LUND UNIVERSITY
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Boom goes bust goes crisis
Fluctuations in household debt during financial crises in Sweden 1873-2015

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Abstract: In this thesis I examine fluctuations and growth rates of household debt before, during and after financial crises in Sweden 1873-2015. The results show similar patterns in fluctuations between crisis and their adjacent years in Sweden. The results also show a significantly higher volatility of household debt growth rate fluctuations before, during and after financial crises compared to the rest of the period. Through previous research and with the Kindleberger-Minksy-theory as a theoretical framework I argue that the fluctuation patterns and its volatility is a good indicator for predicting future financial crisis in Sweden. Given the fluctuation of household debt growth rate of recent years I argue that Sweden is not heading for financial crisis in the near future.
Key words: Household debt, fluctuations, boom and bust, financial crises.

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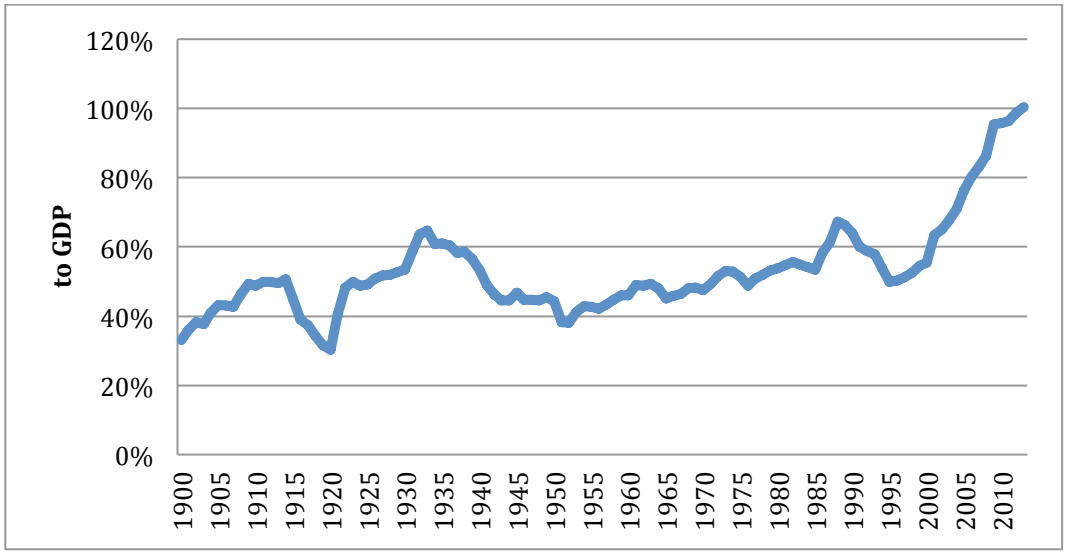
1. Introduction

The phenomenon of financial crisis and debt has probably existed ever since the concept of currency was invented (Reinhart, Rogoff 2009: Preface XXVI). However, it was primarily when human society started using financial "intermediaries", such as banks, that both financial crisis and indebtedness started to become a more common, a more important, and also a more problematic, part of the economy. This is largely because of the *fractional reserve banking* phenomenon, which means that banks are primarily driven by deposits and loans and relatively little capital of its own. Deposits are primarily short term– people can always take out their money from the banks – the lending is primarily long term, which means that banks generally cannot bring their credits back immediately. This makes the banks vulnerable for economic fluctuations (Larsson, Lönnborg 2014: 10).

Academics been interested in these phenomenons for a long time and since the relatively recent global financial crisis of 2007-2009, hence the "Great Recession", the literature of these matters has expanded significantly (Larsson, Lönnborg 2014: 9). However, there has been a tendency in academics to focus more on the public debt in relations to financial crisis, rather than *private business* and *household debt* in relation to financial crisis. This has had its natural cause, in fact Reinhart and Rogoff pointed out in their modern classic book "This Time is Different" (2009) that public debt has *historically* been a more important factor for financial crises than private debt (Reinhart, Rogoff 2009: Preface XXXIII). Steve Keen also points out (and criticize) that: *"private debt is largely ignored by conventional macroeconomics"* (Keen 2009: 347). But it might also have to do with the fact that increasing household debt is a relatively new phenomenon. For instance, when the modern financial market started to evolve in Sweden during the 19th century the shift from agrarian to industrial society was just beginning and most people still lived in the countryside were the demand for credit from the financial system, hence banks, was very limited partly because a lot of commodities that during the forthcoming industrial and modern time that lay ahead was to be gathered primarily through the market – like for instance, food, clothes, houses etc. - was during the pre-industrial time produced by the households themselves. In those relatively rare times when somebody needed credit, friends, neighbors, family members and so forth was the lender, not the financial system (Waldenström 2015). In fact in the beginning of the period that I examine in this thesis (1873-2015) household debt was a relatively small part of the economy, at the end of the period it has growth to be the biggest part of national debt, higher

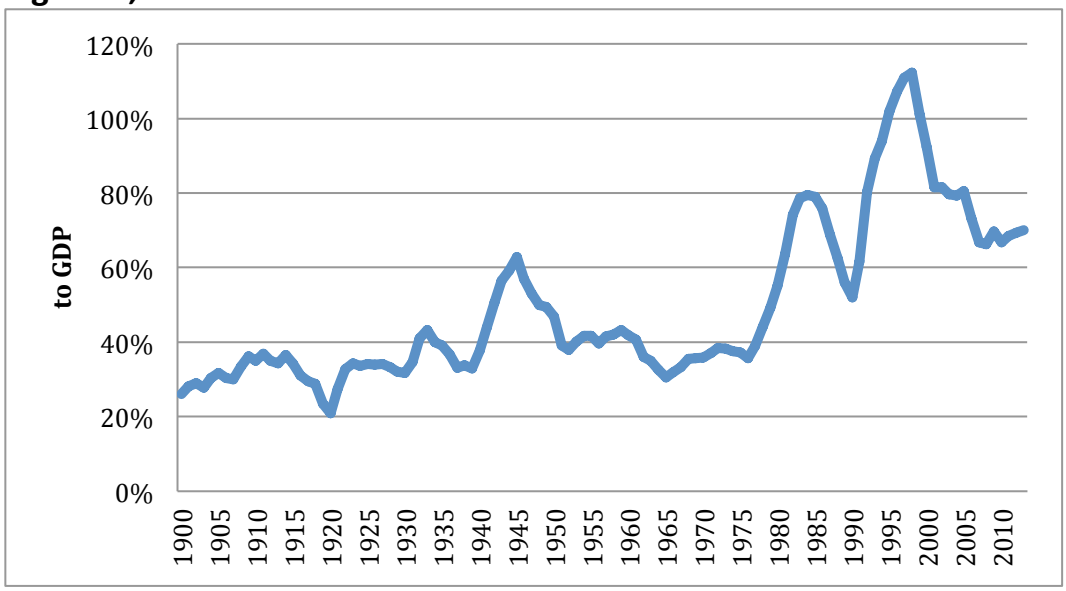
than both public debt and private business debt - see figure 1, 2 and 3 - Unfortunately I do not have data on private business debt before 1900 but still shows the overall trend.

Figure 1, Household debt to GDP 1900-2013



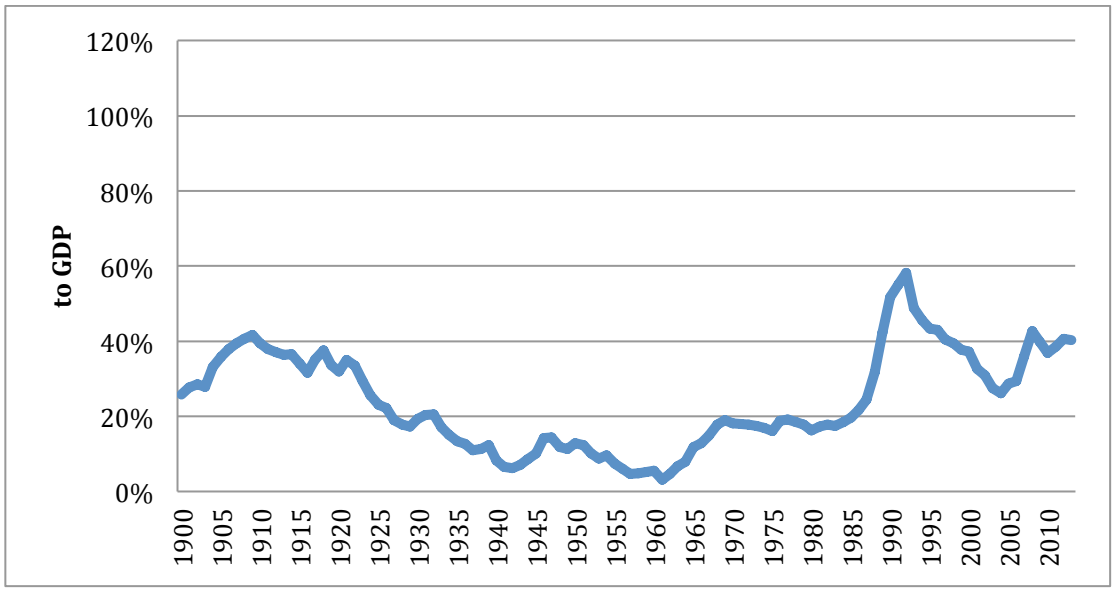
Data sources: (Waldenström 2015) (Krantz, Schön 2015)

Figure 2, Public debt to GDP



Data sources: (Waldenström 2015) (Krantz, Schön 2015)

Figure 3, Private business debt to GDP 1900-2013



Data sources: (Waldenström 2015) (Krantz, Schön 2015) (Ahnland 2015)

1.1 Research problem

This fact that household debt now is the biggest form of debt in Sweden and actually has a bigger ratio to GDP than even before in history is part of the reason why the relationship between household debt and financial crises in Sweden is legitimate to examine. Even though a high level of the debt to GDP might not necessarily be an indicator of a financial crisis it probably makes households and economy as a whole more vulnerably when the crisis occur. Authorities like for instance the Swedish Central Bank ("The Riksbank"), The Swedish National Debt Office ("Riksgälden") and Sweden's financial supervisory authority "Finansinspektionen" have recently claimed that this rate and level is potentially dangerous (Ingves, Lindblad, Noréus 2015). Internationally there has also been a significant increase in household debt to GDP ratio and the most severe financial crisis since the Great Depression in the 1930s, namely the Great *Recession* of 2008-2009, was primarily caused by household debt thorough the so called subprime loans (Mian, Sufi 2010). Therefore an examination of household debt and its relation to financial crisis is legitimate. However, there are of course several ways one can examine this phenomenon. Since a lot of previous research and theories emphasize the fluctuations, the "boom" and "bust" or the "bubbles" – for instance Minksy (1977) Kindleberger (1989) and Schiller (2015) - I am going to examine the fluctuations of

household debt the years before, during and after a crisis in comparison to other years outside the this frame. I could of course examine the pure magnitude hence for instance debt to GDP and I also compare the fluctuation aspect with this magnitude aspect and see more reasons to look at fluctuations for indications of financial crises than actual magnitude, even though magnitude might be an indication of the severances of a possible crises.

Since Sweden started it modern finalization around the time when the gold standard was adopted namely 1873 I have chosen 1873 and 2015 as a suitable time scope for this examination. This leads us to the aim and scope of this thesis.

1.2 Aim and scope

My aim is to compare household debt rate and fluctuation between the five financial crises that Sweden has experienced between the time scope of 1873 and 2015 and also to compare these growth rates and fluctuations to non-financial crises times to point out differences and similarities that can be useful to understand the relationship of household debt and financial crisis. Since considerable changes in debt fluctuations usually appear the third year before a crisis and because growth rates do not regain "non-crisis" levels after three years after a crises I will look three years before, the crisis years and three years after the crisis years and compare these interval to all the other years in the time scope of 1873-2015. Since I am also interested in how we can partly predict or see indications of future financial crises I will also discuss these results possible utility for predicting future crises in comparison to aggregate level of household debt to GDP.

1.3. Research question

Therefore, my research questions are:

1) How does household debt growth fluctuate before, during and after financial crises in Sweden 1873-2015 in comparison to "non-financial crisis years"?

2) What does this findings indicate about a possible financial crisis in Sweden in the near future?

2. Definitions

To clearly answer this research question five key concepts has to be defined. Since of their arbitrary meaning they risks otherwise to be interpreted wrongly by the reader. Below their specific meaning in this thesis is clearly stated.

- **Household debt**
  Household debt is in this thesis exclusively the personal debt of individuals and families in their personal economy. It includes all kinds of debt that households can have to the private financial sector, the public sector as well as informal debts.

- **Pure household debt growth rare**
  This is the growth rate of household debt in relation to the growth rate the previous year

- **Household debt to disposable income ratio growth rate**
  This is the growth rate of the household to disposable income ratio.

- **Household debt to GDP ratio growth rate**
  This is the growth rate of the household to GDP ratio.

- **Private business debt,**
  Hence household debt shall not be confused with "private business debt" which, in this thesis, refers to all kinds of liabilities public and private debt that private companies can have.

- **Public debt**
  In this thesis public debt relates to all kinds of debt that the public sector can have. In this thesis public sector includes the central government, county councils and municipalities.

- **Financial crisis**
  For a financial crisis to occur the role of the financial system - hence to redistribute risk and to provide credit - has to (for external and/or internal reasons) be disturbed to the extent that one or more banks either has to go bankrupt or has to receive liquidity from the state to avoid bankruptcy. Hence economic crisis, like for instance structural crisis (that evolve from the transformations of the economy through for instance an technical innovation which causes "creative destruction" or "structural crisis") does

not necessarily evolve into a financial crisis. Sweden has in fact a number of economic and structural crises though this period – like for instance the oil crisis and the dot-com bubble - that did not evolve into financial crises. Sweden was very close to enter a financial crisis during the global "Great Recession" during 2007-2009, but since no Swedish bank went bankrupt or received directed liquidity from the state, Sweden did not experience a financial crisis during this period. It is important to point out that by directed liquidity I refer to specific "lender of last resort"-actions towards specific banks by the state. I do not refer to quantitative easing, expansionary monetary policy and low interest rates directed to the whole economy.

- **Boom and bust period**
  Since this thesis examines three years before and three years after beyond the actual financial crisis there is important to separate the period before, during and after financial crisis with purely the years of the financial crisis. Therefore the period three years before, three years after plus the actual financial crisis will furthermore go under the name "boom and bust interval". The concept of boom and bust leads us into the theory chapter of this thesis.

3.Theory

A common theory for explaining the financial crisis is the concept of "boom and bust" whereas "boom" refers to an abnormal increase in economic activity (often including increase of debt growth rate) and "bust" refers to an abnormal decrease of economic activity (often including decrease of debt growth rate). One of the most famous theories on booms and busts is the Kindleberger-Minsky-theory, which I will use as a theoretical framework and hypothesis in this thesis. However, to put this theory into context a brief review of previous research on debt and financial crises is suitable before presenting this theory in more detail.

3.1. Previous research

As pointed out in the introduction, financial crisis and has probably existed ever since currency was invented. Furthermore these have also drawn people intellectual attention for a very long time. The litterateurs on financial crises are therefore vast. However, since I deal with the period of 1873-2015 and financial crises in *relation to debt* I have focused my previous research examination on studies dealing with debt *in relation to* financial crisis within in the time span of late 19th century and current time.

