation phase, which includes individuals who typically already past their mid-career points and most probably paid off their loans, debts and took care of other high importance financial needs and now have some left-over funds since earning exceeds expenses, and they are willing to invest in order to gain additional earnings. People included in this group still has a seemingly long time for investments and returns, which could be up to 30 years; however, they tend to prefer moderate high-risk investment options, as they concentrate on capital preservation. The second, consolidation, the phase is between the 35 and 65 age group.

The third phase typically starts when people retire and is the spending or gifting phase. During this phase, individuals' incomes have been covered by social security and previous investments, including employers' contributions to the pension funds. During this phase, investors tend to be highly risk-averse and choose investment options with minimal risk; however, some diversification and growth investments should be included in their portfolios due to the hedging necessity from inflation. The gifting phase is closely related to the spending phase, and if individuals in their retirement decide that they have covered all the necessary needs for themselves and have their financial future taken care of as well start donating or financially helping their relatives. The third phase group age is usually after retirement, and it is different around the world but preliminary its people in their mid-60 and older.

Furthermore, following the idea on risk averseness level and age correlation, presented in both topics that have been previously discussed, Malkiel (2019) in his book "Random walk in Wall street" presents the life cycle fund investment option, which has been offered by many main investment fund groups in the US such as "Vanguard", "Fidelity", "American Century" and similar. In his example, he indicates 4 main portfolio ideas based on age main groups being mid-thirties, the end of forty and beginning of fifty, mid-sixties, and end of seventy or retirement period. According to the presented data, the portfolios tend to become more conservative

according to the investor's age. As per authors example the main pictures of the possible investment options have been created.

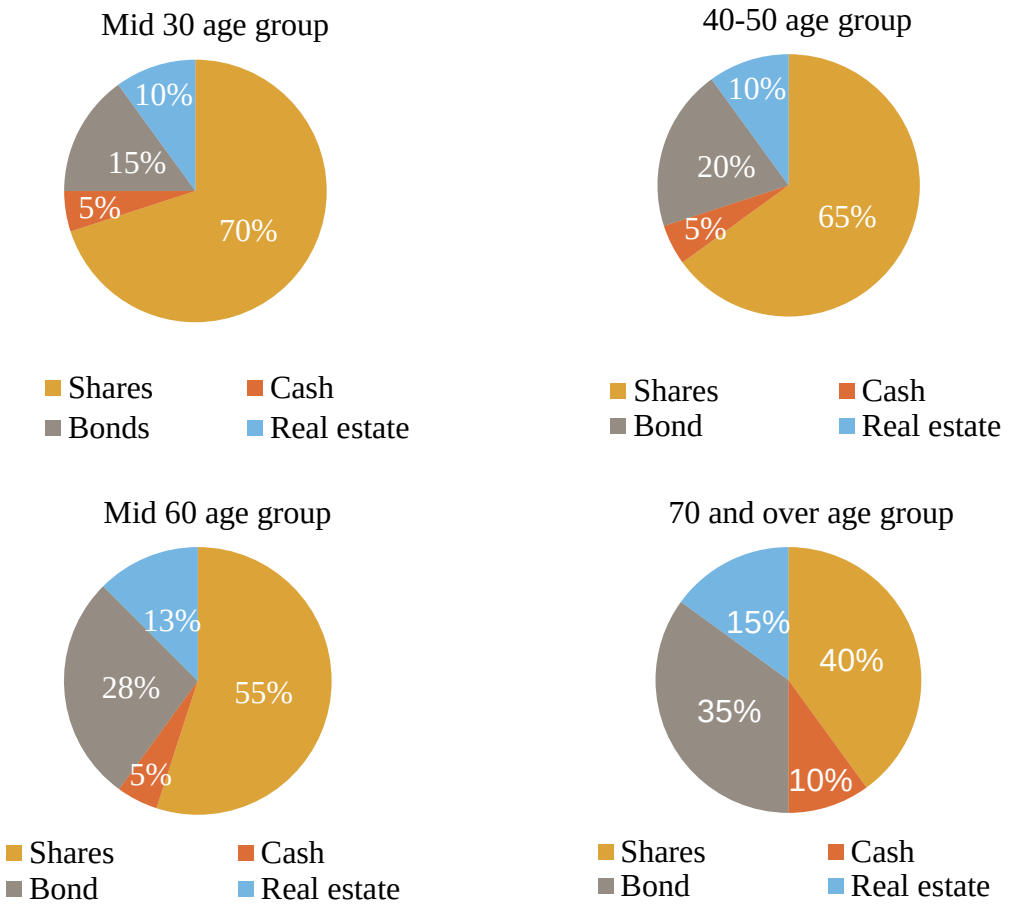


Fig. 5. Portfolio types by age group

Source: Malkiel (2019)

The main idea presented by the example above is that with age, individuals tend to become more risk-averse, and the tolerance level makes a major impact on the investment selection process and portfolio formation and management. According to the author, the main attribute of mid 30 age group portfolio is that the lifestyle of these investors is fast and aggressive; if the income is stabile there ten to be the ability to tolerate high-level risk, there is a need to implement discipline and save from the main income source for the future. The second portfolio is based on an individual age group between 40 and 50 years, and the main characteristics accredited to this group are the possibility of the middle age crisis. The risk acceptability level depends on whether the individuals have children or chose to pursue a career instead. The third group is people in their mid-60, and the author describes them as individuals who are still recovering after all the lives financial burdens and already have to start intensively think about

how to protect their current assets and manage their life during the pension. Furthermore, the last group is 70 and over who should be already enjoying their free time and worrying about their income; this group's risk perception becomes very minimal or none at all.

To summarize, personal investment management models depends on various factors, for instance, age, risk averseness, capital return goals, and the ability to generate the funds for investing purposes. Based on an individual's investment management selection, the two main personal investment strategies are passive or active investment portfolio management options. Portfolio construction processes and investment option preferences are closely related to the investors' age and risk perception level. After deciding on the personal investment strategy management model, including the main determination of portfolio structure and the inclusion of investment products, the portfolio management model should be created, which will forecast the constructed investment portfolio performance.

The combination of investment goal, return, time frame, the decision on acceptable risk level, and careful selection of investment options while creating personal investment strategy is a lead path to success. After the investment strategy is being formulated and investment options selected, the future returns and risk could be evaluated by using formulas such as the measure of the historical returns, the measure of the expected returns, the measure of the risk of the expected returns, and rates, risk measure for the historical returns and by evaluating using the models and theories. Personal investment strategy management model selection and proper application allow managing the portfolios most acceptably.

2. RESEARCH METHODOLOGY OF PERSONAL INVESTMENT STRATEGIES AMONG WOMEN

2.1. Research goal, strategy, and stages

This thesis research's main goal was to study female personal investment management peculiarities in Lithuania and prepare the comparison analysis with Australian females' strategies. This goal has been formed to evaluate current Lithuanian female investor's profiles and conduct a thorough analysis and establish potential investment portfolios to improve the current women investor's situation in Lithuania. The main research object is the personal investment decision features of females in Lithuania and Australia.

The research strategy contains two main stages. The first stage - the data collection initiation, and the second stage is the analysis of the data and presentation of findings for further step - optimal portfolio formation.

The best method to collect data for public and sociologic research surveys and the economics research area; the best approach is statistical data analysis (Saris & Gallhofer, 2014). To satisfy these requirements and to gather data for female investment strategy management research quantitative survey dedicated to collecting statistics of female invest-ing peculiarities has been created. The most substantial part of collecting accurate data for this study is to clarify and precisely implement the questionnaire's components. The main segments included in the survey are sampling, questions design, mode of data collection, and total survey design (Fowler, 2014). Considering previously mentioned details of questionnaire formation, the respondents' sample size has been calculated, the relative question to the topic has been prepared, the survey has been designed and delivered to the participant group.

Based on the answers received at the survey, the four target groups have been indicated. To elevate the current Lithuanian female investment returns for each target group, preliminary investment portfolios have been constructed based on the participants' needs and relying as a good practice method on Australian female investor's strategies. Modern portfolio (Markowitz, 2011) model has been used for portfolio formation and evaluation.

2.2. Selection of the research sample and presentation of the questionnaire

To conduct the survey, it is a must to perform the selection of suitable participants. Since this questionnaire has been dedicated to observing and analyze female personal investment strategies in Lithuania and Australia, the target group and participants were women in Lithuania and Australia. The assumption is made that it is not possible to distribute the survey to the whole population in either of these countries; moreover, fund limitation is considered

(Wolf, Joye, Smith, & Fu, 2016). The sample that would represent all the population in this survey must be selected. Notwithstanding, while performing the research, the issues and errors could occur if the sample scale size would be selected too narrow; however, the same dilemma might appear with too extensive sampling that is why the medium proportion group of participants should be chosen to get the most accurate results (Verma & Verma (2020), Valliant, Dever, & Kreuter (2018)).

A simple random sampling technique has been chosen, and the persons who would take part in this survey were determined using Slovin's formula. (Mclean, Guilford, & Fruchter, 1979):

$$n = \frac{N}{(1 + Ne^2)} \tag{1}$$

Where:

n = Number of samples

N = Total population

e = Error tolerance (level).

The variables used during the thesis research for Slovin's sample determination formula have been presented in the table below.

Table 2. Research samples in Australia and Lithuania

Variables	Lithuania	Australia
N	1500000	12600000
E	0,1	0,1
Confidence level	95 %	95 %
n	~100	~100

Source: created by author

In many literature sources with a 10 % margin of error after the number of all population that is being analyzed gets over one million, the sufficient sample size for the survey is ~ 100 participants (Ryan, 2013; Blair & Blair, 2015) Following the above calculation results and the information provided in written scientific origin this number of participants in Lithuania and Australia have been selected for thesis research.

The survey's main questions were related to female demographic statistics, financial literacy, and personal investment management information. The list of the questions is presented in table 3 below.

Table 3. Areas of survey questions

Demographic question	Personal finance management question	Personal investment related question
Age	Expenditure	Invest or not invest
Location	Savings planning	Where to invest
Family status	Monthly savings	Investment knowledge
Marital status	Savings preferences	Reason for not investing
Employment status		Suppose Investment plan preferences
Monthly income		
Education status related to financial literacy		

Source: created by author

The questions have been presented in five different forms:

1. Dichotomous questions (Yes/No)
2. Open-ended questions
3. Multiply choice questions
4. Ranking questions
5. Matrix questions

Each of the forms listed above allowed the researcher to get sufficient answers to the handed-out questions to gather new and significant knowledge on the subject. These question types taken separately would not provide the same quality results, so the combination was required. These questions helped determine participants' personal finance preferences and investment management peculiarities and figure out why females do not invest, what is lacking, and what financial advice and instruments could improve this area.

A self-administered survey type (Andres, 2012) has been created using Google forms and Anketa.lt tools to distribute this questionnaire. The participant target group was indicated as Lithuanians and Australian females. They have been reached via social media such as Facebook page, some women organizations and groups have been contacted by email, and the main part of the respondents was from personal students' and thesis supervisors' contacts.

In conclusion, the 100 recipients sample size has been calculated as an adequate number to represent the all-female population in Lithuania and Australia with 95 % of certainty that the population would express an identical opinion to the matter and 10 % of marginal error possibility that the answers fairness could fluctuate to the negative or positive side. Furthermore, to obtain the required data for further analysis, questionnaires have been formed with questions about demographics, personal finance, and personal investment strategy areas, allowing them to figure out the participant profile's statistical information. A variety of different structure questions have been prepared to gather accurate material for the topic analysis, and they have been introduced in the form of a survey placed in Google form and Anketa.lt and distributed through personal contacts and social media.

2.3. Portfolio creation methodology

Based on the research conducted in Lithuania and Australia, the evidence is that fewer females are investing in Lithuania. The main reasons for this inadequacy were lack of investing and financial knowledge with the addition of deficiency of reserve funds that could be dedicated to this purpose. To encourage Lithuanian women to use investment benefits and using Australian female investors' good practice examples and investment choices in line with the investment management theories and practices, investment portfolio examples have been constructed.

The first step has been to distinguish the main age groups of investors. Based on the literature review and examples, the age ranges to be used were 25-year-old, between 25 and 40, 40 and 60, and 60 and over. These selected age groups have been the base for the questionnaire, investment strategy, and personal investment portfolio creation. Data presented in the surveys were collected and analyzed based on these age groups that Lithuanian and Australian females were assigned to.

The second step has been to evaluate the Lithuanian female priority ranking presented in the survey's responses on the query about what priorities they would single out regarding the personal investment processes. To find the most significant factor of the respondents' ranking, Garret's ranking technique has been applied. The main attribute, Garrett's Table, was used to calculate the percent position that has been established and converted into scores. After the conversion, for every factor individually, the scores of each survey recipient has been added and the total value of percentage is calculated and converted to the scores, additionaly the mean values of scores have been calculated, and based on the results the ranks have been establihed (Appendix 1).

The formula for Garret’s ranking technique is as follows:

$$Percent\ position = \frac{100\ (Rij - 0.5)}{Nj} \quad (2)$$

Where:

Rij = Rank given for the ith variable by jth respondents

Nj = Number of variables ranked by jth respondents

Third step has been to assemble the investment portfolios that would be dedicated to personal investment strategy application for each female age group based on their requirements such as return expectations, time frame for the investment specification, risk perception level as well as the available funds.

To perform investment portfolio modeling it was important to select the best performing available investment options on Nasdaq Baltic exchange. After the research it has been established that based on the literature review and investors examples the best way to do so was to follow the indexes as they reflect the data of such investment options on the trade market. Hence, the OMXBBGI, OMX_BALTIC_BENCHMARK_GI index has been chosen to be used for the portfolio creation which included the most actively traded stocks on the Nasdaq Baltic exchange of such companies as Apranga, AUGA group, Grigeo, Harju Elekter, LHV Group, Linas Agro Group, Merko Ehitus, Nordecon, Novaturas, Olainfarm, Pieno Zvaigzdes, Siauliu Bankas, SAF Tehnika, Silvano Fashion Group, Tallink Grupp, Telia Lietuva, Tallinna Kaubamaja Grupp, Tallinna Sadam, Tallinna Vesi. The main trait of these stocks were limited number and liquidity which made these investment options as the best suit for the Lithuanian women investment portfolio construction. In addition, based on the combination of personal investment strategies (Fidelity (2020)) and portfolio construction strategies based on age groups (Malkiel (2019) presented in the literature sources the liquid investment such as cash and almost risk free – government bonds were included. The main calculation and data collection applied to all of the investment options.

The selected and above introduced investment options first have been evaluated by using the arithmetical mean to calculate the historical monthly and yearly returns. (Brown & Reilly, 2015, Greenwood & Shleifer, 2014). Formulas for these calculations goes as follows and it has been calculated on Excel application:

$$\text{AM (arithmetical mean)} = \sum HPN/n \quad (3)$$

Where:

n=number of years and ΣHPY = the sum of annual holding period yields.

After the specification of the monthly returns the yearly averages of the earnings and stock fluctuation has been evaluated.

The formula that has been applied to measure the historical rates of the returns is:

$$\text{HPR (holding period return)} = \frac{EndingValueofInvestment/}{BeginningValueofInvestment} \quad (4)$$

$$\text{HPY (holding period yield)} = \text{HPR-1} \quad (5)$$

$$\text{Annual HPR} = HPR^{1/n} \quad (6)$$

where n = number of years the investment is held

$$\text{Annual HPY=Annual HPR -1} \quad (7)$$

Going further based on the literature reviews, specifically taking into consideration Brown and Reilly's method, we need to compute mean historical returns in order to explore wider information of the returns over the years. Since the investment might have had a significant downfalls or profit during some time (as an example 10 years) it is important to do the deeper research to get all the possible information. The mean historical rate of return (HPY) for a portfolio of investments is measured as the weighted average of the HPYs for the individual investments in the portfolio, or the overall percent change in value of the original portfolio (Brown & Reilly, 2015).

The next step is to calculate the expected returns. In this case the previously mentioned authors use the formula:

$$\text{Expected return} = \sum_{i=1}^{n}(Probabilityofreturns) \times (Posiblereturns) \quad (8)$$

$$E(R_i)=[(P_1)(R_1)+(P_2)(R_2)+\ldots (P_n)(R_n)] \quad (9)$$

Where

P_1=Probability of returns

R_1=Possible returns

Since the diversification of the portfolio improvement is directly related to investment tools correlation among each other, before measuring the risk for each of the investment option, the correlation among each other has been calculated.

$$r = \frac{\sum(x-m_x)(y-m_y)}{\sqrt{\sum(x-mx)^2}\sqrt{\sum(y-my)^2}} \quad (10)$$

Where:

mx and my are the means of x and y variables (Schumacker & Lomax, 2016)

To measure the risk of the expected rates of returns Brown and Reilly are using two options: variance and standard deviation. During the portfolio construction in this thesis these two measurements were used as well. The above stock monthly return data for the last 5 years has been taken and used to calculate variance and standard deviation.

The formula for variance goes as follows:

$$\text{Variance}(\sigma)=\sum_{i=1}^{n}(P_i)[R_i - E(R_i)]^2 \quad (11)$$

It is important to know that the larger the variance for an expected rate of return, the greater the dispersion of expected returns and the greater the uncertainty, or risk, of the investment.

The formula for standard deviations is:

$$\text{Standard deviation}(\sigma) = \sqrt{\sum_{i=1}^{n}(P_i)[R_i - E(R_i)]^2} \quad (12)$$

The most popular way of evaluating all portfolio risk and return levels is Modern Portfolio theory which proposes that a portfolio manager must carefully choose various assets while designing a portfolio for maximum guaranteed returns in the future (Kaplan, 2017, Chen, 2016).

