MYKOLAS ROMERIS UNIVERSITY

IN PARTNERSHIP WITH MIDDLESEX UNIVERSITY

DEPARTMENT OF BUSINESS AND MEDIA SCHOOL

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ESTIMATION OF HOUSEHOLDS' FINANCIAL RISK-TAKING OVER THE BUSINESS CYCLE IN LITHUANIA

A master's final thesis

Supervisor
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VILNIUS, 2015

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A master`s thesis on financial markets
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INTRODUCTION

Novelty and significance of the research. Households take a large share of the economy as an economic entity which, differently from other entities, is extremely diverse. Households make a significant impact on the economy depending on their consumption, saving, investment, borrowing and lending habits. Lithuanian households hold more than 33 billion euro of financial assets and make decisions on its usage every day. It is indeed a significant amount as it makes approximately 25 percent of the whole financial assets in Lithuania. Quarterly net financial investments (2015 Q2) of households in Lithuania sum up to 801 million euro.

Households' financial investment depends on their risk tolerance which is influenced by the phase of the business cycle. Uncertainty often makes individuals' investment decisions complicated to understand, explore and predict. With some evidence, they worry about buying too soon or selling too late. It can also be stated that businesses and even governments face problems under uncertainty as well. Even though as experts and professionals they have better access to information about state of the economy that is important for investors. Most of investors spend a lot of time trying to determine when the next tuning point is coming. Households as an institutional unit make a significant part of country's economy. Thus, it becomes a natural need to analyze households' financial investment over the business cycle.

Stocks and flows of households' financial assets are well reflected in the financial accounts of Lithuania. Aggregate data of households' financial assets in Lithuania is available since the end of 2003 together with other financial account data, or in other words, data of the flow of funds. The flow of funds data was firstly developed in the United States. Since 1951 US Federal Reserve System is publishing financial accounts data and it is used to assess financial development. Whereas, European Central Bank (ECB) started publishing Euro area financial account data only since 2001. Nowadays, the flow of funds data acts as an indicator for ECB's economic and monetary analysis. Flow of funds analysis helps revealing the sources and uses of funds that are needed for growth and development in a country.

Relevance of the research. There is a lot of research that analyze financial account data in various European countries, as well as in US. Ramb, Scharnagl (2011) analyze German financial account data and households' investment into financial asset portfolio structure in the period of 1959-2009. Shrestha et al. (2012) study financial position on a frame of from whom to whom bases in US. Duc and Breton (2009) investigate framework and applications of flow of funds in European area. Bostner (2010) analyzes balance sheet positions of households in Slovenia. Ricciarelli (2011) investigates Italian households' financial asset allocation. Bank of Lithuania performs survey regarding households' financial behaviour twice a year. Survey explores households' consumption and

saving habits, also future expectations for saving. However, neither Bank of Lithuania, nor researchers provide households' financial assets comprehensive analysis.

International practice shows that understanding the most recent business cycle adds to the ease and precision of analysing households' balance sheets and their cyclical investment habits. The National Bureau of Economic Research (NBER) performs many studies in analysis of business cycle. NBER and OECD also announce information regarding business cycles. However, in Lithuania, there is no institution that provides data about business cycle phase or makes researches particularly for analysing business cycles in Lithuania. Even though there is no practice in Lithuania, it does not diminish the need and importance of business cycle studies in the country. As a result, business cycle analysis may add value to investment return: capital and financial as well.

Having more information about country's economic fluctuations may lead to better investment decisions. Dzinkevicius and Zamicas (2012) state that investors jump in and out before the economy turns, thus investment into stock markets, according to the mentioned researchers, is leading the business cycle. However, a question arises: how do Lithuanian households invest? Gangopadhyay et al. (2009) concluded that households' capital investment cyclical behaviour leads the business cycle in US. Still, other results may appear when analyzing financial investments, especially in other countries. Nonetheless, there is an opinion that experts have more information about economic indicators than ordinary households. Moreover, similar research was not performed in Lithuania. Thus, there is a need for better view of how households decide on their financial assets structure in approach of business cycle in Lithuania.

Such analysis results are important for economists, businesses and policy makers because financial account analysis reveal sources of funds that are needed for growth and development. Flow of funds data is used to estimate development of sectors' financial position. Moreover, knowing the comprehensive flow of funds framework may serve in forecasting future trends of households' investment. Data on households' financial assets is used by governments in setting social protection policies. It is useful to have an indication of how well households are prepared for the future, especially pension provisions. Analysis of households' saving rates is valuable for having a view of how households would be able to cope with an economic downturn.

Problem of the research questions: what are the predominating trends of households' investment into financial assets in approach of business cycle phases in Lithuania?

The object of the research is financial assets of households in Lithuania.

Aim of the research — to estimate households' financial risk-taking over business cycle in Lithuania.

The objectives of the research:

1. To determine the concept of a household in approach of System of National Accounts.

2. To distinguish financial asset classes with different level of financial risk.
3. To analyze theoretical aspects of business cycle.
4. To identify a business cycle in Lithuania.
5. To carry out the analysis of predominating trends of households' investment into financial assets over business cycle phases in Lithuania.

The methods of the research:

- systematic study of scientific literature;
- financial accounts of Lithuania data analysis;
- Lithuanian economic indicators analysis;
- graphical data visualization;
- 6^{th} degree polynomial trendline reasoning;
- correlation analysis;
- multiple regression analysis.

Structure of the master thesis consists of five sections: introduction, theoretical analysis, methodological part, estimation and conclusion. Section 2 provides theoretical aspects of households' financial risk-taking over the business cycle. In the mentioned section the framework of flow of funds in approach of System of National Accounts is to be analyzed. Whereas, the concept of household is determined and financial asset classes with different financial risk levels are distinguished in the first section of the research. Further, the theoretical study of business cycle and its impact for households' investment is explored. Section 3 provides methodological clarifying of the research. Model of the research is visualized, data availability and data preparation for the research explained in this section. Also, correlation, regression and polynomial trendline analysis methods are disclosed. In Section 4, main findings of the estimation are reported. In this section households' investment into financial assets growth since 2003 Q4 and changes of financial asset portfolio structure are presented, business cycle in Lithuania identified. Investment into financial assets cycle compared with business cycle trends. Finally, section 5 provides conclusions of the whole research work.

1. THEORETICAL ASPECTS OF HOUSEHOLDS' FINANCIAL RISK-TAKING OVER BUSINESS CYCLES

1.1. Framework of flow of funds

1.1.1. Financial account concept in the System of National Accounts

Duc and Breton (2009) determine that National accounts reflect the allocation of the aggregated (at the sector level) disposable income of economic agents between consumption and saving. Gross savings are allocated between gross financial investments and capital formation. From the broader portfolio aspect, agents allocate their cumulated financial savings between different types of asset classes, regarding to differences in returns, liquidity and risks, due to that the different decisions on investment and liabilities can be regarded as taking place simultaneously.

Since 1968, according to Tsujimura (2002), flow of funds accounts have been embraced into the System of National Accounts (SNA). SNA also includes National Income Accounts, National Balance Sheets, Balance of International Payments Accounts and Input/Output Tables. Balance sheets of institutional sectors are allocated in a traditional way and are an integral part of flow of funds accounts. This financial account format is widely used due to its ease of data accumulation based on the statistical accounting system.

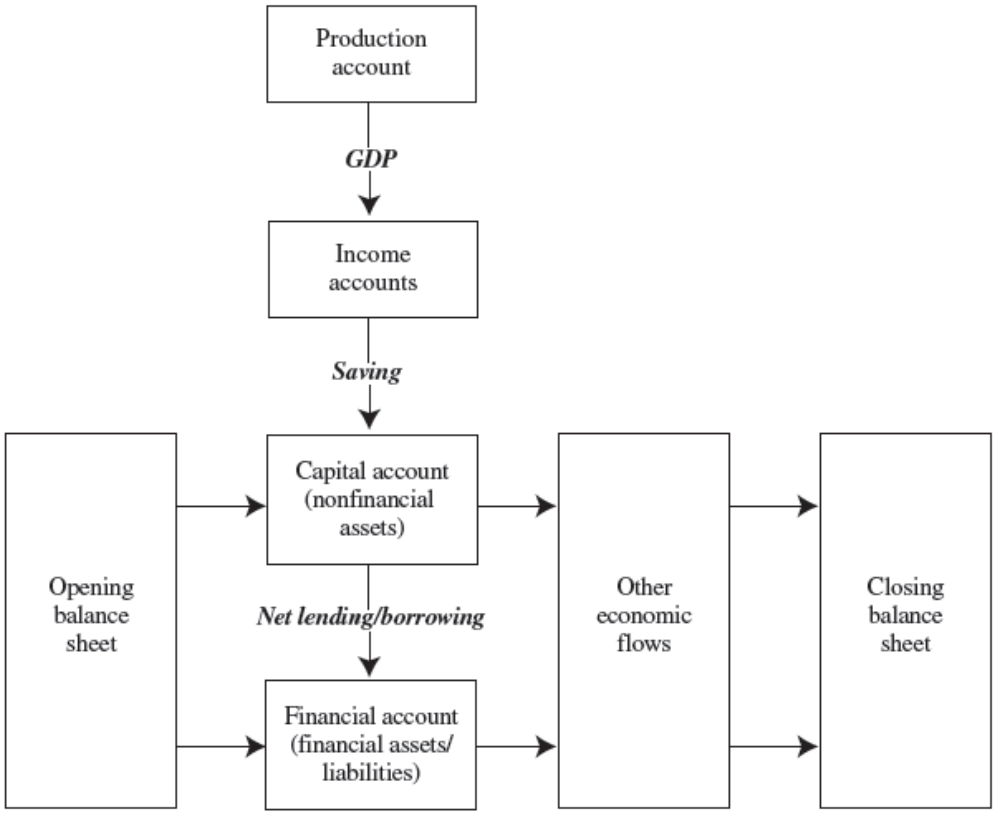
Looking back into flow of funds accounts, it could be said that these accounts first of all were developed in the United States. There they have been published by the US Federal Reserve System since 1951. Flow of funds statistics are used to evaluate financial development, what impact they make on economic activity and the future perspectives for price development (Duc and Breton, 2009). Teplin, Tyler (2000) argues that every day the wealth of data for analysing habits of households, business and government as well, become more and more available.

For the Japanese economy, the Bank of Japan (BOJ) has been responsibly compiling the FFA since 1954, says Hagino (2011) and states that "it is universally regarded as the most detailed and comprehensive set of financial statistics" (p. 3).

Euro area's financial account data has been published at an annual frequency since 2002 and at a quarterly frequency since 2007. However, partial data was first published as early as 2001. Flow-of-funds analysis at the European Central Bank has developed based on expanding set of data, in addition to the already available country data, in support of the ECB's economic and monetary analysis, argues Duc and Breton (2009).

In Methodological Notes of Financial accounts of Lithuania (2014) it is emphasised that the methodology of the compilation of financial accounts is defined by Regulation (EU) No 549/2013 of the European Parliament and of the Council of 21st May 2013 (ESA 2010). Also, flow of funds is

determined as an integral part of the SNA. Main sets of accounts in the 1993 SNA framework are illustrated in a book "The system of macroeconomic accounts statistic" (see Fig. 1).



Source: IMF, The System of Macroeconomic Accounts Statistics, 2007, p. 20

Fig. 1. 1993 SNA Framework

"The financial account is the final account in the full sequence of accounts that records transactions between institutional units". (SNA 2008, p. 2019). According to Klein (2003), the main function of flow of funds accounts is to reveal the sources and uses of funds that are needed for growth and development. The balancing item of the use of income accounts is net saving, to accumulate non-financial assets net saving is added to net capital transfers receivable or payable. If the result is in surplus, it is called net lending. From the opposite side, if the net accumulation of non-financial assets may not be covered by net saving and capital transfers, the resulting deficit is called net borrowing. Net Lending or net borrowing (the surplus or deficit), is the balancing item that is carried forward from the capital accounting to the financial account.

"*The financial account does not have a balancing item that is carried forward to another account, as has been the case with all the accounts. It simply explains how net lending or net borrowing is affected by means of changes in holdings of financial assets and liabilities. The sum of these changes is conceptually equal in magnitude, but on the opposite side of the account, to the balancing item of the capital account*" (SNA2008, p. 2019).

The item “net financial transactions” is a balancing item of the financial accounts of households. It is calculated as a difference, in a given period, between net acquisition of financial assets and net incurrence of liabilities, which correspond to the financial transactions taking place between households and the other institutional sectors, including the rest of the world (IMF, 2008, p.74). As it is explained in IMF working paper made by Shrestha (2012), economic entities having a surplus may act in several scenarios. They may acquire financial assets also they may redeem their liabilities or act in both ways simultaneously. Respectively**,** entities with a deficit of financing may be placed under obligation to use their accumulated financial assets to fulfil the financial lack. Otherwise, in a deficit period, entities may increase their financial liabilities. Briefly, it is that situation in “real” part of economy affects and makes result in “financial” sphere.

According to Antoniewicz et al. (2004), the SNA separates statements for sectors of the economy. Each statement contains accounts for production, income, saving, investment, and financial flows for that sector. Those sectors’ flow accounts are combined with information on changes in value of assets and liabilities due to factors not related directly to production and saving. Here establishes debtor and creditor relations, or in other words financial flows occur. Interaction is created between entities with a lack of financial sources or borrowers and those with surplus financial funds or creditors. As it is stated in the “The System of Macroeconomic Accounts Statistics”, the IMF book, the financial flows taking place in an economy, through financial accounts are provided at the aggregate level the whole economy. According to Shrestha (2012), “in the recent periods, the debtor/creditor relationships created within the financial markets in terms of flows and positions have grown substantially and become more complex”. Also, previously mentioned scientist states that interaction between entities with surplus and entities with deficit flow in the real and the financial spheres should be recorded and delivered in an integrated statistical framework, which must assure sequence of data between institutional units and their nonfinancial and financial transactions.

It is widely accepted to use international recommendations for acquiring national statistical data. “SNA is an internationally agreed standard set of recommendations on how to compile measures of economic activity in accordance with strict accounting conventions based on economic principles. The main objective of the SNA is to provide a comprehensive conceptual and accounting framework that can be used to create a macroeconomic database suitable for analysing and evaluating the performance of an economy” (SNA2008). Shrestha (2012) is arguing that the *SNA* constitutes the comprehensive system of macroeconomic statistics for registering integrated and consistent data on the economic actions by all economic agents in an economy. The *SNA* not only capture the economic activity within an accounting period but also the capital and financial stocks of the institutional units, or in other words, their balance sheets.

From financial account approach, data of financial transactions and financial positions of sectors in the economy are captured in flow of funds accounts. Financial account data besides balance sheet positions presets all financial transactions according to their type and the economic sectors involved from the approach of purchasers or issuers of financial assets, argues Duc and Breton (2009)

All data about the outstanding amounts of the financial assets and liabilities of the institutional sectors of the domestic economy at the end of the period as well as changes in the financial assets and liabilities (transactions, revaluation and other volume changes) over the period are recorded in Financial accounts (FA), as it is stated in Methodological Notes of Financial accounts of Lithuania (Lithuanian Bank, 2014). “The financial account is the final account in the full sequence of accounts that records transactions between institutional units”. (SNA 2008, p. 2019).

According Ritter (1963) “*the flow of funds is a system of social accounting in which the economy is divided into a number of sectors and a "sources- and-uses-of-funds statement" is constructed for each sector. When all these sector sources-and-uses-of funds statements are placed side by side, we obtain the flow-of funds matrix for the economy as a whole that is the sum and substance of the matter*” (p. 220).

In other words, as Duc and Breton (2009) states, the flow-of-funds data presents the financial assets and liabilities of all the institutional sectors of the economy, moreover these financial accounts reflects relations of institutional sectors with the rest of the world. One main frame work for explaining the finance growth nexus is the flow of funds, which details the intersectoral distribution of sources and uses of funds in an economy, Al-Zu’b, Murinde (2011). In IMF book “The system of macroeconomic accounts statistic” it is stated that “A flow of funds measures all the important financial relationships in an economy and between an economy and the rest of the world” (p. 72). “Analysis of flow-of-funds data offers an important window on developments, as such data provide the most comprehensive and consistent set of macro-financial information for all sectors in the economy and reflect the interrelations between them” (Duc and Breton, 2009, p. 10)

It has to be mentioned that in some terminology it is widely used flow of funds definition, in national account terminology they are also called financial accounts, as in the United Nations System of National Accounts (SNA 93) and the European System of Accounts 1995 (ESA 95), states Duc and Breton (2009). In “The system of macroeconomic accounts statistic” financial accounts or flow of funds are considered as important for analyzing development and is stated that a country may develop a broader basis for financial analysis.

According Duc and Breton (2009) the financial accounts include measures outstanding amounts or in other words - stocks, and flows. Stocks constitute elements of the balance sheet of each sector and flows reflect changes in the stocks owing to transactions. The Flow of Funds Accounts (FFA) is a

statistical record of both financial transactions and the outstanding amount of the financial assets and liabilities in the economy, says Hagino (2011).

All in all, data of financial transactions and financial positions of sectors in the economy are reflected in flow of funds accounts. Financial flows, taking place in an economy, through financial accounts are provided at the aggregate level of the whole economy. Flow of funds, or in national accounts terminology, financial account is the final account in the chain of accounts that gathers data of transactions between institutional units. Financial account is essential part of the SNA. The difference between net acquisition of financial assets and net incurrence of liabilities is the balancing item of the financial accounts of the households. Recently, interaction created between economic entities, in terms of financial flows and positions in the financial market, has developed rapidly and became more complicated. Thus, the SNA's main objective is to provide widespread framework for macroeconomic database that suits for economic performance analysis.

1.1.2. Financial sectors in approach of SNA standards

Following The SNA standards, to record flows and positions of institutional units, the residence approach is applied. These economic entities are grouped into sectors and subsectors, resident in an economy between them and with non-residents. Here scientist distinguishes limitation of data due to cross-border operations. It is said that, "it may not be able to provide proper risk-based measures for macroprudential analysis and for financial stability purposes particularly when cross-border operations (through branches and subsidiaries) controlled by home country entities grow significance" (Shrestha, 2012, p. 6).

However, for the purposes of the national accounts system, economic entities that are capable of owning goods and assets, of incurring liabilities and involved in economic activities and transactions with other entities, are grouped together into institutional sectors. These sectors are later grouped into more detailed sub-sectors (Methodological Notes of Financial accounts of Lithuania, 2014). Ritter (1963) elucidates the number of sectors as a technical question, rather than a fundamental. However, in order to permit transactions between sectors, there must be more than one sector to do that. The homogeneity of groups of decision-making units in the economy, the availability of raw data, and ease of handling are the factors on that depends practical number of economic sectors. And as Ritter (1963) argues, it depends solely on those factors. There have to be optimal number of economic sectors found. Significant relationships may be hided if there are too few sectors, while too many might become too precise and make data unwieldy.

As it is stated in Duc and Breton (2009) paper, there are seven main institutional sectors defined in the national accounts, such as non-financial corporations; monetary financial institutions; insurance corporations and pension funds; other financial intermediaries (including in particular investment funds); general government; households; and non-profit institutions serving households. Looking back

into history, it should be mentioned that Ritter (1963) provides different sector categories for different accounts in US. Author determines that in the national income accounts, the Department of Commerce divides the domestic economy into three sectors: households, business firms, and governments. While in the financial accounts, or flow of funds, the board of Governors prefers four main domestic sectors, with financial institutions added to the three sectors mentioned above.

As it is stated in SNA 2008, "the institutional units are grouped together to form institutional sectors, on the basis of their principal functions, behaviour and objectives" (p. 17). Duc and Breton (2009) extract more and explain that the institutional sectors group together institutional units. These institutional units may be defined as entities, such as individual households or firms. Entities are characterised by their autonomy for decision-making. Also, it is mentioned that institutional units with other entities display a similar type of economic behaviour. Institutional unit is defined as the basic building block of macroeconomic statistics in the System of Macroeconomic Accounts Statistics (2007).

An institutional unit may be described as an entity whose' economic activity is made on its own behalf, so an entity is directly accountable and responsible for economic actions. The System of Macroeconomic Accounts Statistics (2007), in term of its own behalf, means that institutional unit is able to capture assets and experience liabilities. According to their different economic objectives, functions, and behaviour, institutional units are grouped into five mutually exclusive institutional sectors of the economy.

From SNA 2008 institutional sectors are as follows:

a. ***Non-financial corporations*** *are institutional units that are principally engaged in the production of market goods and non-financial services.*

b. ***Financial corporations*** *are institutional units that are principally engaged in financial services including financial intermediation.*

c. ***General government*** *consists of institutional units that, in addition to fulfilling their political responsibilities and their role of economic regulation, produce services (and possibly goods) for individual or collective consumption mainly on a non-market basis and redistribute income and wealth.*

d. ***Households*** *are institutional units consisting of one individual or a group of individuals. All physical persons in the economy must belong to one and only one household. The principal functions of households are to supply labour, to undertake final consumption and, as entrepreneurs, to produce market goods and non-financial (and possibly financial) services. The entrepreneurial activities of a household consist of unincorporated enterprises that remain within the household except under certain specific conditions.*

e. ***Non-profit institutions serving households*** *(NPISHs) are legal entities that are principally engaged in the production of non-market services for households or the community at large and whose main resources are voluntary contributions* (p. 17).

For a broader approach, these main sectors may be further divided into sub-sectors. Duc and Breton (2009) provide an example as for instance, general government may be further split into central government, social security and local government. In any case, Ritter (1963) argues that, the sectoring should be comprehensive. Author states that, entire economy should be included, if necessary by the use of a residual "all other" category" (p.221). According Duc and Breton (2009), the financial relations between domestic sectors and the rest of the world are reported in the rest of the world account. This account provides a general view of economic links between national economy and the rest of the world. Sector of rest of the world consists of non-resident units that make transactions with residents institutional units, also EU and international organisations are included.

To conclude, it could be said that economic entities that are capable to capture assets and incurring liabilities on their own behalf are grouped into institutional sectors. These economic sectors are involved in economic activities and transactions, and are directly accountable and responsible for economic actions. It is important to set an optimal number of institutional sectors, otherwise, too few sectors may hide significant relationships between entities, or too many sectors may provide too precise data, which is unwieldy. According to the SNA's standards, institutional units are grouped into five institutional sectors of the economy according to their different functions and behaviour. Hence, households are economic entities grouped into one of the five institutional sectors. Each individual in the economy belongs to only one household. Main functions of households are to take final consumption and to supply labour. Besides that, households save, invest, borrow and lend. Therefore, these economic actions are reflected as financial flows in financial accounts.

1.1.3. Financial asset classes according SNA

As it is argued in National accounts at glance (2014), financial assets and liabilities accrued by households play an important role in country's economy. It follows to an importance of data of financial assets held by households' analysis in approach of as studies of asset bubbles and analyses of welfare.

Duc and Breton (2009) contemplate and states that, financial account data contribute to evaluate and quantify portfolio shifts between monetary assets and other financial assets, in connection with the monetary analysis. Scientists argue that developments in money holding can be broken down into two parts. The first one is called "credit effect" which may be determined as the money stock increases simultaneously with increases in total financial assets, driven generally by bank credit. The second one is called a "portfolio shift effect" which is explained that the money stock changes according to agents' preference for liquidity.

The previously mentioned preference for liquidity is the result of financial risk-taking. According OECD factbook (2014), thereby with income, wealth is the central measure of households' economic resources. Also, households hold not only non-financial wealth but the financial as well. The structure of financial assets influence households financial risks as different types of securities carry different risk levels. Reasonable, financial assets are classified according to their liquidity.

