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FINANCIAL INVESTMENT TIMING STRATEGIES UNDER THE INFLUENCE OF COUNTRIES ECONOMICAL CYCLE. THE CASE OF LITHUANIA

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Abstract

After the analysis of scientific studies and evaluation of available research results, which all of them confirm the investors' financial management efficiency based on well timed management of investment decisions, main problem is identified - investor's choice of investment instruments under influence of different economic cycle periods. The purpose of article defined – to select the appropriate financial investment timing strategies according countries economical cycle stages, based on the case of Lithuania economical cycle. After the financial investment timing strategies analysis, equity shares and funds were assigned for economic growth period; meanwhile commodities, bonds and deposits in the banks were assigned for recession period. The results of Hodrick-Prescott filter application showed, that Lithuanian economical cycle continued from 2004 Q2 till 2010 Q1. These periods can be viewed as the effective timescales of financial investment and strategies defined can be used to reflect investment decisions according country's economical cycle. Research methods used are based on systematic literature analysis, mathematical statistics methods, logical comparative and generalization analysis.

Keywords: Countries economical cycle, Hodrick-Prescott filter, investment strategies, investment timing.

JEL Classification: *E32, G11, C41.*

Introduction

After the overlook of science studies and evaluation of problematic analyses, which all of them confirm the investors' financial management efficiency based on well timed management of investment decisions, main problem is identified - investor's choice of investment instruments on the influence of different economic cycle periods. According to today's society, importance of financial management solutions reached the one of the highest points. As a rule, investment decisions make a huge influence for individuals or for the companies they are holding in.

Varanauskienė (2009) and Cibulskienė (2009) argues that basically companies plan, run, monitor, evaluate profitability and efficiency of investment decisions, even special working groups and/or committees are organized. Investor is faced with several problems: the fact of investing, objectives of investment, structure and diversification of portfolio, relevant investment term selection, its duration as well, of course, investment instruments and asset allocation issues. Considering these facts, the purpose of article defined – to summarize countries economical cycles, specify their types and identification, and also generalize investment actions on the influence of Lithuania economical cycle.

After the assessment of the need to invest, main problem is identified – the time when investor should start using more efficient and improved investment instruments, which generate sustainable cash flows, the term for investment and the best moment to capture profits. According to the literature authors (Bailard, 1992), one possible way to solve this problem is to understand and follow country's economic cycles. Misienė (2000) argues that economic progress of each country is very important part of economical policy. Nor the car can't run increasing speed constantly, neither the country can't has steady economics – what's way the volume of gross domestic product (hereinafter, GDP) continually changing – after the boom recession is coming, and after it, economic rises again. Basically, whole GDP is growing, however fluctuations are inherent for it's growth and this cyclical nature is known as economic cycle. In the context of country, this phenomenon comes like periodic fluctuations of economy, in other words – the process of vicissitude of expansion and recession.

In fact, several economic variables outstrip countries economical cycle, what's way it is possible to forecast a trend of cycle. This is the main idea of advanced ratio called Composite Leading Index (OECD), which is a multiple average index of several economical advanced variables. However there is opportunity to calculate economical cycle trend using Hodrick-Prescott filter and to make investment portfolio management decisions. According to Greenwood (2000) and Griffin (2003), during different stages of economical cycle

not only activity of investors, profitability and risk of investment are changing, but even the types of investment instruments. Authors propose to allocate and keep more risky instruments with higher profitability during the first part of cycle, meanwhile reallocate instruments during contraction stage into assets which are not sensitive (or sensitive is very small) for external economic factors and to capture profit from investment what was done before.

In the second part of this article, there is Lithuania economical cycle identified using Hodrick-Prescott filter and investment instruments applied considering countries cycle' stages.

1. Countries economical cycle and its' identification

According to Lakštutienė, Krušinskas, Platenkovienė (2011), economic (sometimes called "business") cycle research is one of the most popular topics of scientific literature discussions over the last years encompassing global economy long-term grow and recession starting from 2007. O'Sullivan (2003) argues, that business cycle or economical cycle is mostly associated with verity of economical fluctuations of industry or activity of economics during several months or years. These fluctuations are coming from growth of trend in long term and usually are changing between fast economic expansion or boom and stagnation, in other words called recession. Usually these fluctuations are measuring by GPD variations and despite the fact of fixed time terms most of all fluctuations don't occur mechanically or predicting the change of period. Schumpeter (2003) and other authors described typologies of economical cycles considering their periodicity and group them like listed below:

- Kitchin inventory cycle – 3-5 years;
- Juglar fixed investment cycle – 7-11 years;
- Kuznets infrastructure investment cycle 15-20 years;
- Kondratiev'o wave or technological cycle – 45-60 years.