One of the most famous researchers interested in the phenomenon of financial crisis and debt was the American economist Irving Fisher. His debt-deflation theory (1933) is a classic contribution to the research of financial crisis and is embraced by several different perspectives on economics like for instance the Neo-Classical-school and the Post-Keynesian-school of economics (Minsky 1992) (Keen 1995) (Bernanke 1995). Fishers argument was that when debt had to be paid back - after the asset-prices were falling during the first part of the financial crisis - it enhanced the deflation and thus the recession during and after a financial crisis since money that could otherwise go to consumption went to repayments. The enhanced deflation of course led to fewer people willing to borrow money since deflation made loans more expensive over time (Fisher 1933). Fisher's debt-deflation theory was an important inspiration for the Kindleberger-Minsky-theory, which I will use as a main theoretical framework and hypothesis in this thesis (Minksy 1977) (Minksy 1992). The Kindleberger-Minsky theory is based on Hyman Minskys "financial instability theory" (1977) and Charles Kindlebergers empirical implementation of it (Larsson Lönnborg 2014: 26). The theory claims that the financial markets in general and credit market in particular are endogenously instable since they enhance the fluctuations in the economy through cheap credit in good times and expensive credit in bad times. However, a critical interpretation might be that both the Fisher theory and the Kindleberger/Minsky theory assumed a very free market economy without state involvement that actually could be able to edit these problematic parts of the market. The almost "lassire faire" economy these theories presumes, hardly exists in the real world today. But on the other side, these theories might just as well be partly aimed as an argument for state involvement in the financial market and cycle, which is something that Minksy actually does in Minksy (1992). Since I use Kindleberger-Minsky theory as a hypothesis and theoretical framework I will present and discuss it in more detail in section 3.2 in this thesis.

A more recent study by Cynamon and Fazzari named *"Household Debt in the Consumer Age: Source of Growth – Risk of Collapse"* (2008) is arguing that households means of consumption has changed dramatically in recent decades. The "Great Moderation" (hence the less volatility in the economy) has largely evolved though increased consumption by households in recessions and thus manages to avoid these recessions to become severe. However, this consumption is also largely funded by loans from the financial market, hence household use credit in a historically unprecedented extent to finance their consumption. Cynamon and Fazzari claims this borrowing is more due to social norms and "group mentality" than serious calculations of risk and plans for future repayments. This hence makes

households and the financial system more fragile and increases the risk of severe financial instability in the future recessions, Cynamon and Fazzari argues. This study points out an important factor, which is the larger extent of household debt to GDP that has been evolving in recent decades. It also points out the fluctuations and "boom and bust" phenomenon since more credit leads to more economic activity and hence a sharper bust – and they are indeed using Hyman Minksys "financial instability" theory to understand this phenomenon.

With a similar theoretical framework and argument Steve Keen claims in his study *"Household Debt: The Final Stage in an Artificially Extended Ponzi Bubble"* (2009) that "Private debt is largely ignored by conventional macroeconomics" (Keen 2009:347) and that it has both extended significantly in the last decades and that its increase, although its eases the temporal recession, might be unsustainable in the long run and thus cause significant recession in the future. Keen also claims that its impact on the economy is affected by:

"Its scale relative to gross domestic product (GDP), its composition, purpose and rate of change" (Keen 2009:347).

This is thus relevant to my study since it is the *rate of change* hence the fluctuations that are in the forefront of my analysis at the same time as I show aggregate debt relation to GDP and its possible relevance for financial crises.

The fluctuation which is the main focus of my study are also most relevant in the study "Credit Booms Gone Bust" (Schularick and Taylor 2012) that examines the Swedish credit market together with thirteen other countries credit markets during 1800-2000. The study is also relevant for my thesis since I use a similar method as Schularick and Taylor do. The Schularick and Taylor study also produce strikingly similar results on timing for the busts period namely the second year before the crisis. However, according to Schularick and Taylor it is reasonable to divide the period into the pre world war two period and the post world war two period since the relation between money and credit differs significantly between the two periods. *Before* world war two money and credit is in the long run parallel in extent and *after* world war two credits is expanding faster than money, according to their study. They also argue that credit is the main factor for predicting and understanding financial crisis and financial instability and they claim that this has not been sufficiently taking into account by policy makers in general and central banks in particular who has – with focus on price stability – put more effort into understanding money and not credit. Since I have chosen to employ Schularick and Taylors (2012) method for my study I find the study very appealing

and have relatively few objections towards it. However, I would like to see a similar international study but on the *household debt* which is often considered more problematic than the private debt today. I intend to do a *small part* of that myself hence examine the household debt of Sweden with a similar method as Schularick and Taylor (2012).

Regarding research dealing with the Swedish context I have not came across any work that *specifically* examines *household* debt rate and fluctuations and financial crisis in a historical perspective. However, Lars Ahnland has done significant research regarding *private* business debt rate (hence private business and household debt rate combined) and its relation to financial crisis. He has presented his research in the paper *"Private Debt in Sweden in 1900-2013 and the risk of financial crisis"* (Ahnland 2015). Ahnland shows through *logit regression* that increased lending to private sector and a high level of private debt to GDP are in line with the risk and probability of financial crisis in Sweden 1900-2013. Even though Ahnland study is very neatly done in method and actually manage to show compelling causality of private debt and financial crises through the depended and independent variables in his logit regression, his analyze of the *context and surrounding exogenous* reasons for periods of financial crises is relatively scant, however this is not necessarily the aim for his paper and he does attend this issue by pointing out the difficulty of knowing what is cause and effect on for instance tighter regulations and fewer financial crisis. On the contrary, Larsson and Lönnborgs book *"Finanskriser i Sverige"* (2014) does focus more on the exogenous *context* for financial crisis with a more qualitative method but with less of the quantitative neatness that Ahnland employ. Larsson and Lönnborgs book is a very important study for my thesis since it deals with the general context – cause, process and aftermath - of the financial crises in Sweden that I examine more specifically through the factor of household debt growth and fluctuation. It is also an important study for the theoretical framework of this thesis since it also uses the Kindleberger-Minsky-theory for understanding these financial crises. However, I do interpret both the Kindleberger-Minsky-theory and the general context of Swedish financial crisis slightly different from Larsson and Lönnborg for instance in *naturally* putting more empathies on fluctuation of household debt and its role for both how to understand Kindleberger-Minksy-theory and to understand the nature of the different crises.

Finally Fredrik N.G. Anderssons and Lars Jonungs paper "Krasch boom krasch: den svenska kreditcykeln" examine specifically the Swedish credit cycle and brings light on both the Swedish context for public, private and household credit - including the monetary policy factors affecting it – and its potential consequences for the economy as a whole. Andersson and Jonung examine credit expansion to GDP and disposable income during 1964-

2015 and its role for financial instability and crisis. They conclude that there has been a significant credit expansion in Sweden in later decades and that this increases the possibility for - and fragility in regards to - financial instability and crisis. However, relating debt to GDP and/or disposable income holds some limitations since the changes do not necessarily reflecting increased debt but just as well decreased GDP or disposable income. At the same time this might of course also be seen as a strength since the risks with debt might just be visible in relation to these other factors and not only by itself.

All of these previous research deal with financial instability, although not all of them do deal with the *Kindleberger-Minsky-theory* of financial instability specifically, which is the theory that I use as a theoretical framework and hypothesis for financial crisis in Sweden. Below I present this theoretical framework in more detail and why I find it desirable as a theoretical framework in my thesis.

3.2. The Kindleberger-Minsky theory

To answer, understand and put my research question in my research deeper and more solid context I have decided to use the Kindleberger-Minsky-theory as theoretical framework and hypothesis for the nature of financial instability and hence the role of credit and debt in that instability. The reason why I use this theory instead of for instance the monetarist theory which puts monetary policy as the dominant factor of financial crisis is that the Kindleberger-Minsky-theory is both more holistic and broad which endogenous and exogenous factors takes into account and also, in my perspective, more feasible in our monetary regime today where credit and broad money are more and more drifting apart from one another in the role of the economy. In fact, the monetarist view is actually assuming that money and credit goes hand in hand as they in fact did before world war two which makes it a problematic theory for understanding todays financial instability were they have drifted apart considerable (Larsson, Lönnborg 2014: 25ff) (Schularick, Taylor 2012) (Friedman, Schwartz 1963). Unlike the pure Monetarist theory the Kindleberger-Minsky-theory does work both for the money credit integration *before* world war two and the money credit disintegration *after* world war two as it deals primarily with credit which both goes hand in hand with broad money *before* world war two and dominates the field after world war two.

A common vocabulary in explaining the process leading up to financial crisis is the “boom and bust”-concept. Where “boom” refers to a sharp increase in economic activity, prices and debt and “bust” refers to sharp fall in asset prices, increase in the price for credit (interest rate) and thus insolvency, illiquidity for banks and in the worst scenario: a financial

crisis. This phenomenon of "booms and busts" is central to the "Kindleberger-Minsky-theory" - which named after its main founder Hyman Minsky, and main implementer Charles Kindleberger, who where economic researchers active primarily during the 20th century (Larsson, Lönnroth 2014: 26f). The theory is built on the assumption that the financial market is *endogenously* instable because of its market nature during the fluctuations in the economy and thus risks creating "boom and bust" -periods. The reason is that during the boom period - that can occur for many different reasons, for instance *exogenous* factors like war, new technical innovations and new regulations that creates imbalance and speculation - credit is cheap since prices increases and economy is flourishing, hence the "boom" or the "bubble" is reinforced endogenously by the financial market through cheap credit. The boom period is, according to this theory, characterized by three "units" or stages of income and debt relations, those are the "hedge"- the "speculative"- and the "ponzi finance"-stages.

The "hedge" stages are characterized by people who can pay back all of their debts to their creditors by their equity or cash flows they possess or will possess in the future. People who can pay their interests to with their own money but can only pay their debts by issuing new debt characterize the "speculative" stages. The "Ponzi finance" stages are characterized by operators who can neither pay their interest nor their repayment of principle with their own money and have to borrow and/or sell assets to pay both their debt and interests.

The "hedge" is thus a stable and relatively secure unit whereas the "speculative" brings certain risks and "ponzi finance" units puts a significant risk on their creditors and borrowers and thus for bringing the entire financial market into an unstable state. According to the financial instability theory of Kindleberger and Minsky the periods of significant booms, hence good economic times, the capitalist economies tend to endogenously move from a system of more hedge units to a system of more speculative and ponzi-finance units. The reason is that boom are, by the nature of the financial markets, encouraged and enhanced by cheap credits since the good economic times creates a false sense of security for credits and hence the financial system is in itself creating the "boom" (Minksy 1992) (Minksy 1977). That is part of the reason why *credit* and not just *broad money* are central for financial crises.

In "busts", when asset prices are falling due to lack of trust in the sustainability of the prices the boom creates, the debt has to be repaid which enhances the deflation –in line with the debt-deflation theory of Fisher (1933) - and insolvency and illiquidity becomes a problem for banks and economic activity stagnates. The credit is then expensive since the risk with lending is increasing during these bad economic period and people tend to borrow less

during deflation. Therefore the "bust" is enhanced and prolonged, by the financial market both through the debt-deflation phenomenon and the expensive credit that follows bad economic times. The boom is therefore endogenously self-reinforced by the financial system. In modern times a central banks monetary policy that lowers the interest-rate during the downfall and eases the bust is desirable according to Minsky. However, worth noticing is that Minsky pointed out the danger of governments constraining the monetary policy during inflationary booms since it increased the change of hedge turning into speculative and speculative to ponzi and ponzi to evaporation might lead to a collapse of asset values and thus a financial crisis. Furthermore, Minsky stated that modern central banks tended to lowering the interest and expanding the money supply during bust and not to the same extent higher interest rate and constraint monetary policy during boom and inflation, whereas, in practice, the bust got eased but the boom did not get cooled down and sometimes got even more reinforced by central banks monetary policy (Minsky 1992) (Minsky 1977). Kindleberger/Minsky theory should therefore, in my view, not be seen as theory which presumes Laissez faire-economy for these fluctuations but actually both uses these fluctuations of the market for arguing for some state involvement while at the same time also warns of counterproductive state involvement.

Kindleberger-Minsky theory is - as mentioned earlier - also taking into account exogenous factors – like for instance war, innovations and new rule of law - as the "trigger" for financial instability and crises. It can thus be claimed that Kindleberger-Minsky-theory is broad in its scope since it takes into account the nature of financial markets, government monetary policy and the exogenous factors outside the financial market as opposed to for instance a pure Monetarist view that is exclusively looking at monetary policy (Larsson, Lönnroth 2014: 25ff)

I intend to apply the Kindleberger-Minsky-theory as theoretical framework for my thesis. Hence the analysis, interpretation and conclusion of my data will relate to this theory. However, I will not use it uncritically and I will point out both its strong and weak spots in relation to my findings. I will hence test the Kindleberger-theory as a hypothesis for the evolution of and relationship between financial crisis and household debt fluctuations in Sweden 1873-2015 and point out both possible support and possible contracts for the hypothesis together with more moderate comparisons with earlier research presented in chapter 2.1, for doing that I will of course have to use a relatively robust and reliable data. In the next chapter I will present and discuss the data I use.

4. Data

I use three data series from "Swedish National Wealth Database" (SNWD) namely "total household liabilities", which is all household debt - including liabilities to the private financial sector, liabilities to the public sector and informal debts - and household disposable income which includes all legal income after tax and data on public debt (Waldenström 2015). This data are created and provided by professor Daniel Waldenström at Uppsala University as a part of his "Swedish National Wealth Database" (SNWD) which is created and presented in line with the principles of The System of National Accounts of the United Nations, SNA 2008 and Eurostat's, ESA 2010 (Waldenström 2015b).

I will also use Ahnland (2015) data on private debt - which is private business debt and household debt - and subtract it with the household debt of Daniel Waldenström data to separate private business debt and household debt. To do this I have also subtracted certain part of each data series to make them more comparable, since Ahnland and Waldenström use slightly different data for these numbers. The parts I have subtracted are "Farming, shipping and industrial mortgage and credit company credit" and "Finance company credit" from Ahnlands data, and "liabilities insurance companies" from Waldenströms data (Ahnland 2015) (Waldenström 2015b). However, I what to point out that I only have been able to subtract liabilities to insurance companies up until 1970, after this year they are "hidden" in private liabilities since Statistics Sweden started to measure this differently. On the other hand the part of household debt that goes to insurance companies are about 1 % around 1970 and it is not a very big part today either, even though it increased a little bit during the 1980s, in 2005 it was still only about 3 % (Waldenström 2015b). This small difference does not, in any notable way, affect the over all picture that I intend to visualize with comparing household debt to private business debt and public debt.

Furthermore I will use historical data on GDP from the *"The Swedish Historical National Accounts 1560—2010"* that are created and provided by professor Olle Krantz and professor Lennart Schön (Krantz, Schön 2015). I will deflate all current prices in all my data with the GDP in real prices of 1910, 1911, 1912 divided by 3, as the prices in Krantz and Schön are (2015). All these data have also complemented with relevant and suiting data from Statistic Sweden to fill out those recent years that are not covered in the historical data-set, there are generally two or three years at the end of my time period regarding household debt, household disposable income and public debt (SCB 2016) (SCB 2016b) (SCB 2016c). I will also use Mats Larssons and Mikael Lönnborgs book "Finanskriser i Sverige" (2014) as

qualitative data to utilize the broader contexts for the reasons, developments and solutions of these different financial crisis in Sweden.

To get something useful out of the data I will of course have to use a suitable method for my research question. I have found the *Event analysis approach* as used in Schuler and Taylor (2012) to be very suitable for this thesis; below I will present that method in more detail.

5. Methods

In similarity with the *event analysis approach,* as used in Taylor and Schuler (2012), I will in this thesis take every third, second and first year before the crisis, then the average rate of the crisis years of the event and then the first, second, third year after the crisis –however, Schularick and Taylor is doing a slightly different interval namely just the crises and five years after. I will then make averages of every one of those years in every crisis and compare them to the average of the whole time period, minus this "crisis frame", of 1873-2015. The reason for using three year before and after as an frame and interval is that the growth rates and fluctuations in significantly different during those years compared to "normal years" outside the period adjacent to a crises. For visualization in graphs I will extend this interval to five years before and after. The reason for this is that I what to visualize the growth rate and fluctuations in relatively normal years to the three years before and after. I find five year before and after the crisis suitable, because you can see the (some) fluctuations from "normal" growth rates to "abnormal" ones quite clearly. Another reason is that before world war two (which is the period 80 % of the crisis events in this thesis belongs to) debt growth level did not go back to its "normal" levels until about five years after a crisis (Schularick, Taylor 2012). However, as my visualization will show the debt rates goes back to normal levels before year five in my data set.