In the SNA 1993 financial assets are determined as "a subset of economic assets— entities over which ownership rights are enforced, individually or collectively, by institutional units and from which economic benefits can be derived by holding or using the assets over a period of time" (p. 276). In ESA 95 defines financial assets as "economic assets, comprising means of payment, financial claims and economic assets which are close to financial claims in nature" (p. 128). Duc and Breton (2009) append this definition and broaden it with explanation about creditor and debtor interaction. Authors explain that counterpart liability which is issued by the debtor overlaid on each financial asset that are owned by the creditor. Solely exception is for monetary gold and special drawing rights. But this is not related with our subject when analyzing households' financial assets.

In IMF manual there is an explanation for the classification scheme that is provided and recommended by SNA 1993. There a main two criteria for classifying financial assets in provided scheme. One criterion is the liquidity of the asset, or in other word how quick an asset may be returned to money. Another one is the legal characteristics that describe the form of the underlying borrower and lender relationship. Furthermore liquidity concept is composed by other specific characteristics, such as negotiability, transferability, marketability, or convertibility. Mentioned features have an important impact in identifying the categories. Also it is noticeable that they are not separately excluded. This SNA 1993 classification is created to release the analysis of transactions of institutional units and is a structure to assess the uses and sources of financing and degree of liquidity for these units. Palumbo, Parker (2009) criticises the structure of financial assets provided by SNA. They state that broaden classification may provide more information about risk of financial asset.

In "Households finance and consumption survey" (2013) made by ECB there is proved structural classification of financial assets which consists of:

- *Deposits (sight accounts, saving accounts)*
- *Investments in mutual funds*
- *Bonds*
- *Investments held in non-self-employment private businesses*
- *Publicly traded shares*
- *Managed investment accounts*
- *Money owed to households as private loans*

• *Other financial assets: options, futures, index certificates, precious metals, oil and gas leases, future proceeds from a lawsuit or estate that is being settled, royalties or any other.*

• *Private pension plans and whole life insurance policies* (p. 107).

Therefore Duc and Breton (2009) as the main financial assets and liabilities distinguish the currency and deposits, debt securities, shares and other equity (including mutual fund shares), loans, insurance technical reserves, and other accounts payable and receivable. Scientist provided the lists of financial assets not accidently, it should be noticed that in this enumeration financial assets is given in liquidity descending manner. In other words from the one that can be easily and quickly exchanged against other means of payment.

Bruno, Bonis (2009) have listed financial assets into four groups and as the ones under consideration in analysis stocks of assets and liabilities of households and non-financial corporations.

First section determined by them is **currency and deposit**. According above mentioned authors, this section includes currency in circulation, transferable deposits, other non-transferable deposits, and repos. Second group consist of bearer financial assets that are negotiable on the market, such as securities issued by the general government, firms and banks. This section is named – s**ecurities other than shares**. An opposite section to the previously discussed is – **shares and other equity**. Into this category, financial instruments that have property rights on corporations and quasi corporations, is included. The category includes mutual fund shares as well. These assets are divided into quoted shares, unquoted shares and other equity. Finally there is **insurance technical reserves category** excluded. In here, products of insurance corporations and pension fund are included. These products are characterized as the ones for future payments to beneficiaries. However, assets linked to public pension's schemes, according to the current international statistical rules, are not included into this category.

According SNA standards there are also **financial derivatives** class which include instruments linked to a specific financial instrument, indicator, or commodity. In IMF explanation risks such as interest rate risk, price risk may be experiences through these instruments. Also, there are other accounts receivable/payable separated as one of financial asset group. In this group trade credit and advances and a wide range of miscellaneous creditor and debtor relationships that do not fall under the other categories (IMF, 2007).

Summarising the above, the SNA provides and recommends financial asset classification scheme in the framework of financial accounts. Such differentiation of financial assets is established for better release of analysis of transactions among institutional units. There are mainly two criteria for classifying financial assets according the SNA's standards. Liquidity of the asset is one criterion and legal characteristics that describes the form of underlying debtor and creditor relationship is another one. Furthermore, there are features such as negotiability, transferability, marketability or

convertibility that impact the identifying financial asset classes. The main financial assets distinguish the currency and deposits, debt securities, shares and other equity (including mutual fund shares), loans, insurance technical reserves.

1.2. Households' financial risk-taking in approach of the SNA

1.2.1. Households' asset allocation

Household is one of two main types of entities that qualify as institutional units, according to International Monetary Fund (IMF) (2007). The other type is social entities but latter is not the case of the subject. According to Ramb and Scharnagl (2011) "Households are one of the most fundamental and diverse behavioural units in the economy. Households consume, save, invest, borrow and lend" (p. 7). There could not be many explanations or interpretations for determining the household conception from the statistical point of view.

SNA 2008 provided definition: "A household is defined as a group of persons who share the same living accommodation, who pool some, or all, of their income and wealth and who consume certain types of goods and services collectively, mainly housing and food" (p. 462). The Bank of Lithuania determines households as: "sector *Households* consists of individuals or groups of individuals as consumers; farmers, as market producers; own-account workers and sole proprietorships".

Various scientist and authors provide many definitions of a household but they all have the same elements: a person or a group with joint assets/liabilities. For example in The Eurosystem Household Finance and Consumption Survey (HFCS), results from the first wave (2013) a household is defined as "a person living alone or a group of people who live together and share expenditures" (p. 11). In this way individual members of multi-person households are not treated as separate institutional units because they own many assets jointly, incur liabilities jointly, often pool income, and decide collectively about expenditures for the household as a whole, is determined by IMF (2007).

Taking into account previously mentioned definition, it may be derived that household as an economic agent acquires assets and incurs liabilities with different levels of risk and liquidity. However, according to HFCS (2013) the assets and liabilities of a household may vary significantly. It depends on different characteristics of households. A number of members of the household, age of a household members, education, employment status, inheritances, and other various characteristics that determine the difference of households' assets and liabilities.

Thus, in other words it may be stated, that economic agents allocate their disposable income to consumption and savings differently. Savings are allocated between investment into capital and/or financial investment respectively. In turn, allocation of financial asset, as well as capital investment, has different risks and liquidity profiles due to the chosen types of asset classes (Duc, Breton, 2009).

In general, to explain the functioning of economy, it requires a comprehensive view of the economic actions that cover both economic and financial activities. “The main economic activities take place in the spheres of production, income distribution and use, and accumulation (Shrestha et al., 2012, p. 5)”. According to mentioned scientist, the economic agents interact in the production of goods and services. This interaction generates income that is later distributed between economic agents that participated with their contributions of capital and labour. So here, households may use their income for consumption or saving. Later these savings together with received net capital transfers arrange own financing source for both “real” and financial investments. Furthermore, if own financing resources for “real” investment funding is in deficit, this deficit part of funds is supplemented by disposing of financial assets and/or incurring financial liabilities. This process is called net borrowing. Respectively, the net lending exists. It is when the surplus which arises when funds needed for “real” investment are lower than own financing resources, are used for the liquidation of liabilities and/or acquiring additional financial assets.

Researchers Babeau, Sbano (2002) have used more detailed classification for financial instruments than that generally found the financial accounts. Objective of such classification is to specify the level of risk actually borne by the individual household. The “ideal” classification is listed in risk ascending way:

- currency and transferable deposits;
- time deposits, savings and other deposits;
- money market funds;
- securities other than shares;
- shares and other equity:
    - listed shares;
    - unlisted shares and other equity.
- mutual funds:
    - equity funds;
    - bond funds;
    - hybrid funds.
- claims on life insurance companies:
    - unit linked vehicles;
    - non unit linked vehicles.
- claims on non-life insurance companies;
- pension funds:
    - defined-benefit funds;
    - defined-contribution funds.
- other investments.

However, the very first allocation of households' savings, determined by Marionnet (2009), is the alternative between financial and non-financial investment. Non-financial investment is mainly assumed as investment into housing. Many researches explored that presently this type of investment takes the lion's share of households' asset portfolios. Marionnet's (2009) study on French households showed that the part of investments into non-financial assets always exceeded the investments into financial assets. Research on households' balance sheets in ten OECD countries (2008) also indicates the major part of non-financial investments.

However, the reason for such a large fraction of investment into non-financial asset is usually primarily influenced by socio-demographic motivations. Moreover, even if the fraction of households' investment into financial asset is evidently smaller than the latter one, its influence for economy is way more important. For example, Shrestha et al. (2012) state that "the global crisis of 2008 also highlighted the need to understand financial interconnectedness among the various sectors of an economy and between them and their counterparties in the rest of the world" (p. 3). Thus in this thesis there is a focus on investment into financial assets which is assumed as financial risk-taking.

Because there is no direct evidence for the quantification of portfolio shifts, as it is stated by Ramb and Scharnagl (2011), there is a need for deeper understanding of how households decide on their financial assets' structure. The relation between risk-taking and financial wealth is of primary importance, because it distinguishes the simplest constant relative risk aversion specification from increasingly popular alternatives (Calvet, Sodini, 2014). Financial assets are generally the result of pure portfolio allocation decisions, with the possible exception of sight accounts that often are held for transaction purposes, given in HFCS (2013). The starting point for the theoretical discussion and for the empirical analysis of households' portfolio models were the papers by Brainard and Tobin (1968) and Tobin (1969), argues Ramb and Scharnagl (2011).

When allocating their assets into financial investment, the economic entity has to choose whether to invest directly into financial markets or to use the services of financial intermediaries, such as banks for deposits or non-bank institutions for mutual fund shares or life insurance contracts (Marionnet, 2009). In other words it could be said that households are formatting their investment portfolio by choosing to invest into different types of financial asset.

It is obvious that every asset has some specific characteristics that motivates or discourages the decision whether to invest in it or not. For example, currency and deposits are the most liquid of the asset categories and also considered the ones with the least risk (OECD Factbook 2014). As it is stated in HFCS (2013), different financial assets have different risk profiles and transaction costs. Also some traditional financial assets are more widely known by a broader public than the other ones. For this reason when analysing financial asset holdings, it is useful to distinguish between traditional bank products such as deposits (sight and saving accounts), and financial investment products such as

bonds, shares and mutual funds. The third separate class of financial products are insurance type products such as voluntary private pension plans and whole life insurance.

Real assets and financial assets are the components of household portfolios. Looking into financial asset portfolio, almost all households hold low-risk financial assets; the smaller fraction consists of high-risk assets. Looking into the low-risk financial asset part, almost all households hold deposits or savings accounts. Simultaneously, rather smaller fraction of households holds assets are held in stocks, bonds and mutual funds (Arronde et al. 2014).

OECD Factbook 2014 compares the structure of households' stocks of financial assets between 2007 and 2012 in OECD countries. The result of analysis provides some insight into the impact of recent economic developments on the restructuring of households' portfolios towards financial instruments better adapted to the new environment, in other words – more liquid and less risky. On one hand, shares became less popular in most OECD countries. On the other hand, the increase of the fraction of currency and deposits was noticeable for almost all the OECD countries. The increase of life insurance and pension fund assets was noticed for a large part of OECD countries.

In Germany during the last 50 years, all financial assets and their weight in households' portfolio could be characterized as very volatile, shows research made by Ramb and Scharnagl (2011). However, it should be mentioned the exception of insurance and pension entitlements. While shares lost their popularity, in another hand, debt securities and mutual funds seem to be gained greater request. Also, descriptive statistics in this analysis shows that the attractiveness of savings deposits decreased noticeable. Researchers explain these results as the reaction influenced by the introduction of new products. They emphasize products such as mutual funds and debt securities. Another reason that made an impact on portfolio choices from risky asset to less risky in Germany is explained by a more interest rate sensitive behaviour of households.

Bogan (2013) states that several determinants of household stock market participation have been well established. Stock market participation is strongly increasing in wealth, increasing in household education, sensitive to transaction costs and influenced by neighbour and peer effects. Furthermore, as it is stated by Arronde et al (2014) the ownership rates of all asset categories generally increase with households' position in the net wealth and income distribution. The study reflects that that share owned by households as a safe financial assets are gradually high across all euro area countries. They diverge noticeable between households with difference ownership of the main residence.

Substantially, the household in the net wealth distribution raises the fraction of risky financial asset sharply. However is stays surprisingly low even for households in the highest net wealth deciles. For the wealth accumulations process the importance and significant part of inheritances is remarkable (Arronde et al, 2014). Bogan (2013) supplements and asserts that "historically, portfolio choices of stock have been critical to long-term wealth building. Given family wealth levels have an effect on

intergenerational wealth transfers, offspring educational attainment and offspring socio economic status, this parental accounting could have important implications for distributional welfare issues" (p. 4429). According to Bucciol, Miniaci (2011) models examining optimal portfolio choices in the presence of non-tradable labour income show the tendency of equity shares to decrease over the life-cycle. It is explained by the households' choice to invest an optimal share of wealth into high-risk assets while seeing their future labour income as their low-risk asset. During the life-cycle, as the future labour income becomes present labour income, it is being invested into bonds considered as a low-risk asset.

As stated by Ampudia and Ehrman (2014), during the period of global financial crisis, households show tendency to choose low-risk investment over the high risk investment when managing their assets. The tendency is noticed by different researches: financial markets, banks and households. This tendency shows that the households' financial risk-taking habits are different depending on the overall global financial situation and past experience undergone.

According researchers, households act differently when it comes to allocating their assets/liabilities and tends to change their investment and risk-taking habits during different periods of economic life-cycles. Households' experiences of financial crisis-type events make strong influence on their portfolio structure (Arrondel et al, 2014).

It is obvious that customer portfolio choice depends on macroeconomic situation or in other words it could be said that it is related with business cycle of the economy. In the study of Duc and Breton (2009) there is reflected that in year of 2000-2003 strong growth of money holding in the euro area. The ECB monetary analysis explained that the growth of money flows during this period is mainly related to the basis of portfolio shifts. This reallocation of assets from securities (with long maturities) into money in the portfolio of the money-holding sectors has been prompted by the exceptional geopolitical and financial market uncertainties prevailing at the time. The root of households risk averse and their persistence of high levels of excess liquidity in that time have been explained by the increasing role of credit growth in an environment of low interest rates.

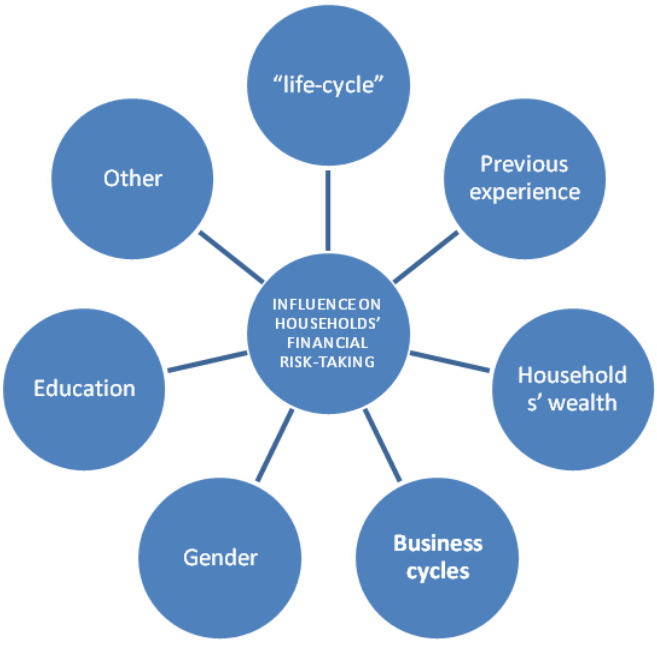
To conclude, a household is determined as a group of individuals who share their liabilities, pool some or all of their income, consume housing and food goods and services collectively. Household as an economic agent acquires assets and incurs liabilities with different levels of risk and liquidity. Households' savings are allocated between investment into capital and/or financial investment respectively. When allocating their assets into financial investment, the economic entity has to choose whether to invest directly into financial markets or to use the services of financial intermediaries, such as banks for deposits or non-bank institutions for mutual fund shares or life insurance contracts. Different financial assets have different risk profiles. Also, some traditional financial assets are more widely known by a broader public than the other ones. Thus, it is useful to

distinguish products such as deposits and financial investment products such as bonds, shares and mutual funds that are more popular.

1.2.2. Features influencing households' financial risk-taking

Many researchers and analyst try to explain what factors do have an influence on households' investment decisions. One sort of explanations provides the efficient market theory. A generation ago, the efficient market hypothesis was widely accepted by academic financial economists, says Burtnon G. Malkiel (2003). Meanwhile, Bogan (2013) argues that science of behavioural finance highlights that often households do not behave rationally and often base their financial decisions out of overconfidence, excessive optimism and loss aversion. Also gender related differenced are being noticed when the financial asset/liability allocation decisions have to be made.

There are many researches made on explaining households' financial behaviour with factors of age, the wealth, gender etc. A large share of portfolio choice theory analyze how a household's optimal asset allocation should depend on its main financial and demographic feature, including financial wealth, real estate, human capital, labour income risk and consumption habit (Calvet, Sodini, 2014). Researchers on behavioural finance are trying to figure out the trends of households' financial decision making and what does influence in decision making (see Fig. 2).



Source: prepared by the author.

Fig. 2. Influencing elements for households' financial risk-taking

Investigations and researches on investment-decision making behaviour have been being conducted for a few decades now. Gathered and systemized data is used to find and explain the links between finance decision making behaviour and asset pricing models. What determines the behaviour of stock market has been the highest point of interest since the start of the existence of the stock market itself. Various recognized asset pricing models quite often fail to determine the behaviour of

the stock market even though all the variables of the theory are known or as planned. For example, in 2013, household stock market participation was much less active than it had been expected by the Capital Asset Pricing Model (CAPM) calculations. It is important to understand and foresee the portfolio choices in stock market as these choices are vital to the health of economics. Taking into consideration that understanding stock market is very important. Understanding the behaviour of households' choices on stock portfolio is a sector of interest respectfully. (Bogan, Fertig, 2013)

Nowadays, the availability of detailed data on household decision making has disclosed that households appear to follow concrete models in their consumption and investment decisions, across different countries and different ways of data collection, assert Makarov, Schornick (2010). Meanwhile, Bucciol, Miniaci (2011) emphasize the most essential part of behavioural finance. They state that attention is paid to what households actually do with their money, what financial risk they are taking, and on how it changes with age and over time. For most of analysis in the theoretical and empirical approach, this means to study and research the part of household financial wealth invested in risky assets, usually stocks.

According to Ampudia and Ehrman (2014) there is evidence that in the course of the global financial crisis, the willingness of economic entities to take financial risks has decreased. Mentioned authors state that such a manner has been notices in financial markets, banks and households. This statement can be assumed that the willingness to take financial risks differs in time, and depends on the experiences that economic entities have acquired.

By Ampudia and Ehrman (2014) individual's background is important when determining his beliefs and behaviour in a household on the financial decision making. Individual's parents' educational background also has influence on individual's risk-taking behaviour. Bucciol, Miniaci (2011) explains the household age factor on participation in stock market. Younger households have larger shares of their assets invested into housing and have limited resourced to invest in stocks. Older households tend to have more assets to allocate freely as the basic needs/goods are covered. Thus, the older households are more willing to invest into high-risk assets. Another research, performed by Jianakoplos and Bemasekf (2006), studied financial risk-taking by the age and birth generation. The research results have revealed that economic agents take less financial risk when getting older, or in other words the age-risk correlation is downward sloping. This finding supports the conventional wisdom that risk taking decreases with age. They also expose "a cohort effect that shifts the age-risk profile down from older to younger cohorts. This suggests that successively younger cohorts are willing to take less financial risk than their older counterparts. Both of these results have important implications for securities markets and financial management" (p. 984).

Above mentioned propositions have a relation with Ampudia, Ehrman (2014) statements that beyond the sudden reaction to undesirable effects, households' risk taking is moreover influenced by

their experiences over longer period of time: households tend to take higher financial risks if they have gained greater real stock market returns over their lifetime. They are able to have a higher inclination to hold stocks and hold larger amounts of stocks.

However, standard models in economics assume that individuals are equipped with steady risk preferences, remaining the same economic experiences. Researchers are arguing that standard models also assume that economic agents link up all approachable historical information when weigh up beliefs about risky consequences, Malmendier , Nagel (2009) deliver. Researchers Ampudia and Ehrman (2014) furthermore study how long suffered experience persists. Authors later find that earliest experiences are relatively less influencing than experiences suffered in a recent time, talking in approach of financial market experience on risk taking. However, even very old experience remains noticeable for some decades. Their findings also suggest that young individuals are particularly affected by more recent events.

Moreover, it Malmendier, Nagel (2009) emphasize the importance of personal experiences. Suffered returns or loses, especially recent ones, exert a greater influence on investment decisions than provided statistical information educational books. Scientists suggest that environment in which individuals live also is influencing investment decisions. The cultural and political enviroment affects their preference and belief formation, such as the level of trust in financial institutions, stock market participation, and preferences over social policies. *"Personal experiences shape economic behaviour in a variety of ways. Having experienced higher inflation, for instance, tends to lower happiness, increase inflation expectations and inflation aversion. Having grown up during recessionary times matters for preferences: individuals are more likely to believe that success in life depends more on luck than on effort, and therefore have a more favourable attitude toward redistribution policies".* (Ampudia, Ehrman, 2014, p. 24). Peek, Rosengren (2013) emphasise significance of personal experience as well. Researchers state that after the past crisis, households have shifted the composition of their assets enough to contribute to the slow economic recovery.

Bonci (2011) research results show that households reacting to the policy tightening in the short run mostly by reducing the issuance of liabilities by reduction of net funds rose from the rest of the economy. Also, there are signs of a re-composition of households' financial portfolio from bank deposits to equity instruments. Interest rates have a strong influence on households portfolio behaviours states Moore et al. (2005). Therefore, it is expected that financial reforms that affect the interest rate structure, may have a significant impact on structure of households' financial portfolio. Monetary and, in general, financial policies are thought to be effective depending on the reaction of investors who actually populate financial markets, according to Ricciarelli (2011)

To sum up above, it could be said that economists, professionals and policy makers look at data and theories on household portfolios from different perspectives and with different aims, but all of

them are interested in an accurate information of what has the influence on households' financial risk-taking decisions. A risk-taking decision may be influenced by many factors, such as age of "life-cycle", education, households' wealth etc. Most of the researchers agree that very important determinants in a risk-taking decision are previous experience and macroeconomic events or in other words – business cycles.

1.3. The concept of business cycle and its importance for financial risk-taking

According to researchers, the "business-cycle analysis" can be explained from several different perspectives. Various theories and analytical models are constructed, historical investigations and short-term forecasts are being provided continuously, according Visan and Ailenei (2013). Indeed most of scientists start their studies on theoretical business cycle with the definition which was provided in1946 by Burns and Mitchell. Therefore business cycles are determined as "*type of fluctuations found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into expansion phase of the next cycle; this sequence of changes is recurrent but not periodic; in duration business cycles vary from more than one year to ten or twelve years*." (Burns, Mitchell, 1946, p. 3).

Indeed, this comparably short definition in general covers rich insights and thus becomes comprehensive. First of all, it could be observed that business cycle may be applied only for economies based on business enterprises. Consequently, it will not be rational to analyze business cycle in centrally planned economies or agrarian societies. Second of all, cycle has an expected progression of phase indicating interchange between different phases: contraction and expansion. The third revealing is that the same phase of the cycle at about similar time occurs in whole economy – almost all sectors. One more but not the last insight reminds that history repeats itself – cycles happen again and again over time but not exactly, thus not periodically. The last thing determined in researchers' definition that cycle lasts from one to twelve years.