Markowitz modern portfolio theory formula for the returns is:

$$R_p = \sum_{i=1}^{n} w_i R_i \quad (13)$$

Where:

R_p- Return of portfolio

$\sum_(i = 1)\hat{}n$ – the sum of the investment

w_i- the weights of the investment

R_i- the return of the investment

Markowitz modern portfolio theory formula for the risk is:

$$\sigma_p = \left[\sum_{i=1}^{N} \sum_{j=1}^{M} w_i w_j COV(R_i R_j) \right]^{1/2} \quad (14)$$

where:

COV – covariance

$$\sigma_p^2 = \begin{pmatrix} w_1 & w_2 & w_3 & w_4 \end{pmatrix} \begin{pmatrix} \sigma_{11} & \sigma_{12} & \sigma_{13} & \sigma_{14} \\ \sigma_{21} & \sigma_{22} & \sigma_{23} & \sigma_{24} \\ \sigma_{31} & \sigma_{32} & \sigma_{33} & \sigma_{34} \\ \sigma_{41} & \sigma_{42} & \sigma_{43} & \sigma_{44} \end{pmatrix} \begin{pmatrix} w_1 \\ w_2 \\ w_3 \\ w_4 \end{pmatrix} \quad (15)$$

Based on the selected investment strategies, 4 portfolio types were constructed:

1. Aggressive
2. Growth
3. Balanced
4. Conservative

Each of the portfolios included the same investment options that have been mentioned and described in the text above; they conducted the same weights of the portfolio; however, the percentage in each of the investment portfolio was different. To be specific aggressive portfolio included 85 % stocks available on Nasdaq Baltic exchange, 15 % government bonds and 5 % liquid investment – cash, growth portfolio 70 %, 25 % and 5 %, balanced 40 %, 50 % and 10 %, conservative - 50 %, 20 % and 30 % respectively.

To summarize, the surveys were created and distributed among Australian and Lithuanian females with questions regarding their personal finance habits and preferences. Australian women's responses have been analyzed and used together with strategies presented in literature reviews as an example for Lithuanian women investors with the main goal to encourage them to enhance their current participation in personal investing processes. The personal investment portfolios for females, divided into groups by age, have been constructed based on the available

investment options on the Nasdaq Baltic market. The investments have been selected based on the index following strategy. Their performance has been evaluated using such measures as historical returns, risk, and expected returns for each of the investment tools separately and included in the portfolio.

3. ANALYSIS OF WOMEN PERSONAL INVESTMENT STRATEGIES IN AUSTRALIA AND LITHUANIA

3.1. Australia's and Lithuania's economic analysis

A comparative economic analysis of Australia and Lithuania economies' initial objective was to evaluate the investment context's fundamental economic indexes. To form a successful personal investment strategy, every investor needs to develop a comprehensive understanding of the country's current and future health and financial markets of the country they selected to invest in.

The main indicators that were used to evaluate the economic situation in both selected countries were:

- Gross domestic products (GDP)
- The Consumer Price Index (CPI) and Inflation
- Currency strength and stability
- Labor market statistics e.g., unemployment rate.
- The stock market and bond yields
- Housing and construction
- Production and manufacturing statistics

The data of Lithuania's and Australia's yearly GDP seasonally and working day adjusted percentage changes has been presented in a figure 6:

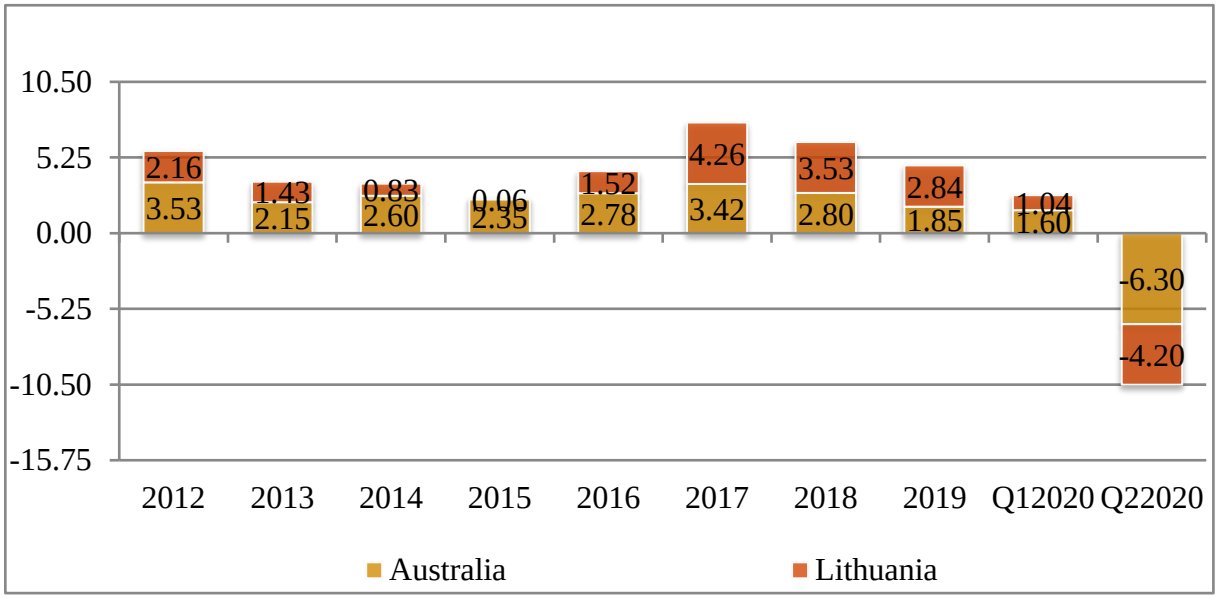


Fig. 6. Yearly GDP (%) changes in Australia and Lithuania

Source: created by author based on Statistics Lithuania (2020), Australian Bureau of Statistics (2020)

The graph above compares the summary statistics for Australia's and Lithuania's annual GDP changes from 2012 to 2019 and the first two quarters of 2020 expressed in percent. According to the data presented above, the evidence is that Australia's average Gross Domestic Product throughout the years was higher and fluctuated less than Lithuanian. However, as well as all the rest of the world, both countries' economies were affected by the Covid-19 pandemic in 2020. Analyzing BVP, it could be seen that Australia's economy shrank almost a bit over than 6 % in the second quarter, whereas in Lithuania it was minus 4 %. The assumption could be made that while facing the global crisis, Lithuania's economy resisted slightly better than Australia's. Here many scenarios could be considered form the investors' standpoint - for example, if the prediction were made that the economies will get back to the same place like they had been for almost 10 years, based on the BVP index, Australia would be the country to consider to invest into, especially with current changes in a market, since many company's shares have dropped, it would seem to be the best time to invest and earn a profit once the situation picks up. On the other hand, if the scenario with the current economic situation is placed - Lithuania seems to be handling the pandemic better and taking into consideration that the country is in European Union, and other political and economic information, the prediction could be made that this country will recover quicker than Australia - based on this idea Lithuania should be chosen as a country to gain earning on once investments.

The second and the third most important indicators for investors to evaluate while analyzing country's economic shape are The Consumer Price Index (CPI) and Inflation. The CPI fluctuation from 2012 to third quarter of 2020 has been illustrated in figure 7:

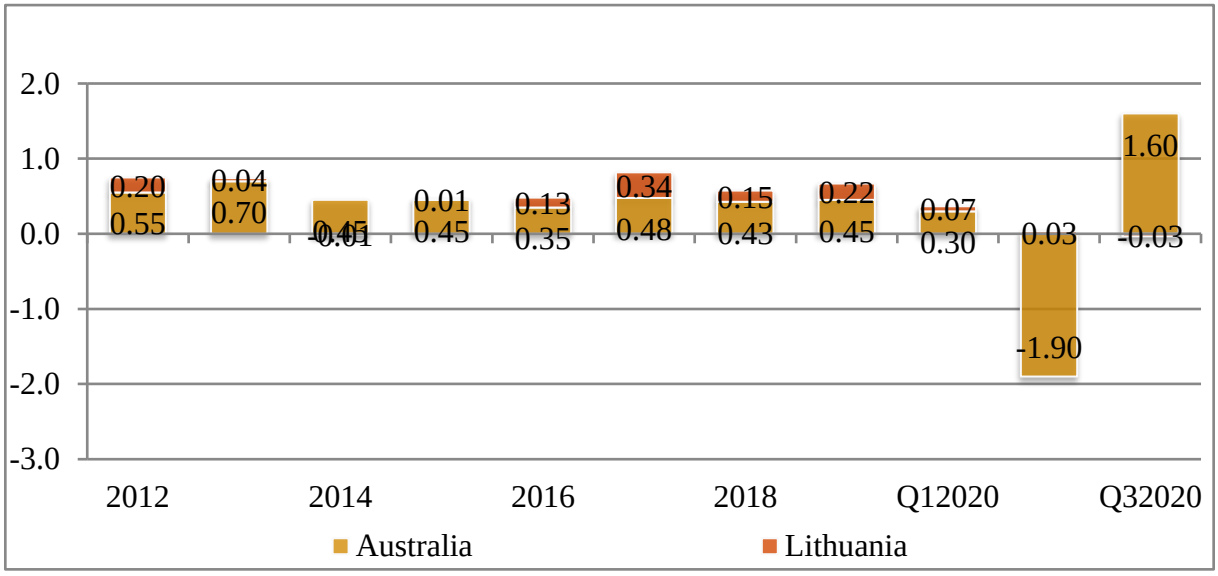


Fig. 7. Yearly CPI changes (%) in Australia and Lithuania

Source: created by author based on Statistics Lithuania (2020), Australian Bureau of Statistics (2020)

The graph above reflects that the average change in prices during 2012 to 2020 were stable, however, higher in Australia, and consumers paid for a basket of goods much less than usual during the Covid-19 pandemic and countries locked down in second quarter of 2020 and the price changes rocketed to 1,60 % compared to previous month, which is not surprising knowing the current overall economic situation in the world. In Lithuania's case it could be seen that the CPI was fluctuating more rapidly during 2012 until 2020, however, it appeared to be more stable during the crisis. The CPI indicator is closely related to inflation, deflation and stagflation measuring and reveals which stage of economy changes the country experiences. The yearly inflation and deflation results since 2012 up to third quarter of 2020 have been presented in a figure below.

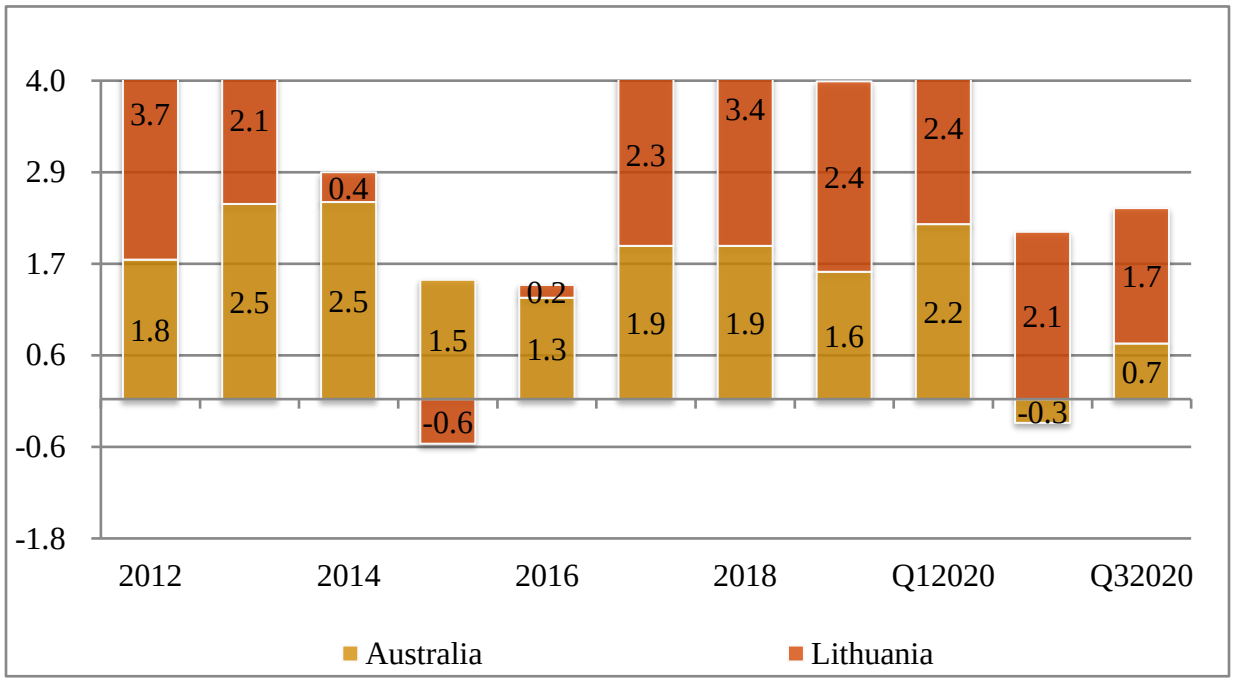


Fig. 8. Yearly inflation (%) changes in Australia and Lithuania

Source: created by author based on Statistics Lithuania (2020), Australian Bureau of Statistics (2020)

Figure 8 compares and overview Australia's and Lithuania's economic situation regarding inflation, and in support of the data presented above, it would seem that inflation in Lithuania was evidently higher and oscillated sharply examining in contrast to Australia. Hence, it tends to be the case that the investor should see Australia's economy as more resilient and stable to place their funds to gain the returns based on CPI and Inflation indexes.

The next indicator that should be observed to analyze and evaluate an exploratory country to invest in is its currency strength and stability. It is a lagging indicator as the country's currency's value would change to reflect the country's political and economic circumstances.

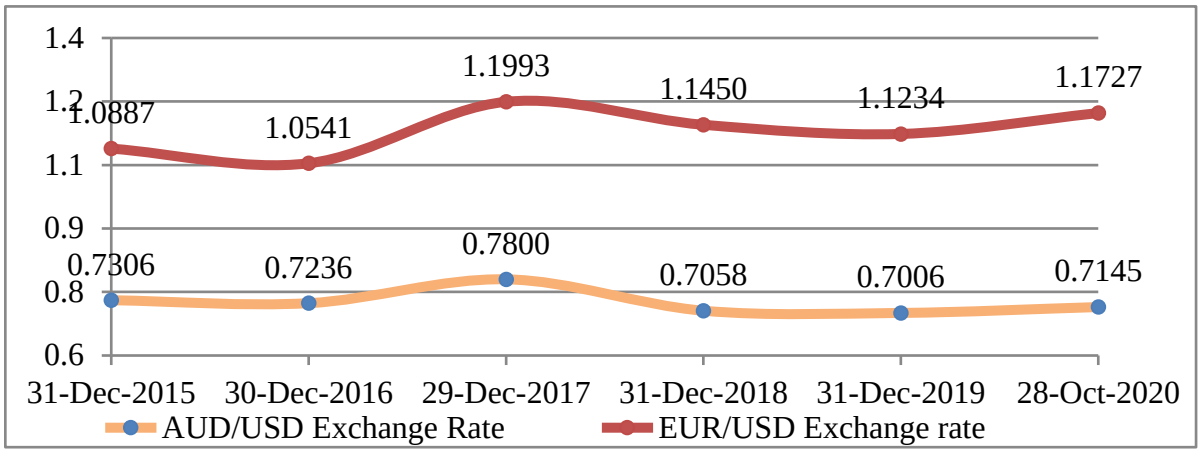


Fig. 9. Yearly currency exchange rate changes in Australia and Lithuania

Source: created by author based on Reserve Bank of Australia (2020), Bank of Lithuania (2020)

Figure 9 above provides the summary statistics of currency exchange rates regarding USD in Australia and Lithuania from the end of 2015 to the 28th of October 2020. Since investors could use this indicator to analyze overall economic performance, interest rates, or fundamental economic data, evidence points to Lithuania's currency Euro to be stronger as its exchange is higher. On the other hand, it might be suggested that both currencies are comparatively stable as the fluctuation is relatively low.

The other important indicator to oversee and analyze is employment indexes, particularly unemployment, which could be used by the investor as a reflection of the country's job market situation that is directly related to business performance situation.

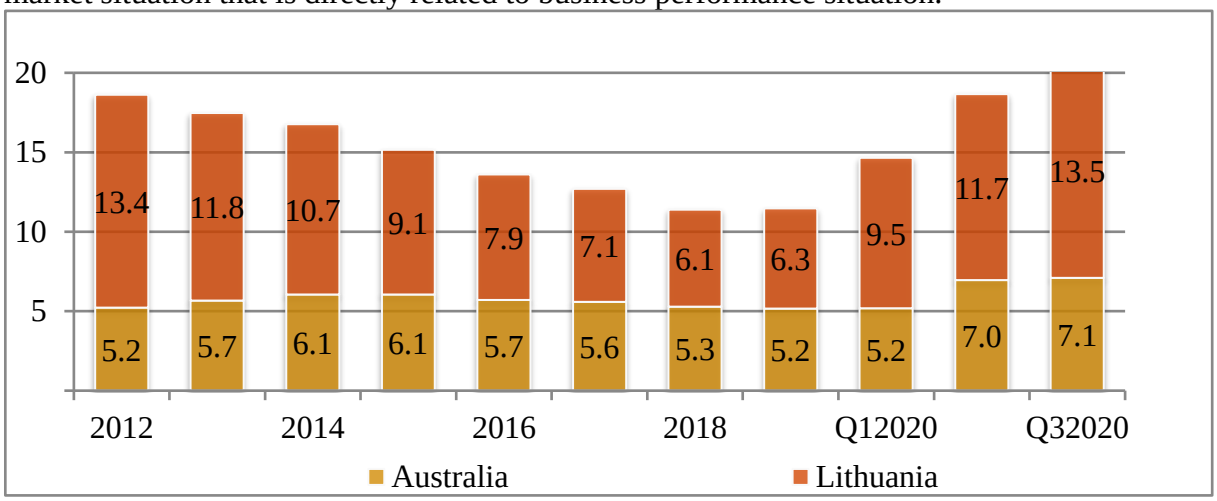


Fig. 10. Yearly currency exchange rate changes in Australia and Lithuania

Source: created by author based on Statistics Lithuania (2020), Australian Bureau of Statistics (2020)

As shown in Figure 10, the above unemployment rate between 2012 and the 3rd quarter of 2020 has been substantially lowered in Australia compared to Lithuania. The closest to the matching point was in 2018 and 2019, wherein Australia unemployment was 5,3 % and 5,2 % and in Lithuania 6,1 % and 6,3 %, respectively. What can be seen from this graph, once the Covid-19 crisis hit, Australia's unemployment rate did not change in the first quarter of 2020 but rose by around 2 % in the second and third quarters, whereas Lithuania's first-quarter shifted by 3,2 %, in the second and third quarter by 2,2 % and 1,8 % accordingly, in overall reaching 7,2 % difference since 2019. It should be the case that many residents in both countries were let go from their employment due to lockdown, business closure, and other to pandemic related reasons. However, the assumption could be made that the Australian government's crisis plan was more successful; hence, more citizens could save their jobs, and the unemployment level did not rise as dramatically as in Lithuania.

