Could confidence predict households’ debt growth?

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ABSTRACT

This thesis analyses if households’ confidence could be a significant variable to predict households’ debt growth in Sweden. Households’ debts have an important role in the financial system where the vulnerability of households’ debts has increased over time. To test whether households’ confidence is a significant variable for the prediction of households’ debt growth in Sweden, an econometric model with the households’ debt change as the dependent variable and the changes in the repo rate, unemployment, gross domestic product and consumer confidence index as independent variables was used. Consumer confidence index was used as a proxy variable for households’ confidence. It was lagged by one time period in order to quantify if consumer confidence index could, with previous value, predict the households’ debt growth. The result showed that the households’ confidence was not significant to predict the households’ debt growth.

Keywords: Consumer Confidence Index, Gross Domestic Product, Unemployment, Repo rate, Households’ debt growth
SAMMANFATTNING


Nyckelord: Konsumentförtroendeindex, Bruttonationalprodukt, Arbetslöshet, reporäntan, hushållens skuldtillväxt
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Debts have been a useful method in order to boost the economy with a faster pace in absolute terms than without. They have allowed consumers and businesses to take actions that would not have been possible without them. However, debts are a good instrument until there are too much. When there are too much debts, it makes the borrower vulnerable, specially, if the debts have been used for assets that are unliquidated. One of the severe consequences of too much debts is a financial downturn which happened during 2008 (Dalio, 2017; Finansinspektionen, 2010a). Finansinspektionen [FI] (2015a) conducted a survey regarding mortgages for households, where they found that the debts for households have increased in a significant pace over the past years. Finocchiaro, et al (2016) concluded that the debts of Swedish households are at high levels from a historical and international perspective.

Households’ debts, especially mortgages, play an important role in the financial system. In Sweden, the total debts are for the most part from the households. Hence, it is important to monitor and understand when the households’ debt growth is changing (Riksbanken, 2017a & 2018). If there are too much debts owned by households, an increase in the interest rate could affect the whole economy. Because, if the interest rate increases, the debts for households become more expensive which force the households to decrease their consumption. When the households decrease their consumption, the profitability of businesses decreases and force these businesses to discharge employees. This increases the unemployment. In this situation, the households face a greater difficulty in repaying the debts. Hence, the banks face credit losses and the confidence in banks starts to decrease because of this. All of this create a downward spiral where the economy falls (Riksbanken, 2019b; Dalio, 2017).
This thesis is interested in the households’ confidence and its relationship with the households’ debt growth. Consumer Confidence Index (CCI) is a proxy used to quantify the households’ confidence. CCI is an indicator used for describing the future households’ consumptions and savings. The value for CCI is retrieved from Konjunkturinstitutet who questions Swedish households regarding their expected financial situation, their view on the general economic situation, unemployment and capability of savings (OECD, 2019a; Konjunkturinstitutet, 2019).

This thesis tests if households’ confidence is a significant indicator of the households’ debt growth. FI has showed that CCI has prediction power with regard to the households’ debt (FI, 2015b). However, since 2015, new laws have been implemented with regard to the households’ indebtedness. For example, in 2016, an amortization requirement was implemented by FI (SCB, 2018a). This was later followed up with an even stricter amortization requirement by FI in 2018 (FI, 2018 a; Svensk Fastighetsförmedling, 2019). Based on this thesis’s orientation, the question that will be answered is:

- Is Swedish households’ debt growth affected by their confidence and if so, by how much?

1.1 Previous research
Garner (1991) has questioned if economist should pay attention to CCI. Based on his results, Garner is skeptical on whether CCI should be taken into consideration to do predictions. He recommends some guidelines regarding policymaking and when to use CCI in predicting the economic future. One of his findings is when making a purchase of a durable good, CCI is not a good indicator under normal circumstances itself. In this scenario, he suggests that CCI should not be a primary forecasting variable. Another finding was that the index has low complementary power when being used with macroeconomic variables. His last suggestion is that CCI can be used in noneconomic events that cannot be foreseen and is not common. He explains that the last suggestion is more crucial to consider when he performed his study after the Gulf War focusing on the US economy.
Berg & Bergström (1996) have conducted a study of CCI and consumption in Sweden. They started out to investigate which variables that have an impact on confidence. Berg & Bergström found that changes in real interest rate and changes in inflation rate are two factors. Also, they found that the personal financial situation can explain changes in consumption rather than the sentiment about the economic situation. The personal financial situation has an explanatory power of almost 40% of the variance in the growth rate of consumption. Some other findings in their study were that important consumption determinants included real interest rate after tax and changes in inflation.

Klopocka (2016) has in her study been focusing at the savings and borrowing in Poland and if these factors can be related to CCI and its predictionary power. Her main focus is to answer whether the CCI has predictive power regarding borrowing and savings in the future for households. Klopocka also wanted to find out if CCI holds information that could provide help about the future savings and borrowing for the households. An OLS- technique was used with a time series and data from Poland. These gave positive answer to her questions. Klopocka’s findings suggest that the best prediction of changes in the borrowing and savings of the households is when a regression of changes in borrowing and savings rates against lagged values of changes in confidence is made. The expectation of unemployment in relation to the change in the component index is the best indicator. She concludes that the index is an important factor to the consumption. One crucial finding in her study is that the behavior connected to borrowing is more confidence sensitive than the behavior related to savings is. She also found that the forecasting ability of CCI can be used even beyond economic references and the savings and borrowing behavior can be predicted as well as forecasts when using it.

Mazurek & Mielcová (2017) have examined the relationship between CCI and GDP growth with a focus on economic recessions in the US. Their findings included that there is a relationship between CCI and differences in consumer spending when CCI changes. The majority of their investigated periods implied that a change in CCI was followed by a change in GDP from the change in consumer spending. The period that
did not follow this pattern was the dot com bubble where the change in CCI came after the change in GDP. They also concluded that CCI is a good indicator for growth of GDP in the US. In the short run there is a possibility for some deviations which are influenced by chocks that are nonsystematic.

