MYKOLAS ROMERIS UNIVERSITY

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ASSESSMENT OF MONEY ILLUSION IMPACT ON INDIVIDUALS' ECONOMIC BEHAVIOUR IN LITHUANIA

Master Thesis

Supervisor
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INTRODUCTION

The relevance of the research. In the last century, behavioural economics was in a process of rapid development. One of behavioural phenomenons that were discovered by economists is money illusion – a tendency to make biased decisions based on nominal rather than real monetary values. This illusion influences all money-related habits and decisions (perception of income, spending, savings, prices, etc.) and, hence, influences individuals' economic behaviour. The evidence of money illusion effect is more noticeable in countries that experience a change from one currency to another. This process causes significant changes for people who lose their sense of value for a currency, and until citizens develop a new one they are prone to money illusion. Euro illusion concept, which determines money illusion in countries that adopted the euro, became commonly used after money illusion has been identified and studied in a number of the Euro zone countries. Money illusion effect on Lithuanian citizens has not been deeply studied and the euro introduction in Lithuania in 2015 provides an additional reason to study the impact of money illusion on Lithuanians and their economic behaviour.

The scientific level. The concept and peculiarities of money illusion were analyzed by many authors, such as Fisher (1928), Patinkin (1965), Fischer and Modigliani (1978), Shafir et al. (1997), Cohen et al. (2005), Gamble (2007), Noussair et al. (2012), Miao and Xie (2013), Dzokoto et al. (2010). More attention to the impact of money illusion on individuals' behaviour was given in works of Missier et al. (2007), Basak and Yan (2007), Ackert et al. (2011). An important part of money illusion effect is individuals' perception of economic transactions. It was analyzed by Raghubir and Srivastava (2002), Desmet (2002), Kerem et al. (2013) and others. Numerosity heuristic, which is related to money illusion concept, was studied by Soman et al. (2007). Scientific analyses of euro illusion effect in different countries were carried out by van Raaij and van Rijen (2003), Gärling and Thøgersen (2007), Ramoniene and Brazys (2007), and other authors.

The problem of the research: Do Lithuanians experience money illusion and what is the impact of it on individuals' economic behaviour?

The object of the research is the effect of money illusion.

The aim of the research is after the identification of existence of money illusion between Lithuanians, to evaluate the impact of money illusion on individuals' economic behaviour in Lithuania.

Objectives of the research:

1. To analyse theoretical aspects of money illusion and its impact on individual's economic behaviour.

2. To prepare the methodology for the identification and the assessment of the impact of money illusion on individuals' economic behaviour in Lithuania.
3. To identify money illusion in Lithuania and to evaluate its impact on individuals' economic behaviour in Lithuania.

Methods of the research include systematic and comparative analysis of scientific literature, the method of experimental study and statistical methods – descriptive statistics (tables, graphs and charts), Spearman's correlation coefficient, paired samples *t*-test, Pearson's chi-square test, and Wilcoxon signed-rank test.

The structure of the research comprises three main parts. In the first chapter, the scientific literature on the topic of money illusion and related concepts is analysed. In the second part, the methodology for the research of the impact of money illusion on individuals' economic behaviour in Lithuania is prepared. In the third chapter, the results of the research are presented and evaluated. Every subchapter ends with a short summary of the material discussed in it.

Significance and novelty of the research. The current research presents a newly collected data and analysis on money illusion in Lithuania – it identifies and evaluates the impact of money illusion (including the euro illusion effect) on Lithuanian citizens and their economic behaviour. Results of the research can be helpful in understanding of individuals' economic habits, their perception of money-related processes and phenomenons, as well as in explaining individuals' economic decisions and the cognitive process of making those decisions.

Scientific value of the research. The model of the research allows to study money illusion in Lithuania from both sides – when it is caused by inflation and by currency changeover. Current research is also the first scientific study of euro illusion effect in Lithuania after the euro was introduced.

Limitations of the research. It is important to note that the research presented in this work has some limitations. Since experiment was chosen as a method in this research and its structure required organizing two sessions with same respondents, the number of participants was limited. Problems presented in the experiment are hypothetical and decisions made by participant may not extend to real world. Participant may bear in mind their own assumptions like personal experience which could affect their decisions. The results that are related to the introduction of the euro in Lithuania and euro illusion effect are valid for this moment, and can change with time.

Further researches. Since the effect of money and euro illusion may change with time, further researches can be conducted in order to reveal the tendency of this phenomenon. They could be expanded, include more participants and gather more data for the analysis.

1. THEORETICAL ASPECTS OF MONEY ILLUSION IMPACT ON INDIVIDUALS' ECONOMIC BEHAVIOUR

1.1. The concept of money illusion and its causes

Money illusion is one of behavioural phenomenons that attracted economists' attention and begun to be studied in the last century, when behavioural economics was in a process of rapid development. The concept of money illusion was introduced by economist Irving Fisher in 1928. He discovered a tendency to make biased decisions by thinking in terms of nominal rather than real monetary values. Fisher argued that almost every individual is influenced by money illusion in respect to his country's currency (Fisher, 2012).

During the rational expectations revolution in the 1970's, money illusion concept was often forgotten (Basak, Yan, 2007). However, since the 1990's, the attention to money illusion was renewed and this phenomenon became supported by many authors. Currently, the growing number of theoretical and empirical works proves that money illusion is widespread and common bias.

In order to clarify the concept of money illusion for better understanding and further analysis, it is useful to review how different authors define it in their works (see Table 1).

Table 1. Definitions of money illusion

Author, year of publication	Definition of money illusion
Fisher (1928)	Money illusion is "the failure to perceive that the dollar, or any other unit of money, expands or shrinks in value".
Patinkin (1965)	"An individual will be said to be suffering from such an illusion [money illusion] if his excess-demand functions for commodities do not depend solely on relative prices and real wealth".
Fischer, Modigliani (1978)	Money illusion "results from the convenience of using money as a unit of account, rather than the medium of exchange function". "The use of nominal accounting methods is one example of the type of money illusion that may remain in the economic system despite continuing inflation".
Shafir et al. (1997)	"Money illusion refers to a tendency to think in terms of nominal rather than real monetary values". It is "a bias in the assessment of the real value of transactions, induced by their nominal representation".
van Raaij, van Rijen (2003)	"This is the tendency to think of economic transactions in nominal terms, because the nominal value is a salient and natural unit of money".
Soman et al. (2007)	"Money illusion primarily refers to the focus on the numerical face value of a given amount of money without regard to its real value (adjusted for inflation)".

Table 1 is continued on the next page

Continuation of Table 1

Ramoniene, Brazys (2007)	Money Illusion "is a person's bias towards the nominal value of money".
Ackert et al. (2011)	"Money illusion is a behavioral bias in which a person thinks in terms of nominal rather than real values".
Noussair et al. (2012)	"Money illusion is a general term describing the tendency of individuals to make economic decisions based on nominal rather than real variables".
Miao, Xie (2013)	"The term money illusion refers to the phenomenon where people confuse nominal with real magnitudes".

Source: prepared by the author.

After systematizing and reviewing money illusion definitions used by different authors, it can be stated that all of them have a common feature which determines the concept of money illusion – it is confusing nominal values with real monetary values when making economic decisions. Nominal value of money is a value expressed on the currency note. Real value differs from nominal one – it changes over time due to inflation. Therefore, it can be stated that inflation is one of the main reasons why money illusion effect appears.

People often think of economic transactions in nominal values instead of real because nominal terms are more accessible and salient. Converting nominal to real values requires some economic knowledge and mathematical skills. To calculate real value of money, nominal value has to be adjusted for the inflation. Not everyone has such kind of skills.

Even if it is assumed that people generally are able to convert nominal to real values, they do not tend to do it in their daily life (Ramoniene, Brazys, 2007). People are used to deal with nominal values when making economic decisions – evaluating and comparing prices, salaries, buying and selling products, using services etc., because it is much more convenient and simpler in everyday situations. Converting nominal to real terms requires effort, which is most of the time considered dispensable in the short term (Desmet, 2002).

Confusing nominal values with real values is a reason why people often perceive rises in salaries or prices as real gains. It means that money illusion distorts individuals' perception of the growth of wealth and thus affects spending and savings decisions (Miao, Xie, 2013). In fact, above-mentioned rises should be interpreted as a consequence of a general process of wage and price inflation (Burgoyne et al., 1999).

The impact of money illusion in the short run, when making daily decisions, may not be significant, while its impact in the long run is more noticeable. This bias is more important in making decisions regarding long-term financial contracts – for example, choosing between buying and renting a home (Cohen et al., 2005). In such case money illusion can strongly affect an individual's perception of the value of a particular asset.

Money illusion is a multifaceted phenomenon. Although current research focuses on money illusion influence on individuals' economic behaviour, it is useful to overview its features and impact

in other contexts. Not only individuals (i.e. consumers) experience money illusion bias – it can appear on both the demand and supply sides (Ackert et al., 2011). Businessmen, managers and other decision makers in companies and institutions are also subjects to money illusion, thus this bias can cause adverse effect on economic behaviour of these market participants and worsen such financial results as company's profitability, etc. (Modigliani, Cohn, 1979).

Money illusion effect also appears in financial markets. Empirical studies proved that the market suffers from this bias (Modigliani, Cohn, 1979; Cohen et al., 2005; Basak, Yan, 2007; Noussair, 2012). Modigliani and Cohn (1979) claim that money illusion occurs when investors discount real cash flows with nominal discount rates which influence activity in the market. It means that investors can overlook the impact of inflation when making decisions because the cost of doing so is relatively small to investors, however the impact on asset prices can be substantial (Basak, Yan, 2007). The result is that prices in the market do not reflect real economic value of assets. The evidence that financial markets suffer from money illusion, which causes mispricing, is important because the stakes in these markets are very high (Cohen et al., 2005).

After the overview of money illusion effect on business companies, institutions, financial and other fields of economic activities, it was noticed that money illusion in the market is caused by the human factor. Hence, it can be stated that individuals' decisions are the only factor that lead to money illusion presence in the economy.

Previously it was shown that the overlooking inflation in making economic decisions in different fields of activity causes money illusion. It can be assumed that if decision makers were not confused by inflation they would not experience money illusion and their economic behaviour would be rational and correct (Fisher, 2012; Fischer, Modigliani, 1978). However, Shafir et al. (1997) state that money illusion may extend to noninflationary circumstances. In some situations, money illusion can occur due to external factors (Soman, 2007) such as unfamiliar or new currency usage.

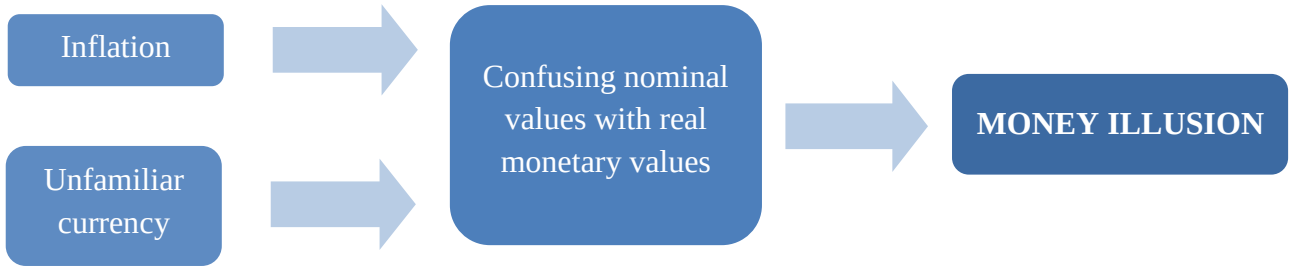
People are prone to money illusion when they have to deal with a currency to which they are not used to in their daily life. Examples of such situation in a country include currency redenomination, mostly as a reaction to excessive inflation or currency devaluation (Dzokoto et al., 2010), and a change from one currency to another. Mentioned cases have a common feature – in both situations nominal value of currency changes, which provides an opportunity for money illusion to appear.

Citizens' economic behaviour is directly linked to the usage of country's currency (Kerem et al., 2013). Currency changeover and, hence, difference between new nominal value and real value of money create distortion in people's behaviour (Missier et al., 2007) – they lose their sense of value for a currency, frame of reference. Even though currency changeover does not change the real value of money and to convert an old currency to a new one requires simple multiplication or dividing operation, people often use old currency as a general benchmark, and thus, suffer from money illusion

and make irrational decisions. That is why all decisions need to be considered more carefully in this period and the main task for citizens is to learn the value of a new currency (Gärling, Thøgersen, 2007).

✓ The concept of money illusion was introduced in economics by Fisher in 1928. Theoretical and empirical works prove that money illusion is a widespread bias. This behavioural phenomenon can be defined as individuals' tendency to confuse nominal values with real monetary values when making economic decisions.

The process of how money illusion appears is summarized and illustrated below (see Figure 1).



Source: prepared by the author.

Figure 1. Causes of money illusion effect

Two main causes of money illusion effect can be distinguished – inflation and unfamiliar currency usage. Due to these two factors, which can influence individuals' behaviour together or separately, people confuse nominal with real representations of money. As a result, individuals suffer from money illusion while making economic decisions based on nominal monetary values.

1.2. The impact of money illusion on individuals' economic behaviour

Causes of money illusion and some general issues about its impact on people were discussed in previous subchapter. This subchapter is focused on exploring the impact of this bias on individuals' economic behaviour more deeply.

Before discussing money illusion influence on individuals' economic behaviour, it would be useful to determine what is meant by individuals' economic behaviour in current research, and what is the difference between economic and financial behaviour? Individuals' financial behaviour is decisions and actions of individuals (households) that are related to acquisition and allocation of funds, which lead to satisfaction of financial needs. Financial behaviour is a part of economic behaviour, which in turn considers more features and is essentially a social behaviour. Economic behaviour reflects such factors as specifics of decision-making process, individuals' perception of money-related processes and phenomenons, economic habits, reasons and consequences of actions. Thus, economic behaviour is a broader concept than financial behaviour.

The main channel through which the impact of money illusion on economic behaviour is most noticeable is individuals' perception of value of economic transactions. This case can be analyzed with an example of understanding prices of goods and services. Money illusion changes perception and evaluation of prices which leads to making irrational economic decisions.

Price perception is individual's subjective evaluation of value obtained from a particular price (Desmet, 2002). In other words, it is decoding process from a price scale to a value scale. As it was discussed in previous subchapter, in the case of price changes due to inflation people often perceive price rises or cuts as real gains or losses. Thereby money illusion effect appears. In reality, in such case the value of goods and services does not change and price rises or cuts should be understood as a consequence of a general process of inflation.

Another way in which price perception could be distorted due to money illusion is currency changeover in a country. While using familiar national currency, the process of price perception and evaluation becomes rather automatic and intuitive for country's citizens. When currency changes the link between price and its value is cut (Desmet, 2002). It creates a possibility for money illusion to appear.

When consumers are forced to use unfamiliar currency, they experience uncertainty while making economic decisions, thus they have a choice – to adapt and learn a new price scale or to convert new prices to old ones. The first strategy is more intuitive – it does not rely on any comparison with the old currency and old reference prices. It can also occur as the anchoring strategy, when people learn to evaluate new prices based on prices of products, which they are used to buy very frequently (Missier et al., 2007).

Conversion strategy can be used as exact calculation or approximate conversion to the familiar currency (Missier et al., 2007). Exact calculation is performed using a converter and precise exchange rate of currencies. Approximate calculation is based on an inexact or rounded exchange rate, or some association between the old and new currencies.

The most common way to estimate new price is to compare it with old reference point. Reference is a price against which consumers compare other prices in order to decide whether they are too high or too low. Reference price is not an exact price – it is price acceptability zone or price latitude, which range from determined minimum and maximum prices (Anttila, 2004). Reference points are based on buyers' experience and well memorized prices of often bought products and services. During a currency changeover, under conditions of uncertainty, consumers try to simplify their decisions by adjusting well-memorized reference points to new price levels until some conclusion and decisions can be made. This phenomenon refers to Tversky and Kahneman anchoring and adjustment effect (Gaston-Breton, 2006).

In case of exact conversion, there is less possibility for money illusion effect to appear. In all other cases, whichever another strategy is being used, there is a great chance that a consumer will be affected by money illusion and will be prone to inaccurate perception of new prices.

The move from familiar pricing scale to lower or higher one changes the interpretation of prices and their differences. The nominal value of currency influences its perceived value. It was found that currency with lower nominal value makes prices appear smaller than prices expressed in currency with higher nominal value (Raghubir, Srivastava, 2002; van Raaij, van Rijen, 2003; Dzokoto et al., 2010). It means that individuals spend their budgets more easily while using currency with lower nominal value in comparison with currency familiar for them.

Gärling and Thøgersen (2007) also claim that currency with a lower nominal value makes differences between prices appear smaller. This is called compression effect (Gamble, 2007). Respectively, with a currency of higher nominal value price differences appear bigger. To eliminate compression effect, two prices should be converted to the same currency before comparing the difference between them (Gärling, Thøgersen, 2007).

According to Raghubir and Srivastava (2002), people understand prices better if they are expressed in currency with higher nominal value. That is why usually they are more willing to pay for goods and services when the currency has lower nominal values than the familiar currency, because prices appear cheaper. Authors state, that the smaller is the nominal value of a currency in relation to the familiar currency, the more consumers are willing to pay and even overspend. Thus, it can be stated, that the nominal value of a currency influences individuals' willingness to pay.

It was shown above that the impact of lower or higher value of a currency on price perception and compression effect influence individual's economic behaviour. Influenced by money illusion, they decide what goods and services they should choose, what prices are acceptable for them, are certain products worth paying for or not, etc. For example, unfamiliar currency usage changes individuals' understanding of the difference between prices of prestigious and regular brands (van Raaij, van Rijen, 2003). Due to money illusion people are more willing to pay for expensive brands while using currency with lower nominal value.

The importance of currency's nominal value in the decision-making process can be explained by numerosity heuristic. Soman et al. (2007) proved that subjective evaluation of economic transaction is motivated by the numerosity of the nominal difference between the price of transaction and reference standard. This standard could be an individual's budget or a reference price, expressed in familiar currency. Consumers, influenced by numerosity heuristic, assess their purchasing power and make a decision to pay or not (Dzokoto et al., 2010). Such kind of economic behaviour is irrational, because the concept of numerosity is not the same as quantity.

Numerosity is the number of units into which something is divided, but not the quantity. Thus, numerosity heuristic is a false opinion that "many" means "much" (Ramonienė, Brazys, 2007). Individuals perceive the price as higher if it can be divided into more small units. For example, the price of 10 EUR appears as cheaper than the price of 34.53 LTL, although the value of both prices is the same due to conversion rate (1 EUR = 3.4528 LTL). The quantity and the real value of money remains the same, but the amount of 34.53 LTL is more numerous than 10 EUR. Consumers often perceive this difference in prices as difference in quantity of money which they have to pay for a product or service, thus the number of units into which the price can be divided plays a larger role in decision-making process that the real value (size) of each unit. That is why prices expressed in a currency with lower nominal value appear cheaper.

The effect of numerosity heuristic also appears when consumers compare prices of two products in different currencies. For example, one product costs 10 EUR (34.53 LTL), another one – 12 EUR (41.43 LTL). The difference between prices of 2 EUR (12 - 10) is perceived as rather small in comparison with the difference of 6.9 LTL (41.43 - 34.53), because the latter is more numerous. Thus, a consumer will be more willing to pay for the more expensive product if its price is expressed in currency with lower nominal value (in this case – in euro).

On one hand, while comparing the price of economic transaction with a reference price, it is more likely that an individual will perceive the price expressed in a currency with lower nominal value as a cheaper. On the other hand, there is another side of numerosity heuristic which can be noticed when individuals assess economic transaction in the context of budgetary constraints. According to the theory called Difference Assessment Account (DAA), individuals perceive the value of an economic transaction by comparing the numerosity of the difference between the price and given budget (Soman et al., 2007; Ramoniene, Brazys, 2007). For example, a consumer is given a budget of 40 EUR (138.11 LTL). The price of a product is 10 EUR (34.53 LTL). According to the DAA, a person will be more willing to pay 34.53 LTL than 10 EUR, because the nominal difference between the price and the budget expressed in LTL (138.11 - 34.53 = 103.58) is more numerous than expressed in EUR (40 - 10 = 30). Thus, the more numerous is the difference between the price and given budget, the more an individual is ready to spend his money.

Since people tend to evaluate economic transactions relying on nominal instead of real monetary values and suffer from numerosity heuristic when assessing prices expressed in two different currencies, the link between price perception and exchange rate between two currencies can be observed. Desmet (2002) hypothesized that there is a positive relationship between the conversion rate and money illusion effect – the effect is larger when the exchange rate is higher and, respectively, it is smaller when the rate is lower. It means that the higher the conversion rate is, the cheaper the prices appear due to numerosity heuristic, and thus people are more prone to suffer from money illusion.

However, this tendency is not a rule for all consumers in every country. It was found that in some situations, if the exchange rate is low (when prices in two different currencies look more or less similar), people tend to use familiar currency as a reference when assessing prices in unfamiliar currency, thus increasing the probability of making a mistake. When the exchange rate is high (when the nominal values of prices are very different), price scales become incompatible and people have to abandon their references and create new ones, thus decreasing the risk of making mistakes (Desmet, 2002; Kerem et al., 2013). This tendency means that sometimes people suffer from money illusion more when the conversion rate is low.

Desmet (2002) tried to explain the last finding, which contradicts the major hypothesis. Author assumed that, in reality, the more mentally difficult is to convert one currency to another (the higher is conversion rate), the more an individual doubts his abilities to do that and uses a converter, thus minimizing the risk of a mistake. In this case, the effect of money illusion is weaker than when the exchange rate is low and a consumer tries to convert mentally one currency to another.

In the case with a currency changeover in a country, the dual price system is often used to help citizens to assess prices. However, this system has been criticized as it forces people to rely on the old currency and old reference points longer instead of learning new price scale (Kerem et al., 2013). The dual price system does not help citizens to develop a new correct price perception, thus, increases money illusion effect in a country.