According to Schumpeter (2003), economic cycles are not simply aggregated economic fluctuations. There are critical features differentiating economical cycles from earlier commercial shocks or from seasonal variations which have wide range variety of aggregated economy fluctuations, in other words, the mix of industry, commerce or other relations with financial sectors. It is an inter-related part that's way understanding of economic cycles must be analyzed like network of macroeconomic factors. Schumpeter (2003) continues, that these cycles is one of the main macroeconomic problems, because fluctuations are appreciable in all countries economic. When economy is growing fast, almost all countries markets and sectors, welfare of the capital owners or people are growing too, meanwhile economy is falling, sales are decreasing almost in all sectors, industry are declining and unemployment rate is growing.

Basically five issues of economical cycle is described: total economic activity, expansion and contraction, overall movement, constantly repeated, however irregular, inertia. Slater (2002) and Schumpeter (2003) assume, that economic cycles are described as total or aggregated activities of economy' fluctuations, but not like specific variable of economy, for example GDP fluctuations. Despite the fact, that GDP perhaps is the only one variable, which could reflect total economic activity best; these authors thought that it is important to evaluate unemployment and other financial market indicators.

Typical economic cycle diagram (see Figure 1) explains Baxter and King (1999) expansions and contractions theories. The dotted line shows the trajectory of averaged (or normal) multiple economic growths; the solid curve shows the changing of actual business activity. Račickas and Vasiliauskaitė (2010) argue, that every country's economy after a long boom will inevitably face a recession stage, after which the re-start of economic growth will occur. In different countries only the phase of economic cycle and its frequency of recurrence differ. According to Dornbusch, Fischer and Starts (1998), all business cycles have the same four different phases: depression, recovery, boom and slump. The most important of these phases is the recovery and slump, also known as expansion and contraction (or deceleration).

All this sequence (or fluctuations) is the country economic cycle.

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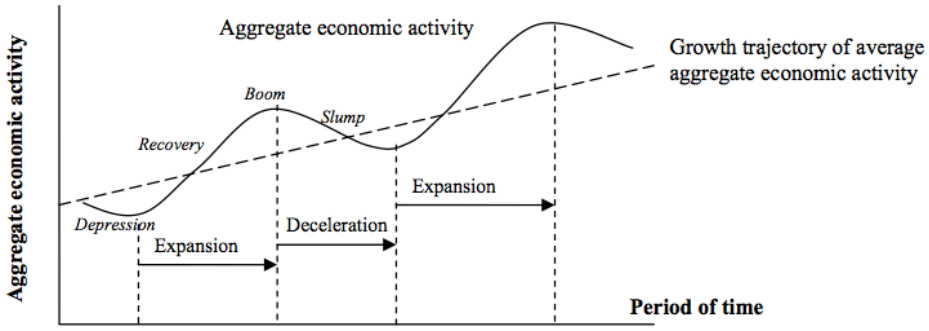

Figure 1. Diagram of typical countries economic cycle

According to Campbell (1997) all peak and trough points of countries economical cycle are called turning points. The aim of all countries economical cycle analysis is to define turning points. As was mentioned before, aggregated economy can't be valuated directly by one ratio, that is way there is no simple formula to define turning points. Practically, there are multiple ratios and indexes analyzed to understand and define if the turning points were reached and if they were, when it happened.

Baxter (1999) maintains Slater (2002) and Schumpeter (2003) propositions and assumes that economical cycles can't be recognized only in several sectors or markets and can't be reflected by only one or several ratios. Author argues, that expansions and contractions are traced at the same tame almost in all sectors. All these co-movements involve economical indexes, prices, productivity, investments, national purchases and regulations, etc. A tendency of fluctuations has persistence, that's way all these co-movements can be forecasted and decisions can be timely made.

