CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

Department of Economics

BACHELOR THESIS

Economic Analysis of Personal Investments of Average Income Households

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Declaration

I declare I have worked on my diploma thesis titled "Economic Analysis of Personal Investments of Average Income Households" by myself and I have used only sources that are mentioned at the end of the thesis.

In Prague on _____   Signature _____

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Economic Analysis of Personal Investments of Average Income Households

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Ekonomická analýza osobních investic domácností s průměrným příjmem

Summary

The subject matter of the bachelor thesis is the issue of investing. Aim of this work is to create and evaluate optimal investment plan for average income households based on presumable income and expenditures of these households, given the current changing economic conditions in the Czech Republic. Bachelor thesis is divided into several parts. The issue of investing is first described and approached in general. Subsequently, practical investment plan based on research, professional advices, and recommendations of specialist from the field of finance consulting is formed and presented as well as its possible impact on the lives of households.

Souhrn

Bakalářská práce se zabývá metodou investic. Cílem této práce je vytvořit a ohodnotit optimální investiční plán domácností s průměrným příjmem. Plán je založen na předpokládaných příjmech a výdajích těchto domácností a na současných podmínkách v České Republice. Práce je rozdělena do několika částí. Problematika investování se řeší v první řadě všeobecně. Následně je na základě výzkumu, rad a doporučení profesionála z oblasti finančního poradenství vytvořen a popsán praktický investiční plán a jeho možný vliv na život domácností.

Key words

Personal investments, household income, household expenditures, risk, diversification, inflation, liquidity, rent

Klíčová slova

Osobní investice, příjem domácností, výdaje domácností, risk, diverzifikace, inflace, likvidita, renta

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1. INTRODUCTION

Money became an essential part of everyday's life. Most people face question what is the best to be done with their funds. There are many possible ways of appreciating savings and one of them is through investments.

There are many ways of investing, some more and some less rational. Basic investment products such as commercial instruments, banking products, real estates and other products of financial market will be covered within this thesis as well as measures which can take an average person in order to have enough funds for life and retirement.

Some may be afraid that investing is too complicated, but "to invest successfully over a lifetime does not require a stratospheric IQ, unusual business insights, or inside information. What is needed is a sound intellectual framework for making decisions and the ability to keep emotions from corroding that framework."[1] Investments are for regular people as well. If a person manages his emotions and learns to follow behavioural and business principles he can look forward to positive results.

Investment is a powerful instrument. As was said before, it is possible to rather easily achieve positive results when following specific guidelines and rules.

Through the thesis is worked with several sources like books, internet. Theoretical information from economical field are combined with valuable thoughts and suggestions of successful investors such as Benjamin Graham, Warren E. Buffett, or Robert T. Kiyosaki in order to create guidance in an adopting and executing of an investment policy.

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[1] GRAHAM, B., ZWEIG, J., *The Intelligent Investor*, p. viii

1. OBJECTIVES OF THESIS AND METHODOLOGY

1.1. Objectives of thesis

The objective is to create and evaluate optimal investment plan based on presumable income and expenditures of average household in the Czech Republic, given the current changing economic conditions in the Czech Republic.

1.2. Methodology

The work is based on the analysis of literature and other source data. For the literature review is used the methodology of synthesis and deduction. The analysis is addressed in term of investment returns, risk, and time as well as selected products of investment portfolio. Finally, practical case study concerns with practical investment plan based on research, professional advices, and recommendations of specialist from the field of finance consulting.

2. LITERATURE REVIEW

2.1. Terms and definitions

In this part are the basic terms and definitions laid out in order to provide explanation of terminology used in the thesis which is connected with the problem of household investments.

As an investigated group are households, terms such as household, household income and expenditures need to be explained first. Main goal is to evaluate investments of households. Therefore, next terms that are clarified are investment, interest rate, diversification, liquidity, and inflation.

2.1.1. Household

Household is formed by individuals who comprise a family unit and who live together under the same roof.[2] Members of the household are usually related by blood or law. However, they don't need to be related at all.

2.1.2. Household income

Household income represents the total income of all members of the household. Income refers not only to the salaries and benefits received but also to receipts from any personal business, investments, dividends and other income. Household income is often frequently used economic indicator.[3]

2.1.3. Household expenditures

Household expenditure is a sum of total living expenses of all members of the household.

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[2] The Free Dictionary [online], available at WWW http://www.businessdictionary.com/definition/household.html [viewed on 2012-01-05]
[3] Business Dictionary [online], available at WWW http://www.businessdictionary.com/definition/household-income.html [viewed on 2012-01-05]

Household expenses include rent paid or the rental value of the home, food, utilities paid, repairs, and other expenses such as insurance, education, clothing, and others.

2.1.4. Household savings

Savings represent the amount of money left when household expenditures are subtracted from household disposable income earned in a given period of time.[4]

In this case this sum represents the amount left for investing.

2.1.5. Investment

"Investment is use of capital to create more money, either through income-producing vehicles or through more risk-oriented ventures designed to result in capital gains."[5]

In economy is the term investment characterized as deferring consumption. In general, it can be characterized as an activity based on putting money into assets which are expected to appreciate[6] or generate future return on investments[7].

2.1.6. Interest rate

An interest rate is financial reward for lending money to borrower. From a investor's perspective, the interest rate is expressed as annual percentage yield.

2.1.7. Diversification

In finance, diversification is investment technique which tries to reduce risk by investing into variety of investment products within a portfolio. Leading economists proved that proper diversification really reduces the risk of loss. Portfolio of different kinds of investments will, on average, yield higher returns and pose a lower risk than any individual investment found

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[4] Investopedia [online], available at WWW http://www.investopedia.com/terms/s/savings.asp#axzz1mlnLN72i [viewed on 2012-01-05]
[5] DOWNES, J., GOODMAN, E., *Dictionary of Finance and Investment Terms,* p. 295
[6] Typical examples are real estates, antiques or any commodities.
[7] Typical examples are money market instruments, such as certificates of deposit, bonds, shares, et cetera.

within the portfolio.[8]

2.1.8. Liquidity

Liquidity can be defined as momentary ability to pay our obligations. Liquidity is asset´s ability to convert into the form of cash. Liquid assets are able to be sold rapidly without causing significant movement in the price and with minimum loss of value. Otherwise, assets that can be generally sold after a long search for a buyer are known as illiquid.

The most liquid asset is money in the form of cash. Illiquid assets are for example real estates or state bonds.

2.1.9. Inflation

Originally, economists referred to increases in the amount of money in circulation. Nowadays, inflation commonly refers to the growth of price level over a certain period of time. As a statistical concept, inflation is based on measuring net changes in prices using consumer price indices (CPI).[9]

A percentage increase in consumer price indices is called the "Inflation rate". Inflation rate is an important figure when speaking about investments because it devaluates money. In the table 1 can be seen the average year-on-year inflation rates from the year 2000 until the year 2011.

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[8] Investopedia [online], available at WWW
http://www.investopedia.com/terms/d/diversification.asp#axzz1mlnLN72i [viewed on 2012-01-10]
[9] Czech Statistical Office [online], available at WWW
http://www.czso.cz/eng/redakce.nsf/i/what_is_it_inflation_resp_inflation_rate#1 [viewed on 2012-01-05]

Table 1: Inflation rate as an increase in CPI compared with the corresponding month of preceding year

Year	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
2010	0,7	0,6	0,7	1,1	1,2	1,2	1,9	1,9	2,0	2,0	2,0	2,3
2011	1,7	1,8	1,7	1,6	2,0	1,8	1,7	1,7	1,8	2,3	2,5	2,4
2012	3,5	3,7										

Source: http://www.czso.cz/eng/redakce.nsf/i/inflation_rate

From investor's point of view, at the end investor should be interested in the amount of money he earned (nominal return) but what he can actually buy for this amount (actual return).