Furthermore, the main stock index of the country, for the prospective investors, should be used as a reflection of local investors' confidence in the future of businesses in the country, which, likely, could lead to economic growth.

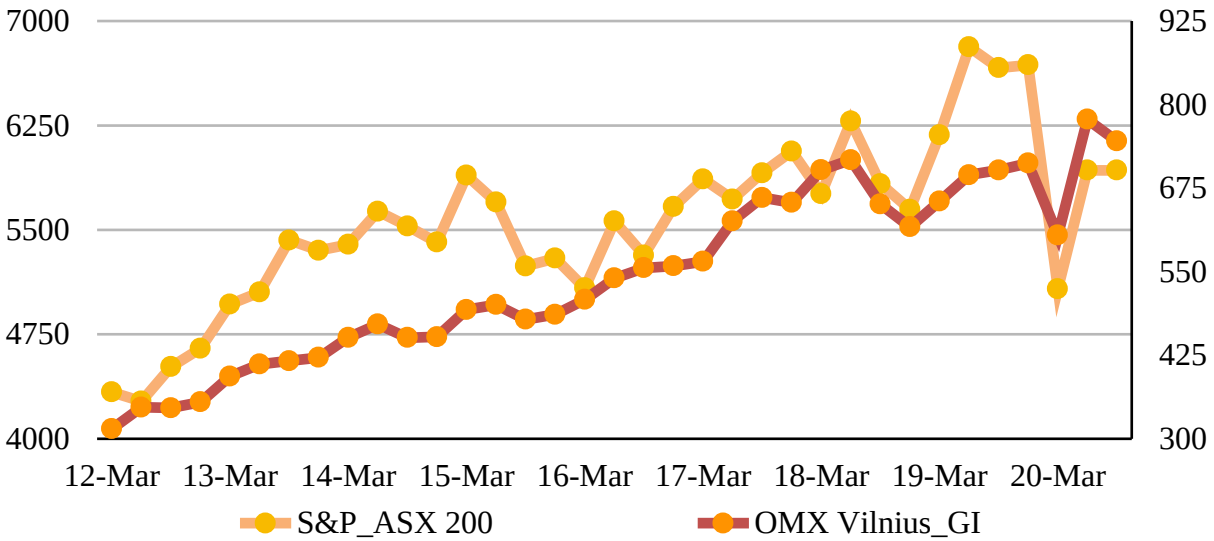


Fig. 11. S&P_ASX 200 and OMX Vilnius GI changes from 2012 January to 2020 October

Source: created by author based on Australian Security Exchange (2020), Nasdaq Baltic (2020)

The graph above has been presented the main stock indexes in Australia and Lithuania. Australia's S&P ASX 200 includes and tracks the performance of 200 large companies in Australia, whereas Lithuanian OMX Vilnius Gi is the total return index, which includes all the shares listed on the main and secondary lists on the Vilnius Stock Exchange. What stands out in graph 3.6. both countries' stock indexes grew from 2012 to 2019 with some minor drops or

peaks. However, they commonly declined once the Covid-19 pandemic started. Analyzing the data before this event Australia's stock index was higher than Lithuania's from 2012 to 2015, fluctuated drastically from 2016 to the end of 2018, and picked up again in 2019. It is worth mentioning that stock index prices compared in the example above, which includes the country's companies' selected stocks and is computed from their weighted prices, extremely differ in amounts itself. S&P ASX 200 started in 2012 from 4262 AUD, which is around 2600 Eur, and the last price was 5927 AUD converted it makes approximately 3692 Eur in 2020 October. Whereas OMX Vilnius GI began from 310 Eur at the beginning of 2012, the last data was taken from October 2020, which substituted for 745 Eur. This index price difference reflects investors' diversity in measuring Lithuania's and Australia's stock market, or a subset of the stock market, and could assist them while comparing current price levels with past prices to calculate market performance in both countries.

The next step in stock market analysis is government bond yield rates of data research. In figures 12 and 13, Australia's and Lithuania's government bond yield fluctuation since 2016 to 2020 have been presented.

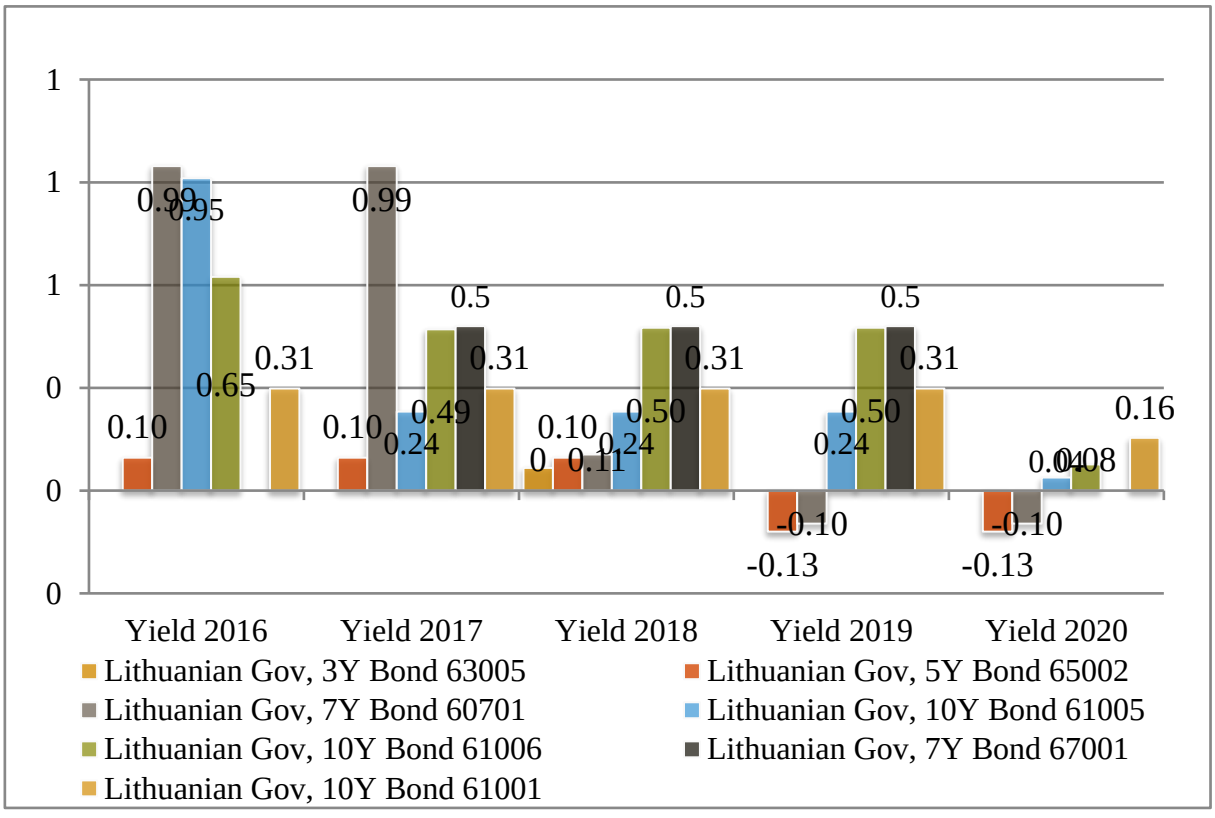


Fig. 12. Lithuania's government bond yields (%) 2016-2020

Source: created by author based on Nasdaq Baltic (2020)

The graph above reflects Lithuania's bond yield curve for the main mature and short-term bonds that could be traded on the Nasdaq Baltic exchange. Closer inspection of the graph shows that long-term bonds would return higher returns than the short term. However, the returns themselves tend to be low, and this would indicate that investor could expect the economy to grow in the long term in the future slightly, but if these government bonds would be considered as an investment, despite being a safe option, it is not going to return high funds.

The second graph displays bonds issued by Australian government and the performance during 2016 to 2020.

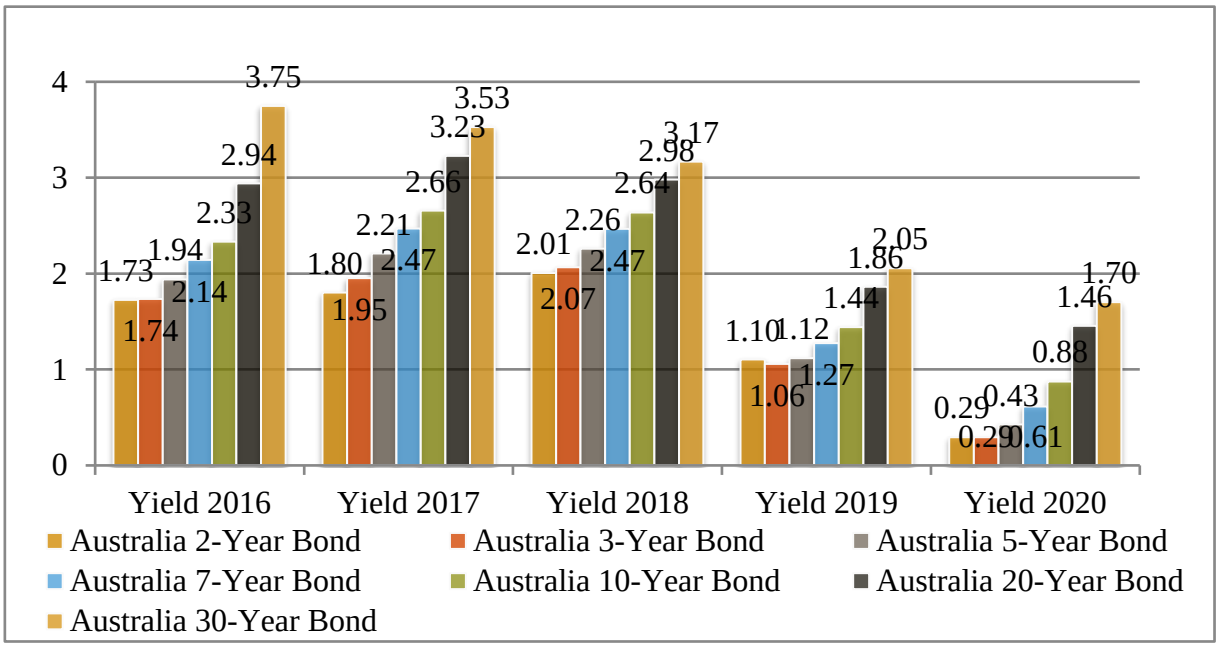


Fig. 13. Australia's government bond yields (%) 2016-2020

Source: created by author based on Australian Security Exchange (2020)

Compared to Lithuania's government bond yields, Australia seems to be more profitable with the higher returns on the investment itself. On the other hand, the similarity is that the long-term bonds return higher earnings than the short term.

Since the performance of shorter-term bonds are directly impacted by central bank decisions and interest rate expectations, on the other hand, longer-term bonds (with maturity time of longer than two years) are impacted by interest rates but also factors like inflation and economic growth, which can take longer to come into effect the government bond yields reflect country's economic situation in two ways - short- and long-term forecast of the investment efficiency could be performed. Based on the data presented in both graphs above, the assumption could be made that based on government bond performance represented by the yield curve,

Australia seems to have a more stable economic environment, and investors should consider a beneficial trend while choosing which country to invest in.

The other economic indicators that should be used as reflecting the economic situation in a particular country and could be used for the analysis are the construction and housing sectors and their changes.

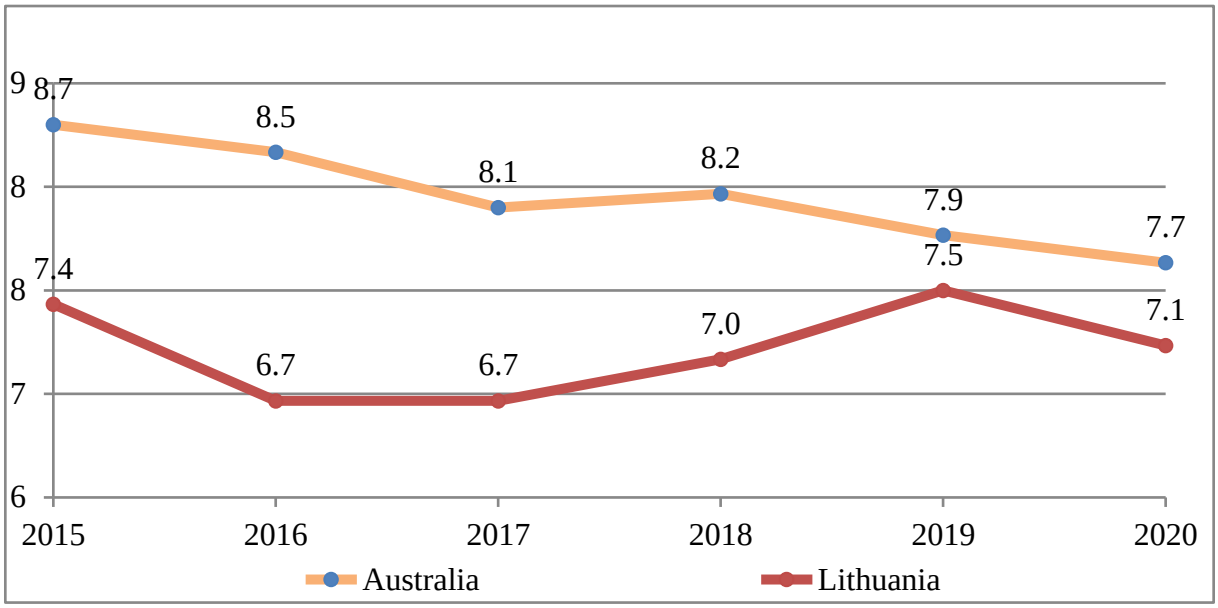


Fig. 14. GVA by construction sector (%) in Australia and Lithuania 2015-2020

Source: created by author based on Statistics Lithuania (2020), Australian Bureau of Statistics (2020)

It can be seen from the data in a graph above that based on the changes of the Gross Value Added by the construction sector in Australia's comparison to Lithuania, Australia would be the country that produces more financial worth to Gross Domestic Product during the time range in between 2015 and 2020. This evidence supposes that Australia's economy is getting a slightly higher impact by the construction section, especially GVA. Viewed in this way, it might be suggested that Australia's construction sector is marginally more developed and impactful to the economy's growth than Lithuania's; hence, based on construction indicator, Australia's economy could be identified as stronger compared to Lithuania's.

The second macroeconomic indicator is the Residential property price changes index, and it could be the leading indicator since the data could be gathered and used to present the information of the state of the economy months in advance. To elaborate, for instance, a decline in housing prices indicates that the number of residential properties exceeds the number of people who are planning to buy them. The reason for this could vary; an example could be the prices that have been inflated, or another reason could be that residents cannot afford to buy. It is important to mention that when the housing sector weakens, the entire economy is impacted

and reflects the downturn. In general, the decline in residential property price might have an impact on homeowner's wealth, jobs in the construction sector, and taxes; besides, it could impact homeowners and force them into foreclosure, the process where lenders seek to recover the mortgage loans from borrowers.

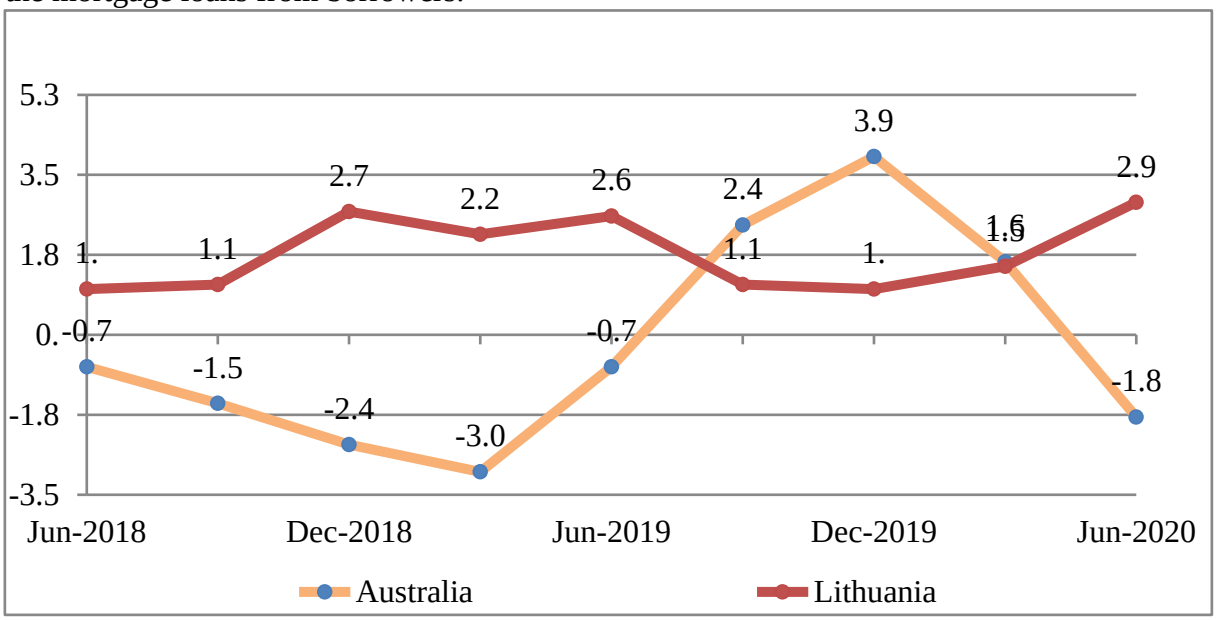


Fig. 15. Residential property price index changes (%) in Australia and Lithuania 2015-2020

Source: created by author based on Statistics Lithuania (2020), Australian Bureau of Statistics (2020)

The graph above illustrates residential property price change indexes in Australia and Lithuania from 2018 to the third quarter of 2020. The evidence points out to Australia's high fluctuation and strong declination in the residential property prices throughout these years; on the other hand, Lithuania's price index seems to be considered stable and quite high. The main difference that stands out in this data is that during the Covid-19 pandemic, Australia's residential price index fell quite rapidly, whereas Lithuania's grew at a similar pace. Therefore, it can be assumed that Lithuanian residents increased their investment in the housing market; in contrast, Australians withhold from this investment and choose other options. For the investor who is investigating this index, it might suggest different scenarios, including the brilliant time to invest in Australia's property since the prices are lower and it might be a tremendous opportunity to gain additional profit in the future, or value this fall as a recession in the economy and consider Australia as a country too risky to invest into.