Till 7-decade economists generally believed, that countries economical cycles are temporally events. According to this approach, after the recession, expansion always reached the same level as was before contraction. In this case, despite the fact that contraction has short-term problems, these problems do not affect countries economic in long term. Baxter (1999) describes Charles Nelson approach that countries economical cycles are not temporary events. Instead, typical contraction leads a certain permanent decrease of manufacture. Statistical techniques were applied and results showed, that in every variable, except unemployment rate, a part of typical fluctuations reflects permanent changes. Only in case of unemployment they found, what fluctuations were completely temporary. According to Nobel Prize winner Lucas, all economical cycles have the same features in common and that approves qualitative behavior approach of co-movements between time series (economic variables). This conclusion offers a unified explanation of economical cycles on the influence of market economy law, without political and/or institutional issues which are specific for certain countries or time periods.

Baxter (1999), Schumpeter (2003) and other authors in analyze of countries economic cycles purpose to valuate consumptions, investment, employment, unemployment, average productivity of labor, real wages, expansions of monetary, inflation, quotes of stocks, nominal interest rate and etc. ratios. Basically, there are two main multiple parts of countries economical cycle. The first one describes factors, which affects economy (e.g. wars, inventions, failure of crops, political changes). These factors are called shocks and usually are not forecasted. The second part of countries economical cycle is model, which shows how economy are going to change or react against various of shocks.

To sum up, it is very important for market members to understand the stage of economical cycle and change their behavior according to it. These issues can empower market members to allocate and manage their financial asset more efficient. Further in this article the mathematical tool is analyzed, which could determine the periods of real country economical cycle.

2. The tool for countries economical cycle recognition - Hodrick-Prescott filter

Harvey (2003) propagates Hodrick-Prescot filter, which is mathematical tool and can be used in macroeconomic - to define real economical cycle components' fluctuations in the particular time series. According to Hodrick (1997) this tool helps to get "gentle" non-linear graphical sequence in the analyse of sensibility of periodical fluctuations in short and long terms. Frech (2001) argues, that the sensibility of trend is obtained under the modification of multiplayer λ (the frequency of period) in short term. Hodrick and Prescott recommend to use λ=1600 value in analyse of quarterly steps of fluctuations. Theoretical solution is showed in the figure no 2.

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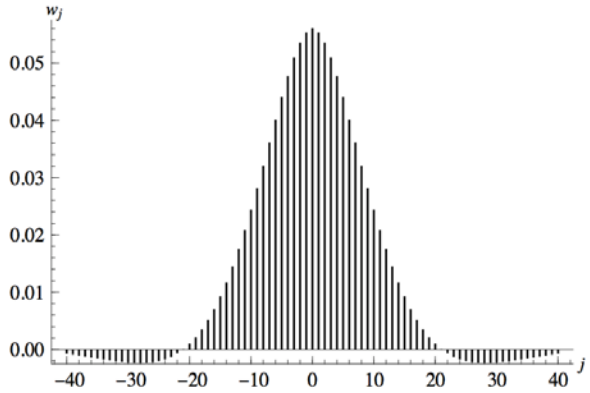

Figure 2. Theoretical arrangement of HP values when multiplayer λ = 1600

According to Koopman (2003) and Frech (2001), the main idea of methodology of Hodrick-Prescott is the decomposition of time series. Let say y_t (when t=1,2,..., T) shows logarithms of time series. When the series y_t is made from trend components, which is denoted by τ and components of cycle denoted by *c*, that's is way $y_t = \tau_t + c_t$. Considering relevant and positive values of λ, there is a component of trend, which minimize:

$$\min \sum_{t=1}^{T} (y_t - \tau_t)^2 + \lambda \sum_{t=2}^{T-1} [(\tau_{t+1} - \tau_t) - (\tau_t - \tau_{t-1})]^2 \qquad (1)$$

The first term of the equation is the sum of the squared deviations $d_t = y_t - \tau_t$ which penalizes the cyclical component. According to Ahumada (1999), the second term is a multiple λ of the sum of the squares of the trend component's second differences. This second term penalizes variations in the growth rate of the trend component. The larger the value of λ, the higher is the penalty.

This HP filter is one of the most popular methodologies to define countries economical cycle and to render it on a graph. Mostly GDP is used as a main variable in this filter.