1.2 Purpose
The purpose of this thesis is to estimate the confidence of Swedish households measured with the CCI and if it has predictive power with regard to households’ debt growth. Hoping to enrich decision makers but also government legislations when regulations and/or advices are necessary based on the chosen indicator. If CCI has predictive power, it could be used as one important indicator for forecasting the debt growth.

1.3 Method
This thesis uses a regression analysis model with CCI in combination with other variables that are estimated as determinants of households’ debt. The other variables included are the repo rate, unemployment and GDP. The approach is based on collected data for the variables and a regression analysis after the data has been collected.

1.4 Delimitation
This thesis is only concerned for Swedish households and their debts during a period between 1996-2018. Hence, there has been no focus on foreign households and their debts, businesses and public administration as their determinants for the debts probably would differ from the households and are therefore excluded from this thesis.

1.5 Outline
In chapter one there is an introduction of the subject. The problem is presented with support of previous research. In chapter two, a background regarding the households’ debts is presented and also an explanation of the CCI. This will enrich the reader from an historical standpoint on how households’ debts and CCI have evolved. In chapter three, relevant economic theories are presented in order to structure a null- and
alternative hypothesis. Theories as the consumption theory and expectations are presented. In chapter four, the method is explained that was used to answer the question in this thesis. Also, the problems were brought up that were faced when the sample was conducted. In chapter five, the results are presented. In chapter six, the results are discussed. The result was compared with the expected and previous research. In chapter seven, the conclusion is stated.
2 BACKGROUND

2.1 Households’ debts
Debts have been a major component for households’ consumption. Debts help the consumer (or the holder) to use its future income today. From a historical standpoint, debts have been increasing quickly when the interest rate on the debts has been low because it makes credits cheaper for the consumer to use its future income (Fregert & Jonung, 2014). Since the 1990’s, households’ debts have been increasing in a faster pace than the households’ income (Carlgren, 2019). Debts owned by households are defined, according to OECD (2019a), as “all liabilities that require payment or payments of interest or principal by household to the creditor at a date or dates in the future”. However, shares, equity and financial derivatives are not considered as debt (OECD, 2019a). Swedish households’ debts consist mostly by mortgages (Statistiska centralbyrån [SCB], 2018a). Figure 1 illustrates how the households’ debts have increased over a time period of 1996 – 2018.

![Figure 1. Households’ debts (billions SEK) in nominal terms](image_url)

Source: SCB (2019a)
The relation between the debts of households and the disposable income of the households is shown in Figure 2.

![Figure 2](image_url)

**Figure 2. Debts in relation to income in nominal terms**

Source: SCB (2019c)

Since the 1990’s, the households’ debts have increased in a faster speed than the disposable income of households. A major component whether banks should lend more or not to households, is the interest repayment compared to the disposable income. Since the 1990’s the interest rate on debts has decreased (Riksbanken, 2019c; FI, 2015b). Figure 3 illustrates the households’ interest expenses after tax which has a strong connection with Figure 2 (Riksbanken, 2017a):
In 1996 Riksbanken decided to decrease the repo rate from 8.91% to 4.1%. The motive behind this was that the expectations of inflation had heavily decreased from the financial downturn in 1990. The consequence of this was a decrease in mortgages rate which can be seen in Figure 3. This led to an increase in the Swedish households’ debt ratio (Riksbanken, 1999). Since then the interest rate has decreased, except between 2007 and 2008 which is derived from the financial crisis (Fregert & Jonung, 2014).

Mortgages have an important role in the economy because they make it possible for the households to buy, for an example, an apartment that are to a certain amount financed by future incomes. However, too much mortgages and debts overall, creates a risk for the economy because if there is a macroeconomic disturbance, households are forced to decrease their spending. Hence, a declining phase in the economy (Finansinspektionen, 2017; Riksbanken, 2018). In Sweden, households’ debts consist around 80% of mortgages (Riksbanken, 2013). Riksbanken (2017b; 2017c) considers the indebtedness of Swedish households to be one of the major risks to the Swedish economy. In order to slow the pace of debt growth, FI (2010b) decided to implement a mortgage ceiling. This meant that it was only possible to borrow 85% of the value of

Figure 3. Household interest expenses after tax

Source: Riksbanken (2017c)
the household with the household as security. This stopped the households’ debts in relation to the disposable income for 2 years (shown in Figure 2).

However, after 2012, the households’ debts in relation to disposable income started to grow again. This led to an amortization requirement. It was implemented in 2016 by Finansinspektionen (SCB, 2018a). The scope of this requirement reflected the mortgages by households. New mortgages (that exceed 50% of the residential value) with a leverage over 70% are forced to be amortized with at least 2% of its original loan amount each year and 1% of the original loan amount each year if the leverage is between 50% and 70% (FI, 2016; Regeringskansliet, 2019). Still, Riksbanken (2017c) expected the lending of Swedish banks to continue, mostly because of the low interest rates. That has been true (shown in Figure 2, 2016-2017). But debt growth of households continued with a slower pace after the amortization requirement (SCB, 2018a).