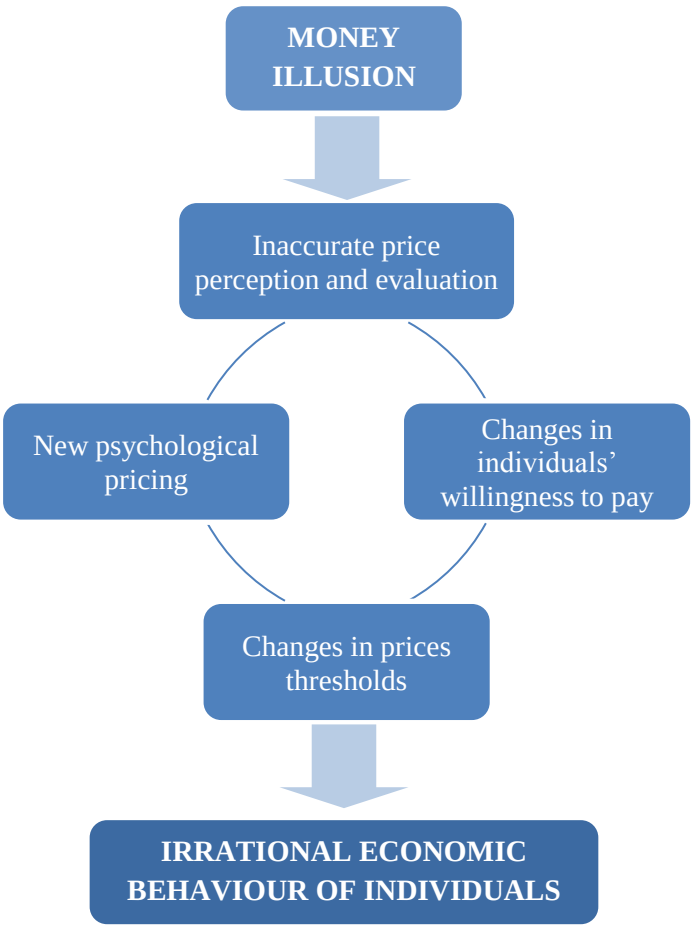
Consumers' willingness to pay, which changes during currency changeover in a country due to arising money illusion effect, can lead to price changes. Wertenbroch et al. (2006) found that money illusion and numerosity effect lead to changes in consumer willingness to pay and, thus, in price levels depending on reference standards used by citizens. If people learn quite quickly how to use new price scale after currency changeover in a country, then short-term changes in prices due to changes in willingness to pay will shift to initial point. However, if changes in willingness to pay are long-term, it means that citizens got used to pay higher or lower prices and it will lead to permanent increase or decrease in prices.

Another factor, by which money illusion can change a perception of prices and, afterwards, their level, is psychological pricing altered due to currency changeover. This can be explained by price acceptability and usage of price thresholds while making economic decisions. Consumers use price thresholds to simplify choice and reject alternatives (Desmet, 2002). Thresholds help to decide whether the price is acceptable or is on rejection level because it is too high or too low. That is why psychological pricing is often used in the market. For example, sellers will be more likely to set psychological price of 9.99 EUR than rounded price of 10 EUR, even though the difference is insignificant. It can be explained by the fact that when a price increases till a higher unit (in the example – threshold of 10.000 EUR), it appears bigger for consumers and negative price elasticity

becomes larger (van Raaij, van Rijen, 2003). This rule also works when prices change – an increase from 9.95 EUR to 10.00 EUR is perceived as larger than the same increase from 10.00 EUR to 10.05 EUR.

After currency changeover and, thus, changes in nominal prices, old price thresholds lose their meaning and give misleading impression about prices expressed in new currency. Consumers need to create new thresholds in their mind (Anttila, 2004). Prices, after they have been converted to another currency, also lose their psychological attractiveness, thus it also leads to changes in price acceptability (Desmet, 2002). As a result, new prices can be gradually adjusted to new psychological levels – that is how money illusion leads to changes in real prices through psychological pricing. The research carried out by Glauben et al. (2004) showed that currency changeover may have no significant impact on wholesale and retail prices, however a big part of grocery stores tend to react and change prices after an introduction of a new currency. It this way money illusion can impact an adjustment of prices in a country.

✓ As a conclusion of this subchapter, it can be stated that the correct process of perception of economic transactions requires converting nominal to real monetary values. It is not suitable for daily economic behaviour, because usually such kind of decisions should be made in fast and convenient way. That is why people rely on nominal values when assessing prices and economic transactions. It is less cognitively demanding process (Dzokoto et al., 2010) than the correct calculation of real value considering all factors, such as inflation and conversion rate. Thus, individuals experience money illusion caused by imprecise mental converting of currencies, numerosity heuristic, usage of old reference points, etc.



Source: prepared by the author.

Figure 2. The impact of money illusion on economic decisions

Money illusion affects economic behaviour through factors that are illustrated on Figure 2. Inaccurate price perception and evaluation appear when individuals cannot determine real value of money during inflation or currency changeover. Changes in willingness to pay arise due to distorted evaluation of prices. Psychological pricing influences individuals' assessment of economic transactions when nominal prices are adjusted to new psychological levels after inflation or currency changeover. Changes in prices thresholds appear when old prices thresholds lose their meaning due to changes in nominal prices, therefore individuals are left with no reference points for making economic decisions. As a result, mentioned factors force individuals to make irrational and incorrect decisions.

1.3. Money illusion in the context of the euro introduction

The impact of money illusion during the currency changeover in a country was discussed in previous subchapters. During the introduction of common currency of the euro in the European Monetary Union the term of euro illusion was introduced. It is related to money illusion and is basically the same phenomenon. In order to confirm this statement and better understand the term of euro illusion, it is useful to look how different authors explain it (see Table 2).

Table 2. Definitions of euro illusion

Author, year of publication	Definition of euro illusion
Gamble (2007)	"A bias known as the "euro illusion" has been documented such that the subjective value of money is influenced in the direction of the nominal value <…>". "The money illusion and the euro illusion are basically the same phenomenon in that the nominal representation in both cases influences the subjective value of money <…>".
Gärling, Thøgersen (2007)	Euro illusion refers "to the tendency to evaluate prices and salaries on the basis of their nominal representation in different currencies. The illusion citizens in the EU countries are susceptible to when their national currency is converted to the euro has given rise to this term".
Missier et al. (2007)	"The euro illusion is a transient phenomenon that consists of currency-related asymmetries in the intuitive judgment of product prices made by consumers". "The mere difference between the nominal values of two different currencies in which the same price-related task is performed <…> produces asymmetries in consumers' intuitive judgments or choices, despite the fact that the real value of money is the same".
Dzokoto et al. (2010)	Euro illusion describes "the influence that the nominal value of a currency has on decision making".

Source: prepared by the author.

After reviewing euro illusion descriptions provided by several authors, it can be summarized that this phenomenon is closely related to money illusion and the influence of nominal monetary values on perception of economic transactions after the transition to the euro in a country.

The introduction of the euro in member-states of the European Monetary Union required citizens to adapt to many changes related with their daily economic transactions. Prices of products and services, salaries and all financial contracts such as loans and pension plans, were converted to euro. In order to adapt for these changes people need to learn new reference points and new system of currency value.

Eventually the common currency of the euro should benefit citizens due to convenience since there is no need to exchange currency travelling to another Euro zone country. It also brings the opportunity to compare and assess prices in different countries more precisely. It should make the market more competitive and lead to lowering the prices of goods and services across the Euro zone (Gamble, 2007). However, the transition and adaptation to the euro is not a quick and simple process, thus this complexity gives a possibility for euro illusion to appear in each country of European Monetary Union.

The size of euro illusion and changes in perception of economic transactions in a particular country depend on such factors as exchange rate from national currency to the euro, conversion strategy and complexity, transition period, adaptation strategies used by citizens, an attitude towards the introduction of the euro in the country, etc. Researches of euro illusion and its effect were

conducted in different European countries before and/or after the introduction of the euro. Some results, authors' findings and interpretation of them are presented below.

Desmet (2002) assumed that after transition to the euro citizens dedicate more attention to prices. The process of price perception and assessment becomes more important for consumers due to uncertainty and perceived risk of making economic transactions using a newly introduces currency of euro. Research conducted by Antilla (2004) revealed that usually consumers' price-consciousness decrease in this period. People are always confused about the changes in prices due to the euro introduction and find it difficult and time-costly to assess the price and make a right decision. This effect was typical especially for elderly people, people with low income and consumers with less shopping experience.

Prices expressed in euro create euro illusion – citizens assess new prices differently from prices before the introduction of the euro. As it was described in previous subchapter, this happens mostly due to differences in nominal and real values of currencies. In most Euro zone countries national currencies had higher nominal value than the euro. Despite the fact that real prices do not change right after the introduction of the euro, wages, prices and differences between prices appear smaller. It is called the compression effect (Desmet, 2002; Gärling, Thøgersen, 2007).

As it was mentioned, the euro has lower nominal value than most old currencies in Euro-area with an exception of Ireland (Gamble, 2007). Thus, prices appear smaller in those countries – they were divided by 1.95 in Germany, 2.20 in The Netherlands, 6.55 in France, 40.34 in Belgium, 166 in Spain, 200 in Portugal and even 1936 in Italy (Desmet, 2002; Gaston-Breton, 2006). As people tend to evaluate nominal values instead of real, this kind of change in the price scale leads to euro illusion and change in individual's economic habits and behaviour.

Researchers in several Euro zone countries studied an effect of euro illusion. For example, Anttila (2004) examined how Finnish consumers perceive prices after the introduction of the euro. Different strategies of price assessment and using of reference points were analyzed. Euro illusion was found to exist in Finland to some extent.

In the research study conducted by Missier et al. (2007) the effect of euro illusion was compared in two countries – Italy and Ireland. These countries were chosen because of the greatest difference in the conversion rate from national currency to the euro (1 EUR = 0.79 IEP in Ireland, 1 EUR = 1936 ITL in Italy). The results of the research showed that euro illusion effect was stronger in Italy due to extreme exchange rate. Thus, Italian consumers had more difficulties in assessment of prices. They often reverted to the lira and used old reference frames trying to assess new prices. The effect of euro illusion in Ireland was weaker because the nominal values of Irish pound and euro were close to each other. The research also unveiled the interaction of such factors as exchange rate and psychological aspects in the process of euro illusion formation between individuals.

Another study that was carried out by van Raaij and van Rijen (2003) showed that citizens of The Netherlands also experienced the effect of euro illusion after the currency changeover. Due to lower nominal value of the euro consumers perceived new prices as cheaper than old prices expressed in Dutch guilders. There was also found a widespread tendency to convert one currency to another one inaccurately and to use old reference points while assessing economic transactions. This also led to euro illusion.

The currency changeover affected not only price, but also income assessment. In most Euro zone countries, citizens perceived their salaries as smaller when they were converted from domestic currency to euro. In this way, euro illusion causes people to feel poorer (Gamble, 2007). On the other hand, as it was mentioned before, the same effect of different nominal values make people think that prices expressed in euro are lower. This creates a paradox – after currency changeover individuals believe that their budget decreased, however they spend it more easily after currency changeover because prices appear for them cheaper.

Differences between prices expressed in euro also appear smaller in most countries. Because of that consumers are more willing to pay for more expensive brands after the transition to the euro (van Raaij, van Rijen, 2003). This is one more reason why they spend their budget more easily and quickly.

Glauben et al. (2004) assumed that because the changes in nominal value of prices make them seem less psychologically attractive, prices could be rounded to new, more attractive levels. Thus, it was hypothesized that the introduction of the euro might lead to changes in real prices, more often – to higher ones. The research carried out by the authors in Germany revealed that about 20% of wholesalers increased their prices for retail stores. The conclusion was made that euro illusion can have an impact on adjustment of prices in the country after the introduction of the euro.

According to findings of previously discussed researches, it can be assumed that the steepness of euro illusion effect depends on conversion rate between the euro and national currency of the country. Most common relationship between an exchange rate and euro illusion effect is positive – the higher the exchange rate, the bigger is illusion effect in the country. Desmet (2002) tested this hypothesis and found that it is not valid for all the cases – there is not always a positive relationship between conversion rate and euro illusion. For example, in Spain with higher exchange rate (1:166) the observed effect of euro illusion was smaller than in Germany with lower conversion rate (1:1.956).

Therefore, there was proposed alternative explanation – the size of euro illusion depends more on difficulty of mental conversion from one currency to another. Desmet (2002) has noted a paradoxical fact that often the more difficult mental computation the conversion rate requires, the more often citizens use a converter and assess prices accurately, the smaller is the effect of money/euro illusion in the country. For example, the author found that in Germany the conversion rate of 1:1.956

was simplified by citizens – 91% of them just multiplied prices by 2. Only about 8% used a converter to get exact converted prices. The situation in Spain was the opposite – due to difficult conversion rate (1:166) 60% of citizens used a converter, thus euro illusion in Spain was found to be weaker than in Germany.

When the conversion rate is simple, the consumer adapts to the new price scale by performing mental computation and rounding conversion rate, and by using old reference points. This could lead to mistakes in assessment of prices and create euro illusion effect (Kerem et al., 2013). For example, in France with quite simple conversion rate 1:6.5 a lot of citizens use simple mental calculating strategy of rounding conversion rate to 6 or 7 (Desmet, 2002). Evidently, this inaccurate conversion creates incorrect perception of prices. The use of converter would make a big difference in this case.

When the conversion rate between euro and national currency is difficult to calculate mentally and new prices have nothing in common with old price scale, citizens cannot use old reference points and have to create new ones. An often use of converters in this case minimize the risk of making an error, thus it weakens the effect of euro illusion as it was noticed in Spain.

In both cases – either an individual converts euro to the old currency mentally or do it with a calculator – the adaptation to the euro is not fast and simple process (Gamble, 2007). On one hand, mental conversion of euro to the national currency makes people rely on old price scale longer. They assess prices based on old reference points and do not create new ones. Thus, consumers who use this strategy are prone to anchoring bias and intuitive price estimation, which can lead to euro illusion (Missier et al., 2007). On the other hand, when consumers convert prices using converter – it also slows down the process of relearning prices and adapting to the euro. The advantage of this strategy is that in this case they experience euro illusion to a lesser extent.

As it was mentioned, adaptation to the novel currency of euro may last long. For instance, in Ireland and Italy euro illusion was found to exist on the third year after the introduction of the euro (Missier et al., 2007). However, in some cases the adaptation to the euro may take less time. For example, according to Gamble (2007), in Austria the relearning to the euro scale was processing quite smoothly and quickly in comparison with Portugal, were the adaptation took longer. Germans have also adapted the euro easier than citizens of most other Euro zone countries. The research conducted by Jonas (2003) after the transition to the euro in Germany revealed that citizens did not see a bigger risk in making an investment in euro than in Deutsche mark. Even though consumers were less confident in making economic decision expressed in euro, they adapted to and assessed new prices without making big errors, thus the effect of euro illusion in this country was not very influential.

Citizens can use different strategies for adaptation while country is transitioning to the euro – intuitive (based on abandoning old reference points and creating new ones), anchoring (based on comparing prices of products, which are bought very frequently), conversion (translating prices to old

currency), etc. The research conducted in Ireland and Italy showed that usually consumers use more than one strategy for adapting for the euro (Missier, 2007). All of the strategies, except of exact conversion of currencies, create euro illusion.

The adaptation to the euro could be easier for those individuals who had regular practice in using this currency – for travelers or those who lived in one of Euro zone countries for some time. However, for the majority of citizens the process of adaptation to the new currency is not so smooth. In order to make the transition to the euro easier for citizens, government can apply different strategies. First, in the beginning of currency changeover period the dual cash circulation is introduced in the country when payments can be done in both euro and national currency. This process is more related with the transition to the euro as a physical currency. The adaptation for the euro as a psychological currency that citizens have to accept as they new national money is another matter.

The process of relearning new currency scale in people's minds is more complex. For this purpose, the system of dual pricing is used in a country that enters Euro zone. Dual pricing implies that retailers are obliged to provide prices expressed in both euro and national currency in predetermined period before and after the introduction of the euro. It was assumed that this kind of system should facilitate the relearning of new prices and encourage people to adapt to euro scale (Gamble, 2007). However, in practice this system is often criticized as it forces people to rely on old reference points longer – citizens continue to make economic decisions based on the old national currency. This tendency was noticed in Estonia, Austria and other Euro zone countries (Glauben et al., 2004). Thus, dual pricing does not motivate consumers to learn new currency values and adapt to the euro.

One of the factors that can prevent citizens from smooth adaptation to the euro is their negative attitude towards the new currency. People are always afraid of uncertainty that arises from any significant changes in the country. Currency changeover is one of those processes that can make citizens feel unsecure. One of the reasons is that they experience money illusion while making economic decisions. Therefore, euro introduction and euro illusion cause negative opinion in society about the new currency, which in turn can even worsen the scope of euro illusion experienced in the country.

After the cross-country research conducted in Ireland and Italy, Missier et al. (2007) concluded that euro illusion makes relearning of new currency scale difficult and, thus, causes annoyance between citizens. People experience personal negative outcomes, and therefore in the long term usually have negative attitude towards the euro. Kerem et al. (2013) state that in the case of Estonia people expressed pessimistic feelings about the euro. Van Raaij and van Rijen (2003) found that most of the citizens of The Netherlands also had negative opinion about the euro. Researchers state that as a consequence of negative attitude, consumers may evaluate the euro as less valuable currency and

assess new prices inaccurately. It means that citizens' personal attitude towards the euro creates an opportunity to euro illusion to be stronger in the particular country.

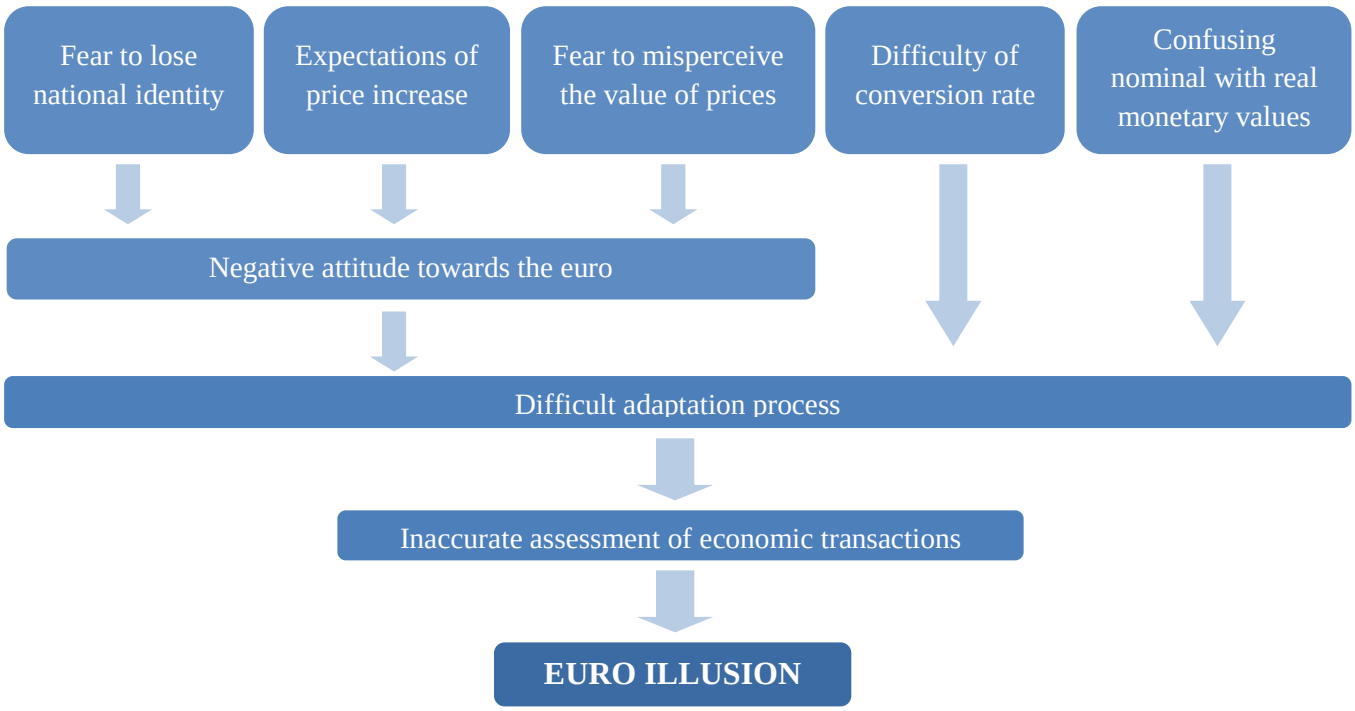
Missier et al. (2007) stressed the fact that pessimistic attitude toward the euro can switch to negative opinion about the public institutions which foster the adoption of the euro. Thus, in order to avoid this, it is important for such institutions to ensure effective public policies to make the transition to the euro less stressful for citizens and prevent their negative attitude.

As it was written above, the effect of euro illusion was weak in Germany. Jonas (2003) also found that the negative attitude towards the euro in Germany was not so noticeable in comparison with other Euro zone countries. Although citizens considered national currency as more stable and attractive, the negative view on the euro was not so strong and the impact of such attitudes on price estimation was found to be not so significant. Thus, it can be assumed that negative attitudes toward the euro and the scope of money illusion are interrelated phenomenons. The more positive attitude people have, the less they are prone to euro illusion effect.

Kerem et al. (2013) studied consumer attitudes toward the euro adoption. The results of the research showed that consumer opinions about the currency changeover are multifaceted and arise due to both rational and emotional (psychological) factors. Researchers pointed out that emotional factors are often underestimated. Most of citizens experience difficult adaptation to the euro not only because of concerns that they will misperceive new prices due to exchange rate or that real prices will rise after the changeover, they are also afraid of losing national identity with the loss of their local currency. This factors influences consumer attitudes towards the euro, makes the adaptation more complicated and stimulates euro illusion in the country.