3. The changes of equity prices and investment instruments strategies on the influence of countries economical cycle

In the past, according to Wonnacot (1994), business cycle coincides with the equity and interest rates changes (a determinant which affect straight debt securities' and preferred shares' prices). Normally equity prices tend to grow before and during the countries economic expansion periods, because of the expectancy of increasing profits which leads to larger dividends or income of larger detained or reinvested income (larger book value) or both of them at once. Equity is the best for investors who are trying to get gains from income or capital changes during the expansion of economical cycle. Despite the fact, that this conception is simple, it encounters a lot of problems of time line definition. The encouraging effect of equity prices often provides a point of crisis in the countries economical cycle. It can start to rise at the time, when conditions of the business are still poor and the conditions of economical growth are still seems to be impossible. That is way it is very difficult to evaluate the length of this kind of period. In one long term analyses, which was done in US, was wound that price changes of equity is likely to be from 5 to 9 months before the cyclical variations in the economical cycle. However this study had a lot of exceptions.

According to Colby (2002), the price of equity shares tend to decrease during contraction period of countries economical cycle and also peak can be predicted to wit economical conditions seems to be still advantageous. The reason of price decrease is an investors' hope to obtain lower profits and this can cause decrease of amount of dividends and smaller growth of corporate assets account value. At the time, when investors concern about their income, basically they sell equity shares in order to reinvest assets into fixed income securities (maintain or increase return of assets).

The prices of fixed income securities (straight bonds and straight preferred issues) react conversely to interest rate changes: then interest rates are growing, the prices of bonds are falling. Interest rates are changing in variation of economical activity during countries economical cycle. In the expansion period the

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growth of demand of money increase interest rates and the prices of fixed income securities falls down. Meanwhile at the contraction period, the demand of money is decreasing and interest rates are decreasing too, while prices of fixed income securities are growing.

It was noticed, that the prices of fixed income securities are changing conversely to equity shares prices. However, at the time when interest rates are extremely high, the growth of corporate' debts starts to decrease and the opportunities of future profits disappear. Under these conditions, the prices of both equity shares and fixed income securities are tend to decrease.

4. Investment strategies under the influence of countries economical cycle

According to Bodie (2002), the most successful investment strategy is possible when countries economical cycle variations are defined several months before. At he end of expansion period, till the peak is not reached, it is known that contraction is coming. At that time the market of securities is strong and growing, the interest rates are growing too and the demand of debts is huge. At this stage of countries economical cycle author do not recommend do own ordinary shares. It is recommended to invest into short-term interest generating securities and/or bonds. When monetary policy limit is running, short-term interest rates are usually higher than long-term rates.

According to (1996), when peak is reached, prices of ordinary shares starts to decrease, that's way it is recommended to sell those securities which are in the most breakable cycles of the industry and those with have high P/E ratio and low profitability. Also it is recommended to invest into short-term bonds or debt instruments, which still offers the higher possible yield in the bond market.

Graham (2000) argues, that during contraction period recession is coming and the outlook of economy is uncertain. The investment strategy describes, that the decision of the bond storage solution is available only without loss of income. Thus, investor should either sell short-term bonds, or buy mid term bonds.

When the end of recession is coming, it is recommended to start selling long-term bonds. The prices of them will grow when interest rates got down and the conditions of obtaining credit got simpler, also it is recommended to buy ordinary shares, especially whose companies' which are in the cyclical industry and in which investors look unfavourably.

Bodie (2002) argues, that government regulates countries economy by fiscal, monetary and economic stimulation policies, however not always it is so simple to maintain stable situation of economy, that's way it is not possible to avoid fluctuations of economical cycle (see table no. 1).

Table 1. Investment timing strategies on the influence of countries economical cycle (Bodie, 2002)

Stage of countries economical cycle	Investment strategy
Expansion	The prices of stocks are growing, because of expectations of better profits and dividends. At this time it is difficult to define the point of expansion period, in other word, where is profitability, that prices of stocks are fairly high and expansion period is ending. The interest rates are growing and this is the reason to purchase short term securities with fixed amount of return (bonds and/or preferred shares), because of monetary politics short-term interest rates must be higher than long-term.
Peak	During this period the prices of ordinary shares are declining, because of lower forecasted profits. It is recommended to sell ordinary shares, which are very sensitive to economical cycles. The interest rates are very high, so it is recommended to purchase short-term bonds, because of higher possible yield.
Contraction	Because of uncertain economical situation, the prices of ordinary shares are declining and the activity of markets is poor. The interest rates are declining too. It is recommended to purchase short-term and/or middle-term bonds.
Recession	The prices of ordinary shares begin to grow when the end of recession is coming. Thus, it is recommended to purchase ordinary shares. It is not recommended to purchase securities with fixed returns, because of poor interest rates.