I will compare this to all other years hence all years except every crises years three years before every crises and three years after each crises. I will hence calculate the average growth rate for this period. To also compare the fluctuation between the crises frame and the non-crises frame years I will use a standard deviation for all crises frame years and compare it to every non-crises frame years. When calculating the fluctuation I will use a standard deviation and compare it between crises and non-crises periods. However, since the crises periods are smaller than the non-crises periods there might be risk for the fluctuations in the non-crises to be less visible than in the crises periods. I have 41 years in standard deviation for crises periods and 101 years in standard deviation in non-crises years. Even

though the results are significantly higher in crises than in non-crises periods, this weakness in comparison might be important to bear in mind.

The method I use resembles the method, which is used in Taylor, Schularick (2012) and Ahnland (2015) and the method is labeled ”event analysis approach” by Taylor, Schularick (2012). However, there are differences in my methods and the methods used in Taylor, Schularick (2012) and Ahnland (2015). Besides the fact that I used different data-sources, I am also using a simpler and more “straightforward” approach. For instance, Ahnland (2015) uses a *logit regression* to analysis the probability of crisis in relation with private debt. My analysis is purely based on fluctuation patterns in earlier crisis to judge if we are in the risk of a financial crisis now. The reason for this is both that Ahnland already have used the method, but also, since I am purely interested in the growth rates the fluctuation patterns the logit regression is not indispensable. Below I will present those results on household debt growth rate and fluctuations in the empirical analysis.

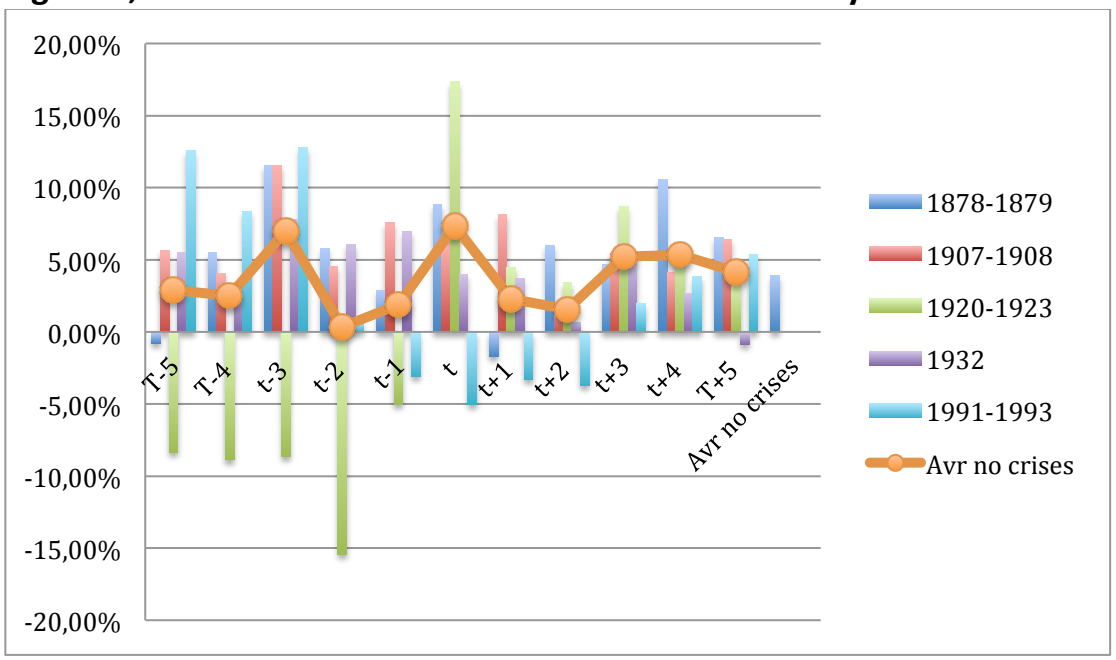
6. Empirical analysis

In this section the results from the data analysis of household debt fluctuations five years before the crises, the years during the crises, and five years after the crisis, for all (five) financial crisis in Sweden from 1873 to 2015 will be presented. These results will be compared to the average household debt fluctuations in non-boom and bust times, which is all other years except the crisis years and *three* years before and *three* years after each crises, which in the boom and bust period as defined in section 2.8. . The reasons for this definitions of crisis and non-crisis period is that I have found significant differences in fluctuations – almost twice as much during boom and bust periods than in non-boom and bust periods. When looking at the fourth and fifth years before and after the crises the fluctuation and growth rates of becomes significantly more in line with non- boom and bust years. The same happens when one adds the fourth and fifth years to the boom and bust period.

However, one shall bare in mind that non-crisis year of course is non *financial* – crises years. There are therefore economic and structural crisis that *almost* qualifies as financial crises happening in the non financial-crisis years, for instance the oil-crises in the 1970s, the dot.com-bubble in the early 2000s and the great recession in 2008-2009 - where some banks was very close to go bankrupt and receiving state funds (Riksgälden 2015). However, looking at the fluctuation for these periods they are not in line with the pattern of the financial crises, for instance there is no boom in the third year before the “crises” (t-3) and bust in the second year before the “crises” (t-2).

Because of the each crises uniqueness I will first briefly present and discuss each crises and boom and bust period separately and compare them to the average growth rate and fluctuation of all crises and boom and bust periods and also to the growth rate of all non-boom and bust periods. Figure 4 is showing this diversity of household debt rate for each crisis and boom and bust period. The results on household debt growth rate will be presented in three ways namely as *pure growth rate*, *debt to disposable income ratio growth rate* and *debt to GDP ratio growth rate*. This is for bringing a broader view of how debt growth relates both to itself but also in relation to the important factors of disposable income ratio growth rate, because it indicates the household vulnerability, and GDP ratio growth rate because it shows how big household debt is compared whole economy. The results will then be analyzed and compared to previous and relevant research and also to the Kindleberger-Minsky theory. The crises that I will examine occur in five events over the years of 1873 and 2015 namely, 1878 to 1879, 1907 to 1908, 1920 to 1923, 1932 and 1991 to1993. I will present and analyze the crises including boom and bust period chronologically starting with the first financial crisis 1878-1879 and its adjacent years including the boom and bust period.

Figure 4, Pure household debt in crises and non-crises years 1873-2015



Data sources: (Waldenström 2015) (Krantz, Schön 2015) (Ahnland 2015)
T= years of the crisis. T-1= first year before crisis, T-2 second year after the crises, and so on.
Avr no-crises= Average of growth rate in all years excepts crises years and three years before and after crises years
Blue bar = Household debt growth rate in 1878-1879 and adjacent years plus average growth rate of all average non-crises years
Red line= Average growth rate of all crises years and adjacent years to these crises years 1873-2015

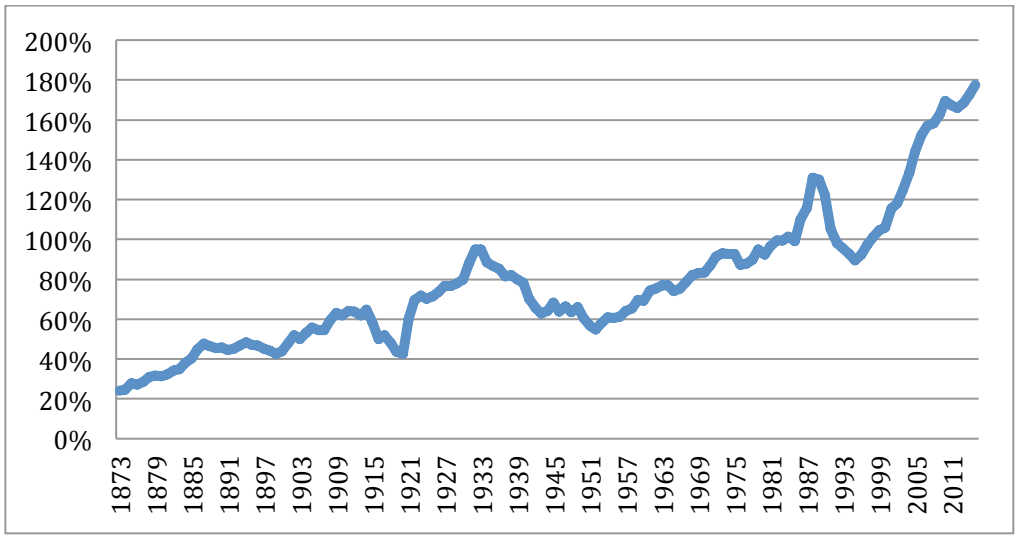
6.1 1878-1879 crisis

6.1.2 Background

The crisis of 1878 and 1879 took place in the cradle of Swedish industrialization, finalization and modernization. It was just fourteen years earlier, in 1864, that Sweden introduced the "Statute on Freedom of Trade" (which completed the abolishing of the guild system that took place in 1846) (Schön 2010:130). It was just five years earlier that Sweden adopted the gold standard (Schön 2010:108). And it was during these times that people actually started to use the financial system in a relatively widespread way for their personal borrowing of money to their household economy (Waldenström 2015). However, there was actually an external factor, namely the French-German war of 1870-1871 that - though distortion in the commodity market caused an artificial "hausse" - was the trigger for the imbalances that would eventually lead up the actual financial crises. Through price distortion in bonds created by international economic imbalances during and after the war a bubble was building up that eventually burst (Larsson, Lönnborg 2014: 63-66).

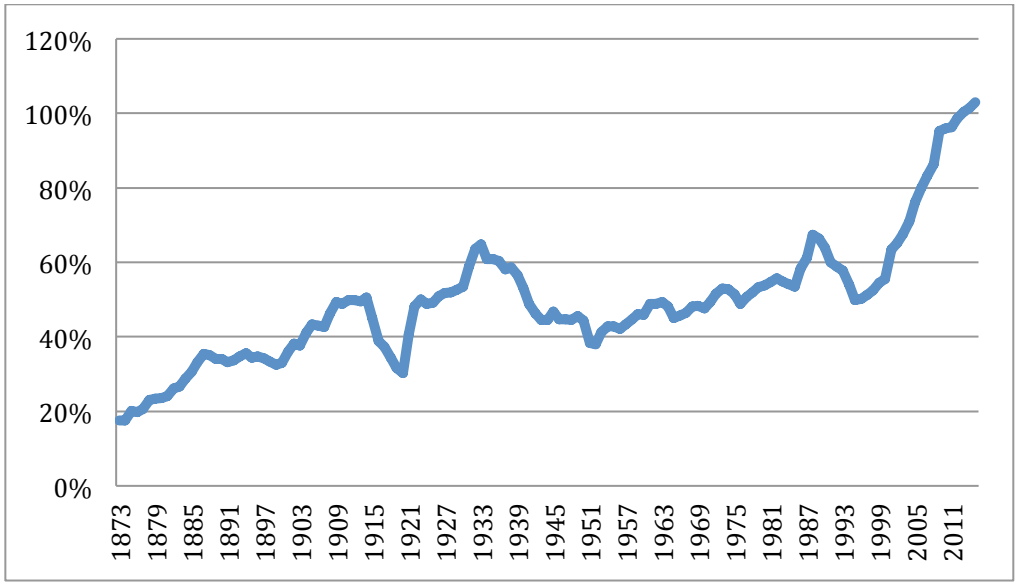
Even though household debt was relatively moderate compared to the levels it would eventually evolve into the coming 142 year (see figure 5 and 6), the pattern of household debt fluctuations during this period is very similar to the other crises periods, in where household debt was a vastly bigger factor of the economy both in relation to GDP and disposable income. In the next section this pattern will be examined in more detail.

Figure 5, Household debt to disposable income ratio 1873-2015



Data sources: (Waldenström 2015) (Krantz, Schön 2015)

Figure 6, Household debt to GDP ratio 1873-2015



Data sources: (Waldenström 2015) (Krantz, Schön 2015)

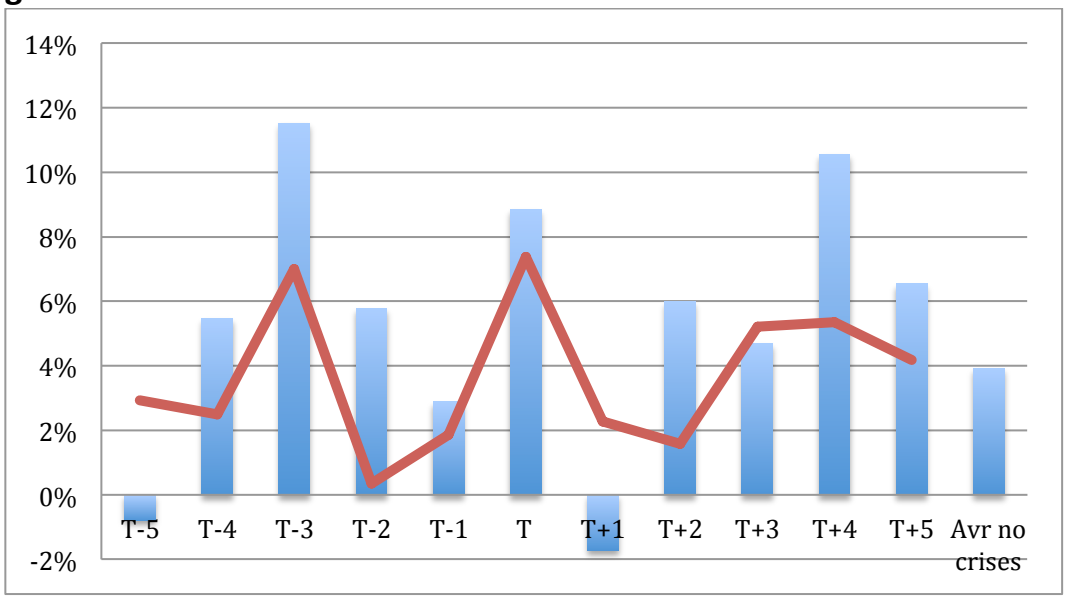
6.2.2 Results household debt fluctuation and growth

As figure 7 shows the fluctuation pattern of household debt rate of the crisis period of 1878-1879 are in line with the fluctuation of the average crises period. The growth rates generally a little higher except in the T+1 year. This is partly because the average is probably lowered significantly by the quite unique deflation crisis of 1920-1923 – see figure 4.

When comparing at the debt to disposable income ratio growth rate – figure 8 - for this crises period and average crises period one can see that the pattern does differ a little more especially in T-1 T+3 and T+5. The fluctuation is sharper both in the average and the crises period of 1878-1879, which indicates that disposable income also follows the debt fluctuation negatively and therefore enhances it the ratio.

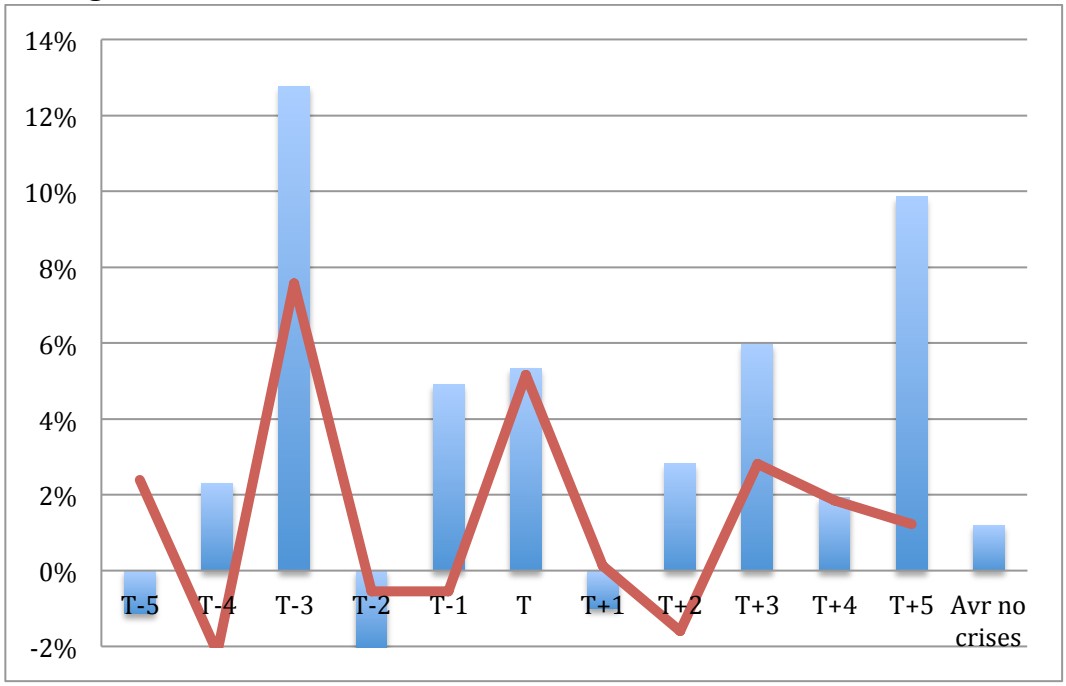
When comparing with the growth rate of debt to GDP – figure 9 - the pattern is very similar to the growth rate of debt to disposable income. However, the fluctuation is even more pronounced in the debt to GDP ratio, which naturally indicates that GDP has an even more negative relation than disposable income in relation to the rise and fall of household debt. Both the growth rate of debt to GDP and the debt to disposable income ratio during the crisis period are significantly higher and lower than the average of the non-crises period. Very much more than if we separate the debt and do not take disposable income of GDP into account.