The last economic indicator to analyze to gain the information of the country's economy to select to invest into is gross value added by manufacturing. This index allows evaluating the country's current economic situation because an increase in production and manufacturing tends to positively impact gross domestic product (GDP), which could be seen as a sign of

increased consumption and possible positive economic growth. The GVA in millions in Australia and Lithuania has been provided in figure 16 below.

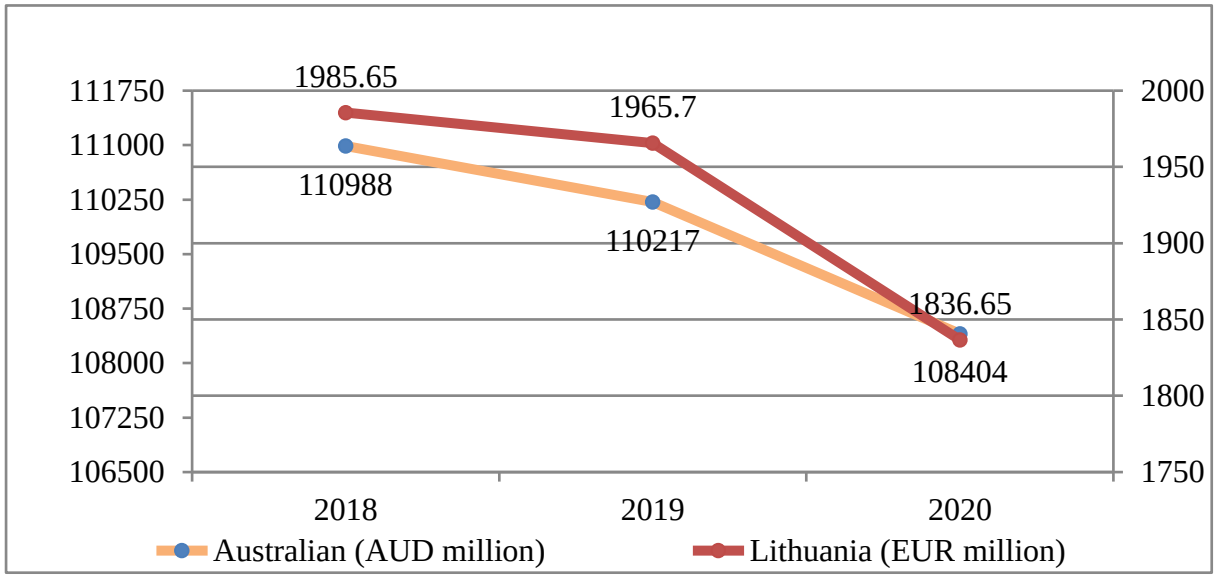


Fig. 16. GVA by manufacturing (mln) in Australia and Lithuania 2018-2020

Source: created by author based on Statistics Lithuania (2020), Australian Bureau of Statistics (2020)

It can be seen from the data in the graph above that Australia's manufacturing sector provides substantial higher amounts to the country's economy in comparison to Lithuania despite the drop in 2020 impacted by the Covid-19 global pandemic. The GVA to BVP by the manufacturing sector in Australia was 110988 million AUD in 2018 and slowly declined throughout 2019 and reached the lowest point, which was 108404 million AUD in 2020. In comparison, Lithuania's GVA to BVP by manufacturing was 1986 million Euro in 2018 and by falling in 2019 and 2020 reached 1836 million Eur in 2020. The evidence points to Australia's economy being superior to Lithuania's regarding manufacturing GVA data analysis despite the declination during the worldwide pandemic that affected all the economies.

The conclusions could be made that Australia has a stronger economy in many analyzed factors, and investors should consider before deciding to invest. Additionally, these evidences support this master's thesis idea that Australia could and should be used as an example country for investment purposes.

3.2. Investors profile in Australia and Lithuania

To analyze the personal investment management selection topic and include the full scope of it, the investors' profile research in Lithuania and Australia has been conducted; the findings were presented and analyzed. First, to thoroughly research and obtain sufficient knowledge about the context, the first step was to collect as much data as possible, and, in Lithuania's case, there were not many articles or statistics available in this area. Lithuanian

Statistic department has been contacted, and the information was received that currently there has been no official research done by this authority and none of the data exists on the investors' profile, personal investment, or female investment decisions matters. The logical decision was made to use the publicly available information on this topic.

The first research was conducted by "INVL Asset Management" and published on their website (Invalda, 2017). This research took place in 2017 and included 1011 Lithuanian residents between 18 and 75; it was most informative and thorough, besides including gender differences and priorities. The main topic that has been assessed during this research is the difference between female and male investment and pension choices. The main discovery presented by "Invalda" is that Lithuanian women investors profile tends to be more conservative than men; additionally, females tend to choose to save rather than investing. The subject of pension has been discussed to substantiate these findings, and the summary of findings was presented. It concluded that a higher percentage of female participants - 48,5 % stated that to keep living in dignity during their pension time, the compensation itself should be equal to the current salary, whereas 39,7 % of the male had expressed the same aspiration. Women also tend to lean towards the safer side while asked about savings management habits. The data from this survey has shown that in their opinion (33,5 % of respondents), people should start saving for their retirement from age 19–25, and 8,1 % of female questionnaire partakers suggested that the age should even be 18 years old. In this case, male participants were a bit more nonchalant and 19 to 25 years as an age point to start putting money aside for this purpose chose 28,9 % and 6,6 % 18 years old. However, the opinions almost coincide with starting to save for retirement at age 26-35 years old and continually differed on the oldest age to be 36-45 years old and chose 16,1 % male and 13,5 % females. The other important findings have been presented during this research are more women (36,1 %) than man (32,7 %) are expecting to be able to use money from their retirement or pension funds, majority of participants are planning to use the funds for their retirement from "Sodra" (female - 89,8 % and male - 88,7 %) and working during their retirement are planning 19,6 % of female and 20,8 % of man. The interesting fact is that more male than female participants plan to live from their savings once the retirement period comes - 35,5 % and 30,9 %, respectively. Regarding the investment subject, females were presented as more restrained since 14.3 % responded positively to the question of whether they invest; as a comparison, 18,7 % of male respondents answered the same. Women investors could also be called more careful once it comes to the invested amount since more of them agreed that it consists of 20 Eur - 12,5 %, respectively 4,8 % males choose the same option. Male investors

preferred to start with 51 to 100 Eur investment funds - 37,5 % and 27,1 % females. A similar percentage of participants declared that they invest between 21-50 and 101-200 Eur per month.

Lithuanian investors' profile has been analyzed in-depth in 2013 by L. Macijauskas, and the research findings have been publicly published on Investavimas.lt webpage (Macijauskas L., 2013). The survey took place for four months, and 426 Lithuanian residents participated, the sample size of 100 answers has been selected for further analysis with 95 % of confidence level and 5 % as an error tolerance level. 65 % of the investors were males and 35 % females. Other demographic details included 25 years old and 39 participants, 26 to 40 years old 39 and more than 40 years old 22, respectively. All participants responded to having higher education or profound knowledge about the investment strategy or investing itself.

Since the survey has been conducted before Lithuania adopting the Euro, which took place in January 2015, the investment amounts have been indicated in litas. After Lithuania changeover to Euro litas was pegged to the euro at 3.4528 litas to 1 euro, from the presented data could be assumed that most of the survey participants (46) have invested around up to 10000 Lt (~2900 Eur), the second most popular amount was between 10000 ((~2900 Eur) and 100000 (~29000) that 37 people invested and only around 16 Lithuania's residents from the survey invested over 100000 (~29000).

Evaluating the familiarity with the main investment tools, it can be seen that survey participants have the most knowledge about investment funds and, in contrast, lacks an understating of derivatives and stock exchange-traded funds. Furthermore, regarding the knowledge of other financial investment instruments, the research pointed out that investors in Lithuania are the most familiar with money market instruments and stock/ shares investment; on the contrary, the expertise in commodities gap has been revealed.

The investment options have been divided into saving, for instance, cash, deposit, bonds, etc., or risky - shares/ stocks, commodities, real estate, and so on, and the respondents were asked how they distribute the investments in their portfolios. The replies are presented in picture 17 below:

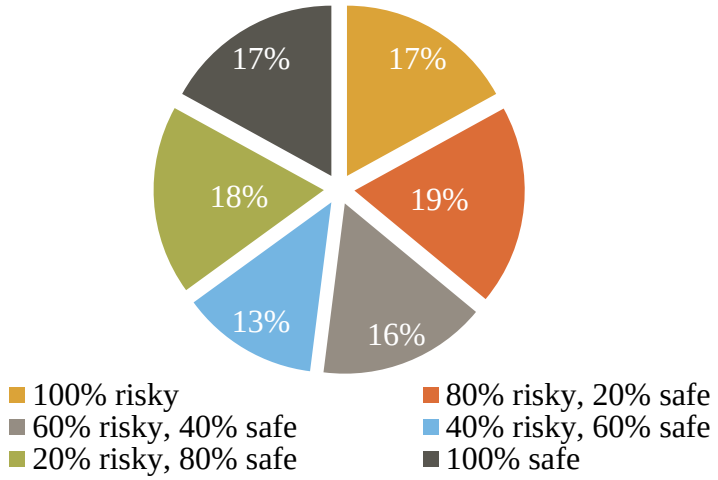


Fig. 17. Investment distribution in Lithuanian investors' portfolios

Source: Macijauskas (2013)

In support of the picture above could be declared that most of the survey recipients' portfolios include 80 % risky and 20 % non-risky investment options; hence, the conclusion could be made that Lithuanian investors tend to choose higher-risk investment options. However, contrasting data has been provided regarding female personal investment strategy, which states that men chose risky investment portfolios one point six times more often than women. This information leads to the assumption that Lithuanian female investors lean towards safer investment options. The other point that has been presented, and it supports this supposition, is that women choose a 100 % safe investment portfolio structure as a personal investment strategy twice more frequently than a 100 % risky portfolio option.

To paint the objective, Lithuania's investors' profile is necessary to introduce other aspects of investor's behavior - expected profit and risk tolerance level. Lithuanian investors seemed to be optimistic, and their expectations of the invested fund growth were between 4 % and even 16 %. However, the majority (33 %) of the recipients were realistic and forecasted to grow around 4 % to 8 %.

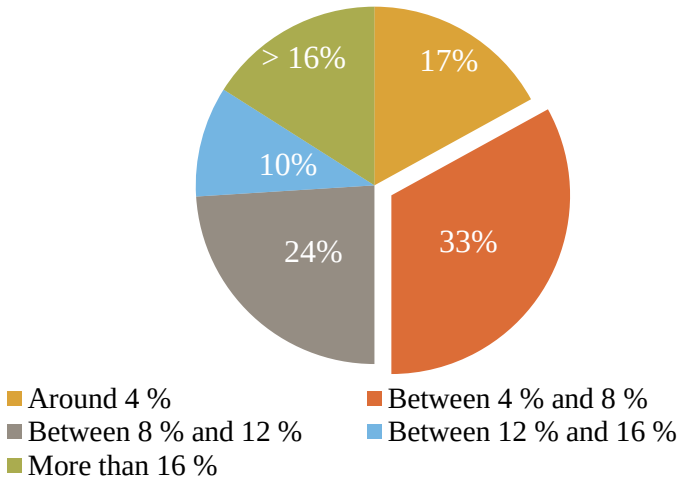


Fig. 18. Lithuanian investors investment return expectations in 2013

Source: Macijauskas (2013)

The risk perception was comparably high as well; most of the investors confirmed they could afford to lose around 20 % or the invested funds; for 24 % of participants, this limit was constituted around 30 % of the invested amount, 10 % of the survey contributors would accept 50 % loss of the investment, and 50 % loss could be acceptable to 16 % of investors, whereas, to lose 10 % would afford almost the same amount of participants - 17 %.

This survey has revealed that in 2013 in Lithuania, investors were more likely to be a man than women, had a high level of confidence in their investing knowledge, which grew in parallel to portfolio risk, were quite risk-tolerant, and expected to gain medium to extremely high returns from self-build portfolios using independently selected investment instruments. On the other hand, female respondents were more restrained regarding investing - less of Lithuanian women choose to invest; their portfolios were less risky.

The other research was organized and presented by such financial institutions as Swedbank, SEB Bank, and Bank of Lithuania. Bank of Lithuania has performed detailed research and analysis of investors and securities traded on Nasdaq Vilnius Stock Exchange in March of 2020. As it is published on the bank's official website: "By disclosing data to the public, we aim to increase the transparency of stock exchange trading further and provide market participants with an additional tool for analyzing securities trading" (Bank of Lithuania, 2020). This research exhibited that in 2019 at least one transaction was performed by 8,813 investors, the absolute majority of them were local investors and constituted 8,204 whole number of participants, and it accounts for around 0,29 % of Lithuanian residents.

Research that has been introduced by Swedbank (Swedbank, 2020) and SEB Bank (SEB Bank, 2020) reveals that saves around 40 % of Lithuania's residents; however, the number as well as savings amount slightly increase during the Covid-19 pandemic and currently, it constitutes over 20 % of the salary. Alternatively, the results have reported that only around 2 % of the Lithuanian population selects investing as the finance management technique. Investors tend to choose less risky investment options and incline to use financial advisers instead of investing independently. Additionally, the information was provided in the articles mentioned above that 4 % returns are counted as sufficient.

Overall, the assumption could be made that Lithuanians prefer to save than invest, and if they do invest, the first choice is a safer investment option with lower returns than high earnings and risky investment. In addition to that, as the main financial goals, Lithuanians indicated financial reserve and dignified retirement. Females seem to be more reserved than males when the financial topic is introduced. These researchers' women in Lithuania make more conservative decisions on investment and savings compared to a man.

To investigate the investor's profile in Australia, several kinds of research have been conducted during the last ten years. The most comprehensive reports have been published by the Australian Securities Exchange institution in 2014 and the latest in 2017.

"The Australian Share Ownership study" has been conducted in 2014 to provide an insight into retail share market investor's knowledge and practices in Australia (Australian Security Exchange, 2014) and included 6409 adult participants. The research was focused on the share investing category, and it revealed that around 36 % of Australian residents were investing in shares. Going forward, the main share ownership allocation discoveries revealed that the majority of shareholders (26 %) preferred the direct investment option, 3 % chose indirect only, and 7 % owned a combination of direct and indirect shares. Additionally, shareowners were distinctly concentrated on domestic shares, with only 13 % of all investors investing in international shares. Besides, the direct investment portfolio examples included shares of the company, other investments, and derivatives bought on a stock exchange, and in addition to that, many participants hold residential or other type investment property. The overall distribution of Australian investor's investments strategy has been displayed in figure 19 below.

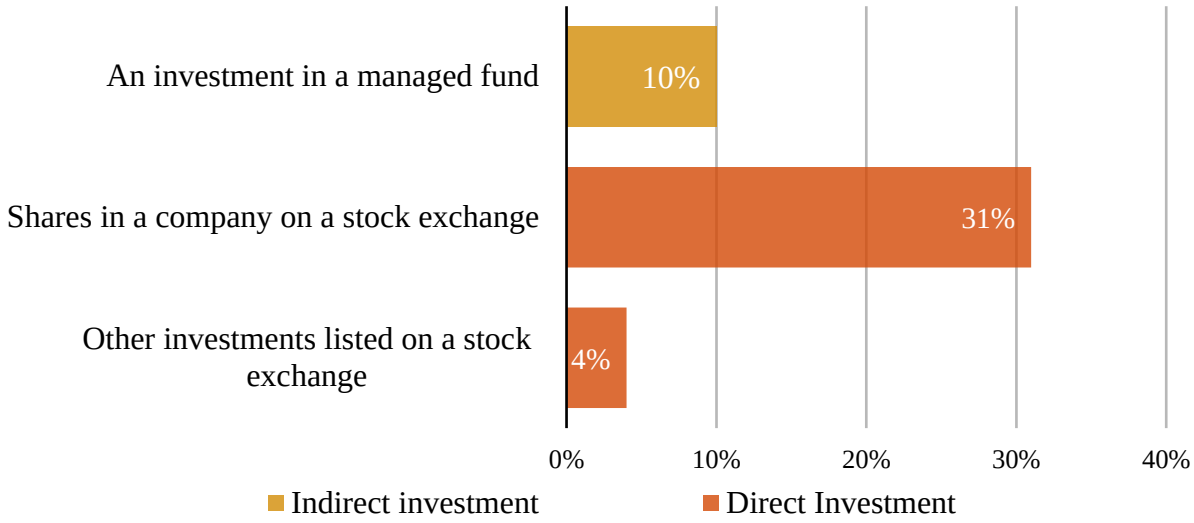


Fig. 19. Australian investors direct and indirect investment distribution

Source: Australian Security Exchange (2014)

Other investment and derivatives options included 1.8 % of A-REITs, 1.4 % of Options, 1.3 % of ETFs and Infrastructure Funds, 1.1 % of LICs, 0.9 % of Hybrid Securities, 0.7 % of Bonds (Govt and Corporate), 0.6 % of Futures, 0.6 % of CFDs and 0.6 % of Instalments/Warrants. The details of Australian investors' portfolios revealed that there is a wide selection of investment options available for direct investment in Australia; the investors choose not very much diversified portfolios and share investing goes parallel with property investing; besides, investors rather choose domestic shares than international to build their personal investment strategy.