However Pring (2002) and Chordia (2002) represent investment strategies differently. These authors argue that is very important to relocate the assets position according to the stage of countries economical cycle (see Figure 3).

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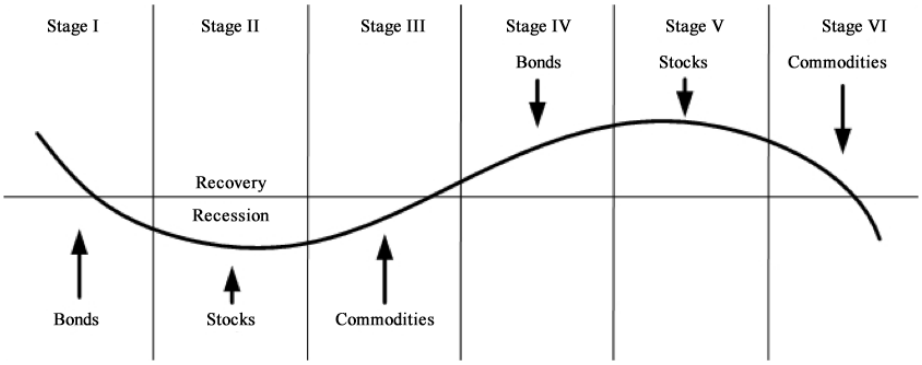

Figure 3. Investment strategies on the influence of the countries economical cycle (Pring ir Chordia)

According to Pring (2002) and Grinblatt (2001), figure no. 3 shows perfect countries economical cycle. Fluctuations shows economic expansion and contraction periods and cells describe the investment strategies during different stages of cycle. The extrapolation of history data observed that a chronological series of events exists over a countries economical cycle and these events make it possible to identify the stage of cycle based on financial and economical indicators as well as some economical tools rebound. Authors argue, that six stages are defined. The information of economical and financial ratios and also appropriate stage of cycle, allows investor to reallocate assets efficiently.

5. Determination of Lithuanian' economical cycle

There was Hodrick-Prescott filter described above as a method to identify countries economical cycle. There is identification of Lithuania economical cycle done. The effective investment periods in this article are the terms of Lithuania economical cycle.

Basically, GDP is usually taken to analyze the countries economical cycle. In the Figure 4 both GDP of Lithuania changes and trend line of Hodrick-Prescott filter for GDP changes are presented of period from y 2000 to y 2010 Q3.

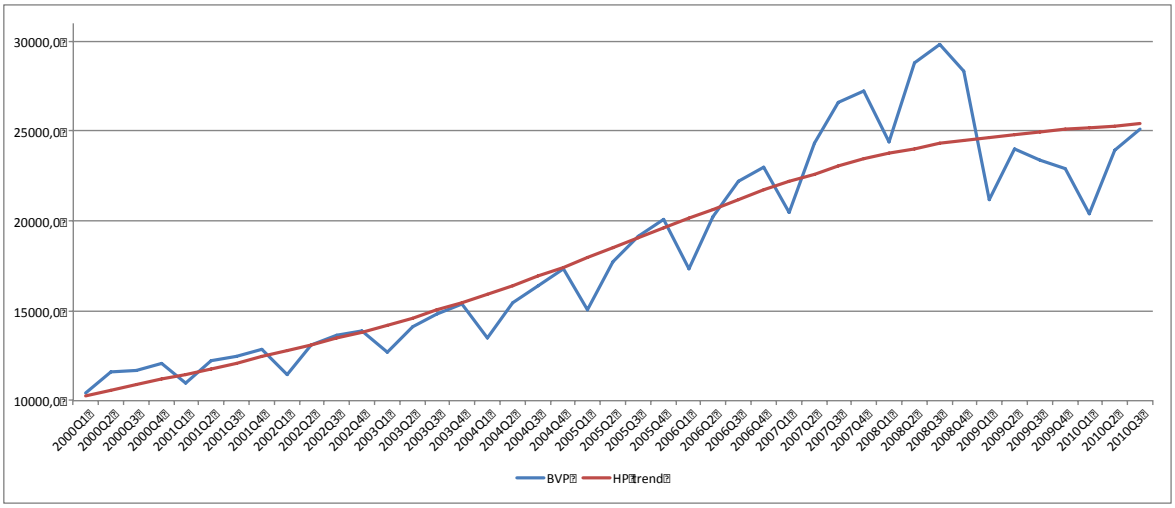

Figure 4. GDP of Lithuania and Hodrick-Prescott filter trend for period of 2000-2010 Q3