In general, the concept of business cycles refers to fluctuations of economic activity around its long-run growth path, according Gangopadhyay et al (2009). Scientists the long-run growth path commonly indicate as the trend of the time series of an economic variable. The deviation from the general trend is considered as cyclical component of the series. Thus, in business cycle theory, economists study the behaviour of the cyclical component. Researches of business cycles concentrate on „notions of persistence in the detrended component of economic aggregates, co-movement among various detrended (cyclical) components and the leading or lagging behaviour relative to the detrended

component of output, and also the relative amplitudes of standard deviation or volatilities of various detrended series“ states Gangopadhyay et al (2009, p. 271).

Even thought business cycles are recurrent, so repeats itself but not periodically, some researchers states that cycles may be predicted. For example, Rivas and Perez-Quiros (2014) assert that empirical literature considers that phase of the cycle is known in a priori approach, thus financial crises or recessions are known. These finding may be done either by using historical records or by pinpointing them with non-parametric techniques. Crises are usually treated as isolated events, exogenous to the model, and the behaviour of some financial and macroeconomic variables is analyzed only near the turning points. Moreover, other researchers provide that positive financial risk-aversion shocks on the contrary have a persistent and large negative impact on the economy and are more important in driving business cycles than uncertainty shocks. Overall, both measures are largely endogenous to the business cycle and contribute to amplifying fluctuation, but risk-premium shocks also do have significant (contractionary) effects on their own (Popescu, Smets, 2010).

As the business cycles in most of studied literature are divided into four phases, Layton et al. (2015) argues that country’s business cycle chronology is the set of peaks and troughs. The phase of the business cycle between its peak and subsequent trough is its recessionary stage. Scientists provide NBER definition of recession that is taken as decline in economic activity spread across the economy. This decline lasts more than a few months, also it could be observed in real GDP, real income, employment, industrial production, and wholesale-retail sales (Lustig, Verdelhan, 2012, Layton et al., 2015). Respectively the phase of a business cycle between trough and a subsequent peak is its expansionary stage.

Abberger et al. (2015) say that various econometric methods have been developed for the construction and optimization of business cycle indicators. According mentioned researchers, many recent methodological developments try to capture large data sets. For some countries analysis of business cycles is developed well, also there are countries where the data for analyzing business cycles is not rich.

For example, in US business cycle analysis is well developed by the National Bureau of Economic research (NBER). Layton et al. (2015) provides information from NBER research which states that evidently expansions are typically much longer then recessions. Recessions, when they occur, are fairly painful, with rapidly rising unemployment. Even after the country has entered back into an expansionary stage, unemployment may take many years to revert to its pre-recession levels.

Indeed, business cycle analysis is important for investors. Abberger et al. (2015) states that indicators which help to assess business cycle phase are important for the monitoring of economic development of economies. Scientists argue that these indicators are closely watched by the public, by politicians and by capital markets. As Dzimkevicius and Zmcikas (2012) states business cycles are

crucial for investors. Most of investors spend a lot of time trying to guess when the next tuning point is coming. According to Gloede, Rungruxsirivorn (2013), a large set of studies has examined the link between financial development and economic development on the macro level. Most of the empirical studies find that financial development leads to larger economic growth. Thus, the financial growth of micro level may impact economic growth as well.

Dzimkevicius and Zmcikas (2012) they study business cycles as it is done in most of researches, i.e. by dividing them into four stages and notices that stock returns and determinants across the stages can be analyzed. Authors explain, decrease in returns over the expansion and first half of recessionary periods in economic. In the first half of recession average returns gains negatives value and strike their lowest values. Respectively, the highest values of returns are reached in the conclusion of recession. Falling returns occur in the expansion period. The major drivers according scientist are falling expectations for future earning and rising log term interest rates. Meanwhile rising expectations combined with the changes in short-term rates are major contributing determinants for rising returns over the recession phase.

Lusting and Verdelham (2012), in their research, focus on excess returns at precise points over the business cycles. The study showed that the quarters that follow the peak of a cycle and thus signal the start of a recession and the quarters that follow the trough of a cycle and thus signal the start of an expansion. The analysis on excess returns on the state of the economy evidently reflects that turning points are informative about marginal utility growth. However, authors emphasise the significance of understanding the business cycle phase. They call it a challenge to pick the right measure which reflects “bad times”, because this increases ability to take value from market fluctuations. Thus high average returns or low prices may be kept as compensation for assets tendency to pay off poorly in bad times.

Layton et all (2015) state that practice shows that the length of the cycle, the strength of the upswing and the depth of the recession are often misjudged and underestimated. Reasonable expectations of what is going to happen with the economy are denied by some instant changes. Nevertheless, it is of the most importance for the investors to be aware of the market signs to minimize possible loses and maximize possible gains. Cycle analysis gives investors an opportunity to improve their understanding of the global markets have a better sight for critical signs. With the information provided by the analysis of the business cycle, investors are able to manage their assets – equities, bonds, cash and other investments within their portfolios with a better possibility making the correct decisions.

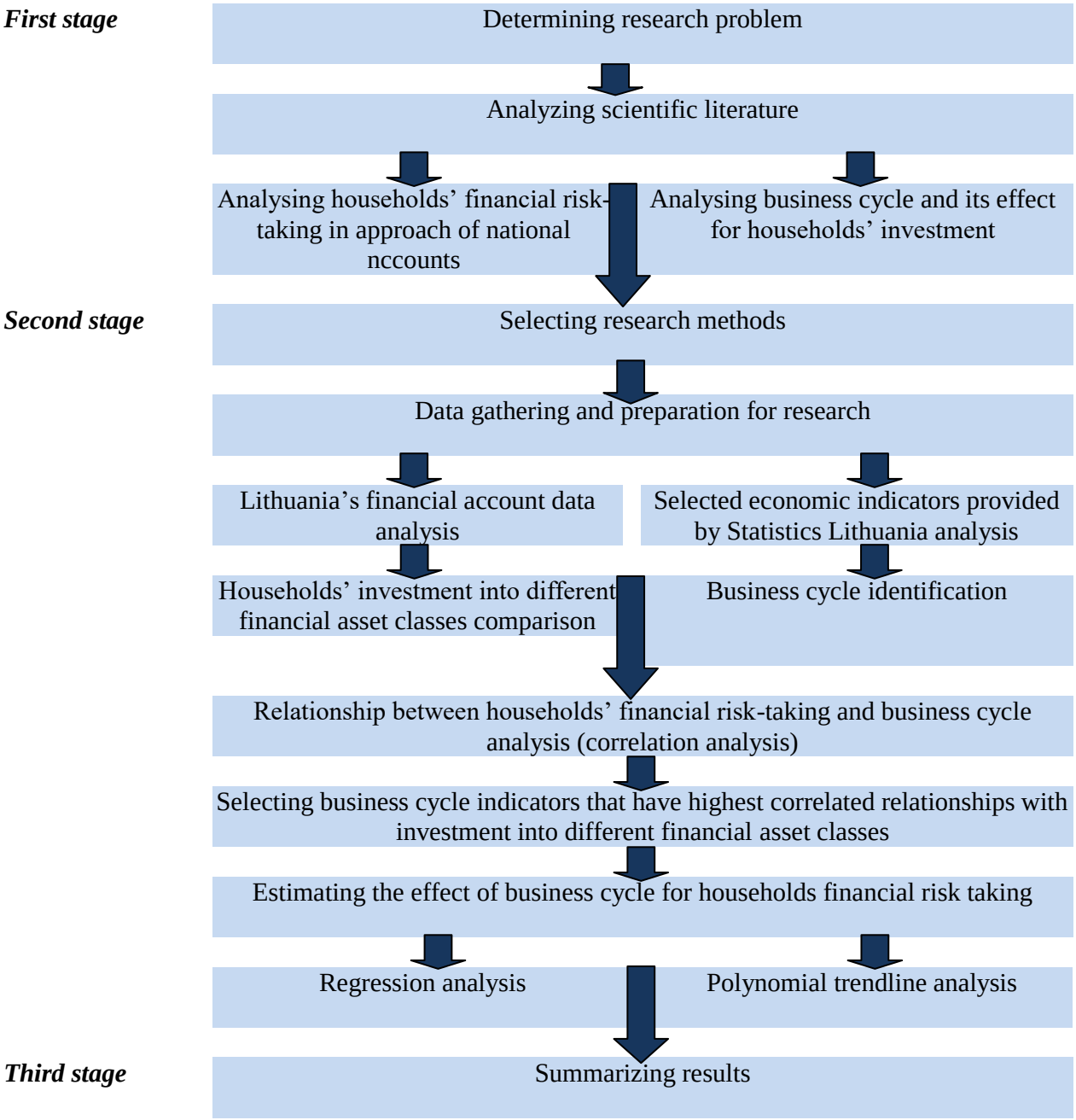
Investors are often worried that when they decide to buy, it would be too soon or when they decide to sell, it would be too late. At the time of market fall, that fear becomes even stronger, investors tend to overestimate the fall and start thinking that the fall could go much lower and most of

the times it would not. The same is when the market is rising - the investors overestimate the market believing it still has potential to go up and end up making a bad asset allocation decision. Another reason at failing on the stock market is the human factor – the sentiment that “it is different this time” would lead to irrational decision-making. From mentioned perspective, participation in stock market is seen as leading business cycle indicator (Dzimkevicius, Vetrov, 2012). Gangopadhyay, Hatchondo (2009) emphasises that household investment leads the cycle whereas business investment lags the cycle. However the latter researchers explore tendencies in capital investment and not into financial asset which may appear differently. Nonetheless, to find out leading or lagging behaviour of investment, business cycle has to be determined. As researches Jakaitiene A., Kalinauskas Z. (2003) argues that in order to estimate Lithuanian economic growth in approach of real GDP growth, it is enough to use economic indicator data provided by Statistics Lithuania and Bank of Lithuania.

To sum up the explanations of many authors, a business cycle is a set of economy fluctuations that can last from one year up to 10-12 years. Usually a business cycle would be divided into four phases: expansion, peak, contraction, and trough. Usually expansion and peak period lasts much longer than contraction and trough. It takes only a few months in a row to go into recession reaching the trough at the end and the period would last for up to a few years, but the recovery period might last much longer. It may take five or ten years while unemployment numbers become low and economy engine begins working without choking again. It is clear that business cycles repeat after each other with the same four phases but each time they are different in length, and depth. Much effort is put to understand and explain the business cycles better to be able to predict the next phase. Knowing what to expect from the economy would provide a certain level of resistance against recessions and sudden economic fluctuations for many economy players: businesses, governments, financial institutions, households and etc.

2. METHODOLOGICAL CLARIFYING

2.1. Research model



Source: prepared by the author

Fig. 3. Research model

An estimation of households' financial risk-taking over business cycle in Lithuania is performed using research model above (see Fig. 3). The estimation consists of five analytical parts. In the first part stock of households' financial asset comparison in 2003 and 2015 is reflected. In the second part of the research, business cycle in Lithuania has been identified. Later, business cycle and cycle of investment financial asset comparison is performed. After that, relationships between different financial asset growth and business cycle indicators were analyzed. Finally, different financial asset classes' tendencies analysis over the business cycle phases is done.

The estimation begins with data gathering part. Secondary data analysis in estimation is used. Data is divided into dependent variables and independent variables. As the purpose of the research is to find how business cycle affects households' financial-risk taking, hence financial account data is determined as dependent variable and economic indicators as independent variables.

2.2. Financial accounts' data availability

In order estimate households' financial risk-taking over the business cycle in Lithuania, data from Statistics Lithuania and Bank of Lithuania is analyzed. Secondary statistical data analysis has been chosen reasoning that data provided by the mentioned institutions are comprehensive and reliable. Financial statistics provided by the Bank of Lithuania is used by various individuals, groups and institutions such as politicians, journalists, students, banks, various domestic and international companies and so forth.

Statistics Lithuania is one of institutions and agencies managing official statistics and included into Lithuanian statistical system. Together with ministries, Bank of Lithuania and other institutions, Statistics Lithuania provides data that comply with international standards.

Bank of Lithuania plays an important role in providing statistical data of Lithuania. The central bank of the country is one of the key providers of official country statistics. A large portion of the statistics data is being provided and updated periodically which covers comprehensive financial digits that are of the one standard with other EU countries' financial statistics. That way it is easy and convenient analyze the numbers and compare them with other EU member countries.

The Bank of Lithuania, besides other statistical data, collects, compiles, publishes and provides statistical information on quarterly financial accounts of institutional sectors. This information is analyzed and estimated in empirical part of the thesis. Financial accounts reflect flow of funds information. The Bank of Lithuania, as a member of the European System of Central Banks (ESCB), effectively contributes to the development, production and dissemination of European statistics that is necessary for the performance of the ESCB's tasks. As a member of the ESCB, the Bank of Lithuania develops, produces and disseminates statistics in compliance with the main principles laid down in the Public Commitment on European Statistics by the ESCB and applying the Policy regarding the reuse of ESCB statistics.

According Duc, Breton (2009), the ECB had undertaken flow of funds analysis since 1999 which was based on a dataset that has been in a constant state of development and refinement. The dataset reflected the relatively recent creation of the euro area and the Eurosystem. Later From 2001 to March 2007 the ECB published partial statistics, covering only the non-financial sectors, and did not report all the information. As from 2002, annual financial account data covering (individual country) financial account data (stocks and flows) for all sectors have been published by Eurostat, with the available time

series starting in 1995. However only in June 2007 publication of the euro area integrated economic and financial accounts reflected complete quarterly financial account data.

However nowadays national accounts are compiled according to the internationally harmonized methodology and data provision requirements which are the same across the EU. Thus financial accounts of Lithuania are the part of National Accounts System and data of flow of funds compiles requirements of the Regulation (EU) No 549/2013 of the European Parliament and of the Council of 21 May 2013 on the European system of national and regional accounts in the European Union (ESA2010). Statistics Lithuania publishes revised national accounts data for 1995–2014. That means that all Lithuanian national accounts data and data for general government sector as from October 2015 are recalculated according to the updated ESA 2010 methodological provisions, as well as new methods and data sources.

The new ESA 2010 replaced the ESA 95 in order to adjust the system of national accounts to the changed economic environment while taking into account the progress achieved in improving methodological provisions. The ESA 2010 is harmonized with the System of National Accounts 2008 (2008 SNA) and the sixth edition of the Balance of Payments and International Investment Position Manual (BPM6). The 2008 SNA provisions were prepared by the United Nations, the International Monetary Fund, Eurostat, the Organisation for Economic Co-operation and Development and the World Bank. The 2008 SNA was approved in 2009, while the ESA 2010 in 2013.

When publishing statistics, the Bank of Lithuania observes the Special Data Dissemination Standards. To produce statistics, the Bank of Lithuania exchanges statistical information with Statistics Lithuania and uses the data collected by other official statistics institutions.

2.3. Data preparation for research

Secondary data analysis is chosen for the estimation of households' financial risk-taking over business cycle in Lithuania. Financial account data provided by Bank of Lithuania and various macroeconomic indicators provided by Statistics Lithuania are analyzed. As it was previously mentioned, Lithuanian financial data is available since 2003 Q3 for stocks and since 2004 Q1 for flow data. Business cycle indicators have different availability periods but all they are provided more when since 2003 Q4. However in order to have comparable data and to make equal time series, data have been selected since 2004 Q1 till 2015 Q2 when the newest data were available.

Financial account quarterly stock data is analyzed in order to compare 2003 Q4 stocks when data have started to be gathered and in 2015 Q2 when the newest data is available. Flow data is analyzed in order to estimate the change of households' investment decisions. Households' financial transactions reflect changes in the outstanding amounts. However, not only transactions have an impact on balance sheet changes. According Bank of Lithuania methodological notes of financial account of Lithuania

(2014) other flows may comprise changes between opening and closing balance sheet values. Other flows are divided into three parts, see Formula (1).

$$S_t = S_{t-1} + T + R + V; \qquad (1)$$

where: S_t – outstanding amount at the end of period;

S_{t-1} – outstanding amount at the beginning of period;

T – financial transactions;

$\boldsymbol{R}$ – revaluation;

$\boldsymbol{V}$ – other volume changes.

Seven financial asset classes distinguished for households according to SNA 2008 and later SNA 2010. In this research, financial asset class is analyzed if it presents more than 0.5 percent in households' financial investment portfolio. Thus, financial derivatives class is not analyzed in this research. Households' investment into financial derivatives despite enormous increase compared 2003 Q4 and 2015 Q2 stocks, compile less that 0.5 percent of households' portfolio. Thus, it is eliminated from this research.

For further analysis 11 economic indicators are selected and divided into leading, lagging and coincident business cycle indicators. Money supply, number of building permits for construction of new residential building, hours worked in industry enterprises are taken as leading indicators. Production price index, average wages, industrial production index are selected as coincident indicators. Finally, lagging indicators are GDP at constant prices, consumer price index, unemployment rate, interest rates.

Nonetheless, data of financial account and data of economic indicators equalized by converting them into annualized growth data. Data annualization has been done by using Formula (2).

$$r = \left[\left(\frac{X_t}{X_{t-1}}\right)^{\frac{m}{n}} - 1\right] \times 100\%; \qquad (2)$$

where: r – annualized growth rate;

x_t – ending value;

x_{t-1} – beginning value;

n –periodicity of the data;

m – number of periods between the beginning and ending value.

When all data have been gathered, time series were made. From time series made from financial asset classes time series outliers have been detected. For detecting outliers Formula (3) has been used. Also, analysis of detected outliers has been made.

$$h_j = \frac{1}{n} + \frac{(x_j - \bar{x})^2}{\sum_{i=1}^{n}(x_i + \bar{x})^2}; \qquad (3)$$

where: If $h_j > 4/nn$ – estimation is considered as outlier;

n – number of estimations;

x_j – value of predicted outlier;

$\bar{x}$ – mean of time series values.

Growth rate of investments into debt instruments in 2004 Q4 have been eliminated from time series. The growth was due to May 1st 2004 when Lithuania has joined European Union. According to Securities Commission 2004 Annual Report, a number of private investors has been growing fast since 2003 which are due to favourable macroeconomic conditions. Joining the European Union has done positive impact on country's reliability.

The growth of investment into loans in 2011 Q4 was enormous, 332637.50 percent. The very number already indicated that this growth was not normal. After the analysis it has been accepted that this growth was due to "Snoras" bank collapse in 2011 November 24th. Uninsured deposit part which belonged to bankrupted bank due to the change of legal status of "Snoras" (from deposit taking financial institution it became a different financial institution not accepting deposits). Thus, uninsured deposits have been classified as loans provided by households to other financial institutions.

2.4. Business cycle identification and analysis methodology

In the analysis of scientific literature there has been determined that business cycles are aggregate economic activity fluctuations. To reflect aggregate economic activity the indicator of Gross Domestic Product is compiled by the Statistic Department of Lithuania. In Statistics Lithuania meta-info for National accounts Gross domestic product is determined as one of the main indicator of the System of National Accounts (SNA) defining the level of economic development of a country.

Hence, in a purpose to evaluate business cycle of Lithuania, real GDP growth rate indicator is employed in this research. Moreover, in order to measure volume growth of GDP and its components, the effect of price changes has to be eliminated (i.e. prices have to be kept constant). Lithuanian statistical department uses TRAMO/SEATS method for the main components of GDP data to make seasonally adjusted. Thus, for assessing the phase of business cycle in Lithuania, GDP data given by Lithuanian Statistical Department is used. Reasoning above mentioned factors seasonally and working day adjusted GDP data is used. Seasonally adjusted GDP volumes also are "Chain-linked" which means that changes of volumes are calculated using the prices of previous year.

GDP indices, at constant prices (chain-linking method), seasonally and working days adjusted compared to the corresponding period of previous year has been used to uncover business cycle in Lithuania. Business cycles varies from more than a year to twelve years, is defined in Burns and Mitchell (1946) definition of business cycle. Taking into account this attribution, also having in mind that decent financial accounts data is available since 2003 Q4, twelve year time series of GDP data will be analyzed, i.e. from 2003 Q3 to 2015 Q2 (48 quarters). Real GDP index fluctuations are reflected in linear graph. However, clear view of cycle phase change has not been well reflected.

Hence, business cycle disclosed by time series of real GDP growth, in order to analyze its peculiarities, data approximation has been employed. Real GDP growth linear function has been approximated by 6^{th} degree polynomial trend line and drawn on the same graph. It has been performed by using MS Excel 2011 trendline analysis tool. Rule of approximation accuracy has been chosen when $R^2 > 0.5$ which means that approximated data point has to differ from real data point by the rule that has been set. Mentioned rule is met with the lowest polynomial degree of 6. Also, MS Excel 2011 provides tool for 6^{th} degree polynomial trendline drawing. Moreover, by increasing polynomial degree, accuracy of approximation is increasing slightly and making more complex analysis. Polynomial trendline of 6^{th} degree may have 6 bends (hills and valleys) in the curve line. Thus, having 6^{th} degree polynomial line drawn on original real GDP growth linear graph, cycles are clearly determined and prepared for further analysis.

For analysis of business cycle phases descriptive statistics have been employed. All descriptive statistics has been computed using MS Excel 2011 functions. Extreme values (MIN/MAX functions) have been determined in order to define the peak and trough values. The mean (AVERAGE function), well known measure of central tendency has been computed in order to find an average economic growth or decrease in particular business cycle phase. For comparing an average growth with an upper half and lower half, statistics of median (MEDIAN function) has been counted. In order to analyze the spread of economic growth during the phase of the cycle, standard deviation (STDEV function) has been used. In order to compare different phases of business cycle Kurtosis (KURT function) and Skewness (SKEW) statistics were employed.

2.5. Methodology for multiple regression analysis

In order to estimate the effect of business cycle phase for the households' investment patterns, multiple regression analysis has been chosen. According Sykes A. O. (1992), regression analysis is a statistical tool for the investigation of relationships between variables. To explore such relationships, the investigator assembles data on the underlying variables of interest and employs regression to estimate the quantitative effect of the causal variables upon the variable that they influence.

Thus, in particular research, six financial asset classes are dependent variables and economic indicators, which are leading, lagging or coincident indicators of business cycle, are independent variables. Hence, six multiple regression equations are made according to formula (4):

$$Y_j = \alpha + \beta X_1 + \gamma X_2 + \cdots + \delta X_n; \qquad (4)$$

Y_j – financial asset class;

X_n – statistically significant business cycle indicator;

$\alpha, \beta, \gamma, \delta$ – coefficients of regression analysis.

For multiple regression analysis only statistically significant relationships between variables are relevant. With a purpose to choose independent variables for regression equation that are statistically significant, correlation analysis has been done. For exploration of relationship between six financial assets and leading, lagging, coincident business cycle indicators, SPSS 17.0 program has been employed. As Kasiulevicius and Denapiene (2008) argue, correlation analysis is a statistical method that explores strengths of variables' relationships. Pearson correlation coefficient reflects how well normally distributed variables are correlated. Correlation coefficient may vary in the interval between -1 to 1. Thus, correlated relationship may be negative or positive and may be differently evaluated and according Kasiulevicius and Denapiene (2008) correlation can be:

- very weak when $r \geq -0.19$ or $r \leq 0.19$;
- weak, when $-0.39 \leq r \leq -0.20$ or $0.20 \leq r \leq 0.39$;
- average, when$-0.69 \leq r \leq -0.40$ or $0.40 \leq r \leq 0.69$;
- strong, when $-0.89 \leq r \leq -0.70$ or $0.70 \leq r \leq 0.89$;
- very strong, when $-1.00 \leq r \leq -0.90$ or $0.90 \leq r \leq 1.00$.