✓ The concept of euro illusion was introduced in economics during the adoption of common currency of the euro in the European Monetary Union. Euro illusion is related to money illusion and is basically the same phenomenon. It emphasizes the influence of nominal monetary values on perception of economic transactions after the transition to the euro in a country.

Eventually the common currency of the euro should benefit citizens, however the adaptation to the euro is a difficult process which gives a possibility for euro illusion to appear in a country.



Source: prepared by the author.

Figure 3. Factors causing euro illusion

The scheme on Figure 3 shows the main factors that cause euro illusion in countries, which enter Euro zone. It is very difficult for individuals to avoid the influence of such aspects as difficulty of conversion rate between old national currency and the euro, and confusion of nominal with real monetary values. Thus, they are common for all country‘s citizens. Such factors as fear of price increase and misperceiving their value, as well as loosing national pride are more individual and psychological. They create negative attitude towards the euro.

The consequence of all mentioned factors is difficult adaptation period for citizens and, therefore, inaccurate assessment of economic transactions which worsens the effect of euro illusion in a country.

2. RESEARCH METHODOLOGY

2.1. Methodologies of previously conducted researches on money illusion

The purpose of the second chapter is to prepare the methodology for the assessment of the impact of money illusion on individuals' economic behaviour in Lithuania. It is important to decide how the research should be organized and what empirical methods should be chosen in order to receive reliable results. For this purpose, it would be useful to overview methodologies that were previously used by researchers who studied money illusion. It should make the basis for forming the current research model.

One of the ways to explore the impact of money illusion is to study individuals' personal experience using particular currency. Common empirical method for receiving qualitative information of such kind is a questionnaire with open-ended questions or interview. Dzokoto et al. (2010) in their research used interview method to get the information about respondents' experience using old and new currency in Ghana, transition process and evaluation of new currency. The interviews consisting of semi-structured, open-ended questions were conducted in public places. 40 adults of different age and education participated in the research. Obtained data was analyzed through generating the codes from meaningful recurring units in text, and then by grouping them. It allowed authors to find, analyze and discuss four themes of codes that were related to money illusion.

Kerem et al. (2013) conducted a research in Estonia before the introduction of the euro in order to enhance the understanding of consumers' attitudes towards new currency that cause money illusion. Authors used semi-structured interview method. Respondents were answering questions in public spaces or at their homes. After analysis of the data, authors distinguished and discussed several aspects that are related to the introduction of the euro and which could be possible reasons for euro/money illusion to appear in the country: the perception of value scale and usage of price references, expectation of inflation and price changes, and the impact of national identity on currency perception.

Jonas (2003) in his article described a series of qualitative and quantitative studies carried out by him and his colleagues that are related to the introduction of the euro in Germany. For example, author investigated individuals' psychological attitudes and adaptation to the euro by asking people to estimate the physical size of the euro and deutsche mark coins before and after the introduction of new currency. In addition, two surveys were conducted (before and after the introduction of the euro) in which respondents were asked to evaluate the attractiveness of currencies in a scale from 1 to 10. Another study, in which methods of questionnaire and correlation analysis were used, revealed the relationship between individuals' belief in euro introduction before it happened and their attitudes

towards the euro after the transition. These and other similar studies helped to assess citizens' attitudes, adaptation processes and other factors, which in turn can influence the scope of experienced money illusion in a country.

Another kind of questionnaires to study money illusion consist questions which do not ask respondents to evaluate currency or say their opinion about particular phenomenon directly, but to solve hypothetical problems. The analysis of results then gives the answer whether respondents experience money illusion or not.

Shafir, Diamond and Tversky (1997) formed one of such research models. It was later used by other researchers (sometimes slightly modified and adapted for particular country). Authors prepared structured questionnaire that was initially presented to people in public spaces as well as to a group of students in the university. Problems, which described situations and suggested respondents to evaluate them or make a decision, were formed similar to experimental situations in which individuals show how they would behave under stated conditions. Questions were grouped into five categories according to different factors, which are influenced by or cause money illusion – earnings, transactions, contracts, investments, mental accounting, and moral. In total of seven problems were presented to participants of the study. Received and analyzed data let the authors to evaluate and discuss the effects of money illusion on individuals' assessment of economic transactions and on their behaviour.

Research model of Shafir, Diamond and Tversky was used as a basis for later researches. One of them is the study conducted by Ackert et al. (2011). The aim of their survey was to measure the extent of money illusion and its effect on homeowners' expectations regarding home valuations. Authors chose one suburban area in USA and asked its residents to complete a survey. 141 adults of various age and education answered a questionnaire during different community events. Survey included specific questions regarding home valuations and knowledge of types of mortgage as well as important part with scenarios from Shafir, Diamond and Tversky model. Its purpose was to find out whether residents experience money illusion or not. Problems described in initial scenarios were adapted to market conditions of the time when the survey was conducted (e.g. salary levels were increased). Obtained results were analyzed using statistical methods. In addition, the relationship between money illusion and respondents' expectations of home prices was analyzed.

Another model for studying money illusion effect was formed by Soman, Wertenbroch and Chattopadhyay (2007). They studied the impact of numerosity effect on individuals' perception of economic transactions in 2002 and called their model Difference Assessment Account (DAA). Authors investigated how nominal vs. real prices influence consumers' behaviour as well as the effect of reference points (such as budget, difference and ratio between income and prices) on willingness to pay. Students of universities in USA and Hong Kong were chosen as participants of the study (for each

experiment from 20 to 150 individuals). The model of the research represented six experimental scenarios, which described situations and asked participants to make a decision. Respondents were given a budget in U.S. or Hong Kong dollars but they needed to make economic choices in hypothetical currency. Participants were given similar scenarios in different sessions but with different price conditions – with low, medium (control) and high numerosity. Authors manipulated the nominal value of prices in order to find out what is the effect of numerosity and, hence, money illusion on consumers' decisions. The relationship between such factors as numerosity, budget, willingness to pay, perceived value of transaction, etc. was investigated using statistical methods.

DAA model was later applied in other works. Ramoniene and Brazys (2007) used DAA for investigating possible effects of expected at that time euro introduction in Lithuania and Latvia. Authors tested DAA model by investigating if consumers compare prices to their income and if nominal values and numerosity influences their economic decisions. Differently from initial experiment, Ramoniene and Brazys used not hypothetical currency, but real – litas, lat and euro. The participants of the research were 38 students from Lithuania and 20 students from Latvia. Both groups were participating in two sessions. In the first session students were given a budget, expressed in their home country's currency, and were asked to spend it on suggested goods and services expressed as well in litas and lat. In the second session the task was the same, but currency was changed to euro (prices and budget were converted using exchange rate so the purchasing power has not changed). The aim of two sessions was to investigate if consumers assess value of money differently when nominal values of budget and prices differ, i.e. if they experience money illusion effect.

One of quantitative methods that can be used for money illusion research in case of currency changeover in a country is analysis and comparison of acceptance levels for prices expressed in familiar and unfamiliar currencies. This method is called Gabor-Granger price test. Desmet (2002) used it while studying the effect of money illusion in two countries – Germany and Spain. In order to find out if the introduction of the euro would create money illusion effect, author modelled a survey in which acceptance and rejection levels for prices in home currency and euro were identified. Two products that are well known in both countries were selected for the research. Two samples of 120 participants in two countries were asked to randomly select prices from envelope and decide if they would buy the product for indicated price; if not – to specify if the price seems too low or too high. The survey was carried out for home currencies as well as for the euro. Responses were collected and placed on both sides of the mean observed price for the product in each country. Then the results for different currencies and two countries were analyzed and compared, conclusions how the euro introduction would affect consumer's economic decisions were made.

Van Raaij and van Rijen (2003) also used Gabor-Granger method in their research conducted in the Netherlands prior the introduction on the euro. Authors sought to find empirical support for money

illusion when citizens assess prices in euro. The second objective was to compare psychological pricing in euro and guilder. Participants of the experiment were 117 customers at a bank office who were chosen using quota based on demographic factors. Two products were selected like in previously described research, however the procedure of the experiment was slightly different. Participants of the research were asked to assess four series of prices (in euro and in guilder; psychological and rounded) for each product. The starting price was the middle price in the series. The participant had to say if he/she would buy the product for indicated price. Depending on the answer, the respondent was asked to assess the next higher/lower price in the series. In this way, rejection and acceptance levels for prices in euro and home currency were indentified. The results were analyzed by computing cumulative frequencies and showing them in the graphs for each currency and product as willingness to pay curves. Finally, conclusions about the effect of euro illusion were made and discussed.

Anttila (2004) also used the method with price scales. Two surveys of 477 and 507 respondents were conducted before and after the introduction of the euro in Finland. Participants were asked to indicate their average, lower and upper reference prices expressed in euro and in markka for 17 categories of products and services. The relationship between average reference prices, lower and upper reference prices of each product for both currencies was analyzed with regression model to explain the differences between reference levels in two currencies. The analysis allowed author to discuss the presence of money illusion and its influence on price perception.

Missier et al. (2007) while studying money illusion effect in Italy and Ireland also used consumers' price estimation for his research. Two samples of 96 respondents in each country were asked to estimate the basket with products. Two versions of questionnaire with home currency and euro prices were randomly suggested for participants. The results for home currencies and the euro as well as results in two countries were analyzed and compared using statistical methods. The differences in each product's estimation asymmetries between participants were analyzed by performing dependent-samples *t*-test. The results allowed to assess the extent of euro illusion in each country.

Raghubir and Srivastava (2002) studied money illusion effect on consumers' behaviour when using foreign currency. Authors stated that due to anchoring and adjustment biases individuals estimate prices not in real terms, but as a combination of nominal and real values. They created a model which shows that subjective value of economic transaction depends on nominal value of the price expressed in foreign currency and real value expressed in home currency (nominal value in foreign currency is adjusted based on exchange rate to get real value in home currency terms). Authors investigated individuals' spending behaviour using different ratios of face values of foreign and home currencies. Six studies were carried out in which 97 students from USA participated. They were asked to make a purchase decision indicating the price in foreign currency, which they would be willing to pay for the same product in different countries. They were also asked to charge prices for each product

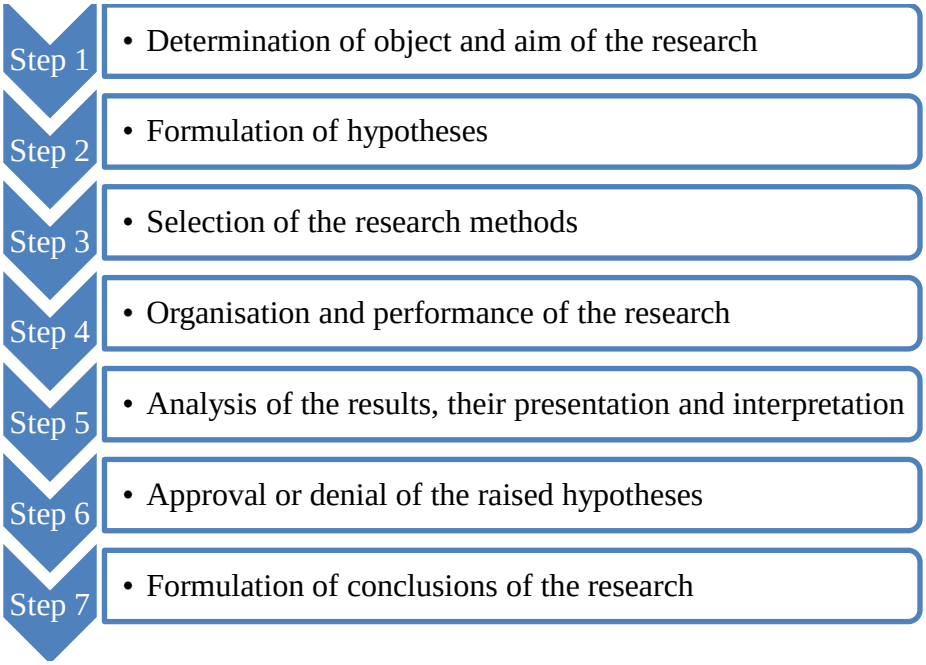
in USD. Authors also manipulated such factors as exchange rate and time pressure. Obtained results were analyzed using statistical methods and the effect of relationship between face values of foreign and home currencies on individuals' spending behaviour was discussed.

✓ The research models described in this subchapter show that both quantitative and qualitative methods could be applied for studying money illusion effect on individuals. In every research, it is important to investigate the way consumers assess value of money and evaluate economic transactions, as it is the main motive that explains individuals' economic behaviour. Particular models of studying money illusion could become a basis and reference point for creating a model of studying money illusion effect on Lithuanians' economic behaviour.

2.2. Methodological framework and data collection

Distinguishing methods used for studying money illusion in scientific literature was useful for formulation of the purpose, object of current research and for planning methods which will be used in it. Methods should be chosen in such way so they would allow to make conclusions and to answer main questions of the research.

Empirical research of money illusion effect on individuals' economic behaviour in Lithuania is carried out by the logic structure presented below (see Figure 4):



Source: prepared by the author.

Figure 4. Logical structure of the research

The problem of the research can be distinguished in form of question – do Lithuanians experience money illusion and what is the impact of it on individuals' economic behaviour?

The object of the research is the effect of money illusion. **The aim of the research** is after the identification of existence of money illusion between Lithuanians, to evaluate the impact of money illusion on individuals' economic behaviour in Lithuania.

In order to achieve the aim, the following **objectives** were pursued:

1. To analyze if individuals are prone to money illusion by investigating how they assess economic transactions – in real or nominal terms;
2. To find out if individuals experience euro illusion (as a part of money illusion) after the introduction of the euro in Lithuania in January 2015 by comparing their economic decisions made using two currencies – litas and euro;
3. To study individuals' attitude towards the introduction of the euro in Lithuania and their adaptation process, as well as to investigate if these factors have an influence on the strength of money illusion.

Before conducting the research, further **hypotheses** were raised (see Table 3):

Table 3. Research hypotheses

Nr.	Hypothesis	Comment
H1	The strength of money illusion effect experienced by individuals is related with their demographic characteristics.	Such individual characteristics as gender, age, level of education, habits, etc. may explain the logic of economic behaviour and the scope of experienced money illusion.
H2	Individuals' experienced money illusion effect is related to their attitudes towards the euro.	This hypothesis is formed based on works of Missier et al. (2007), Kerem et al. (2013), Van Raaij and van Rijen (2003) who discussed the impact of negative or positive opinion about the new currency on the scope of money illusion in a country.
H3	Today, the process of adaptation to the euro is topical issue among Lithuanian citizens.	Adaptation to the new currency in a country may last long. Difficulties in this process can make the effect of money illusion last longer. It was discussed by such authors as Jonas (2003), Missier et al. (2007), Gamble (2007).
H4	Individuals are focused on nominal rather than real monetary terms when assessing economic transactions.	Confusing nominal vs. real terms is the main reason why individuals experience money illusion while making economic decisions. In order to find out if Lithuanians are prone to this bias it is important to find out if they are more focused on nominal rather than real monetary values.

Table 3 is continued on the next page

Continuation of Table 3

H5	Individuals' willingness to pay is higher when prices are expressed in more numerous currency (litas).	This hypothesis is based on Difference Assessment Account theory (DAA) modelled by Soman et al. (2007). It states that individuals are more willing to pay in more numerous currency, because differences between prices and the budget appear bigger. Litas is more numerous than euro, thus it is reasonable to study how Lithuanians' willingness to pay is related to numerosity of two currencies.
H6	Individuals are more risk averse when making investment decisions in less familiar currency (euro).	Investments are important part of economic decisions that can be affected by currency changeover in a country. Individuals may be less confident in making investment decisions using unfamiliar currency (Jonas, 2003), thus it is important to examine if Lithuanians became more risk averse in their investment behaviour after the introduction of the euro.

Source: prepared by the author.

Methods of the research include the method of experimental study and statistical methods – descriptive statistics (tables, graphics), Pearson's chi-square test, paired samples *t*-test, Spearman's correlation coefficient, and Wilcoxon signed-rank test.

Experiment is interdisciplinary method to obtain information in controlled and managed conditions, to identify cause-effect relationship between events or things (Tidikis, 2003). It is important to determine independent and dependent variables in the experiment. By manipulating independent variable the researcher observes its impact on dependent variables (Kardelis, 2002). According to Tidikis (2003), experiments can be divided into groups by the nature of the object under investigation – economic, legal, pedagogical etc. The experiment conducted in this paper is economic.

Tidikis (2003) distinguishes parallel experiment, when the experiment is conducted with two groups and their results are compared, and consistent experiment, when there is one group of participants and conclusions are made based on comparison of the data obtained at different time points (e.g. before and after, one month apart). For conducting current research a consistent type of experiment was chosen.

A method of experiment was also chosen because it was used in works of Shafir et al. (1997), Soman et al. (2007), Ramoniene and Brazys (2014) who used similar research model for studying money illusion.

Random **sampling method** was used for selecting participants of the experiment. Kardelis (2002) states that it is the best way to choose subjects for an experiment. Certain frames should be set for selecting participants. In current research individuals could participate in the experiment if they are citizens of Lithuania and are older than 18 years. These criteria were set in order to ensure than an individual has experience in using both currencies (litas and euro) and is used to make economic

decisions independently. Thus, the target population in this research are Lithuanians older than 18 years. Selection method of a sample ensures that the results will be valid for target population.

The structure of the experiment. The experimental study was designed in form of structured questionnaire with closed- and open-ended questions (see the list of questions in Annex 1). Questions and problems were presented to participants of the experiment. Independent variables in this case were budget and prices expressed in two different currencies (litas and euro with different numerosity) which were manipulated. The dependent variable was consumers' assessment of economic transaction.

The questionnaire used in the experiment is comprised of introduction and 21 questions divided into four sections. The structure of the questionnaire is described in Table 4. It shows the title of the section, questions related to it, hypotheses that are tested in it, as well as short explanations what is the aim of each part and on which researches some questions' formulation is based. Problems that were formed based on other researches where slightly modified and adopted so they would comply with current situation in Lithuania.

Table 4. Questionnaire structure

Nr.	Questions	Section	Aims	Hypotheses tested
		Introduction	Respondents are informed about the purpose of the questionnaire.	
1.	1-6	Demographic questions	The aim is to receive respondents' demographic information (gender, age, education etc.)	H1
2.	7-12	Adaptation to the euro and attitude related questions	This part aims to find out how individuals feel about the introduction of the euro and how difficult the process of adaptation is going. These factors can influence the scope of money illusion experienced in a country. Questions 8-12 are based on those used in the research conducted by Missier et al. (2007).	H2, H3
3.	13-17	Money illusion related questions	The purpose of this part is to evaluate in which terms – nominal or real – individuals assess prices, economic transactions and their income. Confusion of nominal with real monetary values is the main reason that leads to money illusion. Questions 13-17 are based on problems that were initially described by Shafir et al. (1997) and later used in several works whose purpose was to study the effect of money illusion.	H4
4.	18-21	Euro illusion related questions	This part aims to investigate if Lithuanians experience euro illusion after the introduction of the euro in January 2015. It is important to find out if their economic decisions made using euro and litas differ. Questions 18-19 are based on initial problem from the study of Soman et al. (2007) and its adaptation in the research conducted by Ramoniene and Brazys (2014).	H5, H6

Source: prepared by the author.

Performance of the research. The experiment was conducted with two groups of participants in two places – with employees of bank office based in Vilnius city and with employees of a firm based in Visaginas town. Two groups of participants did not differ in some important way and the purpose of the experiment is not to compare two groups, but to compare the results of two sessions. Thus, the results are presented and analyzed in a combined format as of one big group of participants.

Participants were 25 workers from different departments. Each group took part in two sessions of the experiment that were performed one week apart: the first group on 22 and 29 of September, the second – on 25 of September and 2 of October, 2015. Participants were given sheets of paper with questions and problems posed in a questionnaire format. In the first session questions 1-6, 13-15, 18, 20 were asked. In the second – 7-12, 16-17, 19, 21. The purpose of making two session and dividing questions into two parts was to ensure unbiased decisions made by participants regarding questions where formulation is the same but the currency and numerosity differ (however real values are the same). If participant received these questions in one session they would have compared them and made biased decisions. Questions were written in English language, however translation to Lithuanian was also prepared in case participants have difficulties with understanding questions.

Performance of such experiment has some limitations. Problems presented in a survey are hypothetical and decisions made by participant may not extend to real world. Also participant may bear in mind their own assumptions like personal experience (e.g. income, savings, debts etc.) which could affect their decisions. Shafir et al. (1997) state that it is important to be aware of such limitations, however carefully constructed questionnaire helps to reduce biases. Authors also note that behavioural phenomenons first observed in hypothetical settings have often been repeated in real-world situations.

The analysis of the research data. The data obtained from the experiment is organized and systemized in Microsoft Office Excel program. It is analyzed in IMB SPSS Statistics program using statistical methods, represented with descriptive statistics as tables, graphics and diagrams. On the basis of analysis conclusions are made.

Data validity and reliability. Any experiment that is related to human factor always comes under question. The reliability and validity of the results are ensured by several factors. Experiment is modelled based on well-established researches conducted by Shafir et al. (1997), Soman et al. (2007), Missier et al. (2007). The application of combination of already tested research models ensures that valid information will be received. The model of the experiment allows other researchers to repeat it under similar conditions. The group of participants was chosen using random sampling method. Experimental design is structured precisely for the purpose to test hypotheses that were raised in the research. During the experiment, the quality of data collection was ensured so no fake records or

results of poor quality would be used in the analysis. The significance of the results was tested and only statistically significant results (where $p<0.05$) were used for making conclusions.

Practical relevance of the research. The results of the research will help to reveal weaknesses of individuals' economic decision-making process which lead to money illusion. Such information could become a base for making recommendations of how to interpret individuals' economic behaviour. On one hand, consumers that would know reasons and the impact of money illusion can avoid this bias while making economic decisions. On the other hand, this information could help suppliers of goods and services, economists etc. to understand consumers' needs and motives, thus to adapt to their behaviour and achieve better results.