According to formulas listed above, quarterly GDP changes are analysed and the results are shown into Figure 5. It is obvious that every year for the first quarter GDP declines seasonally and this phenomenon distorts the theoretical model of the cycle. Despite the fact, that Hodrick-Prescott filter repeals the seasonality by itself, manual changes has to be done and values of every year fist quarter must be removed (see Figure 6).

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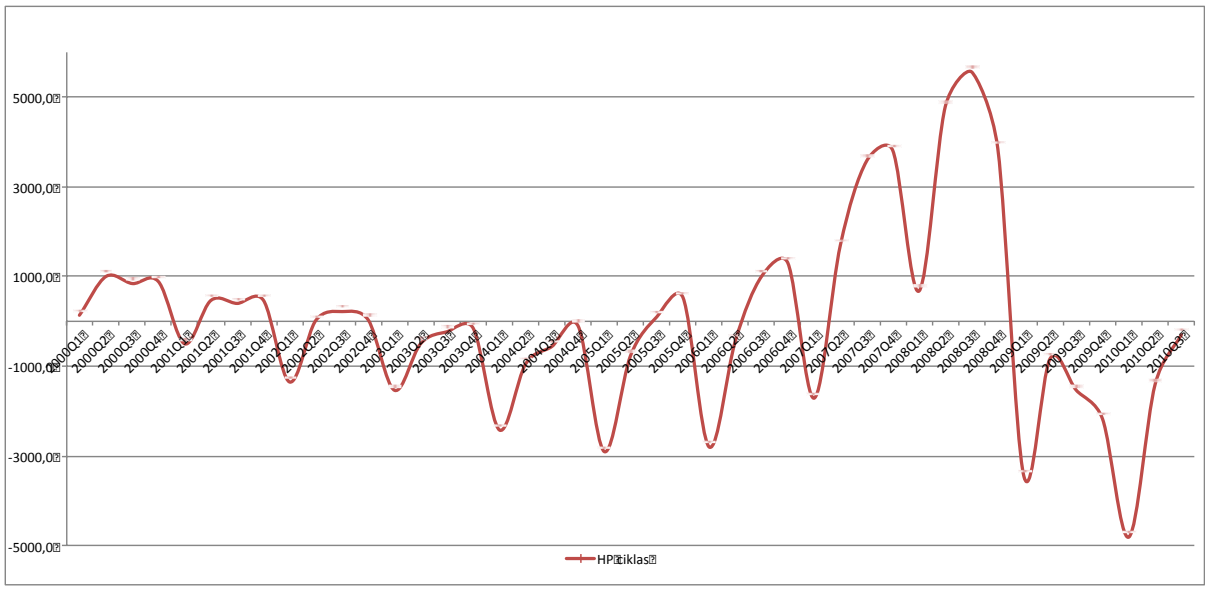

Figure 5. Lithuania economical cycle exported with HP filter

The results showed (see Figure 6.), that Lithuania economical cycle began in the third quarter of 2004. The expansion period continues till the third quarter of 2008, when peak was defined. The contraction period was much shorter and ended in the first quarter of 2010. To sum up, Lithuanian economical cycle was defined and it continued from 2004 Q2 till 2010 Q1. These periods can be used as the effective terms of investment and strategies listed above can be adapted for this country economical cycle.