Hence, in this research for making regression equation, independent variables have been selected that have very strong, strong and average strong relationships with investment growth into particular asset class. However, there is a need to perform a significant test to decide whether the true relationship is close to the estimated relationship. To assess the "statistical significance" of the relationships Student's statistics has been counted by using Formula (5).

$$T = r_P \sqrt{\frac{n-2}{1-r_P^2}}; \qquad (5)$$

where: T – the value of Student's statistic;

r_p – Pearson correlation coefficient;

n – number of estimations.

Having the value of Student's statistic there is a need to make a decision if correlation results are statistically significant or not. Thus, statistical hypothesis is checked: H_0 that there is no correlation

between growth into financial asset class and particular business cycle indicator, H_1 that particular correlation is statistically significant. The test expression is reflected in Formula (6).

$$\begin{cases} H_0: r_p = 0 \\ H_1: r_p \neq 0 \end{cases}; \qquad (6)$$

where: H_0 – hypothesis confirms that correlation coefficient is not statistically significantly different from 0;

H_1 – hypothesis confirms that correlation coefficient is statistically significantly different from 0;

r_p – Pearson correlation coefficient.

The degree of confidence in this research has been chosen with $\alpha = 0.05$. If value received fits the rule, thus it is clear that existing correlation is statistically significant. The correlation analysis has been done by using SPSS 17.0 program. The program reports p-value. Hence, for testing the hypothesis results only with p-value less than 0.05 has been selected.

Thus, in this research, H_0 is eliminated (meaning that correlation between variables exists) when Student's statistics value is higher than Student's distribution with *(n-1)* with critical value of degree of freedom $\alpha/2$., see Formula (7) which has been counted by using MS Excel 2011 "TINV" function.

$$|T| > t_{\frac{\alpha}{2}}(n-2); \qquad (7)$$

Where: T – Student's statistics value;

α – the degree of freedom;

n – number of estimations.

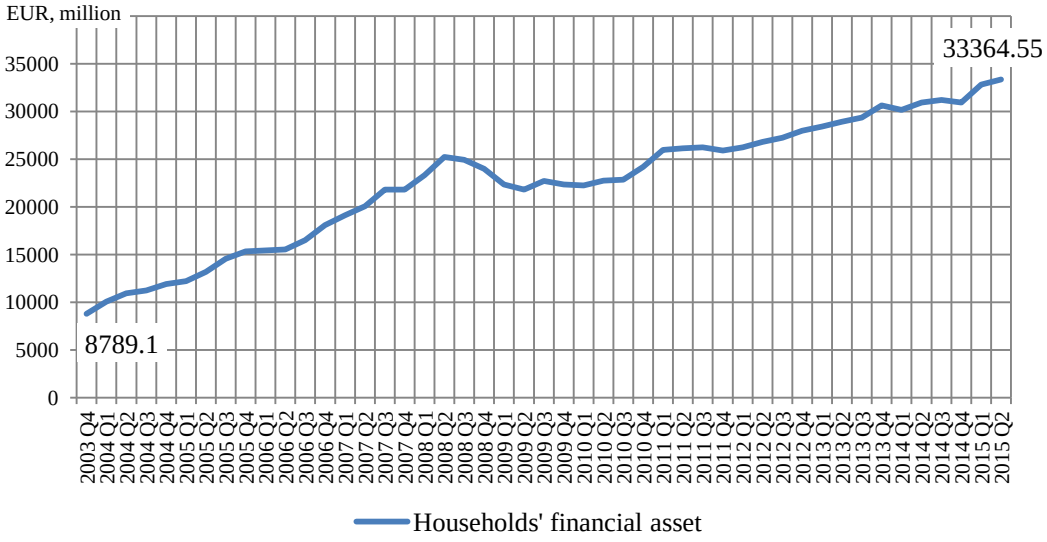
After the selection of business cycle indicators that have average, strong and very strong relationships with particular financial asset class, statistical significance test has been performed. That way, independent variables have been selected that are reasonable to compile multiple regression equations for analyzing the relationship between investment into financial asset growth and leading, lagging and coincident business cycle indicators.

Considering that data has no trend and no seasonality, simple exponential smoothing has been used for forecasting data and making coherent time series. Exponential smoothing has been selected because using this method recent observations are given relatively more weight in forecasting than the older observation. Dumping factor has been chosen 0.8, meaning that for counting smoothed value, 0.8 weight is taken from future value and 0.2 weight of previous value. This method has been applied by using MS Excel 2011 Data Analysis tool – exponential smoothing.

3. ESTIMATION OF HOUSEHOLDS' FINANCIAL RISK-TAKING OVER THE BUSINESS CYCLE

3.1. Households' financial asset portfolio comparison in 2003 and 2015

Financial asset of households and non-profit institutions serving households in Lithuania has increased from 8.8 billion EUR in 2003 to a 33.4 billion EUR in 2015 (see Fig. 4). Amounts are given in nominal expression valued at market prices. The three and a half times increase indicates an average annual growth rate of almost 14 percent. Current households' financial asset composes around 25 percent of total financial asset of Lithuanian economy.

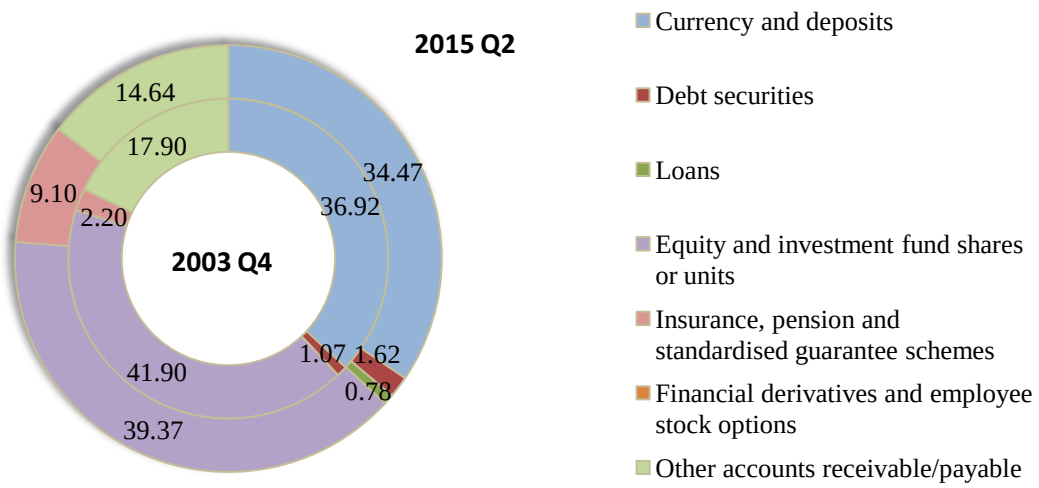


Source: prepared by the author using The Bank of Lithuania financial accounts data

Fig. 4. Households' financial asset growth (EUR, million)

There is number of economic and political factors that played a significant role for households' financial asset growth in Lithuania. One of such is that in May 1st in 2004 Lithuania gained full membership of the European Union. This was an important factor for development of financial markets. Another important fact is that in 2002, The Parliament of the Republic of Lithuania adopted the law regarding reform in Lithuanian pension system. With this law the mandatory funded pension scheme was introduced on January 1st in 2004. Also, supplementary voluntary pension provision started operating since that time. Moreover, the households of Lithuania together with a whole world had experienced a global financial crisis on 2007-2009. It may be assumed that this kind of experience may have affected households' decision in risk-taking.

Households' financial asset portfolio structure in Lithuania has not changed a lot over the last decade (see Fig. 5). There are inconspicuous portfolio structure fluctuations in most of financial asset classes. There are insignificant decreases in currency and deposit, also, in shares and other equity asset classes. Financial asset class of bonds and other debt securities increased by 1.3 percent in households' financial asset portfolio. These changes indicate about households' negative slope for risk-taking.

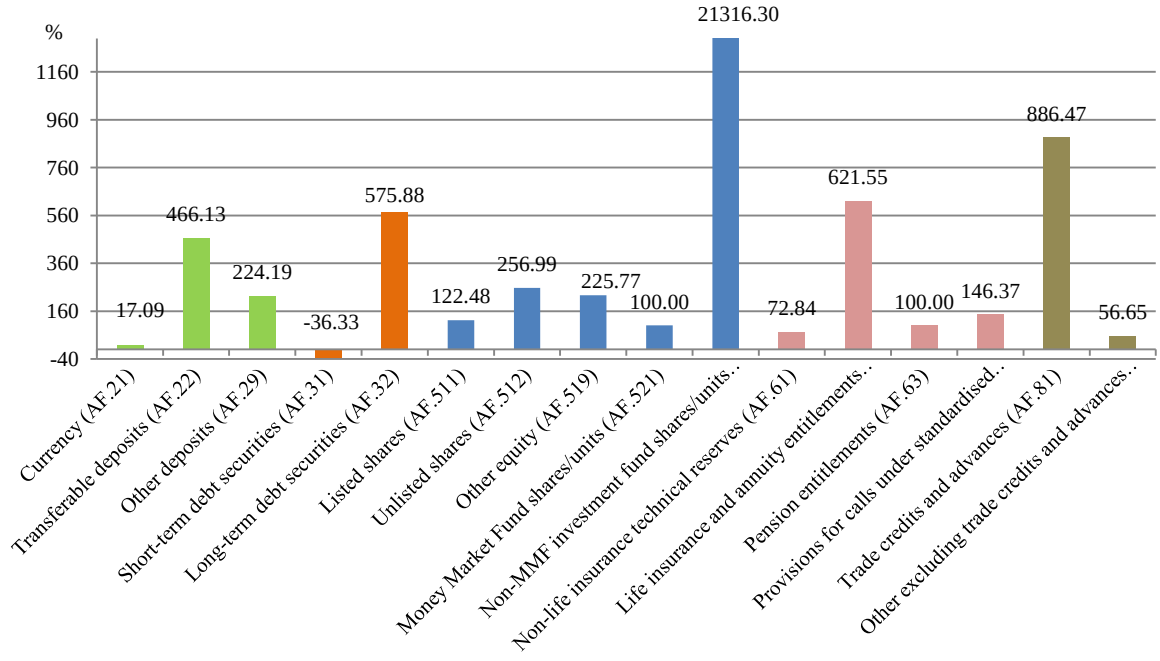


Source: prepared by the author using The Bank of Lithuania financial accounts data

Fig. 5. Households' financial asset portfolio structure (%)

Significant households' financial asset portfolio structure changes are seen as well (see Fig. 5). They are considered as greater financial risk-taking tendency of Lithuanian households. Insurance, pension and standardised guarantee schemes have increased significantly, from 2.2 percent in the financial asset portfolio to 9.1 percent. Such increase is circumstantial to pension reform in Lithuania that has been implemented in the beginning of 2004. Moreover, a considerable development in loans provided by households is worth mentioning. However, this increase in loans' class is not related with households' risk-taking habits. Mostly it is related with collapse of bank of "Snoras" when status of collapsed bank changed. From deposit taking and credit providing institution bank was reclassified to other financial institution. Thus, all non-insured deposits have been moved from deposit class to loans provided by households to other financial institutions.

Various financial products show different growth performance comparing 2003 and 2015, even though they belong to the same financial asset class (see Fig. 6). Currency and deposit is slightly less important to households now than it was in 2003, and that this particular asset class has increased in parallel with the whole financial asset growth. Transferable deposits increased more than five times, other deposits increased more than two times, however the percentage part in portfolio of whole currency and deposits class remain similar (36.92 percent in 2003 and 34.47 percent in 2015). Fluctuations in debt securities asset class may be interpreted as higher risk tolerance of households but increased part of debt securities in the investment portfolio shows opposite results. Short term debt securities decreased by 36.33 percent, whereas, investment into long term debt instruments developed from 78.65 to 531.58 billion EUR respectively, meaning almost seven times increase.



Source: prepared by the author using The Bank of Lithuania financial accounts data

Fig. 6. Comparison of financial products' growth (2003 against 2015, %)

Changes in class of equity instruments indicate about greater risk tolerance of households. Popularity of investment funds have increased extremely, more than 200 times (see Fig. 6). Nonetheless, the part of equity instruments in households' financial portfolio has decreased from 41.90 percent to 39.97 percent. Listed shares appreciated by 122.48 percent and unlisted shares showed growth more than two times. One more important factor that must be emphasized is that a pattern may be considered as households' risk aversion, especially when debt securities' part in the financial asset portfolio increases from 1.07 to 1.62 percent respectively. These differences encourage for a deeper analysis of households' portfolio structure and its development.

Although, significant increase of insurance technical reserves class seen in financial asset portfolio might seem astonishing (Particular growth from 2.2 percent and 9.1 percent respectively in 2003 and 2015), it may be handily explained by a pension reform which had an effect since the 1st of January 2004 in Lithuania. Besides, in this section, according to current SNA 2010 statistical rules, assets linked to public pension's schemes are not included. As follows, largest increase per particular asset class is seen in life insurance and annuity products. The growth of this section indicates that Lithuanian households increased their investment into products of insurance corporations and pension funds which reflect higher risk tolerance.

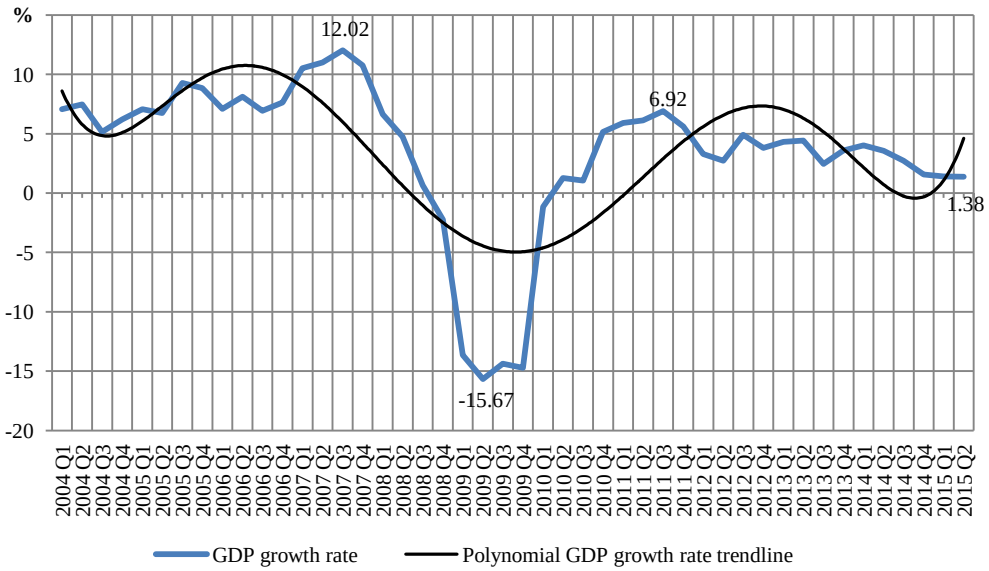
All in all, financial assets have improved a lot from the perspective of Lithuanian households in a time period between 2003 and 2015. In general, the growth of financial assets and changes in the portfolio structure are mostly affected by macroeconomic environment. In this case, the membership in European Union and the new pension system in Lithuania had most influence for households' financial

asset growth in Lithuania. On one hand, financial asset portfolio inconspicuous fluctuations over last decade indicate similar risk tolerance comparing 2003 and 2015. On the other hand, there are fluctuations that may be considered as higher financial risk tolerance on behalf of households. Significant development of insurance, pension and standardised guarantee schemes in portfolio structure indicates greater financial risk-taking tendency. Moreover, investment movements from short-term to long-term debt securities, from listed to unlisted shares, also high increase investment fund shares, prove the tendency of greater financial risk-taking.

3.2. Identification of business cycle in Lithuania

In order to estimate households' financial risk-taking over business cycles, the very business cycle in Lithuania has to be identified. For identification of business cycle real GDP growth rate has been used. As it was studied in theoretical part, GDP is the most important economic indicator. In international practice it is accepted to use real GDP growth rate for evaluation of country's economy level.

For economic fluctuation graph, GDP growth rate used which is counted at constant prices. GDP growth rate received using chain-linking method meaning that for eliminating price changes, base year that are updated on annual bases are used. Moreover, in order to get more accurate graph, GDP growth rate that is seasonally and working days adjusted. In order to determine business cycle in Lithuania, real GDP growth rate graph is visualized which reflects economic fluctuation in Lithuania (see Fig. 7).



Source: prepared by the author using data of Statistics Lithuania

Fig. 7. Business cycles in Lithuania

In order to determine the direction of movement of GDP growth, polynomial approximation of 6^{th} degree has been done and showed on the same graph (see Fig. 7). A polynomial trendline is useful when data fluctuates, when time series are short and have small amount of periods. The condition for

coefficient of determination needs to be $R^2 > 0.5$ which shows how well the regression line approximates the real data points (perfect condition $R^2 = 1$). This condition can be satisfied when the lowest polynomial degree is 6. To show the direction of movement of GDP growth graphically, MS Excel polynomial trendline is employed.

Data approximation by polynomial trendline:

$$y = (8 \times 10^7)x^6 - 0.0001x^5 + 0.0067x^4 - 0.1764x^3 + 2.1308x^2 - 10.494x + 122.39.$$

Coefficient of determination:

$$R^2 = 0.5471.$$

Usually business cycle is divided into four phases, as it was analyzed in theoretical part. Thus cycle in Lithuania is also separated into expansion, peak, recession and trough. Period from the end of 2004 and the middle of 2015 is analyzed in this research. Using a polynomial GDP growth trendline, cyclical fluctuations are broke down into four periods. These periods have different cyclical characteristics that are determined in Table 1.

Table 1. Characteristics of cyclical fluctuations

Period	**2004 Q1 – 2007Q3**	**2007 Q4 – 2009 Q4**	**2010 Q1 – 2011 Q3**	**2011 Q4 – 2015 Q2**
Cycle phase name	**Expansion (first)**	**Contraction (first)**	**Expansion (second)**	**Contraction (second)**
Duration (month)	45	27	21	45
Extreme name	Peak	Trough	Peak	Trough (current)
Extreme value	12.02	-15.67	6.92	1.38
Mean (per quarter)	8.07	-4.21	3.61	3.32
Median	7.47	-2.24	5.16	3.56
Standard Deviation	1.91	10.51	3.15	1.28
Kurtosis	-0.04	-1.96	-1.71	-0.68
Skewness	0.76	0.13	-0.52	-0.07

Source: author's calculations

The first cycle phase – expansion, which may said was increasing in fast but coherent way. The first expansion phase lasts for 45 months and has reaches the peak of 12.02 percent GDP growth compared to the corresponding period of last year (see Table 1). The average growth rate during this expansion period is 8 percent. Median value is not far from the mean, also standard deviation is 1.91, which is not high, especially when comparing contraction phase. Also the first expansion phase has negative kurtosis which shows that bigger part of the mass is concentrated to the right of the mean.

In this expansion period Lithuanian economy was constantly growing. One of the most important reasons is that in 2004 Q2 Lithuania joined European Union. Lithuania's economy became more open and inspired more confidence for foreign investors. According to Davulis' (2014) analysis, decreasing unemployment, increasing income, hard currency and financial support of EU were the main factors of

the growth of Lithuanian economy. The growing country‘s economics led to increased country‘s exported production volumes. However, expansion phase has been interrupted by the global crisis.

First contraction phase is revealed by extremely sharp and fast decrease in real GDP growth rate. Therefore the graph has steep downward trend on that period indicating high economic turbulence. The average quarterly decrease is equal to 4.21 percent. It changed from median by 1.97 points and compared with previously discussed expansion phase the average indicators show higher deviation from median during the recession period. The standard deviation is extremely high. Kurtosis value is also very high and positive.

Such a sharp and steep decrease in real GDP growth indicates about the global crisis and how it affected Lithuanian’s economy. The first sign about it was when real GDP growth rate has changed the trend’s direction. It was in 2007Q4 when GDP growth rate was 1.27 points smaller when in previous quarter. Since when growth rate decreased sharply and in 2008 Q4 reached negative growth compared with the corresponding period of last year. Negative growth continued six quarters and according theory when growth is negative for two quarters in a row, this phase is called recession. Economic analysis of Bank of Lithuania (2009) argues that drop in BVP growth was mostly affected by decrease in private consumption. The latter respectively has been influenced by increased unemployment, decrease in wages, strict crediting conditions and doubts about future. While the graph shows an up warding curve on the period of 2009 Q2 – 2010 Q1, from the perspective of GDP the economy is still shrinking as the GDP is still negative and shows only less shrinking rather than growth compared to the previous year. However, government stimulus programs have started to show results and economy has changed from downward to upward trend.

In the beginning of 2010 Lithuanian economy started to recover and it can be stated that the second expansion phase begins. Since the GDP crosses the 0 percent point and continuously increases with some up and down fluctuations included. Yet, the economy growth has not reached the rate that was present before the last contraction. The highest point (extreme point) recorded so far for this new expansion (recovery) phase is 6,92 percent with an average growth rate of 3.15 percent and is more than twice lower compared to the average growth of the previous expansion phase (8.07 percent). Median is higher than an average growth, indicating that more quarters had higher increase when average. Besides that, standard deviation is not significantly high, strongly negative kurtosis and negative skewness indicates that mass of values is dispersed in the left side tail and it is done in steep way. Hence, it is seen that economy growth rate is slightly going in down sloping trend.

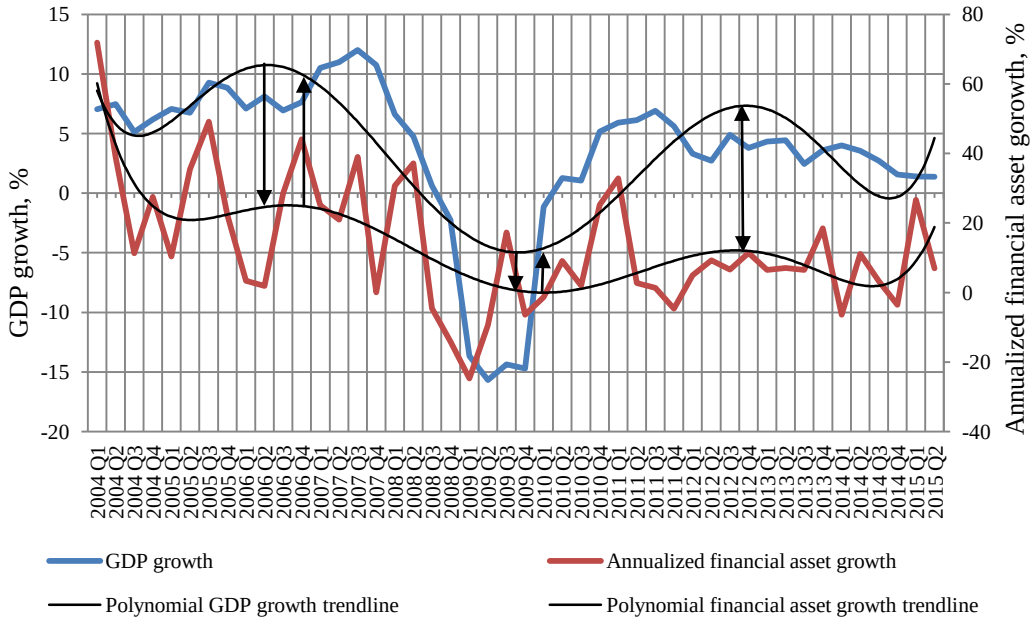
In the end of 2011, when world economy was receding and because of it expectations were deteriorating in Lithuania, economic growth in the country slowed down. Despite that average GDP growth is 3.3 percent, the median value indicates that for all 45 quarters aggregate output growth are similar and do not show improving signs. Deviation around the mean reveals consistency of growth.

Such slight downward sloping direction leads to the lowest GDP growth value in 2015 Q2 which is 1.38 percent compared to the corresponding period of last year. Thus, period since 2011 Q3 is marked as the beginning of second contraction phase.