Aspects introduced by the Australian Security Exchange study related to gender data was similar to Lithuania's and revealed that men are more likely to invest than women. Of all adult Australian males, 38 % are direct shareowners, whereas of all adult Australian females, 27 % are direct shareowners. Among the 33 % total direct shareowners that have been mentioned above, 57 % are men and 43 % women.

Another interesting fact the research revealed was that education level as well as income correlated with each other and with the investing process. For example, the higher the education, the more likely the person will invest, and if Australian residents earn a higher salary, they will presumably become investors.

The most recent research was conducted by the Australian Security Exchange (ASX) (Australian Security Exchange, 2017) in 2017. This study has concentrated on detailed investor profile analysis, which painted an accurate picture of the investment choices made by males

and females to gain additional earnings. There were 4000 study participants, and based on whether they invest or do not invest, they have been divided into two groups - investors and non-investor. During this research, 60 % (2391) of the respondents were investing, and 40 % (1609) were not.

Going further, all participants from previously mentioned groups strategically were observed in a more detailed analysis, and based on their answers; each has been split into two more segments:

1. Investors:
   - On-Exchange
   - Other
2. Non-investors:
   - Lapsed
   - Never invested

On-exchange, investors hold investments available on the financial exchange, and another type of investors chose different investment options. Non-investors were separated into lapsed, which means, stopped invested for different reasons but used to do this before and never invested. Among all investors having a personal investment strategy is investing in on-exchange listed financial investments 44 % were man and 31 % women.

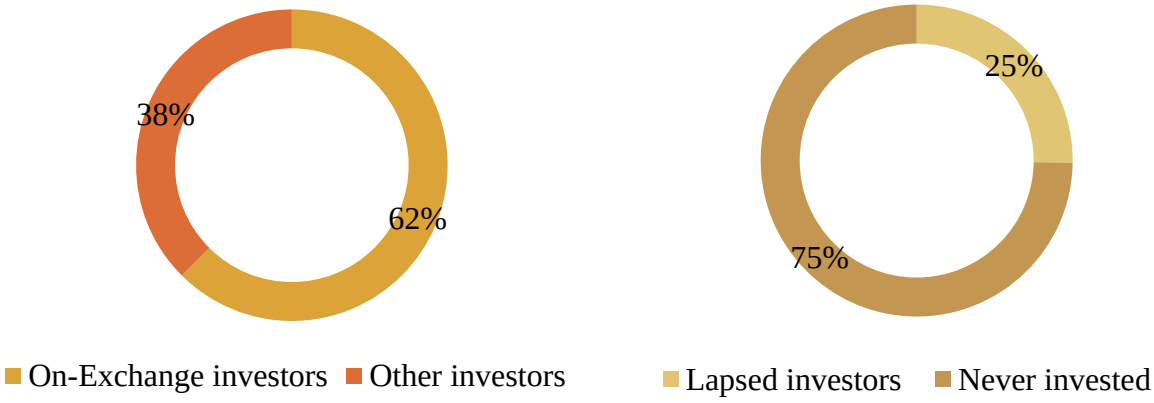


Fig. 20. The detailed view of respondents' investment preferences

Source: created by author Australian Security Exchange (2017)

This division introduced the study from a different perspective and allowed to deeper understand Australia's investors profile. As per the data in the pictures above, the assumption could be made that a higher number of survey participants chose to invest to gain additional earnings; besides, 62 % of all respondents preferred the exchange market as an investment tool. Simultaneously, 38 % had chosen other investment alternatives, such as various funds, cash, property, and others. This diversification in investor's selections could indicate Australian venture capitalist's wide knowledge about the investment products and the broad availability of

investment tools accessible in the country. Concerning lapsed investors, the study showed that 84 % are planning to return to growing the additional funds by investing shortly.

The detailed investors profile research presented by ASX participants has been partitioned by age into three main groups. The first group was called the "Next-generation," and it included 18-24-year-old investors, the second - "Wealth accumulators" - 25-59-year-old, and the third one was named "Retirees" and referred to 60 and over year-old respondents. The questions related to three main financial goals, the expectation of financial returns, the risk reluctancy level, and investment portfolio structure have been presented to be answered by the survey participants whose investors were already. The other part of the questions regarding Australian investors' profile was related to the personal investment strategy preparation, and the answers to questions such as using the financial advice, artificial intelligence tools as advisors, and trading methods were required. The summary of this part of the research has been given in tables 4 and 5.

Table 4. Australian investors profile - financial goals, risk, return and portfolio structure

	18-24-year-old investors	**25-59-year-old investors**	**60 and over years old investors**
Main financial goals	1.Accumulating wealth 2.Saving for a home deposit 3.Saving for travel	1. Planning for retirement 2. Accumulating wealth 3. Supplementing current or future income	1. Planning for retirement 2. Supplementing current or future income 3. Accumulating wealth
Return expectations	~ 8.2 %	~ 9.2 %	~ 8.0 %
Risk appetite	81 % would like to get guaranteed or stable returns	67 % would like to get guaranteed or stable returns	60 % would like to get guaranteed or stable returns
Investment portfolio	• 44 % hold cash • 31 % hold shares • 25 % hold investment property • 22 % hold other investments on-exchange and derivatives	• 53 % hold cash • 51 % hold shares • 42 % hold investment property • 25 % hold other investments on-exchange and derivatives	• 68 % hold cash • 58 % hold shares • 26 % hold investment property • 18 % hold other investments on-exchange and derivatives

Source: create by author based on Australian Security Exchange (2017)

Table 4 shows that the main financial goals adjust during the life cycle and the priorities differ based on age. Since the middle group, which started to be neither young nor retired investors, is quite broad and included 25- to 59-year-old participants, the data which falls under

this segment is related to both - first and the third groups. For instance, the youngest and middle investor's targets were concentrated towards wealth accumulation; in contrast, people closer to retirement or already retired prioritized planning retirement and supplementing their income. However, second group investors also set their goals similar to the third group and, by choosing to invest, were expecting not just to earn additional financial benefits but to prepare for retirement and subsidize their current or future incomes.

The further instance of this research disclosed that the biggest return on the investment has been being expected by investors between 25- to 59-year-old, and the highest return expectation could be seen in youngest participant group answers. This study also suggested that the first group participants gave priority to cash holding as an investment, seconds most popular selection between 18-24-year-old participants shared, and investment property with other investment options hold on the exchange including derivatives were third and fourth pick, respectively. On the other hand, the second group holds cash and shares in almost the same amount - 53 % and 51 % cash being slightly more favorable investment option, investment property constituted to 42 % which is very high comparing to the first group and other investments were the least favorite, only 25 % of respondents answered owning such kind of investments. Furthermore, the third group with participants age 60 and over prioritized cash holding; perhaps, this choice might be established relying on this investment liquidity property. Additionally, 58 % hold shares and 26 % and 18 % own property or other on-exchange investments accordingly.

Introducing the research's return segment should be mentioned that the lowest number of participants that were expecting stable or guaranteed returns were in a group of age 60 and over. This might be related to realistic calculations based on previous experience. The results stated that 81 % of the first group of age 18-24 and 67 % of the second group of age 25-59 were expecting the same risk accordingly. The study also suggested that Australian females were more risk-averse than male investors and only 26 % of women investors were willing to accept higher fluctuation in return or possible loss in their investments compared to 40 % of male investors. The introduction of this fact acknowledges that female investors differ from males and choose safer investment options rather than risky ones.

The next table reveals how Australian investors select their investment options in addition to the information provided.

Table 5. Australian investors profile and financial advice.

	18-24-year-old investors	25-59-year-old investors	60 and over years old investors
Use of financial advice	37 %	44 %	52 %
Main reasons for using financial advice	1. Obtain advice tailored to their personal circumstances 2. Get investment ideas 3. Help them diversify their portfolios and minimize risk	1. Obtain advice tailored to their personal circumstances 2. Help them diversify their portfolios and minimize risk 3. Gain access to investments they would otherwise not be aware of or able to access	1. Obtain advice tailored to their personal circumstances 2. Help them diversify their portfolios and minimize risk 3. Help them navigate the administrative and tax requirements of investing
Use of robot advice	15 % would use, 28 % would not, 43 % are unsure	13 % would, 29 % would not, 58 % are unsure	4 % would use, 41 % would not, 55 % are unsure
Trading methods of investors that have transacted in the past 12 months	1. 42 % used a non-advice broker or online trading platform 2. 36 % used an advice or full-service broker 3. 24 % used a financial planner	1. 65 % used a non-advice broker or online trading platform 2. 21 % used an advice or full-service broker 3. 18 % used a financial planner	1. 69 % used a non-advice broker or online trading platform 2. 21 % used an advice or full-service broker 3. 13 % used a financial planner

Source: created by author based on Australian Security Exchange (2017)

The evidence presented in Table 5 points out that the search for investment advice has grown respectively to survey participants age and the 52 % from the third group answered positively to the question of whether they are seeking some advice before choosing the investment option. The main reason provided by all groups for seeking and using the financial advice was to obtain advice tailored to their personal state of life; the second most popular intention between groups was portfolio diversification and risk minimization. The aims that split between all groups were the first group thought it is important to get some advice to create investment idea, the second group believed it was an option to access the investments they would not be aware of or would not be able to approach. The third group singled out that the investment advice was necessary to navigate the tax and administrative requirements. Overall, all the participants suspiciously evaluated the robot's advice, and most chose to invest via a non-advice broker or online trading platforms. The second and third choice of investment assistance for all age groups was full-service brokers and financial planners.

In summary, the Australian Security Exchange investor profile study conducted in 2017 reported Australians to be active investors and as a main personal investment strategy to choose various financial instruments available on an exchange or hold cash as a more liquid investment. They also expected medium or low returns in an average of 8.5 % and get more risk averse as well as tend to seek financial advice with age. The main goals of becoming an investor were wealth accumulation or retirement funding; additionally, the most popular investment approach was a non-advice broker or online investment platform. Regarding female and male investment strategy difference - men invested more often than women, and female investors were more likely to be risk-averse than male investors.

In support of the evidence that investment decisions differ among female and male investors, the elaboration of Australian female investment behavior has been presented in several research and articles (Rapaport, 2020; Investment Trends Pty Ltd, 2019) has been analyzed. The main reasons that are related to negative influence have been introduced by one of the lead women and finance research in Australia (Hartge-Hazelman, 2020) why female choose to invest less often, invest smaller amount and choose safer investment options compared to man was the influence of existing gender inequality and gaps in pay, superannuation, employment, unpaid labor and lack of female employees in leadership positions including diversity shortage.

The information presented in research and articles publicly available in Australian media reveals that female investors number is growing and, based on answers provided by women who participated in research and has been interviewed by journalists, this is due to the information available on social media as well as investing into familiar companies. For instance, as a part of the investment portfolio, women select the company which product they use and believe that this company will do well in the future. The other aspect disclosed was that females choose safer investment options with guaranteed returns, such as cash, which included high-interest savings account and term deposits, and investment options that provided fixed interest, such as government or corporate bonds. Studies additional suggested that on-exchange investing could be described as a male-dominant investing area as 58 % of them choose this higher volatility and risk investment option, which is not surprising having the information on female risk averseness.

Regarding the Covid-19 situation, the research conducted by ASX (Australian Security Exchange, 2020) has introduced the fact that in 2020 there were 46 % out of all population who invested, 42 % of all investors were females, the number has grown compared to the 2017 survey results, 28 % of all investors changed their retirement plans during Covid-19 pandemic, 54 % of investors made adjustments to their investment portfolios, 17 % have invested all their

spare cash, 64 % of investors said they would accept high or medium variability for the potentially high returns, 36 % prioritized stability of the dividends and 31 % they are concentrated on the portfolio diversification to prevent volatility and accumulate higher profit.

In summary, the investor's profile analysis revealed that Australians had higher accessibility to a wider variety of investment options; besides, a higher number of females were investing to accumulate wealth than in Lithuania. Also, Lithuanians tended to save rather than invest, and if they did invest, they were choosing higher-risk investment options and expected high returns; the percentage fluctuated between 4 % and over 16 %, whereas Australians chose to invest more often and selected less risky investment strategies such as cash to constitute for the major part in their investment portfolio with the expectation of ~8.5 % of the return. However, risk averseness, investment strategy creation, and return expectation depended on the country's age and gender. Regarding the Covid-19 situation, based on the available surveys and research, the main difference was that Lithuanians started to save more and become slightly more financially responsible. Australians made changes to their investment portfolios, pension funds, and even invested their spare cash.

3.3. Comparison of financial literacy level and financial education accessibility in Australia and Lithuania

In the theory part of this master's thesis, it has been established that financial education and financial literacy take a crucial role in everybody's life. The quality and well-being of a person's life depend on the level of finance, economic, and investment understanding since it is directly related to managing money and plainly presented, makes them work for once needs.

Based on the results presented at Global Financial Literacy Survey (The Standard & Poor's Ratings Services, 2015) in 2015, the key findings included the astonishingly low level of financial literacy among the worldwide participants, the surprising fact that inflation and numeracy were the most understood concepts. In contrast, the risk diversification was undeservedly neglected; moreover, the young people group was declared a vulnerable class, and the concentration should be placed on education programs dedicated to improving this group's financial knowledge and literacy. Lastly, the most related to this paperwork; hence, the most significant discovery women's financial literacy levels were lower than men. There was also mentioned that females had weaker financial skills despite the country's economy, age, education, or income. As this report and other prior studies that have been analyzed during this research have noted the importance of the inequality issue among gender in the finance field,

therefore, it is useful and important to study, analyze, evaluate, and find the possible solution to reduce the gender gap in financial literacy and education area.

Another aspect related to this thesis, presented in the Global Financial Literacy Survey report, was the percentage of financial literacy and education among Lithuanian and Australian adults. The document declared that 39 % of Lithuanians were indicated as financial literate; in contrast, Australia has been selected as one of the countries with the highest literacy rates globally, and its financially knowledgeable residents substituted for 64 % out of all Australians. This difference could be taken as a clear indication that Lithuanians could use Australia's methods of education and financial literacy presentation to society and level of availability as an example and implement changes to the current system based on good practice method.

A few questions related to the topic have been included in the questionnaire to compare the differences between Australian and Lithuanian female economic and financial knowledge and to research female financial literacy and education level profoundly. The collected data results have been introduced in the figures 21 and 22 below.

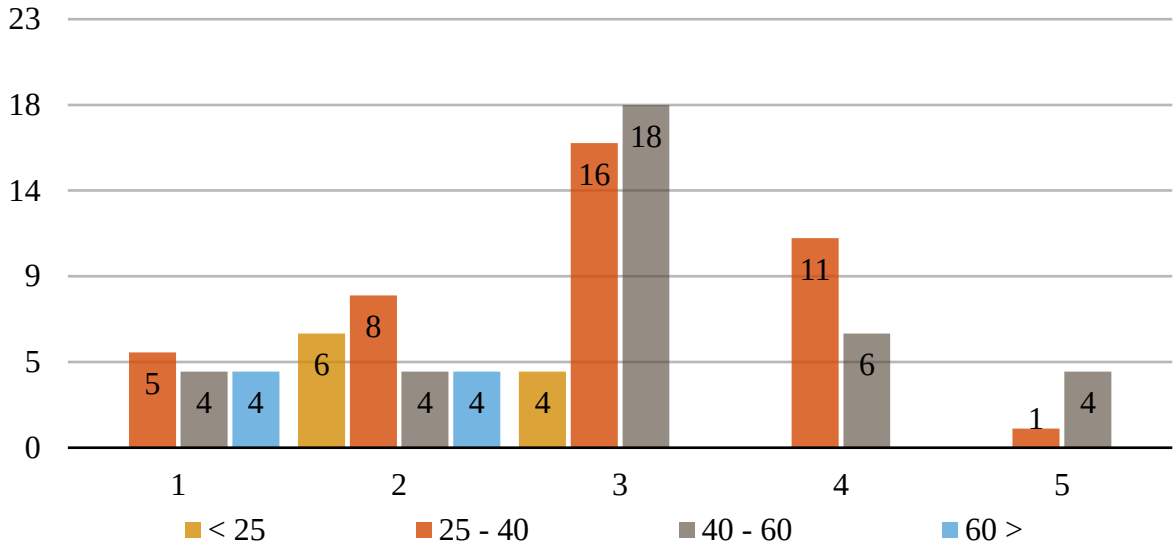


Fig. 21. Self-evaluation of knowledge level in finance area by Lithuanian females

Source: created by author

As can be seen from the graph above the confidence level between women in Lithuania in their financial knowledge grew in correlation to age increase, however, on average Lithuanian females evaluated their financial literacy as the medium level. This conclusion could be made based on most of the participants replies to self-evaluation question on how much

knowledge do you have in investing and finance areas where most popular selection was 3 out of 5.

The other data source graph 22 has been dedicated to the same question answer results among Australian females.