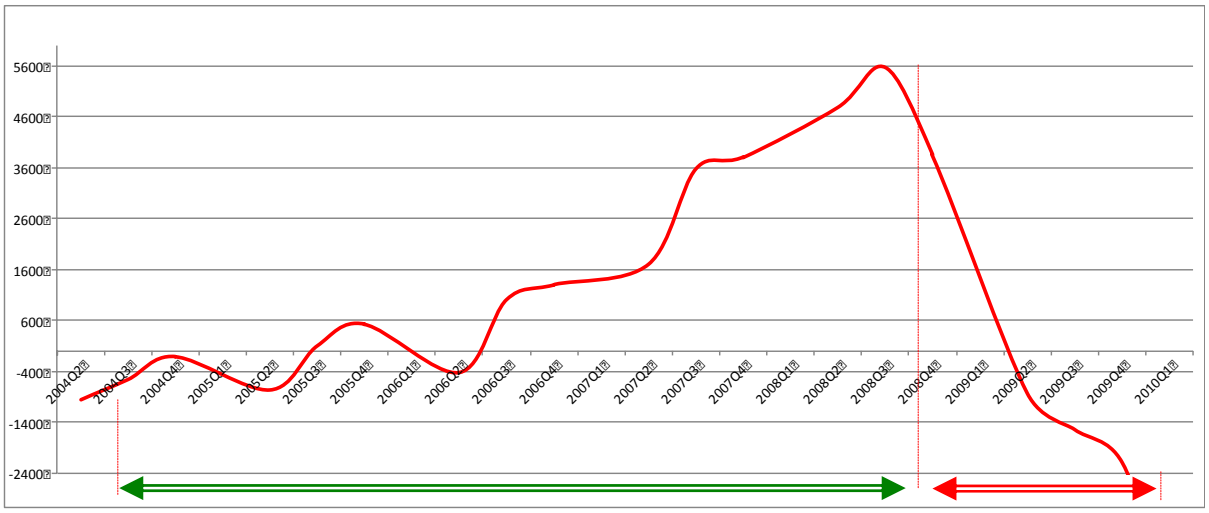

Figure 6. The stages of Lithuania economical cycle

The results allow defining Lithuania economical cycle stages and durations. According to this information it is possible to evaluate the behaviour of investor. It is possible to analyse the population of Lithuania, deposits in the banks, generated average returns and other ratios for these periods.

The study can be continued by creating effective investment portfolios, assets allocation and calculations of effective management of Lithuania resident savings.

6. Investment strategies and investors' behaviour during Lithuania economical cycle

As was mentioned before, Lithuania economical cycle periods were identified. These periods will be considered as effective investment periods. After the investment timing strategies analysis, equity shares and funds (Nasdaq OMX Baltic) were assigned for expansion period, meanwhile commodities, bonds and deposits in the banks were assigned for contraction period. Besides, Exchange-Trade funds (ETF) of commodities will be used instead of real commodities for some reasons: it trades like a stock; by owning an

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ETF, investor gets the diversification of an index fund as well as the ability to sell short, buy on margin and purchase as little as one share; another advantage is that the expense ratios for most ETFs are lower than those of the average mutual fund or commodity position. In order to evaluate e.g. private investors investment efficiency under the influence of countries economical cycle, amount of investment sum is required. In this case amount equals savings in banks deposits of average Lithuania resident (see table no. 2).

Table 2. Deposits in banks and average return of Lithuania resident

Term	Average population	Average amount of deposits, mil. Lt	Average return, mil. Lt	Deposit for one citizen, Lt	Annual return for one citizen, Lt
2004 Q2 - 2004 Q4	3.435.245	3.930,9	104,8	1.144,28 Lt	30,51 Lt
2005 Q1 - 2005 Q4	3.414.698	4.614,0	121,6	1.351,22 Lt	35,61 Lt
2006 Q1 -2006 Q4	3.394.406	6.326,7	172,5	1.863,85 Lt	50,81 Lt
2007 Q1 - 2007 Q4	3.375.910	8.678,0	317,3	2.570,57 Lt	94,00 Lt
2008 Q1 - 2008 Q3	3.360.764	11.240,8	566,5	3.344,72 Lt	168,56 Lt
2008 Q4	3.353.205	12.206,4	770,2	3.640,22 Lt	229,70 Lt
2009 Q1 - 2009 Q4	3.340.505	11.490,6	890,7	3.439,77 Lt	266,65 Lt
2010 Q1	3.326.800	11.758,5	774,4	3.534,48 Lt	232,79 Lt
The amount of annual average deposit of Lithuania resident during expansion period					2.054,93 Lt
The amount of annual average return of Lithuania resident during expansion period					101,53 Lt (4,94%)
The amount of annual average deposit of Lithuania resident during recession period					3.538,16 Lt
The amount of annual average return of Lithuania resident during recession period					243,04 Lt (6,87%)