In order to reflect economic fluctuations in Lithuania, real GDP growth rate, measured at current prices, using chain-linking method and seasonally and working days adjusted, is used. For determining business cycle from the given GDP growth graph, 6th degree polynomial trendline is drawn. For analysis of cyclical fluctuations descriptive statistics are employed. The results showed that in the period since the beginning of 2004 till the middle of 2015 Lithuanian economy has experienced all cycle phases. In the first expansion phase economy was constantly growing and reached the peak in 2007 Q3. Later, sharp and fast decrease in GDP growth indicated about contraction phase with the trough point in 2009 Q2. Since the beginning of 2010 second expansion phase is evident. Finally, since the end of 2011 Lithuania is experiencing slow down of economic growth, thus in this research it is emphasised as second contraction phase.

3.3. Households' financial asset allocation over business cycles

In order to study predominating trends of households' financial asset allocation over the last decade, cyclical trends of investment into financial asset is analyzed. Similarities with business cycle trends are seen, as they both move in the same direction. However, the delay tendency of cycle of investment into financial asset reveals in comparison to business cycle first expansion phase. Also, coincidences of these two cycles appear in second expansion phase (see Fig. 8).



Source: prepared by the author

Fig. 8. Business and investment cycles in Lithuania (%)

The growth of investments into financial asset appears much more volatile than the growth of aggregate output (see Fig. 8). Cycle of households' investment into financial asset appears less steep than business cycle, meaning that the boundaries of investment cycle are not as clear as it is in business cycle. Nonetheless, cyclical trends are still important. Growth of investment increases when GDP rises. In contrast when GDP growth decreases, financial asset growth falls as well.

During periods of above trend growth, aggregate households' investment experienced much larger percentage rise. In first expansion period the peak of aggregate output growth reached 12 percent growth, while annualized investment into financial asset was equal to 39 percent growth. Moreover, when growth rates are below trend, such as in recessions, household's investments into financial asset decrease far more sharply than the GDP growth rate falls. Decrease of investment into financial asset stood at almost 25 percent in trough, while aggregate output decreased by almost 16 percent.

The delay of investment cycle from business cycle reveal in first expansion phase. In 2006 Q2 GDP growth polynomial trendline shows prognosis about future cycle trend change. Polynomial trendline of households' investment into financial asset also forewarns about cycle's trend change, however the change only is clear only after two quarters in 2006 Q4. Downward sloping trend in aggregate output starts in 2007 Q3, whereas negative slope of financial investment cycle is seen after two quarters in 2008 Q2.From the perspective of trough period, households' investment leads the business cycle despite the opposite results of polynomial trend line. Growth of financial asset shows the trend change in 2009 Q1, meanwhile, GDP growth indicates about new expansion in 2009 Q2. The peak of second expansion of aggregate financial investments is reached in 2011 Q1 and aggregate output reached the peak two quarters after. Furthermore, in 2012 Q4 trendlines for both cycles are coincident.

As a result of the above, aggregate households' investment into financial assets is procyclical. Investments are growing when GDP rises and decreases when GDP falls. In expansion phase households' investment into financial assets growth indicates much larger percentage rise. During recessions, households' financial investments fall far more sharply than aggregate output does. Households' investment into financial assets growth indicates delay in the first expansion phase, and since the trough, cycle of investment into financial asset leads the business cycle. For a further analysis, multiple regressions will be performed in order to compare separate financial asset classes' growth and their correlation with different business cycle indicators.

3.4. Multiple regression analysis

Seeking to explore relationship between business cycle indicators and the growth of investment into particular financial asset class, the regression analysis is employed. Regression analysis helps to

estimate quantitative effect of the causal variables upon the variables that they influence. In order to make regression, main leading, coincident and lagging business cycle indicators used as independent variables in regression equation (see Table 2). It will be estimated separately about what effect they do have on different financial asset classes.

Table 2. Variables for regression equation

Dependent variables		Independent variables		
Financial asset classes		**Business cycle indicators**		
N/A	Monetary gold and special drawing rights – N/A for households	X_1	Money supply (M2)	*Leading*
Y_1	Currency and deposits	X_2	Number of building permits for the construction of new residential buildings	*Leading*
Y_2	Debt securities	X_3	Index of hours worked in industry enterprises	*Leading*
Y_3	Loans	X_4	Producer Price Index	*Coincident*
Y_4	Equity and investment fund shares or units	X_5	Indices of average earnings	*Coincident*
Y_5	Insurance, pension and standardised guarantee schemes	X_6	Industrial production index	*Coincident*
N/A	Financial derivatives and employee stock options – will not be analyzed due to its insignificance	X_7	GDP, at current prices	*Coincident*
Y_6	Other accounts receivable/payable	X_8	Consumer Price Index	*Lagging*
		X_9	Seasonally adjusted unemployment rate	*Lagging*
		X_{10}	Short term interest rates	*Lagging*
		X_{11}	Long term interest rates	*Lagging*

Source: prepared by author using Bank of Lithuania and Statistics Lithuania data.

Having a purpose to compare different statistical data and to study relationships between them, data for variables is analyzed in approach of change. All independent and depended variables are transformed into annual growth rate data (see Annex 3 and Annex 5), using quarterly growth rate data annualization which is disclosed in the methodology part, (Formula 2). Moreover, data for regression analysis is produced using exponential smoothing method which is determined in the methodological part more broadly. Smoothed data is provided in Annex 4 and Annex 5.

Consequently, six regression equations need to be performed as there are six financial asset classes to be investigated (see Table 2). In order to select independent variables for every regression equation, correlation analysis is done. Pearson correlation coefficient is computed using SPSS 17.0 statistical program tool. However, in order to verify relationship strength and to find out if relationship is statistically significant, Student's statistic is used. Statistical significance was assessed on the estimated relationships, concerning the degree of confidence that the real relationship is close to the

estimated relationship, therefore $\alpha = 0.05$, meaning that data for regression analysis will be chosen with p-value smaller than 0.05.

Every financial asset class has different correlation relationships with various business cycle indicators (see Annex 6). Correlation exists almost between all dependent and independent variables. However, in this study, results were selected only with average strong, strong and very strong correlation relationships that are explained in methodology part. Also, all selected variables have met p-value criterion, meaning that degree of freedom has to be less than selected α criteria which is equal to 0.05. Furthermore, significance of correlation relationship has met the criterion which was checked using Student's t-distribution value. The regression analysis is performed by using SPSS Statistics 17.0 statistical programming tool.

Evaluating currency and deposit as a low-risk financial asset it is seen that indicator which prognoses future economic growth has insignificant influence on particular financial asset class increase. Coincident indicators of aggregate output have greater influence on currency and deposit growth**.** However, households' accumulation of currency and deposits are mostly affected by the lagging indicator. Accomplished regression analysis indicates that accumulation of currency and deposits slightly develops when the number of building permits and producer price index is increasing. More rapid growth of particular financial asset class is influenced by growing GDP. When country's inflation is increasing, households tend to accumulate more currency and deposits. Households' investments into low-risk assets such as currency and deposits are decreasing when average earnings are growing. Households are willing to take higher financial risks as they generate more income. An opposite tendency is seen when unemployment is growing. Households are less willing to invest into high-risk assets as their future wage income is less certain.

$$Y_1 = -0.635 + 0.046x_2 + 0.243x_4 - 0.327x_5 + 0.484x_7 + 1.230x_8 - 0.034x_9;$$

where: Y_1 – annualized growth of households; investments into currency and deposits;
x_n – annualized growth of business cycle indicator.

Households' investment into debt securities are mostly affected by leading economic growth indicator. The leading economic growth indicator shows households' tendency to decrease debt securities investment before the increase of aggregate output. Despite, it is strong enough influenced by coincident and lagging indicators that decrease leading position of households' investments. Multiple regression equation shows that households' decrease of investment into bonds and other debt instruments are mostly affected by the increase of hours worked in industry companies which indicates about future economic growth. When average earnings of households rise, investment into low-risk

financial assets decreases. Also, safe investments into debt securities are chosen when unemployment rate is growing which indicates about present economic contraction.

$$Y_2 = 71.001 - 8.766x_3 - 1.427x_5 + 0.839x_9;$$

where: Y_2 – annualized growth of households' investments into debt securities;
x_n – annualized growth of business cycle indicator.

Similar predominating trends are seen in growth of loans provided by households. Loan provisions are decreasing when economic indicators suggest about future economic growth. Most significant influence is done by coincident indicator which has an impact on decrease in loans provided by households. Strong enough influence done by lagging indicator is seen as well. When analysing the equation above, it is seen that when hours worked in industry enterprises rises and at the same time indicates about future aggregate output increase, loans - provided by households – begin shrinking. The increase of Growth of loans is influenced by the rise of producer price index that indicates about current growth of the economy. Also growth is positively influence by raising short term interest rates.

$$Y_3 = -53.526 - 8.071x_3 + 16.626x_4 + 2.556x_{10};$$

where: Y_3 – annualized growth of loans provided by households;
x_n – annualized growth of business cycle indicator.

Households' investment into equity instruments takes predominating position comparing to the business cycle, since it is mostly affected by leading business cycle indicators. Also it could be stated that decrease of investment into shares and other equity instruments come with a delay, as it is affected by lagging business cycle indicators. Regression analysis shows that increasing amount of money in the economy, hours worked in industry companies and growing income have influence on growth of investments into equity and investment fund shares and units. Increasing unemployment forces households to reduce investment into high-risk financial assets. Also increase in interest rates, since it creates better conditions for investment into debt securities, has influence on investment into equity products decrease.

$$Y_4 = -9.654 + 1.767x_1 + 0.059x_2 + 2.559x_3 + 0.887x_5 - 0.217x_9 - 0.157x_{11};$$

where: Y_4 – annualized growth of investments into equity and investment funds shares;
x_n – annualized growth of business cycle indicator.

Insurance, pension and standardized guarantee schemes show that the liabilities of insurance companies and pension funds to participants are increasing depending on leading, coincident and lagging business cycle indicators. These liabilities include net equity of households in life insurance reserves, net equity of households in pension funds, amounts outstanding but not earned when premiums are prepaid, and amounts reserved for outstanding claims. Regression analysis shows that growth of investment into insurance products is mostly affected by amount of money supply in the market which encourages investing surplus of funds into insurance and pension schemes. Also, when households' income is rising, the growth of investment into particular asset is evident. Even when lagging indicators such as interest rates are increasing, households' investment into insurance and pension schemes is developing. Thus it could be said that households' investment into particular asset class is always rising since it had no negative influence from any of analysed business cycle indicator.

$$Y_5 = 4.947 + 1.758x_1 + 0.017x_2 + 0.018x_4 + 0.807x_5 + 0.017x_7 + 0.251x_{10};$$

where: Y_5 – annualized growth of investments into insurance, pension and standardized guarantee schemes;

x_n – annualized growth of business cycle indicator.

Other accounts receivable include trade credit and advances, also it includes a wide range of miscellaneous creditor and debtor relationships that do not fall under the other categories also have correlation with business cycle indicators. The growth of investments into particular asset class is mostly affected by coincident business cycle indicators. Performed regression analysis shows that strongest influence for the growth of households' accumulation of other account receivables is made by consumer price index. Rising inflation encourages households to provide more trade credits. Rising unemployment rate forces households to decrease accumulation of other accounts receivables.

$$Y_6 = 7.625 + 0.835x_1 + 0.010x_2 + 2.124x_3 + 0.234x_5 + 3.668x_8 - 0.160x_9;$$

where: Y_6 – annualized growth of investments into other accounts receivable;

x_n – annualized growth of business cycle indicator.

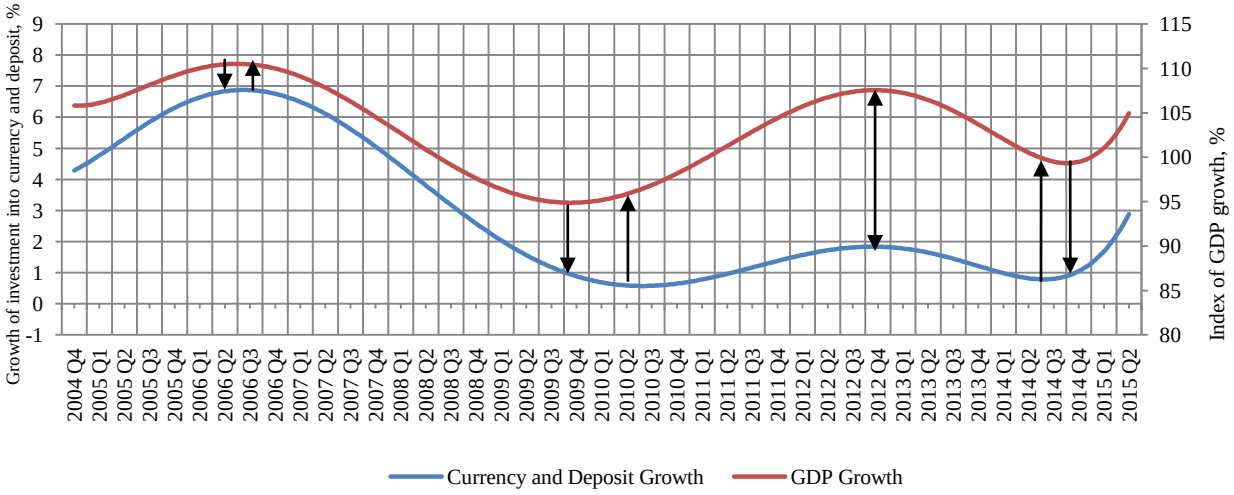
To conclude this chapter, it can reasonably be stated that dependent variables, i.e. six analyzed financial asset classes, have correlated relationship between leading, coincident and lagging business cycle indicators. A strong tendency of households' increase of investment into financial assets is evident when the coincident indicators are present. Households tend to invest more into financial assets when the economy is expanding rather than when the economy is shrinking. Thus, they are not taking benefit from cyclical fluctuations. Households' investments into low-risk assets such as

currency and deposits, bonds and other debt instruments are decreasing when average earnings are growing. Households are willing to take higher financial risks as households generate more income. An opposite tendency is seen when unemployment is growing which indicates about present economic contraction. Households are less willing to invest into high-risk assets as their future employment is less certain. Thus, they choose to invest into bonds. Households' investment into equity instruments is mostly affected by leading business cycle indicators, even though the decrease of investment into shares and other equity instruments comes with a delay. Also, increase in interest rates, since it creates better conditions for investment into debt securities, has influence on investment into equity products' decrease. The growth of investment into insurance products has been always rising since it had no negative influence from any of analysed business cycle indicator. However, growth is mostly affected by amount of money supply in the market which encourages investing surplus of funds into insurance and pension schemes.

3.5. Cyclical analysis of financial asset classes

In this chapter, six financial asset classes are analyzed separately, their cyclical movements investigated and compared with business cycle. The comparison of cyclical movements is done by using sixth degree polynomial trendline. Peaks of financial assets will be determined by using financial asset transaction data that reflects amount of money that has been spent for acquiring financial asset or how much money has been received from redemption of financial asset. Moreover, average growth data is studied and compared over different cycle phases.

Comparison of polynomial trendlines of growth of investment into currency and deposit and real GDP growth revealed that during the first expansion phase, cycle of investment into currency and deposit class is lagging the business cycle by one quarter (see Fig. 9).

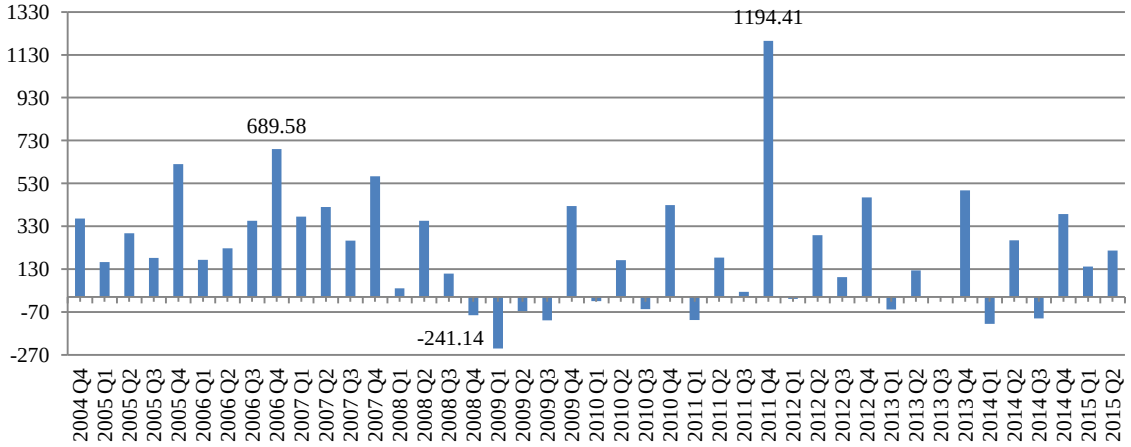


Source: prepared by the author

Fig. 9. Business cycle and cycle of investment into currency and deposit (%)

Same tendency appears in the first contraction phase, when recovery signs in the cycle of investment into currency and deposit are seen three quarters later than it is performed by business cycle. Nonetheless, in recovery phase it can be seen that cyclical movements of investment into currency and deposits match the GDP growth tendencies and reach the peak simultaneously. Hereafter, in the recovery phase, when polynomial trendline shows change of movement direction, growth of investment into currency and deposits leads the business cycle and indicates about increase (see Fig. 9).

On the other hand, from the perspective of transactions in currency and deposits asset class, the peak in expansion phase was reached in 2006 Q4. It is three quarters earlier than the real GDP growth reached the peak in 2007 Q3 and it is seen as the end of expansion phase (see Fig. 10). Same tendency is evident in the contraction phase when trough is reached in 2009 Q1, from the perspective of currency and deposit. Meanwhile, the trough of business cycle is kept in 2009 Q2. However, after the recovery, investment into currency and deposit growth reached the peak one quarter later than had the GDP growth rate reached it. So, this analysis shows controversial results indicating that increasing growth of currency in deposit asset class is leading against the business cycle in expansion phase and is moving behind the business cycle in the recovery phase.



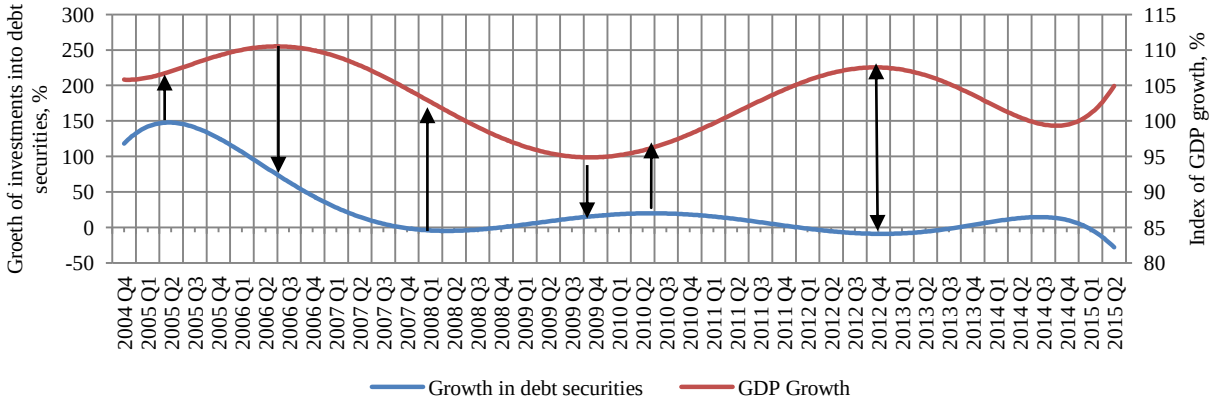
Source: prepared by the author

Fig. 10. Transactions in currency and deposit asset class (EUR, million)

The analysis of average growth rate of investment into currency and deposit reveals that growth has always been positive in the analyzed period. The average quarterly growth in expansion phase is equal to 6.61 percent. In comparison, GDP quarterly growth in the same cycle phase is 8.45 percent. In the contraction phase, as it was mentioned before, the growth of investment into currency and deposit is positive by 1.27 percent increase. Meanwhile, average GDP growth rate was negative and equal to 1.26 percent decrease. During the recovery phase, accumulation of currency and deposits do not change a lot, from 1.27 percent growth to 1.34 percent growth. At the same cycle phase average GDP growth has almost got over the negative growth, and it was equal to decrease of 0.42 percent. In the

more current period from 2011 Q3 when the recovery is at the ending phase, the growth of financial asset is still modest (1.41 percent), at the same time the average GDP growth is 3.32 percent. Such situation, when accumulation of currency and deposit are growing similarly, can be explained that households are choosing alternative, more "modern" investment ways. Also, monetary policy created environment where keeping assets as currency and deposits became unfavourable, meaning low or zero percent interest rates. However, even mentioned average growth in accumulation of currency and deposits indicate that households are still afraid of riskier choice for savings and that even unfavourable monetary policy does not significantly affect their choice.

Different situation is reflected in investment into debt securities asset class. From the polynomial trendlines (see Fig. 11) it can be seen that investment into debt securities does not match the business cycle movements. Moreover, the opposite trend appears. In ideal situation, investments into debt securities should reach the highest point when business cycle reaches its lowest point and vice versa. However, it is seen that in expansion and contraction phases, investment into debt securities lags the business cycle and in the recovery phase conform the ideal option. The growth of investment into debt securities during expansion phase had reached the highest point four quarters earlier than the GDP growth did. The lowest point of debt securities investment in the contraction phase had been hit even six quarters earlier. What is more worth to mention, that in the recovery phase when GDP growth rate reaches the peak, at the same time the growth of investment into debt securities is hitting the lowest point.

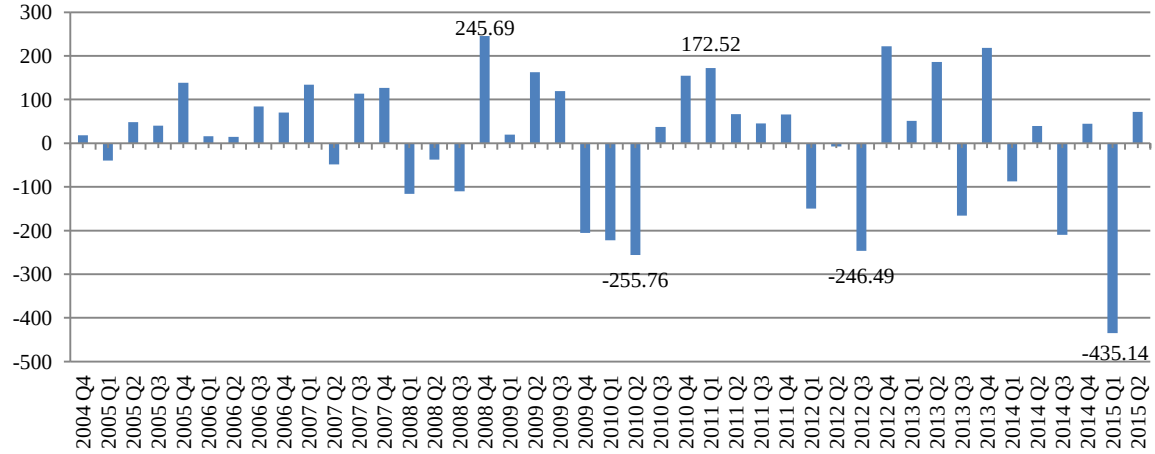


Source: prepared by the author

Fig. 11. Business cycle and cycle of investment into debt securities (%)

Investment into debt securities transactions indicates that during the expansion phase GDP was growing consistently. Only when GDP growth reached the peak of expansion, flows of investment into debt securities were negative. When the economy was declining, households debt securities purchases also were decreasing, despite the theory that during the bad times it is better to invest in safe asset as bonds. The same tendency appears when economy was in recovery phase, together with increasing

GDP growth, debt securities transactions were increasing. However, there is seen a clear influence of ECB asset purchase programme. The one that has started in July 2009, hence since 2009 Q4 three quarters in a row there is seen a households' debt securities redemption in transactions. The second bond purchase programme (CBPP2) was forced since 2011 Q4, i.e. November 2011. The effect is seen on 2012 Q1 when sales increase of debt securities is seen. Lately, in 2014 Q4 two more programs have started under asset back securities purchase programme (ABSPP) and covered bond purchase programme (CBPP3). Clearly it affected Lithuanian households' redemption of debt securities. The biggest redemption transactions over the analyzed period are seen as the effect of mentioned programs in 2015 Q1 (see Fig. 12).

