CAN WE RELY ON CONFIDENCE? THE CASE OF LATVIA

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Acknowledgements

Abstract

The aim of this paper is to research whether in Latvia the Consumer Confidence Index (CCI) contains information about household consumption apart from the information contained by economic factors. The determinants of consumption have been under discussion in the existing literature. It has been argued that not only economic factors, but also consumer confidence play a role in explaining consumption patterns.

In the research the authors test which factors predict consumption of Latvian households and, furthermore, the analysis of main determinants of the CCI is performed. In the research process quarterly data from 1995 to 2013 is employed.

Results reveal that the CCI is a significant predictor of household consumption even when controlled for other factors. The authors find that that the CCI can be explained by unemployment, inflation, 3-month money market interest rates and major economic events, such as, the global recession.

Overall, the authors find that the CCI has little, yet significant predicting power over household consumption and therefore it is valuable to acknowledge the determinants of the index itself. By knowing the factors explaining the CCI, the authors suggest potential policies that the government could pursue.

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1. Introduction

From an economist's standpoint it can be said that at present people live in a world where everything has a price. In particular, every person's life can be evaluated with a series of economic models – budget constraints, opportunity costs, purchasing power, etc. The term "utility" is being used more and more to describe the degree to which a person's needs are satisfied. On a daily basis everyone tries to maximize it, be it subconsciously or intentionally. According to the economic theory, one's utility can be measured by the amount of goods and services he/she can afford; therefore, wealth is the key prerequisite for maximizing it (Simon, 1959).

One of the main indicators of a country's prosperity is Gross Domestic Product (GDP). It is the total monetary value of all goods and services produced in a specific period of time within a country (Eurostat, 2013). As a result, it provides a good overview of how much the country is able to earn. It should be noted that countries with a higher level of GDP per capita have more money to spend on less population and, in turn, are considered wealthier. According to the theory of consumption, approximately two-thirds of GDP comes from household consumption (Palley, 2010). Therefore, in order to obtain a higher level of GDP the citizens' willingness to consume needs to be maximized. In economic terms it turns out that households need to spend more in order to live wealthier.

According to the growth rate of real GDP in Latvia the overall development of the country's economy was quite volatile in the past. Throughout last 10 years the GDP growth rate has fluctuated from -17.7% to 11% (Eurostat, 2014). The volatile development has left its marks on most of the sectors of the economy – many companies and factories went out of business due to either lack of financing or lack of demand caused by the economic turmoil. This indicates that particular attention should be paid to factors that influence the development of GDP the most.

As consumption correlates to a major part of the country's GDP, it is wise to study what influences it in order to stabilize and control it. Considerable amount of attempts has been made to explain and predict household consumption. This has led to emergence of many indicators that are used by governments and institutions to track the consumption level. One of these alternatives is to look at consumer confidence as a predictor of consumption, which takes into account people's perceptions about the future economic situation, personal purchasing power and other factors. Confidence, on the other hand, directly influences willingness to consume goods and services or make savings if needed (Household budget and

consumption expenditure, 2013). Consumer confidence is evaluated on a monthly basis across a number of countries and obtained results are compiled in the Consumer Confidence Index (CCI) (Consumer confidence index, 2013).

In Latvia during the last two decades the average value of the CCI has been around minus 21, which is significantly lower than that of wealthier countries (European Commission, 2014). In addition to that, during the 2-month period from June to August of 2013 the index has plunged from -8.6 to -15.5, which constitutes to a drop of around 80% (Consumer confidence index, 2013). This fact indicates that inhabitants of Latvia are unsure about the country's future economic situation and, as a result, may be willing to cut down on spending in order to save more money for the future. As, according to the theory, consumption correlates to a major part of GDP, any negative change in the consumer confidence and increase in savings constitute to a significant share of not-obtained wealth for the country. The long-term volatility of the index in Latvia shows that even though expectations of Latvians tend to change quite rapidly, there still is much uncertainty about the future. Like in the demand-supply relationship the household consumption triggers production and is one of the key components of the country's GDP. Therefore, the government should focus on improving and stabilizing the level of consumers' confidence in order to maintain stable development of the country. For comparison, in September 2013 the CCI of the United States declined from 82.1 to 77.5 (only 5,6%), as consumers saw higher interest rates and lower economic growth ahead – the decrease was one of the sharpest in a 2-year period, whereas for Latvia it would have been one of the lowest in all history (Lopez, 2013). As suggested by the example, the Consumer Confidence Index in the United States is quite stable. Therefore, the authors conclude that the government has been successful at drawing attention to and controlling the level of consumer confidence and household consumption. Given the abovementioned, the authors believe that Latvia is a good example of the need of stable economic development.

This paper aims to assess the extent to which the Consumer Confidence Index can predict the level of consumption of Latvian households. Moreover, in order to better explain changes in the consumption pattern of Latvian households the authors will examine which factors predict changes in the Consumer Confidence Index. This will indicate fields on which the government should concentrate in order to stabilize and control the level of consumption and, as a result, the development of the economy in general. For this purpose the following research question is stated: **Can consumer confidence indicators predict consumption of Latvian households?**

Furthermore, based on the review of the existing literature, three hypotheses have been proposed:

Hypothesis 1: The CCI is a predictor of the level of household consumption.

Hypothesis 2: The CCI remains a good predictor of the level of household consumption when controlled for other factors.

Hypothesis 3: Macroeconomic variables have explanatory power over the CCI.

The following Literature Review section provides a critical overview of the existing studies on the examined topic. In the Methodology section the authors introduce the methodology used in the research process, as well as descriptive statistics and potential threats to validity. The authors also disclose the data selection process followed by the description of gathered variables. The Review of Empirical Findings section presents the necessary modification of the variables, reveals and interprets the results of regressions. In the Conclusion section the authors summarise the paper and its main findings and provide suggestions for future research.

2. The Review of Literature

2.1. GDP and Consumption

Gross Domestic Product is the most widely-used indicator of a country's wealth. According to the expenditure method, GDP is a sum of final household consumption, gross investment, government spending and net exports in a specific period of time. Usually it is compared to previous quarter of the year, to determine growth of the economy at that period (International Monetary Fund, 2012).

As mentioned, the theory of consumption states that private consumption constitutes to approximately two-thirds of the total amount of GDP (Palley, 2010). It is the total value of durable goods (i.e. electronic, jewellery, etc.), non-durable goods (i.e. food, etc.) and services bought by individuals in a country. Consumption has a direct impact on many variables important for a country. For instance, most of countries have imposed the value added tax (VAT) on goods and services, thus the governments are interested in maintaining stable consumption pattern, as it affects their revenues. Moreover, increased consumption may increase investments, which also drive the growth of the country's economy (Piana, 2001).

The origin of modern consumption theory can be found in Keynes's (1936) work *The General Theory.* In his work Keynes found the relation between consumption and income and suggested that aggregate consumption was a positive function of aggregate income. In other words, he suggested that people's spending depends on the current income. The theory was followed by Friedman's (1957) permanent income hypothesis (PIH). Friedman challenged Keynes's theory by suggesting that instead of focusing on actual income one should use permanent income, which represents income over lifetime (Palley, 2010). By doing so, the economist managed to add a reasonable forward-looking aspect and thus improve consumption theory. Friedman's hypothesis revealed that consumption depends on both the current situation and expected future income (Eisner, 1958; Fan & Wong, 1998). Meanwhile, Modigliani and Brumberg introduced the life-cycle hypothesis as an alternative explanation of consumption and, more importantly, it helped to nest Friedman's PIH (Palley, 2010).

Since then economic forecasting has been trying to improve consumption forecasting measures by including also other economic variables. These variables are inflation, nominal interest rate, unemployment and stock prices (Desroches & Gosselin, 2002). Empirical findings show that higher interest rates and unemployment lead to lower consumption as people get paid less and it is more expensive for them to borrow. Thus, their purchasing power and consumption suffers. Higher inflation indeed proves to decrease consumption in

the upcoming periods by reducing purchasing power. Also Hymans (1970) and Croushore (2005) include such factors as unemployment rate, interest rate and stock prices in their analysis. In addition to economic variables, Hymans included also, for example, auto strikes against two large companies in order to better explain consumption of durables. He emphasised the effect of consumers' mood particularly on their spending on durable goods. Increasing unemployment lowers people's spending on durables, for example cars, because these types of purchases usually can be postponed. That is, during times of high unemployment people would spend less and more cautiously, which consequently would lower consumption.