Sources: Central Bank of the rebuclic of Lithuania, Statistics Lithuania

The results had shown that although the average annual population was declining, the average annual amount of deposits increased, which shows that during this period statistical Lithuanian remained enough revenue for savings. The part of deposits for one statistical citizen increased from 1.144,28 LTL in 2004 y to 3.534,48 LTL in 2010 y. The peak of deposits was defined at 2007 and reached the highest point in 2008 when recession began. Results showed that during expansion stage average deposit for one statistical citizen was 2.054,93 LTL, meanwhile during contraction period - 3.538,16 LTL and this means, that average annual profitability of deposits during expansion period reached 4,94% and during recession – 6,87%. According to Central bank of Lithuania during the period of 2005-2008 it was observed that average inflation rate exceeded interest rates of deposits and this means, that savings in the bank deposits just only decreased the influence of price changes and did not create additional return of "working money". This fact again approves that the personal finance management issues are relevant.

Analyse of savings in bank deposits was selected to calculate the real return because this method is one of the favourite and mostly used in Lithuania. However, there are more strategies described in this article, that is why the average returns of investment subjects are detailed in the table no. 3.

Table 3. Summary of average return of investment instruments on the influence of countries economical cycle

Stage of cycle:	Expansion	Contraction
Term	**2004 Q2 - 2008 Q3**	**2008 Q4 - 2010 Q1**
Average return of deposits in banks	**17,8%**	**10,3%**
Average return of stocks	**53,4%**	-22,0%
Average return of Bonds		**14,2%**
Average return of ETFS (commodities)		**34,9%**

The Nasdaq OMX Baltic Bechmark GI index was selected to evaluate the changes of stock (funds) prices in Baltic region. The average return during expansion period was 53,44% and during contraction period had negative return of 21,95%. It was possible to allocate savings into Bonds of Lithuania (with reinvesting fact) and received 14,17% profitability. It was noticed, that investor exposed with currency risk using ETFS, however the average return of most popular position (e.g. gold) was 34,91%. This analysis

approves the fact of financial investment timing efficiency necessity with huge difference between mostly used bank deposits and other investment subjects.

Conclusions

1. Different investment solutions and private investors' behavior are inefficient and very careful in the conservative countries, such as Lithuania, therefore, main research problem was identified – investor's choice of investment instruments under the influence of different economic cycle periods. The main targets for research were the time when investor should start using more efficient and improved investment instruments, which generate sustainable cash flows, the term for investment and the best moment to capture profits. Thus, it is important for research to select the appropriate financial investment timing strategies according countries economical cycle stages.
2. Many mathematical tools can be used to identify countries economical cycle periods, however, after the overlook of science literature Hodrick-Prescott filter was selected, which helps to get "gentle" non-linear graphical sequence in the analyse of sensibility of periodical fluctuations in short and long terms. Mostly GDP is used as a main variable in this filter.
3. After the analysis of investment timing strategies, equity shares and funds were assigned for expansion period; meanwhile commodities, bonds and deposits in the banks were assigned for contraction period. It must be mentioned, that risks of each instrument is estimated for those strategies. Also authors argue, that these investment instruments must be most efficient according to countries economical cycle and asset allocation must be done to keep portfolio sustainable and profitable. Sequence described in this paper allows to evaluate specific countries economical cycle and average returns of investment subjects.
4. After the Hodrick-Prescott filter adjustment for Lithuania economical cycle analysis, results showed, that assigned Lithuania economical cycle began in the third quarter of 2004. The expansion period continues till the third quarter of 2008, when peak was defined. The contraction period was much shorter and ended in the first quarter of 2010. To sum up, the analysed Lithuanian economical cycle was defined and it continued from 2004 Q2 till 2010 Q1. According to authors, strategies mentioned before must be adopted for these periods.
5. To compare and perceive returns of investment subjects analysis was done and results showed that during periods defined those investment solutions are more profitable than average inhabitant financial behaviour. It is very important that statistical investors of conservative countries do not understand and/or evaluate the impact of inflation and whose investment decisions some times do not cover the weight of inflation rate. Also a huge amount of cash is circulating and usually statistical investors prefer to keep savings in the "stocks". That means that economical and finance knowledge are poor and it is necessary to create models which could show the real benefits of investment solutions.
6. Analysis approves the fact of financial investment timing efficiency necessity with huge difference between mostly used bank deposits and other investment subjects, however these solutions have some constrains: the decision to purchase security can be difficult since there are many attributes to consider and can include the necessary examination of several attributes, it can be thought of as a multi-criteria decision-making problem.

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