2.2.   Detailed look at investments

It is good to have more thorough look at investments when speaking about them. Investing is not only a question of where to deposit money in order to have the highest yield. Investment is determined by measures such as investment risk, horizon, and liquidity as well alongside different investment strategies and approaches. Investor can invest periodically or otherwise, he can follow conservative, balanced, or more aggressive strategy. In this part will be covered more detailed information concerning these topics.

2.2.1. Why to invest

There are several motives for people to start thinking about investing. The process of investing helps to reach long-time financial goals. Such goal can be for example a future purchase of some asset, such as own flat, car, or suchlike.

Another good reason to consider investing is to be able to cover future studying expenses of children or to help them financially start their life.

Important is to consider personal financial independence as well. "Financial independence means the ability to manage money in such a way to have sufficient funds to live your chosen lifestyle without assistance from others." [10] In other words, to have assets that generate income that is greater than expenses - to have enough money to meet all needs whether working or not.

Financial independence isn´t specified by concrete number because every person has different standard of living. For many, it can mean no need to worry about bills any more or having sufficient income when not working, while for others it can mean luxurious car and vacations.[11]

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[10] COMMUTA, J., *The Myths & Realities of Achieving Financial Independence* [online], available at WWW http://www.nightingale.com/ae_article.aspx?a=achievingfinancialindependence&i=217 [viewed on 2012-02-13]
[11] Ibid.

Financial independence is closely related to savings for retirement. Savings for retirement are very important, especially nowadays when people cannot rely on government to take financial care of them when retired.

On the graph below is demonstrated the difference in money consumption possibility when people save money for retirement and when they don't. As it is shown on this graph, between the age of 25 and 65, money consumption of people saving for retirement is decreased compare to money consumption of people who are not. There is noticeable difference in consumption after the age of 65. People with savings for retirement can afford not to change their money consumption. People who don't have savings are forced to significantly decrease their consumption which has most likely big impact on their living standard.

Graph 1: Money consumption in time according to personal's savings
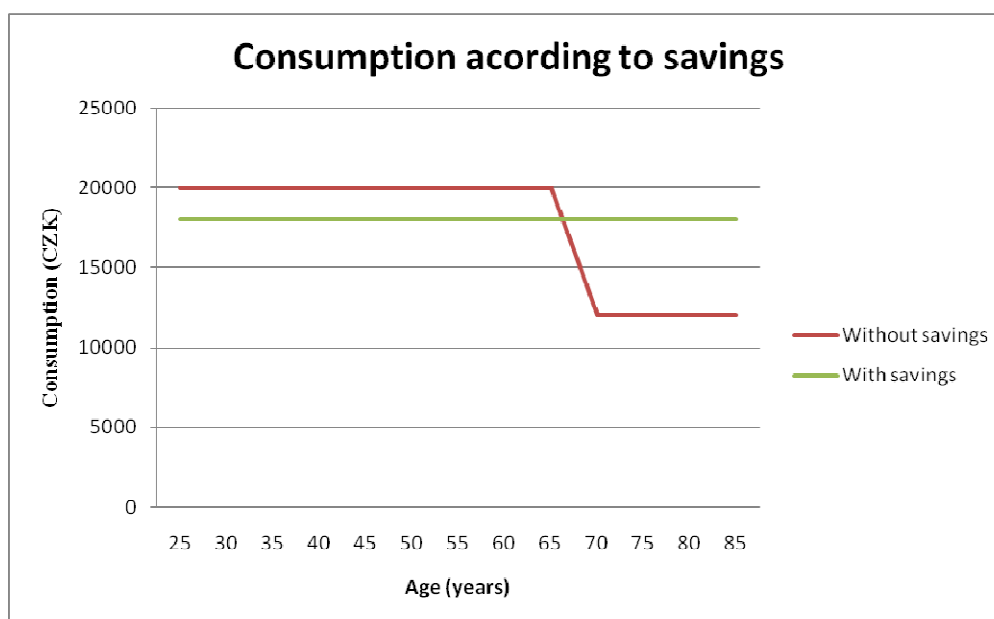
Source: SYROVÝ, P., *Investování pro začátečníky,* p. 14

And finally, leaving money at a bank account or holding too much cash money instead of investing it results firstly in loosing value because of devaluation by inflation, and secondly in

losing yield we could obtained when investing.

2.2.2. Investment risk

Risk is something that most investors try to avoid. The riskier the investment is the more return there should be to compensate for taking on that risk.

Investment risk is measured by standard deviation. It measures how much the price investment product fluctuates high and low compare to its average price. Low risk investment will have small fluctuation and therefore it will be more predictable while high risk investment is unpredictable with higher fluctuation. This is demonstrated on the graph below.

Graph 2: High risk and low risk investment - price fluctuation in time
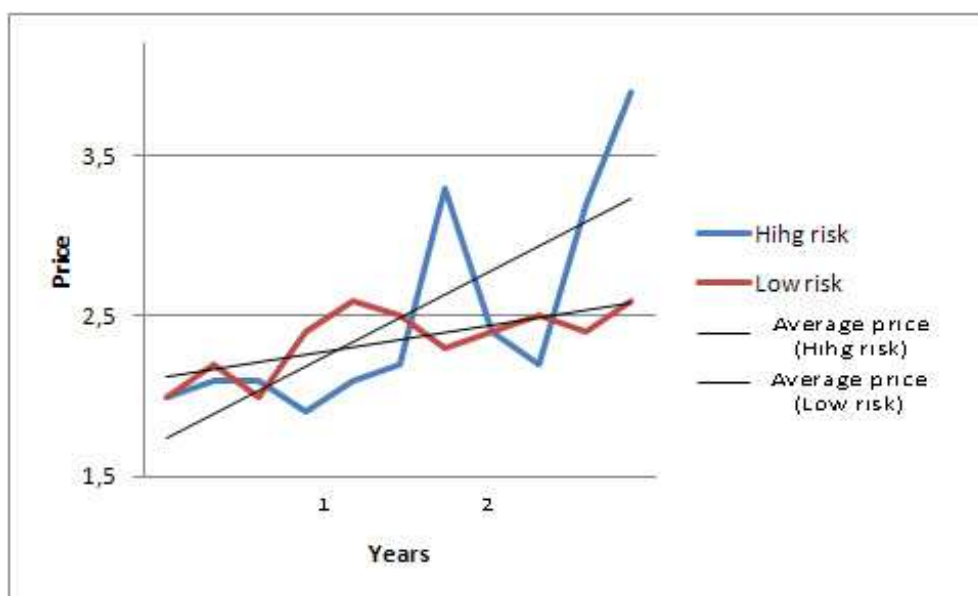
Source: author

2.2.2.1. Time horizon

High risk investments are usually more profitable than the low risk ones as long as investor withdraws money during a high (when the price increases). However, investor may be forced

to withdraw during a price dip (when the price decreased). That is why a time horizon needs to be considered.

Time horizon determines the amount of time investor expects to hold a security or portfolio and thus keep his money invested. "With a longer time horizon, investor has more time to recoup any possible losses and is therefore theoretically more tolerant of higher risks."[12]

For example, if the investment is planned for long time horizon, such as 10 years and longer, investor can put the money into higher-risk investment products because there is more time available to recover any losses and less likelihood of being forced to sell out of the position too early.[13] On the other side, if the investor plans to invest for short time horizon, such as one year, there may be bigger chance he will be forced to sell out the position during the price fall and thus lose.

2.2.2.2. Investment risk versus investment yield

The fundamental issue of investing is the relation of the investment risk and investment yield. All investors would like to find the most profitable investment possibility with the lowest risk. However, as it is explained further, this cannot be accomplished.

Basic factors which influence each investment opportunity are risk, yield, and liquidity. Investors try to find the right balance between the highest yield and minimum risk while maintaining the highest possible liquidity of investment. This relation is shown in "Investment triangle" on figure 1.