Figure 7, 1878-79 crisis in relation to average crises in pure household debt growth rate



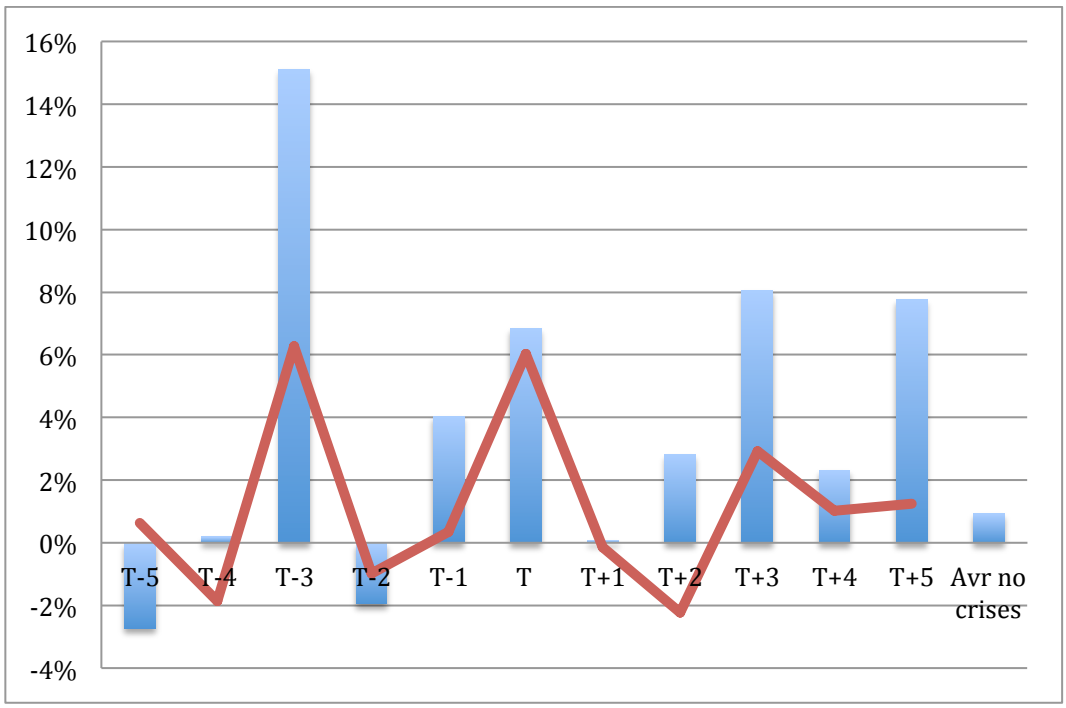
Data sources: (Waldenström 2015)
T= years of the crisis. T-1= first year before crisis, T-2 second year after the crises, and so on.
Avr no-crises= Average of growth rate in all years excepts crises years and three years before and after crises years
Blue bar = Household debt growth rate in 1878-1879 and adjacent years plus average growth rate of all average non-crises years
Red line= Average growth rate of all crises years and adjacent years to these crises years 1873-2015

Figure 8 1878-1879 crisis compared to average crises in disposable income ratio growth rate



Data sources: (Waldenström 2015) (Krantz, Schön 2015)

Figure 9, 1878-79 crisis compared to average crises in household debt to GDP growth rate



Data sources: (Waldenström 2015) (Krantz, Schön 2015)

6.2.3 Discussion In relation to Minsky-Kindleberger theory and relevant previous research

The crisis of 1878-1879 is in many ways in line with the Kindleberger-Minksy theory of financial crisis evolution. An external shock – in this crisis through the French-German war – created a demand boom for Swedish oat and steel. Obligations were the tool for which the demand for credit to these industries was handled. These obligations turned out to be unsustainable when the bust came and the financial crisis started to evolve (Larsson, Lönnborg 2014: 63-66).

In all three measurements (pure debt growth rate, disposable income ratio growth rate and GDP ratio growth rate) during the years around the crisis of 1878-1879 we see a pattern of "boom" and "bust". Just as in the average of all crises the most striking is the "boom" rise of t-3 followed by the sharp "bust" fall in t-2. This is in line with Taylor and Schularick findings that a fall in debt growth rate the second year before a crisis is typical for financial crisis. One can interpret this as credit boom euphoria in t-3 that turns into a bust in t-2, which hence in line with Kindleberger-Minsky theory might lead to a financial crisis. However the self-reinforcing mechanism of boom and bust is not crystal clear since growth rate increases both t-1 and in crisis to fall again in t+1. One can also question the level of impact that household

debt in this crisis. In 1878 and 1879 the modern financial, credit and banking system was in its "cradle" and banking credit was first and foremost reserved for private business and public sector. The finalization of household was during this time not evolved in a significant way (Waldenström 2015b). Nevertheless since the trend of household debt follows the same pattern as in crises which more excessive household credit periods the indication is that household debt was affected *by* the crisis and maybe also affected the crisis. How *much* it actually affected and was affected by the crisis is a more arbitrary question. The fisherian debt-deflation mechanism was relatively short 1878-1879 - if we assume that household debt is following the deflation trend. Debt levels seems to have turned back to more "normal" levels already in the third year which is a bit faster than Schularick and Taylor finding in private debt which does not turn back to normal levels until five years after financial crisis that occurs before world war two (Schularick, Taylor 2012).

However, even though household debt had started its increase in the period in and around the crisis of 1878-1879 the level of household debt to GDP was significantly higher – and went past both public and private business debt - in the next financial crisis of 1907-1908 (se figure 13, 14, 15) which I present and analyze below.

6.3. 1907-1908

6.3.1. Background

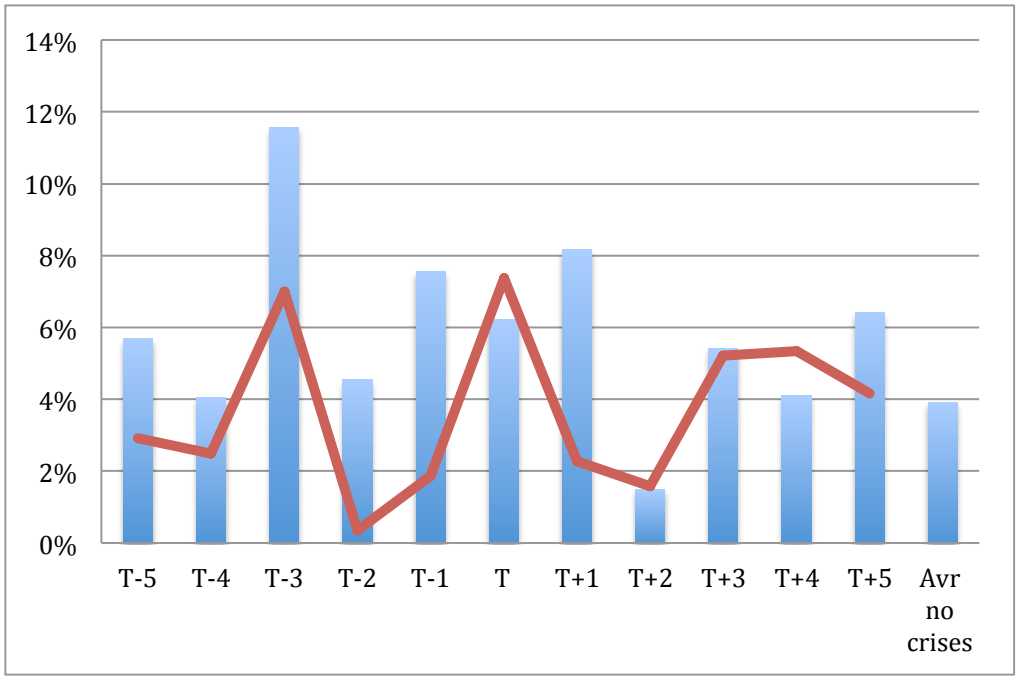
Urbanization was increasing rapidly during the years around the turn of the century of the 19th and 20th century and the abrupt imbalances that the earthquake and destruction in San Francisco – which lead to a sharply increased demand in capital and resources that effected the interest rates globally - had on the international market in general – partly through the gold standard - and in real estate and urbanization commodities in particular lead to a boom and bust in Sweden and hence a financial crisis (Larsson, Lönnborg 2014: 76).
During the period around 1907-1908 imbalances in real estate and industry was the main cause for the financial crisis. This was during a time when urbanization and was already causing a significant demand – not least for household due to the shift from agriculture to urban life. People living of agriculture decreased in absolute numbers and the number of factory worker increased from 10% to 30% during the period of 1870-1910 and the people

was therefore demanding more and more necessities on the market instead of producing them by themselves in the agriculture society (Waldenström 2015b).

6.3.2 Results household debt fluctuation and growth

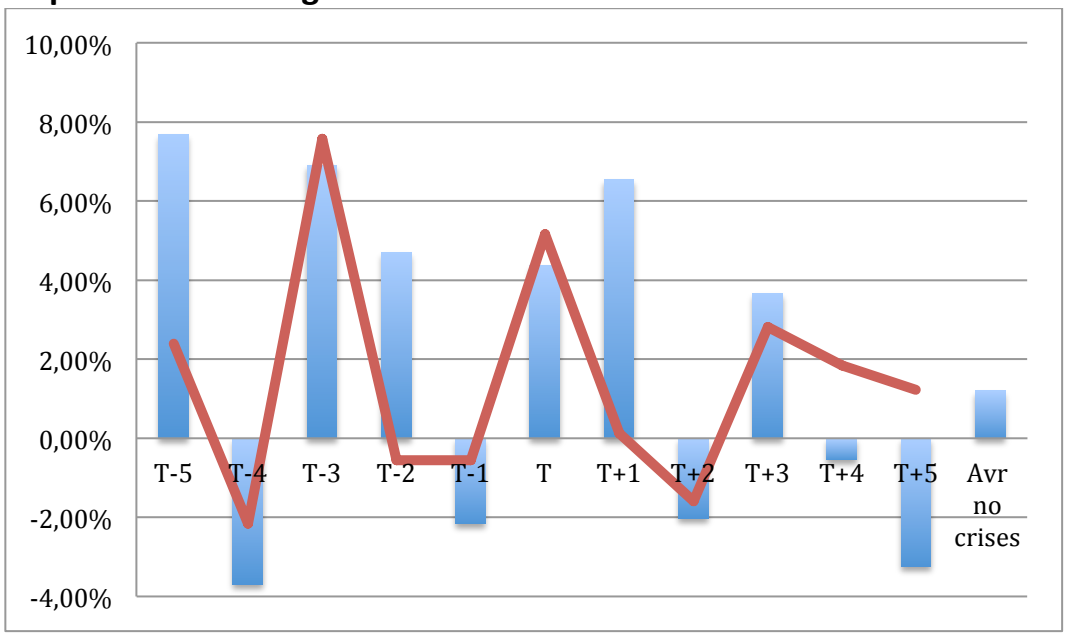
The results are very similar to the average of all financial crises. When differences in the fluctuation pattern appear they do appear within the T-1, T and t+1 and to a different extent depending whether calculating pure debt growth, disposable income ratio growth, or debt to GDP ratio growth. Comparing with both the average and the 1878-1879 crisis the boom in T-3 is there however, even though the bust in T-2 are there in both crises it is milder in the disposable income and GDP ratio growth in 1907-08 than in 1878-1879. At the same time it is sharper in pure debt growth rate in 1907-1908 than in 1878-1879.

Figure 10 1907-1908 crisis compared to average crisis years in household debt growth rate



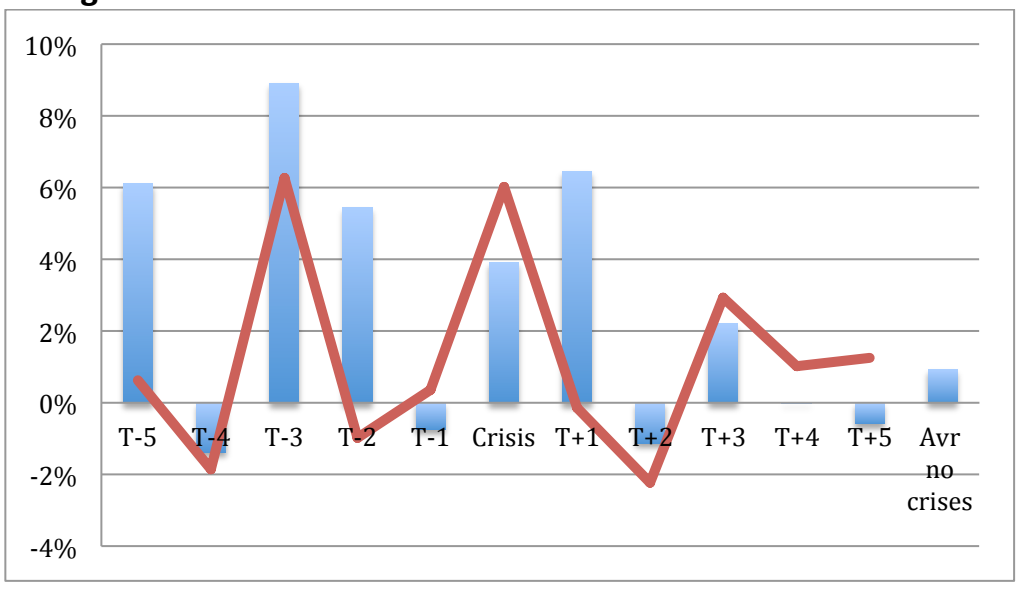
Data sources: (Waldenström 2015)

Figure 11 1907-1908 crisis compared to the average of all crisis in debt to disposable income growth rate



Data sources: (Waldenström 2015)

Figure 12, 1907-1908 crisis comared to average crisis in household debt to GDP growth rate



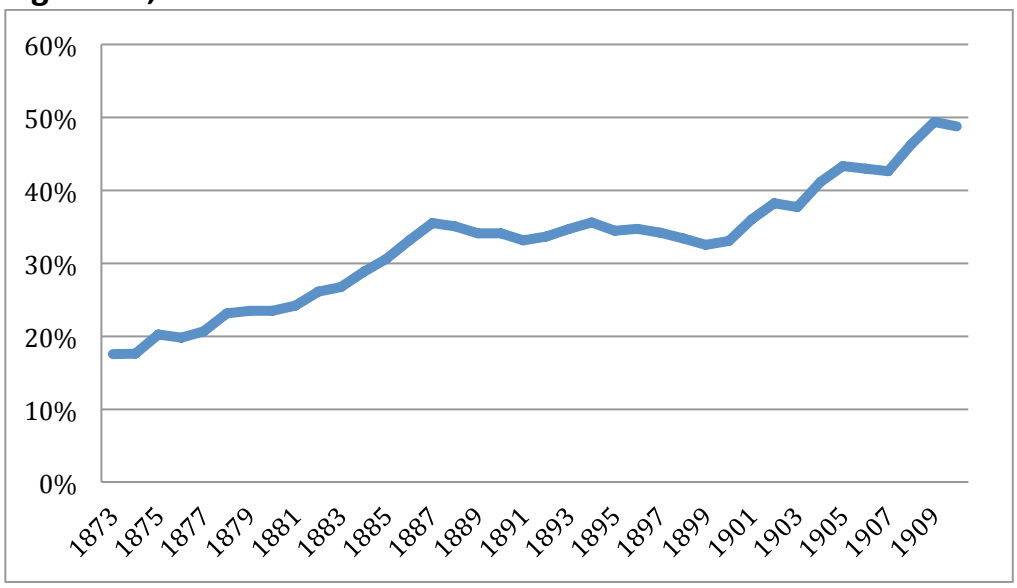
Data sources: (Waldenström 2015) (Krantz, Schön 2015)

6.3.3 Discussion in relation previous research and to the Minsky-Kindleberger theory

In the 1907-1908 crisis we do see a similar pattern of "boom and bust" as in the 1878-1879. The typical sharp decrease in debt growth rat between third and second year before the crisis also appear here. The crisis of 1907-08 thereby follows Kindleberger-Minsky-theory in its self-reinforcing boom and self-reinforcing bust period although the boom and the bust is not as sharp or volatile as in the 1878-1879 crisis. The Kindleberger-Minsky-theory is also supported in this crisis by the external shock that lead up lead up to the instability in mainly real estate and industrial material business namely the earthquake in San Francisco which lead to a demand in capital and resources that effected the interest rates of the whole economy within all countries that were linked to the US market through the gold standard. One can of course question how relevant household debt is in a crisis like this, which first and foremost affect private industry and public economy. However, since the transformation of Swedish society with more household debt as a consequence the demand for capital and credit from household of course also affect the crisis. In fact during this time household debt became bigger than both public and private business debt and the demand for credit and capital by households would therefore indicate notable impact on the crisis - see figure 13, 14 and 15.