✓ In this subchapter the logical structure and methodological framework of the research of money illusion effect on individuals' economic behaviour in Lithuania are presented. The object of the research is the effect of money illusion. The aim is after the identification of existence of money illusion between Lithuanians, to evaluate the impact of money illusion on individuals' economic behaviour in Lithuania. Six hypotheses are raised in the research. Experiment and statistical methods are chosen.

The experimental study is designed in form of structured questionnaire comprised of 21 question divided into four sections (demographic, adaptation to the euro and attitude related, money illusion related, and euro illusion related questions). 25 employees of two companies were chosen to participate in the experiment using random selection method. They need to meet such requirements: to be citizen of Lithuania who is older than 18 years. The experiment was performed in two sessions with the same group of people. The results were analyzed using Microsoft Office Excel and IMB SPSS Statistics programs.

2.3. Decoding of the data

In order to make interpretation of the experiment's results easier, this subchapter aims to decode answer options as well as to explain models of certain questions.

Questions 7, 8, 9 and 12 have answer options represented in ordinal scale that measures non-parametric concepts. ***Decoding:*** Ordinal data is used:

- in 7^{th} question – to measure individuals' attitudes towards the introduction of the euro in Lithuania ("negative – neutral – positive");
- in 8^{th} question – to measure difficulty of their adaptation to the euro ("difficult – not difficult nor easy – easy");

- in 9th question – to measure participant's feeling if the euro causes them difficulty today ("a lot of difficulty – some difficulty – no difficulty");
- in 12th question – to measure individuals' opinion if goods and services had become less or more expensive after the introduction of the euro ("less expensive – not less expensive nor more expensive – more expensive").

In order the information received in ordinal format could be used for further analysis, certain ranks are assigned to answer options. The more negative is the answer (e.g., "difficult", "negative"), the lower rank it has. Accordingly, the more positive is the answer (e.g., "easy", "positive"), the higher rank is assigned to it. The ranks are assigned to the data and are used for statistical analyses in IMB SPSS Statistics program.

Next questions and their answers are explained and decoded below.

10 and 11 questions

10. When doing exceptional purchases like a car or expensive electronics, do you count mentally most often in … ?

11. When doing daily shopping, do you count mentally most often in ... ?

Decoding: These questions aim to investigate what is the current situation with individuals' adaptation to the euro in terms of assessing more and less expensive transactions.

- Most often in euro = Individual has adapted to the euro – he/she assesses and compares prices in euro.
- Most often in litas = Individual has not adapted to the euro because he/she converts prices expressed in euro to litas.
- As often in euro as in litas = Individual has not completely adapted to the euro.

13 and 14 questions

Consider two individuals – Ann and Barbara – who took similar jobs. Ann started with a yearly salary of EUR 10,000. During the first year there was no inflation and the next year Ann got a 2% (EUR 200) raise in her salary. Barbara also started with a yearly salary of EUR 10,000. During the year there was an inflation of 4%, and Barbara received a 5% (EUR 500) raise in salary.

13. Who do you think was doing better in economic terms after the raise in salary?

14. Who do you think was happier after the raise in salary?

Decoding: The aim of these two questions is to find out if individuals distinguish between nominal and real monetary terms.

In economic terms (i.e. taking inflation into consideration) Ann is doing better because she got bigger raise in salary (2%) than Barbara (1% = 5% - 4%). So, the right answer is Ann.

Talking about attribution of happiness, there is no right or wrong answer. It depends on how an individual understands well-being – in nominal or real terms. It is common when people connect economic welfare to nominal terms. In nominal terms Barbara is doing better than Ann (5% > 2%).

15 and 16 questions

Imagine that European Union experienced very high inflation which affected Lithuanian economy. Within 6-month period all prices and salaries went up by 25% – now you earn and spend 25% more than before.

15. Six months ago you were planning to buy a computer whose price during this period went up from EUR 400 to EUR 500. Would you be more likely to buy it now or six months ago?

16. Six months ago you were planning to sell a computer whose price during this period went up from EUR 400 to EUR 500. Would you be more likely to sell it now or six months ago?

Decoding: Real values of EUR 400 six months ago and EUR 500 now are the same (400+400*25%=500), thus there is no difference when to buy or to sell a computer. Questions show if individuals distinguish between nominal and real monetary terms as well as if there is reluctance to buy and keenness to sell when prices changed due to inflation.

- Now = Willingness to sell or buy now means that an individual does not distinguish between nominal and real terms.
- Six months ago = Willingness to sell or buy six months ago means that an individual does not distinguish between nominal and real terms.
- No difference = Individual distinguishes between nominal and real terms and does not experience money illusion in this case.

17 question

Suppose Adam, Ben and Carl each purchased a house for EUR 100,000. Each of them sold the house a year after buying it. Economic conditions, however, were different in each case:

- When Adam owned the house, there was a 25% deflation – prices decreased by approximately 25%. A year after Adam bought the house, he sold it for EUR 77,000 (23% less than he paid).
- When Ben owned the house, there was no inflation or deflation – prices had not changed. He sold the house for EUR 99,000 (1% less than he paid).
- When Carl owned the house, there was 25% inflation – prices increased by approximately 25%. A year after he bought the house, Carl sold it for EUR 123,000 (23% more than he paid).

Please rank Adam, Ben and Carl in terms of the success of their deal. Assign '1' to the person who did best, '3' – worst.

Decoding: This problem is more complicated than previous and requires more skills and attention to solve it. It aims to show if individuals distinguish between nominal and real terms when

assessing economic transactions. The right rank of Adam, Ben and Carl is shown below. Nominal terms are adjusted to inflation/deflation to get gains/losses expressed in real terms.

	Adam	**Ben**	**Carl**
Nominal terms	-23%	-1%	+23%
Real terms	+2%	-1%	-2%
Rank	**1**	**2**	**3**

Adam sold his house with a 23% nominal loss, however due to 25% deflation he closed the deal with 2% of real gain (-23% + 25% = 2%). Ben has 1% of both nominal and real loss because in his case there was no inflation or deflation. Carl sold his house for a 23% nominal gain, however due to 25% inflation he lost 2% in real terms (23% - 25% = -2%).

If an individual ranks Adam, Ben and Carl in the same way as indicated above, it means that he/she distinguishes between nominal and real terms and does not experience money illusion. If he/she does it in another way – an individual evaluates only nominal monetary terms, thus he/she is prone to money illusion.

18 and 19 questions

18. Imagine that you have monthly after-tax income of LTL 2,200. On all essential expenses (such as rent, food, transportation, utilities and other bills, etc.) you spend on average LTL 1,180. You have no other essential expenses, however you would like to budget some money on non-essential expenses like those indicated in the table below.

Keeping in mind that you have LTL 1,020 to spend and that you also saving some money every month, how much would you budget for each of these types of expenses per month?

Eating out	
Dinner at a fancy restaurant	LTL 50
A beer and food at bar	LTL 25
Entertainment	
Movie ticket	LTL 15
Ticket to a sport event or a concert	LTL 45
Shopping	
A pair of branded casual pants	LTL 130
T-Shirt suitable for daily wear	LTL 35

19. Imagine that you have monthly after-tax income of EUR 640. On all essential expenses (such as rent, food, transportation, utilities and other bills, etc.) you spend on average EUR 343. You have no other essential expenses, however you would like to budget some money on non-essential expenses like those indicated in the table below.

Keeping in mind that you have EUR 297 to spend and that you also saving some money every month, how much would you budget for each of these types of expenses per month?

Eating out	
Dinner at a fancy restaurant	EUR 14.50
A beer and food at bar	EUR 7.20
Entertainment	
Movie ticket	EUR 4.30
Ticket to a sport event or a concert	EUR 13
Shopping	
A pair of branded casual pants	EUR 37.50
T-Shirt suitable for daily wear	EUR 10

Decoding: The aim of 18 and 19 problems is to study if individuals are prone to euro illusion by investigating their willingness to pay (WTP) for different spending categories in two currencies – litas and euro. The budget and prices are given in the questions as reference points for experiment participants. They have different face values, however the real values are approximately the same (according to exchange rate EUR 1 = LTL 3.4528). This means that if an individual does not experience euro illusion, there would be no significant difference in his/her WTP in two currencies.

There are also two possibilities in which an individual can evaluate prices – based on a difference between or a ratio with a given budget. In case of using one currency, there is no significant difference whether an individual uses one or another strategy. However, during currency changeover in a country the numerosity of the currency changes and it influences assessment of economic transactions. If a citizen evaluates the ratio between prices and given budget – his/her economic decisions should not change significantly when using different currencies since the ratio does not change. However, if one assesses differences between prices and budget, his/her decisions are biased by numerosity effect, thus the effect of euro illusion appears.

Soman et al. (2007) explains this observation by two different theories. The ratio assessment account theory expects no difference in WTP in different currency conditions. In contrast, the Difference assessment account theory (DAA) assumes that there is a difference in WTP and that an individual is more willing to pay in a currency which is more numerous (because the nominal difference between prices and budget is bigger in this case).

After receiving the results for 18 and 19 questions, WTP in litas and euro is compared by measuring the difference between the amounts that were budgeted in litas and euro and investigating if this difference is significant.

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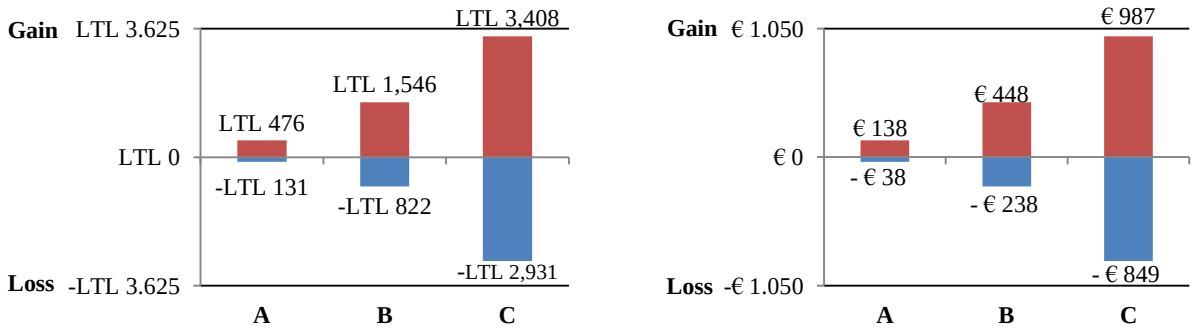
20 and 21 questions

20. Imagine that you are an investor who wants to invest 7,250 LTL. The chart below illustrates maximum potential gains and losses on three 1-year hypothetical investments of 7,250 LTL. Which one investment option would you choose?

- A (loss LTL 131; gain LTL 476)
- B (loss LTL 822; gain LTL 1,546)
- C (loss LTL 2,931; gain LTL 3,408)

21. Imagine that you are an investor who wants to invest 2,100 EUR. The chart below illustrates maximum potential gains and losses on three 1-year hypothetical investments of 2,100 EUR. Which one investment option would you choose?

- A (loss EUR 38; gain EUR 138)
- B (loss EUR 238; gain EUR 448)
- C (loss EUR 849; gain EUR 987)



Decoding: These questions aim to identify if individuals' investment decisions are influenced by the euro illusion after 9 months after the currency changeover in Lithuania. As it was discussed in previous chapters, usually people are more risk averse when making economic decisions in less familiar currency.

Answer options in both questions have different nominal values as they are expressed in litas and euro, however real values are approximately the same (according to exchange rate EUR 1 = LTL 3.4528). It means that an individual who is not prone to euro illusion should choose the same risk in both questions.

- A – is least risky decision
- B – medium risky decision
- C – most risky decision

Answers for 20 and 21 questions allow to compare two sets of data – if investment decisions made using litas differ significantly from decisions made using euro.

✓ In this subchapter, explanation and decoding of answer options to experiment questions are presented. How certain questions were modelled is also discussed. Such information would be useful for understanding interpretation of the experiment's results in the next chapter.

3. RESULTS OF THE RESEARCH OF MONEY ILLUSION IMPACT ON INDIVIDUALS' ECONOMIC BEHAVIOUR IN LITHUANIA

In this part the results of the research of money illusion impact on individuals' economic behaviour in Lithuania, which is described in the second part, are presented and analyzed. As it was mentioned before, the analysis is conducted in Microsoft Office Excel and IMB SPSS Statistics programs using statistical methods – descriptive statistics (tables, graphics), Pearson's chi-square test, paired samples *t*-test, Spearman's correlation coefficient, and Wilcoxon signed-rank test. A significance level of 0.05 is assumed in the analysis.

The results from each section of questionnaire are presented and analysed in the same order as in the questionnaire structure presented in previous part. Although questions were divided into two parts and were allocated into two experimental sessions, the results are discussed using the same numbering of questions as indicated in Annex 1.

The results of two groups of participants are presented in a combined format as they do not differ in some important way.

3.1. Demographic data

The first section of questions used in the experiment shows demographic information of the experiment's participants (see Table 5). Demographic data will be necessary for checking hypothesis H1="The strength of money illusion effect experienced by individuals is related with their demographic characteristics". It will be checked after performing analysis of questions from other parts.

Table 5. Demographic data of experiment participants

Question	Number of participants	Percentage
Gender		
Male	11	44%
Female	14	56%
Age		
18-24	4	16%
25-34	9	36%
35-44	5	20%
45-54	4	16%
55-64	3	12%
Monthly income in EUR		
Less than 300	3	12%
300-400	3	12%

Table 5 is continued on the next page

Continuation of Table 5

401-500	3	12%
501-600	4	16%
601-700	3	12%
701-800	3	12%
801-900	1	4%
901-1000	1	4%
1000 and over	4	16%
Education level		
Secondary education	2	8%
Vocational and technical education	2	8%
College	3	12%
Bachelor's degree	10	40%
Master's degree	8	32%
Education related to economics/finance		
Related	11	44%
Not related	14	56%
Travelling habits (number of trips made to Euro zone countries in past 10 years)		
Never	2	8%
1 trip per year	10	40%
2-3 trips per year	9	36%
4-6 trips per year	2	8%
7-10 trips per year	1	4%
More than 10 trips per year	1	4%

Source: prepared by the author.

After systemizing the results it can be noted that participants' demographic data is various – individuals are of different gender, age, education, level of income and travelling habits.

The proportion of males and females is approximately the same – 44% of men and 56% of women participated in the experiment. Subjects represent different age groups – from 18 to over 60 years old.

Monthly income level also differs among participants and varies from 300 EUR or less to 1000 EUR and over. The proportions of income categories do not differ significantly – five of them represented by 12% of participants, two by 16% and two by 4%.

It is noteworthy that most of experiment's participants are highly educated – 72% of them have Bachelor's or higher degree. 56% of participants' education is related to economics or finance field. Later analysis will show if this criteria reduces the effect of money illusion on individuals.

Travelling to Euro zone habits differ among participants. The majority of them have been making about 1 trip (40%) or 2-3 trips (36%) to Euro zone countries per year. It means that most of respondents have not been using the euro very often in the past, thus they were not closely familiar with it when the euro was introduced in Lithuania in January 2015. The criteria of travelling habits will allow to investigate if travelling experience and previous experience in using the euro is related with the strength of the effect of euro illusion on individuals.

✓ The first section of questions of the experiment aimed to gather demographic information about the experiment's participants. The results showed diverse distribution of data – subjects are of different gender, age groups (from 18 till over 60 years old), income level (from 300 EUR or less to 1000 EUR and over), education level (from secondary education to Master's degree), travelling to Euro zone habits and thus different previous experience in using the euro. This data will be used in the analysis of further questions related to money illusion and euro illusion effects. The fact that participants have different demographic characteristics ensures the usefulness of application of demographic data in further analysis.

3.2. Adaptation to the euro and attitude related data

The second section of questions is intended to collect the data about participants' adaptation to the euro process as well as their attitude towards the new currency.

Data obtained from this part allows to test hypothesis H2="Individuals' experienced money illusion effect is related to their attitudes towards the euro". It will be checked later, after performing analysis of questions from the third section (euro illusion related questions).

In current section H3="Today, the process of adaptation to the euro is topical issue among Lithuanian citizens" is tested.

The distribution of the answers to second section of questions is presented below (see Table 6).

Table 6. Participants' adaptation to the euro and attitude related data

Question	Number of participants	Percentage
How would you describe your attitude towards the introduction of the euro in Lithuania?		
Negative	7	28%
Neutral	9	36%
Positive	9	36%
How would you describe your adaptation to the euro?		
Difficult	7	28%
Not difficult nor easy	8	32%
Easy	10	40%
Today, the euro causes you …		
A lot of difficulty	2	8%
Some difficulty	12	48%
No difficulty	11	44%
When doing exceptional purchases like a car or expensive electronics, you count mentally …		
Most often in euro	9	36%
Most often in litas	14	56%
As often in euro as in litas	2	8%

Table 6 is continued on the next page

Continuation of Table 6

When doing daily shopping, you count mentally …		
Most often in euro	7	28%
Most often in litas	12	48%
As often in euro as in litas	6	24%
You believe that after the introduction of the euro goods and services had become …		
More expensive	19	76%
Not less expensive nor more expensive	5	20%
Less expensive	1	4%

Source: prepared by the author.

The results which are systemized in Table 6 show diverse distribution of answers, however it is not enough to analyse these questions separately to illustrate what is the situation with the adaptation to the euro in Lithuania. In order to evaluate how the process of adaptation to the euro is going, it would be useful to evaluate the relationship between these factors:

1. individuals' attitude towards the introduction of the euro and the difficulty of their adaptation. The assumption that more positive attitude helps to adapt to the new currency is tested;
2. individuals' attitude towards the introduction of the euro and their opinion on whether goods and services became more or less expensive after the introduction of the euro. The assumption that attitude influences perception of prices is tested;
3. difficulty of adaptation for individuals and if the euro causes difficulty for them today. It is investigated whether the adaptation is still ongoing and if it still causes difficulty for citizens;
4. in which currency terms individuals assess exceptional purchases and daily shopping purchases – litas or euro. The importance of litas and euro for consumers is investigated by testing in which currency terms individuals assess transactions when making more and less important economic decisions;
5. individuals' travelling experience, their attitude towards the introduction of the euro and difficulty of adaptation. The assumption that the more often individuals have been using euro currency in the past and the more they are used to it, the better attitude they will have towards the introduction of the euro and the easier process of adaptation they will go through;
6. individuals' education level, their attitude towards the introduction of the euro and difficulty of adaptation. The assumption that education level and knowledge in economics/finance field have an impact on individual's attitude towards the introduction of the euro and the difficulty of the adaptation to it is investigated.

Each of the six parts will be discussed and analyzed below.

For the analysis of factors' relationship in parts 1, 2, 3, 5 and 6, Spearman's correlation coefficient is applied. Field (2005) defines it as a non-parametric statistic that is used when data has violated parametric assumptions. If the data is ordinal, it is said to be non-parametric, thus Pearson's

correlation cannot be use in this case and Spearman's correlation test is used instead (Field, 2005). Since the data that was obtained from above mentioned parts is measured in ordinal scale, Spearman's correlation coefficient is used for its analysis. It works by first ranking the data and then applying Pearson's correlation test.

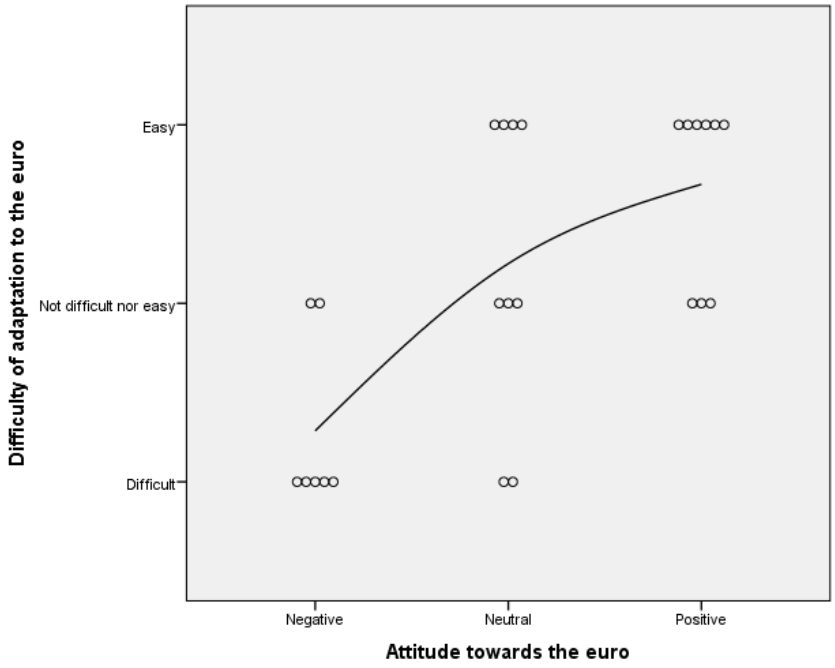
For the analysis of relationship in part 4, Pearson's chi-square test is applied. It can be used as a test for equality of proportions (Levine et al., 2007). In other words, it is used to investigate if the difference between the percentages of answers is significant.

For better illustration of the results of analyses, several types of diagrams are used. Pie chart is used to show distribution of answers in proportions in order to compare them. Scatter chart is used in order to illustrate the relationship between two factors. The data is displayed as a collection of points, each having a value in horizontal and vertical axis. Since the data is ordinal, points with the same values are stacked next to each other so they would not overlap and would show the frequency of the answers. In addition, interpolation line is added to show the trend or a correlation between two factors.

The results of the analyses in this section are shown in Annex 2. The analyses of six parts discussed above and their interpretation are presented below.

1. *Individuals' attitude towards the introduction of the euro and the difficulty of their adaptation*.

The results of Spearman's correlation analysis indicate that there is significant strong positive correlation between individuals' attitude towards the introduction of the euro ant the difficulty of adaptation process that they are going through (ρ=0.651; p=0.000425) (see Table 1 in Annex 2).