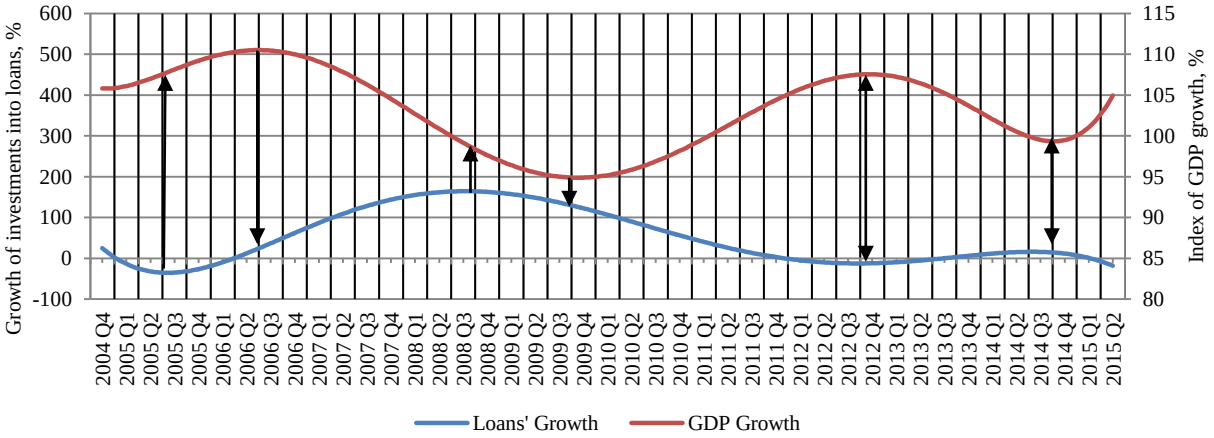


Source: prepared by the author

Fig. 12. Transactions in debt securities asset class (EUR, million)

Above mentioned redemption for 435.14 million EUR has influenced the average growth of investment into debt securities, and it became a negative growth. This 0.85 percent decrease is seen for the first time over the analyzed period. In general, since 2004 downward sloping tendency appears. During the expansion phase the average increase in debt securities stock were 13.36 percent, whereas during the recovery only 3.5 percent increase.

Another financial product that has similar characteristics to debt securities is loans. From the polynomial trendlines it is seen that the growth of investment into loans have similar movement direction as the debt securities do. It can be stated that cycle of loans and business cycle are moving in opposite directions. In expansion and contraction phases growth of loans provided by households were leading the GDP growth. Even thought, in the recovery phase and in the current period two cycles are totally opposite, when GDP is in peak, loans are in trough (see Fig. 13).



Source: prepared by the author

Fig. 13. Business cycle and cycle of investment into loans (%)

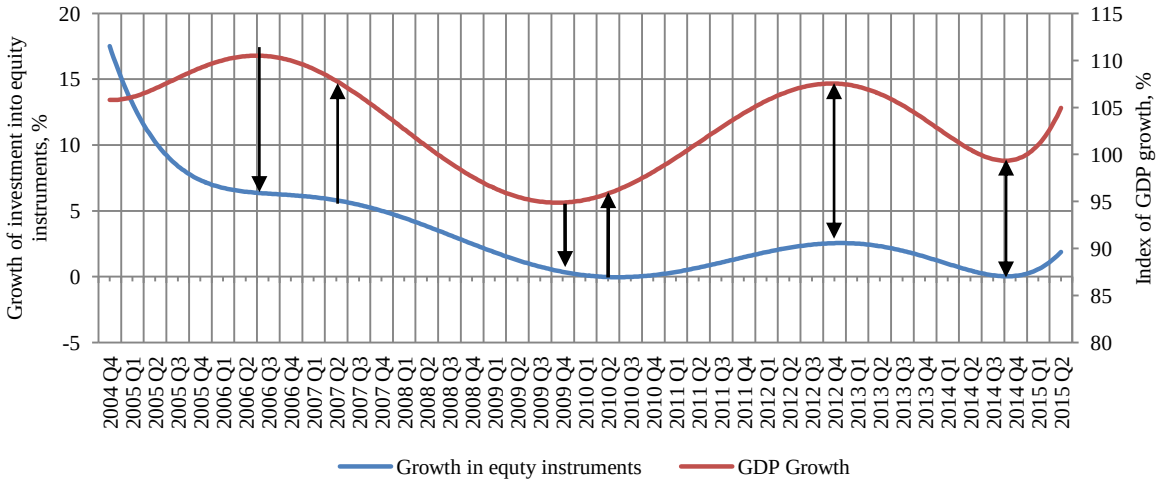
Average growth analysis showed that the average households' investment in loans have been increasing for 34.84 percent during the expansion phase. Whereas, during the contraction phase, when GDP growth was negative by 1.26 percent, loans provided by households have been increasing by 170 percent. Such a huge growth mostly was influenced by transactions in 2008 Q2. For 2008 Q2 transactions reached 0.32 million EUR, comparing with the stock in 2008Q1 that was only 0.01 million EUR. Hence, it is seen that when trough of the business cycle is approaching, households show tendency to give more short term loans. In the recovery phase there is an average growth in stock of loans for 20.79 percent seen. Looking into period since 2011 Q3, the average growth of stock in loans is negative by 0.06 percent which means Lithuanian households increase their borrowing.

Thus, it is seen that households have been borrowing more than has been lending before the peak of business cycle during expansion phase and have been lending more before the trough of the business cycle. During the recovery and in current period it is recognized that households are borrowing the most during the peak of the cycle and lending more in trough.

One more financial asset class in national account system is equity and investment fund shares or units. This particular asset class differs by financial asset characteristic, it has different level of risk. According the analyzed theory Shares are more risky than bonds. Looking into average investment into equity instruments growth there is seen a similar tendency with the business cycle. During the expansion phase stocks and shares grew by 5.27 percent in average, meanwhile GDP average growth was 8.45 percent. During the contraction phase both had negative growth, -0.90 percent decrease in equity instruments and -1.26 percent in GDP. Moreover, in recovery phase investment into equity instruments is increasing in modest way, 2.58 percent.

Equivalent situation is seen from the polynomial graphs (see Fig. 14). In the period since 2004 there is seen decrease in equity instrument acquiring which is related with unfulfilled market expectations when Lithuania has joined the European Union. Thus, in the polynomial trendline there

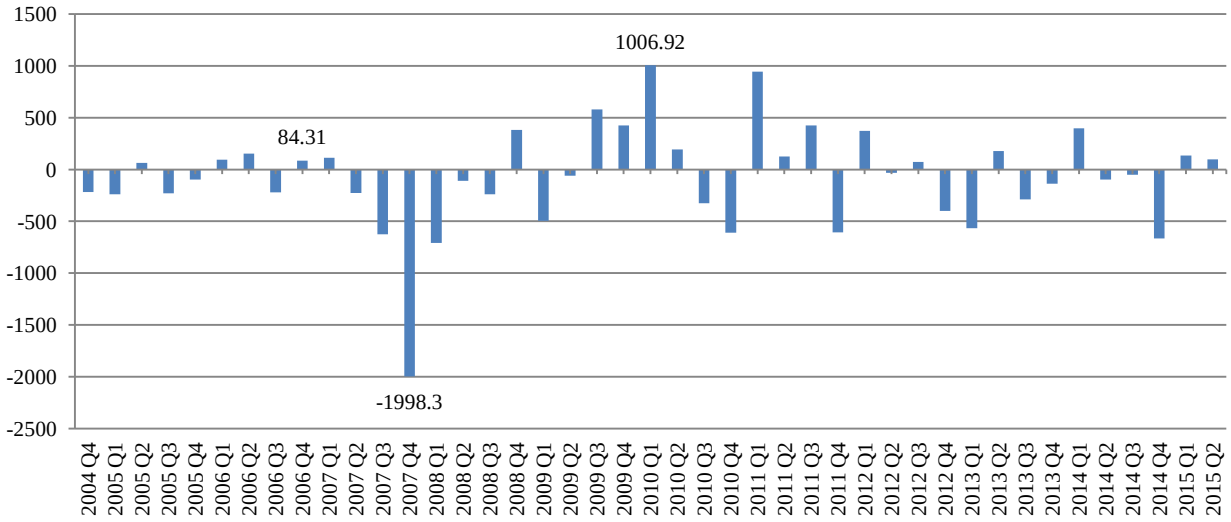
are no clear hills seen in that period which could show if equity cycle leads or lags the business cycle. However, it appears that in the contraction phase of the business cycle, investments into equity products lag the business cycle around two quarters. Despite that, in later cycle phases, contraction and current period, it is identified that investments into equity products match the business cycle and reach the peak as well as the trough at the same period.



Source: prepared by the author

Fig. 14. Business cycle and cycle of investment into equity instruments (%)

Nonetheless, transactions data show a little bit different situation. Since 2004 there are seen higher sales than purchases till 2007Q2 (see Fig. 15). Whereas, the business was in the expansion phase till 2007 Q3 when reached the peak and started to contract. Investment into equity instruments shows significant decrease in 2007 Q3. Moreover, in the last quarter of 2007 there were sold equity instruments for 1998.3 million EUR. Comparing with the same period of previous year households had bought equity and investment fund shares or units for 84.31 million EUR.

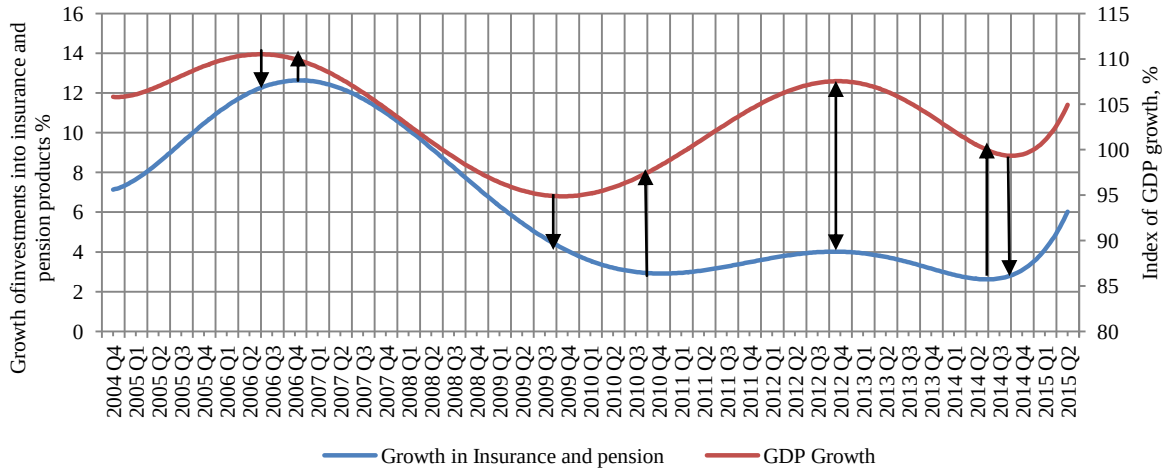


Source: prepared by the author

Fig. 15. Transactions in equity instruments (EUR, million)

Despite that, since 2007 Q4 households' investment flows were negative an upward trend is seen looking into next periods. The highest point of equity purchases is seen in 2010 Q4. Households have purchased shares and fund units for 1006.92 million EUR on that time (see Fig. 15). However, recovery phase started in 2009 Q2 and from the perspective of the most positive time to acquire shares is the time when business cycle is in the lowest point. With two quarters lag households have re-priced risky asset upward and transactions in financial asset class of equity product increased together with the business cycle. During the recovery phase, the downward sloping tendency appears. Since 2010 Q1 when the peak of transaction is reached, amounts invested by households started to decrease with two quarters lag from the business cycle.

Another financial asset class that is a part of Lithuanian financial accounts is insurance, pension and standardized guarantee schemes. Particular asset class includes net equity of households in life insurance reserves, net equity of households in pension funds, amounts outstanding but not earned when premiums are prepaid, and amounts reserved for outstanding claims. Thus, insurance technical reserves reflect the liabilities of insurance companies and pension funds to participants. The rapid growth of participation in investment into insurance, pension and standardized guarantee schemes particularly is related with pension reform in Lithuania. In 2002 The Parliament of the Republic of Lithuania adopted the law regarding reform in Lithuanian pension system. With this law the mandatory funded pension scheme was introduced on January 1st in 2004. Since 2004 the upward trend is seen.



Source: prepared by the author

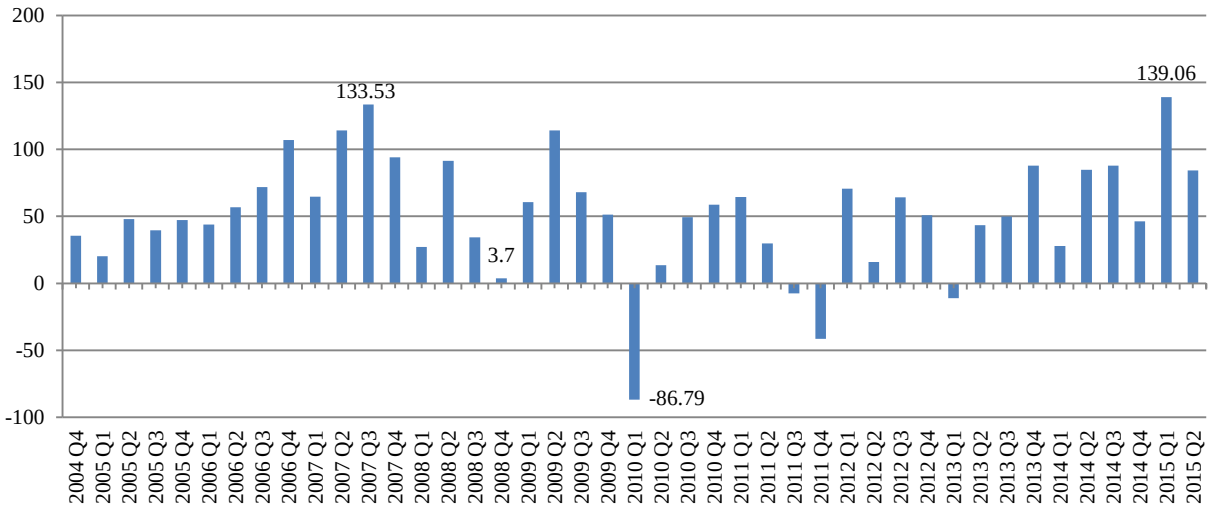
Fig. 16. Business cycle and cycle of investment into insurance, pension and standardized guarantee schemes (%)

Polynomial trendline analysis showed (see Fig. 16) that investment into insurance and pension lagged the business cycle and reached the peak two quarters later during the expansion. In the contraction phase even bigger lag appears. Business cycle had reached the bottom four quarters earlier that the investment into insurance and technical reserves did. Mostly it is related with households'

earnings and unemployment. Unemployment is not decreasing immediately after the expansion phase starts and is not rising immediately when contraction phase starts. Companies want to fully use their existing workforce and wait to hire new employees until are sure that the economy is getting better. Also companies do not want to fire employees until they are sure that it is not a temporary slowdown for the economy. Respectively households' earnings changes lag the business cycle. In the same pattern investments into insurance and pension are moving. However, in the recovery phase business cycle movements match the cycle of investment into insurance and pensions. Moreover, in later periods polynomial trend line shows that particular asset class leads the business cycle.

Similar tendency is seen from average growth analysis. During the expansion phase the average quarterly growth of investments into insurance and technical reserves were 12.45 percent. When GDP growth was negative in contraction phase, growth of investments into mentioned asset class was 4.35 percent. It is relatively high compared with the growth of 2.17 percent during the recovery. In the period since 2011 Q3 the average growth in insurance and pension is 4.25 percent and is higher than real GDP average growth of 3.32 percent.

In approach of transactions, analysis uncovered that almost in all periods insurance, pension and standardised guarantee schemes purchases exceeded redemptions. The highest point in transaction was reached in 2007 Q3, when GDP growth started to slow down and changed direction to downward sloping trend (see Fig. 17).



Source: prepared by the author

Fig. 17. Transactions in Insurance, pension and standardised guarantee schemes (EUR, million)

In 2010 Q1 sales of 86.79 million EUR appear and this is a two quarters lagged effect of decreasing economy. However, since 2010 Q2 insurance and pension purchases exceed sales with some insignificant deviations in 2011 and 2013. Hence, particular analysis show that insurance and pension investment cycle lag the business cycle in the expansion and contraction phases, whereas in the recovery phase these cycles match each others' movements. It is worth mentioning that in 2015 Q1

transactions in investment into insurance and technical reserves reached new peak of 139.06 million EUR purchase which is the highest pint in all the analyzed period.

One more asset class that is included in Lithuanian financial accounts is other accounts receivable/payable. This asset class include wide range of miscellaneous creditor and debtor claims and their relationships which do not fall under the other categories. Such asset class may not be determined as risky, less risky or safe investment. Due to that, particular asset class will not be analyzed.

Behind such cyclical considerations, it appears that different asset classes move separately in approach of business cycle. Accumulation of currency and deposit has a delay tendency comparing to business cycle in the first expansion and contraction phase. Meanwhile in the second expansion phase growth of investment into currency and deposit matches the business cycle and since 2011 leads the business cycle. On the other hand, cycles of investment into debt securities and loans have the same direction of movement. They are moving into opposite direction than the business cycle. Even though, in expansion and contraction phases cycles of debt securities and loans are lagging and reach the bottom two quarters later when the business cycle reaches the top, and vice versa. However, in the second expansion phase mentioned cycles of financial asset classes match the business cycle and reach the bottom and top in opposite way at the same time. Cycle of investment into equity instruments moves in the same direction as business cycle does. Nonetheless, growth of investments into shares delays comparing with the increase of real GDP during the first expansion and first contraction phase. Whereas, during the second expansion phase mentioned two cycles match and it continues since 2011. Cycle of investment into insurance, pension and standardised guarantee schemes has similarities with the cycle of currency and deposit. Both of them have delay tendency in periods of the first expansion and contraction, in the second expansion phase match the business cycle and in the current period since 2011 lead the business cycle. All in all, following points can be made, that different financial asset class direction of movements and their tendencies are formatting cycle of the whole financial asset class. Investment into financial assets reveals lagging position in the expansion and contraction periods of business cycle, whereas in the second expansion phase gains leading position due to currency and deposit also insurance and technical reserves classes leading position.

CONCLUSIONS

1. Household is an economic entity determined as a group of individuals who share their liabilities, pool some, or all, of their income, consume housing and food goods and services collectively. According SNA standards, economic entities that are capable to capture assets and incurring liabilities on their own behalf are grouped in institutional sectors according to their different functions and behaviour. Households are economic entities grouped into one of the five institutional sectors. Main functions of households are to take final consumption and to supply labour. Besides that households save, invest, borrow and lend. Therefore, these economic actions are reflected as financial flows in financial accounts. Financial transactions and financial positions of sectors in the economy are reflected in flow of funds accounts. Financial flows taking place in an economy, through financial accounts is provided at the aggregate level for the whole economy. Flow of funds, or in national accounts terminology, financial account is the final account in the chain of accounts that gathers data of transactions between institutional units.
2. Household as an economic agent acquires assets and incurs liabilities with different levels of risk and liquidity. Households' savings are allocated between investment into capital and/or financial investment respectively. When allocating their assets into financial investment, the economic entity has to choose at what level of risk to invest. Different financial assets have different risk profiles. The SNA provides and recommends financial asset classification scheme in the framework of financial accounts. Such differentiation of financial asset is established for better release the analysis of transactions of institutional units. There are mainly two criteria for classifying financial assets according SNA standards. Liquidity of the asset is one criterion and legal characteristics that describe the form of underlying debtor and creditor relationship are another one. The main financial assets distinguish the currency and deposits, debt securities, shares and other equity (including mutual fund shares), loans, insurance technical reserves.
3. The business cycle is a set of economy fluctuations that may take from one year up to 10-12 years. Beside rich business cycle analysis, often business cycle is measured by real GDP growth. Usually a business cycle would be divided into four phases: expansion, peak, recession, and trough. Most of the times, expansion and peak period last much longer than contraction and trough. Business cycles repeat after each other with the same four phases but each time they are different in length, and depth. Much effort is put to understand and explain the business cycles better to be able to predict the next phase. Knowing what to expect from the economy would provide a certain level of resistance against recessions and sudden economic fluctuations for many economy players: businesses, governments, financial institutions, households and etc. It is of the most importance for the investors to be aware of the market signs to minimize possible loses and maximize possible

gains. Cycle analysis gives investors an opportunity to improve their understanding of the global markets and to have a better sight for critical signs.

4. Real GDP growth rate, measured at current prices, using chain-linking method and seasonally and working days adjusted, is used for identification of business cycle in Lithuania. The results showed that in the analyzed period since the beginning of 2004 till the middle of 2015 Lithuanian economy has experienced all cycle phases. A larger period than one cycle's has been analyzed in this research since there are no strict boundaries where the first expansion had started. In the first expansion phase economy was continuously growing and reached the peak in 2007 Q3. Later, sharp and fast decrease in GDP growth indicated about contraction phase with the trough point in 2009 Q2. In the beginning of 2010 a second expansion phase is determined. Finally, since the end of 2011 Lithuania is experiencing slow down of economic growth, thus in this research it is defined as second contraction phase.
5. Financial assets have improved more than 4 times owned by Lithuanian households during the analyzed period. Financial asset portfolio structure represents inconspicuous fluctuations over last decade. However, there are fluctuations that may be considered as higher financial risk tolerance on behalf of households. Significant development of insurance, pension and standardized guarantee schemes development in portfolio structure is seen. Moreover, investment movements from short to long debt securities, from listed to unlisted shares, also high increase investment fund shares, prove the tendency of greater financial risk-taking.
6. Aggregate households' investment into financial asset may be considered as pro-cyclical. Investments are growing when GDP rises and vice-versa, decreases when GDP falls. In expansion phase households' investment into financial asset growth indicates much larger percentage rise. During recessions, households' financial investments fall far more sharply than aggregate output does. Households' investment into financial asset growth indicates delay on the first expansion phase, and beginning with the trough point, cycle of investment into financial asset starts leading the business cycle.
7. Six analyzed financial asset classes have correlated relationships between leading, coincident and lagging business cycle indicators. A strong tendency of households' increase of investment into financial assets is evident when the coincident indicators are present. Households tend to invest more into financial assets when the economy is expanding rather than when the economy is shrinking. Thus they are not taking benefit from cyclical fluctuations. Households' investments into low-risk assets such as currency and deposits, bonds and other debt instruments are decreasing when average earnings are growing. Households are willing to take higher financial risks as they generate more income. An opposite tendency is seen when unemployment is growing which indicates about present economic contraction. Households are less willing to invest into high-risk

assets as their future employment is less certain. Thus they choose to invest into bonds. Households' investment into equity instruments is mostly affected by leading business cycle indicators. Even though, the decrease of investment into shares and other equity instruments comes with a delay. Investment into insurance products is always rising. Growth is mostly affected by amount of money supply in the market which encourages investing surplus of funds into insurance and pension schemes.