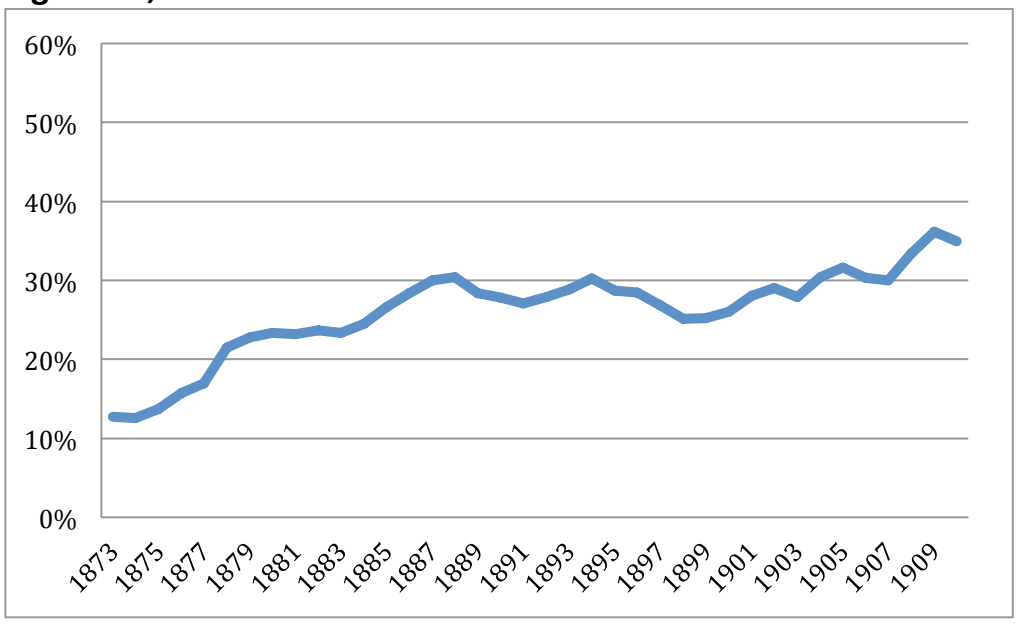
The magnitude of household debt is hence bigger than in the previous crisis of 1878-1879. This can be shown both in qualitative and quantitative evidence. The rapid industrialization between 1870s and 1910s had put a significant change in demand for households. Agriculture work decreased in absolute numbers and the level of factory workers increased from 10% to 30% during this period. Thereby more and more people was demanding a bigger amount of food, clothes, housing and other necessities on the *market* instead of producing them by themselves in the agriculture society This is also shown in the financial system were credit to households is expanding first and foremost through the so-called "Savings banks" or "Sparbankerna" (Waldenström 2015b) The following graphs show the increase of household debt during this time.

Figure 13, Household debt to GDP 1873-1910



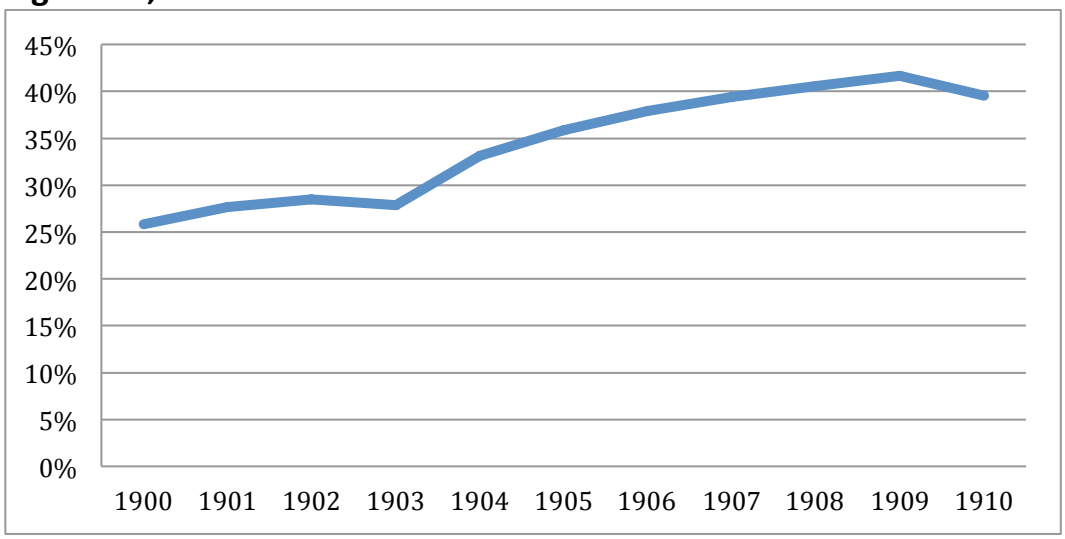
Data sources: (Waldenström 2015) (Krantz, Schön 2015)

Figure 14, Public debt to GDP 1873-1910



Data sources: (Waldenström 2015) (Krantz, Schön 2015*)*

Figure 15, Private business debt to GDP 1900-1910



Data sources: (Waldenström 2015) (Krantz, Schön 2015) (Ahnland 2015)

This graphs shows the significant increase of household debt to GDP between1878-1879 crisis and the 1907-1908 crisis. This reflects the "finalization" of households, were a lot more of the households commodities was *bought* on the the market and not *produced* on their own farm. One can compare the magnitude of household debt to the magnitude of public debt to get a clearer view of the expansion of household debt during this time period. One can notice that they start at fairly similar levels in 1873 but end up with household debt at a higher level than public debt. Unfortunately I do not have data on private business debt before 1900 but at 1910 it was smaller than household debt. However, debt in general and household debt in particular would experience a significant decrease to GDP in the following years during world war one and the deflation period after the war. Which leads us into the next crisis namely the deflation crisis of 1920-1923.

6.4. 1920-1923

6.4.1. Background

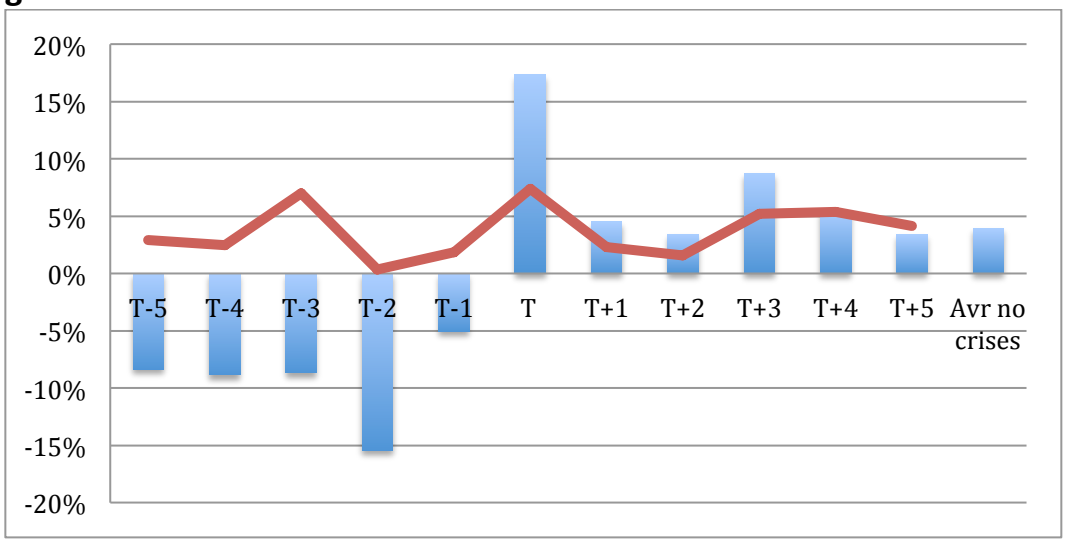
The 1920-1923 crisis stands out in the group of crises in this thesis as the most volatile and the only one with negative growth rate in household debt five years before the crisis. The reason for this is probably that this crisis was preceded and partly caused by severe deflation. This in turn was probably due to the imbalances in prices that world war one had caused. During the war, which Sweden was not part of, Sweden developed a successful inward industry of goods that normally would have come from imports. The war had, however, made

those imports impossible. Prices had then gone up on those commodities, which was previously imported but now, to a large extent, was produced in Sweden. However, when the war ended and foreign countries started exporting again, the Swedish industry could not compete with the re-imported commodities and their prices. This lead to a deflation in the swedish economy and bankruptcy for those companies specialized in the commodities that had been imported before the war and that now was imported again. Naturally people probably borrowed less and less money during the deflation – because of the increased values of their debt - and also tried to pay back their debt before they becomes larger due to the deflation, a behavior which of course enhanced the deflation.

6.4.2 Results household debt fluctuation and growth

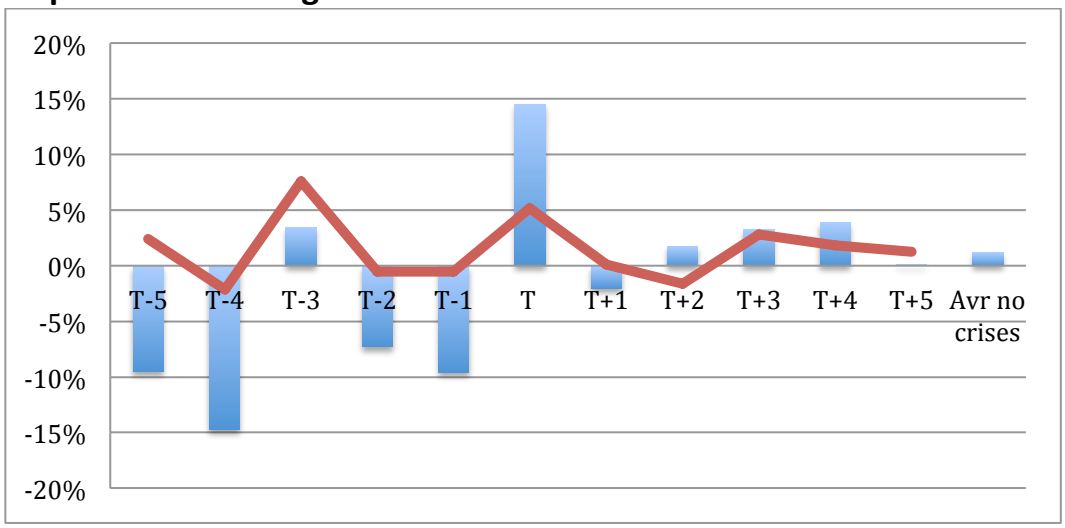
Nevertheless, the pattern is almost the same as in all other crisis except that the "boom" is only occurring in relation to disposable income and GDP and not in it self during the third year before the crisis. However, the "bust" is occurring in all three ways of measurements at the same year as most other crisis, namely the second year - the decrease in debt growth rate is significant between year t-3 and t-2. The growth rate of debt is however back to quite normal levels already the first year after the crisis and if we assume that debt growth is following deflation and inflation the debt-deflation theory does not seem to be accurate here,; which lead us into the discussion on the results in relation to previous research and the Minsky-Kindleberger-theory.

Figure 16 1920-1923 crisis compared to average crises in household debt growth rate



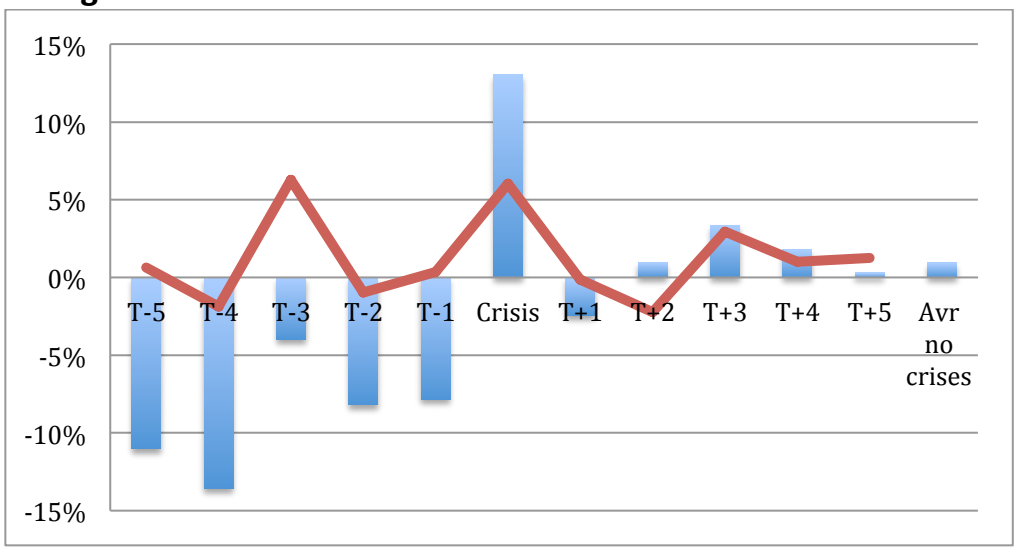
Data sources: (Waldenström 2015)

Figure 17, 1920-1923 crisis compared to average crises in household debt to disposable income growth rate



Data sources: (Waldenström 2015)

Figure 18, 1920-1923 crisis compared to average crisis in household debt to GDP growth rate



Data sources: (Waldenström 2015) (Krantz, Schön 2015)

6.4.3 Discussion in relation to previous research and the Minsky-Kindleberger-theory

Even though the growth rate of household debt is negative in the years before this crisis the findings are as much in line with the Kindleberger- Minsky theory as the previous crises. However, part of the theory that is emphasizing external shock is definitely relevant since world war one was probably the main reason for the whole crisis and an *extreme* external shock to the global economy and society as a whole. Speculation was also frequent during world war one– although not necessarily visible in household debt growth rates - and had significant relevance for the crisis.

However, these results differs from Schularick and Taylors findings that debt levels (for private debt) is back to normal first after five years after a crisis in the pre world war two era.