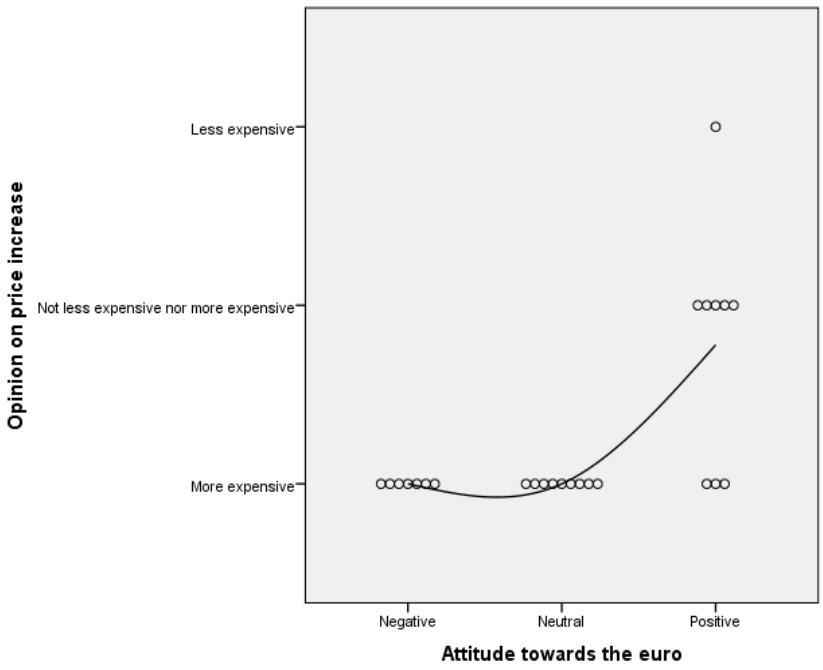
Source: prepared by the author.

Figure 5. Attitude towards the euro vs. Difficulty of adaptation to the euro

The trend line on Figure 5 illustrates that the better the attitude of an individual is, the easier for him/her is adaptation process, and vice versa. This phenomenon can be explained by pure

psychology – an individual is reluctant to get familiar and adapt to events, which he/she evaluates negatively. Accordingly, the more open he/she is for new things, the easier he/she gets used to them.

2. *Individuals' attitude towards the introduction of the euro and their opinion on whether goods and services became more or less expensive after the introduction of the euro*. It is noteworthy that the vast majority (76%) of experiment participants think that the prices increased after they were converted to the euro (see Table 6 and Figure 6). Whether price levels have in fact altered is not the question that is investigated – individuals' perception of prices is studied instead. A significant strong correlation between the attitude towards the introduction of the euro and individuals' opinion on whether prices changed after the introduction of the euro was found (ρ=0.659; p=0.000342) (see Table 1 in Annex 2).

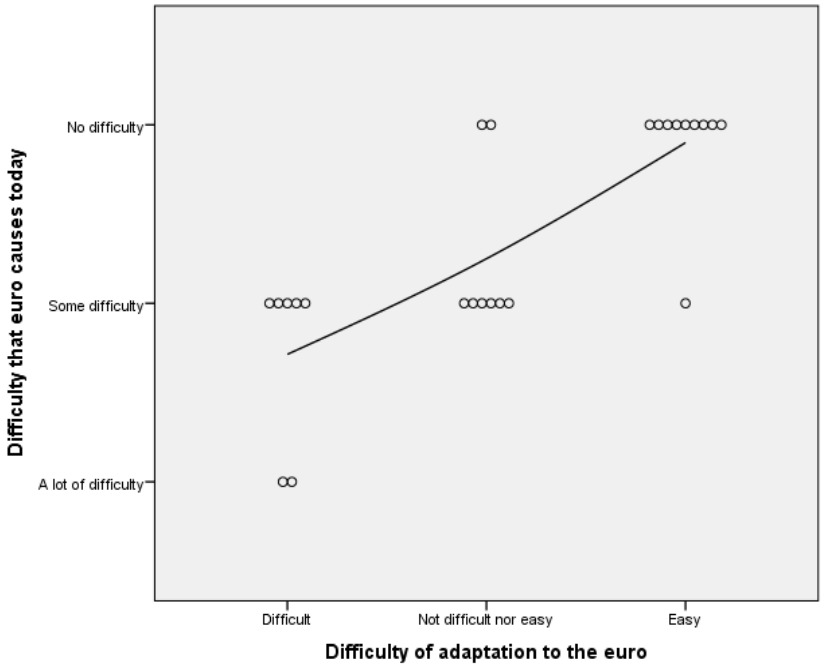


Source: prepared by the author.

Figure 6. Attitude towards the euro vs. Opinion on price increase after the introduction of euro

This association indicates that an attitude towards the euro is related to individuals' perception of price levels after they were converted from litas to euro. Trend line on Figure 6 confirms this finding. The worse the attitude towards the introduction of the euro, the more negatively an individual evaluates prices expressed in euro, thus he/she assesses them as becoming higher. If prices appear higher, then the negative attitude towards the euro will not change to a positive one. Thus, this vicious circle makes the process of adaptation more difficult.

3. *Difficulty of adaptation for individuals and if the euro causes difficulty for them today*. There was found a strong association between the difficulty of the adaptation process and the difficulty which the euro causes for an individual today (ρ=0.792; p=0.000002) (see Table 1 in Annex 2).

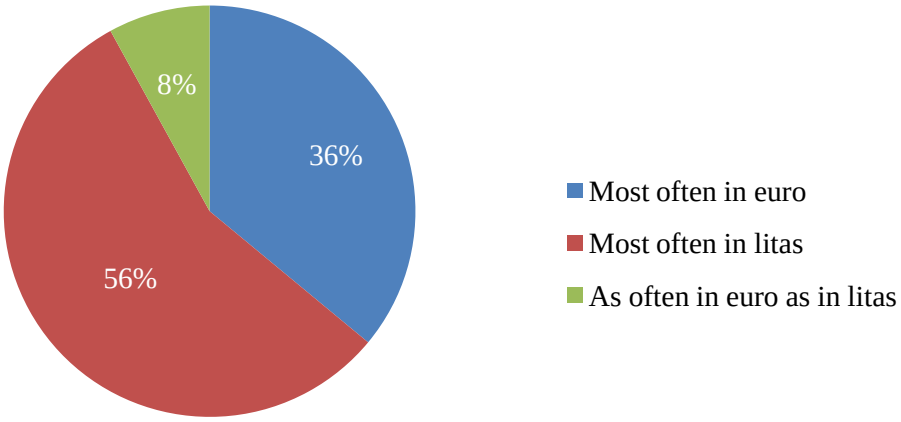


Source: prepared by the author.

Figure 7. Difficulty of adaptation to the euro vs. Difficulty that the euro causes today

Trend line on the graph (see Figure 7) also illustrates that those who had easier adaptation period have fewer difficulties today. However, those who evaluated their adaptation as difficult are still experiencing problems while using euro. Thus it can be stated that after 9 months since the euro was introduces in January 2015 individuals are still adapting to the new currency and the process is still ongoing.

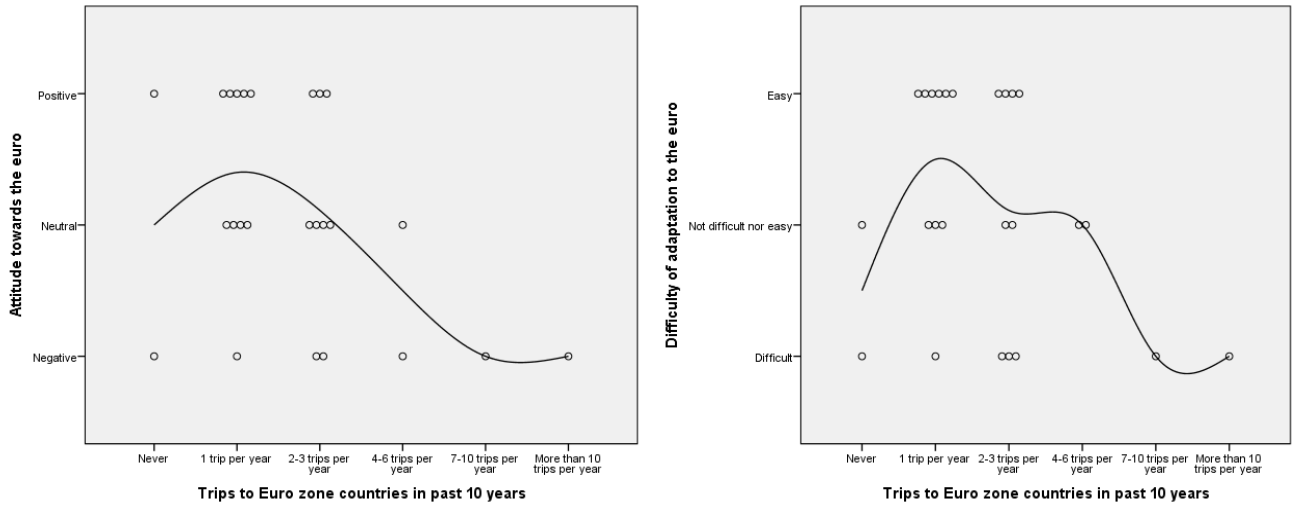
4. *In which currency terms individuals assess exceptional purchases and daily shopping purchases*. The results for the assessment of daily purchases indicate that 48% of the respondents evaluate them in litas, 28% in euro and 24% as often in euro as in litas (see Table 6). However chi-square test for this question (see Table 2 in Annex 2) indicates that the difference between groups of respondents who chose different answers is not significant (χ^2=2.480, p=0.289). Thus, the distribution of such answers may be due to sampling chance. So the focus on litas when making daily shopping is not as obvious and significant as in case of making expensive purchases. Pie chart (see Figure 8) shows that the majority (56%) of experiment participants assess exceptional (expensive) purchases in litas. Chi-square test (see Table 3 in Annex 2) proves that the difference between groups of participants who choose different answer options is significant and the distribution of percentages is not due to chance (χ^2=8.720, p=0.013). It means that the result of 56% is significant and it can be stated that individuals trust litas more as they understand value scale of litas better than the scale of euro.



Source: prepared by the author.

Figure 8. Individuals' assessment of exceptional purchases

5. *Individuals' travelling experience, their attitude towards the introduction of the euro and difficulty of adaptation*. It was assumed that individuals who have been travelling to Euro zone countries more often and had more experience in using euro would have a better attitude towards the euro and their adaptation to will be easier. However, the analysis revealed that there is no significant correlation between these factors (ρ=0.373, p=0.066; ρ=0.250, p=0.228) (see Table 1 in Annex 2). Scatter charts (see Figure 9) with no clear trends between number of trips, attitude towards the euro and difficulty of adaptation also prove that previous short experiences in using euro while travelling cannot be considered as a factor that helps to adapt to the euro after its introduction in Lithuania.

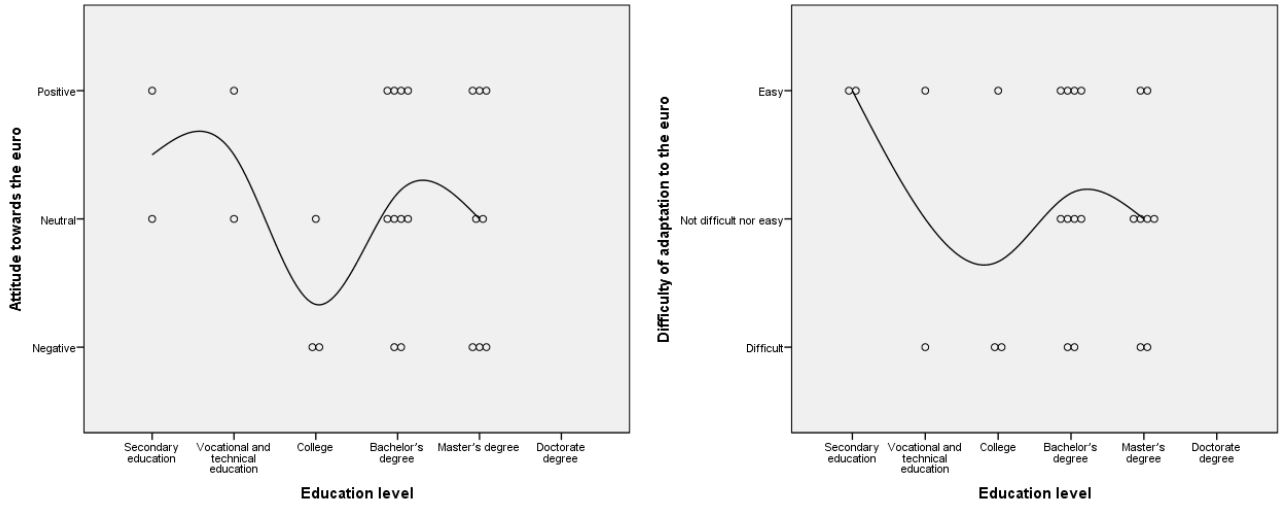


Source: prepared by the author.

Figure 9. Trips to Euro zone countries in past 10 years vs. Attitude towards the euro and Difficulty of adaptation to the euro

6. *Individuals' education level, their attitude towards the introduction of the euro and difficulty of adaptation*. The assumption that education level is associated with attitude towards the introduction of the euro and difficulty of adaptation to it was not proved as well. There is no significant correlation between these factors (ρ=0.053, p=0.802; ρ=0.142, p=0.5) (see Table 1 in Annex 2) and charts prove it

as they show no trends (see Figure 10). The education in economics or finance field has no impact on attitude and adaptation as well. Therefore, it can be stated that an education is not the factor that could influence individual's adaptation process.



Source: prepared by the author.

Figure 10. Education level vs. Attitude towards the euro and Difficulty of adaptation to the euro

After considering all mentioned factors and the relationship between them, it can be stated that hypothesis H3="Today, the process of adaptation to the euro is topical issue among Lithuanian citizens" can be accepted. The results of the second section of questions will be helpful while analyzing the data obtained from the fourth part which is related to the impact of euro illusion.

✓ In the second section, the data about participants' adaptation to the euro as well as their attitude towards the introduction of the euro in Lithuania was gathered. After analysis of the results, the most important points can be distinguished. Almost 30% of experiment participants have negative attitude towards the introduction of the euro and the same percentage evaluates their adaptation to the euro as difficult. It was found that these factors are related. More than a half of participants experience a lot of or some difficulties when using euro till today and the majority still count mentally in litas. Previous experience of using the euro in other Euro zone countries or individuals' education level has no impact on the adaptation process and does not make it easier.

3.3. Money illusion related results

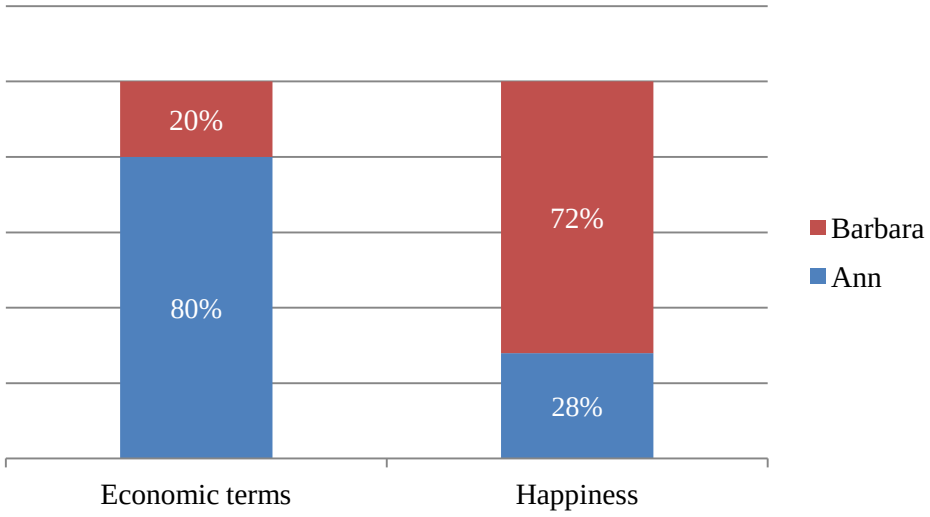
The third section of questions shows the results of how participants evaluate economic transactions and their income – in real or nominal monetary terms. This part shows directly if individuals are prone to money illusion effect caused by inflation. Hypothesis H4="Individuals are focused on nominal rather than real monetary terms when assessing economic transactions" is tested in this part.

The third section consists of 13-14 (related), 15-16 (related) and 17 questions (see Annex 1). They will be discussed and analysed below in this subchapter. Obtained data and its analysis are presented in Annex 3.

13-14 questions. In these questions, participants were asked to evaluate who did better in economic terms and who was happier after the raise in salary under certain inflationary conditions. Frequencies table shows that in 13th question 80% of respondents have chosen the right answer (Ann is doing better in economic terms) and 20% answered wrongly (see Table 1 in Annex 3). Chi-square test proves that the difference between these percentages is significant (χ^2=9.0, p=0.003) (see Table 3 in Annex 3). It means that the majority of individuals distinguishes between nominal and real monetary terms, however at the same time the results for 14th questions showed that 72% of experiment participants think that Barbara should feel happier (despite the fact that she is doing worse in economic terms) (see Table 2 in Annex 3). Chi-square test confirms that the difference between groups of people who chose different answers is significant (χ^2=4.84, p=0.028) (see Table 4 in Annex 3).

In order to evaluate the difference between two sets of answers (for 13th and 14th questions) Wilcoxon signed-rank test is applied. It is used for comparing two sets of scores which come from the same participants, and is a non-parametric equivalent of the dependent *t*-test (Field, 2005). In our case, participants are the same and the change in the data from two questions is compared.

Wilcoxon signed-rank test shows that there is a significant difference between answers for 13th and 14th questions (Z=-3.153; p=0.002) – 15 individuals distinguished that Ann is doing better in economic terms, but think that Barbara feels happier (see Table 5 in Annex 3). The difference in answers for 13th and 14th questions is more illustrative and noticeable in Figure 11.



Source: prepared by the author.

Figure 11. Distribution of answers for 13th and 14th questions

Overall, it can be stated that when economic terms are emphasized most of individuals see the difference between real and nominal monetary terms. However, they still attribute feeling of wellbeing

to nominal terms. It means that the problem is not that people cannot distinguish between real and nominal terms, but that they see the difference only when they are forced to think in economic terms, but not in usual conditions. When individuals are not asked to think about economic benefit, they focus on nominal terms – they attribute happiness to nominal raises, despite lower real raises or even decreases in real terms. These findings correspond to conclusions made by Shafir (1997) in his initial study of money illusion.

For investigating whether money illusion effect is related to individuals' demographic characteristics, Spearman's correlation test was performed (see Table 6 in Annex 3). It revealed that there is no significant association between individuals' ability to distinguish between nominal and real terms (their answer for 13th question) and such factors as gender, age, income level, level and field of education (see Table 7).

Table 7. Spearman's correlation – individuals' ability to distinguish between nominal and real terms in 13th question / demographic factors

		Gender	Age	Monthly income in EUR	Education level
Ability to distinguish between nominal and real terms (answer for 13th question)	ρ	.040	.100	.063	-.124
	p	.848	.633	.765	.554
	N	25	25	25	25

Source: prepared by the author.

15-16 questions. In these questions, which were presented in different experiment sessions, participants had to indicate at which point of time they would like to buy or sell a computer under stated conditions of inflation.

Frequencies table for 15th question illustrates that the majority of respondents (48%) see no difference when to buy a computer (see Table 7 in Annex 3). It can be assumed that they understand that the real price has not changed. Despite this fact, 36% of respondents would be more willing to buy the computer six months ago when the nominal price was lower – it means that one third of participants do not take inflation into consideration and base their economic decision on nominal values.

The results for 16th question indicate that 32% of experiment participants said that there is no difference when to sell a computer – less than in 14th question (see Table 8 in Annex 3). Despite the nominal price became higher and it is assumed that the majority of people would like to sell a computer now in order to get bigger nominal gain, only 28% of participants indicated that they would do it and most of them (40%) would wish to sell a computer six months ago, when the nominal price was lower. Such results can be explained by individuals' ability to distinguish that the real prices are the same and their willingness to sell a computer earlier in order to get the profit right away.

In order to evaluate if the difference between groups of people who chose different answers in 15-16 questions is significant, chi-square test was performed for the results of both questions. It

revealed that there is no significant difference between them (χ^2=3.92, p=0.141; χ^2=0.5, p=0.756) (see Tables 9 and 10 in Annex 3), however it is noteworthy that less than a half of participants chose to answer "no difference" in both questions. This observation corresponds with the results of similar questions used by Shafir (1997) in his initial model of the research of money illusion.

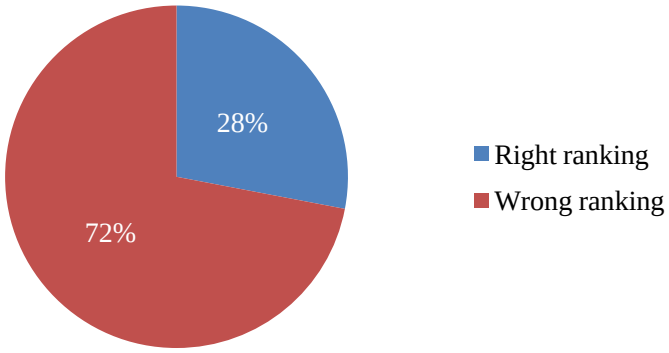
17 question. This question was also used with the intention to investigate if individuals distinguish between real and nominal monetary terms, however this case was more complicated and higher prices were suggested to evaluate in three situations with different inflationary/deflationary conditions. Thus, solving 17th question requires more attention and understanding of the concept of inflation.

In order to understand the data obtained from this question better, the summary of the results calculated in three frequencies tables (see Table 11 in Annex 3) are presented below:

Real Rank	**Adam** 1	**Ben** 2	**Carl** 3
Results:			
1	36%	16%	**48%**
2	24%	**60%**	16%
3	**40%**	24%	36%

Results presented above make clear that most of experiment participants were assessing economic transactions described in 17th question based on nominal terms – the majority (48%) of individuals assigned the first rank to Carl (whose real rank is the third in terms of real monetary values), and the third rank (40%) to Adam (whose real rank is the first).