8. Different financial asset classes move separately in approach of business cycle. Their directions of movement and tendencies are formatting the cycle of investment into a whole financial asset class. Investment into financial assets reveals position with a delay in expansion and contraction periods of business cycle, whereas in recovery phase lead position appears due to the leading position of growth of investments into equity and investment fund shares, also insurance and technical reserves classes.

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Kazlauskienė R. *Estimation of households' financial risk-taking over the business cycle in Lithuania* / Final master thesis on financial markets. Supervisor doc. dr. R. J. Vaicenavičius. – Vilnius: Mykolas Romeris University, in cooperation with Middlesex University, Business and Media school, 2015.

ANNOTATION

Households' financial risk-taking over the business cycle in Lithuania analyzed in the final master thesis. The sixth degree polynomial, correlation and multiple regression analysis methods have been used to evaluate habits of households' investment into financial assets. The first chapter of the master thesis covers the concept of a household from the national accounts perspective, importance of financial accounts in a framework of national accounts, different types of financial assets distinguished according to the level of risks involved, concept of a business cycle according to various authors provided. The second chapter of the master thesis includes description of data's availability, methodological clarifying of the research provided. The third chapter of the master thesis provides the analysis of household's financial portfolio structure, investigation of households' investment tendencies economic fluctuations in Lithuania, evaluated the influence of cyclical fluctuations on households' investment into financial assets, using regression analysis. The finishing part of the master thesis provides conclusions of the analysis and evaluation done.

Key words: national accounts, financial accounts, flow of funds, households, financial asset, risk-taking, business cycle.

Kazlauskienė R. *Namų ūkių finansinės rizikos polinkių vertinimas verslo cikle Lietuvoje* / Finansų rinkų magistro baigiamasis darbas. Vadovas doc. dr. R. J. Vaicenavičius. – Vilnius: Mykolo Romerio universitetas, kartu su Middlesex universitetu, Verslo ir medijų mokykla, 2015.

ANOTACIJA

Magistro baigiamajame darbe išanalizuoti namų ūkių finansinės rizikos prisiėmimo polinkiai Lietuvos verslo cikluose. Namų ūkių investavimo į finansinį turtą tendencijos įvertintos šeštojo laipsnio polinomine, koreliacijos, daugianarės tiesinės regresijos analizės metodais. Pirmajame darbo skyriuje nagrinėjama namų ūkių koncepcija nacionalinių sąskaitų aspektu, aiškinama finansinių sąskaitų reikšmė nacionalinių sąskaitų struktūroje, finansinis turtas skirstomas pagal jų rizikos charakteristikas, pateikiama teorinė verslo ciklo samprata. Antrajame darbo skyriuje yra aiškinamas tyrimo duomenų prieinamumas, atliktas tyrimo metodikos pagrindimas. Trečiajame darbo skyriuje yra analizuojama namų ūkių finansinio turto portfelio struktūra, tiriamos investavimo tendencijos Lietuvos ekonomikos cikliniuose svyravimuose. Regresijos analizės būdu įvertinta ekonomikos ciklinių

svyravimų įtaka namų ūkių finansinėms investicijoms. Paskutinėje darbo dalyje yra pateikiamos atliktos analizės ir vertinimo išvados.

Raktiniai žodžiai: nacionalinės sąskaitos, finansinės sąskaitos, finansiniai srautai, namų ūkiai, finansinis turtas, finansinė rizika, verslo ciklas.

Kazlauskienė R. *Estimation of households' financial risk-taking over the business cycle in Lithuania* / Final master thesis on financial markets. Supervisor doc. dr. R. J. Vaicenavičius. – Vilnius: Mykolas Romeris University, in cooperation with Middlesex University, Business and Media school, 2015.

SUMMARY

Master thesis on financial markets is relevant because households take a large share of the economy. Households hold 25 percent of the whole financial assets in Lithuania. Data on households' financial assets is used by governments in setting social protection policies. It is useful to have an indication of how well households are prepared for the future, especially pension provisions, also how households would be able to cope with an economic downturn. However, there are no researches in Lithuania that provide households' financial asset comprehensive analysis. Therefore, in this research the problem – what are the predominating trends of households' investment into financial assets in approach of business cycle phases in Lithuania is raised. The object of the research is financial assets of households in Lithuania. Aim of the research — to estimate households' financial risk-taking over business cycle in Lithuania. Main objectives of the research: to determine the concept of household in approach of System of National Accounts, to distinguish financial asset classes with different level of financial risk, to analyze the theoretical aspects of business cycle, to identify business cycle in Lithuania, to carry out the analysis of predominating trends of households' investment into financial asset over business cycle phases in Lithuania. The methods of the research: systematic study of scientific literature, financial accounts of Lithuania data analysis, Lithuanian economic indicators analysis, graphical data visualization, 6^{th} degree polynomial trendline reasoning, correlation analysis, multiple regression analysis.

Aggregate households' investment into financial assets is found as procyclical. During expansion phase households' investment into financial asset growth indicates much larger percentage rise compared to GDP growth, while during recession periods – fall far more sharply than aggregate output does. Households' investment into financial assets growth indicates delay in the first expansion phase, and since the trough, cycle of investment into financial asset leads the business cycle. Households tend to invest more into financial assets when the economy is expanding rather than when the economy is shrinking. Thus they are not taking benefit from cyclical fluctuations. Such analysis results are important for economists, businesses and policy makers because it reveals households' financial position and their willingness to take financial risk.

The master thesis consists of introduction, theoretical aspects of households' financial risk-taking over business cycle, methodological clarifying of the research, estimation of households' financial investment habits over cyclical fluctuations, conclusions of the whole research work.

Kazlauskienė R. *Namų ūkių finansinės rizikos polinkių vertinimas verslo cikle Lietuvoje* / Finansų rinkų magistro baigiamasis darbas. Vadovas doc. dr. R. J. Vaicenavičius. – Vilnius: Mykolo Romerio universitetas, kartu su Middlesex universitetu, Verslo ir medijų mokykla, 2015.

SANTRAUKA

Finansų rinkų baigiamasis magistro darbas yra aktualus dėl namų ūkių investicijų į finansinį turtą masto. Namų ūkių finansinis turtas šiuo metu sudaro 25 proc. visos Lietuvos ekonomikos finansinio turto. Namų ūkių finansinio turto duomenys yra naudojami valdžios sektoriaus, diegiant socialinės apsaugos programas. Namų ūkių finansinių sąskaitų analizė naudinga siekiant įvertinti namų ūkių finansinį pasiruošimą ateičiai, ypač pasiruošimą pensiniam amžiui, ar tai, kaip gerai jie bus pasiruošę ekonominiams nuosmukiams. Nepaisant to, Lietuvoje nėra visapusiškų tyrimų, kurie tirtų namų ūkių finansinių investicijų polinkius. Dėl to buvo iškelta tyrimo problema – kokios yra namų ūkių finansinių investicijų vyraujančios tendencijos Lietuvos verslo cikluose. Tyrimo objektas – Lietuvos namų ūkių finansinis turtas. Pagrindiniai tyrimo uždaviniai yra: apibrėžti namų ūkių sąvoką nacionalinių sąskaitų sistemos aspektu, išskirti finansinio turto klases pagal jų rizikingumo charakteristikas, išanalizuoti teorinius verslo ciklo aspektus, nustatyti Lietuvos verslo ciklą analizuojamame laikotarpyje, atlikti namų ūkių investavimo į finansinį turtą Lietuvos verslo cikle vyraujančių tendencijų vertinamąją analizę. Tyrimo metodai: sisteminė mokslinės literatūros studija, Lietuvos finansinių sąskaitų duomenų analizė, Lietuvos ekonomikos rodiklių analizė, grafinis duomenų vaizdavimas, koreliacinė analizė, daugianarė tiesinė regresinė analizė.

Bendras namų ūkių investavimas į finansinį turtą yra procikliškas. Ekonominio pakilimo metu investicijos į finansinį turtą auga kur kas sparčiau nei auga BVP. Ekonominių nuosmukių metu – turi spartesnę kritimo tendenciją nei BVP. Namų ūkių finansinių investicijų ciklas atsilieka nuo verslo ciklo ekonomikos pirmojo augimo laikotarpiu. Nuo pasiekto ekonominio dugno pirmojo nuosmukio metu, finansinių investicijų ciklas lenkia verslo ciklą. Namų ūkiai labiau linkę investuoti finansinį turtą ekonominio pakilimo metu. Tokiu būdų negaunama naudos iš ciklinių svyravimų. Šie tyrimo rezultatai yra svarbūs ekonomistams, verslui, įstatymų leidėjams nes nusako namų ūkių finansinę poziciją ir pasiruošimą priimti finansinę riziką.

Magistrinis darbą sudaro įvadas, teoriniai namų ūkių finansinės rizikos polinkiai verslo cikluose aspektai, metodologinis tyrimo pagrindimas, namų ūkių investavimo polinkių cikliniuose svyravimuose vertinimas, viso tyrimo išvados.

ANNEXES

ANNEX 1

TOTAL FINANCIAL ASSET

	Stocks	Total flows	Transactions	Revaluations	Other volume changes	Annualized growth
2003 Q4	8789.1					
2004 Q1	10062.89	1273.79	489.14	786.72	-2.07	71.84
2004 Q2	10923.47	860.58	138.17	724.34	-1.93	38.85
2004 Q3	11219.27	295.8	-57.51	357.64	-4.33	11.28
2004 Q4	11921.5	702.23	-31.07	761.52	-28.22	27.49
2005 Q1	12219.68	298.18	302.6	-1.4	-3.02	10.39
2005 Q2	13180.88	961.2	316.2	646.43	-1.43	35.37
2005 Q3	14564.78	1383.9	113.75	1271.45	-1.3	49.09
2005 Q4	15315.22	750.44	486.13	268.59	-4.28	22.26
2006 Q1	15442.46	127.24	916.1	-787.9	-0.96	3.36
2006 Q2	15514.84	72.38	288.25	-214.75	-1.12	1.89
2006 Q3	16517.59	1002.75	217.82	785.39	-0.46	28.47
2006 Q4	18097.06	1579.47	914.35	664.89	0.23	44.09
2007 Q1	19139.49	1042.43	886.42	157.21	-1.2	25.11
2007 Q2	20071.23	931.74	389.2	543.82	-1.28	20.94
2007 Q3	21793.37	1722.14	158.73	1563.4	0.01	39.00
2007 Q4	21796.31	2.94	-1402.47	1410.62	-5.21	0.05
2008 Q1	23304.96	1508.65	-298.14	1807.99	-1.2	30.70
2008 Q2	25220.2	1915.24	560.2	1355.43	-0.39	37.15
2008 Q3	24930.62	-289.58	-222.46	-64.29	-2.83	-4.51
2008 Q4	24002.61	-928.01	-127.99	-799.77	-0.25	-14.08
2009 Q1	22361.42	-1641.19	-933.45	-707.6	-0.14	-24.67
2009 Q2	21820.03	-541.39	187.96	-722.35	-7	-9.34
2009 Q3	22707.2	887.17	387.13	500.11	-0.07	17.28
2009 Q4	22334.02	-373.18	548.3	-926.75	5.27	-6.41
2010 Q1	22257.82	-76.2	1012.03	-1086.72	-1.51	-1.36
2010 Q2	22745.16	487.34	245.71	244.18	-2.55	9.05
2010 Q3	22858.72	113.56	-252.66	367.27	-1.05	2.01
2010 Q4	24177.64	1318.92	8.34	1257.34	53.24	25.15
2011 Q1	25958.26	1780.62	1624.25	130.3	26.07	32.88
2011 Q2	26133.09	174.83	401.12	-215.11	-11.18	2.72
2011 Q3	26222.91	89.82	573.55	-487.92	4.19	1.38
2011 Q4	25910.72	-312.19	274.36	81.96	-668.51	-4.68
2012 Q1	26226.28	315.56	271.19	48.41	-4.04	4.96
2012 Q2	26814.81	588.53	179.31	429.05	-19.83	9.28
2012 Q3	27244.38	429.57	-118.4	549.21	-1.24	6.56
2012 Q4	27988.91	744.53	534.32	421.5	-211.29	11.39
2013 Q1	28430.34	441.43	-301.66	692.07	51.02	6.46
2013 Q2	28917.04	486.7	601.31	-62.58	-52.03	7.03
2013 Q3	29376.41	459.37	-418.36	882.36	-4.63	6.51
2013 Q4	30648.15	1271.74	830.27	451.91	-10.44	18.47
2014 Q1	30149.61	-498.54	425.06	236.3	-1159.9	-6.35
2014 Q2	30952.7	803.09	907.1	-106.4	2.39	11.09
2014 Q3	31205.11	252.41	147.74	105.89	-1.22	3.30
2014 Q4	30924.53	-280.58	-738.91	464.88	-6.55	-3.55
2015 Q1	32806.82	1882.29	624.11	1260.68	-2.5	26.66
2015 Q2	33364.55	557.73	801.36	-267.32	23.69	6.98

ANNEX 2

BUSINESS CYCLE INDICATORS

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
2003 Q3	20.60	714.00	137.20	64.05	104.21	114.90	4132.30	0.00	12.43		
2003 Q4	19.50	780.00	145.00	65.06	105.48	117.10	4334.45	0.10	11.70		
2004 Q1	20.17	589.00	145.80	65.74	101.82	112.40	4491.50	1.80	11.20		
2004 Q2	18.83	1200.00	146.80	68.41	105.01	120.70	3931.97	0.50	10.80		
2004 Q3	19.07	1085.00	143.20	70.41	107.31	108.30	4504.67	0.60	10.70		
2004 Q4	21.20	1127.00	150.10	71.32	108.47	108.40	4760.82	0.30	10.30	3.85	4.45
2005 Q1	27.00	781.00	145.40	71.79	110.81	105.70	5040.26	1.00	9.30	3.35	4.36
2005 Q2	30.00	1592.00	149.70	75.50	108.95	110.50	4391.10	0.40	8.60	3.19	4.30
2005 Q3	30.03	1484.00	138.70	80.06	109.38	106.30	5176.19	1.30	7.40	3.43	4.36
2005 Q4	30.00	1631.00	146.50	80.44	110.93	105.40	5576.44	0.60	6.90	3.57	4.00
2006 Q1	25.70	1151.00	149.90	81.19	113.17	110.50	5858.63	1.20	6.20	4.02	4.46
2006 Q2	24.20	1923.00	143.00	83.31	114.13	113.00	5040.50	0.70	5.80	4.45	4.99
2006 Q3	24.67	1971.00	139.40	85.02	119.90	104.10	5887.02	1.50	5.60	4.77	4.92
2006 Q4	22.27	2441.00	145.30	81.20	119.12	95.40	6456.91	0.80	5.00	5.04	5.22
2007 Q1	24.37	1760.00	145.30	82.06	120.93	94.30	6694.75	1.70	4.40	5.29	5.49
2007 Q2	25.77	2268.00	139.50	87.36	120.18	99.80	6030.83	1.70	4.30	5.68	5.67
2007 Q3	23.70	2459.00	134.40	89.67	117.92	108.40	7176.09	3.40	4.20	5.89	5.55
2007 Q4	23.23	2313.00	140.60	94.87	118.52	104.50	7834.30	3.40	4.10	5.79	5.45
2008 Q1	19.97	1711.00	136.30	100.00	123.80	108.60	7999.44	3.10	4.10	6.05	6.05
2008 Q2	15.33	2320.00	135.30	106.76	122.50	109.60	7167.34	1.40	4.80	6.35	6.76
2008 Q3	11.73	2141.00	127.40	112.20	119.00	103.00	8483.33	1.20	7.10	6.22	7.20
2008 Q4	3.27	2017.00	125.50	99.27	113.00	98.50	8741.72	2.80	9.00	4.92	6.87
2009 Q1	-1.53	1289.00	109.30	89.98	101.90	87.20	8303.90	-0.20	11.60	4.26	7.42
2009 Q2	-6.17	1642.00	104.40	90.71	97.10	79.60	6395.68	-1.00	14.00	4.09	7.91
2009 Q3	-8.23	1553.00	101.20	90.77	92.30	85.10	7065.63	-0.20	15.40	4.16	8.06
2009 Q4	-0.93	1510.00	103.40	91.15	91.30	93.50	6825.01	1.10	16.60	4.08	8.59
2010 Q1	2.20	1087.00	95.80	95.64	92.60	98.10	6648.50	0.70	17.80	3.74	7.64
2010 Q2	6.93	1719.00	100.20	100.63	94.60	104.10	6285.91	0.20	18.30	3.80	6.63
2010 Q3	9.60	1755.00	99.20	100.21	97.20	107.30	7122.51	1.00	18.00	3.77	6.32
2010 Q4	8.53	1315.00	104.80	103.52	100.20	115.60	7336.92	1.30	17.40	3.77	6.63
2011 Q1	8.93	943.00	104.70	110.30	102.00	112.30	7282.32	2.20	16.40	3.73	7.04
2011 Q2	7.47	1285.00	107.80	114.20	102.50	109.70	6906.67	-0.10	15.60	3.91	6.47
2011 Q3	8.13	1435.00	106.20	115.03	101.60	106.90	7974.24	0.50	14.70	3.86	6.70
2011 Q4	9.40	1161.00	109.40	115.70	102.50	98.10	8348.67	0.90	14.10	3.50	7.31
2012 Q1	13.60	992.00	111.40	119.60	103.20	102.80	8033.51	1.40	13.80	3.15	6.00
2012 Q2	13.97	1469.00	111.00	119.05	102.20	96.20	7480.32	0.30	13.40	2.87	5.77
2012 Q3	13.90	1418.00	107.10	120.77	102.60	106.60	8317.96	0.20	13.10	2.58	5.81
2012 Q4	12.30	1499.00	111.60	118.66	102.60	108.70	8959.75	0.10	12.70	2.45	6.63
2013 Q1	7.03	1517.00	111.10	119.39	104.40	106.40	8576.71	0.50	12.20	2.53	6.42
2013 Q2	6.13	1846.00	112.00	115.97	104.60	109.50	7695.14	-0.50	11.90	2.38	7.07
2013 Q3	4.67	1888.00	110.70	116.93	106.20	100.20	8772.31	0.20	11.70	2.34	7.63
2013 Q4	4.50	1320.00	113.50	114.47	104.80	98.30	9515.48	-0.10	11.40	2.38	7.52
2014 Q1	4.77	1086.00	115.00	113.40	103.70	92.50	8979.30	0.50	11.20	2.43	7.69
2014 Q2	4.57	1671.00	114.70	112.56	104.60	103.60	8184.87	-0.50	10.90	2.23	10.67
2014 Q3	3.67	1810.00	114.30	111.70	104.30	100.40	9204.63	0.10	10.30	2.08	7.22
2014 Q4	1.87	1378.00	117.50	106.30	105.40	103.60	9777.34	-1.70	10.00	2.74	9.73
2015 Q1	27.33	1115.00	117.40	101.20	104.30	104.90	9277.52	1.40	9.10	2.42	6.91
2015 Q2	28.46	1496.00	118.30	104.60	104.60	105.30	8251.54	-0.70	9.50	2.14	9.01

ANNEX 3

ANNUALIZED GROWTH OF BUSINESS CYCLE INDICATORS

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
2003 Q4	19.50	42.42	24.75	6.46	4.97	7.88	21.05	0.40	-21.50		
2004 Q1	20.17	-67.49	2.23	4.24	-13.18	-15.11	15.30	6.97	-16.03		
2004 Q2	18.83	1622.91	2.77	17.32	13.12	32.97	-41.27	-5.01	-13.54		
2004 Q3	19.07	-33.17	-9.45	12.21	9.06	-35.18	72.27	0.40	-3.65		
2004 Q4	21.20	16.41	20.71	5.24	4.39	0.37	24.76	-1.19	-14.14		
2005 Q1	27.00	-76.94	-11.95	2.68	8.93	-9.60	25.63	2.82	-33.54	-42.45	-7.57
2005 Q2	30.00	1626.51	12.36	22.31	-6.55	19.44	-42.39	-2.36	-26.88	-18.45	-5.69
2005 Q3	30.03	-24.50	-26.31	26.49	1.59	-14.36	93.08	3.63	-45.18	34.75	6.03
2005 Q4	30.00	45.91	24.46	1.89	5.78	-3.34	34.71	-2.74	-24.41	16.46	-28.92
2006 Q1	25.70	-75.20	9.61	3.77	8.32	20.81	21.83	2.41	-34.81	60.85	54.05
2006 Q2	24.20	679.14	-17.18	10.86	3.46	9.36	-45.21	-1.96	-23.41	50.20	56.70
2006 Q3	24.67	10.36	-9.70	8.49	21.78	-27.97	86.07	3.22	-13.10	32.41	-5.75
2006 Q4	22.27	135.25	18.04	-16.81	-2.57	-29.47	44.72	-2.73	-36.45	24.64	26.73
2007 Q1	24.37	-72.97	0.00	4.33	6.22	-4.53	15.57	3.62	-40.03	21.37	22.96
2007 Q2	25.77	175.75	-15.04	28.45	-2.48	25.45	-34.15	0.00	-8.79	33.23	13.50
2007 Q3	23.70	38.19	-13.84	10.98	-7.30	39.19	100.47	6.86	-8.98	15.36	-8.42
2007 Q4	23.23	-21.72	19.77	25.27	2.06	-13.63	42.05	0.00	-9.19	-6.62	-6.79
2008 Q1	19.97	-70.06	-11.68	23.48	19.03	16.64	8.70	-1.16	0.00	18.95	52.19
2008 Q2	15.33	238.03	-2.90	29.90	-4.13	3.73	-35.55	-6.43	87.86	21.63	55.83
2008 Q3	11.73	-27.47	-21.39	22.00	-10.95	-22.00	96.26	-0.79	378.71	-7.94	28.44
2008 Q4	3.27	-21.23	-5.83	-38.72	-18.69	-16.36	12.75	6.48	158.19	-60.85	-17.27
2009 Q1	-1.53	-83.32	-42.47	-32.50	-33.87	-38.58	-18.58	-11.17	175.97	-43.97	36.59
2009 Q2	-6.17	163.32	-16.76	3.30	-17.55	-30.56	-64.81	-3.17	112.17	-15.04	28.92
2009 Q3	-8.23	-19.98	-11.71	0.27	-18.35	30.64	48.96	3.27	46.41	7.37	7.98
2009 Q4	-0.93	-10.62	8.98	1.66	-4.26	45.72	-12.94	5.31	35.00	-7.47	28.60
2010 Q1	2.20	-73.15	-26.31	21.22	5.82	21.18	-9.95	-1.57	32.20	-29.64	-37.44
2010 Q2	6.93	525.44	19.68	22.56	8.92	26.80	-20.09	-1.97	11.72	6.95	-43.30
2010 Q3	9.60	8.64	-3.93	-1.67	11.46	12.87	64.84	3.23	-6.40	-3.12	-17.44
2010 Q4	8.53	-68.48	24.57	13.91	12.93	34.72	12.60	1.19	-12.68	0.35	21.12
2011 Q1	8.93	-73.55	-0.38	28.85	7.38	-10.94	-2.94	3.60	-21.08	-4.86	27.14
2011 Q2	7.47	244.80	12.38	14.91	1.98	-8.94	-19.09	-8.70	-18.13	20.77	-28.53
2011 Q3	8.13	55.52	-5.81	2.97	-3.47	-9.83	77.70	2.42	-21.16	-4.36	15.00
2011 Q4	9.40	-57.15	12.61	2.34	3.59	-29.08	20.15	1.60	-15.35	-32.38	41.44
2012 Q1	13.60	-46.70	7.52	14.19	2.76	20.59	-14.27	2.00	-8.24	-34.36	-54.43
2012 Q2	13.97	380.88	-1.43	-1.85	-3.82	-23.31	-24.83	-4.27	-11.10	-31.38	-14.47
2012 Q3	13.90	-13.18	-13.33	5.93	1.57	50.77	52.89	-0.40	-8.66	-34.36	2.33
2012 Q4	12.30	24.88	17.90	-6.81	0.00	8.12	34.62	-0.40	-11.67	-18.66	70.30
2013 Q1	7.03	4.89	-1.78	2.47	7.20	-8.20	-16.03	1.61	-14.84	12.50	-12.07
2013 Q2	6.13	119.27	3.28	-10.97	0.77	12.17	-35.20	-3.92	-9.48	-21.27	47.05
2013 Q3	4.67	9.42	-4.56	3.36	6.26	-29.88	68.88	2.84	-6.56	-6.56	35.63
2013 Q4	4.50	-76.11	10.51	-8.16	-5.17	-7.37	38.44	-1.19	-9.87	7.62	-5.81
2014 Q1	4.77	-54.18	5.39	-3.70	-4.13	-21.59	-20.70	2.42	-6.84	8.66	9.16
2014 Q2	4.57	460.51	-1.04	-2.91	3.52	57.35	-30.96	-3.92	-10.29	-29.88	270.82
2014 Q3	3.67	37.66	-1.39	-3.05	-1.14	-11.79	59.95	2.43	-20.27	-23.86	-79.05
2014 Q4	1.87	-66.40	11.68	-17.96	4.29	13.37	27.31	-7.00	-11.15	201.13	230.90
2015 Q1	27.33	-57.14	-0.34	-17.88	-4.11	5.11	-18.93	13.22	-31.43	-39.15	-74.65
2015 Q2	28.46	224.06	3.10	14.16	1.16	1.53	-37.42	-8.03	18.78	-39.23	189.19