6.5 1932 crisis

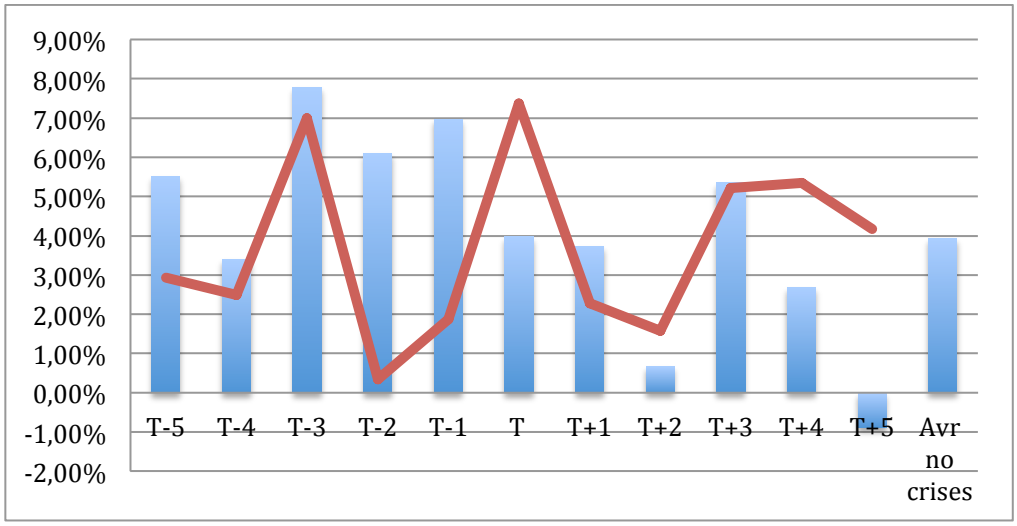
6.5.1. Background

The great depression had actually not hit Sweden until the Krueger Company caused severe imbalances in the Swedish economy in 1932. This financial crisis stands out from the other financial crises during this time period both in fluctuation pattern and in the nature of the context that caused it. The "Great Depression" was affecting different part of the world economy but Sweden had for a long time actually manage to stay out of the worst form of economic downturn. This changed however, when the unsustainable lending to the Krueger Group met mean end. The Krueger Group had an disproportionately large share of Sweden's total credits and economy, this combined with a expansion of the Group though excessive borrowing and in fact severe manipulation of the internal economic status lead to financial crisis in Sweden 1932. This was largely due to one single company and its lack of transparency. The lack of transparency and thus knowledge of what was going on in the balance sheet of the company might be a reason why the results in household debt growth rate quite different from other financial crises in Sweden. This leads us to the results of fluctuations and household debt growth rates.

6.5.2 Results household debt fluctuation and growth

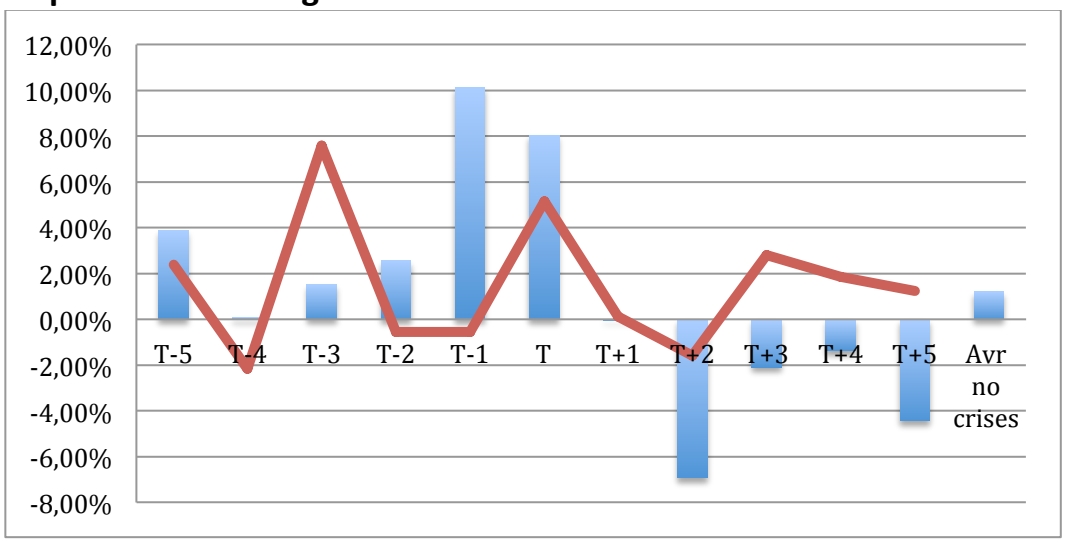
The results of household debt during this crisis and adjacent years differ the most from all other crisis during the time period of 1873-2015. This might not be that surprising since the crisis was where rare in its context. In fact in was mostly caused by a single company the Krueger Group that had an abnormal big part in the total national debt in Sweden. As we see the pure household debt growth rate is rather stable before the crisis and has a decrease first after it. This might be because the Krueger Group actually was manipulation information about its current economic state and thus the market did not react to the risks that lay ahead.

Figure 19, 1932 crisis compared to average crisis in household debt growth rate



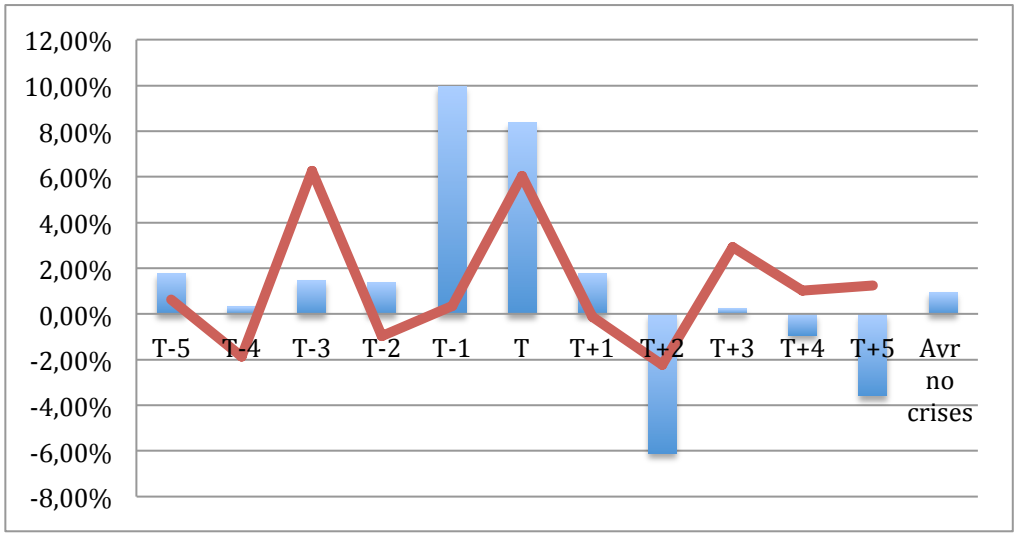
Data sources: (Waldenström 2015)

Figure 20, 1932 crisis compared to average of all crisi in household debt to disposable income growth rate



Data sources: (Waldenström 2015)

Figure 21, 1932 crisis compared to average of all crises in household debt to GDP growth rate



Data sources: (Waldenström 2015) (Krantz, Schön 2015)

6.5.3 Discussion in relation to previous research and the Minsky-Kindleberger-theory

Therefore this crisis also differs significantly from the previous research on crises and on the Kindleberger-Minsky-theory. The only this we can see is a slight downturn after the crisis in pure household debt growth rate and an increase in relation to GDP and disposable income during the crisis which is caused by severe fall in both GDP and disposable income. Otherwise there is no direct link to the Kindleberger-Minsky theory in regards to this rather exceptional crisis.

6.6. 1991-1993 crisis

6.6.1. Background

Finally there is the crisis of the 1990s. The only crisis that take place after world war two and also the most severe one of all the crisis represented in this thesis – the speculation bubble leading up to this crisis is actually on Kindleberger and Aliber list of the ten biggest speculation bubbles in world history (Kindleberger Aliber 2011:11) (Larsson, Lönnroth 2014). Apart from the other crisis in this thesis the 90s crisis affected *all* parts of the economy. Its cause was also quite complex and manifold.

After the Great Depression and during the Bretton Woods system the financial system was relatively strictly regulated. This was, not the least, evident in strict credit and currency regulation – Sweden defended its fixed exchange rate until 1992 and had a tight credit ceiling rule for banks during these times (Larsson, Lönnroth 2014: 125-128). However, after Bretton Woods ceased in 1973 the world economy became both more global and more credit based than under this monetary regime – the fiat standard made credit creation more easy and important and the floating exchange rates that started to become popular was very feasible for the free movement of capital around the world (Eichengreen 2008: 134ff). Sweden on the other hand defended its fixed exchange rate with several devaluations during the 1970s and early 1980s. In 1985 Sweden started to adapt to the world trend and deregulated large part of its financial market including abounding the credit ceiling for banks. This released a long pent demand for credit which is very evident in the growth rate of household debt from 1985 to 1986 which increased enormously - see figure 25, 26, 27). However, Sweden continued to defend its fixed exchange rate. This combination of deregulated credit and financial market and a rigid defend of the fixed exchange rate – which in its most extreme form resulted in interest rates of 500 % during a few week in 1992 – was probably both the trigger and the cause of aggravation of the crisis in 1991-1993. The deregulation of credit market lead to a minskian "ponzi-speculation" in stocks and housing and the defense of the fixed exchange rate probably prolonged the agony of the recession since it made interest rates increase dramatically. In 1992 after a few weeks of 500 % interest rate, Sweden finally switched from a fixed to a floating exchange rate (Larsson Lönnborg 2014:137ff, 149ff). This deface of the fixed exchange rate probably explains a large part of the difference in fluctuation patters in this boom and bust period compared to the others. This leads us into the results of growth and fluctuations in this boom and bust period.

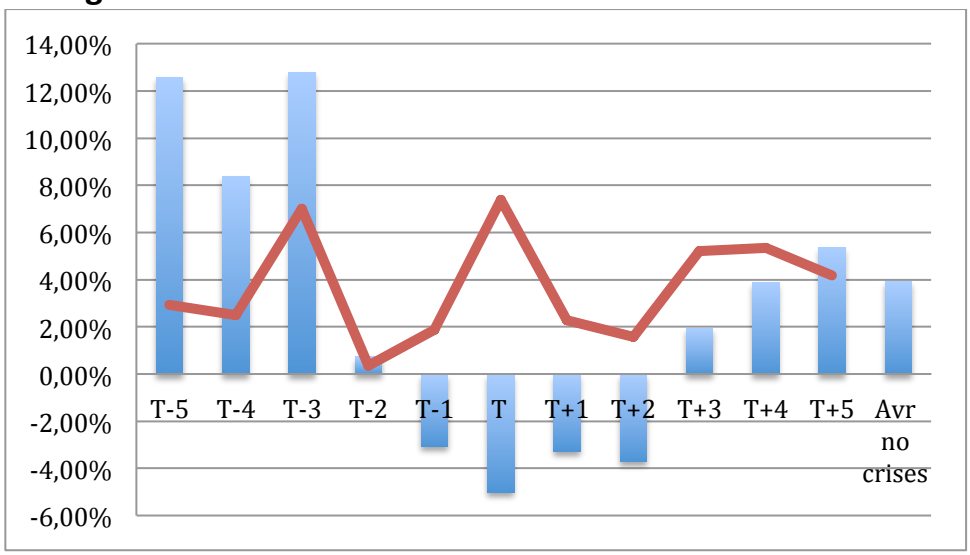
6.6.2 Results household debt fluctuation and growth

Since this crisis have very much to do with the 1985 deregulation of the credit market I have extended the number of graphs with three (figure 25, 26 and 27) which are all going back two years further than the other three graphs (figure 22, figure 23 and figure 24).

The growth rate pattern of the debt similar to the average in the pre years, once again there is a slight boom in year t-3 followed by a sharp bust in year t-2 – although the biggest boom is in year t-5 (1986) after the deregulation in, this boom is not followed by a very sharp bust "only" 50 % decrease (in relation to the average "bust" of 2038,95%). The defense of the fixed exchange rate with high interest rates is probably an important reasons why household

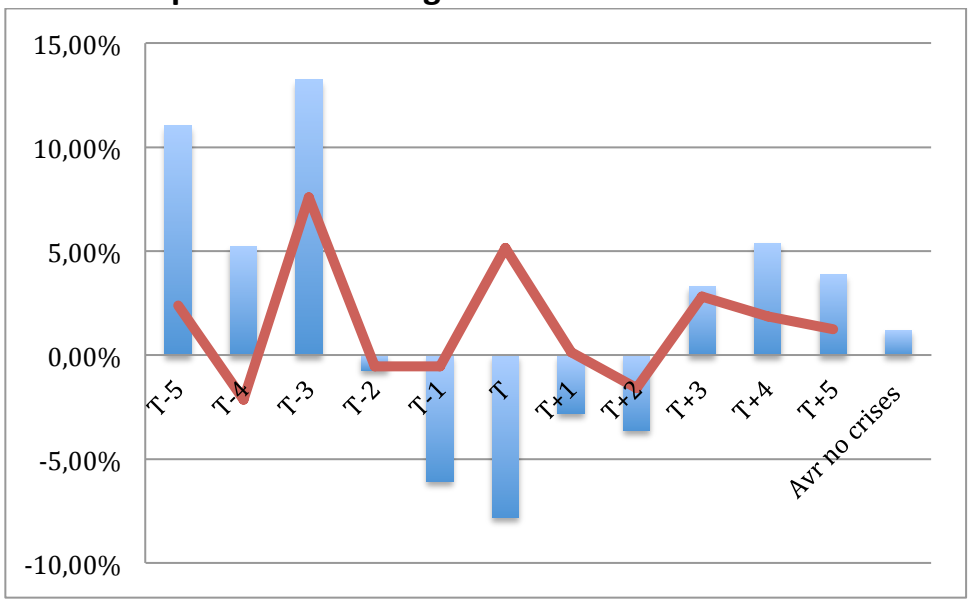
debt growth rate decreased during t-1, t, t+1,t+2 which differs from the average pattern of *increased* household debt growth rate those years. This probably prolonged the recession since liquidity was hindered to get out in the economic system.

Figure 22, 1991-1993 crisis compared to average of all crises in household debt growth rate



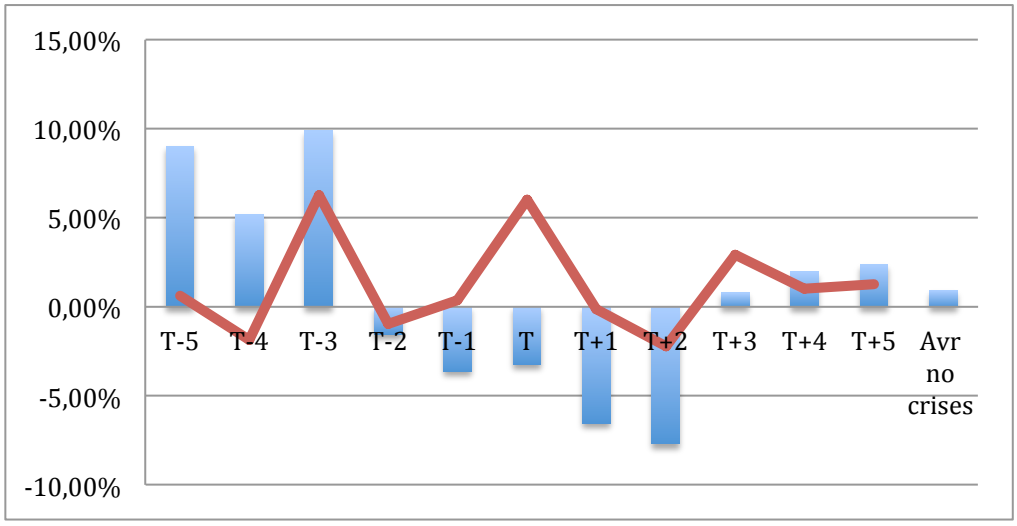
Data sources: (Waldenström 2015)

Figure 23, 1991-1993 crisis compared to average of all crises in household debt to disposable income growth rate