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[12] Investopedia [online], available at WWW
http://www.investopedia.com/articles/basics/03/050203.asp#axzz1oiVBowga [viewed on 2012-02-28]
[13] Ibid.

Figure 1: Investment triangle
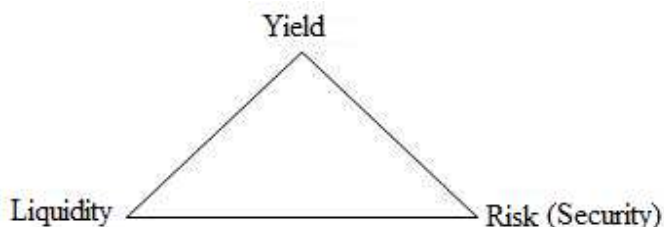
Source: author

Investment triangle demonstrates that it is not possible to achieve all three peaks at once. The higher is the expected yield, the higher is investment risk. And the other way around, the higher is the investment risk, the higher should be the yield. At the same time, the lower is the liquidity, the higher should be the yield or the lower should be the risk.

Right choice of risk and yield proportion is the key to the right investment.[14]

2.2.2.3. Different types of risk

Different types of risk are connected with investments. It is important to distinguish among these risks. If investor knows the types of risk he might face, he can make choices and try to manage these investment risks to offset potential problems.[15]

Risk can be divided into two basic types - Systematic and Unsystematic risk.

Systematic risk is also known as "market risk". It affects the entire market and cannot be avoided through diversification.[16]

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[14] SYROVÝ, P., *Investování pro začátečníky,* p. 23
[15] FINRA [online], available at WWW
http://www.finra.org/Investors/SmartInvesting/AdvancedInvesting/ManagingInvestmentRisk/ [viewed on 2012-02-28]
[16] Investopedia [online], available at WWW
http://www.investopedia.com/terms/s/systematicrisk.asp#axzz1oiVBowga [viewed on 2012-02-28]

Examples of most common systematic risks are:

- **Interest rate risk** "is the risk that an investment's value will change as a result of a change in interest rates." [17]

- **Inflation risk** is the risk that prices will increase due to inflation, and thus reduce purchasing power.

Interest rate risk and inflation risk are closely related as interest rates commonly rise with inflation.[18]

- **Currency risk** occurs because of investing in different currency other than domestic one. Any change in the exchange rates between domestic and foreign currency has affect on investment's return. Currency risk usually occurs only when investing in international securities or funds that invest in international securities.[19]

Unsystematic risk is referred to as "specific risk" or "diversifiable risk". It is "company or industry specific risk that is inherent in each investment." [20] This risk is connected with investing in certain product, company, or industry sector. Unsystematic risks can be reduced by right diversification.

Examples of most common specific risks are:

- **Market risk** which is the most common risk. It refers to changes in investment value due to volatility or fluctuation in investment price.

- **Credit risk**, also called default risk, is possibility that company or individual won't be

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[17] Investopedia [online], available at WWW
http://www.investopedia.com/university/risk/risk2.asp#axzz1oiVBowga [viewed on 2012-02-28]
[18] FINRA [online], available at WWW
http://www.finra.org/Investors/SmartInvesting/AdvancedInvesting/ManagingInvestmentRisk/ [viewed on 2012-02-28]
[19] FINRA [online], available at WWW
http://www.finra.org/Investors/SmartInvesting/AdvancedInvesting/ManagingInvestmentRisk/ [viewed on 2012-02-28]
[20] Investopedia [online], available at WWW
http://www.investopedia.com/terms/u/unsystematicrisk.asp#axzz1oiVBowga [viewed on 2012-02-28]

able to pay interest as scheduled or repay the principal at maturity.[21]

- **Management risk**, also called company risk, refers to bad management and other decisions which could have negative impact on company's performance and thus lower the value of investment.

2.2.2.4. Investment risk pyramid

Investing into different types of investment products carries different levels of risk. The "Investment risk pyramid", on the figure below, is used for right balancing of assets. The risk pyramid can be considered an asset allocation tool investors can use when diversifying their portfolio according to preferred level of risk (and thus yield).[22]

Figure 2: Investment risk pyramid

Source: http://globalyoungenterpreneurs.wordpress.com/2010/02/25/

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[21] FINRA [online], available at WWW
http://www.finra.org/Investors/SmartInvesting/AdvancedInvesting/ManagingInvestmentRisk/ [viewed on 2012-02-28]
[22] Investopedia [online], available at WWW
http://www.investopedia.com/articles/basics/03/050203.asp#axzz1oiVBowga [viewed on 2012-03-05]

Investment pyramid has four distinct levels. Moving from the lowest level up to the top of the pyramid increases the risk but at the same time, potential for the gain.

Level 1 represents the foundation of pyramid. Basic security needs, such as retirement plan, life and health insurance, as well as cash and cash equivalents are included. These assets have high liquidity in order to be accessible whenever needed. This is generally the lowest risk area but it produces the lowest rate of return. Concrete examples of investment products from level 1 are Savings Accounts, Treasury Bills, Certificates of Deposit, and Money Market Funds.

In level 2 are low risk investments. Investments on this level are safe and it is unlikely they will lose but on the other side they offer just low potential rate of return. Here belong from example Utility Stocks, Balanced Mutual Funds, Corporate Bonds, and Municipal Bonds.

Level 3 contains moderate risk investments. These investments are made in purpose of growth. Investors on level 3 take more risk and hope for higher gains. Here is bigger chance of losing money but long-term potential for higher rates of return is offered. In level 3 belongs for example investing into Real Estates, Growth Stocks, Growth Mutual Funds, Blue Chip Stocks, and Moderate Yield Bonds.

Summit of the pyramid, or level 4, comprises speculative investment. Investor make on this level risky investments which may yield large gains as well as losses. For example Futures, Stock Options, High Yield Bonds, Precious Metals and Gems, and Aggressive Growth Stocks belong to this group.

Risk is very important factor when speaking about investments. As is explained above, the level of risk is connected with expected yield, planned time horizon, liquidity, and investment product.
Defining the time horizon and the amount of money investor can stand to lose is an important step before determining investors risk tolerance and thereby right investment products and strategy. Investment products and strategies will be spoken of later.

2.3. Investment strategies

Choosing the right strategy is a big part of investment plan. According to one study, the right investment strategy is decisive for future returns in 92% of cases. In remaining 8% is yield influenced by the choice of investment product and by the timing of investment. [23]

Basic investment strategies could be divided into three categories – conservative, balanced, and aggressive.

Conservative strategy is also known as defensive. This strategy is usually for those who cannot afford to take risks, and thus should be content with a relatively low return on their invested funds. Goals that come under conservative strategies are not to lose money or eliminate inflation. Investors care less about yield, their main priority is safety. For those are saving bank accounts, terms deposits, or building savings appropriate investment tools.

Balanced strategy is somewhere in between of conservative and aggressive. Investors care for higher yield but they don't want too much risk. Investment tools may combination of money market tools, bond funds, and stock fund.

As the name already says, aggressive or enterprising investor has high risk tolerance. His main goal is to get above-average return. This way of investing is risky and can bear high potential risk of loss. However, on the other side, the potential yield is much higher. Aggressive investors choose mostly stock fund. Portfolio of aggressive investor may as well comprise speculative investments such as investing into speculative stocks, junk bonds, collectibles, options and futures contracts.

Investment strategy is also connected with way of investing. This can be done for example in single investment or periodical deposits.

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[23] SYROVÝ, P., *Investování pro začátečníky*, p. 47

3. INVESTMENT PRODUCTS

After clarifying investors preferred tolerance to risk and optimal investment strategy comes a time to choose concrete investment products and create actual investment plan.

Products that are going to be laid out in the next part are only investment product most suitable for households as it is a target group of this thesis. Low-quality, speculative, and advanced investment tools will be left out.

3.1. Mutual funds

"Mutual fund is a fund operated by an investment company that raises money from shareholders and invests it in stocks, bonds, options, futures, currencies, money market securities,"[24] or some combination of these investments.