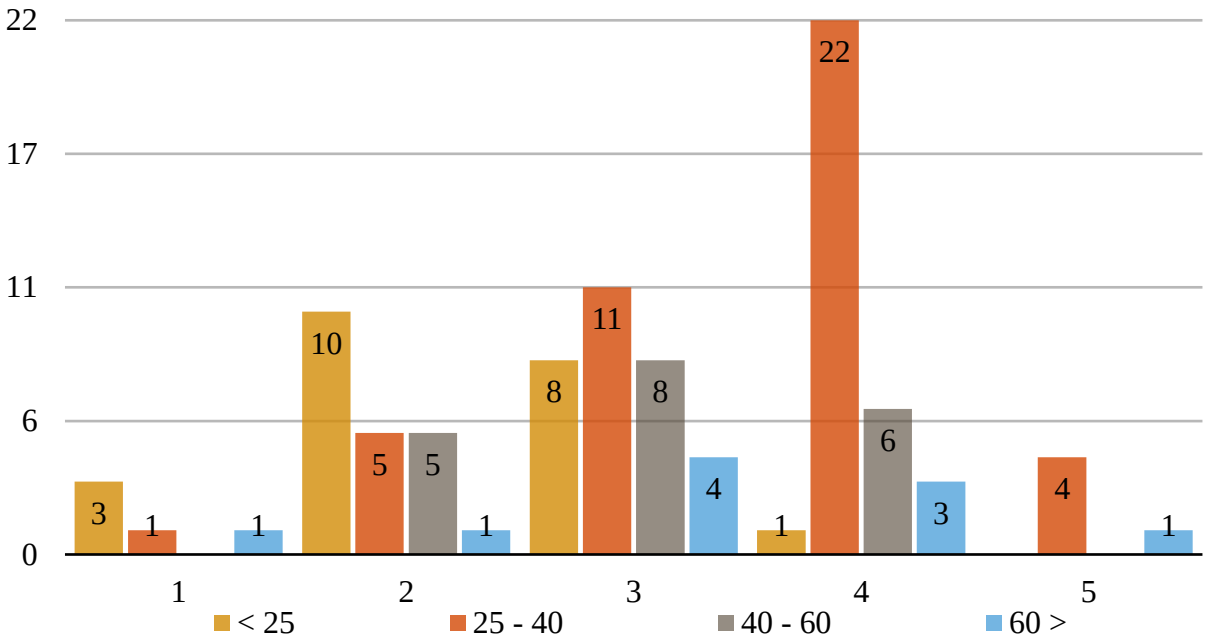


Fig. 22. Self-evaluation of knowledge level in finance area by Australian females

Source: created by author

Based on the outcome represented in the graph above, the assumption could be made that Australian females believe that they are well knowledgeable in the finance and investing field as most survey members selected 4 out of 5 while evaluating their understanding of finances and investments.

The next part for which the data was collected using the survey was the query where this understanding and knowledge of finances were received. The summary of the answers revealed that around 35 % of Lithuanians answered that they have gained their understanding in finance and investing fields from their studies such as high school, Bachelors or master's degrees, one participant, was a Ph.D. holder in Economics. In comparison, only 20 % of Australian females who participated in this survey obtained their financial literacy from formal education, and they rather attended additional lectures, courses, or training provided by the government, their company, or purchased independently. The common ground on the subject and one interesting finding are that most participants said they were seeking the financial, economic, and investing intelligence independently by reading magazines, books, or watching related videos.

The main assumption that could be made based on this survey results is Australians attend more courses whereas Lithuanians either graduate from a formal education institution or do not pursue financial knowledge; thus, a higher percentage of the female participants claimed to have a greater level of knowledge in a field compared to Lithuanian women. The other disturbing finding is that global financial literacy results evaluated the overall Lithuanian population as less than a medium level of financial literacy. On the contrary, Australia's residents were evaluated as one of the most knowledgeable in this area among all the world countries. Based on the results of the findings revealed in this section, the conclusion could be made that financial literacy is a major issue among Lithuanians, they lack the knowledge in this field, and changes should be implemented to improve the situation. After comparing Australia and Lithuania based on financial education and literacy level, the evidence leads towards the suggestion that Australia could be used as an example for the development of the financial education stimulation plan and state improvement in Lithuania.

3.4. Personal investment strategies among women in Lithuania and Australia

Taken together the information provided during this research, it is now well established that the economic situation and investors profile and financial literacy and education levels vary among Australia and Lithuania. Previous studies have also explored and established differences between female and male personal investment strategy management processes. In addition to this knowledge, some evidence suggests that the personal investment method is altering throughout the phases of a person's life and could be developed based on age, risk perception, and needs. During this thesis section, personal investment strategies among Lithuanian and Australian women have been distinguished, analyzed, and compared. Furthermore, suggestions for preliminary female investors' plan has been introduced based on previous research and using Australian women investing examples as a good practice method.

To analyze the current workforce structure and overall environment that affects one's ability to invest, the questions have been prepared and distributed through the questionnaire to Australia's and Lithuania's females. The first question that will be used to provide demographics data was related to the workplace, and it reflects the ability to get earnings. The results of the division of employment options have been indicated in figure 23 below.

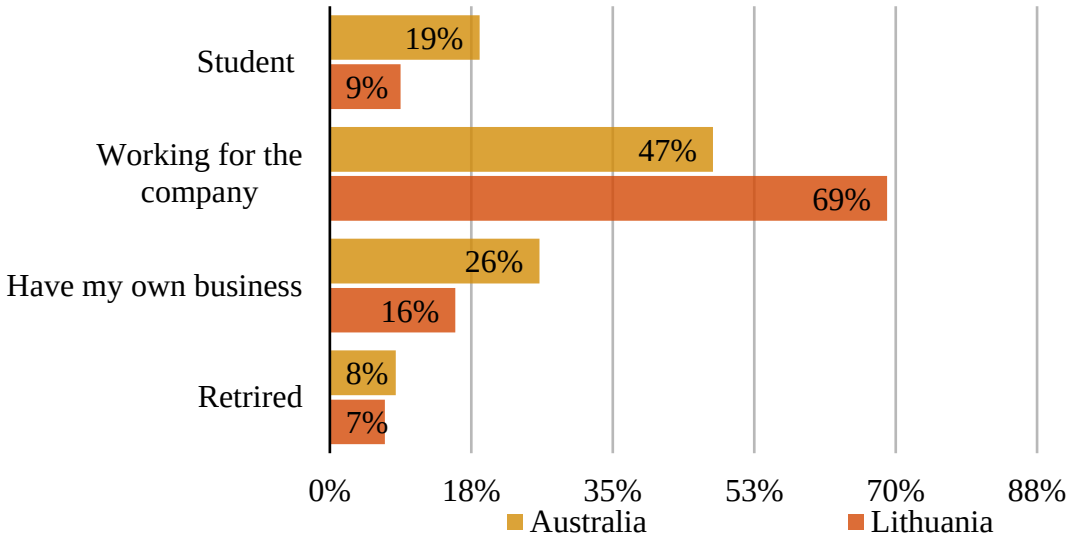


Fig. 23. The division between employment options among Australian and Lithuanian females

Source: created by author

It is apparent from the graph above that most Australian females have been studying to improve their current skills and working for the company, almost as half as much as working for the employer also owns their own businesses and only 8 % of respondents has been retired. It is worth mentioning that around 50 % of respondents were involved in two activities at once, for example, working for the company and owning their own business, owning the business during the time of pension, or studying while working for the company or running their own venture. In contrast, Lithuanians mainly chose to be involved in one activity at once, unless studying while working for the employer. Based on the introduced results, the assumption could be made that it is important to understand whether there is a connection between one activity and the number of funds.

Keeping in mind the results from the first question, the second step in parallel was to analyze Australian and Lithuanian females' average earnings to determine the capability to invest or choose a different investment approach. The specific question and a set of possible answers have been created to collect the data. Based on the replies of the survey participants, the information has been collected, and the results have been introduced in the chart below:

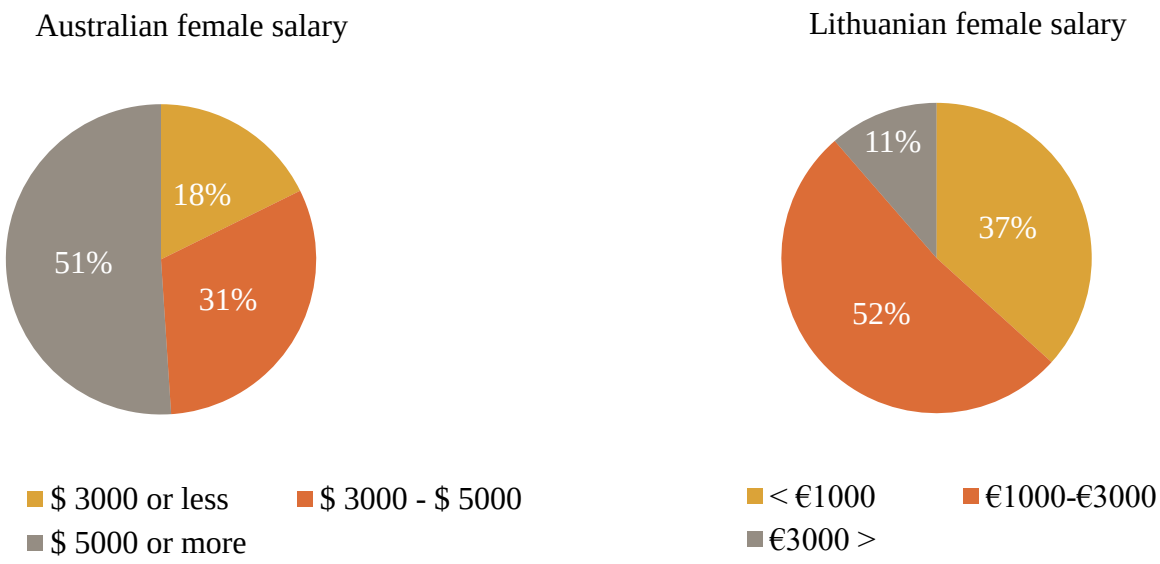


Fig. 24. Salary ranges among Australian and Lithuanian females

Source: created by author

The pie chart above illustrates the difference between Australian and Lithuanian women's salaries. The majority of Australian females who responded indicated their salary to be over 5000 AUD, which is currently equal to approximately 3067 Euros, whereas most Lithuanian female survey participants specified their average salary to be between 1000 and 3000 euros. These results reveal that it should be the case that Lithuanian women's salaries tend to be considerably lower compared to Australians. The most obvious finding to emerge from the analysis of the responses is that the biggest possible issue regarding personal investment strategy creation for Lithuanian females would be the lack of available supplementary funds dedicated to investing purposes.

The next step was to analyze current personal investment strategies among women and their management tendencies. This would allow analyzing the main distinctions in both countries and generate a broader view that will support this thesis's future steps. To do so, the other question asked the survey participants what investment options they prefer as of the present day. The main findings have been presented in graph 25 below to compare Australian and Lithuanian female respondents' differences.

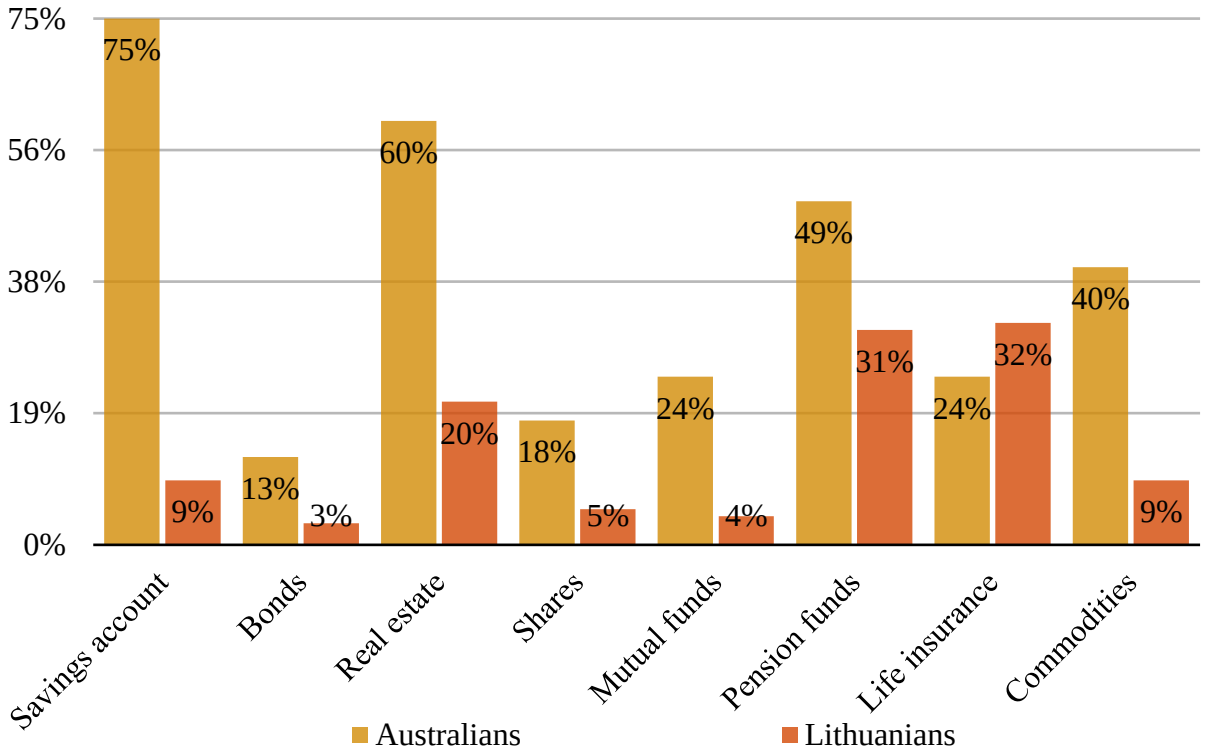


Fig. 25. Personal investment option selections among Australian and Lithuanian females

Source: created by author

The light orange bars of the graph illustrates the breakdown among Australian female investment instruments, and the dark orange shows the responses provided by Lithuanian women. What stands out in the graph is that Australians were more likely to invest overall than Lithuanians, and the main reason that could be seen from the evidence above is the variety of available investment instruments in the country. As an example, the simplest investment options savings account could be taken. Since in Australia, there is a possibility to get interest rates if you are holding your money into a savings account and it could be as high as 3 % per month, many females, who tend to place their funds into as safe as possible investment instrument prefer this opportunity. The second most common investment alternative is real estate, the third pension funds, and the fourth commodities. In comparison, Lithuanians choose to invest in life insurance, pension funds, real estate, commodities, or savings accounts. The reasons for these selections could be the education and information available in the country on each of the investment instruments and uncomplicated as possible availability to access these investments. However, the other investment options that have not been introduced in the question mentioned by the participants as additional selections were introduced in Table 6 below.

Table 6. Other personal investment option selections among Australian and Lithuanian females

Australians	Lithuanians
Annuities, P2P, REITs	Cryptocurency
Australian gems, annuities, LICs and REITs	Education
buy stuff cheaper on Gumtree and resell for higher amount	My health
Cryptocurrency	Mutual borrowing platform
Fintech products such as bitcoin, crowdfunding also currency exchange	Savings
I buy and resell old furniture	
P2P and REITs	
Startups, art, wine	

Source: created by author

As can be seen from the table above, Australians do invest in wider investment instruments; this leads to expansive abilities to earn more and opportunities to develop extensive skills and understanding of investment tools and options.

To clarify the main reasons why Lithuanian females hold back reading investing compared with males from the same country as well as females in Australia, the other set of questions has been created, and the collected data has been summarized. The main findings indicated that Lithuanian women rather choose to save than invest, and the fundamental reasons for that were either lack of the knowledge and understanding of the investment tools or lack of side funds that they could afford to lose since investing inseparable from risk. The percentage distribution of the Lithuanian female responses has been presented in graph 26 below.

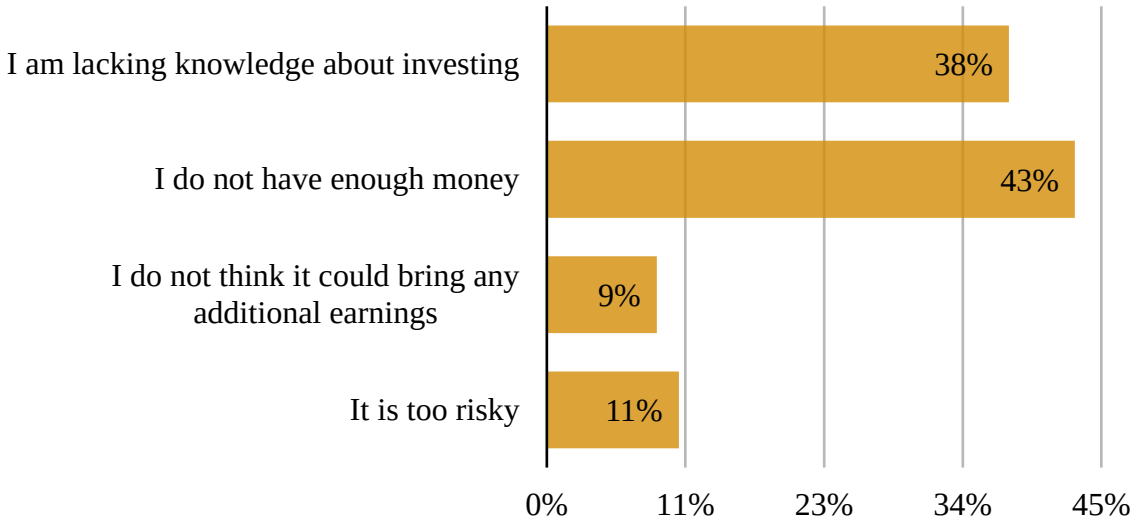


Fig. 26. Reasons for not investing among Lithuanian females

Source: created by author

The main reasons for not investing among Lithuanian females have been lack of knowledge about the subject 38 % out of all responders that answered they are not investing selected this option, but the most important impact to the choice has been made by lack of money as 43 % of females selected this as the main reason.

Overall, these survey results provide important insights into the comparative analysis of personal investment strategies among Australians and Lithuanian females. The data collected by the first couple of questions indicated that most Australian females tend to participate in several activities at once that generate returns; hence, their salaries and funds are relatively higher than Lithuanian women. The second important finding was that there is a broader selection of investment tools; consequently, Australians are familiar with a substantial variety of investment instruments, and women in this country invest in diversified investment instruments. The most significant discovery established in this section of the thesis was that Lithuanian females chose not to invest due to the lack of additional funds and the shortage of financial knowledge, such as understanding investing processes and investment tools.