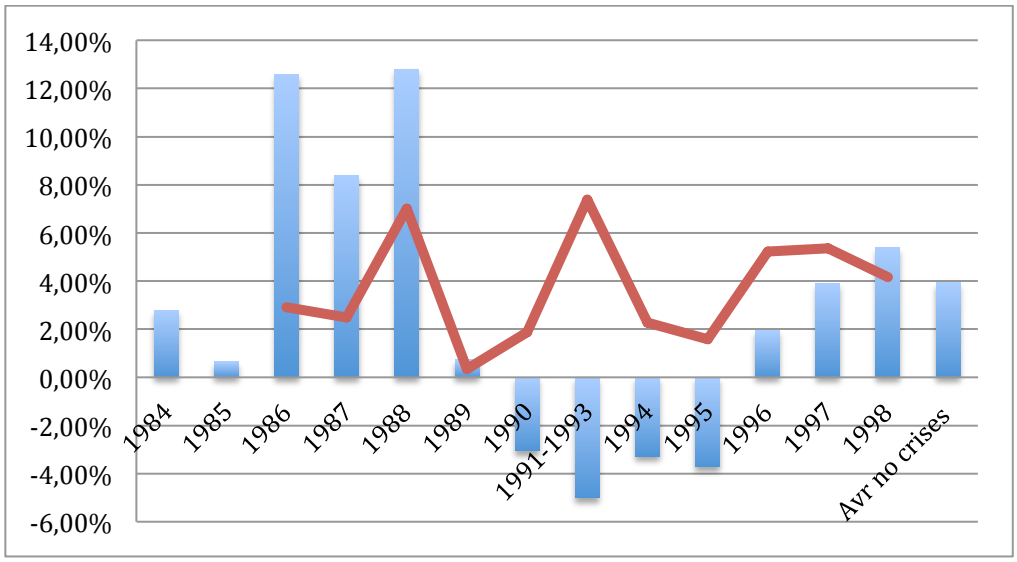
Data sources: (Waldenström 2015)

Figure 24, 1991-1993 crisis compared to average of all crisis in household debt to GDP growth rate



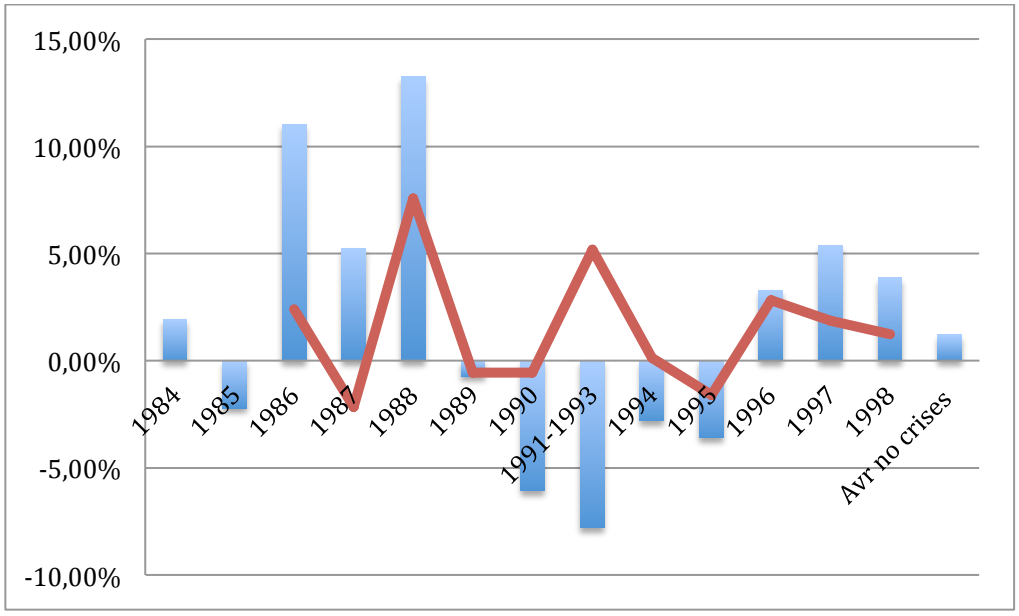
Data sources: (Waldenström 2015) (Krantz, Schön 2015)

Figure 25, 1991-1993 crisis with household debt growth rate from 1984



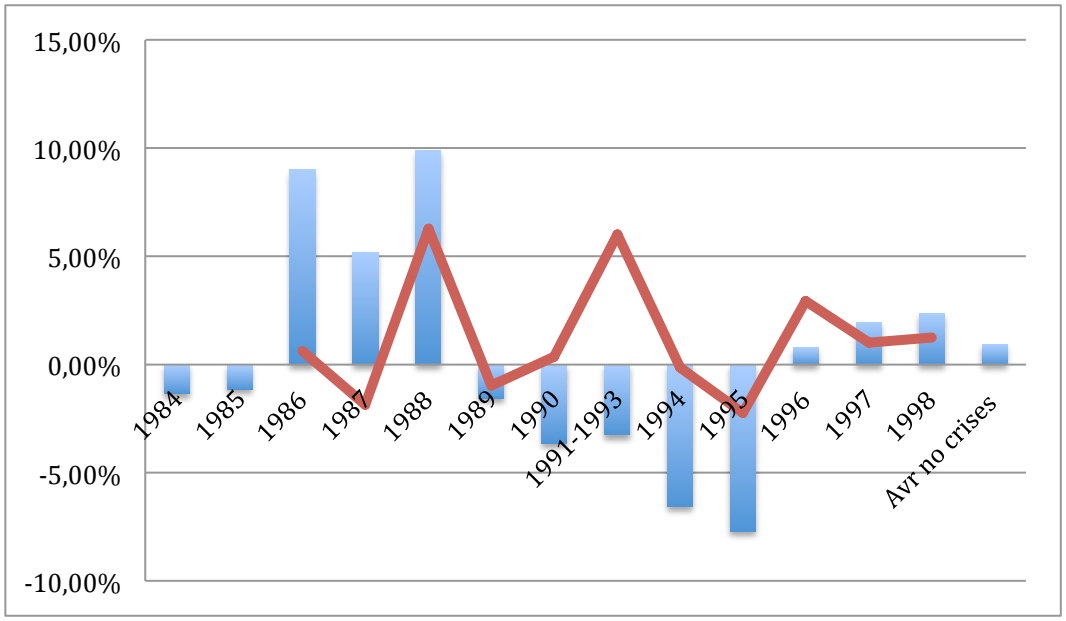
Data sources: (Waldenström 2015)

Figure 26, 1991-1993 crisis with household debt to disposable income from 1984



Data sources: (Waldenström 2015)

Figure 27, 1991-1993 crisis with household debt to GDP growth rate from 1984



Data sources: (Waldenström 2015) (Krantz, Schön 2015)

6.6.3 Discussion in relation to Minsky-Kindleberger theory and relevant previous research

The defense of the fixed exchange rate is probably one of the reasons why the post crisis year of this crisis differ from the average trend and from the Schularick and Taylor (2012) examination of post world war two period which according their study do not differ at all from the average non-crisis debt growth rate after a crisis. But as we can see it certainly does during the aftermath of the 1991-1993 crisis. It does not go back to relatively normal level until t+3 and t+4 after.

But in relation to the Kindleberger-Minsky theory this crisis is very much a boom and bust caused by an external mechanism hence the deregulation of the credit market. According to Larsson and Lönnborg (2014) the deregulation of the credit market can hardly be seen as an external "shock" but I am more willing to actually call it a shock since it was very radical from previous regulation and because it directly affected the credit market. Other shocks like war might have been more extreme it its all over human political and economic consequences but the credit deregulation was in a direct sense affecting the credit market - which is a central market in this thesis - and when we look at the difference in 1985 and 1986 growth rate in household debt weather measured in pure household debt, disposable income ratio growth rate or GDP ratio growth rate it is an increase that almost presupposes a "shock". Almost all crises have had some kind of shock presuming it although they have been very different in nature and in magnitude. This leads us to the examination of the average of all crises compared to non-crises times.

6.7 Average of all crises 1873-2015

6.7.1. Background

As we have seen there are quite different reasons and quite different contexts for each of these crisis, which is hardly surprising; each of them occur in very different economic, political and social contexts. Also the *level* of fluctuation and the *level* of household debt growth rates are quite different between crises. This indicates that crisis occur both in high and low household debt growth rates and that some crises has significantly more dramatic fluctuations than others. This is not surprising either since this period have had a number of significantly different economic and financial policy context; some of hard financial and credit regulation, some of significant deregulation and some of very expansionary monetary policy, some of strictly almost deflationary monetary policy, and of course a number of different monetary

regimes like for instance the gold standard, Bretton Woods-system and the fixed and floating fiat standards. Figure 4 is showing both the differences and the similarities in fluctuation patterns and growth that I have presented in the previous section.
Given all these differences there are however some stinking similarities with crises from 1878 to 1991 namely the pattern of household debt in general and the "boom" of year three (t-3) and bust of years two (t-2) before a crisis in particular. Another stinking trend during this time frame is the overall increasing level of debt (public, private and household debt) in general and household debt in particular. Especially household debt but also public debt has increased significantly during this period; private business debt, however, stands out as *relatively* moderate in its increase to GDP during the same period – see figure 1, 2 and 3.

In the remaining part of this section the average results of all crisis compared to non-crisis will be examined more deeply. Also, besides showing the fluctuations in crises frame years I will also try to show an indication of the differences in the level of fluctuation between crises frames and non-crises frames years. I will do this by showing the standard deviation in boom and bust periods and compare it to the standard deviation of the non-boom and bust years. After that I will discuss the average results of boom and bust periods and non-boom and bust periods- including the added a standard deviation result - through the lens of the Kindleberger-Minsky-theory and partly though other relevant previous research.

6.7.2 Results household debt fluctuation and growth

The results clearly show a "boom" in debt growth rate in the average third (t-3) year before a crises with a growth rate of 7 %, which is almost double non-crisis average, which is 3,92% and almost 2,5 times higher than the year before (t-4). This "boom" is followed by a sharp "bust" in the year two (t-2) before the crises. The average of year two is 0,34% which is about one eleventh of the average non-crisis growth rate of 3,72 % and only a fraction about one twentieth than the previous year. The fluctuation between years t-4, t-3 and t-2 can hence be seen as a debt "boom" and "bust".

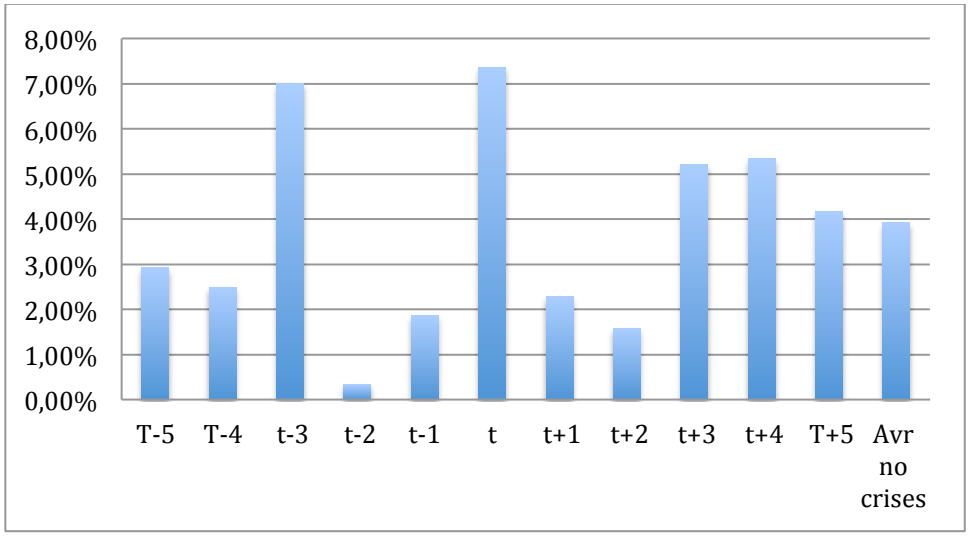
When the debt/disposable income ratio annual growth rate is calculated the pattern are generally speaking the same as when pure debt growth rate is calculated. Year t-2 and t-1 is basically the same rate in this calculation and in pure debt it increases quite significant from 0,36 % to 1,86 %. The reason is naturally that disposable income increases almost just as much. The volatility is however bigger in debt/disposable income, for instance, the boom of T-4 to T-3 goes from -2,16 to plus 7,58 growth rate which is almost five times bigger. The same years in the pure debt calculation goes from 2,49 to 7%, which is almost

three times more. Debt is hence increasing but disposable income is at the same time decreasing.

When calculation the growth rate of the debt to GDP ratio the pattern is the same but volatility bigger, which indicates that GDP has negative correlations with household debt growth rate. This enhances the theory that debt and credit growth and volatility is a crucial factor in the period surrounding the crisis.

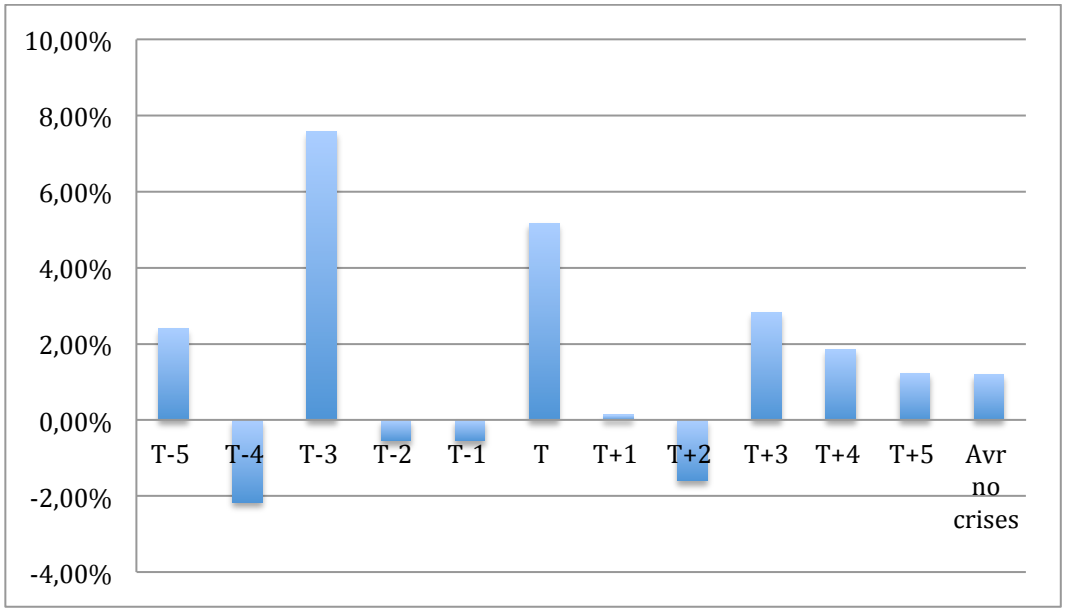
When you look at only the debt growth this might be the most significant difference, more significant than growth rate in general since average growth rate during the average crises years, hence the average household debt growth rate from t-3 to t+3, is actually lower 3,66 % than average non-crisis, which is 3,92 % (average three years before is just 3,07 and average three years after is just 3,02 %). In debt to disposable income and debt to GDP ratio, the growth rate is higher in average boom and bust periods than in non-boom and bust periods, 1.20 % in non-boom and bust periods and 1.86 % in boom and bust. And in debt to GDP the growth rate in boom and bust periods are significantly higher, 1,75 % compared to 0,93 % in non-crises periods. However, this does not tell us anything about the fluctuation during the non-boom and bust period. For comparing the boom and bust period fluctuation with the non-boom and bust period fluctuation I will in the next section calculate and compare the standard deviations of these periods.