However, it has been proposed and long discussed that not only economic variables contain information about consumption expenditures. A number of researchers have been looking at a more psychological approach to determine the level of consumption. As one of the first examples can be mentioned Katona's (1975) approach developed in the 1950s. According to it, an individual's consumption can be explained by both capacity and willingness to spend. If the person is uncertain or afraid about the political situation or her salary next year, he/she might be willing to spend less, although capacity is still the same – he/she is still employed and receives his/her wage. In this view, consumption will depend on individuals' confidence about their future financial situation.

The main pillar of this theory is the idea that solely economic factors are not enough to explain the willingness to consume. Individuals' willingness can be affected also by non-economic variables, such as wars and political events. That is, changes in confidence can lead to changes in consumption, and it might not be forecasted by economic variables since there has been no change in income, for example (Desroches & Gosselin, 2002).

2.2. Consumer Confidence

One can consider Keynes's works as the origin of the more psychological approach. Already in the 1930s the economist used the term "animal spirit" to describe human psychological motivations which are non-rational and non-economic and it was argued that people's willingness to take risks or trust is driven by it (Shiller, 2009). Later the economists Akerlof and Shiller expanded Keynes's concept and acknowledged that the animal spirits are mainly driven by confidence (Ross Gittins is the Herald's Economics, 2010). In their book they state that animal spirits drive the financial events worldwide leading to increasing importance of understanding the level of confidence a population has.

Consequently, in the 1940s at the University of Michigan George Katona was the first behavioural economist who developed the concept and measurement of consumer sentiment to predict consumer spending. Nowadays this measurement is called the Consumer Sentiment Index and it is one of the two main indices used worldwide to measure consumer confidence. Another index of confidence was created in 1967 by the Conference Board of the United States (Averkiou, Girson, & Richards). Since then even more consumer confidence measurements have been developed such as Consumer Comfort Index, Current Economic Conditions, Gallup Polls, LJS National Poll, RBC CASH Index, TIPP Indices (Richard K. M. & Associates, 2012).

In economic analysis the value added of the consumer indicators can be approached from three different viewpoints. The first one argues that confidence, along with income, is a very significant predictor of people's spending on optional items such as durable goods. According to this view, confidence cannot be represented by a single question or only economic variables; on the contrary, a survey of a set of questions is needed. A second viewpoint believes that confidence measures optimism or pessimism regarding future economic situation. This view is in line with the permanent income and life-cycle hypotheses, where consumption depends significantly on expected future income. Consumer confidence is thus believed to tell more about future income expectations and expenditures than just looking at observations about the past income. In the third view the most valuable aspect of the confidence indicators comes from their ability to assess risk or uncertainty coming from the possibility of job loss and/or income loss. Higher likelihood of financial distress would make people save more in liquid than illiquid form. People would choose to postpone part of their expenditures if there were some risks associated with future financial conditions. They would save some money in order to cover future spending in case of financial distress. This view states that, however, it might be the case that people's uncertainty and perceptions of risk can be measured equally well by economic indicators (Throop, 1992).

Overall, improving consumer confidence can be seen as a way to support consumer spending, which will in turn help to stabilize economic activity and finally will help its growth. In the Eurozone, for example, after the recent recession consumers' mood about the economic situation was one of the lowest in years. Although consumers are becoming less pessimistic, no considerable increase in consumer spending should be expected, and economists and politicians are still concerned about the low levels of confidence (Hannon, 2013).

2.2.1. Comparison of the Consumer Sentiment Index and Consumer Confidence Index

The Consumer Sentiment Index (CSI) is a measure of confidence that is based on monthly household interviews. As mentioned previously, the Consumer Sentiment Index was developed in the US in the 1940s by the professor Katona. Nowadays the index is still calculated by the University of Michigan's Institute for Social Research where it was developed, as well as, by the Directorate General for Economic and Financial Affairs. Initially the index was calculated on annual basis, but in 1978 it was decided to switch to monthly calculations. In the US each month at least 500 telephone surveys of households are conducted. Interviewed households are selected randomly. 40% of the sample are contacted again in six month. The telephone interview consists of 5 main questions regarding current and expected economic conditions. Out of five main questions two are dedicated to the assessment of current conditions and remaining three are about the future (Merkle, Langer, & Sussman, 2004).

The Consumer Confidence Index (CCI), same as the CSI, is a measure of confidence and was developed in the US. The two indices are based on monthly household interviews; however, the methodology how they are computed differs. The CCI is gauged by the Conference Board of the US already for 46 years and is calculated from approximately 2500 household email responses (Merkle, Langer, & Sussman, 2004).

Today these measures are used not only in the origin country US, but all over the world. However, sample sizes, survey process and questions of both indices differ and are adjusted for each country.

Both indices attempt to measure household perception of current socio-economic conditions and future expectations. However, they differ not only in methodology, but also how both questioners are compiled and what they capture. In terms of present condition questions, CSI survey focus on purchases of durable goods and changes in respondent's financial situation. Therefore, the CSI index is highly influenced by changes in interest rates and inflation. The CCI captures respondent's attitude towards business environment situation and job availability in the country, thus the index is more associated with labour market conditions (Bram & Ludvigson, 1998).

Another important aspect is what type of benchmarks is used in the indices. In the CCI absolute benchmark is used. This indicates that the index reaches its highest point, when the level of unemployment is the lowest and there is high economic activity. The CSI uses relative benchmarking approach. It compares the situation of the respondent a year ago.

Therefore, the index peaks in times, when economic recovery is taking place and both interest rates and inflation are on a low level (Bram & Ludvigson, 1998).

In both indices the emphasis is put on future expectations, since three out of five questions are regarding future conditions. Overall, compared to present condition questions, future condition questions do not differ so much. Still the time period on which these surveys focus is different. The CCI captures projections regarding the upcoming six month, while the CSI includes questions about the next five years. The research of Federal Reserve Bank of New York shows that since the CCI survey is more short-term oriented, it displays a peak reaction to an impulse quicker than the CSI, which will have the same reaction many quarters later (Bram & Ludvigson, 1998).

2.2.2. Confidence Measures of Households in Latvia

In Latvia mainly only the Consumer Confidence Index is used to determine the population's assessment of their household's financial situation and perception of the country's economic conditions. The authors conclude that the reason for measuring only the CCI in Latvia is due to the difference between both indices and country's historical economic development. Since the inflation rate over the last decade has been very volatile, as well as, the interest rate, it is assumed that the CCI better reflects actual situation due to its quick reaction to impulses and focus on labour market conditions, when compared with the CSI.

The CCI survey is compiled by the market and opinion research agency *Latvian Facts* and it is conducted on a monthly basis. For the first time the index was calculated in the early 1990s (Melihovs & Rusakova, 2005). The agency acknowledges the Consumer Confidence Index as a measurement of consumers' expectations of the situation in the next 12 months of the following factors: overall economic situation, level of unemployment, financial situation of the respondent's family and possibility that respondent could make any savings during the next 12 months (Consumer confidence index, 2013). The contribution of each of the factors to the CCI is provided in Appendix 1.

2.3. The Linkage Between Consumption and Consumer Confidence

In the existing literature the linkage between consumption decisions and consumer confidence has been discussed quite widely. As previously mentioned, already in the 1950s researchers started to discuss and pay attention to consumer confidence and its potential importance in economics. Since then a number of studies have tried to examine how well

consumer confidence indices can predict future purchase behaviour. However, the results regarding the importance of consumer confidence differ across the studies.

To begin with, there are studies which are rather sceptical about the capability of consumer confidence indicators to improve expenditures forecasting. For example, Hymans (1970) in his work presented that confidence indices proved to be a useful addition to simple models using only income. Nevertheless, in more sophisticated models they had little predictive power over future consumption. Moreover, consumer confidence improved the forecasting of expenditures only if there were significant changes in consumer confidence. Similar results, that is, consumer confidence indices lose their explanatory power when additional variables are included in the model, were observed also in the paper by Burch and Gordon (1984).