Riksbanken (2017a) argues that households with high debt in relation to their income would be forced to decrease their consumption if the cost for their loans increased. FI decided then to implement a stricter amortization requirement that is not only based on residential value but also the household gross income after March 2018. Households with a gross income multiplied by 4.5 that is less than their mortgage will be affected by this stricter requirement (FI, 2018; Svensk Fastighetsförmedling, 2019). The result of this has been a decreasing pace in debt growth by households (SCB, 2018a). Riksbanken (2017a) argues that a stricter amortization requirement is a good action done by FI. Also, if the results have not been positive, in slowing the debt growth, Riksbanken considers that FI should consider further adjustment to the amortization requirement. The primary drivers of debt growth, specially mortgages, have been high residential prices, low mortgages rates and a strong economy (FI, 2017).
2.2 Consumer Confidence Index (CCI)

Consumer confidence Index (CCI) is an indicator that provides an estimation of households’ future consumption and saving. CCI value is retrieved from answers on households’ expected financial situation, their sentiment about the general economic situation, unemployment and their capability of saving (OECD, 2019a). In Sweden, Konjunkturinstitutet is responsible for CCI. Konjunkturinstitutet conduct this through telephone interview with 1 500 Swedish households each month with an age target between 16 and 84. The sample of the target population is selected randomly. The interviews are done through a computer-assisted telephone interview (CATI) software. This allows logic checks on the responses and manages all call-backs. In order to make sure that the sample is representative of the population, the data collection is done through a matrix based on gender, age and regional distribution of the population.

The questions asked in the survey can be divided into Micro and Macro. The Micro questions reflect the households’ view on their personal finance. The Macro questions reflect the households’ view of the Swedish economy. For further information how the questions are formed, see Appendix 1.

Table 1. Questions asked in the survey divided into Micro and Macro

<table>
<thead>
<tr>
<th>Index</th>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro</td>
<td>Financial position of household (assessment of present situation) + financial position of household (expectations) + right time to make major purchases (assessment of present situation) + major purchases by household (expectations)</td>
</tr>
<tr>
<td>Macro</td>
<td>Swedish economy (assessment of present situation) + Swedish economy (expectations) - unemployment (expectations)</td>
</tr>
</tbody>
</table>

Source: Konjunkturinstitutet (2019)

If the value of CCI is above 100, it signals that the consumers are confident towards the future economic situation with the consequence that they spend more and save less. Hence, it signals a stronger economic growth than normal and if CCI is above 110, it corresponds to an even stronger growth. However, if the value is below 100, it signals that the consumers are less confident and have a pessimistic attitude towards the future economic situation with the consequence that they spend less and save more. Hence, a weaker economic growth should be expected (OECD, 2019b, Konjunkturinstitutet, 2019). Figure 4 illustrates how CCI has varied from 1995 to 2019:
CCI is used and mentioned in Swedish institutions’ reports. Mainly, it has been used in order to predict how GDP will develop in the future. Because spending is a major part for a healthy economy (SCB, 2016; Dalio, 2017). But FI has also used and think that CCI should be used as a measure of households’ future debt growth (FI, 2015b). Konjunkturinstitutet has used CCI for various reasons (Konjunkturinstitutet, 2018).

The role of CCI has received different opinions of its usefulness over time. Mainly, there are two sorts of distinct opinions about confidence indicators. The first one agrees that CCI is useful and could be used for predicting the households’ spending and saving, hence how GDP moves. The second one disagrees and argues that CCI is affected by “animal spirits”. Hence, there are independent changes in the responder beliefs that have casual effects on business cycles (Keynes, 1936; Katona, 1975; ECB, 2013). According to Deés & Soares Brinca (2011), it is important to stress the problems of measuring the consumers’ confidence, since CCI is built on households’ sentiments that are both personal and subjective. Dominitz & Manski (2004) have showed that the consumer sentiment might suffer from measurement errors because the survey
questions are often ambiguous for the respondent. Also, the questions are often too qualitative to be used for quantitative assessment.
3 THEORY

3.1 Consumption
Debts are driven by consumption, based on the idea that households smooth out their consumption over time, the theory of the life cycle was developed by Franco Modigliani & Richard Brumberg in the 1950’s. Since then, the theory has been remodeled. The theory states that the expenditure of consumers regards the income throughout the life cycle as well as the needs of consumption for the households (Ando & Modigliani, 1963). The theory also states that utility throughout the life-cycle consumption should be maximized. This implies that consumption is active throughout the life cycle. Also, in periods where income is not positive (Baranzini, 2005).

The early version of the theory includes assumptions stating that

1. In the event of the individual accumulates an extra dollar, this extra money will be allocated to consumption at the same proportion as before the accumulation.
2. The individual neglects the possibility of inheritance and will neither leave any.
3. The individual’s idea is to spend his resources evenly over the remaining lifespan.
4. The same average income in any given year is the same for same age groups and earnings span as well as the average expected income is the same within the age group and earning span. The households ‘have identical life and earning span where the respective actual and expected is considered.
5. The rate of return on assets is expected to stay constant. (Ando & Modigliani, 1963).

More recent, Modigliani has stated assumptions connected to the simple life cycle theory which are:

1. Income is accounted to be constant until the individual reaches retirement. After this, the income is zero.
2. The interest rate is equal to zero.
3. Throughout the life cycle, the individual faces constant consumption.
4. Bequest are not taken into considerations. (Baranzini, 2005)

In Figure 5, the income, consumption and wealth for an individual throughout the lifecycle is shown. The Figure shows that at a younger age, when individuals are able to borrow money, the consumption is above income for instance while studying. They will continue to gather debt when income is below consumption during an amount of time, as individuals grow older the gap between the consumption and income will decrease. The debts are then compensated by savings during the middle age with an income at the maximum. This happens in the age-span where individuals have completed their studies, are a part of the work force and have started to settle down where the consumption and income lines intersect, and the income begins to exceed the consumption. This gap increases until the retirement has been reached. The individuals will go back to the negative savings between retirement and the end of life where the consumption exceeds the income once again (Barazini, 2005). However, throughout their work life, individuals have a risk of being unemployed and during the time where the consumption is above the individual’s income the interest rate is something to be considered as long as the individual is in debt.
What should be noted is that Deaton (2005) describes that one of the critiques following the life-cycle theory, based on that individuals expect a growing income in their lives, is that they would over consume when they are younger which would increase the gap between income and consumption that is shown in Figure 5 and also would lead to dissaving in both ends of the lifecycle. This would then be paid back during the middle-age during the years when income exceeds consumption. The answer to this critique, by Modigliani, is that in practice it would be unlikely for younger individuals to borrow the amount of resources that would be necessary to achieve the living standards that is beyond the one they are currently in. In the later stage of the lifespan the individuals need to prepare for retirement despite their borrowing in the beginning of the lifespan (Deaton, 2005). Hence, increasing the gap to an even consumption as income drastically decreases when the individuals become retired. This economic theory
assumes that the goal for the households is to maximize utility throughout the lifespan (Konjunkturinstitutet, 2012).

