

# Money View or Credit View - Reasons for Financial Crises: How Money View and Credit View are seen in Great Depression and Great Recession in Finland, Sweden and the United States

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## Abstract

This Master's thesis evaluates two theories of banking and economic crises, the Money view and the Credit view, and reviews them from the Great Depression (1929-1933) and the Great Recession (2008-2009) point of view. The crises are studied by literature and using Finnish, Swedish and US data. The data is used to investigate how some phenomena of the theories and the crises, in question, appear in the data of the countries, in question. The studies in the original papers of the theories are not repeated. Based on the studies of this thesis it seems that the Money View, as Friedman and Schwartz (1963a) it describe, may have had a role in the United States in the days of the Great Depression, in 1930s, but may not have been exactly in the same role, in 2000s, during the Great Recession. The evidence of the Money View is not equally clear, related to the Finland and Sweden, during the Great Depression but money stocks have, at least, raised during the boom and declined after that in the time of the Great Recession in Finland and Sweden. The Credit view has had a role in many crises, as Reinhart and Rogoff (2009, 2011) report. However, based on this thesis, it cannot be exactly proved to be the main reason for the crises, in question, in Finland, Sweden and the United States. Yet, it is not the main purpose of this thesis to prove the theories as a cause of the crises but investigate how the phenomena of the theories appear in the data of the each country, in question.

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## 1 Introduction (5-10 pages)

In recent years, there has been a growing interest in investigations into the causes of the crises, particularly, after the latest great economic crisis. The Great Depression, in 1930s, is still, after about 80 years, inspiring to new studies, like this thesis. The same effect has also the recent crisis, the Great Recession, in 2000s. A particular interest is targeting phenomena in both great international crises to explore whether they have similarities, in spite of, a long interval between the crises. This thesis focuses also on the great crises, the Great Depression, in 1929 - 1933, and the Great Recession, in 2007 - 2009. This chapter will present shortly some phenomena of the crises and some theories or models of crisis, except, the Money View and the Credit View that will be presented more thoroughly in latter chapters. Regarding the Great Depression, John M. Keynes (1972 [1931]), Charles Kindleberger(2013 [1973]; 2002 [1978]), Barry Eichengreen (1990), and Milton Friedman and Anna Schwartz (1963a) will present their opinions of the crisis. In case of the Great Recession, Reinhart and Rogoff (2009) will present their observations of that last great economic crisis. After that, first, Irving Fisher (1923, 1933) presents his two theories of crisis, secondly, Samuelson (1967) explains his thoughts and, third, Hyman P. Minsky (2008) discuss his ideas of crisis. The first of the theories of Fisher (the Dance of the dollar) and Samuelson have been selected because Friedman and Schwartz refer to them in their presentation of the Money View. The second theory of Fisher and Minsky discuss about the role of debt in their models. Their models illustrate somewhat the history of the Credit View. In addition, concerning the latest studies, Bordo and Haubrich (2009), and Schularick and Taylor (2012) will shortly explain their findings related to the Credit View.

John M. Keynes (1972 [1931]) describes the time of the Great Depression in 1930:

The world has been slow to realize that we are living this year (1930) in the shadow of one of the greatest economic catastrophes of modern history. First of all, the extreme violence of the slump is to be noticed. In the three leading industrial countries of the world - the United States, Great Britain, and Germany - 10 million workers stand idle. There is scarcely an important industry anywhere earning enough profit to make it expand - which is the test of progress. At the same time, in the countries of primary production the output of mining and of agriculture is selling, in the case of almost every important commodity, at a price which for many or for the majority of producers, does not cover its cost. In 1921, when prices fell as heavily, the fall was from a boom level at which producers were making abnormal profits; and there is no example in modern history of so great and rapid a fall of prices from a normal figure as has occurred in the past year. Hence the magnitude of the catastrophe.

Kindleberger (2013 [1973]) argue that, after the World War I, the international economic and monetary system would have needed leadership, that is, a country which is prepared to set standards

of conduct for other countries; and seek to get others to follow them, to take on an undue share of the burdens of the system, and in particular to take on its support in adversity by accepting its redundant commodities, maintaining a flow of investment capital and discounting its paper. He adds that Britain performed this role in the century to 1913, and the City of London was interested in restoring its pre-war position as a world financial centre after the World War I, and to a degree it succeeded. Kindleberger (2013) proposes that part of the reason for the length, and most of the explanation for the depth of the world depression, was the inability of the British to continue their role of underwriter to the system and the reluctance of the United States to take it on until 1936. Kindleberger (2002 [1978]) continues that the Great Depression was so wide, so deep, and so prolonged because there was no international lender of last resort.