However, there is a number of studies that are in favour of the predictive value of consumer confidence indices. Early studies done by Tobin (1959) and Mueller (1963) show that the index of consumer sentiment is successful in predicting future purchases. Also in later studies Garner (1991) and Throop (1992) suggest that confidence indices contain information about consumption expenditures, and that this information is beyond the one provided by economic fundamentals. They argue that in case of large economic or political events consumer confidence might change independently of the current economic situation. Therefore, during such times it is especially important and contains information additional to economic variables.

Huth et al. (1994) also present empirical evidence that the CSI and CCI are valuable predictors of aggregate consumer spending. In turn, they see this at great importance for manufacturers, which thus can adapt to consumer buying behaviour by shifting their production and marketing activities. Also Carroll et al. (1994) find supportive evidence for the predictive power of consumer confidence measures. They present that the CSI on its own can explain approximately 14 percent of the variation in the changes of total personal consumption. Studies done by Eppright et al. (1998) and Batchelor and Dua (1998) are as well in favour of consumer confidence indices. They argue that confidence measures contain additional information about consumer expenditures, that is, information that is not possessed by economic variables. However, Batchelor and Dua add that this is the case only when there is a sharp fall in consumer confidence, otherwise it does not improve forecasting.

Overall, the empirical findings of these studies can be divided into three categories. First are the ones which present value of the indices as negligible because their predicting power decreases if other variables are added to the analysis. As examples here can be

mentioned previously discussed Hymans's (1970) and Burch and Gordon's (1984) works. Second category can consist of, for example, the study by Eppright et al. (1998). This category suggests that the explanatory value of consumer confidence indices is incremental and thus provide information not contained by economic indicators. A third group can be represented by studies which find the indices valuable because they improve consumption forecasts during extraordinary periods coming from economic or political events. These findings are presented in Garner's (1991) and Throop's (1992) studies (Desroches & Gosselin, 2002).

While most of the early studies focus on the US, in more recent studies researchers have tried to analyse the case also in other countries, for example, Russia, Australia, European Union countries (Cotsomitis & Kwan, 2006; Curtin, 2000; Roberts & Simon, 2001). When looking at more recent studies, still mixed results can be observed, especially, when looking at different countries.

As the authors study the link between consumer confidence and consumption in Latvia, papers that have focused on Europe are particularly in the authors' interest. A number of studies have looked at the euro area and some countries in the European Union. A research done by the European Central Bank looks at consumer confidence in the euro area and the United States. It proposes that the Consumer Sentiment Index in certain conditions is a useful predictor of consumption, especially, when the index faces large changes (Dees & Brinca, 2011). Celik and Ozerkek (2009) look at 9 EU countries (Denmark, France, Germany, Ireland, Italy, the Netherlands, Portugal, Spain, and the United Kingdom) and also find a relationship between consumer sentiment and personal consumption. Conversely, Costomitis and Kwan (2006) find evidence that in 14 EU countries (Austria, Belgium. Denmark, Finland, France, Ireland, Italy, Germany, Greece, Portugal, Spain, Sweden, the Netherlands, and the United Kingdom) the CCI provides rather limited information about future consumption and therefore should be used with caution.

However, to the best extent of the authors' knowledge, there is no study conducted that would try to examine whether consumer confidence has some explanatory power over consumption in Latvia. The only paper that talks about the link between economic development and confidence indicators is the paper by Melihovs and Rusakova (2005) from the Bank of Latvia. Nevertheless, this study looks at the effect on GDP and real value added of the goods sector and industry, not specifically consumption. In turn, the confidence indicators used in the analysis represent confidence of a specific industry or sector, and not

individual consumers. Also the time period covered in the paper is from the early 1990s till the end of 2002, indicating that a more updated research could be done.

Taking into account the review of literature, the authors propose the following hypotheses:

Hypothesis 1: The CCI is a predictor of the level of household consumption.

Hypothesis 2: The CCI remains a good predictor of the level of household consumption when controlled for other factors.

As suggested by Kwan & Costomitis (2004) policy makers and forecasters might do better if they paid attention to consumer confidence indicators, most notably during times of economic fluctuations. In order to increase GDP and wealth of the country, the government needs to create favourable conditions where people feel safe and do not slow down consumption. Thus, the authors are willing to determine which economic variables can explain the CCI. This would help to acknowledge which economic factors in particular are important for consumers and consequently which factors should be looked after and improved to increase consumer confidence. Consequently, the authors put forward the third hypothesis:

Hypothesis 3: Macroeconomic variables have explanatory power over the CCI.

3. Methodology

In order to test the hypotheses introduced in the Literature Review section and answer the research question, the authors follow the methods presented by Carroll et al. (1994) and Ramalho, Caleiro and Dionfsio (2011). The methods are taken as a base and then further adjusted to make them more suitable for the case of Latvia.

3.1. Regression Models

To examine the predicting power of the CCI, the authors follow a two-step procedure developed in the study by Carroll et al. (1994). Firstly, the authors assess regressions of the growth of consumption on lagged values of the CCI, which is examined by the following model:

$$\Delta log(C_t) = \alpha + \sum_{i=1}^{N} \beta_i \, CCI_{t-i} + \varepsilon_t \, ,$$

where

C_t - consumption at time t,

α - a constant term,

CCI_t - consumer confidence at time t,

ε_t - an error term.

The model will help the authors to test the first hypothesis, which states that the CCI is a predictor of the level of household consumption.

Next, in order to test the second hypothesis, the authors are willing to determine the predictive ability of the CCI when other control variables, more specifically, macroeconomic variables are included in the analysis. The expanded equation takes the following form:

$$\Delta log(C_t) = \alpha + \sum_{i=1}^{N} \beta_i \, CCI_{t-i} + \gamma Z_t + \varepsilon_t \, ,$$

where

C_t - consumption at time t,

α - a constant term,

CCI_t - consumer confidence at time t,

Z_t - a vector of other variables,

ε_t - an error term.

As Carroll et al. (1994) describes, other variables are chosen somewhat arbitrarily, and in their model as the control variables they take lagged values of the change in real labour income.

As the model introduced by Carroll et al. (1994) does not specify which other variables should be included in the analysis, the authors have chosen a number of variables based on previous studies discussed in the Literature Review section. The variables that the authors are willing to test and include as the control variables are inflation, interest rates, wages and unemployment. Previous studies look also at stock prices; however, the stock market in Latvia is relatively new and small in size, and thus the authors choose to not include this variable (Stock Market in Latvia, 2011).

In order to test the third hypothesis, the authors undertake the method suggested by Ramalho et al. (2011). Their study strives to explain the changes in consumer confidence by looking at such economic variables as inflation, unemployment, interest rate and business cycle indicators, either the Industrial Production Index (IPI) or real GDP. In addition, the study tests the importance of electoral variables and variables explaining context, for example, presence of serious crisis and entering the Eurozone. The decision on the data to be used in the regression model is a trade-off between monthly and quarterly data. Ramalho et al. (2011) explain that the use of monthly data is more precise when including, for example, electoral variables, while quarterly data is more applicable if one wants to incorporate real GDP, which is not available on a monthly basis.

The authors plan to use quarterly data in order to incorporate both electoral variables and real GDP. Also such context variables as joining the European Union (EU) in May 2004 and referendums are potential explanatory variables. Overall, the authors are interested in testing the explanatory power of real GDP, inflation, unemployment rate, interest rates, elections, referendums and major economic events such as the accession to the EU. The variables of elections, referendums and context are to be included in the model as dummy variables. The variable takes the value 1 for a specified period of time before and after the event. The aim of the period after the occasion is to capture the post-event sentiment or so-called honeymoon effect. For normal elections, the ones taking place in a normal electoral cycle, Ramalho et al. (2011) propose the variable to take the value 1 for 3 quarters before and 1 quarter after the election. For early elections, which are called in between a normal electoral cycle, they set the value 1 for all quarters when it was perceptible that an election might be called and also for 1 quarter after the election. In the case of Latvia, since 1990 six

normal parliamentary elections and one early parliamentary election, six municipal elections and eight national referendums have taken place (CVK, 2013a; CVK, 2013b).

3.2. Threats to Validity

The authors acknowledge that there are several possible threats that might lead to biased results; therefore, the data should be treated with caution and a number of tests should be performed.