The combined holdings owed by mutual fund are known as its portfolio. Each share represents an investor's proportionate ownership of the fund's holdings and the income those holdings generate. Investors purchase redeemable shares directly from the fund or through a broker for the fund instead of purchasing from investors on a secondary market. [25] All shareholders share equally in the gains and losses generated by the fund.

Over the last 20 years mutual funds gained on its popularity. One of the reasons why is that it is easy way to invest for common people without any extraordinary knowledge. Mutual funds should be the base of household's portfolio.

Mutual funds have both advantages and disadvantages compared to direct investing in individual securities. Some investors can find mutual funds an attractive investment choice

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[24] DOWNES, J., GOODMAN, E., *Dictionary of Finance and Investment Terms,* p. 377
[25] U.S. Securities and Exchange Commision [online], available at WWW
http://www.sec.gov/investor/pubs/inwsmf.htm [viewed on 2012-03-10]

because they offer the following features:

- **Professional management** is the primary advantage of investing into funds. It offers professional managers who administrate money. This is easy and inexpensive way for small investors who don't have the time or knowledge to manage their own portfolios.
- **Increased diversification** as funds spreading investments across a wide range of companies and industry sectors. Owning shares in mutual fund instead of separate stock of bonds spreads the risk.
- **Daily liquidity** since mutual fund offers to redeem shares at any time. Shares are repurchased at the current net asset value plus any fees for doing so.
- **Ability to participate in investments that may be available only to larger investors.** This can be done thanks to utilizing the strength of numbers of investors as the initial investments can be bought for low amount. Most companies also offer possibility of investing on monthly bases.
- **Taxes.** Big advantage is that when investing into funds for more than 6 months are not subject to income tax.

Mutual funds have also disadvantages which include following:

- **Fees** are the biggest problem with mutual funds. Costs of running mutual fund are passed on to the investors in the form of fees. Fees vary from fund to fund. Therefore, it is important to pay attention to them since they may have negative long-term consequences.

  Total costs of fund are determined by Total expanse ratio (TER) indicator. This indicator says how expensive the fond is for investors.[26]

  Funds levy fees such as management fee, sales charges, annual fee, exchange fee, and other administrative charges. These fees have to be paid even if the fund is performing poorly.

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[26] SYROVÝ, P., *Investování pro začátečníky*, p. 51

- **Less control** because investors usually cannot determine the exact make-up of a fund's portfolio at any given time. What is more, choice of securities and timing depend on fund's managers and it cannot be directly influenced by investor.
- **Dilution** as it happen that portfolio will be too much diversified. Funds have small holdings in so many different companies that high returns from a few investments often don't make much difference on the overall return.[27]

Mutual funds are classified by their principal investments. Most mutual funds fall into these four largest categories - money market funds, bond or fixed income funds, stock or equity funds, and hybrid funds. Each type has different features and different risks and rewards.

3.1.1. Money market fund

Money market funds prefer safety to return. By law, they can invest in only certain high-quality and short-term investments usually issued by government. Investor losses have been rare, but they are possible. These funds are intended to protect investments. Usually, investor can gain twice the amount than from regular savings account and a little less than the average certificate of deposit. Average return that could be expected is from 2,5% to 3,5% annually. Return usually outpaces inflation rate which is why money market funds may be used to meet the inflation. Due to low level of risk is recommended investment horizon from 1 to 3 years.

3.1.2. Bond or fixed income fund

"Bond mutual fund is mutual fund holding bonds. Such funds may specialize in a particular kind of bond, such as government, corporate, convertible, high-yield, mortgage-backed, municipal, foreign, or zero-coupon bonds."[28]

Most bond mutual funds are designed to produce current income for shareholders on steady basis. Bond funds usually pay higher returns than certificates of deposit and money market

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[27] Investopedia [online], available at WWW
http://www.investopedia.com/university/mutualfunds/mutualfunds.asp#axzz1oiVBowga [viewed on 2012-03-10]
[28] DOWNES, J., GOODMAN, E., *Dictionary of Finance and Investment Terms,* p. 61

investments, but they aren't without risk. Some of the risks associated with bond funds include:[29]

- **Interest rate risk** as bond mutual funds are sensitive to changes in interest rates. The longer is the time to maturity the more sensitive is bond to changes in interest rate and therefore the bigger is its risk and rewards. If interest rates fall they produce capital gains and if interest rates rise they produce capital losses.
- **Credit risk** determines the quality of bonds in bond fund and the possibility that companies or other issuers whose bonds are owned by the fund may fail to pay their debts. Credit risk when investing into bonds issued by government is very low. By contrast, investing into bonds of companies with poor credit ratings is generally subject to higher risk.[30]

3.1.3. Equity fund or stock fund

Equity fund is a mutual fund that invests principally in stocks. It is also known as "stock fund".

There is a large amount of types of equity funds. Stock mutual funds are mainly categorized according to company size, the investment style, and geography. There are for example growth funds, income funds, index funds, or sector funds.

Unlike the bond mutual funds, investing into global equity fund that specializes both on domestic and foreign markets is recommended. The reason is that Czech market isn't that extensive, and thus offers just limited amount of securities. This is not good for portfolio diversification.[31]

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[29] U.S. Securities and Exchange Commision [online], available at WWW
http://www.sec.gov/investor/pubs/inwsmf.htm [viewed on 2012-03-10]
[30] U.S. Securities and Exchange Commision [online], available at WWW
http://www.sec.gov/investor/pubs/inwsmf.htm [viewed on 2012-03-10]
[31] SYROVÝ, P., *Investování pro začátečníky*, p. 62

Stock fund's value can rise and fall dramatically over short term. However, historically stocks have performed better over long term than any other types of investments — including corporate bonds, government bonds, and treasury securities.[32] Therefore, using stock funds is recommended mainly for long-term investments as there is enough time for coping with stock value fluctuation.

3.1.4. Hybrid funds

Hybrid funds are in between of bond and equity funds as they invest in both bonds and stocks. The share and bond ratio is crucial for hybrid funds as it affects fund's strategy and level of risk. The mount of shares is the way of controlling the level of risk.

There can be conservative, balanced, and aggressive (dynamic) hybrid funds. Usually the share ratio in conservative funds is from 20% to 30%. This amount of shares cannot dramatically change fund's returns in the case of shares performing poorly. In dynamic funds the share ratio is from 50% to 60%. These funds have similar features as equity funds.[33]

3.2. Other categories of funds

Money market fund, bond fund, equity fund and hybrid fund are generally the most important and used types of funds. However, there are other categories of funds besides these - for example life-cycle fund. This fund may be suitable for household investments as well.

3.2.1. Life-cycle fund

Life-cycle fund is a special category of balanced mutual funds suitable for long-time periodical investments. It could be used instead of retirement reinsurance or as its complement. This fund is good for investors who don't want to look after their investments and change funds throughout their lives.

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[32] U.S. Securities and Exchange Commision [online], available at WWW
http://www.sec.gov/investor/pubs/inwsmf.htm [viewed on 2012-03-10]
[33] SYROVÝ, P., *Investování pro začátečníky*, p. 63 - 64

Fund's portfolio is automatically changes during investor's life-time. This adjustment runs from a high risk in youth to a lower risk as the investor ages. Near retirement portfolio consist only from minimal risk investments (see the table below).

Table 2: CONSEQ Horizont Invest Life-cycle fund's component ration changes in time

Number of years towards the end of program	Dynamic portfolio		Growt portfolio		Balanced portfolio	
	Shares	Bonds	Shares	Bonds	Shares	Bonds
more than 10	100%	0%	70%	30%	40%	60%
10 -	90%	10%				
9 -	80%	20%				
8 -	70%	30%				
7 -	60%	40%	60%	40%		
6 -	50%	50%	50%	50%		
5 -	40%	60%	40%	60%		
4 -	30%	70%	30%	70%	30%	70%
3 -	20%	80%	20%	80%	20%	80%
2 -	10%	90%	10%	90%	10%	90%
1 -	0%	100%	0%	100%	0%	100%

Source: https://www.conseq.cz/page.asp?page=171

3.3. Investment products with state allowances

Retirement reinsurance and life insurance are commonly offered as investment products. These products offer advantages in the form of state allowance or tax benefits.