3.5. Proposal of personal investment strategy for each target group in Lithuania

Based on the previous literature review and data analysis, the main target groups have been formed based on women age range and to prepare the proposition of possible investment portfolio scenarios, females have been categorized into age groups of less than 25-year-old, between 25 and 40, 40 and 60, and 60 and over. These age ranges have been selected based on a theoretical framework that has been presented, discussed, and analyzed in the theory part of

this paperwork. The main idea that has been outlined in the literature analysis part regarding portfolio formation was that it had been suggested that investors' preliminary portfolio risk and instruments selection must be established based on the investor's age and current life cycle whereabouts.

The second parameter that needed to be set was the amount designated for investing purposes by Lithuanian female participants in this portfolio creation and distributed among investment instruments in the dedicated portfolios. Since the data presented in the survey stated that most of the Lithuanian females, 52 % of the respondents, earn an average salary between 1000 and 3000 euros and other responses revealed that they averagely save between 20 and 30 % of the salary, it could be assumed that the amount which could be dedicated to investments would be 6000 Euros yearly. The third requirement for the substantial and robust portfolio construction is to understand what the clients are, in this case, females in Lithuania, investing needs, and how they imagine the main benefits they want to receive by choosing to place their funds into investment instruments. During the survey dedicated to understanding Lithuanian women's future investor's goals, the survey participant responses were analyzed by applying Garret's ranking technique (Dr. Dhanavandan (2016)). The majority of the respondents lined up their preferences, as presented in the table below.

Table 7. Investment priority ranking among Lithuanian females

Age Groups	Risk management	As high as possible return	High return, short term, no matter the risk	Longer period, but stable return	To start with the smaller amount of money
< 25	2nd	1st	3rd-4th	5th	3rd-4th
25 - 40	2nd-3rd	1st	5th	4th	2nd-3rd
40 – 60	2nd	3rd	5th	1st	4th
60 >	1st	2nd	3rd	4th-5th	4th-5th

Source: created by author

As can be seen form the table above the most important concern regarding the investments fluctuated for different age groups. However, as one of the highest concern risk management has been selected in line with as high as possible returns. If the results divide by the age group the pattern could be determined that participants who were the age of 25 or less were equally distressed about the risk management, starting with the smaller amount of money as well as earning either stabile returns during the stretched period or high returns in a short term

no matter the risk. The main exclusivity that appears in this group compared to other age groups is almost equally distributed preferences that could lead to the assumption that by age until 25 investors are non-risk averse, has less funds to invest and are not concerned about the timing during which the investment will mature and return the revenue. On the other hand, females in the age group of 25 - 40 distinctively selected as high as possible returns and sufficient risk management as the highest importance and high return in a short time despite the high risk as the least important investment priority. In contrast, the age group that composed of women in the 40-60 age range as a priority set stabile returns during the long term and well managed risk. The last group of females in their sixties and older as the most important investment criteria selected risk management and high returns, however, an opportunity to start with a small amount of money as well as get high returns despite the higher risk.

Taken together, these results suggest that there is an association between age and risk perception, priorities, and investment goals in general. Based on combination of the survey answers provided by female participants from Lithuania together with the investment portfolio scheme and examples presented in previously mentioned literature sources initial examples of portfolios have been constructed and presented.

3.6. The portfolio formation for each target group in Lithuania based on Nasdaq Vilnius exchange investment options

The last part of this thesis was portfolio formation for each target group based on the female's age range and best-performing investment tools available on the Nasdaq Vilnius market.

According to the previous research, the idea has been established that portfolio risk level and investment tools included in the set of traded securities should be selected by the age group. Therefore, it has been determined that the main portfolio types were to be aggressive, growth, balanced and conservative portfolios. Additionally, the age groups were < 25, 25 - 40, 40 - 60 and 60 > accordingly. The main attribute for each of the portfolio types was as follows: conservative - 50 % of bonds, 20 % of national and foreign stocks, and 30 % of short term investments in this case cash; balanced portfolio consists of 40 % of bonds, 10 % and 50 % of cash and variety of stocks respectively; growth portfolio included 70 % of mixed stocks, 25 % of government and corporate bonds and 5 % of cash; and aggressive portfolio involved majority of foreign and local shares - 85 %, 15 % constituted bonds and 5 % cash.

During the previous stage of this paperwork, it was formulated that based on Lithuanian females' survey answers, on average, they secure the payment of approximately between

1000 and 3000 Eur; also, they save median 20-30 % out of this amount. These findings led to the prediction that around 6000 Eur yearly could be used for investing purposes; hence, the calculations and weights that have been introduced in the table below.

Table 8. Personal investment strategy for the portfolio construction

Weights	**Conservative portfolio**	**Balanced portfolio**	**Growth portfolio**	**Aggressive portfolio**
Stocks	20 %	50 %	70 %	80 %
Bonds	50 %	40 %	25 %	15 %
Cash	30 %	10 %	5 %	5 %
Investment amount (Eur)				
Stocks	€1200	€3000	€4200	€4800
Bonds	€3000	€2400	€1500	€900
Cash	€1800	€600	€300	€300

Source: created by author

To select the best performing securities, one of the main Nasdaq Baltic indexes consists of the most traded and the largest shares available on the market - OMX Baltic Benchmark. The list of available stocks that have been used in the portfolio creation included Lithuanian, Latvian, and Estonian stocks. For the last 5 years, the historical data have been used for the historical return calculation and to calculate and evaluate overall stock performance indicators. One of the stocks has been removed as it has been added to the list only in 2020 and does not have enough historical data to be evaluated and calculated - the company was Coop Pank. The other exception was Novaturas stocks, which provided negative earnings results for the last 5 years and needed to be removed to improve overall portfolios' performance. The list of the shares that have been researched and used for the portfolio construction has been selected based on the data available on Nasdaq Baltics (Appendix 2).

The first indicator of the stock performance calculated based on the available data were monthly historical returns of the past five years and the correlation of these returns among each other. The returns indicated whether sufficient future earnings could be expected based on the past performance evaluation and the correlation indicated the relationship between the stock returns. All the stocks mentioned in the table above had either medium or low positive and negative correlation. This indicator showed that stock complimented each other or have gone and opposite way regarding the returns, which lead to the conclusion that all the shares from

OMX Baltic Benchmark could be used for the investment portfolio creation. The other indicator, variance, has been used that reflected the amplitude of average monthly return scattering. This meter showed stable and not too much fluctuating results, which lead to the assumption that the returns were quite consistent; hence, it should be expected to continue being this way for the future forecast year. One more indicator was the standard deviation of the monthly returns, which have reflected the past risk of these investments. It fluctuated between 0,18 % to 11,70 % depending on the security in the past five years. The summary of these results has been presented in the table below.

Table 9. Monthly stock performance during the last five years (2015-2020)

Stock	**APG1L**	**AUG1L**	**GRG1L**	**HAE1T**	**LHV1T**	**LNA1L**	**MRK1T**
Monthly Average return	0,18 %	0,69 %	0,85 %	1,85 %	1,92 %	0,16 %	1,24 %
Monthly Variance	0,007	0,005	0,003	0,007	0,005	0,002	0,005
Monthly Standard deviation	8,27 %	7,28 %	5,29 %	8,32 %	7,10 %	4,55 %	6,97 %
Stock	**NCN1T**	**OLF1R**	**PZV1L**	**SAB1L**	**SAF1R**	**SFG1T**	**TAL1T**
Monthly Average return	0,98 %	0,58 %	0,49 %	2,09 %	1,73 %	2,04 %	0,50 %
Monthly Variance	0,006	0,004	0,003	0,006	0,013	0,010	0,006
Monthly Standard deviation	7,54 %	6,54 %	5,95 %	7,51 %	11,37 %	10,31 %	7,96 %
Stock	**TEL1L**	**TKM1T**	**TSM1T**	**TVEAT**			
Monthly Average return	1,49 %	1,27 %	0,31 %	0,71 %			
Monthly Variance	0,002	0,002	0,003	0,003			
Monthly Standard deviation	4,03 %	4,16 %	5,39 %	5,18 %			

Source: created by author based on Nasdaq (2020)

For diversification purposes and following previously introduced strategies, bonds and cash have been included in the portfolio. Four best performing bonds, two Lithuanian governments, and two Latvian governments have been used as well as Euro as the cash investment. The yearly returns - yields for bonds and average returns for Euro of the last 5 years were as follows:

Bonds and Cash	Lithuanian Gov, 10Y Bond 61005	Lithuanian Gov, 10Y Bond 61006	Latvian Gov 10-year T-bond 58004	Latv Gov, 10,5-year T-bond 58005
Last Yield	0,24 %	0,5 %	1,8 %	3,9 %
Euro (5 Y)	2,46 %			

Table 10. Bonds and cash yearly historical returns

Source: created by author based on Nasdaq (2020)

Based on the collected and analyzed historical data and four selected strategies, Lithuanian females' investment portfolio based on the age group and risk perception has been constructed. Portfolio expected returns have been calculated using the average yearly return and weight multiplication and adding the investment results. Furthermore, the portfolios' risk has been determined by using the standard deviation of the same variables included in the portfolio.

The first portfolio has been dedicated to 25 and lower age groups and has been concentrated on returns rather than risk. This portfolio strategy is called Aggressive, and it seeks to obtain as high as possible returns with inevitable higher risk. The portfolio weights have been spread into 80 % for stocks - this 80% have been split equally among all the shares despite their returns or risk, then 15 % have been dedicated to bond, that weighted in equal amount and the rest 5 % used for the liquid investment - cash and in Lithuania's case Euros, for which return has been calculated based on their exchange relation to USD. The detailed division of the investments in the Aggressive portfolio have been introduced (Appendix 3): Based on the provided calculations the overall yearly expected returns established using historical data of the Aggressive portfolio were 10.53 % and the expected risk should be around 10.54%. The main character of this portfolio type is the risk is highest; however, its earnings are substantial compared to other investment portfolio types.

For Lithuanian females between 25 and 40 the Growth portfolio has been dedicated and it consists of the same investments as in Aggressive portfolio, however, the weights have been assigned in different manner. Shares substituted for 70 %, bonds 25 % and cash 5 %. The calculation of the expected investment portfolio performance based on historical data has been

done (Appendix 4). The Growth portfolio expected returns were 9.42 % which is slightly lower than aggressive, however, the risk is smaller as well and has been expected to be around 9.23 %. The main trait of this portfolio is that the forecasted yearly earnings are still immense, but the risk is already slightly lower in comparison to the most risky – Aggressive portfolio type.

The third, Balanced portfolio, has been dedicated to women in the age group of 40-60 and its' returns are slightly smaller, however, the risk is lower as well. The calculations have been done and the assumptions introduced (Appendix 5) that revealed this portfolio offers 7.30 % expected yearly returns with 6.78 % of expected risk. Based on these estimations Balanced portfolio provides medium returns facing average risk compared to Aggressive and Growth investment portfolios. Since during the survey Lithuanian females of age between 40 and 60 expressed their concerns for the risk management and specify the long time period as posible option if it would guarantee stable returns this type of portfolio alows to earn reasonable returns with lower risk; hence, meets the expressed requirements.

The last portfolio has been designed to satisfy the needs of females in the age group of 60 and over, which based on many theories and market examples, should be concentrated into risk hedging instead of high returns. That is the main reason why this portfolio consists of as high as 50 % of government bonds and only 20 % of shares and involves a big share of cash investment to be highly liquid in case if needed. The Conservative portfolio calculations were done, and the results introduced (Appendix 6). The investment portfolio expected returns were 4,08 % and the risk accordingly should be expected to be approximately 3,57 %. This type of the portfolio had the lowest risk; hence, steady returns and adhere to the main women of age 60 and over prerequisite – concentration on risk management.

In the previously analyzed theory and research parts, the assumptions have been introduced that the risk perception should become lower in correlation with aging. Based on the research conducting during this master's thesis, after analyzing Australian females' investment strategies, the findings were positively confirming these hypotheses; hence, the investment portfolios have been constructed to comply with these conclusions. Each of the portfolio types has been adapted to the Lithuanian females based on their age groups and requirements expressed during the survey.

CONCLUSIONS AND SUGGESTIONS

This thesis aimed to analyze current investor's profiles in Lithuania and Australia and identify the main differences among all investors. The next step is to research and analyze the data segregated by gender to distinguish the main differences regarding personal investment management among male and female investors. The second goal was to introduce and research the personal investment strategies among women in Lithuania and Australia and prepare the comparative analysis to include the financial literacy aspect and its possible impact on the investment choices. The third task was to prepare the preliminary personal investment strategy proposal for each target group in Lithuania using the investment strategies available in literature sources and Australian female investment examples' good practice method. The last aim was to construct the preliminary personal investment portfolio for each female target group in Lithuania based on Nasdaq Baltic's best-performing investment instruments and in line with a firstly created investment strategy.

The main limitation that appeared from the beginning could also be viewed as an opportunity, and it was the lack of available data and surveys on personal investment topics in Lithuania. After contacting the Lithuanian Statistics Department and receiving the confirmation that they do not collect or hold this type of data, the main research object becomes surveys published on banks and investment management companies' websites.

1. After analyzing the officially published data containing information about investor's profiles in Lithuania and Australia, the analysis revealed that the key distinctions among the investors in both countries were that Lithuanians chose to save rather than invest. Only 2 % invested, among them the minority of the population, preferred risky investment portfolios, and expected substantially high returns, where the majority preferred low risk and stabile or even low future earnings. Australians had higher accessibility to a wider variety of investment options and invested more often. The 8.7 % of the population hold one or another investment, they often seek advice from the professionals, and the majority were investing in balanced risk and return investment portfolios. Regarding investment peculiarities associated with gender, in Lithuania, the main differences were considerably fewer females invested than males as they preferred to save for the rainy day or retirement. If they did invest, the investments were more conservative and with low risk. In Australia, more males than females were investing; however, the gap was much smaller and decreasing every year. Also, females were choosing various options for investments.

2. According to the global surveys, Australians, in general, tend to obtain higher financial education than Lithuanians – 64 % of Australians and 39 % of Lithuanians have been assessed as financially literate. Based on the survey question, which concentrated on Australian and Lithuanian female financial literacy level self-evaluation, the results matched with the global surveys – Australians evaluated themselves as knowledgeable or highly knowledgeable in the investment field. In contrast, Lithuanians stated to have a medium amount of understanding. The research also revealed that Lithuanians are mainly obtaining their education from the formal degree where Australians continuously pursue additional education in the form of courses, seminars, or publicly available training. Australian females' main personal investment strategies were investments into saving accounts, real estate, pension funds, commodities, life insurance, shares, bonds, and mutual funds. In comparison, Lithuanian females prefer to save, and the main investment strategies are life insurance, pension funds, but real estate, commodities, shares, bonds, and mutual funds being unpopular investments with as low as 5 % for shares and 3 % for bond investment selection during the survey.

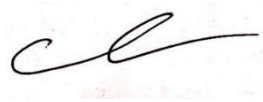
3. As per new information revealed in the Australian and Lithuanian investment strategy comparison section and based on Lithuanian non-investors among females' requirements, risk perception level and age groups, the investment strategies based on literature review and examples have been prepared which involved Aggressive, Growth, Balanced and Conservative strategies based on them and four main preliminary personal investment portfolio options including the currently most overlooked investment tools have been introduced.

4. The portfolios have been modeled following one of the main Nasdaq Baltic OMXBBGI, OMX_BALTIC_BENCHMARK_GI index, which included the main best-performing stocks. The other two investment instruments used – Euro or, in other words, cash, for the liquidity and Lithuanian and Latvian bonds for the safety. The portfolios have been fully diversified by including stock from 3 Baltic markets, with negative or very low correlation, and adding bonds and cash.

The main aims have been achieved, the two economies have been analyzed, and the main distinctions have been presented, the education peculiarities have been researched, and the main findings presented, the Australian female investing example has been evaluated and analyzed and used as good practice method for assistance in portfolio construction for Lithuanian females.

Since education should be the priority in pursuance of a better quality of life for humanity and Lithuania and female financial literacy is not an exception, the suggestions would be to prepare and introduce more pieces of training dedicated to women that would concentrate

on investment and personal finance topics and would be available to broader female groups in Lithuania and especially concentrating on regional areas in order to minimize the social separation first of all among genders second of all among the country. The publication of the prepared portfolio options, with explanations and public access, could be introduced as an example of how females could implement their investment and financial knowledge in the future. There are countless opportunities to implement this project idea, the main being through various women organizations such as non-profit institutions like Women information center (Moterų informacijos centras), Social Innovations Fond (Socialinių inovacijų fondas), Public Institution Equal Opportunity Development Center, (Viešoji įstaiga Lygių galimybių plėtros centras), Public Institution European Innovation Center (Viešoji įstaiga Europinių inovacijų centras), Knowledge Economic center (Žinių ekonomikos forumas), Association of the Third Century University (Trečiojo amžiaus universitetų (TAU) asociacija) and many others in line with collaboration with Lithuanian Ministry of Education and Science. Since Australia's case has been taken as a good practice method example, the collaboration between Lithuanian and Australian government and Education Ministries to receive more information and apply the practices could be included in this project.