Firstly, time series regressions are subject to a threat of non-stationarity. Non-stationarity might lead to unreliable results and spurious regressions. In order to test for stationarity, the authors are going to perform the Dickey-Fuller and Augmented Dickey-Fuller test (ADF). The problem of non-stationarity could be solved by transforming the variables and using their first differences. However, non-stationarity is not a problem if the variables are cointegrated; thus, the authors are going to check for cointegration. Overall, if the variables are not cointegrated and are non-stationary, then first differences have to be used in order to avoid spurious regressions (Stock & Watson, 2004).

Secondly, the variables might be subject to multicollinearity. The Variance Inflation Factor model (VIF) is going to be used in order to test whether independent variables in a regression are not too interconnected. If the value of the VIF equals 1, then there is no problem of multiocollinearity, and, in general, the value of the VIF below 10 is acceptable (Kutner, Neter, & Nachtsheim, 2004).

Thirdly, autocorrelation might be a threat because it would lead to higher variance and inefficient estimates. To check for autocorrelation, the authors are going to use the Durbin-Watson and Breusch-Godfrey LM tests (Haslett & Kevis, 1998).

In addition, as previously mentioned, the model developed by Carroll et al. (1994) does not specify which variables should be included besides consumer confidence. This might lead to an ommitted variable bias as there might be some important variables that have not been included in the regression.

3.3. Data

The aim of the paper is to analyze if the Consumer Confidence Index is a good predictor of household consumption in Latvia as well as determine macroeconomic variables that the best explain the Consumer Confidence Index in Latvia. Since household consumption is measured quarterly, the authors aim to create a data set with quarterly observations for time

period 1990 – 2013 for the hypotheses 1 and 2. In order to test the hypothesis 3 the authors aim to create a data set with quarterly observations for time period 1990 - 2013. Quarterly data is used to test the hypothesis 3 due to two reasons. First, the Consumer Confidence Index has the same values for all three months of a quarter in the early 1990s. Secondly, the authors intend to incorporate real GDP in the analysis of the CCI, and GDP is measured quarterly. 1990 has been chosen as a starting year due to political concerns. In this year Latvia restored its independency (Ministry of Foreign Affairs of the Republic of Latvia, n.d.). Therefore, for Latvia as an independent country data should be available starting from 1990. Nevertheless, the period is adjusted because some of the variables are not available for this period of time, and the reasoning is provided in the following paragraphs.

Majority of the variables, which the authors employ in the analysis, can be found in the Central Statistical Bureau of Latvia (CSB), European Commission and Eurostat databases. The variables used in the analysis are the CCI, CPI, real GDP, household final consumption expenditure, unemployment rate, interest rates and gross wages and salaries. In addition, the authors examine the effect of inclusion of the following variables: elections, referendums and context factors. Information regarding these variables will be acquired from the website of the Central Election Commission (CVK) of Latvia. The website provides detailed information on the dates of the electoral events, which is particularly of interest to the authors (CVK, 2013a).

Due to the fact that data on final consumption expenditure of households is available only from the first quarter of 1995, the authors are constrained to a sample period starting from this date. Consequently, 75 observations of consumption, real GDP, wages, the CPI, short-term and long-term interest rates on credits were gathered until the last quarter of 2013. The CPI is used to calculate inflation. The CCI has 76 observations, and 3-month money market interest rate has 66 values. For the unemployment rate there are 62 observations because comparable data of Labour Force Survey is available only from 1998.

The authors take seasonally adjusted data of consumption, real GDP, wages, the CCI and unemployment rate to smooth out potential periodic fluctuations and to see the general trend. By doing so, the authors are willing to secure against the increased consumption during Christmas time and a 13th salary, for example.

The binary variable of parliamentary elections is based on the elections taking place on September 30 and October 1 in 1995, October 3 in 1998, October 5 in 2001, October 7 in 2006 and October 2 in 2010. Also the only early election, which took place on September 17, 2011, is included in the election variable. The dummy of local elections is created by

incorporating the elections on March 9 in 1997, March 11 in 2011, March 12 in 2005, June 6 in 2009 and June 1 in 2013 (CVK, 2013a). The dummies of both parliamentary and local elections take the value 1 for 3 quarters before the election and 1 quarter after the election. For the early election the value 1 is set for 2 quarters before the election based on the president's proposal for dissolution of the Saeima (CVK, 2011).

For the referendum variable the authors take four referendums because the rest experienced insufficient quorum. The included referendums are on repeal of the law amendments to the citizenship law on October 3, 1998; on Latvia joining the EU on September 20, 2003; on dissolution of the 10th Saeima on July 23, 2011 and on amendments to the Constitution of the Republic of Latvia on February 18, 2012. The variable takes the value 1 for the quarters before the first referendum based on the changes in the citizenship law on June 22, 1998. The value 1 is set for 3 quarters before the EU referendum because of the information events starting already in the late 2002. For the referendums in 2011 and 2012 the value 1 is for the 2 previous quarters based on the announcement of those referendums (CVK, 2013b).

Lastly, as the context variable the authors choose to include joining the EU on May 1, 2004 and the economic downturn in the years 2008 and 2009. Also the acceptance to the Eurozone on July 9, 2013 and preparation period of joining it are included in the context variable. Lastly, the authors also incorporate the demission of Prime Minister after the supermarket roof collapse in Riga in November, 2013. The context variable has the value 1 for 2 quarters before joining the EU, and it is based on the EU referendum in September 2003, which made the accession certain. The value 1 is set also for all quarters in 2008 and 2009 and for the last 3 quarters of 2013.

Summary of the data and detailed descriptive information can be found in Appendix 2 and Appendix 3.

3.3.1. Modification of the Data

In the Modification of the Data part the authors describe steps undertaken in order to examine and assure the validity of the data. Time series data are subject to such previously mentioned threats as non-stationarity, autocorrelation and multicollinearity, and therefore alteration of the variables might be necessary.

Firstly, the non-binary variables are modified into natural logarithms rather than absolute values, which helps to solve several issues such as skewness by making the values

normally distributed. Otherwise, the use of linear regressions or t-tests might provide misleading results. In addition, a logarithmic transformation helps to deal with outliers in the data (MedCalc Software, 2013). The natural logarithms of the variables are constructed in the following way:

$$\ln C_t = \ln(C_t)$$

However, the CCI and interest rates are an exception and are not displayed in the form of natural logarithms. The CCI is an exception due to its mainly negative values, while interest rates are commonly not used in logarithms due to their volatility.

Next, the authors check for stationarity by plotting the variables on a graph, which gives a visual illustration, and then by conducting the Dickey-Fuller test for more precise results. The results show that the data is non-stationary, and the authors acknowledge that this might lead to spurious regressions. The only exception to use non-stationary data is if variables in a regression are cointegrated, that is to say, they have stationary residuals (Stock & Watson, 2004). The authors examine stationarity of the residuals of various regressions for their hypotheses and conclude that the variables are not cointegrated, and hence results might be spurious (Appendix 4).

In order to solve this problem, the authors use first or first log differences for log transformed variables respectively. The first differences are created as follows:

$$\Delta \ln C_t = \ln C_t - \ln C_{t-1}$$

After the modification of the variables into first or first log differences, the authors examine the stationarity of the modified variables. Visual illustrations and the Dickey-Fuller test indicate that the variables are now stationary (Appendix 5). The descriptive summary of the modified data is presented in Appendix 6.

4. Empirical Analysis

After the validity of the variables has been examined and ensured, in the Empirical Analysis section the authors explain implementation of the models and introduce regression results.