3.3.1. Building savings

Building saving is very popular investment tool in the Czech Republic. Every citizen has the right to set up one building saving with state subsidy of maximum of 3 000 CKZ[34] per year. Average rate of return is 2% per year. It follows, that the most effective yearly deposit is 20 000 CZK. The minimum period of 6 years should be also the maximum period. There is no point in keeping building saving for longer because of diminishing returns on investment as it

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[34] From year 2013 will be the subsidy only 2000 CZK.

is shown in table 3. After this period new building saving can be set up or more appropriate investment tools can be chosen.

Table 3: Development of building saving with the deposit of 20 000 per year[35]

	Initial stock	Deposit (CZK)	State subsidy		Yield		Total money (without taxes, fees)	Total yield (%)
			CZK	% from total amount	in CZK	in %		
Year 1	0	20 000	3 000	15	460	2	23 460	17
Year 2	23 460	20 000	3 000	6,9	929	2	47 389	8,9
Year 3	47 389	20 000	3 000	4,5	1 408	2	71 797	6,5
Year 4	71 797	20 000	3 000	3,3	1 896	2	96 693	5,3
Year 5	96 693	20 000	3 000	2,6	2 394	2	122 087	4,6
Year 6	122 087	20 000	3 000	2,1	2 902	2	147 989	4,1

Source: author

The disadvantage of building saving is very low liquidity, entrance fee and other fees. Still, building saving is very good product because of its high beginning yield and very low risk. It should have its place in investment portfolio.

3.3.2. Retirement fund

Retirement funds are very conservative as they are designed for people who require very low level of risk because they are very near retirement. Retirement funds invest mainly into high-quality bonds and usually very little into stocks.

Retirement funds offer state allowance in maximal amount of 150 CZK to monthly deposits of 500 CZK and more. Funds charge fees which are usually higher than mutual bund fund's fees.

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[35] Taxes from interest and entrance fee are not included. Including them would make difference about 3 000 in 6 years.

4. CASE STUDY

Aim of the case study is to create optimal investment plan for average households in the Czech Republic. This plan will be based on collected information about composition of households and their financial situation, as well as on the information on the issue of investing and investment theory which has been already laid out.

4.1. Household characteristic

In the table below are some basic data regarding households in the Czech Republic. There are 4 149 665 households with total 10 402 836 members. Average composition is 2,51 member per household of which are 0,56 dependent children. Two-parent families have the largest representation of 64,4%, followed by individual families and lone-parent families.

Table 4: Household characteristic in 2010, Czech Republic

Number of households total			4 149 665
Number of persons in households			10 402 836
Per household averages:	Members		2,51
	Incl. dependent children		0,56
Household type (%)	Two-parent families		64,4
	Lone-parent families		11,1
	Individuals	Men	9,0
		Women	14,5

Source: http://vdb.czso.cz/vdbvo/en/tabparam.jsp?voa=tabulka&cislotab=ZUR0017UU&&kapitola_id=14

It follows that the two-parent families with one child are the most common type of households.

Single person family, two-person family, two-parent family with one child, and lone-parent family with one child are chosen target groups that will be analyzed. In order to create and apply an investment plan for these groups, their presumable income and outcome have to be defined. This will be achieved by examination of the data provided by the Czech Statistical

Office[36] in the next point.

4.2.   Household income and expenditures

As was said above, in order to be able to determine sum of money left for investing, income and expenditures of households have to be determined. These are summarized in table 5 and table 6 which have been adjusted according to the latest data provided by the Czech Statistical Office.

In table 5 are shown average incomes and expenditures of households that consist of working persons without children. By working person is meant person who has paid job - they are either employed within the labour-law contract or self-employed. It doesn't matter if their job has a permanent, temporary, seasonal, or occasional character.[37]

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[36] Czech Statistical Office is available at http://www.czso.cz.
[37] Czech Statistical Office: Methodical annotation [online], available at WWW
http://www.czso.cz/csu/2011edicniplan.nsf/t/CA00269450/$File/300211m.pdf [viewed on 2012-03-14]

Table 5: Households with no children - income and expenditures according to the number of working members in 2010 - averages in CZK per person per year

	Households with no children, total	Households with working members with no children including households of		
		one-person		two-person
		men	women	
Households - weighted	1 828	85	286	538
GROSS MONEY INCOME, TOTAL	192 959	289 294	275 495	234 448
NET MONEY INCOME, TOTAL	172 323	239 002	230 769	201 207
Income from employment	80 539	181 789	175 880	129 767
Income from self-employment	10 483	29 385	18 346	18 326
Social income	72 969	8 899	23 987	42 181
Other income	8 333	18 931	12 557	10 932
gifts from relatives	3 346	4 008	6 029	3 884
GROSS MONEY EXPENDITURE, TOTAL	173 401	288 699	249 689	202 320
Income tax, health and social insurance	20 636	50 291	44 726	33 241
NET MONEY EXPENDITURE, TOTAL	152 765	238 407	204 962	169 079
by purpose:				
A. Consumption expenditure	137 421	192 123	186 016	151 311
B. Non-consumption expenditure	15 344	46 284	18 947	17 768
by type of expenditure:				
Food, beverages, public catering	34 146	43 697	39 732	36 454
Other consumer goods	41 547	63 854	51 239	52 082
Services	55 181	81 703	84 349	55 476
Payments and other expenditure	21 891	49 152	29 642	25 067

Source: http://www.czso.cz/csu/2011edicniplan.nsf/p/3002-11

In table 6 can be seen average incomes and average expenditures of households with dependent children according to the number of working members. The data are shown for two-parent families and lone-parent families with one child.

By the two-parent family is meant married (partner) couple with dependent children. By dependent child is meant schoolchild at the latest of 26 year of age. No other member or

economically active child live with the family.[38]

Table 6: Households with children - income and expenditures according to the number of working members in 2010 - averages in CZK per person per year

	Households with children, total	including households of	
		Two-parent family, 2 working members	Lone-parent families, 1 working member
		with 1 child	with 1 child
Households – weighted	1 012	176	134
GROSS MONEY INCOME, TOTAL	140 122	185 073	142 826
NET MONEY INCOME, TOTAL	123 188	157 670	127 964
Income from employment	84 300	119 735	78 008
Income from self-employment	14 761	18 993	8 120
Social income	13 462	8 774	16 682
Other income	10 664	10 167	25 154
gifts from relatives	2 896	2 983	3 299
GROSS MONEY EXPENDITURE, TOTAL	128 130	162 211	129 210
Income tax, health and social insurance	16 935	27 403	14 862
NET MONEY EXPENDITURE, TOTAL	111 196	134 808	114 348
by purpose:			
A. Consumption expenditure	98 721	116 230	107 020
B. Non-consumption expenditure	12 475	18 578	7 328
by type of expenditure:			
Food, beverages, public catering	24 389	28 799	24 605
Other consumer goods	33 983	40 562	26 594
Services	36 961	44 796	49 545
Payments and other expenditure	15 863	20 650	13 604
Average subsistence (month/household)	8 320	7 505	4 992

Source: http://www.czso.cz/csu/2011edicniplan.nsf/p/3002-11

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[38] Czech Statistical Office: Methodical annotation [online], available at WWW
http://www.czso.cz/csu/2011edicniplan.nsf/t/CA00269450/$File/300211m.pdf [viewed on 2012-03-14]

4.3. Hypothesis about households

To be able to create optimal investment plan hypothesis have to be specified. What is the investment intended to achieve? Hypothesis about households is determined on the basis of Maslow's hierarchy of needs. What is more, advancing from one level of Maslow's pyramid to the next may be the motivation for households to start with investment plan.