ANNEX 4

ANNUALIZED GROWTH OF BUSINESS CYCLE INDICATROS AFTER EXPONENTIAL SMOOTHING

(Independent variables)

	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11
2004 Q1	20.38	42.42	24.75	6.46	4.97	7.88	21.05	0.40	-21.50		
2004 Q2	20.34	20.44	20.25	6.01	1.34	3.28	19.90	1.71	-20.41		
2004 Q3	20.04	340.94	16.75	8.27	3.70	9.22	7.67	0.37	-19.03		
2004 Q4	19.84	266.12	11.51	9.06	4.77	0.34	20.59	0.37	-15.96		
2005 Q1	20.11	216.17	13.35	8.30	4.69	0.35	21.42	0.06	-15.59	-42.45	-7.57
2005 Q2	21.49	157.55	8.29	7.17	5.54	-1.64	22.26	0.61	-19.18	-42.45	-7.57
2005 Q3	23.19	451.34	9.11	10.20	3.12	2.57	9.33	0.02	-20.72	-37.65	-7.19
2005 Q4	24.56	356.17	2.02	13.46	2.82	-0.81	26.08	0.74	-25.61	-23.17	-4.55
2006 Q1	25.65	294.12	6.51	11.14	3.41	-1.32	27.81	0.05	-25.37	-15.24	-9.42
2006 Q2	25.66	220.26	7.13	9.67	4.39	3.11	26.61	0.52	-27.26	-0.02	3.27
2006 Q3	25.37	312.03	2.27	9.91	4.20	4.36	12.25	0.02	-26.49	10.02	13.96
2006 Q4	25.23	251.70	-0.12	9.62	7.72	-2.11	27.01	0.66	-23.81	14.50	10.01
2007 Q1	24.64	228.41	3.51	4.34	5.66	-7.58	30.55	-0.02	-26.34	16.53	13.36
2007 Q2	24.58	168.13	2.81	4.34	5.77	-6.97	27.56	0.71	-29.08	17.50	15.28
2007 Q3	24.82	169.66	-0.76	9.16	4.12	-0.49	15.22	0.57	-25.02	20.64	14.92
2007 Q4	24.59	143.36	-3.38	9.52	1.84	7.45	32.27	1.83	-21.81	19.58	10.25
2008 Q1	24.32	110.35	1.25	12.67	1.88	3.23	34.22	1.46	-19.29	14.34	6.85
2008 Q2	23.45	74.27	-1.34	14.83	5.31	5.91	29.12	0.94	-15.43	15.26	15.91
2008 Q3	21.83	107.02	-1.65	17.85	3.42	5.48	16.18	-0.54	5.23	16.54	23.90
2008 Q4	19.81	80.12	-5.60	18.68	0.55	-0.02	32.20	-0.59	79.92	11.64	24.81
2009 Q1	16.50	59.85	-5.64	7.20	-3.30	-3.29	28.31	0.83	95.58	-2.86	16.39
2009 Q2	12.89	31.22	-13.01	-0.74	-9.41	-10.34	18.93	-1.57	111.66	-11.08	20.43
2009 Q3	9.08	57.64	-13.76	0.07	-11.04	-14.39	2.18	-1.89	111.76	-11.87	22.13
2009 Q4	5.62	42.11	-13.35	0.11	-12.50	-5.38	11.54	-0.86	98.69	-8.02	19.30
2010 Q1	4.31	31.57	-8.88	0.42	-10.86	4.84	6.64	0.37	85.95	-7.91	21.16
2010 Q2	3.89	10.62	-12.37	4.58	-7.52	8.11	3.32	-0.01	75.20	-12.26	9.44
2010 Q3	4.50	113.59	-5.96	8.17	-4.23	11.85	-1.36	-0.41	62.51	-8.42	-1.11
2010 Q4	5.52	92.60	-5.55	6.20	-1.09	12.05	11.88	0.32	48.72	-7.36	-4.38
2011 Q1	6.12	60.38	0.47	7.75	1.71	16.58	12.02	0.50	36.44	-5.82	0.72
2011 Q2	6.68	33.60	0.30	11.97	2.84	11.08	9.03	1.12	24.94	-5.62	6.01
2011 Q3	6.84	75.84	2.72	12.56	2.67	7.08	3.41	-0.85	16.32	-0.35	-0.90
2011 Q4	7.10	71.77	1.01	10.64	1.44	3.70	18.26	-0.19	8.83	-1.15	2.28
2012 Q1	7.56	45.99	3.33	8.98	1.87	-2.86	18.64	0.17	3.99	-7.40	10.11
2012 Q2	8.77	27.45	4.17	10.02	2.05	1.83	12.06	0.53	1.55	-12.79	-2.80
2012 Q3	9.81	98.14	3.05	7.65	0.88	-3.20	4.68	-0.43	-0.98	-16.51	-5.13
2012 Q4	10.63	75.87	-0.23	7.30	1.02	7.60	14.32	-0.42	-2.52	-20.08	-3.64
2013 Q1	10.96	65.68	3.40	4.48	0.81	7.70	18.38	-0.42	-4.35	-19.79	11.15
2013 Q2	10.17	53.52	2.36	4.08	2.09	4.52	11.50	-0.01	-6.45	-13.33	6.51
2013 Q3	9.37	66.67	2.55	1.07	1.83	6.05	2.16	-0.79	-7.05	-14.92	14.61
2013 Q4	8.43	55.22	1.12	1.53	2.71	-1.14	15.51	-0.07	-6.95	-13.25	18.82
2014 Q1	7.64	28.95	3.00	-0.41	1.14	-2.38	20.09	-0.29	-7.54	-9.08	13.89
2014 Q2	7.07	12.33	3.48	-1.07	0.08	-6.23	11.93	0.25	-7.40	-5.53	12.95
2014 Q3	6.57	101.96	2.58	-1.44	0.77	6.49	3.35	-0.58	-7.98	-10.40	64.52
2014 Q4	5.99	89.10	1.78	-1.76	0.39	2.83	14.67	0.02	-10.43	-13.09	35.81
2015 Q1	5.16	58.00	3.76	-5.00	1.17	4.94	17.20	-1.38	-10.58	29.75	74.83
2015 Q2	9.60	34.97	2.94	-7.57	0.11	4.98	9.97	1.54	-14.75	15.97	44.93

ANNEX 5

DATA OFFIANCIAL ASSET CLASSES

(Dependent variables)

	Y1			Y2			Y3		
	Value	Annualized growth	Smoothed Growth	Value	Annualized growth	Smoothed Growth	Value	Annualized growth	Smoothed Growth
2003 Q4	3244.79			94.34			0.76		
2004 Q1	3397.81	20.24		7.11	-100.00		0.75	-5.16	
2004 Q2	3485.36	10.71	20.24	6.03	-48.26	-100.00	0.74	-5.23	-5.16
2004 Q3	3564.75	9.43	18.33	20.03		-89.65	0.73	-5.30	-5.17
2004 Q4	3887.79	41.48	16.55	185.69		-71.72	0.73	0.00	-5.20
2005 Q1	4071.66	20.30	21.54	172.50	-25.53	-57.38	0.01	-100.00	-4.16
2005 Q2	4395.67	35.84	21.29	296.01	767.10	-51.01	0.01	0.00	-23.33
2005 Q3	4576.11	17.46	24.20	331.37	57.05	112.62	0.01	0.00	-18.66
2005 Q4	5203.99	67.25	22.85	424.81	170.10	101.50	0.01	0.00	-14.93
2006 Q1	5373.62	13.69	31.73	330.50	-63.36	115.22	0.01	0.00	-11.94
2006 Q2	5581.49	16.39	28.12	277.38	-50.38	79.50	0.06		-9.55
2006 Q3	5932.28	27.61	25.78	414.31	397.74	53.53	0.06	0.00	-7.64
2006 Q4	6614.42	54.55	26.14	442.45	30.06	122.37	0.01	-99.92	-6.12
2007 Q1	6981.30	24.10	31.83	495.99	57.92	103.91	0.01	0.00	-24.88
2007 Q2	7395.35	25.92	30.28	369.91	-69.06	94.71	0.01	0.00	-19.90
2007 Q3	7639.18	13.85	29.41	509.72	260.53	61.96	0.02	1500.00	-15.92
2007 Q4	8186.63	31.90	26.30	589.91	79.40	101.67	0.04	1500.00	287.26
2008 Q1	8199.17	0.61	27.42	417.19	-74.99	97.22	0.02	-93.75	529.81
2008 Q2	8554.65	18.50	22.06	463.74	52.67	62.78	0.34		405.10
2008 Q3	8695.84	6.77	21.35	296.60	-83.27	60.76	0.35	12.29	324.08
2008 Q4	8612.05	-3.80	18.43	384.08	181.19	31.95	0.36	11.93	261.72
2009 Q1	8401.00	-9.45	13.98	534.81	275.93	61.80	0.36	0.00	211.76
2009 Q2	8315.26	-4.02	9.30	766.05	320.95	104.63	0.36	0.00	169.41
2009 Q3	8191.27	-5.83	6.63	925.95	113.46	147.89	0.05	-99.96	135.53
2009 Q4	8634.97	23.49	4.14	862.06	-24.87	141.01	0.03	-87.04	88.43
2010 Q1	8643.40	0.39	8.01	907.82	22.98	107.83	0.03	0.00	53.34
2010 Q2	8845.63	9.69	6.49	974.44	32.75	90.86	0.03	0.00	42.67
2010 Q3	8757.17	-3.94	7.13	736.95	-67.29	79.24	0.03	0.00	34.14
2010 Q4	9218.14	22.78	4.91	886.94	109.81	49.93	0.06	1500.00	27.31
2011 Q1	9133.73	-3.61	8.49	838.73	-20.03	61.91	0.10	671.60	321.85
2011 Q2	9298.43	7.41	6.07	921.14	45.48	45.52	0.09	-34.39	391.80
2011 Q3	9347.24	2.12	6.34	962.51	19.21	45.51	0.08	-37.57	306.56
2011 Q4	9422.66	3.27	5.49	947.93	-5.92	40.25	266.19		17.05
2012 Q1	9424.78	0.09	5.05	651.31	-77.71	31.02	260.22	-2.24	11.94
2012 Q2	9737.50	13.95	4.06	821.47	153.06	9.27	258.58	-0.63	7.68
2012 Q3	9840.64	4.30	6.03	594.97	-72.48	38.03	258.06	-0.20	5.19
2012 Q4	10306.51	20.32	5.69	854.51	325.49	15.93	241.36	-6.47	3.57
2013 Q1	10253.55	-2.04	8.62	819.75	-15.31	77.84	241.21	-0.06	0.56
2013 Q2	10356.15	4.06	6.48	907.72	50.34	59.21	259.38	7.53	0.37
2013 Q3	10366.55	0.40	6.00	793.88	-41.49	57.44	257.81	-0.61	2.52
2013 Q4	10862.32	20.55	4.88	1016.61	168.90	37.65	258.57	0.29	1.58
2014 Q1	10718.49	-5.19	8.01	922.36	-32.24	63.90	235.97	-8.74	1.20
2014 Q2	10789.30	2.67	5.37	918.96	-1.47	44.67	259.91	10.15	-1.78
2014 Q3	10716.55	-2.67	4.83	665.45	-72.50	35.45	260.30	0.15	1.79
2014 Q4	11113.91	15.68	3.33	750.53	61.81	13.86	260.64	0.13	1.30
2015 Q1	11303.09	6.98	5.80	451.34	-86.92	23.45	260.49	-0.06	0.95
2015 Q2	11500.87	7.19	6.04	541.57	107.30	1.37	260.45	-0.02	0.65

	Y4			Y5			Y6		
	Value	Annualized growth	Smoothed Growth	Value	Annualized growth	Smoothed Growth	Value	Annualized growth	Smoothed Growth
2003 Q4	3682.43			193.68			1573.10		
2004 Q1	4629.03	149.70		190.89	-5.64		1837.30	86.08	
2004 Q2	5208.00	60.22	149.70	225.67	95.33	-5.64	1997.65	39.75	86.08
2004 Q3	5488.19	23.32	131.81	249.97	50.54	14.55	1895.43	-18.95	76.81
2004 Q4	5898.28	33.41	110.11	285.61	70.43	21.75	1663.34	-40.69	57.66
2005 Q1	5607.12	-18.33	94.77	305.84	31.49	31.49	2062.50	136.40	37.99
2005 Q2	6212.50	50.70	72.15	353.89	79.27	31.49	1922.75	-24.47	57.67
2005 Q3	7259.50	86.45	67.86	393.45	52.79	41.04	2004.26	18.07	41.24
2005 Q4	7464.11	11.76	71.58	440.70	57.40	43.39	1781.51	-37.58	36.61
2006 Q1	6880.87	-27.78	59.61	486.40	48.39	46.19	2370.61	213.54	21.77
2006 Q2	6906.29	1.49	42.13	541.77	53.92	46.63	2207.49	-24.81	60.12
2006 Q3	7418.90	33.16	34.01	615.90	67.02	48.09	2135.45	-12.43	43.14
2006 Q4	8215.69	50.39	33.84	724.89	91.89	51.88	2097.06	-7.00	32.02
2007 Q1	8572.02	18.51	37.15	789.01	40.36	59.88	2296.81	43.90	24.22
2007 Q2	8971.29	19.97	33.42	903.05	71.60	55.98	2423.21	23.90	28.16
2007 Q3	9919.56	49.47	30.73	1017.66	61.27	59.10	2696.69	53.38	27.30
2007 Q4	9398.90	-19.40	34.48	1103.87	38.44	59.53	2485.69	-27.81	32.52
2008 Q1	10598.21	61.67	23.70	1117.43	5.00	55.32	2958.16	100.59	20.45
2008 Q2	11760.35	51.62	31.30	1208.01	36.58	45.25	3214.51	39.44	36.48
2008 Q3	11496.26	-8.68	35.36	1224.80	5.68	43.52	3215.90	0.17	37.07
2008 Q4	11259.49	-7.99	26.55	1197.79	-8.53	35.95	2548.09	-60.59	29.69
2009 Q1	9905.54	-40.10	19.64	1252.20	19.45	27.05	2266.66	-37.38	11.64
2009 Q2	9070.29	-29.70	7.70	1363.68	40.65	25.53	2303.23	6.61	1.83
2009 Q3	10098.00	53.62	0.22	1458.77	30.95	28.56	2032.03	-39.41	2.79
2009 Q4	9421.94	-24.21	10.90	1524.52	19.28	29.04	1889.95	-25.17	-5.65
2010 Q1	9031.22	-15.58	3.88	1449.95	-18.18	27.09	2225.16	92.15	-9.56
2010 Q2	9121.57	4.06	-0.02	1457.49	2.10	18.03	2345.75	23.50	10.79
2010 Q3	9447.66	15.08	0.80	1526.12	20.21	14.85	2390.38	7.83	13.33
2010 Q4	10052.66	28.18	3.66	1602.23	21.49	15.92	2402.71	2.08	12.23
2011 Q1	11352.52	62.65	8.56	1663.48	16.19	17.03	2964.62	131.78	10.20
2011 Q2	11260.62	-3.20	19.38	1689.01	6.28	16.86	2959.62	-0.67	34.51
2011 Q3	11218.58	-1.49	14.86	1644.49	-10.13	14.75	3047.84	12.47	27.48
2011 Q4	10617.18	-19.78	11.59	1900.52	78.39	9.77	2753.94	-33.34	24.48
2012 Q1	11139.70	21.19	5.32	2003.27	23.44	23.49	2743.69	-1.48	12.91
2012 Q2	11328.55	6.96	8.49	2007.54	0.86	23.48	2658.73	-11.82	10.03
2012 Q3	11880.09	20.94	8.19	2114.23	23.01	18.96	2553.41	-14.93	5.66
2012 Q4	11651.31	-7.48	10.74	2183.44	13.75	19.77	2749.59	34.46	1.54
2013 Q1	11886.08	8.31	7.09	2192.63	1.69	18.57	3035.10	48.46	8.13
2013 Q2	12096.15	7.26	7.34	2198.13	1.01	15.19	3098.20	8.58	16.19
2013 Q3	12612.25	18.19	7.32	2277.85	15.32	12.35	3066.44	-4.04	14.67
2013 Q4	12904.20	9.59	9.49	2378.01	18.78	12.95	3226.52	22.57	10.93
2014 Q1	12384.32	-15.17	9.51	2423.95	7.95	14.11	3462.61	32.64	13.26
2014 Q2	12385.30	0.03	4.58	2545.65	21.65	12.88	4050.94	87.33	17.13
2014 Q3	12436.58	1.67	3.67	2653.92	18.13	14.63	4468.69	48.08	31.17
2014 Q4	12097.66	-10.46	3.27	2782.72	20.87	15.33	3916.73	-40.98	34.56
2015 Q1	13195.86	41.56	0.52	3038.04	42.07	16.44	4554.65	82.86	19.45
2015 Q2	13137.29	-1.76	8.73	3036.65	-0.18	21.57	4886.07	32.44	32.13

ANNEX 6

RESULTS OF CORRELATION ANALYSIS

		Y1	Y2	Y3	Y4	Y5	Y6
X1	Pearson correlation		.008	.059	.623**	.776**	.580**
	p-value	O	.957	.700	.000	.000	.000
	t-distribution		0	1	22	42	19
X2	Pearson correlation	.687**	.009	-.274	.591**	.524**	.506**
	p-value	.000	.954	.069	.000	.000	.000
	t-distribution	28	0	-6	20	16	15
X3	Pearson correlation	.317*	-.703**	-.327*	.720**	-.124	.739**
	p-value	.034	.000	.028	.000	.417	.000
	t-distribution	8	-30	-8	32	-3	35
X4	Pearson correlation	.494**	-.017	.438**	.338*	.403**	.315*
	p-value	.001	.912	.003	.023	.006	.035
	t-distribution	14	0	12	8	10	8
X5	Pearson correlation	-.522**	-.374*	-.081	.413**	.302*	.589**
	p-value	.000	.011	.597	.005	.044	.000
	t-distribution	15	-9	-2	11	7	19
X6	Pearson correlation	-.191	-.248	.235	-.019	-.287	.156
	p-value	.208	.100	.120	.901	.056	.307
	t-distribution	-4	-6	5	0	-7	3
X7	Pearson correlation	.670**	.061	.217	.299*	.602**	.252
	Sig. (2-tailed)	.000	.692	.152	.046	.000	.095
	Student's statistic	26	1	5	7	20	6
X8	Pearson correlation	.417**	-.242	.163	.390**	.256	.454**
	p-value	.004	.110	.285	.008	.089	.002
	t-distribution	11	-6	4	10	6	12
X9	Pearson correlation	-.462**	.338*	.280	-.407**	-.253	-.558**
	p-value	.001	.023	.063	.006	.094	.000
	t-distribution	-13	8	7	-10	-6	-17
X10	Pearson correlation	.273	.247	.344*	-.273	.413**	.074
	p-value	.080	.115	.026	.081	.007	.640
	t-distribution	6	5	8	-6	10	1
X11	Pearson correlation	-.246	-.047	-.010	-.424**	-.143	-.047
	p-value	.116	.766	.948	.005	.366	.767
	t-distribution	-5	-1	0	-10	-3	-1

Where: ** – correlation is significant at the 0.01 level (2-tailed);
* – correlation is significant at the 0.05 level (2-tailed);
O – M2 includes currency and deposits (X1 includes Y1);
Student's statistics value is 2.007, when n=45;
Student's statistics value is 2.021, when n=42.

ANNEX 7

RESULTS OF REGRESSION ANALYSIS

		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
Y1	Intercept	-.635	1.877		-.338	.737
	X2	.046	.009	.510	5.262	.000
	X4	.243	.186	.146	1.309	.199
	X5	-.327	.436	-.157	-.750	.458
	X7	.484	.096	.472	5.054	.000
	X8	1.230	1.142	.103	1.077	.288
	X9	-.034	.046	-.147	-.724	.474
Y2	Intercept	71.001	7.456		9.523	.000
	X3	-8.766	1.253	-1.102	-6.994	.000
	X5	-1.427	2.484	-.115	-.574	.569
	X9	.839	.299	.620	2.809	.008
Y3	Intercept	-53.526	39.482		-1.356	.183
	X3	-8.071	3.084	-.334	-2.617	.013
	X4	16.626	3.732	.677	4.455	.000
	X10	2.556	1.267	.309	2.017	.051
Y4	Intercept	-9.654	4.691		-2.058	.047
	X1	1.767	.356	.628	4.967	.000
	X2	.059	.027	.259	2.193	.035
	X3	2.559	.592	.675	4.325	.000
	X5	.887	.847	.182	1.047	.302
	X9	-.217	.092	-.407	-2.357	.024
	X11	-.157	.102	-.121	-1.547	.131
Y5	Intercept	4.947	1.934		2.558	.015
	X1	1.758	.239	.911	7.365	.000
	X2	.017	.014	.107	1.171	.250
	X4	.018	.158	.007	.114	.910
	X5	.807	.206	.242	3.917	.000
	X7	.017	.132	.010	.130	.897
	X10	.251	.054	.268	4.674	.000
Y6	Intercept	7.625	4.508		1.692	.099
	X1	.835	.374	.334	2.230	.032
	X2	.010	.026	.055	.398	.692
	X3	2.124	.417	.758	5.097	.000
	X5	.234	.854	.054	.274	.786
	X8	3.668	2.720	.147	1.348	.186
	X9	-.160	.098	-.335	-1.628	.112

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