4.1. Regression Results

4.1.1. Hypothesis 1

As the baseline model for the first hypothesis the authors use final consumption expenditure of households (designated as $\Delta \ln C$) as the dependent variable and four lags of the CCI (designated as ΔCCI) as the explanatory variables. Although the obtained R^2 of 0.3574 is satisfactory and first three out of four lags of the CCI are statistically significant, the Breusch-Godfrey LM test indicates the presence of autocorrelation. Therefore, the model should be modified and the authors exclude the insignificant variable and choose to add the lagged value of the dependent variable to solve the issue of autocorrelation (Keele & Kelly, 2004) (Appendix 7). The final regression model for the hypothesis 1 looks the following:

$$\Delta \ln C_t = \alpha + \beta_1 \Delta \ln C_{t-1} + \beta_2 \Delta CCI_{t-1} + \beta_3 \Delta CCI_{t-2} + \beta_4 \Delta CCI_{t-3} + \varepsilon_t$$

The results of the final regression model indicate that there is a positive relationship between consumption in the current period and consumption in the previous period. The coefficient is statistically significant (Appendix 7). Intuitively, the authors explain it by the reason that people's style of consumption tend to follow some kind of pattern. That is to say, consumers do not choose to spend more in one period and then suddenly to save more in the next one as it is rather hard to change one's habits and expenditures. And, if the situation is good and stable, consumers might find it tempting to consume more than previously. On the other hand, if, for some reason, people have chosen or need to consume less, it seems to be likely to have this pattern for subsequent periods too.

When looking at the lagged values of the changes in the CCI, the obtained results suggest a positive relationship between consumption in the current period and consumer confidence in the previous periods. Although only the first lag of ΔCCI is statistically significant and the second and third lags individually are insignificant, the coefficients on the lagged ΔCCI are jointly significant at the 1% significance level. Consequently, the authors conclude that changes in the Consumer Confidence Index do have little, yet significant

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explanatory power over future growth of household consumption (Appendix 7). Overall, it means that when households feel more confident about their financial situation and the general situation in Latvia, they are likely to spend more in the upcoming time periods and save less.

The authors acknowledge that the model might be subject to omitted variable bias. In addition, the results should be treated with caution due the rather short sample period compared to the period used in the guiding paper by Carroll et al. (1994). As also noted in the paper, results might vary when examining different periods or extending the sample period.

Overall, the authors have concluded that changes in consumer confidence explain the growth of future household consumption expenditure. These results do not allow the authors to reject the first hypothesis, which states that the CCI is a predictor of household consumption.

4.1.2. Hypothesis 2

In order to test the second hypothesis and conclude if the CCI remains significant when controlled for other factors, additional variables are included in the model of the first hypothesis. The additional macroeconomic variables that potentially explain final consumption of households are short-term interest rates on credits, long-term interest rates on credits, inflation, wages and unemployment. After running several regressions, second and third lags of the CCI, short-term interest rates of credits are variables that the authors exclude due to their insignificance and development of the model's R^2. The final model of the second hypothesis includes such variables as final consumption of households of the previous period, the Consumer Confidence Index of the previous period, long-term interest rates on credits, inflation, wages and unemployment. The VIF of 1.68 indicates the model does not have a problem of multicollinearity, as well as there is no autocorrelation according to the Breusch-Godfrey LM test (Appendix 8).

$$\Delta \ln C_t = \alpha + \beta_1 \Delta \ln C_{t-1} + \beta_2 \Delta CCI_{t-1} + \beta_3 \Delta LT_t + \beta_4 \Delta \ln CPI_t + \beta_5 \Delta \ln Wages_t + \beta_6 \Delta \ln Unemployment_t + \varepsilon_t$$

Results obtained from the model indicate a positive and statistically significant relationship between the current and the previous period's final household consumption. As mentioned before, the authors explain this by stable consumption pattern, which usually does not shift suddenly from period to period. In addition, first lagged value of the CCI remains statistically significant and positively related to the growth of household consumption but

with little explanatory power (Appendix 8). Therefore, it can be concluded that the CCI contains some information about future spending of households.

Long-term interest rate on credits is negatively related to consumption of households. The relationship is statistically significant at 5% (Appendix 8). This implies that household consumption increases if long-term interest rates on credits decrease. Consumption is affected negatively by inflation as well. It has a statistically significant relation suggesting that increased inflation diminishes consumption (Appendix 8). If disposable income is slow to adjust to increasing inflation, households have less purchasing power. In other words, the amount of goods and services a household can purchase is lower for the same income.

Another variable influencing consumption is wage. Wage amount positively influences consumption. This relation is statistically significantly at 1% (Appendix 8). Higher wages mean higher disposable income, therefore, purchasing power of households increases, which raises aggregate consumption.

Unemployment is reversely related to consumption. This finding is statistically significant at 1% level (Appendix 8). This suggests that consumption decreases, when a country experiences a rise of unemployment. Having high unemployment in the country, employers are less eager to increase salaries of their workers or even can cut down on them due to excessive supply of human resources. Therefore, as households have lower income, be it due to the loss of the job or decrease of salary, the aggregate consumption declines.

To sum up, the obtained results from the second model show that the inclusion of such factors as long-term interest rates on credits, inflation, wages and unemployment improves R^2. Still, the lagged value of the CCI remains significant at 1%. This indicates that consumer confidence explains changes in household consumption also when controlled for other factors. Accordingly, the second hypothesis that the CCI remains a good predictor of the level of household consumption when controlled for other factors is not rejected.

4.1.3. Hypothesis 3

To test the third hypothesis, the authors first employ all the variables (real GDP, inflation, unemployment, interest rates, elections, referendums and context variables), described in the Methodology section, as potential explanatory factors of the Consumer Confidence Index. The model incorporates all the variables and up to three lags of these variables, and also three lags of the dependent variable.

Firstly, results of the initial model show R^2 of 0.6335 and that all variables are jointly resulting in an effect significantly different from zero. Nevertheless, the joint significance of

blocks of the variables indicates that only the past values of ΔCCI are jointly significant. Therefore, the authors are willing to improve the model and start by excluding third lags of all the variables as none of them has proved to be statistically relevant. After the elimination of the third lags, both individual and joint significance of the estimated coefficients has improved and R^2 has declined by less than 1% (Appendix 9). The final model is built after running various regressions and excluding the variables that remained statistically insignificant. The final model for the third hypothesis looks as follows:

$$\Delta CCI_t = \alpha + \beta_1 \Delta CCI_{t-1} + \beta_2 \Delta CCI_{t-2} + \beta_3 \Delta Context_t + \beta_4 \Delta \ln CPI_t + \beta_5 \Delta \ln CPI_{t-2} + \beta_6 \Delta \ln Unemployment_t + \beta_7 \Delta \ln Unemployment_{t-1} + \beta_8 \Delta \ln Unemployment_{t-2} + \beta_9 \Delta 3MInterest_{t-1} + \varepsilon_t$$

The obtained results show that the Consumer Confidence Index can be explained by not only its values in the previous periods, but also by macroeconomic factors and context variables. All obtained coefficients are significant, except the second lag of the CCI; however, jointly both the first and second lags of the CCI are significant.

Past value of the 3-month interest rate seems to have a negative effect on the CCI. This finding can be explained by linking the cost of borrowing with two of the four sub-questions shaping the CCI - financial situation and savings, respectively. As the cost of borrowing has increased, it is less attractive to borrow and consequently consumers have less funds. Less funds in turn make people perceive and value their future financial situation and possibility to make any savings worse.

The results suggest a negative relationship between the CCI and the context variable. The context variable includes such events as joining the European Union and being accepted to the Eurozone, demission of Prime Minister, as well as the period of time when the economy experienced severe financial downturn. As a result, such events led to a decrease of the Consumer Confidence Index because consumers were unsure about their future prospects and financial situation.

The authors find it remarkable that economic performance of the country and elections appear to have no explanatory power over people's confidence. However, the authors acknowledge that this statement should be treated with caution, and a different sample period or monthly observations might provide different results. As noted previously, the use of monthly data might lead to more precise results for electoral variables, and therefore the authors are careful with their judgements.

To conclude, the presented results suggest a significant and negative relation between consumer confidence and inflation, unemployment and 3-month money market interest rates. As a result, the third hypothesis of macroeconomic variables having explanatory power over the CCI is not rejected.

4.2. Discussion of the Results and Policy Implications

Consumption of the previous period predicts consumption in the current period. This finding is consistent with the life-cycle hypothesis which addresses individual household consumption patterns. According to it consumers aim to maintain stable consumption pattern over lifetime. In other words, they do not choose to save extraordinary amounts of money in one period to be able to spend everything in the other period, rather they choose to maintain constant percentage of their income which to spend (Modigliani, 1966).