Since there could be several different combinations of ranking, it is worth to investigate what are the proportions of subjects that chose the right ranking model (Adam – 1, Ben – 2, Carl – 3) and wrong models. The value of 'true' was assigned for those individuals who ranked correctly, and 'false' – for those who answered incorrectly. The frequencies table (see Table 12 in Annex 3) shows that 72% of participants have assigned wrong ranks, and 28% did it in the right way by assessing real gains and losses instead of focusing on nominal values (see Figure 12). Chi-square test proved that there is a significant difference between groups of subjects who chose the right and wrong ranking and it could not occur by chance (χ^2=4.84, p=0.028) (see Table 13 in Annex 3). Thus, it can be stated that the majority of subjects evaluate economic transactions by counting in nominal monetary values and do not consider an effect of inflation or deflation.



Source: prepared by the author.

Figure 12. Distribution of right and wrong answers for 17th question

Spearman's correlation analysis (see Table 14 in Annex 3) revealed that there is no significant association between individuals' ability to distinguish between real and nominal values (chosen order of ranks) and such demographic factors as age, gender, income and education level (see Table 8).

Table 8. Spearman's correlation – individuals' ability to distinguish between nominal and real terms in 17th question / demographic factors

		Gender	Age	Monthly income in EUR	Education level
Ability to distinguish between nominal and real terms (answer for 17th question)	ρ	-.165	-.013	.342	.306
	p	.430	.952	.094	.137
	N	25	25	25	25

Source: prepared by the author.

After analyzing the results of questions 13-17, it can be stated that most of individuals focus more on nominal rather than real monetary values while making economic decisions (even if they are able to distinguish nominal and real monetary representations). Thus, the hypothesis H4="Individuals are focused on nominal rather than real monetary terms when assessing economic transactions" can be accepted.

✓ The third section is indented to investigate if individuals are prone to money illusion caused by inflation. The results of questions used in this section show how participants evaluate economic transactions and their income – in real or nominal monetary terms.

After the analysis of data obtained from 13-17 questions it can be concluded that the majority of individuals, while assessing income level, economic transactions and price levels, count mentally in nominal monetary terms. Despite the fact, that some people understand the impact of inflation or deflation on prices and are able to distinguish between real and nominal monetary representations, most of them still focusing more on nominal gains or losses. It means that the majority of people experience money illusion while making economic decisions.

3.4. Euro illusion related results

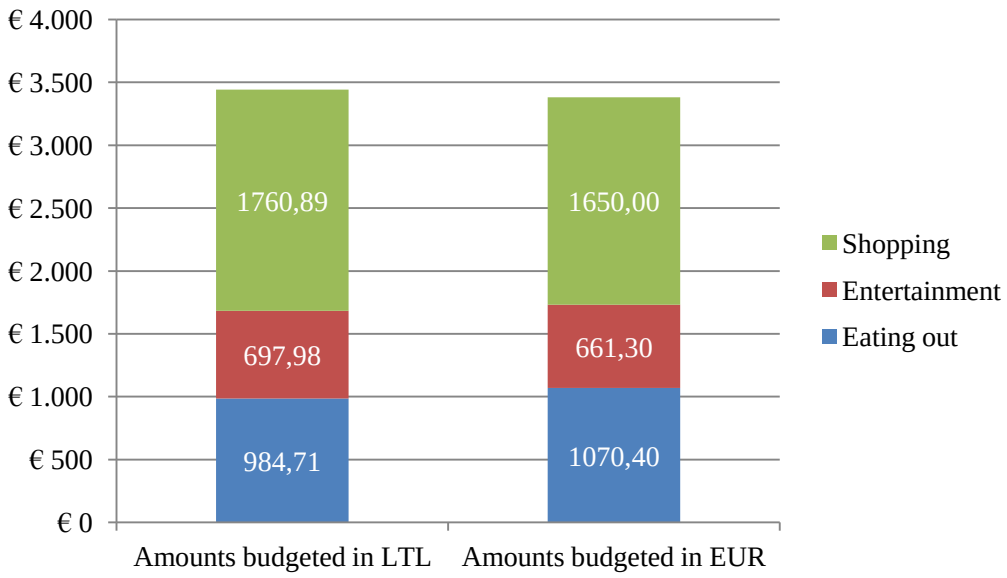
The results from the last section of the experiment demonstrate if Lithuanians experience euro illusion after the introduction of the euro in January 2015. Obtained data allows to test following hypotheses: H5="Individuals' willingness to pay is higher when prices are expressed in more numerous currency (litas)" and H6="Individuals are more risk averse when making investment decisions in less familiar currency (euro)". The results from the first and the last sections also allow to check hypothesis H2="Individuals' experienced money illusion effect is related to their attitudes towards the euro".

The third section consists of 18-19 (related) and 20-21 (related) questions (see Annex 1) which will be discussed and analysed below. The data obtained from these questions and its analysis is presented in Annex 4.

18-19 questions. In these questions, which were presented to experiment participants in different sessions, individuals' willingness to pay in euro and litas is compared and the difference between them is evaluated.

Distribution of answers for 18^{th} and 19^{th} questions is shown in the table (see Table 1 in Annex 4). It illustrates the amounts that every individual would wish to budget for each category in litas and euro and the sum of these amounts in litas and euro. In order to compare the amounts budgeted in litas with the amounts budgeted in euro, the amounts in litas were converted to the euro according to the exchange rate EUR 1 = LTL 3.4528 and showed in the same table.

Proportions of budgeted amounts for different categories in litas and euro are shown in Figure 13. From the results it can be noticed that participants of the experiment have spent bigger amounts in litas than in euro for categories "Entertainment" (697.98 EUR > 661.30 EUR) and "Shopping" (1,760.89 EUR > 1,650.00 EUR), however for category "Eating out" they have budgeted more in euro than in litas (984.71 EUR < 1,070.40 EUR). It is noteworthy that total amounts that were budgeted for all three categories in two currencies are very similar – 3,443.58 EUR were budgeted in litas and 3,381.70 EUR in euro. The difference in favor of litas seems insignificant (61.88 EUR for 25 participants).



Source: prepared by the author.

Figure 13. Amounts budgeted in LTL and EUR

For the purpose of investigating if the amounts that were budgeted in litas and euro are significantly different from each other, paired samples *t*-test was applied. It is used to assess the statistical significance of the difference between the means of two sets of data – if the mean of one set of scores differs from another one (Howitt, 2005). In our case, the related (or correlated) *t*-test is conducted because two sets of data from the same participants need to be compared.

Mean budgeted amount in litas is 137.74 EUR and mean budgeted amount in euro is 135.27 EUR (see Table 2 in Annex 4). The analysis revealed that there is no significant difference between two sets of budgeted amounts (t=0.416, p=0.681) (see Table 2 in Annex 4), thus it cannot be stated that individuals are more willing to spend in litas than in euro.

Such results of the test allow to conclude that individuals may assess economic transaction based on ratio between prices and given budget, and not on a difference between them. The numerosity had no significant effect on subjects' decisions. Therefore, the Difference assessment account theory was not supported in this case.

Another explanation could be that individuals convert prices expressed in euro to litas in order to evaluate them more accurately. Missier et al. (2007) noticed that it slows down the process of relearning prices and adapting to the euro, however in this case individuals experience euro illusion to a lesser extent.

The results also correspond to observation made by Desmet (2002) – after transition to the euro citizens dedicate more attention to prices because of uncertainty and the risk to perceive economic transactions wrongly. It can be the reason why the results showed no significant difference between budgeted amounts – individuals are very attentive while comparing euro terms with litas and assessing prices.

In order to study if individuals' economic decisions of budgeting money can be influenced by their demographic characteristics, Spearman's correlation test was performed (see Table 3 in Annex 4). There wasn't found any significant association between the size of amounts that were budgeted by subjects in litas and euro and such factors as individuals' age, gender, income, education level and travelling experience (number of trips made to Euro zone countries in past 10 years) (see Table 9). Thus, it can be stated that demographic data and travelling experience has no meaningful impact on individuals' economic behaviour.

Spearman's correlation test was also performed in purpose to investigate if individuals' budgeting decisions in litas and euro are related with their attitude towards the introduction of the euro in Lithuania (see Table 4 in Annex 4). The test revealed that in this case there is no significant association between these factors (see Table 9). Therefore, an attitude towards the euro does not make any considerable impact on individuals' spending behaviour in euro.

Table 9. Spearman's correlation – budgeted amounts in litas and euro / demographic factors and attitude towards the euro

		Gender	Age	Monthly income in EUR	Education level	Trips to Euro zone countries in past 10 years	Attitude towards the euro
Budgeted amounts in LTL	ρ	.073	-.200	-.163	-.065	.136	-.115
	p	.730	.337	.437	.756	.515	.583
	N	25	25	25	25	25	25
Budgeted amounts in EUR	ρ	.162	-.267	-.136	.121	.151	.038
	p	.438	.196	.517	.564	.472	.855
	N	25	25	25	25	25	25

Source: prepared by the author.

After the analysis of the data obtained from 18-19 questions, it can be concluded that the results have not complied with the Difference assessment account theory. It means that individuals assess economic transactions based not on nominal difference between prices and given budget, but on ratio between them. Therefore, they are not influenced by numerosity effect. Participants of the experiment didn't show any significant difference in willingness to pay in litas and euro, thus hypothesis H5="Individuals' willingness to pay is higher when prices are expressed in more numerous currency (litas)" can be rejected.

20-21 questions. These questions were presented to experiment participants in different sessions. They were intended to investigate how the introduction of the euro could influence individuals' investment decisions. Participant had to evaluate three investment options expressed in litas and in euro and to make a choice in each case.

The crosstab of the results for two questions (see Table 5 in Annex 4) illustrates that the most common choice of subjects was B – investment option with medium risk. Ten participants (40%) chose B in both sessions – when assessing alternatives using litas and euro. Five participants (20%)

chose B in case of litas and less risky option of A in case of euro. Seven participants (28%) chose least risky alternative A in both sessions. The most risky option C was chosen by only three subjects – two of them chose C in case of litas, but B in case of euro; and only one participant chose C in both sessions.

It is noteworthy that none of individuals has chosen more risky option in case of euro than in case of litas – all participants have chosen either alternatives with the same level of risk in both experiment sessions, or less risky option in case of euro.

For the purpose of investigating if the difference between two sets of data (from both experiment sessions) are significantly different from each other, values for each answer option were assigned – the less risky the investment alternative is, the smaller rank it has (A=1, B=2, C=3). Ranks table illustrates that 18 subjects have chosen investments with the same level of risk in litas and in euro (ties in the ranks), and 7 subjects have chosen less risky investment in case of euro (decision made using euro have smaller values than decisions made using litas, thus there are negative ranks) (see Table 6 in Annex 4). Proportions of choices are shown in Figure 14. Wilcoxon signed-rank test (see Table 6 in Annex 4) revealed that there is a significant difference between options that subjects have chosen in the first session and in the second one (Z=-2.646, p=0.008).

Source: prepared by the author.

Figure 14. Comparison of level of risk of investments chosen in LTL and EUR

Since there were no cases when a participant would choose more risky investment in euro, it can be concluded that individuals assess investment alternatives with possible gains and losses expressed in euro as more risky. Such results correspond with observations made by Jonas (2003) – individuals are less confident and more risk averse when making investment in less familiar currency.

In order to see if individuals' investment decisions depend on their demographic characteristics, Spearman's correlation test was applied (see Table 7 in Annex 4). It revealed that there are no significant associations between subjects' investment decisions and such factor as their gender, age, income, level of education (see Table 10).

Correlation analysis for individuals' investment decisions using litas and euro and their attitude towards the introduction to the euro (see Table 8 in Annex 4) has shown that above mentioned aspects

have no significant associations between each other (see Table 10). Thus, it can be stated that decisions made using euro are not influenced by individuals' negative or positive opinions about the euro introduction in Lithuania.

Table 10. Spearman's correlation – investment decisions using litas and euro / demographic factors and attitude towards the euro

		Gender	Age	Monthly income in EUR	Education level	Trips to Euro zone countries in past 10 years	Attitude towards the euro
Investment decisions in LTL	ρ	-.205	.057	-.199	-.382	.085	.102
	p	.326	.787	.340	.060	.686	.627
	N	25	25	25	25	25	25
Investment decisions in EUR	ρ	-.089	-.125	.093	-.130	-.133	.371
	p	.674	.553	.658	.536	.527	.067
	N	25	25	25	25	25	25

Source: prepared by the author.

After discussing and interpreting the data obtained from 20-21 questions, the hypothesis H6="Individuals are more risk averse when making investment decisions in less familiar currency (euro)" can be accepted since the results showed that subjects are not willing to make riskier investments that are expressed in euro currency.

The data from the first section of questions and the analysis of 18-21 questions included in the last section allow to reject the hypothesis H2="Individuals' experienced money illusion effect is related to their attitudes towards the euro". It was shown that in case of situations, where individuals may be prone to euro illusion, subjects' attitudes towards the euro introduction had no significant association or impact on the difference in their economic decisions made using litas and euro.

Hypothesis H1="The strength of money illusion effect experienced by individuals is related with their demographic characteristics" that was tested in all of the experiment sections, is also rejected. Correlation analyses revealed that the results from 13-21 questions, that investigated if an individual is prone to money and euro illusion, have no significant association with individuals' demographic data. Therefore, such features as gender, age, income level, level and field of education are not the factors that can predict if an individual would be prone to money illusion.

✓ The last section of experiment's questions is intended to investigate if individuals experience euro illusion – money illusion caused by the introduction of the euro in Lithuania and, therefore, altered price scales. The analysis revealed that individuals' willingness to pay in litas and euro does not differ significantly. It can be stated that subjects are not influenced by numerosity effect and do not experience euro illusion when budgeting their income. In spite of this, the results showed that individuals are more risk-averse when making investment decisions in euro. It can be explained by the fact that the euro is less familiar currency for them. It was also found that individuals' attitude

towards the introduction of the euro in Lithuania does not have any significant impact on their economic decisions.

3.5. Summarizing results and testing hypotheses

In order to assess the impact of money illusion on individuals' economic behaviour in Lithuania, the method of experimental studies was used. It allowed to investigate if individuals experience money and/or euro illusion in Lithuania and to study its impact from different perspectives – how people assess economic transactions, prices, income, how they budget their income expressed in different currencies, etc.

The main questions that were studied are:

- if an individual assesses economic transactions in nominal or real monetary terms – this factor determines if he/she experiences money illusions;
- if the introduction of the euro has an impact on individual's economic decisions because of new currency's different value scale (numerosity) – this factor determines if he/she experiences euro illusion.

The results of the experimental studies, which were analyzed in this chapter, allowed to check six hypotheses that were raised in this research. Hypotheses testing results with their explanation are presented below (see Table 11).

Table 11. Results of hypotheses testing

Nr.	Hypothesis	Accepted or rejected
H1	The strength of money illusion effect experienced by individuals is related with their demographic characteristics.	**rejected**
	Comment: The correlation analyses of experiment participants' demographic data and the results of questions, which reveal if they experience money and/or euro illusion, showed no significant associations between them. Such factors as gender, age, income, education level cannot determine if an individual would experience money illusion or not, and what is the scope of its impact.	
H2	Individuals' experienced money illusion effect is related to their attitudes towards the euro.	**rejected**
	Comment: The analysis revealed that individuals' attitude towards the adoption of the euro in Lithuania has no significant associations with the results of questions, which show if they experience money illusion caused by the usage of new currency (euro illusion). The results showed that people are less confident and more risk-averse while using the euro, however their opinion about the euro does not influence their economic decisions made when transactions are expressed in euro currency in some important way.	

Table 11 is continued on the next page

Continuation of Table 11

H3	Today, the process of adaptation to the euro is topical issue among Lithuanian citizens.	**accepted**
	Comment: The experiment revealed that a big part of individuals still have negative attitude towards the euro and have trouble while using it. As a result, the majority of people count mentally in litas while assessing prices. It means that they still have not accepted the new currency and have not learned new currency scale. It was also found that such factors as previous experience in using the euro in other Euro zone countries or education level do not make the adaptation easier. Overall, the adaptation to the euro is still an issue in Lithuania.	
H4	Individuals are focused on nominal rather than real monetary terms when assessing economic transactions.	**accepted**
	Comment: The experiment showed that people tend to evaluate economic transactions, prices and income level in nominal monetary terms. It means that they do not consider inflation and, thus, they are prone to money illusions effect. The problem is not that they cannot distinguish between nominal and real monetary representations, but that they see the difference only when they are forced to think in economic terms, but not in daily life. It was also found that the majority of individuals attribute feeling of well-being to nominal monetary raises and not real values.	
H5	Individuals' willingness to pay is higher when prices are expressed in more numerous currency (litas).	**rejected**
	Comment: The results showed that individuals' willingness to pay in litas and euro does not differ significantly. It means that their assessment of prices is not influenced by numerosity effect and, thus, people do not experience euro illusion that could appear due to different currency scales. It is noteworthy, that most of individuals feel uncomfortable when using euro and count mentally in litas. On one hand, it complicates the process of adaptation to the euro. On the other hand, it eliminates the possibility for euro illusion to appear as people assess prices using litas scale, which is familiar for them.	
H6	Individuals are more risk averse when making investment decisions in less familiar currency (euro).	**accepted**
	Comment: The experiment revealed that individuals' willingness to make riskier investment decisions is lower when investment options are expressed in euro than when they are expressed in litas. Thus, it can be stated that people are more risk averse when making investment decisions in less familiar currency of the euro. The fact that the majority of individuals still count mentally in litas also proves that they feel less confident when assessing economic transaction in euro.	

Source: prepared by the author.

The results of the experiment reveal that individuals are prone to money illusion. This bias has an impact on people's economic behaviour as it distorts the perception of the value of economic transactions, changes in income or prices, etc. Thus, individuals can make incorrect or unfavorable economic decisions while thinking in nominal rather than real monetary terms. For example, they can perceive an increase in income due to inflation as real gains, or an increase in price levels due to inflation as if prices are becoming more expensive. Such incorrect perceptions can make people change their willingness to pay, budgeting and other economic habits.

Despite the fact that Lithuanians are prone to money illusion, the results showed that they do no experience euro illusion in some significant scope. However, at the same time it can be stated that their economic behaviour was nevertheless influenced by the introduction of new currency. They assess prices and income in litas and euro quite similarly, but they achieve it by converting euro terms to litas in order to compare prices with value scale of litas that they are used to. On one hand, it makes decisions making process more complex and time-consuming. On the other hand, this habit helps people to avoid the effect of euro illusion.

The results of the research draw attention to individuals' decisions-making process, reveal its weaknesses and irrational tendencies in consumers' economic behaviour. This kind of information can help to evaluate and interpret individuals' economic decisions more accurately and critically.

It is important to note that the research presented in this work has some limitations:

- since experiment was chosen as a method and its structure required organizing two sessions with same respondents, the number of participants was limited. As the model of the research was based on previously conducted studies of money illusion effect, questions were carefully constructed and respondents were chosen by random selection method, the results of the research are representative of a target population. In spite of this, in case of further research of money and/or euro illusion impact in Lithuania, it would be a good recommendation to use other methods in addition to experiment and to examine larger sample to get more data for the analysis;
- another limitation is related to participants' interpretation of questions. Although they were formulated precisely, subjects may consider not only conditions indicated in the problem, but also their own assumptions like previous experience, personal or country's economic situation, etc. Such factors may cause discrepancies in the results, thus it is important to be aware of them;
- the results that are related to the introduction of the euro in Lithuania and euro illusion effect are valid for this moment, but can change with time – citizens should get more used to the euro, better adapt to it, learn new currency's scale, evaluate economic transaction easier, faster and more precisely, etc. The attitude towards the euro and its adoption in the country might also change. Thus, it would be useful to repeat the research or to conduct a new research of money and/or euro illusion effect in the future.

✓ The research of money illusion impact on individuals' economic behaviour in Lithuania was conducted by using experiment's method. Different angles of people's economic behaviour were analyzed in order to investigate if they experience money and/or euro illusion and in which way it influences their economic decisions. The results allowed to test six hypotheses that were raised in this research. The main points of the results are following:

- the strength of money illusion effect is not determined by individuals' demographic characteristics;
- euro illusion effect is not related to subjects' attitude towards the introduction of the euro in Lithuania;
- the process of adaptation to the euro is still topical and ongoing in Lithuania;
- people are more focused on nominal rather than real monetary terms when making economic decisions, thus they are prone to money illusion effect;
- individuals' willingness to pay in litas and in euro does not differ significantly, thus they do not experience euro illusion;
- people are more risk averse when making investments in euro rather than in litas because they are less familiar with the euro, thus they still do not feel confident while using it.

CONCLUSIONS AND RECOMMENDATIONS

The following **conclusions** were reached in the research:

- Money illusion is behavioural phenomenon that refers to the tendency to make economic decisions based on nominal rather than real monetary values, i.e. when the face value of currency is mistaken for its real purchasing power. Individuals experience money illusion in two cases – when the effect of inflation on prices and income is overlooked, and when people use unfamiliar currency. In both cases, changes in nominal monetary terms make evaluation of prices complicated, and thus, cause money illusion. During the adoption of the euro in European Monetary Union, the concept of money illusion has evolved to euro illusion. After the currency changeover in a country, people are influenced by anchoring and adjusting heuristic (confusing new prices with old reference points) and numerosity heuristic (confusing quantity of money with their real purchasing power).
- The research, modelled as experimental study, allowed to assess whether Lithuanians experience money illusion and to evaluate its impact on individuals' economic behaviour. The research is many-sided as it analyzes the effect of money illusion from two perspectives (when it is caused by inflation and by currency changeover), as well as such factors as individuals' attitudes and adaptation to the euro.
- The results showed that Lithuanian citizens are prone to the effect of money illusion. Despite the fact that most of them understand the essence of inflation and are able to distinguish between nominal and real monetary terms, Lithuanians rely on nominal value of money when making economic decisions. Money illusion influences individuals' evaluation of transactions, prices and income level. Incorrect perception of real value of money leads to irrational economic behaviour. It appears when individuals determine price acceptability and rejection zones, decide what goods and services they should choose, evaluate income and plan budget using nominal monetary terms. It was also found that demographic characteristics (such as gender, age, income, education level) do not determine individuals' propensity to experience money illusion.
- The experiment revealed that Lithuanian citizens do not experience euro illusion. Although the introduction of the euro in Lithuania led to a change in nominal value of the currency, negative attitudes towards the euro and difficulties in assessing prices expressed in euro, Lithuanians' economic decisions and willingness to pay have not changed significantly. It can be explained by the fact that due to difficult psychological adaptation citizens still use litas as a reference point for making economic decisions. This habit slows down the adaptation process, however it helps to assess economic transactions correctly and to avoid euro illusion.