Furthermore, the life cycle theory claims the fact that the households are in debt during their lifetime is not unusual, it is rational, especially in the beginning of an individual’s professional career. Because the individual expects an increase in their income and hence manage the debt they are in from the previous years (Santos et al, 2014). Assarson (1993) agrees and stresses the fact that the consumers in the households can reallocate consumption over time. He highlights the possibility of borrowing when income is low and paying it back when income is higher.

However, as seen in Figure 5, income will differ throughout the lifespan while individuals want to have an even consumption over their lifetime. The restraint is that there are periods in life when income is not sufficient for the desired consumption (Gärtner, 2016). This is seen where the income is below consumption. Hence, the opportunity of loans and savings are an important aspect of life to be able to consume.

With the assumptions that there are:

- no bequests
- individuals do not die in debt
- no interest payments on savings

The sum of the planned lifetime consumption \( C \) is the same as the sum of expected sum of lifetime earnings the consumption functions for each period is (Gärtner, 2016):

\[
C = \frac{1}{n} Y + \frac{1}{n} (Y_{e+1} + Y_{e+2} + Y_{e+3} + \ldots + Y_{e+n-1})
\]  

(1)

The denominator \( n \) is the expected remaining lifetime and \( Y \) is the expected earnings throughout the life. \( Y \) is raised to the power of \( e \), this exponent shows the expectation of the value as it is unknown. \( Y_{e+1} \) represents what the individual expects what the income will be in one period from now. The function shows the expected income from tomorrow until the individual does not live anymore. To simplify, the expected income
in the future can be written as \( Y^e \) which gives a simplified consumption function as (Gärtner, 2016):

\[
C = \frac{1}{n} Y + \frac{1}{n} Y^e
\]  

Equations (1) and (2) shows that the expectations the individuals have are an important effect on their consumption that they spread out during their lifetime. The consumption pattern of the individual will in turn have an effect on the economic activity in general. Expectations also have an impact in the household’s confidence when retrieving CCI as mentioned earlier.

3.2 Expectations and adaptive expectations
The first one to stress the importance of expectations was Beveridge (1909). He thought that expectations are the single underlying factor in a business cycle. Any change in firms’ production is derived from a change in the expectations about demand and profits. An excess optimism about future demand transforms to a wave of pessimism, which leads to cyclical fluctuations. Also, according to Clark (1917) any change in consumer demand could lead to an “impulse” that extends into a cycle. Expectations have an important role in the economy today as economic decisions are based on the expectation’s individuals have of the future which is also more crucial than what individuals experience today (Gärtner, 2016).

The meaning of adaptive expectations is that expectations of the variable of interest are based on how the variable has been from a historical standpoint. The history of the variable is the crucial information and is what the expectations is based upon. Hence, adaptive expectations take into consideration the past to build their expectations (Gärtner, 2012). Colasante et al (2017) means that adaptive expectations represent how individuals acts. Also, these expectations include the coordination where both the individuals’ own prediction and the expectations of other individuals are taken into consideration. Hence, when making expectations the ability to infer with the expectations of others is an aspect in the making of the expectation.
Mlambo (2012) states that the expected value of the variable is a combination of previous expectations along with weighted expectational error. Hence, individuals will also take into consideration past errors they have made. When forming adaptive expectations, Mlambo (2012) states that the historical values of the variable are included in the expectations for decision making today. Gärtner (2016) forms the general equation for adaptive expectations as:

\[ p^e = p^e_{1} + a(p_{-1} - p^e_{1}) \]  

(3)

The coefficient \( a \) represents how quickly the variable adapts to the actual value of the variable. Mlambo (2012) states that the crucial part of the hypothesis is the connection between historically values of the variable together with the previous expectations together with the expectations made today which is represented by the coefficient.

Nerlove (1958) argues that expectations of the future can take the form of autonomous, induced or be divided into two part where one is autonomous, and the other is induced. The induced part comes from changes of the variable in the past. In an increase in the variable the expectation from the individuals will not believe that the whole change is permanent. When a variable change it will have an influence over many periods. Then the individuals will alter their definition of normal in their previous expectations. Hence, the normal is proportional to the differences between the actual value and the previous expected normal value.
4 METHOD

In order to answer the question asked by this thesis, a regressions analysis has been performed. A multiple regression was performed where the households’ debt growth has been the dependent variable as a function of consumer confidence index, interest rate by the central bank, GDP and unemployment (the independent variables):

\[ \Delta HD = \alpha + \beta_2 \Delta GDP + \beta_3 \Delta UN + \beta_4 \Delta CCI_{t-1} + \beta_5 \Delta IR + u_t \]  

\( \Delta HD = \text{Households' debts} \)
\( UN = \text{unemployment} \)
\( IR = \text{The repo rate} \)
\( u_t = \text{Disturbance term} \)

The data is a time series, with a time period between 1996 – 2018. Since time series data was used, two problematic situations arise: non-stationary and serial correlation. These have been discussed in this section.