Long-term interest rate on credits is reversely related to consumption. According to Cromb and Fernandez-Corugedo's (2004) findings, long-term interest rates are more likely to be negatively related to consumption. In addition, they demonstrate that long-term interest rates influence consumption more than short-term rates, which is in line with findings of the authors. Intuitively this can be explained by reduced incentive to save, when interest rates are low because gains from saving are smaller. Another potential explanation is cheap credits that can be obtained in order to finance additional spending of durable goods, which also can be viewed as a form of saving. By lower long-term interest rates households are encouraged to save less and to borrow more to obtain additional funds that in turn boost final consumption of households.

Consumption is predicted by average monthly wage, as well. Meaning, that the higher wage, the higher disposable income a household has available for spending. Therefore, more disposable income increases real consumption of households. Direct way how the government can influence an increase in consumption is to reduce taxes, what consequently increases disposable income of households. Another finding was made by Attanasio and Davis (1994), who suggest that there is a close correlation between men's relative wage movements and relative household consumption movements. Moreover, they argue that better education predicts potentially higher real wage, leading to higher consumption of the household.

Unemployment has a negative relationship with consumption. Consumers react to increasing unemployment by delaying purchases of durable goods. On the one hand, since the

risk of becoming unemployed increases consumers tend to increase their savings. On the other hand, if any of household members has already become unemployed, the amount of disposable income available to household for consumption decreases (Dunn, 1998).

In addition to macroeconomic variables, a part of the changes in consumption is captured by the Consumer Confidence Index. The index predicts consumption and the relationship between them is positive. This indicates that components of the CCI, which are future expectations regarding economic and financial situation, unemployment and willingness to save, have explanatory power over changes in consumption. The more confident households of Latvia are, the more they increase aggregate consumption by increasing demand and, therefore, driving supply. The authors conclude that it is of the utmost importance to understand the determinants of the CCI to be able to stimulate and control it. Therefore, the authors look more closely at the determinants of the CCI and put forward potential government policies.

A decrease in confidence when interest rates increase can be explained by the liquidity concerns, constraints in the credit market and rising cost of capital (Celik, Aslanoglu, & Deniz, 2010).

Joining the EU had a negative effect on the consumer confidence. The relation might seem odd as majority of people voted for joining the EU in the referendum in 2003 (CVK, 2003). However, the negative effect might be explained by some uncertainty which still might have been present before the entry.

The negative effect of the recession is more self-explanatory. It is natural that during tough times not only households' attitude regarding the current situation is negative, but also their expectations are unfavourable. Therefore, as their expectations about future were negative, also their confidence suffered. The overall situation during this period made people feel pessimistic also about the general economic situation in the future. The sharp increases in unemployment affected also households' expectations - after massive lay-offs people in Latvia were unsure about their future employment. In addition, the lay-offs and cuts in wages were unfavourable for households and their confidence regarding future financial situation and ability to make some savings.

The negative relation between the CCI and the context variable coming from the acceptance to the Eurozone could be justified by the rather negative attitude towards Latvia joining the Eurozone. During that time the Eurozone still was suffering from the recession (Weisbrot, 2014). Also one of the common perceptions was that the introduction of the euro

would cause prices to increase. This goes hand in hand with the observation that also inflation has a negative effect on the CCI.

Knowing that the context matters and might negatively affect consumer confidence, it is important for the government to ensure that from its side the necessary steps are taken to provide people with confidence. Of course, during an economic downturn it might be rather difficult to maintain a positive mood. However, the government should work on keeping people updated on current actions and forecasts, even if it is bad news, because a lack of confidence might come from uncertainty, not knowing, misleading perceptions or stereotypes. Therefore, the government should educate people and keep them informed about important events and situations.

Lastly, when looking at inflation and unemployment as the factors affecting the CCI, government policies are particularly of interest. High inflation can be associated with household's uncertainty about its future ability to make savings and also its financial situation as expenses are going to increase. In the case of increasing prices, people end up spending more of their income on ordinary living expenses. Therefore, less money is left for potential savings, but future savings have proven to be the main contributor to consumer confidence (Appendix 1). To address the problem of high inflation, such fiscal policies as tax increases and reduced government spending can be implemented to, in turn, reduce aggregate demand (Dornbusch, Fischer, & Startz, 2011). However, as previously mentioned, higher tax rate decreases disposable income available to households, therefore it might not be the key solution. More complicated, but long-term sustainable approach is to stimulate production, so that it meets increasing demand and consequently raises the country's wealth. This can be done by giving subsidies to encourage production.

Unemployment and its past values seem to trigger negative expectations also about future unemployment. And as the unemployment expectations can be seen as the second largest contributor to consumer confidence in the last two decades, it is important to address the negative relation between unemployment and the CCI (Appendix 1). To reduce the unemployment rate the government might introduce tax cuts or increase its spending (Dornbusch, Fischer, & Startz, 2011). Increased government spending could include more employed people in the public sector and subsidies to businesses. However, it should be taken into account that these expansionary policies could lead to the issue of higher inflation, which the authors discussed previously. It proves how careful decision makers should be about their policies because each of them might have contrary effects on consumer confidence.

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Conclusions

This paper examines the importance of the Consumer Confidence Index to explaining consumption patterns of Latvian households. Given the contribution of household expenditure to a country's GDP, it has been of interest to many economists to understand the drivers of consumption. While most of the existing studies look at economic factors as the determinants of household consumption, the role of non-economic factors varies across the studies. In particular, there has been a discussion regarding the importance of consumer confidence, and opinions both for and against its role can be found. To the best extent of the authors' knowledge, no study has been conducted to analyse the issue in the case of Latvia. Hence, the following research question was introduced: **Can consumer confidence indicators predict consumption of Latvian households?**

In the current study the authors find a positive statistically significant relationship between consumption and the CCI in the both cases of the analysis, that is, when macroeconomic variables are excluded and included. In addition, after performing the analysis on the CCI, the authors conclude that its main determinants for the case of Latvia are unemployment, inflation and 3-month money market interest rates. These variables have a negative statistically significant relation to the CCI. Lastly, major economic events such as joining the European Union and global recession had impact on the CCI in Latvia as well. Overall, the introduced hypotheses are not rejected, and the authors conclude that consumer confidence indicators predict consumption of Latvian households.

The main contribution of the work is to understand the link between consumption and the CCI in Latvia. Moreover, it is crucial to acknowledge the factors driving the CCI. By knowing the factors, the government can pay more detailed attention to them and control the CCI and, most importantly, household consumption. It is important to understand that fiscal policies such as changes in tax and government spending can have a controversial effect on the CCI. Hence, there is no one ultimate solution and while the problem of inflation might be addressed by tight fiscal policy, it would not promote employment.

For further research the authors recommend expanding the sample period, which would improve the number of observations and consequently the reliability of results. In addition, taking more frequent observations, that is monthly, could reveal some additional information not obtained from the quarterly data. Finally, employing additional variables might help in explaining the analysed relationships.