Based on this, the primary goal is the goal of safety – having financial reserve for the unexpected expenses and a feeling safety of habitation.

Secondary goals vary according to composition of households. Based on research done on the internet, most families with children wish to provide resources for the study of children. Secondary goal of families with no children is to raise their living standard.

Third goal is an old age security. However, most individuals start to think about this goal when it is too late. Starting with savings in young age makes enormous difference in the resulting sum of money compare to starting with saving in the older age. This difference is caused by longer horizon which allows accepting higher risk. Compounded investment also makes big difference in long and short horizon. Because of this, ideal investment plan comprises saving for retirement as lifelong goal of every household.

All households wish to secure against risk. All families start their investment plan at the age of 30.

4.4. Creation of investment plan

Optimal investment plan should secure primary goals of safety first. Financial reserve should be created as soon as possible in the volume of three to six times monthly expenses of one household provider[39] with minimal risk. Bank saving account would be and optimal investment tool for this step as it is very safe and accumulates interesting and guaranteed sum.

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[39] Probability of both providers losing job at the same time is very low.

Safety of habitation will be achieved as soon as possible with the lowest risk as well. Building saving would be an optimal investment tool for this step.

The thought of financing own habitation is based on getting mortgage with the longest horizon and the lowest fixation. Thus would the client get low monthly mortgage repayments. It is highly possible, that this repayment will be lower than actually paid rent.[40]This could even lower monthly expenses and consequently generate more free funds. However, this is impossible to cover in computations because of lack of specific information on every family.

Solution of the second objective connected with the rising living standard and obtaining money to fund children's study expenses emerges from the solution of the first one. There arise extra money from the Building saving and what is more, money can be withdrawn from funds any time needed[41].

Securing against risk is done in several ways. Investing plan is planned for very long horizon and investments are based on periodical monthly deposits as this way of purchasing decreases risk thanks to the price averaging. What is more, for long time investments is chosen a product of Life-cycle funds[42] as it automatically spreads the risk through adjusting the ratio of dynamic and conservative components according to the lifetime of the investment in order to secure money already saved.

Model financial plan based on set goals and available funds was created after consultation with expert from the field of financial advice.

In the plan is counted with average yields from interest as follows:
- Bank saving accounts – 2,5% p.a.

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[40] For example Equa Bank offers monthly mortgage repayments of 11 863 CKZ for loan amount of 2 500 000 CZK with own funds of 100 000 CKZ.
[41] Withdrawing money would however lover final annuity.
[42] Concrete product is CONSEQ Horizont Invest.

- Money market funds - 3%
- Bond funds – 5% p.a.
- Equity funds – 7% p.a.

These average percentage returns were recommended by financial adviser. Used returns are lower than the average returns that were stated before. This is because it is better to predict lower final sum and then be positively surprised by higher returns than otherwise.

4.5. Individual investment plans

In this part are depicted individual investment plans for selected households based on their free funds. These plans follow goals depicted above.

Concrete calculations in the plan are primary for guidance. Model plans below are calculated using unchanged conditions until the end of the plan. However, when creating real investment plan it is expected that the plan will be adjusted during its lifetime to investor's actual situation and to the situation on market.

Fees from different kinds of products and average inflation of 2.5% are included. Tax on interest of 15% is included as well.

4.5.1. Single person family

Single or one-person family is the first group that will be analyzed. In this household is just one working member with no children.

In the table 7 is shown the sum of money available for potential investment per household both per year and per month. This amount was calculated by subtracting relevant data from table 5 – average income and expenditures per year per person.

Table 7: The potential investment sum of one-person family in 2010

	One-person family	
	Men	women
Net money income (NMI), total	239 002	230 769
Net money expenditure (NME), total	238 407	204 962
NMI - NME per year	595	25 807
NMI - NME per month	50	2 151

Source: author

Household composed of single man has only 50 CZK per month to invest. These funds are not enough to create investment plan.

Investment plan of household composed of single woman works with free funds of 2 151 CZK per month.

As said before, this household will use the Bank saving account and the Building saving. 1667 CZK will be monthly deposited into building saving. This will result in 139 000 CZK of outcome after six years. When this happens 100 000 CZK out of this sum will be used as own funds for mortgage and the rest of 39 000 CZK can be used for rising of living standard.

Household also need financial reserve of about 51 250. Therefore, the rest out of 2 151 CZK, which is 484 CZK will be deposit to Bank saving account for eight years. There should be sufficient financial reserves of 51 484 CZK accumulated after this period.

By this first investment step is secured accomplishing of both first and second goals. Now is the time to concentrate on fulfilling third goal as well – the old age security.

1 667 CZK isn't needed to be deposited into Building saving and it could be used on more yielding investment. Therefore, this sum will be invested into Life-cycle fund with horizon of 32 years. After two more year when the family has sufficient financial reserves 484 CZK will be a added as deposit into Life-cycle fund.

As it is shown on the graph below in the beginning 100% goes into dynamic components. As we approach the end of the investment horizon, portfolio becomes more and more conservative. Finally, at the end, portfolio is conservative for 100%.

**Graph 3: One-person family portfolio composition in time**

Source: CONSEQ Horizon Invest portfolio plan

This plan will be carried out until the retirement at the age of 68.

During 32 years are the total scheduled deposits 869 044 CZK. The future value of the investment in 32 years is 2 462 158 CZK[43]. This development is shown on the graph 4.

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[43] Counting with given yields.

Graph 4: Deposits versus the value of portfolio of one-person family in time
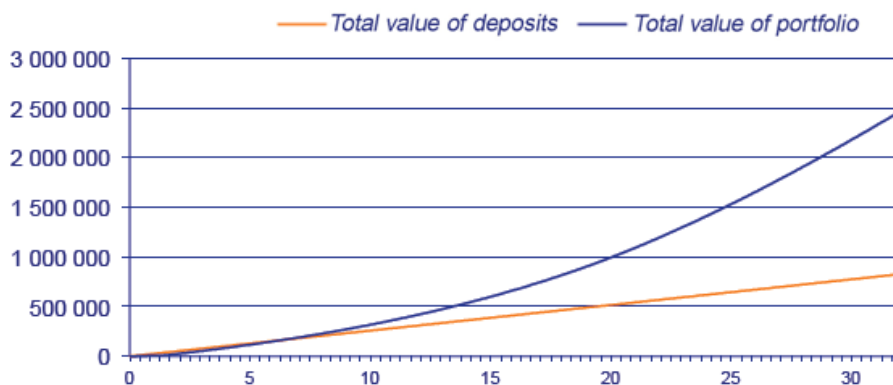
Source: CONSEQ Horizon Invest portfolio plan

On this graph is very well seen the effect of compound interest in long time horizon as the portfolio value grows significantly towards the end of horizon.

Presuming household member will live up to the average life expectancy of 77 years she can enjoy a monthly rent of 22 798 CZK for the next 9 year.

4.5.2. Two-persons family

Two-person family, or married couple, don't have any children and both of them earn same salary. Free financial funds are 5 355 CKZ per month (see the table 8).

Table 8: Two-persons family, average income and expenditures in 2010

	Two-persons family
Net money income (NMI), total	402 414
Net money expenditure (NME), total	338 158
NMI - NME per year	64 256
NMI - NME per month	5 355

Source: author

Investment plan for two-person family will be very similar to the first investment plan with the difference this household has more free funds for investing. Therefore, the future value of

investment at the end of horizon will be proportionally higher.

Two-person household will use the Bank saving account and the Building saving as well. 1667 CZK will be monthly deposited into building saving. This will result in 139 000 CZK of outcome after six years. When this happens 100 000 CZK out of this sum will be used as own funds for mortgage and the rest of 39 000 CZK can be used for rising of living standard. This part have both households same.