4.1 Non-stationary

Non-stationary is common in macroeconomic time series. The definition of this is when data points have variances, means or covariances that change over time. One could say that these “wander” around. This could lead to nonsense regressions where two series seem to have a strong correlation when it is not the case. The reason behind this is that both series contain the same stochastic trend. Hence, non-stationary data are unpredictable and cannot be forecasted. In order to solve this problem, a transformation of the non-stationary data points into a stationary data point were necessary. This was done by differentiate the series. It is the common method to solve the problem. To
differentiate a series means that instead of expressing the variable in levels, they are expressed as differences (Hill et al, 2018):

$$\Delta CCI = CCI_t - CCI_{t-1}$$

(5)

This has not been a problem since this thesis is focused on the change of households’ debts and the change of the CCI. In a natural way the differentiation was used when it came to households’ debt and the independent variables.

### 4.2 Serie correlation

It is common that series correlation exists when dealing with time series data. The problem with this is that the disturbance terms are correlated with each other. Hence, the least squares method (OLS) cannot be used since the standard deviation will be incorrect (Hill, et al., 2018; Dougherty, 2016). There are several ways to handle this. One way is to remodel the series correlation and later estimate the remodel with feasible general least squares (FGLS) or reasonable generalized OLS. If this would have been done, the interpretation of $R^2$ would have been lost, since its value would not have been correct (Wooldridge, 2003). To avoid this, Newey-West's estimator was used. This gave the correct standard error even if there was a series correlation in the disturbance terms. Before Newey-West's estimator was used, the Ljung-Box Q test was performed to see if there was a series correlation in the disturbance terms. Normally, Durbin-Watson test is used but when there are lagged variables, it is inefficient. Also, the Studentized Breusch-Pagan test was used to test if the data set contained heteroscedasticity (Dougherty, 2016).

### 4.3 Criticism

As the data used in the regression was secondary it was easy to collect. The collected data was then used to make regression to answer the research question. This makes the collection of the data a crucial part of the collection. The data was gathered from large organisations which are considered reliable sources. One criticism of the data can be the number of observations that was collected, there were only 21 which is considered
a low number. The data collection would have been more successful with the households’ debts expressed monthly and it would result in a larger number of observations. However, the method and data used in this thesis are similar to previous studies regarding the subject.

4.4 Data

In line with the research question, independent variables were chosen that should influence the dependent variable. These independent variables were selected with support from previous research focusing on debt that had been encountered and pointed out their impact. The regression model was constructed according to this. The statistical data was gathered from different sources such as the Swedish central bank for the interest rate. The central bank is the organization that communicates the level of the interest rate in Sweden and the quantity of money. Data was collected from OECD for the consumer confidence index that were based on answers that Swedish Konjunkturinstitutet has collected. From OECD the data for GDP was retrieved. The data regarding unemployment and households’ debt were gathered from Statistics Sweden.

4.4.1 Debt

The data for households’ debt was gathered from Statistics Sweden. They present the data of households’ debt in shares of different variables such as the disposable income and the households’ financial assets (SCB, 2019a). The latter form is used in this thesis as both sets of the mentioned data would give the same result. Statistic Sweden uses data from Finansinspektionen where the financial assets are subtracted from the transactions for debts which can be expressed as negative savings or financial savings (FI, 2018b). From this data the total debts are calculated by taking the ratio times the total financial savings. This is presented in SEK. The values collected from this calculation were used in the regression as the total households’ debts.
4.4.2 Consumer confidence index

The data with regard to the confidence measured by the consumer confidence index was collected from OECD where the data is presented around the critical number of 100 (OECD, 2019a). However, this was the only variable that were lagged. The reason to lag CCI with one time period is because of adaptive expectations. Since households adjust their consumption and saving based on yesterday values, according to the theory, CCI should be lagged with one time period in order to capture this. Hence, households’ previous expectations on their financial situation, unemployment and the general economics has included in the regression analysis.

4.4.3 Unemployment

Data for the unemployment rate was collected from Statistics Sweden. They present the data in percent and is calculated by taking the amount of unemployed divided by the workforce. By the workforce they mean individuals that are between the ages of 16-64 who either have a job or are unemployed. The number of unemployment includes the individuals who are able to work but do not and are actively searching for work. (SCB, 2019b). The value for unemployment used in the regression was described in actual numbers as a calculation of the total unemployment was done by taking the data from Statistic Sweden multiplied with the workforce.

4.4.4 Interest rate

The Swedish Central Bank provided data for the interest rate. The variable interest rate was in this thesis the Swedish central bank’s repo interest rate. The repo is the interest rate that the bank can loan or place in the central bank over a week (Riksbanken, 2019c). The repo rate functions as a factor in the determination of the interest rate of Swedish banks that provide loans for the households. Through this, it affects the households indirectly as when the repo interest rate changes the interest rate for household will also change. Therefore, the repo interest rate was used as a proxy for the households’ interest rate.
An alternative of the interest rate variable could have been the mortgage rate. The mortgage rate is the interest rate on mortgages. The reason why one could consider the mortgage rate as an alternative is because most of the households’ debts consist of mortgage. However, there was a significant problem with this. There is no average mortgage rate from 1995 to 2018. Each bank’s mortgage rate is separated. This created a problem because information about the proportion of each households’ mortgage in relation to the banks was needed and to create a weighted average mortgage rate. This data was inaccessible; therefore, the repo interest rate was used as a proxy.

4.4.5 Gross Domestic Product
The GDP data was gathered from OECD where the values are shown as the total value in millions USD. It is measured in current prices (OECD, 2019b). The economic situation will have an effect on GDP. Hence, a decrease in GDP is preceded when households spend less which causes the demand on goods to decreases. With less demand, less products will be produced (SCB, 2018b).