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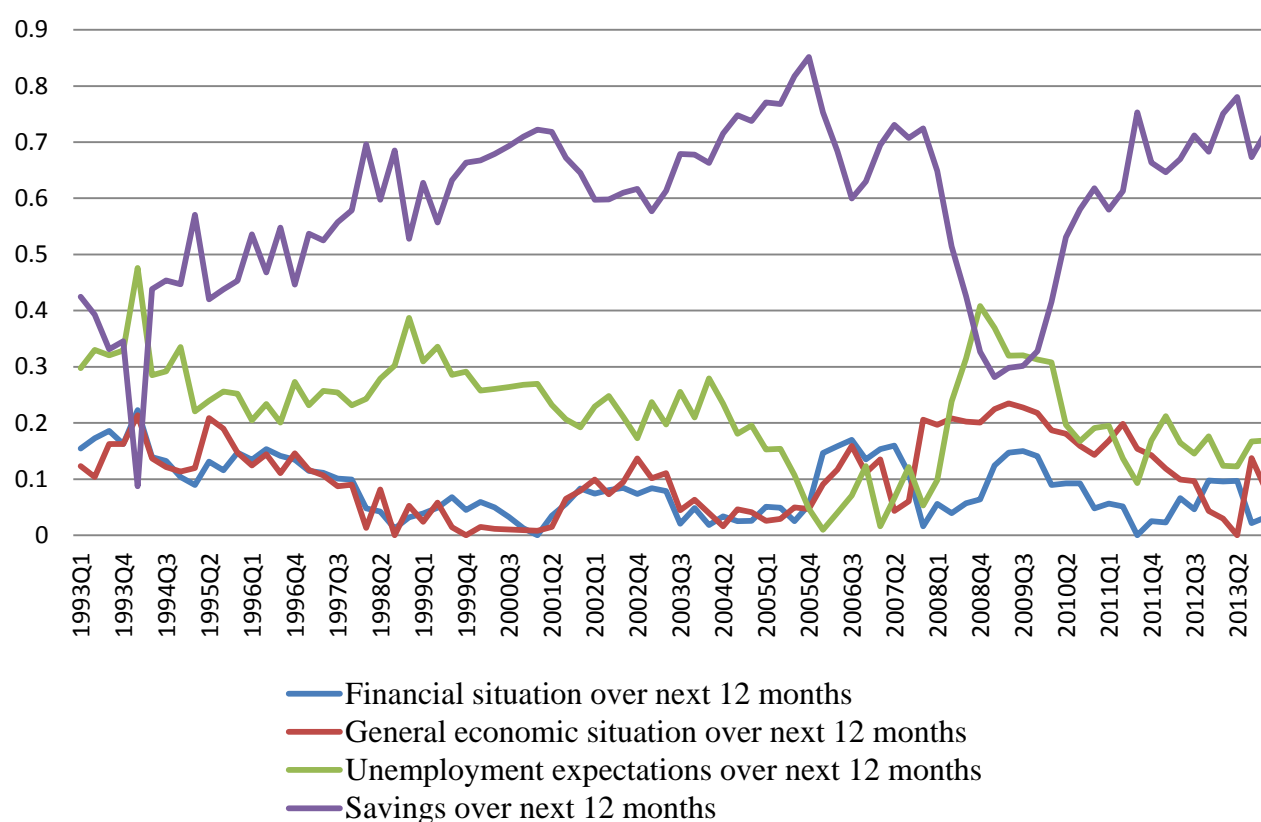
Appendix 1

Appendix 1: Contribution of the factors to the CCI. Created by the authors using data from the European Commission.

Appendix 2

Variable	Description	Source
C	Final consumption expenditure of households. Seasonally adjusted. Millions of national currency. Chain-linked volumes, reference year 2000.	Eurostat
CCI	Consumer confidence indicator. Seasonally adjusted	European Commission
CPI	Consumer price index (December 1990=100).	CSB
Wages	Average monthly gross wages and salaries of the employed in the economy. Seasonally adjusted.	CSB
Unemployment	Unemployment rate. Seasonally adjusted.	Eurostat
LT	Weighted average rates in lats on credits issued in credit institutions to non-financial corporations and households. Long-term.	CSB
ST	Weighted average rates in lats on credits issued in credit institutions to non-financial corporations and households. Short-term.	CSB

GDP	Gross domestic product at market prices. Seasonally adjusted. Millions of national currency, chain-linked volumes, reference year 2000.				Eurostat
3M-Interest	Money market interest rates (3-month rates).				Eurostat
Dummy variables					
Elections	Parliamentary elections.				CVK
Local elections	Local elections.				CVK
Context	Context variable designating joining the EU, the economic recession, acceptance to the Eurozone and the demission of Prime Minister in November, 2013.				CVK
Referendums	Referendums.				CVK

Appendix 2.Summary of the data. Created by the authors.

Appendix 3

Variable	Obs	Mean	Std. Dev.	Min	Max
C	75	1426.169	432.8433	751.4	2222.9
CCI	76	-21.34685	11.73149	-53.2425	2.8603
CPI	75	13157.55	3722.431	6962.47	18956.99
Wages	75	264.4	148.5654	77.615	497.4095
Unemployment	62	12.42581	3.881775	5.7	20.9
LT	75	12.77859	4.963441	7.1304	29.2695
ST	75	11.99618	7.541503	5.0159	35.8871
GDP	75	2137.843	559.441	1265.3	3072.2
3M-Interest	66	5.183485	3.549585	.25	15.67
Dummy variables					
Elections	76	.2894737	.4565315	0	1
Local elections	76	.25	.4358899	0	1
Context	76	.1842105	.3902316	0	1
Referendums	76	.1184211	.3252529	0	1

Appendix 3. Descriptive statistics of the original variables. Created by the authors using data from the European Commission, Eurostat, CSB and CVK.

Appendix 4
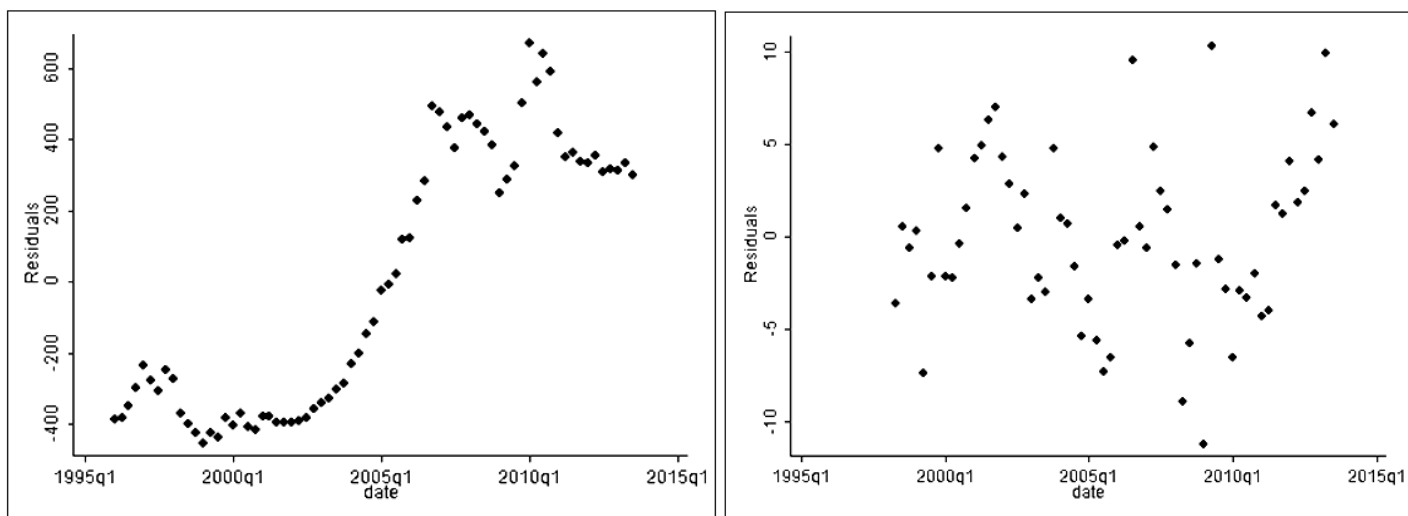
Appendix 4: Scatter diagrams of residuals of equations $C_t = f(CCI_{t-1}, CCI_{t-2}, CCI_{t-3}, CCI_{t-4})$ and $CCI_t = f(Elections_t, Local\ elections_t, Context_t, Referendums_t, GDP_t, CPI_t, Unemployment_t, 3M - Interest_t)$ respectively. Created by the authors using data from Eurostat and the European Commission.

Appendix 5

Appendix 5: Scatter diagrams of the modified variables. Examples of household final consumption expenditure and the CCI. Created by the authors using data from Eurostat and the European Commission.