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APPENDICES

APPENDIX 1. Garret ranking conversion table

Percent	Score	Percent	Score	Percent	Score
0.09	99	22.32	65	83.31	31
0.20	98	23.88	64	84.56	30
0.32	97	25.48	63	85.75	29
0.45	96	27.15	62	86.89	28
0.61	95	28.86	61	87.96	27
0.78	94	30.61	60	88.97	26
0.97	93	32.42	59	89.94	25
1.18	92	34.25	58	90.83	24
1.42	91	36.15	57	91.67	23
1.68	90	38.06	56	92.45	22
1.96	89	40.01	55	93.19	21
2.28	88	41.97	54	93.86	20
2.69	87	43.97	53	94.49	19
3.01	86	45.97	52	95.08	18
3.43	85	47.98	51	95.62	17
3.89	84	50.00	50	96.11	16
4.38	83	52.02	49	96.57	15
4.92	82	54.03	48	96.99	14
5.51	81	56.03	47	97.37	13
6.14	80	58.03	46	97.72	12
6.81	79	59.99	45	98.04	11
7.55	78	61.94	44	98.32	10
8.33	77	63.85	43	98.58	9
9.17	76	65.75	42	98.82	8
10.06	75	67.48	41	99.03	7
11.03	74	69.39	40	99.22	6
12.04	73	71.14	39	99.39	5
13.11	72	72.85	38	99.55	4
14.25	71	74.52	37	99.68	3
15.44	70	76.12	36	99.80	2
16.69	69	77.68	35	99.91	1
18.01	68	79.17	34	100.00	0
19.39	67	80.61	33		
20.93	66	81.99	32		

Source: Dr. Dhanavandan (2016)

APPENDIX 2. OMX Baltic Benchmark

OMXBBGI, OMX_BALTIC_BENCHMARK_GI, (SE0001849993)	
Apranga	APG1L
AUGA group	AUG1L
Grigeo	GRG1L
Harju Elekter	HAE1T
LHV Group	LHV1T
Linas Agro Group	LNA1L
Merko Ehitus	MRK1T
Nordecon	NCN1T
Olainfarm	OLF1R
Pieno Zvaigzdes	PZV1L
Siauliu Bankas	SAB1L
SAF Tehnika	SAF1R
Silvano Fashion Group	SFG1T
Tallink Grupp	TAL1T
Telia Lietuva	TEL1L
Tallinna Kaubamaja Grupp	TKM1T
Tallinna Sadam	TSM1T
Tallinna Vesi	TVEAT

Source: created by author based on Nasdaq (2020)

APPENDIX 3. Aggressive portfolio

Stocks	**Weights**	**Expected yearly returns**
APG1L	0.044	2.14%
AUG1L	0.044	8.28%
GRG1L	0.044	10.17%
HAE1T	0.044	22.17%
LHV1T	0.044	23.05%
LNA1L	0.044	1.95%
MRK1T	0.044	14.83%
NCN1T	0.044	11.81%
OLF1R	0.044	6.95%
PZV1L	0.044	5.92%
SAB1L	0.044	25.08%
SAF1R	0.044	20.76%
SFG1T	0.044	24.46%
TAL1T	0.044	5.97%
TEL1L	0.044	17.90%
TKM1T	0.044	15.20%
TSM1T	0.044	3.70%
TVEAT	0.044	8.49%
Bonds		
Lithuanian Gov, 10Y Bond 61005	0.038	0.24 %
Lithuanian Gov, 10Y Bond 61006	0.038	0.5 %
Latvian Gov 10-year T-bond 58004	0.038	1.8 %
Latv Gov, 10,5-year T-bond 58005	0.038	3.9 %
Cash		
Eur/USD	0.050	2.46 %
	Portfolio Returns	**10.53%**
	Portfolio Standard deviation	**10.54%**

Source: created by author

APPENDIX 4. Growth portfolio

Stocks	**Weights**	**Expected yearly returns**
APG1L	0.0389	2.14%
AUG1L	0.0389	8.28%
GRG1L	0.0389	10.17%
HAE1T	0.0389	22.17%
LHV1T	0.0389	23.05%
LNA1L	0.0389	1.95%
MRK1T	0.0389	14.83%
NCN1T	0.0389	11.81%
OLF1R	0.0389	6.95%
PZV1L	0.0389	5.92%
SAB1L	0.0389	25.08%
SAF1R	0.0389	20.76%
SFG1T	0.0389	24.46%
TAL1T	0.0389	5.97%
TEL1L	0.0389	17.90%
TKM1T	0.0389	15.20%
TSM1T	0.0389	3.70%
TVEAT	0.0389	8.49%
Bonds		
Lithuanian Gov, 10Y Bond 61005	0.063	0.24 %
Lithuanian Gov, 10Y Bond 61006	0.063	0.5 %
Latvian Gov 10-year T-bond 58004	0.063	1.8 %
Latvian Gov, 10,5-year T-bond 58005	0.063	3.9 %
Cash		
Eur/USD	0.050	2.46 %
	Portfolio Returns	**9.42%**
	Portfolio Standard deviation	**9.23%**

Source: created by author

APPENDIX 5. Balanced portfolio

Stocks	**Weights**	**Expected yearly returns**
APG1L	0.028	2.14%
AUG1L	0.028	8.28%
GRG1L	0.028	10.17%
HAE1T	0.028	22.17%
LHV1T	0.028	23.05%
LNA1L	0.028	1.95%
MRK1T	0.028	14.83%
NCN1T	0.028	11.81%
OLF1R	0.028	6.95%
PZV1L	0.028	5.92%
SAB1L	0.028	25.08%
SAF1R	0.028	20.76%
SFG1T	0.028	24.46%
TAL1T	0.028	5.97%
TEL1L	0.028	17.90%
TKM1T	0.028	15.20%
TSM1T	0.028	3.70%
TVEAT	0.028	8.49%
Bonds		
Lithuanian Gov, 10Y Bond 61005	0.10	0.24 %
Lithuanian Gov, 10Y Bond 61006	0.10	0.5 %
Latvian Gov 10-year T-bond 58004	0.10	1.8 %
Latvian Gov, 10,5-year T-bond 58005	0.10	3.9 %
Cash		
Eur/USD	0.10	2.46 %
	Portfolio Returns	**7.30%**
	Portfolio Standard deviation	**6.78%**

Source: created by author

APPENDIX 6. Conservative portfolio

Stocks	**Weights**	**Expected yearly returns**
APG1L	0.011	2.14%
AUG1L	0.011	8.28%
GRG1L	0.011	10.17%
HAE1T	0.011	22.17%
LHV1T	0.011	23.05%
LNA1L	0.011	1.95%
MRK1T	0.011	14.83%
NCN1T	0.011	11.81%
OLF1R	0.011	6.95%
PZV1L	0.011	5.92%
SAB1L	0.011	25.08%
SAF1R	0.011	20.76%
SFG1T	0.011	24.46%
TAL1T	0.011	5.97%
TEL1L	0.011	17.90%
TKM1T	0.011	15.20%
TSM1T	0.011	3.70%
TVEAT	0.011	8.49%
Bonds		
Lithuanian Gov, 10Y Bond 61005	0.13	0.24 %
Lithuanian Gov, 10Y Bond 61006	0.13	0.5 %
Latvian Gov 10-year T-bond 58004	0.13	1.8 %
Latvian Gov, 10,5-year T-bond 58005	0.13	3.9 %
Cash		
Eur/USD	0.30	2.46 %
	Portfolio Returns	**4.08 %**
	Portfolio Standard deviation	**3.57 %**

Source: created by author

APPENDIX 7. Covariation for portfolio standard deviation calculation

Covariation	APG1L	AUG1L	GRG1L	HAE1T	LHV1T	LNA1L	MRK1T	NCN1T	OLF1R	PZV1L	SAB1L	SAF1R	SFG1T	TAL1T	TEL1L	TKM1T	TSM1T	TVEAT	Eur/Usd	Lithuanian Gov, 10Y Bond 61005	Lithuanian Gov, 10Y Bond 61006	Latvian Gov 10-year T-bond 58004	Latv Gov, 10,5-year T-bond 58005
APG1L	0.080694	0.029399	0.015773	0.035354	-0.000465	0.023435	0.034186	0.026545	0.017142	0.024798	0.037391	0.054582	0.062149	0.030859	0.020174	0.001425	0.007024	0.012650	0.002591	0.000016	0.000013	0.000000	0.000000
AUG1L	0.029399	0.062499	0.009508	0.018139	-0.009324	0.008146	0.011310	0.014236	0.009207	0.013352	0.020014	0.025353	0.026828	0.020819	0.011884	0.004960	-0.008194	0.006456	0.003964	0.000025	-0.000008	0.000000	0.000000
GRG1L	0.015773	0.009508	0.033043	0.016063	-0.006982	0.001848	0.002327	0.004785	0.008736	0.010640	0.014424	0.029213	0.008532	0.008515	0.007350	0.000419	0.002605	0.002853	0.003872	-0.000001	-0.000002	0.000000	0.000000
HAE1T	0.035354	0.018139	0.016063	0.081687	-0.000850	0.001517	0.026365	0.020738	0.022375	0.015776	0.028233	0.061782	0.061782	0.022137	0.017260	0.006118	0.009930	0.018722	0.004538	0.000018	0.000007	0.000000	0.000000
LHV1T	-0.000465	-0.009324	-0.006982	-0.000850	0.059412	-0.006282	0.007142	0.008978	-0.007613	0.002169	0.004264	-0.000420	-0.002505	-0.018214	0.001874	-0.001584	-0.004283	0.001166	0.003164	-0.000010	-0.000020	0.000000	0.000000
LNA1L	0.023435	0.008146	0.001848	0.001517	-0.006282	0.024375	0.018409	0.011941	0.016321	0.012437	0.016313	0.019668	0.002534	0.017144	0.009698	0.002141	0.001839	0.005209	-0.000410	-0.000004	-0.000006	0.000000	0.000000
MRK1T	0.034186	0.011310	0.002327	0.026365	0.007142	0.018409	0.057275	0.033123	0.012686	0.021868	0.029937	0.024069	0.033990	0.023304	0.011704	0.004819	-0.005999	0.016629	0.000559	0.000015	0.000014	0.000000	0.000000
NCN1T	0.026545	0.014236	0.004785	0.020738	0.008978	0.011941	0.033123	0.067135	0.016752	0.015676	0.043823	0.039603	0.023691	0.030586	0.011129	0.005188	-0.004000	0.024193	-0.001124	0.000026	0.000006	0.000000	0.000000
OLF1R	0.017142	0.009207	0.008736	0.022375	-0.007613	0.016321	0.012686	0.016752	0.050462	0.016656	0.023684	0.037045	0.017928	0.017887	0.008804	0.008008	-0.004314	0.014900	0.002407	0.000028	0.000004	0.000000	0.000000
PZV1L	0.024798	0.013352	0.010640	0.015776	0.002169	0.012437	0.021868	0.015676	0.016656	0.041785	0.021430	0.027723	0.024689	0.007380	0.010794	0.004227	-0.002179	0.004150	0.000242	-0.000005	-0.000025	0.000000	0.000000
SAB1L	0.037391	0.020014	0.014424	0.028233	0.004264	0.016313	0.029937	0.043823	0.023684	0.021430	0.066473	0.054465	0.038677	0.036564	0.011748	0.013267	-0.003640	0.017809	0.002730	0.000059	0.000026	0.000000	0.000000
SAF1R	0.054582	0.025353	0.029213	0.061782	-0.000420	0.019668	0.024069	0.039603	0.037045	0.027723	0.054465	0.152384	0.033140	0.036271	0.022319	0.009689	0.008397	0.029783	0.006407	0.000023	-0.000005	0.000000	0.000000
SFG1T	0.062149	0.026828	0.008532	0.061782	-0.002505	0.002534	0.033990	0.023691	0.017928	0.024689	0.038677	0.033140	0.125347	0.019974	0.015232	0.002546	-0.003663	0.003266	-0.002849	0.000103	0.000048	0.000000	0.000000
TAL1T	0.030859	0.020819	0.008515	0.022137	-0.018214	0.017144	0.023304	0.030586	0.017887	0.007380	0.036564	0.036271	0.019974	0.074787	0.012870	0.012870	0.002496	0.019242	0.002262	0.000026	0.000019	0.000000	0.000000
TEL1L	0.020174	0.011884	0.007350	0.017260	0.001874	0.009698	0.011704	0.011129	0.008804	0.010794	0.011748	0.022319	0.015232	0.012870	0.019169	0.002031	0.004045	0.010371	0.002742	-0.000031	-0.000021	0.000000	0.000000
TKM1T	0.001425	0.004960	0.000419	0.006118	-0.001584	0.002141	0.004819	0.005188	0.008008	0.004227	0.013267	0.009689	0.002546	0.012870	0.002031	0.020433	0.006721	0.004662	0.002002	0.000026	0.000009	0.000000	0.000000
TSM1T	0.007024	-0.008194	0.002605	0.009930	-0.004283	0.001839	-0.005999	-0.004000	-0.004314	-0.002179	-0.003640	0.008397	-0.003663	0.002496	0.004045	0.006721	0.033687	-0.001650	0.004871	0.000012	0.000002	0.000000	0.000000
TVEAT	0.012650	0.002853	0.018722	0.001166	0.005209	0.016629	0.024193	0.011261	0.004150	0.017809	0.029783	0.003266	0.003266	0.019242	0.010371	0.004662	-0.001650	0.031607	0.000318	0.000011	0.000002	0.000000	0.000000
Eur/Usd	0.002591	0.003964	0.003872	0.004538	0.003164	-0.000410	0.000559	-0.001124	0.002407	0.000242	0.002730	0.006407	-0.002849	0.002262	0.002742	0.002002	0.004871	0.000318	0.003754	-0.000006	-0.000006	0.000000	0.000000
Lithuanian Gov, 10Y Bond 61005	0.000016	0.000025	-0.000001	0.000018	-0.000010	-0.000004	0.000015	0.000026	0.000028	-0.000005	0.000059	0.000023	0.000103	0.000026	-0.000031	0.000026	0.000012	0.000011	-0.000006	0.000001	0.000000	0.000000	0.000000
Lithuanian Gov, 10Y Bond 61006	0.000013	-0.000008	-0.000002	0.000007	-0.000020	-0.000006	0.000014	0.000006	0.000004	-0.000025	0.000026	-0.000005	0.000048	0.000019	0.000021	0.000009	0.000002	0.000002	-0.000006	0.000000	0.000000	0.000000	0.000000
Latvian Gov 10-year T-bond 58004	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Latv Gov, 10,5-year T-bond 58005	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

Source: created by author based on Markowitz Modern Portfolio theory(Fabozzi & Markowitz (2011))

APPENDIX 8. Portfolio correlation

Corelation	APG1L	AUG1L	GRG1L	HAE1T	LHV1T	LNA1L	MRK1T	NCN1T	OLF1R	PZV1L	SAB1L	SAF1R	SFG1T	TAL1T	TEL1L	TKM1T	TSM1T	TVEAT
APG1L	1	41.40%	30.55%	43.55%	-0.66%	-0.66%	50.29%	36.07%	26.86%	42.71%	51.05%	49.22%	61.80%	39.72%	51.30%	3.51%	35.24%	25.05%
AUG1L	41.40%	1	20.92%	25.39%	-15.48%	20.87%	18.90%	21.98%	16.39%	26.13%	31.05%	25.98%	30.31%	30.45%	34.34%	13.88%	-18.61%	14.53%
GRG1L	30.55%	20.92%	1	30.92%	-15.29%	6.51%	5.35%	10.16%	21.39%	28.63%	30.78%	41.17%	13.26%	17.13%	29.20%	1.61%	8.69%	8.83%
HAE1T	43.55%	25.39%	30.92%	1	-1.18%	40.79%	38.54%	28.00%	34.85%	27.00%	38.31%	55.37%	30.45%	28.32%	43.62%	14.97%	18.91%	36.85%
LHV1T	-0.66%	-15.48%	-15.29%	-1.18%	1	-16.25%	11.85%	13.83%	-13.64%	4.27%	6.66%	-0.44%	-2.85%	-27.32%	5.57%	-4.45%	-14.30%	2.61%
LNA1L	-0.66%	20.87%	6.51%	40.79%	-16.25%	1	49.27%	29.52%	46.54%	38.97%	40.53%	32.27%	55.00%	40.15%	44.86%	9.59%	9.02%	18.77%
MRK1T	50.29%	18.90%	5.35%	38.54%	11.85%	49.27%	1	53.42%	23.60%	44.70%	48.52%	25.76%	40.12%	35.61%	35.32%	14.09%	-16.04%	39.08%
NCN1T	36.07%	21.98%	10.16%	28.00%	13.83%	29.52%	53.42%	1	28.78%	29.60%	65.60%	39.15%	25.83%	43.17%	31.02%	14.01%	-11.69%	52.52%
OLF1R	26.86%	16.39%	21.39%	34.85%	-13.64%	46.54%	23.60%	28.78%	1	36.27%	40.89%	42.25%	22.54%	29.12%	28.31%	24.94%	-11.17%	37.31%
PZV1L	42.71%	26.13%	28.63%	27.00%	4.27%	38.97%	44.70%	29.60%	36.27%	1	43.75%	34.74%	34.11%	13.20%	38.14%	14.47%	-7.66%	11.42%
SAB1L	51.05%	31.05%	30.78%	38.31%	6.66%	40.53%	48.52%	65.60%	40.89%	43.75%	1	54.12%	42.37%	51.86%	32.91%	36.00%	-8.63%	38.85%
SAF1R	49.22%	25.98%	41.17%	55.37%	-0.44%	32.27%	25.76%	39.15%	42.25%	34.74%	54.12%	1	23.98%	33.98%	41.30%	17.36%	12.13%	42.91%
SFG1T	61.80%	30.31%	13.26%	30.45%	-2.85%	55.00%	40.12%	25.83%	22.54%	34.11%	42.37%	23.98%	1	20.63%	31.07%	5.03%	-6.84%	5.19%
TAL1T	39.72%	30.45%	17.13%	28.32%	-27.32%	40.15%	35.61%	43.17%	29.12%	13.20%	51.86%	33.98%	20.63%	1	21.87%	32.92%	6.27%	39.58%
TEL1L	51.30%	34.34%	29.20%	43.62%	5.57%	44.86%	35.32%	31.02%	28.31%	38.14%	32.91%	41.30%	31.07%	21.87%	1	10.26%	18.28%	42.14%
TKM1T	3.51%	13.88%	1.61%	14.97%	-4.45%	9.59%	14.09%	14.01%	24.94%	14.47%	36.00%	17.36%	5.03%	32.92%	10.26%	1	27.11%	18.34%
TSM1T	35.24%	-18.61%	8.69%	18.91%	-14.30%	9.02%	-16.04%	-11.69%	-11.17%	-7.66%	-8.63%	12.13%	-6.84%	6.27%	18.28%	27.11%	1	-5.08%
TVEAT	25.05%	14.53%	8.83%	36.85%	2.61%	18.77%	39.08%	52.52%	37.31%	11.42%	38.85%	42.91%	5.19%	39.58%	42.14%	18.34%	-5.08%	1

Source: created by author