4.5 Descriptive statistics
A descriptive statistic, Table 1, was computed for a more generalized picture of the data set for each variable. An interesting measure is “Skewness”. It measures if the data set is normally distributed. A value between -0.5 and 0.5 is assumed to be normally distributed. In this case, only GDP and unemployment could be assumed to be non-normally distributed which is of concern. However, the value of skewness only deviated slightly. The measures of descriptive statistic was done by DescriptiveStats::ds.skewness(variable):
Table 1. Descriptive Statistic

<table>
<thead>
<tr>
<th>COEFFICENTS</th>
<th>MIN</th>
<th>MEDIAN</th>
<th>MEAN</th>
<th>MAX</th>
<th>SKEWNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD</td>
<td>48595</td>
<td>162588.5</td>
<td>153680.41</td>
<td>188099.75</td>
<td>0.054</td>
</tr>
<tr>
<td>CCI</td>
<td>-3.904</td>
<td>0.149</td>
<td>0.194</td>
<td>1.162</td>
<td>0.310</td>
</tr>
<tr>
<td>UN</td>
<td>-77314</td>
<td>-580</td>
<td>-6579.55</td>
<td>10375</td>
<td>0.761</td>
</tr>
<tr>
<td>IR</td>
<td>-2</td>
<td>-0.2</td>
<td>-0.209</td>
<td>0.187</td>
<td>-0.066</td>
</tr>
<tr>
<td>GDP</td>
<td>-17236.53</td>
<td>13697.6</td>
<td>15094.54</td>
<td>22636.49</td>
<td>-0.725</td>
</tr>
</tbody>
</table>

In Table 2, the correlation between the different variables included in the regression is shown. When analysing the table, the results states that there is no significant problem regressing the households’ debts growth with the independent variables. Some of the values are high but will not affect the model.

Table 2. Correlation matrices

<table>
<thead>
<tr>
<th></th>
<th>HD</th>
<th>UN</th>
<th>IR</th>
<th>CCI</th>
<th>GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HD</strong></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>UN</strong></td>
<td>0.24</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IR</strong></td>
<td>0.03</td>
<td>-0.46</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CCI</strong></td>
<td>-0.07</td>
<td>-0.34</td>
<td>0.35</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>GDP</strong></td>
<td>0.31</td>
<td>-0.55</td>
<td>0.66</td>
<td>0.31</td>
<td>1</td>
</tr>
</tbody>
</table>
5 RESULTS

5.1 Regression results
The model has been implemented in R. Each variable has received a data set that contains the difference of its value for each year from 1995 to 2018. This has been done by returning a vector for each variable. The function “c()” in R made this possible where the data set was implemented in the brackets. Since this thesis was interested in households’ confidence as a prediction variable, CCI was delayed by one time period. The following summarize the process done for each variable:

\[
HD \leftarrow c(\Delta data \, set_t)
\]
\[
GDP \leftarrow c(\Delta data \, set_t)
\]
\[
CCI \leftarrow c(\Delta data \, set_{t-1})
\]
\[
IR \leftarrow c(\Delta data \, set_t)
\]
\[
UN \leftarrow c(\Delta data \, set_t)
\]

This was later computed in a regression model called “Reg” by

\[
Reg \leftarrow lm(HD \sim CCI + UN + IR + GDP).
\]

Before adjusting the model in R the need to see if any problems with the model existed. A Box-Ljung test was conducted to see if autocorrelation existed. This was done by

\[
Box.test(Reg, \text{lag} = 1, \text{type} = c("Ljung - Box"))
\]

The conclusion from the Box-Ljung test showed that adjusting the model was necessary since the null hypothesis: that the data has no autocorrelation could not be rejected:

<table>
<thead>
<tr>
<th>data</th>
<th>X-squared</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reg</td>
<td>1.8061</td>
<td>1</td>
<td>0.179</td>
</tr>
</tbody>
</table>

Table 3. Box-Ljung test
In order to remove the autocorrelation a function in R was used which corrects the autocorrelation in the data. But before adjusting the model, another test was performed to see if heteroskedasticity existed. The Breusch-Pagan test was performed by `bp.test(Reg)`. The result was that the null hypothesis could be rejected and confirm the alternative hypothesis that heteroskedasticity existed in the data:

Table 4. Studentized Breusch-Pagan test

<table>
<thead>
<tr>
<th>data</th>
<th>BP</th>
<th>Df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reg</td>
<td>1.6785</td>
<td>4</td>
<td>0.7946</td>
</tr>
</tbody>
</table>

To adjust the model from autocorrelation and heteroskedasticity adjustment to the model was performed by `summaryR.lm(Reg, type = c("hc0"))`. This helped the elimination of these two problems by replacing the standard error with so called “white standard error”. ** means that the null hypothesis can be rejected at an alpha on 1%. The null hypothesis for each independent variable is that its coefficient is equal to zero. Hence, the independent variable has no effect on the dependent variable (HD). The alternative hypothesis is the opposite. In this model, the null hypothesis can be rejected for GDP, UN and the intercept:
Table 5. Regression result

| Coefficients | Estimate | Std. Error | t value | Pr(>|t|) |
|--------------|----------|------------|---------|---------|
| Intercept ** | 94100    | 26200      | 3.592   | 0.00225 |
| CCI          | -1774    | 4702       | -0.377  | 0.71060 |
| UN **        | 0.8491   | 0.2748     | 3.090   | 0.00665 |
| IR           | 13790    | 12560      | -1.098  | 0.28741 |
| GDP **       | 4.149    | 1.323      | 3.137   | 0.00600 |

Other information

| Multiple R-squared | 0.3566 |
| Adjusted R-squared | 0.2052 |
| F-statistic (4,17)  | 6.152  |

The null hypothesis for IR and CCI could not be rejected, which means that their variation does not affect HD. Hence, their coefficient values cannot be interpreted. However, the F-statistic test the joint explanatory power of the variables. In this model the null hypothesis can be rejected which states that all the variables’ coefficient is equal to zero and accept the alternative hypothesis which states that at least one of the variables’ coefficient is different from zero.