Financial reserve of this household should be about 42 270. Therefore, the rest out of 5 355 CZK, which is 3 688 CZK will be deposit to Bank saving account. As this sum is quite high, only one year is necessary to accumulate appropriate reserves of 44 860 CZK after this period.

First and second goals are accomplished. Both 3 688 CZK after one year and 1 667 CZK after six years will be used for fulfilling third goal – the old age security. These sums will be invested into Life-cycle fund as well.

As it is shown on the graph 5, ratio of components corresponds to the first plan. In the beginning 100% goes into dynamic components and at the end is the portfolio 100% conservative.

Graph 5: Two-person family portfolio composition in time

Portfolio: Dynamic portfolio

|	
- component ratio at beginning of program	
- dynamic	100%
- conservative	0%
- component ration at the end of program	
- dynamic	0%
- conservative	100%
- supposed annual yield	
- dynamic	7,00%
- conservative	5,00%
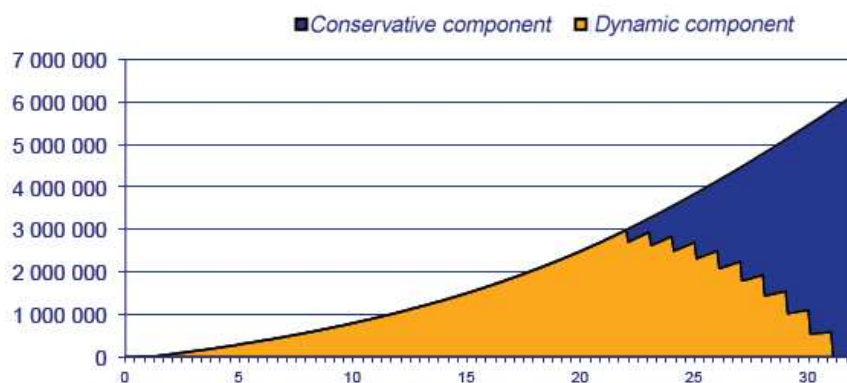
Source: CONSEQ Horizon Invest portfolio plan

This plan will be carried out until the retirement at the age of 68.

During 32 years are the total scheduled deposits 2 321 895 CZK. The future value of the investment in 32 years is 6 164 132 CZK[44]. This development is shown on the graph 6.

---

[44] Counting with given yields.

Graph 6: Deposits versus the value of portfolio of two-person family in time
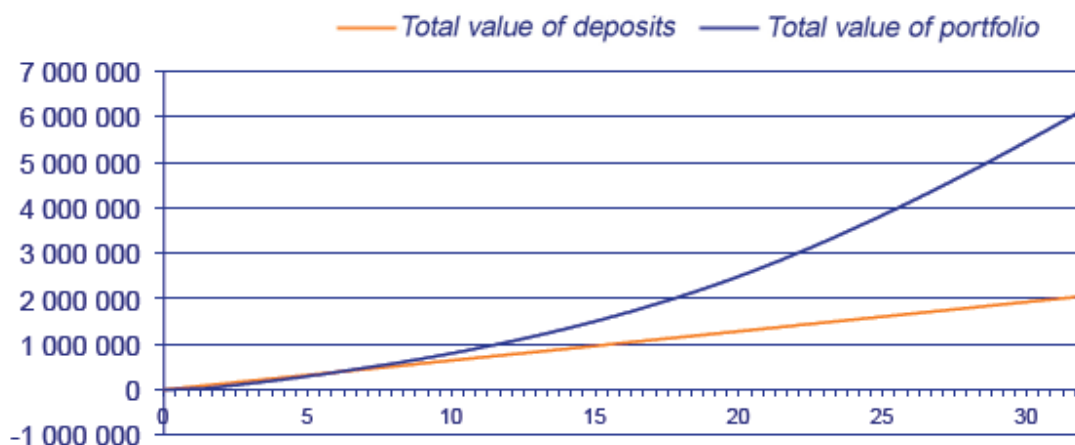
Source: CONSEQ Horizon Invest portfolio plan

Presuming household members will live up to the average life expectancy of 77 years, they can enjoy monthly rent of 57 075 CZK together or 28 538 CZK each for the next 9 year.

4.5.3. Two-parent family with 1 child

In a two-parent family with 1 child are two working members who earn same salary and one depended child. It is shown in the table below that this family has free funds of 3 810 CZK per month.

Table 9: Two-parent family with 1 child, average income and expenditures in 2010

	Two-parent family, 1 child
Net money income (NMI), total	315 340
Net money expenditure (NME), total	269 616
NMI - NME per year	45 724
NMI - NME per month	3 810

Source: author

Investment plan for two-parent family with one child will be similar too. As free funds of this

household are in between the first two, the future value of investment at the end of horizon will be in between as well.

In the beginning Bank saving account and the Building saving will be used.
1667 CZK will be monthly deposited into building saving. This will result in 139 000 CZK of outcome after six years. When this happens 100 000 CZK out of this sum will be used as own funds. This part is same again with the difference, that 39 000 CZK can be used for covering child's expenses.

Financial reserve of this household should be at least 33 700. Therefore, the rest out of 3 810 CZK, which is 2 143 CZK will be deposit to Bank saving account. With given deposits, one year wouldn't create sufficient reserves so the necessary period is two years. This will secure sufficient financial reserves of 52 793 CZK accumulated after this period. It is more than minimal financial reserve but this is not a bad thing.

First and second goals are accomplished. Both 2 143 CZK after two years and 1 667 CZK after six years will be used for the old age security plan using Life-cycle fund again with the same ratios of components as in two previous plans (see the graph 7).

Graph 7: Two-parent family with one child portfolio composition in time

Portfolio: **Dynamic portfolio**

- component ratio at beginning of program	
- dynamic	100%
- conservative	0%
- component ration at the end of program	
- dynamic	0%
- conservative	100%
- supposed annual yield	
- dynamic	7,00%
- conservative	5,00%

■Conservative component □ Dynamic component

Source: CONSEQ Horizon Invest portfolio plan

This plan will be too carried out until the retirement at the age of 68.

During 32 years are the total scheduled deposits 1 463 040 CZK. The future value of the investment in 32 years is 4 361 144 CZK[45]. This development is shown on the graph 8.

---

[45] Counting with given yields.

Graph 8: Deposits versus the value of portfolio of two-parent family with one child in time
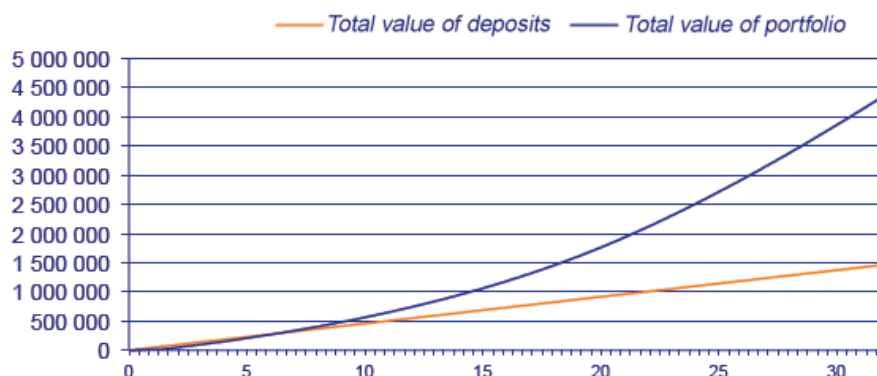
Source: CONSEQ Horizon Invest portfolio plan

Presuming household members will live up to the average life expectancy of 77 years, they can enjoy monthly rent of 40 381 CZK together or 20 190 CZK each for the next 9 year.

4.5.4. Lone-parent family with 1 child

Lone-parent household composes of one working parent and 1 dependent child. In the table below are shown free funds of this household which is 1 135 CZK per month.