The results of the research allow to offer following **recommendations**:

- Better understanding of such concepts as inflation, its influence on real and nominal value of money, and numerosity effect would help individuals to avoid negative impact of money illusion. More critical evaluation of citizens' behaviour, taking the impact of money illusion into consideration, would be useful for the supply side as well (e.g. manufacturers, producers, suppliers, sellers) in order to interpret and adapt to individuals' economic habits and achieve better results.
- Despite there wasn't found any significant impact of euro illusion in Lithuania, responsible institutions could improve their policy of informing citizens about the euro adoption in order to improve citizens' negative attitudes towards the euro and make adaptation process easier.
- In order to reveal what is the tendency of money illusion impact in Lithuania, it would be worth to repeat the experiment or conduct another study on money illusion in the future. Further research could be expanded, include more participants and gather more data for the analysis.

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ABSTRACT IN ENGLISH AND LITHUANIAN

Markelova J. *Assessment of money illusion impact on individuals' economic behaviour in Lithuania* / Financial markets master's thesis. Supervisor prof. dr. D. Jurevičienė. – Vilnius: University of Mykolas Romeris, Business and Media School, 2015. – 70 p.

ABSTRACT

In the master's thesis money illusion is studied and its impact on individuals' economic behaviour in Lithuania is analyzed. In the first part of the thesis, money illusion and related concepts are discussed, its causes and influence are examined. In the second part, the methodology for the research of money illusion impact on individuals' economic behaviour in Lithuania is presented – the experiment is modelled, methods for the analysis are selected. In the third part, the results of the research are analyzed, statistically significant relations are distinguished, individuals' propensity to experience money illusion is assessed, and insights about how money illusion influences their economic behaviour are provided. Finally, conclusions are made and recommendations are offered. The results of the research represent a newly collected data on money illusion impact in Lithuania and promote more critical evaluation of citizens' economic behaviour taking the effect of money illusion into consideration.

Key words: behavioural economics, money illusion, euro illusion, economic behaviour, assessment of economic transactions, nominal and real monetary values.

Markelova J. *Pinigų iliuzijos poveikio individų ekonominei elgsenai vertinimas Lietuvoje* / Finansų rinkų magistro baigiamasis darbas. Vadovė prof. dr. D. Jurevičienė. – Vilnius: Mykolo Romerio Universitetas, Verslo ir medijų mokykla, 2015. – 70 p.

ANOTACIJA

Magistro baigiamajame darbe analizuojama pinigų iliuzija ir jos poveikis individų ekonominei elgsenai Lietuvoje. Pirmame skyriuje nagrinėjama pinigų iliuzija ir su ja susijusios sąvokos, pinigų iliuzijos atsiradimo priežastys ir jos įtaka individų elgsenai. Antrame darbo skyriuje pateikiama pinigų iliuzijos poveikio individų ekonominei elgsenai vertinimo Lietuvoje tyrimo metodologija – pristatomas eksperimento modelis ir analizės metodai. Trečiame skyriuje analizuojami tyrimo rezultatai, įvertinamas individų polinkis patirti pinigų iliuziją, pateikiamos įžvalgos dėl pinigų iliuzijos poveikio ekonominei elgsenai. Galiausiai, pristatomos išvados ir rekomendacijos. Tyrimo rezultatai atspindi naujausią informaciją apie pinigų iliuziją Lietuvoje ir skatina kritiškai vertinti individų ekonominę elgseną atsižvelgiant į pinigų iliuzijos poveikį.

Pagrindiniai žodžiai: elgsenos ekonomika, pinigų iliuzija, euro iliuzija, ekonominė elgsena, ekonominių transakcijų vertinimas, nominali ir reali pinigų vertė.

SUMMARY IN ENGLISH

Markelova J. *Assessment of money illusion impact on individuals' economic behaviour in Lithuania* / Financial markets master's thesis. Supervisor prof. dr. D. Jurevičienė. – Vilnius: University of Mykolas Romeris, Business and Media School, 2015. – 70 p.

With the rapid development of behavioural economics, money illusion became recognized as a widespread economic phenomenon. It refers to a tendency to make biased decisions based on nominal rather than real monetary values. Since money illusion influences individuals' perception of money-related processes, the problem of the research was raised – do Lithuanians experience money illusion and what is the impact of it on individuals' economic behaviour? The object is the effect of money illusion. The aim is after the identification of existence of money illusion between Lithuanians, to evaluate the impact of money illusion on individuals' economic behaviour in Lithuania.

Main objectives of the study are: to analyse theoretical aspects of money illusion and its impact; to prepare the methodology for the identification and the assessment of the impact of money illusion on individuals' economic behaviour in Lithuania; to identify money illusion in Lithuania and to evaluate its impact on individuals' economic behaviour in Lithuania. Objectives determined the structure of the master's thesis: in the first part the scientific literature on the topic of money illusion and related concepts is analysed; in the second part the methodology for the research is prepared; in the third part the results of the research are presented; eventually, conclusions are made. Methods of the research include systematic and comparative analysis of scientific literature, method of experimental study, and statistical methods (descriptive statistics, Spearman's correlation coefficient, paired samples *t*-test, Pearson's chi-square test, Wilcoxon signed-rank test).

The analysis of the experiment results revealed that Lithuanian citizens are prone to the effect of money illusion – despite the fact that most of individuals understand the essence of inflation and are able to distinguish between nominal and real monetary terms, their choices are driven by nominal values. Money illusion influences individuals' economic behaviour by distorting their perception and evaluation of prices and income, which lead to irrational economic decisions. It was also found that Lithuanians do not experience euro illusion, which is related to the introduction of the euro and a change in nominal value of the currency. It can be explained by the fact that due to difficult adaptation and negative attitude towards the euro, Lithuanians still use litas as a reference point for making economic decisions. The results suggest that more critical evaluation of citizens' decisions, taking the impact of money illusion into consideration, would help to understand and interpret their economic behaviour better.

SUMMARY IN LITHUANIAN

Markelova J. *Pinigų iliuzijos poveikio individų ekonominei elgsenai vertinimas Lietuvoje* / Finansų rinkų magistro baigiamasis darbas. Vadovė prof. dr. D. Jurevičienė. – Vilnius: Mykolo Romerio Universitetas, Verslo ir medijų mokykla, 2015. – 70 p.

SANTRAUKA

Sparčiai besivystant elgsenos ekonomikai, pinigų iliuzija buvo pripažinta paplitusiu ekonominiu reiškiniu. Ji nurodo į tendenciją daryti sprendimus remiantis nominalia, o ne realia pinigų verte. Kadangi pinigų iliuzija daro įtaką procesų, susijusių su pinigais, suvokimui, buvo iškelta tyrimo problema – ar lietuviai patiria pinigų iliuziją, ir kokią įtaką ji daro individų ekonominei elgsenai? Tyrimo objektas yra pinigų iliuzijos efektas. Pagrindinis tikslas yra, identifikavus pinigų iliuziją patiriamą lietuvių, įvertinti kokią įtaką ji padaro individų ekonominei elgsenai Lietuvoje.

Siekiant tikslo, buvo iškelti tokie uždaviniai: išanalizuoti teorinius pinigų iliuzijos aspektus; parengti pinigų iliuzijos identifikavimo ir jos poveikio individų ekonominei elgsenai vertinimo Lietuvoje tyrimo metodologiją; identifikuoti pinigų iliuziją Lietuvoje ir įvertinti jos įtaką individų ekonominei elgsenai Lietuvoje. Uždaviniai sąlygojo darbo struktūrą: pirmame skyriuje nagrinėjama pinigų iliuzija ir su ja susijusios sąvokos; antrame skyriuje pateikiama tyrimo metodologija; trečiame skyriuje pristatomi tyrimo rezultatai; galiausiai, pateikiamos išvados. Atliekant tyrimą taikomi tokie metodai: lyginamoji ir sisteminė mokslinės literatūros analizė, eksperimentas, statistiniai metodai (aprašomoji statistika, Spearman‘o koreliacijos koeficientas, porinis *t*-testas, Pearson‘o chi-kvadrato testas, Wilcoxon‘o ženklų kriterijus).

Eksperimento rezultatų analizė parodė, kad Lietuvos piliečiai patiria pinigų iliuzijos efektą – nepaisant to, kad dauguma jų supranta infliacijos esmę ir moka atskirti nominalią nuo realios pinigų vertės, jų pasirinkimai yra lemiami nominalios vertės. Pinigų iliuzija daro įtaką individų ekonominei elgsenai iškreipiant kainų ir pajamų suvokimą. Buvo nustatyta, kad lietuviai nepatiria euro iliuzijos, kuri yra susijusi su euro įvedimu ir valiutos nominalios vertės pakeitimu. Tai gali būti paaiškinama tuo, kad dėl sunkios adaptacijos ir neigiamo požiūrio į eurą, lietuviai vis dar skaičiuoja litais. Tyrimo rezultatai, atspindintys naujausią informaciją apie pinigų iliuziją Lietuvoje, skatina kritiškai vertinti individų ekonominę elgseną atsižvelgiant į pinigų iliuzijos poveikį.

ANNEX 1

STRUCTURE OF QUESTIONNAIRE USED IN THE EXPERIMENT

INTRODUCTION
This survey is done as a part of Master Thesis. The aim of this study is after the identification of existence of money illusion between Lithuanians, to evaluate its impact on individuals' economic behaviour in Lithuania.. The questionnaire is anonymous and your answers are much appreciated. Thank you in advance for you time!

I. DEMOGRAPHIC QUESTIONS	
Hypothesis	**Question**
H1. The strength of money illusion effect experienced by individuals is related with their demographic characteristics.	1. What is your gender? • Male • Female
	2. What is your age? • 18-24 • 25-34 • 35-44 • 45-54 • 55-64 • 65 and over
	3. What is your monthly income in EUR? • Less than 300 • 300-400 • 401-500 • 501-600 • 601-700 • 701-800 • 801-900 • 901-1000 • 1000 and over
	4. What is the highest level of education you have completed? • Secondary education • Vocational and technical education • College

	• Bachelor's degree • Master's degree • Doctorate degree
	5. Is your education related to economics/finance? • Yes • No
	6. How often have you been travelling to Euro zone countries in past 10 years? • Never • 1 trip per year • 2-3 trips per year • 4-6 trips per year • 7-10 trips per year • More than 10 trips per year

II. ADAPTATION TO THE EURO AND ATTITUDE RELATED QUESTIONS	
Hypothesis	**Question**
H2. Individuals' experienced money illusion effect is related to their attitudes towards the euro.	7. How would you describe your attitude towards the introduction of the euro in Lithuania? • Negative • Neutral • Positive
H3. The process of adaptation to the euro is topical issue among Lithuanian citizens.	8. How would you describe your adaptation to the euro? • Difficult • Not difficult nor easy • Easy
	9. Today, would you say that the euro causes you a lot of difficulty, some difficulty or no difficulty at all? • A lot of difficulty • Some difficulty • No difficulty
	10. When doing exceptional purchases like a car or expensive electronics, do you count mentally most often in euro, most often in litas, or as often in euro as in litas? • Most often in euro • Most often in litas • As often in euro as in litas
	11. When doing daily shopping, do you count mentally most often in euro, most often in litas, or as often in euro as in litas?

	• Most often in euro • Most often in litas • As often in euro as in litas
	12. Do you believe that goods and services had become less or more expensive after the introduction of the euro? • More expensive • Not less expensive nor more expensive • Less expensive

III. MONEY ILLUSION RELATED QUESTIONS		
Hypothesis	**What is studied**	**Question**
H4. Individuals are focused on nominal rather than real terms when assessing economic transactions.	Assessment of income level	13. Consider two individuals – Ann and Barbara – who took similar jobs. Ann started with a yearly salary of EUR 10,000. During the first year there was no inflation and the next year Ann got a 2% (EUR 200) raise in her salary. Barbara also started with a yearly salary of EUR 10,000. During the year there was an inflation of 4%, and Barbara received a 5% (EUR 500) raise in salary. Who do you think was doing better in economic terms after the raise in salary? • Ann • Barbara
		14. In a situation described above, who do you think was happier after the raise in salary? • Ann • Barbara
	Assessment of prices and economic transactions	15. Imagine that European Union experienced very high inflation which affected Lithuanian economy. Within 6-month period all prices and salaries went up by 25% – now you earn and spend 25% more than before. Six months ago you were planning to buy a computer whose price during this period went up from EUR 400 to EUR 500. Would you be more likely to buy it now or six months ago? • Now • Six months ago • No difference
		16. Imagine that European Union experienced very high inflation which affected Lithuanian economy. Within 6-month period all prices and salaries went up by 25% – now you earn and spend 25% more than before. Six months ago you were planning to sell a computer whose price during this period went up from EUR 400 to EUR 500. Would you be more likely to sell it now or six months ago? • Now • Six months ago • No difference

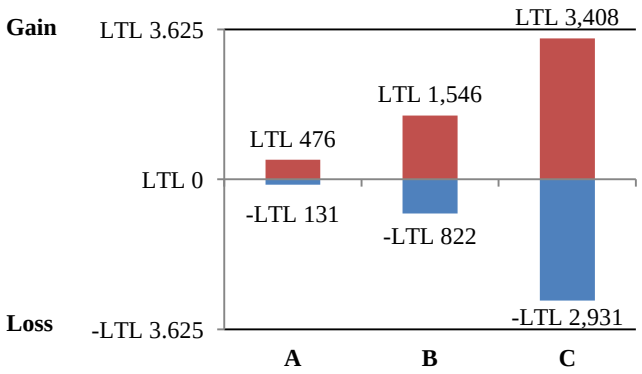
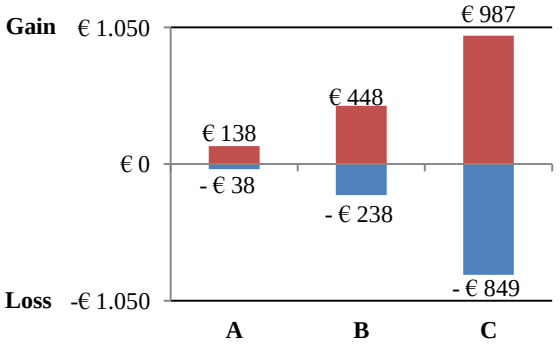
		17. Suppose Adam, Ben and Carl each purchased a house for EUR 100,000. Each of them sold the house a year after buying it. Economic conditions, however, were different in each case: - When Adam owned the house, there was a 25% deflation – prices decreased by approximately 25%. A year after Adam bought the house, he sold it for EUR 77,000 (23% less than he paid). - When Ben owned the house, there was no inflation or deflation – prices had not changed. He sold the house for EUR 99,000 (1% less than he paid). - When Carl owned the house, there was 25% inflation – prices increased by approximately 25%. A year after he bought the house, Carl sold it for EUR 123,000 (23% more than he paid). Please rank Adam, Ben and Carl in terms of the success of their deal. Assign '1' to the person who did best, '3' – worst. • Adam ___ • Ben ___ • Carl ___

IV. EURO ILLUSION RELATED QUESTIONS

Hypothesis	What is studied	Question in LTL	Question in EUR
H5. Individuals' willingness to pay is higher when prices are expressed in more numerous currency (litas).	Difference between willingness to pay in euro and litas	18. Imagine that you have monthly after-tax income of LTL 2,200. On all essential expenses (such as rent, food, transportation, utilities and other bills, etc.) you spend on average LTL 1,180. You have no other essential expenses, however you would like to budget some money on non-essential expenses like those indicated in the table below:	19. Imagine that you have monthly after-tax income of EUR 640. On all essential expenses (such as rent, food, transportation, utilities and other bills, etc.) you spend on average EUR 343. You have no other essential expenses, however you would like to budget some money on non-essential expenses like those indicated in the table below:

Eating out	
Dinner at a fancy restaurant	LTL 50
A beer and food at bar	LTL 25
Entertainment	
Movie ticket	LTL 15
Ticket to a sport event or a concert	LTL 45
Shopping	
A pair of branded casual pants	LTL 130
T-Shirt suitable for daily wear	LTL 35

Eating out	
Dinner at a fancy restaurant	EUR 14.50
A beer and food at bar	EUR 7.20
Entertainment	
Movie ticket	EUR 4.30
Ticket to a sport event or a concert	EUR 13
Shopping	
A pair of branded casual pants	EUR 37.50
T-Shirt suitable for daily wear	EUR 10

		Keeping in mind that you have LTL 1,020 to spend and that you also saving some money every month, how much would you budget for each of these types of expenses per month? • Eating out _____ • Entertainment _____ • Shopping _____	Keeping in mind that you have EUR 297 to spend and that you also saving some money every month, how much would you budget for each of these types of expenses per month? • Eating out _____ • Entertainment _____ • Shopping _____
H6. Individuals are more risk averse when making investment decisions in less familiar currency (euro).	Difference between making investment decisions in euro and litas	20. Imagine that you are an investor who wants to invest 7,250 LTL. The chart below illustrates maximum potential gains and losses on three 1-year hypothetical investments of 7,250 LTL. Which one investment option would you choose? • A (loss LTL 131; gain LTL 476) • B (loss LTL 822; gain LTL 1,546) • C (loss LTL 2,931; gain LTL 3,408) 	21. Imagine that you are an investor who wants to invest 2,100 EUR. The chart below illustrates maximum potential gains and losses on three 1-year hypothetical investments of 2,100 EUR. Which one investment option would you choose? • A (loss EUR 38; gain EUR 138) • B (loss EUR 238; gain EUR 448) • C (loss EUR 849; gain EUR 987) 

ANNEX 2

DEMOGRAPHIC, ADAPTATION TO THE EURO AND ATTITUDE RELATED DATA

Table 1. Correlations between demographic, adaptation to the euro and attitude related data

			Gender	Age	Monthly income in EUR	Education level	Education in economics/ finance	Trips to Euro zone countries in past 10 years	Attitude towards the euro	Difficulty of adaptation to the euro	If the euro causes difficulty today	Opinion on price increase
Spearman's rho	Gender	Correlation Coefficient	1,000	-,190	-,462*	,477*	,299	,338	-,214	-,178	-,355	-,405*
		Sig. (2-tailed)	.	,362	,020	,016	,147	,099	,305	,394	,082	,044
		N	25	25	25	25	25	25	25	25	25	25
	Age	Correlation Coefficient	-,190	1,000	,240	-,073	-,035	-,241	-,225	-,276	-,195	-,224
		Sig. (2-tailed)	,362	.	,247	,727	,869	,246	,281	,182	,351	,281
		N	25	25	25	25	25	25	25	25	25	25
	Monthly income in EUR	Correlation Coefficient	-,462*	,240	1,000	-,078	,124	-,298	,064	-,144	,147	,163
		Sig. (2-tailed)	,020	,247	.	,710	,555	,149	,762	,494	,482	,438
		N	25	25	25	25	25	25	25	25	25	25
	Education level	Correlation Coefficient	,477*	-,073	-,078	1,000	,388	,111	-,053	-,142	-,062	-,155
		Sig. (2-tailed)	,016	,727	,710	.	,055	,597	,802	,500	,769	,459
		N	25	25	25	25	25	25	25	25	25	25
	Education in economics/finance	Correlation Coefficient	,299	-,035	,124	,388	1,000	,201	,214	,250	,243	,090
		Sig. (2-tailed)	,147	,869	,555	,055	.	,334	,305	,229	,242	,668
		N	25	25	25	25	25	25	25	25	25	25
	Trips to Euro zone countries in past 10 years	Correlation Coefficient	,338	-,241	-,298	,111	,201	1,000	-,373	-,250	-,226	-,202
		Sig. (2-tailed)	,099	,246	,149	,597	,334	.	,066	,228	,278	,332
		N	25	25	25	25	25	25	25	25	25	25
	Attitude towards the euro	Correlation Coefficient	-,214	-,225	,064	-,053	,214	-,373	1,000	,651**	,608**	,659**
		Sig. (2-tailed)	,305	,281	,762	,802	,305	,066	.	,000425	,001	,000342
		N	25	25	25	25	25	25	25	25	25	25
	Difficulty of adaptation to the euro	Correlation Coefficient	-,178	-,276	-,144	-,142	,250	-,250	,651**	1,000	,792**	,500*
		Sig. (2-tailed)	,394	,182	,494	,500	,229	,228	,000425	.	,000002	,011
		N	25	25	25	25	25	25	25	25	25	25
	If the euro causes difficulty today	Correlation Coefficient	-,355	-,195	,147	-,062	,243	-,226	,608**	,792**	1,000	,605**
		Sig. (2-tailed)	,082	,351	,482	,769	,242	,278	,001	,000002	.	,001
		N	25	25	25	25	25	25	25	25	25	25
	Opinion on price increase	Correlation Coefficient	-,405*	-,224	,163	-,155	,090	-,202	,659**	,500*	,605**	1,000
		Sig. (2-tailed)	,044	,281	,438	,459	,668	,332	,000342	,011	,001	.
		N	25	25	25	25	25	25	25	25	25	25

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Table 2. Chi-Square Test – Assessing daily purchases

Frequencies - Assessing daily purchases

	Observed N	Expected N	Residual
Most often in euro	7	8,3	-1,3
Most often in litas	12	8,3	3,7
As often in euro as in litas	6	8,3	-2,3
Total	25		

Test Statistics

	Assessing daily purchases
Chi-Square	2,480[a]
df	2
Asymp. Sig.	,289

a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 8,3.