Figure 28, Average all crisis 1873-2015 in household debt growth rate



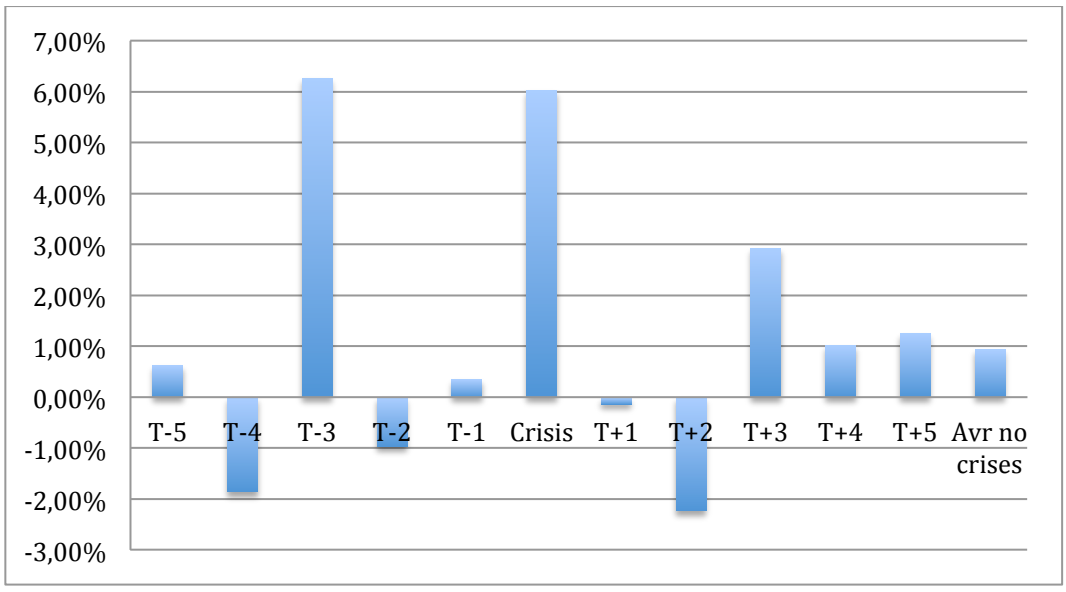
Data sources: (Waldenström 2015)
Note that these blue bars was privously shown in red line in comparison with the other crises

Figure 29, Average all crises in household debt to disposable income



Data sources: (Waldenström 2015)

Figure 30, Average all crises in household debt to GDP



Data sources: (Waldenström 2015) (Krantz, Schön 2015)

6.7.3 Fluctuation in crises years compared to non-crises years

As figures 34 to 39 shows the standard deviation of the all crises periods are significantly higher than the standard deviation of non-crises periods. This indicates that fluctuation is more pronounced in crisis periods than in non-crisis periods.

The differences in standard deviation between non-crises and crises periods are also highest in debt to disposable income ratio which increases 87 % in crises periods compared to non-crises periods, second is debt to GDP which increases 76,5 % and then pure debt growth rate which increases 69,4 % during crises periods compared to non-crises periods. Below each standard deviation for boom and bust periods are compared to each standard of non-boom and bust periods. Each one is measured in three ways namely pure household debt growth rate, household debt to disposable income ratio growth rate and household debt to GDP ratio growth rate. However, one should bear in mind the difference in time-scope, which is 41 years of crisis and 102 years of non-crisis. The difference in standard deviation is however quite significant which can - despite the differences in time-scope – indicate higher fluctuation during boom and bust periods than in non-boom and bust period – see table 1.

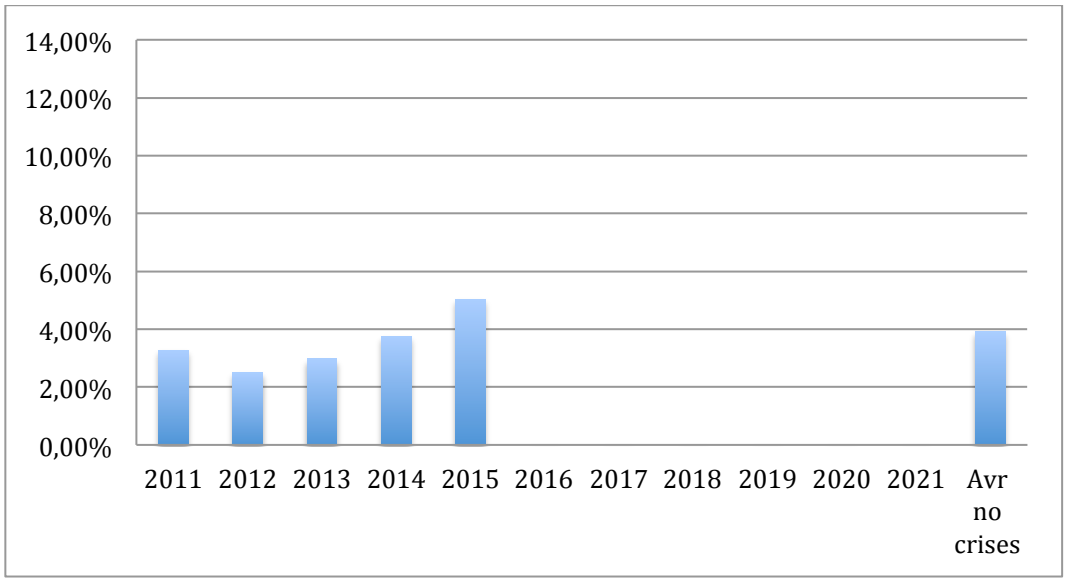
Table 1, Standard deviation in boom and bust periods and non-boom and bust periods

	Pure household debt growth rate	**Debt to disposable income ratio growth rate**	**Debt to GDP ratio growth rate**
Boom and bust periods	Standard deviation = 8,03 Mean = 1,039	Standard deviation = 8,64 Mean = 1,01	Standard Deviation =7,89 Mean = 1,01
Non-boom and bust period	Standard deviation = 4,74 Mean = 1,039	Standard deviation = 4,62 Mean = 1,01	Standard deviation = 4,47 Mean = 1,01

6.7.4 Fluctuation 2011-2015 and the risk of a near financial crisis

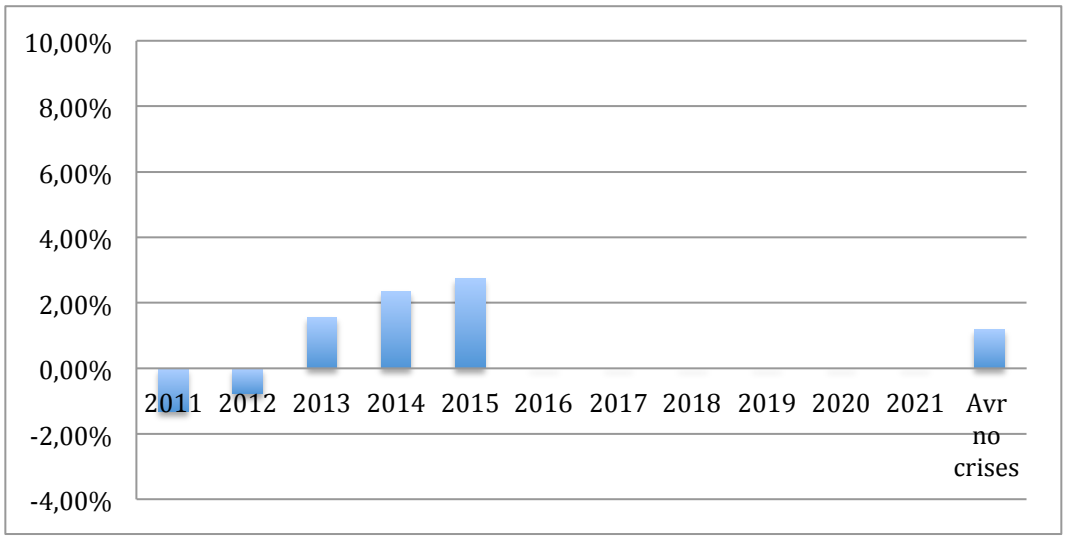
Regarding fluctuation 2011 to 2015 and the risk of a near financial crisis there is nothing in the fluctuation of household debt growth rate that indicate a financial crisis. As figure 40, 41 and 42 shows the growth rats are in fact relatively smooth regardless if one measures in pure household debt growth rate, household debt to disposable income growth rate and household debt to GDP growth rate. The is no sharp booms or any sharps bust in fluctuations and the growth rate are very much in line with the average of non-boom and bust periods.

Figure 31, 2011-2015 in pure household debt growth rate



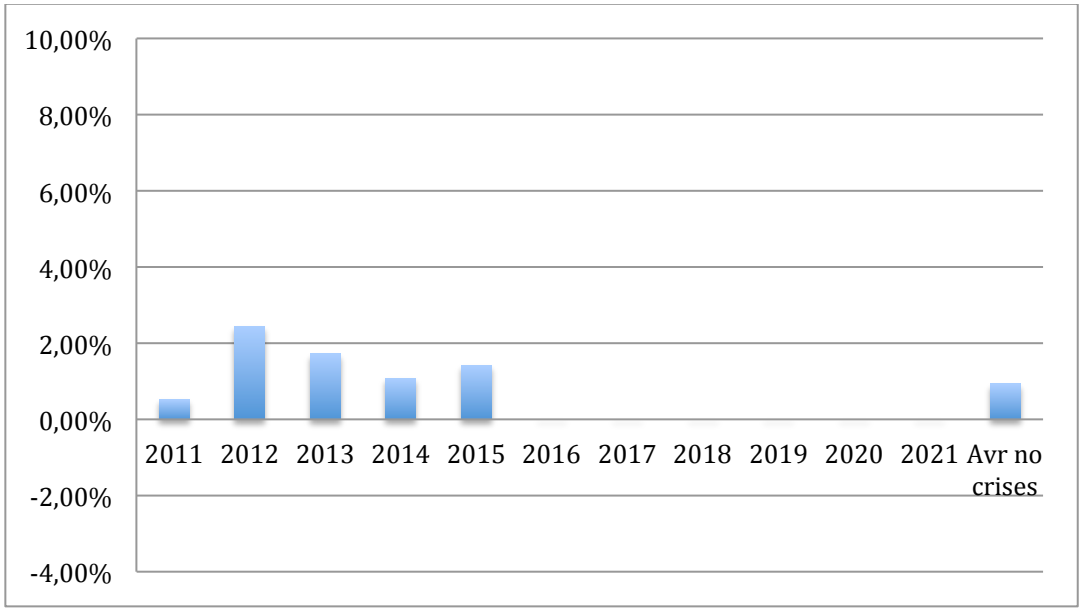
Data sources: (Waldenström 2015)

Figure 32, 2011-2015 in household debt to disposable income ratio growth rate



Data sources: (Waldenström 2015)

Figure 33, 2011-2015 in household debt to GDP ratio growth rate



Data sources: (Waldenström 2015) (Krantz, Schön 2015)

6.7.5 Discussion in relation to Minsky-Kindleberger-theory and previous research

The sharp decrease of household debt – measured in pure household debt - in year two are in line with Schularick and Taylor (2012) and Ahnlands (2015) findings on private debt. However the same pattern of ”boom” and ”bust” fluctuation can be seen in year t-1 and year t and year t+1which is just before during and just after the actual financial crisis.

According to Schularick and Taylor the crises before world war two was followed by a decrease in credit that did not recover to normal level until five years after the crisis - during the post world war two crisis the level was on the other hand the same as normal levels directly after a crisis (Schularick, Taylor 2012). Since 80 % of the crisis I use for this thesis occurred before world war two this pattern could be expected and when we look at pure household debt growth rate - in figure 31 the fifth year (t+5) shows an average growth rate of 4,17 % which is very close average non-crisis growth rate of 3,72%. However, it is actually only the t+2 and t+3 that have abnormal low debt growth levels, t+3 and t+4 indeed has just a little higher growth rate than average non-crisis growth when looking at pure household debt growth rate. Furthermore the average annual growth of the all five year aftermath years of the crisis is actually the same - 3,72 % - as the average non-crisis period.

This indicates that it is not the growth rate of household debt that is abnormal during the aftermath of crisis in the swedish context, but *maybe* the fluctuation hence, the sharp contrast and shift between abnormally high and abnormally low annual household debt growth levels.

These results also in line with Irving Fishers debt-deflation theory since people during deflation are less willing to take new debt and the people that are in debt tries to pay them are therefore spending less money on goods and services and hence enhancing deflation. This is probably more common before world war two since monetary policy after the Great Depression involved more quantitative easing and thus deflation was avoided after crisis in the post - world war two crises. However, my results regarding the five years after a crisis period are only partly in line with both Taylor and Schularick (2012) findings on crisis before world war two and Irving Fisher debt-deflation theory since the recovery happens faster in my findings. And even though 80 % of the crises I examine occurs before world war two the results are slightly arbitrary since the only post world war two crisis that I examine also has below normal debt growth rates up until four years after the crisis – according to Schularick and Taylor (2012) finding the average post world war crisis-aftermath years do have normal growth rates directly from the first aftermath year. Of course, one should not make significant conclusions about this since Schularick and Taylors finding are averages of several crises after world war two in fourteen different countries and I only have one crisis in one country in the post world war two period in my data which for reasons explained earlier (defense of the fixed exchange rate) had low levels of household debt rate the adjacent years after the crisis.

However, these results are in line with Kindleberger-Minsky-theory on credit booms and busts. Also, since the Kindleberger-Minsky-theory also takes into account context-factors like external shocks and the level of financial speculation there is more natural to apply it to specific crisis since those external factors differs from crisis to crisis – as I have done in previous chapters. But looking at the combined boom and bust periods we certainly see a shaper fluctuation in standard deviation in boom and bust periods than in non-boom and bust periods years, regardless weather we measure pure household debt growth rate, household debt to disposable income or household debt to GDP. However, as we have seen before almost all crises have an external "shock" preceding it so in general the Kindleberger-Minsky-theory works rather well although it is not a very precise theory it can guide us on the indications of high and low growth rates in debt and whether they are in the levels of boom and bust periods or non-boom and bust periods in fluctuations.

Because of the smooth household debt growth rate of 2011-2015 there is no indication of financial crisis in these findings and hence no relation to the Kinskeberger-

Minsky-theory or other previous research regarding these findings other than that the findings do not relate to them.

6. Conclusion

In this thesis I have shown the fluctuations pattern within the years of the boom and bust periods in all the financial crises separately and as a single average of all boom and bust periods and compared these results to the average growth rate of non-boom and bust periods. The results shows that the growth rates within the boom and bust period are generally significantly higher or significantly lower than the average growth rate of non-crises years. However, one should bear in mind that this does not indicate that fluctuations is higher in crises times than in non-crises times since the comparison with the non-crises frame is only a single average growth rate. Looking at just these results there is nothing that says what the fluctuations are low during non-boom and bust periods Therefore I have also presented the standard deviation of all the boom and bust periods and compared those to the average standard deviation of all the non-boom and bust years in pure household debt growth rate, debt to disposable income growth rate and household debt to GDP growth rate. These results shown a significantly higher standard deviation in the boom and bust period than in the non-boom and bust periods in all three ways of measurements. However, one should bear in mind though that the number of years examined during the crises years are smaller, namely 41 years, than during the standard deviation of the non-crises years, which is 142 years. Therefore there is a risk that temporarily volatility gets higher weighs in the boom and bust period than in the non-boom and bust period. On the other hand both periods are quite large and since the standard deviation significantly higher during boom and bust periods than non-boom and bust periods – in all three ways of measuring - it is in my judgment reasonable to assume a higher volatility and fluctuation during crises years than non-series years.

However, it is not only the level of fluctuation is interesting for this thesis but also the fluctuations *pattern*. One of the most interesting findings is that the pattern of fluctuation within the crisis frame is strikingly similar in all crisis from 1878 to 1991. The most significant similarity is the boom is the third year (t-3) before a crisis and the bust is the second year (t-2) before a crisis which occur is all crisis except the 1932 crisis – which was a rather special crisis (event if it occurred during the international “Great Depression”) since it almost entirely was due to one single company namely The Krueger-Group. The fact that 80 % of all cries occurred before world war two when household debt - as well as public and private debt – was relatively small to GDP in relation to today’s levels indicates that it is not

the level of GDP that are the central factor but the *level of fluctuation* that are the primary factor that we shall look at when we try to judge the risk of a near financial crisis. Of course one has the take into account the monetary policy after the "great depression" that has indeed lead to a "great moderation" and of course the 1991-1993 was the most severe crisis and also the crisis that has most household debt to GDP level and when we look at differences in levels of household, private and public debt we see (also internationally with the great recession) that increased household debt to GDP has caused severe damage to the economy when financial crises has occurred. And of course expansionary monetary policy as in the "Great Recession" might prevail crisis even in great fluctuations. But even if crisis becomes more severe with higher debt to GDP it might not be the factor to look at for the risk of a near financial crisis *occurring*. In fact we have had historically unprecedented levels of household debt to GDP for decades now. The risk factor might instead be *the level of fluctuation* regardless of the debt to GDP ratio. However, even if we have high household debt to GDP now, we do not have severe fluctuations of household debt, which we had in almost all other financial crises in Sweden since 1873.

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