5.2 Regression notes

It should be mentioned that there were only had 21 observations for each variable in this regression. One common assumption for OLS – regression is that the data set should contain at least 30 observations in order to draw any realistic conclusion. Hence, one should be cautious when interpreting the result. Also, the R-squared is only 0.3566 which means that 35.66% of the variation of ∆HD can be explained by the independent variables. This can be considered as a low R-squared. It is not common that the R-squared is low in time series regression. Another significant result is UN. In the
regression, $UN$ is positive which implies that an increase in unemployment will increase the households’ debts positive, ceteris paribus.
6 DISCUSSION

6.1 Variable results

6.1.1 Confidence in Consumer confidence index

Table 5 presents a negative coefficient between the confidence of households, measured by the CCI, and the households’ debt growth. This is unexpected as the households’ confidence and expectations should affect the debts of households which would support Beveridge’s (1909) idea. These results suggest otherwise, when confidence increases, the debts decrease.

The results are hard to interpret due to the fact that CCI lacks significance. Since the variable is lacking significance there is difficult to say whether it affects the debts of the households or not. Since it is not significant, it supports the fact that there are other variables that affect the debts of households rather than the confidence of the households. Another impact in the regression is the financial crisis. During the years of the crisis, expectations were not high, and households could have been sceptic about the future. Since there was a small sample of observations, this could be a factor to the results presented in the table.

Another perspective of the confidence and the economic situation is the international perspective which have had a greater impact after the financial crisis on individuals. Following this, the households are more aware of what happens internationally. Also, since Sweden is a country that is very dependent on export, Sweden is sensitive to international events affecting the economic situation.
Based on how the confidence is measured in the proxy variable can affect the results which Dominitz & Manski (2004) described as the difficulty for the qualitative questions to be formed into quantitative. Another difficulty with confidence is that it is hard to measure since it is personal and subjective which was Deés & Soares Brinca (2011) suggestion. This could have made it more difficult in the regression and be an underlying factor to the received results. However, as discussed earlier in the theory, an optimistic and positive attitude towards the future should increase the households’ risk taking. Hence, the debts of the households should increase.

### 6.1.2 Unemployment

In Table 5 the result shows that the unemployment had a positive coefficient. One perspective of the positive correlation is that when households in Sweden become unemployed the households borrows more to keep up the consumption on average. This could explain the positive coefficient. This result is consistent with the theory of the life cycle that states that individuals want to smooth out the consumption over time and maximize utility (Baranzini, 2005). Also, the fact that it is easier for individuals to gather debts nowadays despite being unemployed can be a factor effecting the result of the regression.

However, the financial institutions who lend out money could be less eager to accept the loan based on the expected incomes in the future. Also, when individuals are unemployed, there is a greater chance that the individuals in the households increase their debts, as the results suggest. This is consistent with the life cycle theory. When an individual study before becoming a part of the work force, the individual will increase the amount of debt owned by the individual (Santos et al., 2014). This happens at a younger age and when the individual becomes older, repayments of debts will happen. As the life cycle theory states, when an individual is younger, he or she will consume above its income with the consequence that more debts are collected (Baranzini, 2005).
The unemployment variable was one of the significant variables, that could reject its null hypothesis with an alpha at 10%. Hence it is statistically significant and can be considered as a variable that affect households’ debt.

6.1.3 Interest rate

The interest rate has a positive coefficient as seen in Table 5. This is unusual because higher interest rate increases the costs of loans. Since the repo interest rate was used, a reasonable argument for this unusual result could be that the interest rate households face by banks are not sufficiently identical with the repo rate. However, the variable was not significant in the regression which suggest that there are other variables that affect the debt growth. This result agrees with the life cycle theory as the theory does not take into consideration the interest rate (Baranzini, 2005).

6.1.4 Gross Domestic Product

Table 5 gives us a positive coefficient between the GDP in Sweden and the households debts. This could imply that with a higher GDP, there is more consumption financed by debts.

The result is consistent with adaptive expectations. When GDP is increasing, it transforms into expectation, which Sweden has experienced during most of the years included in the data. The households expect a bright future as they have experienced in the past which would make them more eager to put themselves in debt as they see no problem in paying back the debt in the future with a growing economy (Gärtner, 2016). This is one of the variables that is significant with an alpha on 1%, which would support that households think of the future in a positive way and with that in mind they tend to borrow more. The results also imply that GDP is accounted for as one of the factors that affect the debts.
6.2 Further notes on the result

Table 5 gives us a value of $R^2$ on approximately 35 percent which is low given that the data was a time series. Usually time series have a high value of $R^2$. This could imply that there is an error in the regression. However, as two of the variables could be rejected there could be one explanation that there are other variables that should be significant in the debts of the households. Another explanation is the number of observations collected, which might have an impact as there were a few and more observation that were needed to make more reliable results.

The fact that there were only two variables that were significant were not an expected result. It suggests that there are other variables that influence households’ debts. Variables such as the amortization suggestion has been introduced. This demand could have an effect in the debts as it affects the price of the debts. Where also the interest rate variable should be included and that the fact that this was not significant in the received results is surprising. This is the costs that is related to the debt and is something that households should take into consideration when deciding on the change in repaying alongside the expectations of the future.

The received result is in line with Garner (1991) who questions the reliability in having CCI as an indicator. Even if his study has existed for a few years this study points in the same direction, telling that the proxy for confidence measured in CCI should not be an indicator. Also, the results are in line with Berg & Bergström (1996) who found that interest rate and the inflation affect consumption. However, interest rate and inflation were not a reliable factor of the confidence. This could affect the proxy used for the confidence.