Table 3. Chi-Square Test – Assessing exceptional purchases

Frequencies - Assessing exceptional purchases

	Observed N	Expected N	Residual
Most often in euro	9	8,3	,7
Most often in litas	14	8,3	5,7
As often in euro as in litas	2	8,3	-6,3
Total	25		

Test Statistics

	Assessing exceptional purchases
Chi-Square	8,720[a]
df	2
Asymp. Sig.	,013

a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 8,3.

ANNEX 3

MONEY ILLUSION RELATED DATA

Table 1. Frequencies table for 13th question

Ann or Barbara - economic terms

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ann	20	80,0	80,0	80,0
	Barbara	5	20,0	20,0	100,0
	Total	25	100,0	100,0	

Table 2. Frequencies table for 14th question

Ann or Barbara - happiness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Ann	7	28,0	28,0	28,0
	Barbara	18	72,0	72,0	100,0
	Total	25	100,0	100,0	

Table 3. Chi-Square Test - Ann or Barbara - economic terms

Frequencies - Ann or Barbara - economic terms

	Observed N	Expected N	Residual
Ann	20	12,5	7,5
Barbara	5	12,5	-7,5
Total	25		

Test Statistics

	Ann or Barbara - economic terms
Chi-Square	9,000[a]
df	1
Asymp. Sig.	,003

a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 12,5.

Table 4. Chi-Square Test - Ann or Barbara - happiness

Frequencies - Ann or Barbara - happiness

	Observed N	Expected N	Residual
Ann	7	12,5	-5,5
Barbara	18	12,5	5,5
Total	25		

Test Statistics

	Ann or Barbara - happiness
Chi-Square	4,840[a]
df	1
Asymp. Sig.	,028

a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 12,5.

Table 5. Wilcoxon Signed Ranks Test for 13th and 14th questions

Ranks

		N	Mean Rank	Sum of Ranks
Ann or Barbara - happiness – Ann or Barbara - economic terms	Negative Ranks	2[a]	9,00	18,00
	Positive Ranks	15[b]	9,00	135,00
	Ties	8[c]		
	Total	25		

a. Ann or Barbara - happiness < Ann or Barbara - economic terms
b. Ann or Barbara - happiness > Ann or Barbara - economic terms
c. Ann or Barbara - happiness = Ann or Barbara - economic terms

Test Statistics[a]

	Ann or Barbara - happiness – Ann or Barbara - economic terms
Z	-3,153[b]
Asymp. Sig. (2-tailed)	,002

a. Wilcoxon Signed Ranks Test
b. Based on negative ranks.

Table 6. Correlations for 13th question and demographic data

			Ann or Barbara - economic terms	Gender	Age	Monthly income in EUR	Education level	Education in economics/ finance
Spearman's rho	Ann or Barbara - economic terms	Correlation Coefficient	1,000	,040	,100	,063	-,124	,161
		Sig. (2-tailed)	.	,848	,633	,765	,554	,442
		N	25	25	25	25	25	25
	Gender	Correlation Coefficient	,040	1,000	-,190	-,462*	,477*	,299
		Sig. (2-tailed)	,848	.	,362	,020	,016	,147
		N	25	25	25	25	25	25
	Age	Correlation Coefficient	,100	-,190	1,000	,240	-,073	-,035
		Sig. (2-tailed)	,633	,362	.	,247	,727	,869
		N	25	25	25	25	25	25
	Monthly income in EUR	Correlation Coefficient	,063	-,462*	,240	1,000	-,078	,124
		Sig. (2-tailed)	,765	,020	,247	.	,710	,555
		N	25	25	25	25	25	25
	Education level	Correlation Coefficient	-,124	,477*	-,073	-,078	1,000	,388
		Sig. (2-tailed)	,554	,016	,727	,710	.	,055
		N	25	25	25	25	25	25
	Education in economics/ finance	Correlation Coefficient	,161	,299	-,035	,124	,388	1,000
		Sig. (2-tailed)	,442	,147	,869	,555	,055	.
		N	25	25	25	25	25	25

*. Correlation is significant at the 0.05 level (2-tailed).

Table 7. Frequencies table for 15th question

Willingness to buy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	now	4	16,0	16,0	16,0
	six months ago	9	36,0	36,0	52,0
	no difference	12	48,0	48,0	100,0
	Total	25	100,0	100,0	

Table 8. Frequencies table for 16th question

Willingness to sell

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	now	7	28,0	28,0	28,0
	six months ago	10	40,0	40,0	68,0
	no difference	8	32,0	32,0	100,0
	Total	25	100,0	100,0	

Table 9. Chi-Square Test - Willingness to buy

Frequencies - Willingness to buy

	Observed N	Expected N	Residual
now	4	8,3	-4,3
six months ago	9	8,3	,7
no difference	12	8,3	3,7
Total	25		

Test Statistics

	Willingness to buy
Chi-Square	3,920[a]
df	2
Asymp. Sig.	,141

a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 8,3.

Table 10. Chi-Square Test - Willingness to sell

Frequencies - Willingness to sell

	Observed N	Expected N	Residual
now	7	8,3	-1,3
six months ago	10	8,3	1,7
no difference	8	8,3	-,3
Total	25		

Test Statistics

	Willingness to sell
Chi-Square	,560[a]
df	2
Asymp. Sig.	,756

a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 8,3.

Table 11. Frequencies tables for 17th question

Adam

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	best	9	36,0	36,0	36,0
	second	6	24,0	24,0	60,0
	worst	10	**40,0**	40,0	100,0
	Total	25	100,0	100,0	

Ben

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	best	4	16,0	16,0	16,0
	second	15	**60,0**	60,0	76,0
	worst	6	24,0	24,0	100,0
	Total	25	100,0	100,0	

Carl

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	best	12	**48,0**	48,0	48,0
	second	4	16,0	16,0	64,0
	worst	9	36,0	36,0	100,0
	Total	25	100,0	100,0	

Table 12. Frequencies table for right and wrong rankings in 17th question

Right rank Adam-Ben-Carl

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	false	18	72,0	72,0	72,0
	true	7	28,0	28,0	100,0
	Total	25	100,0	100,0	

Table 13. Chi-Square Test – Right ranking in 17th question

Frequencies - Right ranks Adam-Ben-Carl

	Observed N	Expected N	Residual
false	18	12,5	5,5
true	7	12,5	-5,5
Total	25		

Test Statistics

	Right rank Adam-Ben-Carl
Chi-Square	4,840[a]
df	1
Asymp. Sig.	,028

a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 12,5.

Table 14. Correlations for 17th question and demographic data

			Right rank Adam-Ben-Carl	Gender	Age	Monthly income in EUR	Education level
Spearman's rho	Right rank Adam-Ben-Carl	Correlation Coefficient	1,000	-,165	-,013	,342	,306
		Sig. (2-tailed)	.	,430	,952	,094	,137
		N	25	25	25	25	25
	Gender	Correlation Coefficient	-,165	1,000	-,190	-,462*	,477*
		Sig. (2-tailed)	,430	.	,362	,020	,016
		N	25	25	25	25	25
	Age	Correlation Coefficient	-,013	-,190	1,000	,240	-,073
		Sig. (2-tailed)	,952	,362	.	,247	,727
		N	25	25	25	25	25
	Monthly income in EUR	Correlation Coefficient	,342	-,462*	,240	1,000	-,078
		Sig. (2-tailed)	,094	,020	,247	.	,710
		N	25	25	25	25	25
	Education level	Correlation Coefficient	,306	,477*	-,073	-,078	1,000
		Sig. (2-tailed)	,137	,016	,727	,710	.
		N	25	25	25	25	25

*. Correlation is significant at the 0.05 level (2-tailed).

ANNEX 4

EURO ILLUSION RELATED DATA

Table 1. Amounts budgeted in litas and euro

No.	AMOUNTS BUDGETED IN LTL				AMOUNTS BUDGETED IN LTL CONVERTED TO EUR				AMOUNTS BUDGETED IN EUR			
	Eating out	**Entertainment**	**Shopping**	**Total**	**Eating out**	**Entertainment**	**Shopping**	**Total**	**Eating out**	**Entertainment**	**Shopping**	**Total**
1	LTL 100,00	LTL 100,00	LTL 400,00	LTL 600,00	EUR 28,96	EUR 28,96	EUR 115,85	EUR 173,77	EUR 30,00	EUR 30,00	EUR 100,00	EUR 160,00
2	LTL 100,00	LTL 100,00	LTL 200,00	LTL 400,00	EUR 28,96	EUR 28,96	EUR 57,92	EUR 115,85	EUR 30,00	EUR 30,00	EUR 60,00	EUR 120,00
3	LTL 100,00	LTL 100,00	LTL 200,00	LTL 400,00	EUR 28,96	EUR 28,96	EUR 57,92	EUR 115,85	EUR 50,00	EUR 40,00	EUR 85,00	EUR 175,00
4	LTL 125,00	LTL 90,00	LTL 250,00	LTL 465,00	EUR 36,20	EUR 26,07	EUR 72,41	EUR 134,67	EUR 30,00	EUR 30,00	EUR 60,00	EUR 120,00
5	LTL 200,00	LTL 100,00	LTL 200,00	LTL 500,00	EUR 57,92	EUR 28,96	EUR 57,92	EUR 144,81	EUR 60,00	EUR 30,00	EUR 60,00	EUR 150,00
6	LTL 200,00	LTL 200,00	LTL 100,00	LTL 500,00	EUR 57,92	EUR 57,92	EUR 28,96	EUR 144,81	EUR 80,00	EUR 50,00	EUR 40,00	EUR 170,00
7	LTL 300,00	LTL 100,00	LTL 50,00	LTL 450,00	EUR 86,89	EUR 28,96	EUR 14,48	EUR 130,33	EUR 90,00	EUR 30,00	EUR 15,00	EUR 135,00
8	LTL 300,00	LTL 100,00	LTL 100,00	LTL 500,00	EUR 86,89	EUR 28,96	EUR 28,96	EUR 144,81	EUR 80,00	EUR 30,00	EUR 30,00	EUR 140,00
9	LTL 200,00	LTL 100,00	LTL 300,00	LTL 600,00	EUR 57,92	EUR 28,96	EUR 86,89	EUR 173,77	EUR 50,00	EUR 30,00	EUR 70,00	EUR 150,00
10	LTL 100,00	LTL 200,00	LTL 400,00	LTL 700,00	EUR 28,96	EUR 57,92	EUR 115,85	EUR 202,73	EUR 30,00	EUR 60,00	EUR 120,00	EUR 210,00
11	LTL 125,00	LTL 90,00	LTL 130,00	LTL 345,00	EUR 36,20	EUR 26,07	EUR 37,65	EUR 99,92	EUR 25,00	EUR 17,00	EUR 30,00	EUR 72,00
12	LTL 50,00	LTL 20,00	LTL 200,00	LTL 270,00	EUR 14,48	EUR 5,79	EUR 57,92	EUR 78,20	EUR 20,00	EUR 4,30	EUR 47,50	EUR 71,80
13	LTL 25,00	LTL 45,00	LTL 165,00	LTL 235,00	EUR 7,24	EUR 13,03	EUR 47,79	EUR 68,06	EUR 7,20	EUR 13,00	EUR 47,50	EUR 67,70
14	LTL 75,00	LTL 60,00	LTL 600,00	LTL 735,00	EUR 21,72	EUR 17,38	EUR 173,77	EUR 212,87	EUR 70,00	EUR 20,00	EUR 130,00	EUR 220,00
15	LTL 200,00	LTL 45,00	LTL 150,00	LTL 395,00	EUR 57,92	EUR 13,03	EUR 43,44	EUR 114,40	EUR 60,00	EUR 5,00	EUR 40,00	EUR 105,00
16	LTL 75,00	LTL 75,00	LTL 200,00	LTL 350,00	EUR 21,72	EUR 21,72	EUR 57,92	EUR 101,37	EUR 22,00	EUR 18,00	EUR 55,00	EUR 95,00
17	LTL 100,00	LTL 30,00	LTL 350,00	LTL 480,00	EUR 28,96	EUR 8,69	EUR 101,37	EUR 139,02	EUR 30,00	EUR 20,00	EUR 100,00	EUR 150,00
18	LTL 150,00	LTL 200,00	LTL 300,00	LTL 650,00	EUR 43,44	EUR 57,92	EUR 86,89	EUR 188,25	EUR 80,00	EUR 50,00	EUR 150,00	EUR 280,00
19	LTL 200,00	LTL 200,00	LTL 400,00	LTL 800,00	EUR 57,92	EUR 57,92	EUR 115,85	EUR 231,70	EUR 60,00	EUR 30,00	EUR 85,00	EUR 175,00
20	LTL 100,00	LTL 80,00	LTL 200,00	LTL 380,00	EUR 28,96	EUR 23,17	EUR 57,92	EUR 110,06	EUR 25,00	EUR 20,00	EUR 55,00	EUR 100,00
21	LTL 50,00	LTL 15,00	LTL 70,00	LTL 135,00	EUR 14,48	EUR 4,34	EUR 20,27	EUR 39,10	EUR 7,20	EUR 5,00	EUR 20,00	EUR 32,20
22	LTL 200,00	LTL 100,00	LTL 250,00	LTL 550,00	EUR 57,92	EUR 28,96	EUR 72,41	EUR 159,29	EUR 50,00	EUR 25,00	EUR 60,00	EUR 135,00
23	LTL 75,00	LTL 60,00	LTL 300,00	LTL 435,00	EUR 21,72	EUR 17,38	EUR 86,89	EUR 125,98	EUR 25,00	EUR 18,00	EUR 70,00	EUR 113,00
24	LTL 150,00	LTL 100,00	LTL 165,00	LTL 415,00	EUR 43,44	EUR 28,96	EUR 47,79	EUR 120,19	EUR 30,00	EUR 30,00	EUR 50,00	EUR 110,00
25	LTL 100,00	LTL 100,00	LTL 400,00	LTL 600,00	EUR 28,96	EUR 28,96	EUR 115,85	EUR 173,77	EUR 29,00	EUR 26,00	EUR 70,00	EUR 125,00
Total	LTL 3.400,00	LTL 2.410,00	LTL 6.080,00	LTL 11.890,00	EUR 984,71	EUR 697,98	EUR 1.760,89	**EUR 3.443,58**	EUR 1.070,40	EUR 661,30	EUR 1.650,00	**EUR 3.381,70**

Table 2. Paired Samples t-Test for 18th and 19th questions

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Budgeted amounts in LTL	137,7432	25	45,37880	9,07576
	Budgeted amounts in EUR	135,2680	25	53,25551	10,65110

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Budgeted amounts in LTL & Budgeted amounts in EUR	25	,830	,000

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Budgeted amounts in LTL - Budgeted amounts in EUR	2,47520	29,74575	5,94915	-9,80324	14,75364	,416	24	,681

Table 3. Correlations between answers for 18-19 questions and demographic data

			Budgeted amounts in LTL	Budgeted amounts in EUR	Gender	Age	Monthly income in EUR	Education level	Education in economics/ finance	Trips to Euro zone countries in past 10 years
Spearman's rho	Budgeted amounts in LTL	Correlation Coefficient	1,000	,872**	,073	-,200	-,163	-,065	,280	,136
		Sig. (2-tailed)	.	,000	,730	,337	,437	,756	,175	,515
		N	25	25	25	25	25	25	25	25
	Budgeted amounts in EUR	Correlation Coefficient	,872**	1,000	,162	-,267	-,136	,121	,386	,151
		Sig. (2-tailed)	,000	.	,438	,196	,517	,564	,057	,472
		N	25	25	25	25	25	25	25	25
	Gender	Correlation Coefficient	,073	,162	1,000	-,190	-,462*	,477*	,299	,338
		Sig. (2-tailed)	,730	,438	.	,362	,020	,016	,147	,099
		N	25	25	25	25	25	25	25	25
	Age	Correlation Coefficient	-,200	-,267	-,190	1,000	,240	-,073	-,035	-,241
		Sig. (2-tailed)	,337	,196	,362	.	,247	,727	,869	,246
		N	25	25	25	25	25	25	25	25
	Monthly income in EUR	Correlation Coefficient	-,163	-,136	-,462*	,240	1,000	-,078	,124	-,298
		Sig. (2-tailed)	,437	,517	,020	,247	.	,710	,555	,149
		N	25	25	25	25	25	25	25	25
	Education level	Correlation Coefficient	-,065	,121	,477*	-,073	-,078	1,000	,388	,111
		Sig. (2-tailed)	,756	,564	,016	,727	,710	.	,055	,597
		N	25	25	25	25	25	25	25	25
	Education in economics/finance	Correlation Coefficient	,280	,386	,299	-,035	,124	,388	1,000	,201
		Sig. (2-tailed)	,175	,057	,147	,869	,555	,055	.	,334
		N	25	25	25	25	25	25	25	25
	Trips to Euro zone countries in past 10 years	Correlation Coefficient	,136	,151	,338	-,241	-,298	,111	,201	1,000
		Sig. (2-tailed)	,515	,472	,099	,246	,149	,597	,334	.
		N	25	25	25	25	25	25	25	25

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 4. Correlations between answers for 18-19 questions and attitude to the introduction of the euro

			Attitude towards the euro	Budgeted amounts in LTL	Budgeted amounts in EUR
Spearman's rho	Attitude towards the euro	Correlation Coefficient	1,000	-,115	,038
		Sig. (2-tailed)	.	,583	,855
		N	25	25	25
	Budgeted amounts in LTL	Correlation Coefficient	-,115	1,000	,872**
		Sig. (2-tailed)	,583	.	,000
		N	25	25	25
	Budgeted amounts in EUR	Correlation Coefficient	,038	,872**	1,000
		Sig. (2-tailed)	,855	,000	.
		N	25	25	25

**. Correlation is significant at the 0.01 level (2-tailed).

Table 5. Investment decisions in LTL * Investment decisions in EUR Crosstabulation

		Investment decisions in EUR			
		A	B	C	Total
Investment decisions in LTL	A	7	0	0	7
	B	5	10	0	15
	C	0	2	1	3
Total		12	12	1	25

Table 6. Wilcoxon Signed Ranks Test for 21th and 21th questions

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
Investment decisions in LTL	25	1,84	,624	1	3
Investment decisions in EUR	25	1,56	,583	1	3

Ranks

		N	Mean Rank	Sum of Ranks
Investment decisions in EUR - Investment decisions in LTL	Negative Ranks	7[a]	4,00	28,00
	Positive Ranks	0[b]	,00	,00
	Ties	18[c]		
	Total	25		

a. Investment decisions in EUR < Investment decisions in LTL
b. Investment decisions in EUR > Investment decisions in LTL
c. Investment decisions in EUR = Investment decisions in LTL

Test Statistics[a]

	Investment decisions in EUR - Investment decisions in LTL
Z	-2,646[b]
Asymp. Sig. (2-tailed)	,008

a. Wilcoxon Signed Ranks Test
b. Based on positive ranks.

Table 7. Correlations between answers for 20-21 questions and demographic data

			Investment decisions in LTL	Investment decisions in EUR	Gender	Age	Monthly income in EUR	Education level	Education in economics/ finance	Trips to Euro zone countries
Spearman's rho	Investment decisions in LTL	Correlation Coefficient	1,000	,706**	-,205	,057	-,199	-,382	,115	,085
		Sig. (2-tailed)	.	,000080	,326	,787	,340	,060	,583	,686
		N	25	25	25	25	25	25	25	25
	Investment decisions in EUR	Correlation Coefficient	,706**	1,000	-,089	-,125	,093	-,130	,392	-,133
		Sig. (2-tailed)	,000080	.	,674	,553	,658	,536	,052	,527
		N	25	25	25	25	25	25	25	25
	Gender	Correlation Coefficient	-,205	-,089	1,000	-,190	-,462*	,477*	,299	,338
		Sig. (2-tailed)	,326	,674	.	,362	,020	,016	,147	,099
		N	25	25	25	25	25	25	25	25
	Age	Correlation Coefficient	,057	-,125	-,190	1,000	,240	-,073	-,035	-,241
		Sig. (2-tailed)	,787	,553	,362	.	,247	,727	,869	,246
		N	25	25	25	25	25	25	25	25
	Monthly income in EUR	Correlation Coefficient	-,199	,093	-,462*	,240	1,000	-,078	,124	-,298
		Sig. (2-tailed)	,340	,658	,020	,247	.	,710	,555	,149
		N	25	25	25	25	25	25	25	25
	Education level	Correlation Coefficient	-,382	-,130	,477*	-,073	-,078	1,000	,388	,111
		Sig. (2-tailed)	,060	,536	,016	,727	,710	.	,055	,597
		N	25	25	25	25	25	25	25	25
	Education in economics/finance	Correlation Coefficient	,115	,392	,299	-,035	,124	,388	1,000	,201
		Sig. (2-tailed)	,583	,052	,147	,869	,555	,055	.	,334
		N	25	25	25	25	25	25	25	25
	Trips to Euro zone countries in past 10 years	Correlation Coefficient	,085	-,133	,338	-,241	-,298	,111	,201	1,000
		Sig. (2-tailed)	,686	,527	,099	,246	,149	,597	,334	.
		N	25	25	25	25	25	25	25	25

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 8. Correlations between answers for 20-21 questions and attitude to the introduction of the euro

			Attitude towards the euro	Investment decisions in LTL	Investment decisions in EUR
Spearman's rho	Attitude towards the euro	Correlation Coefficient	1,000	,102	,371
		Sig. (2-tailed)	.	,627	,067
		N	25	25	25
	Investment decisions in LTL	Correlation Coefficient	,102	1,000	,706**
		Sig. (2-tailed)	,627	.	,000
		N	25	25	25
	Investment decisions in EUR	Correlation Coefficient	,371	,706**	1,000
		Sig. (2-tailed)	,067	,000	.
		N	25	25	25

**. Correlation is significant at the 0.01 level (2-tailed).