Appendix 6

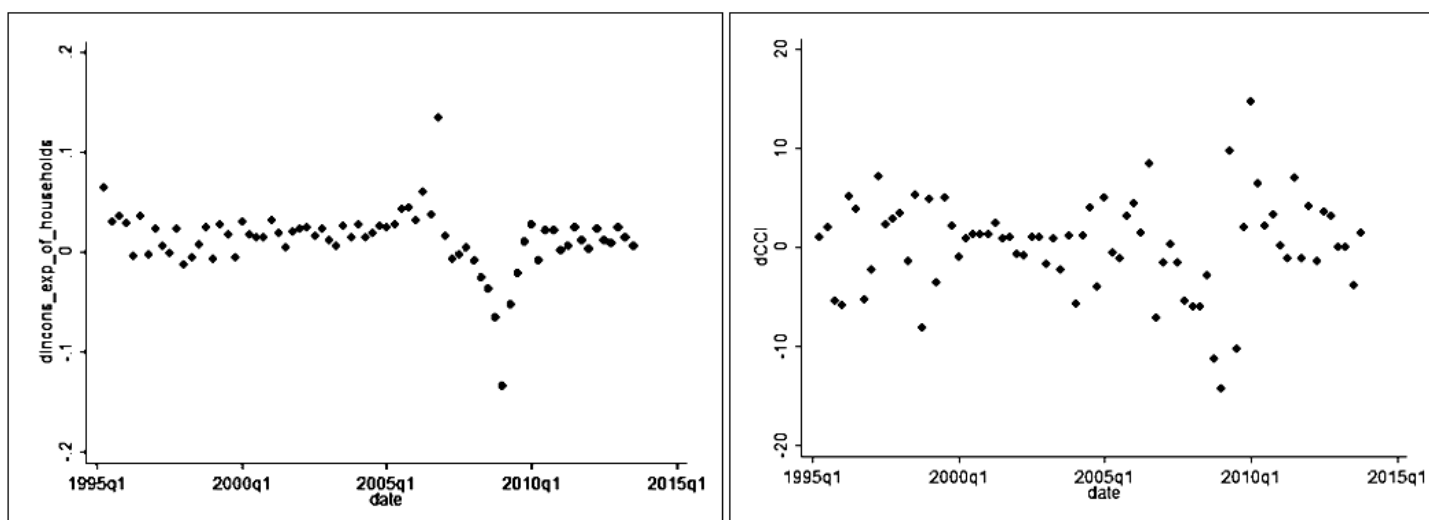| Variable	Obs	Mean	Std. Dev.	Min	Max
ΔlnC	74	.0127604	.0308418	-.133872	.1346478
ΔCCI	75	.2825227	4.772638	-14.2978	14.7781
ΔlnCPI	74	.0134376	.0157174	-.0190506	.068778
ΔlnWages	74	.0251034	.0210517	-.0320883	.0708985
ΔlnUnemployment	61	-.0028746	.0853733	-.1381502	.2595112
ΔLT	74	-.2818986	2.046991	-9.910101	3.098
ΔST	74	-.4067486	2.015705	-7.086601	4.1391
ΔlnGDP	74	.010554	.0245557	-.098968	.0526824
Δ3M-Interest	65	-.072	1.897525	-7.809999	5.77

Appendix 6. Descriptive statistics of the modified variables. Created by the authors using data from the European Commission, Eurostat, CSB and CVK.

Appendix 7

		ΔlnC	ΔlnC	ΔlnC
ΔlnC				
L1	*Coefficient*			.3601903***
	P-value			0.002
ΔCCI				
L1	*Coefficient*	.0026047***	.0025435***	.0020897***
	P-value	0.000	0.000	0.001
L2	*Coefficient*	.0019106***	.0019549***	.0009656
	P-value	0.003	0.002	0.146
L3	*Coefficient*	.0016491**	.0016666***	.0010121
	P-value	0.011	0.009	0.106
L4	*Coefficient*	.0001491		
	P-value	0.819		
Constant	*Coefficient*	.0091262***	.0095625***	.0059393*
	P-value	0.004	0.002	0.055
N		70	71	71
R²		0.3574	0.3481	0.4372
BGodfrey		0.0024	0.0022	0.4005
Mean VIF		1.04	1.01	1.24

Note: The asterisks indicate the level of significance. *, **, *** stand for 10%, 5%, 1% level of significance respectively.

Appendix 7: Regression results for the hypothesis 1. Created by the authors using data from Eurostat and the European Commission.

Appendix 8

		ΔlnC	ΔlnC
ΔlnC			
L1	*Coefficient*	0.0965094	0.197252*
	P-value	0.449	0.080
ΔCCI			
L1	*Coefficient*	0.0018822***	0.0018834***
	P-value	0.004	0.003
L2	*Coefficient*	0.0006759	
	P-value	0.343	
L3	*Coefficient*	0.0011129	
	P-value	0.124	
ΔLT	*Coefficient*	-0.0028313	-0.0038715**
	P-value	0.160	0.046
ΔST	*Coefficient*	-0.0029765	
	P-value	0.137	
ΔlnCPI	*Coefficient*	-0.6997272**	-0.6352038**
	P-value	0.015	0.025
ΔlnWages	*Coefficient*	0.6249912***	0.5012365***
	P-value	0.002	0.006
ΔlnUnemployment	*Coefficient*	-0.1311682***	-0.1667087***
	P-value	0.006	0.000
Constant	*Coefficient*	0.0020181	0.0037076
	P-value	0.625	0.355
N		61	61
R²		0.6695	0.6473
BGodfrey		0.9070	0.3657
Mean VIF		1.93	1.68

*Note: The asterisks indicate the level of significance. *, **, *** stand for 10%, 5%, 1% level of significance respectively.*

Appendix 8: Regression results for the hypothesis 2. Created by the authors using data from Eurostat, CSB and the European Commission.

Appendix 9

		ΔCCI	ΔCCI	ΔCCI
ΔCCI				
L1	*Coefficient*	-.4579572**	-.4595916***	-.4498887***
	P-value	0.015	0.003	0.000
L2	*Coefficient*	-.2367328	-.2560932*	-.1747946
	P-value	0.232	0.088	0.133
L3	*Coefficient*	-.0252136		
	P-value	0.884		
Elections	*Coefficient*	1.178109	.9442646	
	P-value	0.460	0.496	
Local elections	*Coefficient*	.5713795	.1515784	
	P-value	0.714	0.908	
Referendums	*Coefficient*	1.753928	1.674395	
	P-value	0.439	0.415	
Context	*Coefficient*	-3.947685**	-4.134264**	-4.532352***
	P-value	0.044	0.016	0.003
ΔlnCPI	*Coefficient*	-55.06439	-56.48937	-77.42928*
	P-value	0.381	0.266	0.055
L1	*Coefficient*	22.20474	13.97616	
	P-value	0.775	0.819	
L2	*Coefficient*	-75.04067	-82.42808	-89.44028**
	P-value	0.299	0.119	0.032
L3	*Coefficient*	1.638075		
	P-value	0.982		
ΔlnUnemployment	*Coefficient*	-16.10287	-16.95156	-13.66851*
	P-value	0.186	0.102	0.082
L1	*Coefficient*	-18.49655	-17.13299*	-15.75089**
	P-value	0.137	0.086	0.029
L2	*Coefficient*	11.23391	13.07918	12.77461*
	P-value	0.364	0.156	0.099
L3	*Coefficient*	2.143617		
	P-value	0.845		
Δ3M-Interest	*Coefficient*	.0694384	-.0350686	
	P-value	0.858	0.914	
L1	*Coefficient*	-.6728854*	-.7069204**	-.7757396***
	P-value	0.071	0.013	0.003
L2	*Coefficient*	-.3725894	-.3870846	
	P-value	0.281	0.198	
L3	*Coefficient*	.0216987		
	P-value	0.954		
ΔlnGDP	*Coefficient*	45.20804	38.98678	
	P-value	0.249	0.257	
L1	*Coefficient*	-11.29261	-31.75002	
	P-value	0.811	0.364	
L2	*Coefficient*	-29.27536	-21.00682	
	P-value	0.526	0.547	
L3	*Coefficient*	-18.62715		
	P-value	0.641		
Constant	*Coefficient*	1.715659	2.164572	3.026731***
	P-value	0.317	0.104	0.000

		58	59	59
N				
R²		0.6335	0.6294	0.5671
F tests for blocks of variables				
All		0.0064	0.0002	0.0000
CCI		0.0887	0.0107	0.0015
Binary		0.1306	0.0611	
CPI		0.5958	0.1994	0.0083
Unempl.		0.3424	0.0822	0.0267
3M-Interest		0.3271	0.0601	
GDP		0.7605	0.3633	
BGodfrey		0.8855	0.9781	0.8881
Mean VIF		3.24	2.41	1.63

Note: The asterisks indicate the level of significance. *, **, *** stand for 10%, 5%, 1% level of significance respectively.

Appendix 9: Regression results for the hypothesis 3. Created by the authors using data from Eurostat, CSB, CVK and the European Commission.