Table 10: Lone-parent family with 1 child, average income and expenditures in 2010

	Lone-parent family, 1 child
Net money income (NMI), total	127 964
Net money expenditure (NME), total	114 348
NMI - NME per year	13 616
NMI - NME per month	1 135

Source: author

Investment plan for lone-parent with one child household will little bit differ from previous plans because this household has very limited free funds available.

Having Building saving alongside with Bank saving account with such low free funds would

cause creating financial reserve in too long horizon. Having financial reserve for unexpected expenses is really important so the plan will be set up in order to secure this first. This household should have free reserve of 28 590 CZK. Depositing whole sum of 1 135 CZK into Bank saving account will accumulate reserve of 27 961 CZK in two years. This reserve is lower than desired financial reserve but the difference is very small and saving on Bank saving account for longer would even more lover final horizon. Therefore, this reserve is taken for sufficient.

After two year can family start Building saving. Unfortunately, the household doesn't have enough free funds to use maximal state allowance. They will deposit only 1 135 CZK monthly. This will result in 97 500 CZK of outcome after six years. When this happens, all 97 500 CZK will be probably needed to be used as own funds. This depends on actual mortgage offers at that time. If family finds mortgage with very low interest rate it will be possible to use less own fund. The difference then can be used to cover child's expenses.

After eight year the whole sum of 1 135 CZK can be used as investments into Life-cycle fund. The ratios are again same - in the beginning 100% goes into dynamic components and at the end is the portfolio 100% conservative (see the graph 9). Only difference is that investment horizon is only 30 years due to the inability to invest into Bank saving account and Building saving simultaneously.

Graph 9: Lone-parent family with one child portfolio composition in time

Portfolio: Dynamic portfolio

- component ratio at beginning of program	
- dynamic	100%
- conservative	0%
- component ration at the end of program	
- dynamic	0%
- conservative	100%
- supposed annual yield	
- dynamic	7,00%
- conservative	5,00%

■ Conservative component   □ Dynamic component

Source: CONSEQ Horizon Invest portfolio plan

This plan will be too carried out until the retirement at the age of 68.

During 30 years are the total scheduled deposits 408 600 CZK. The future value of the investment in 30 years is 1 118 180 CZK[46]. This development is shown on the graph 10.

---

[46] Counting with given yields.

Graph 10: Deposits versus portfolio value of lone-parent family with one child in time
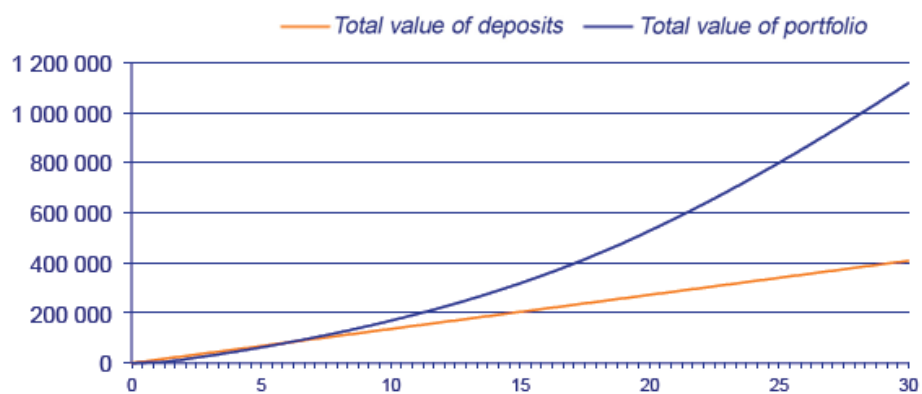
Source: CONSEQ Horizon Invest portfolio plan

Presuming household member will live up to the average life expectancy of 77 years, he can enjoy monthly rent of 10 354 CZK for the next 9 year.

5. CONSLUSION

Goal of this thesis was to create optimal investment plans for average households. In order to accomplish this task average income and expenditures had to be determined.

Households were divided into four groups according to their composition whereupon necessary figures were learned by examining relevant statistical data provided by the Czech Statistical Office.

Although all four groups have higher income than expenses, free funds are very low. The difference between income and expenditures is minimal which points to poor financial situation of citizens of the Czech Republic.

One person family composed of men had to be excluded from creation of own investment plan due to only 50 CZK free funds per month. For other groups were optimal plans created despite little sources available. In the graph below can be seen proportion total deposits to future value of portfolio for all four investment plans.

Graph 11: Proportion of total deposits to future values of all four portfolios
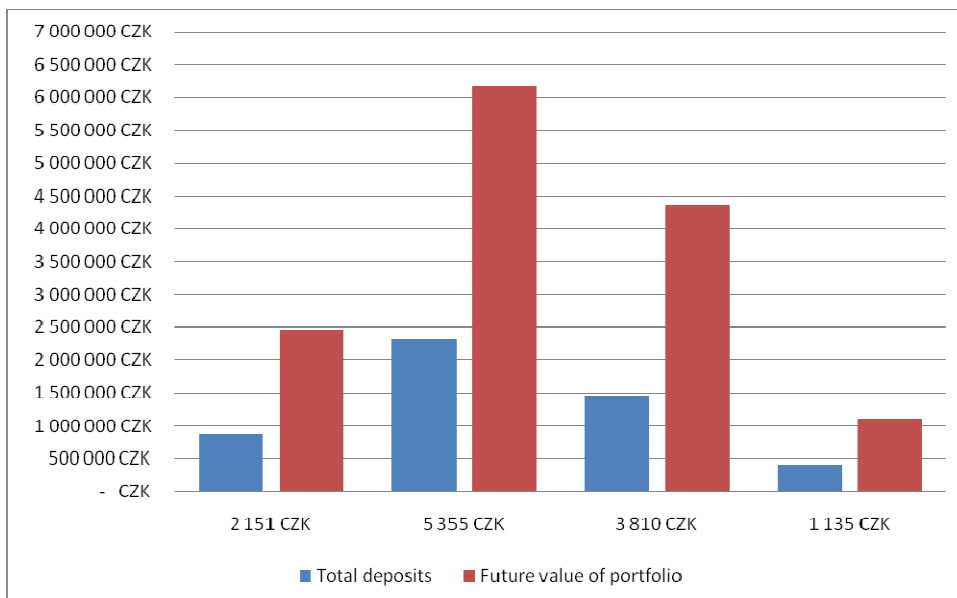
Source: author

Graph of total deposits to future values shows direct proportion – the more household invest every month the more it receives in the end of investment horizon. It can be well seen on this graph that there is a point in following investment plan since the future value received in the end is much higher than total money deposited over life-time of the investment.

Unfortunately, as said before, financial situation of average households isn't good. Since they have so little extra free funds, they may be afraid to loss and therefore, they are unwilling to undertake any risk at all. People usually don't have confidence in investment plans and market so they follow to secure investment plans or they don't follow any investment plans at all. Most people rely on state subsidies for the old age which, in the end, turns out as disaster.

On the graph 12 can be seen comparison of monthly rents received per person since retirement to the average life expectancy of 77 years when following created investment plans.
Present value of portfolio at the end would significantly reduced rent received, however, this cannot be avoided.

Graph 12: Comparison of monthly rent per person of all four portfolios

Source: author

If asking any pensioner, if he would like to receive 10 354 CZK[47] alongside with his pension every month until the age of 77, the answer would be clear. And only so little as 1 135 CZK per month was necessary.

When creating real personal investment plan it is important to bear in mind the plan needs to be flexible. Situation will most probably change during lifetime because of changing conditions in person's life as well as changing conditions on market. Investor's income and expenses may change. He may have children, get married, or divorced, and so on. When this happens investment plan needs to be adjusted to these changes. In this thesis is counted with model unchanging situation and the plan is thus only theoretical.

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[47] Rent 10 354 CZK per month is in future values.

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7. TABLE OF FIGURES

Tables

Graphs

Figures