The fact that the questions are answered by individuals between ages 16-84 could also affect the proxy. The younger gathers more debts according to the life cycle theory as they are in the beginning of their career. As well are individuals that have reached retirement who face the same structure as income is lower than consumption and would result in increasing debts (Barazini, 2005). Depending on how the answers are
distributed around these ages, could have an effect on the results. Another perspective is when making their decision about the economic situation and the future, the older respondent is the more experience the individual has gathered and can base their expectations upon. This fact could influence that the confidence is different in different part of an individual’s lifecycle.
7 CONCLUSION

7.1 Conclusion
The purpose of this thesis was to test if the households’ confidence is a significant indicator for the households’ debt growth. This study was limited to Swedish households solely. Hence, businesses, foreign households, banks etc. were excluded. Based on the hypothesis test, the conclusion is that households’ confidence, through consumer confidence index as a proxy, is not a significant indicator of households’ debt growth. There are different explanations for this result. One of them is the number of observations that are less than necessary to assume consistency. The reason behind this is the transparency of data. However, if the annual data could be transformed to monthly data, the right number of observations would be obtained. This would allow a better interpretation of the result. Another explanation of this result could be the mismatch of the variables. The results gave us a low R-squared, which could indicate that there are other important variables in the regression that are not included. However, by assuming that these results are correct, that confidence is not significant, Garner’s (1991) ideas that confidence should not be used as a predictor is confirmed.

As discussed, confidence and the interest rate were not considered significant indicators for the growth of households’ debt. Therefore, policymakers should not give these variables much attention when predicting or making conclusions about the debt growth. Policymakers should pay attention to growth in unemployment because this was one of the variables that were significant. The GDP should also be observed since this was the other variable that was significant. Also, if there would be any more change in the amortization requirement the focus should not be on the insignificant variables such as increasing the interest rate or rely on the confidence index, instead policymakers should focus on unemployment an GDP. The economy in Sweden will not boom as it has for the past years. So, in the future, there will be years of declining GDP and an increasing unemployment which will influence the debt growth. This is something that should be taken into consideration when predicting the debt growth.
7.2 Future studies

One suggestion for future studies is an increase in the number of observations. Another suggestion is to split the households’ debts in different categories in order to see if the households’ confidence differ for the different type of debts for households. This could lead to an interesting result if there is a significant difference between the different debts. Since there is a proxy variable for businesses’ confidence (Business Confidence Index), research regarding the businesses’ confidence and if it does affect their debt growth would be interesting. Comparing the result of businesses’ confidence with the households’ confidence could provide information on how to improve the measurement of these two confidences. Garner (1991) has argued that households’ confidence should not be used for macroeconomic events. Therefore, research about households’ confidence strength for other macroeconomic events could be conducted to see if Garner (1991) is right.
8 REFERENCES


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Appendix 1. Survey questions by Konjunkturinstitutet

1. How does the financial situation of your household now compare with what it was 12 months ago? Has it…?
   Got a lot better
   Got a little better Stayed the same
   Got a little worse
   Got a lot worse
   Don’t know

2. How do you think the financial position of your household will change over the next 12 months? Will it…?
   Get a lot better
   Get a little better
   Stay the same
   Get a little worse
   Get a lot worse
   Don’t know

3. How do you think the general economic situation in this country has changed over the last 12 months? Has it…?
   Got a lot better
   Got a little better
   Stayed the same
   Got a little worse
   Got a lot worse
   Don’t know

4. How do you think the general economic situation in this country will develop over the next 12 months? Will it…?
   Get a lot better
   Get a little better
Stay the same
Get a little worse
Get a lot worse
Don’t know

5. **Compared with 12 months ago, do you find that prices in general are ...?**

Very much higher
Quit a bit higher
A little higher
About the same
Lower
Don’t know

5a-b. Compared with 12 months ago, how much higher in percent do you think that prices are now? (Average)

Including extreme values
Excluding extreme values

6. **Compared to the situation today, do you think that at in the next 12 months prices in general will ...?**

Increase faster
Increase at the same rate
Increase at a slower rate
Stay about the same
Fall slightly
Don’t know

6a-b. **Compared with today, how much in percent do you think that prices will go up (i.e. the rate of inflation 12 months from now)?**

Including extreme values
Excluding extreme values

7. How do you think the level of unemployment in the country will change over the next 12 months? Will it…?
   - Increase sharply
   - Increase slightly
   - Remain the same
   - Fall slightly
   - Fall sharply
   - Don’t know

8. Do you think there is an advantage for people to make major purchases (furniture, washing machines, TV sets etc.) at the present time?
   - Yes, now is the right time
   - It is neither the right time or the wrong time
   - No, it is the wrong time, purchase should be postponed
   - Don’t know

9. Over the next 12 months, how do you think the amount of money you will spend on major purchases will compare with what you spent over the last 12 months? Will it be…?
   - Much more
   - A little more
   - About the same
   - A little less
   - Much less
   - Don’t know

10. In the view of the general economic situation, do you think this is…?
    - A very good time to save
    - Quite a good time to save
Neither a good, nor an unfavourable time to save
Rather an unfavourable time to save
A very unfavourable time to save
Don’t know

11. Over the next 12 months, how likely are you to be able to save any money?

Very likely
Fairly likely
Fairly unlikely
Very unlikely
Don’t know

12. Which of these statements best describe the present financial situation of your household?

We are saving a lot
We are saving a little
We are just managing to make ends meet on our income
We have to draw on our savings
We are running into debt
Don’t know

13. How likely are you to buy a car within the next 12 months?

Very likely
Fairly likely
Fairly unlikely
Very unlikely
Don’t know

14. Are you planning to purchase or build a home within the next 12 months (to live in yourself, for a member of your family, as a holiday home, to let etc.)?

Yes, definitely
15. Over the next 12 months, how likely are you to spend any large sums of money on home improvements such as central heating, sanitary ware etc.?

- Very likely
- Fairly likely
- Fairly unlikely
- Very unlikely
- Don’t know

16. Compared with 12 months ago, is the risk that you will become unemployed...

- A lot greater
- A little greater
- About the same
- A little less
- A lot less
- No opinion

18a-c. The variable rate for mortgages is currently X per cent. How high do you expect it to be in one year/two years/five years?

- Including extreme values
- Excluding extreme values