Kindleberger (2013 [1973]) refers to a television debate in May 1969 in the United States and argues that in the debate Milton Friedman insisted that the depression had a single cause: errors in carrying out monetary policy in the United States, and Paul Samuelson maintained it was the result of a series of historical accidents. Kindleberger (2013) continues that Milton Friedman finds the origin in the United States rather than in Europe or the periphery; in monetary rather than real factors; in policy rather than in the nature of institutions or in the tasks required of them; in a national economy rather than in the operation of the international system. Kindleberger (2013) analyses further the claim of Friedman and argues that, within the limits of United States monetary policy, Friedman rules out stock-market speculation, and the delay in passing the Glass-Steagall Act of 1932<sup>1</sup> which overcame a domestic shortage of monetary gold by allowing the Federal Reserve System to substitute government securities instead of gold for the lacking eligible paper needed as backing for the central bank's liabilities. He continues that there would doubtless have been a recession or a depression with perfect monetary policy, or a money supply which grew in the United States at some optimal pace. He still adds that Friedman's explanation of the 1929 world-wide great depression is national, monetary, related to a policy decision - it is uni-causal. Kindleberger (2013) concludes that in his judgement Friedman's claim is wrong. He analyses also Samuelson's opinion and argue that Samuelson's explanation of 'a series of historical accidents' is perhaps no more satisfactory, and he adds great depressions recur.

Eichengreen (1990) discusses the connection between the international monetary system and the Great Depression, and refers to Friedman and Schwartz (1963b) that their most influential work on the Depression concentrates on the United States, which is treated essentially as a closed economy. He proposes that both Friedman and Schwartz (1963b) portray the Great Depression basically as a

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<sup>1</sup> Glass-Steagall Act of 1932 is a law regarding the central bank system in the United States.



domestic affair, though the international dimension is not totally absent from their book, neither is it central. He continues that they attribute to feedbacks from overseas at most a subsidiary role in the Depression's depth and duration.

Eichengreen (1990) emphasises that the Great Depression was at root an international phenomenon. He argues that the international monetary system served as one of the channels through which deflationary impulses were propagated and constrained the economic policies adopted in response. He agrees with Friedman and Schwartz (1963b) that economic policy is important but he says his opinion differs on its international dimension. Eichengreen (1990) continues that policy has important cross-border effects through its impact on foreign economies and foreign policymakers. He continues that the failure of officials to take these effects into account played a significant role in the international slump as it was in the Great Depression when unilateral initiatives policymakers often worked at cross-purposes, leaving everyone worse off.

Friedman and Schwartz (1963a) discuss that an initial mild decline in the money stock from 1929 to 1930, accompanying a decline in Federal Reserve credit outstanding, was converted into a sharp decline by a wave of bank failures beginning in late 1930. Those failures, they explain, produced (1) widespread attempts by the public to convert deposits into currency and hence a decline in the deposit-currency ratio, and (2) a scramble for liquidity by the banks and hence a decline in the deposit-reserve ratio. Friedman and Schwartz (1963a) propose that the decline in the stock of money was intensified after September 1931 by deflationary actions on the part of the Federal Reserve System, in response to England's departure from gold, which led to still further bank failures and even sharper declines in the deposit ratios. Yet, they continue, the Federal Reserve at all times had power to prevent the decline in the money stock or to increase it to any desired degree, by providing enough high-powered money to satisfy the banks' desire for liquidity, and almost surely without any serious threat to the gold standard.

About 80 years after the Great Depression, Reinhart and Rogoff (2009) argue that the global financial crisis of the late 2000s, whether measured by the depth, breadth, and (potential) duration of the accompanying recession or by its profound effect on asset markets, stands as the most serious global financial crisis since the Great Depression. They continue that the crisis has been a transformative moment in global economic history whose ultimate resolution will likely reshape politics and economics for at least a generation. They note that a lot of people were convinced that "this time is different" because the United States is "special". Reinhart and Rogoff (2009) report that as money poured into the United States, U.S. financial firms, including mighty investment banks such as Goldman Sachs, Merrill Lynch (which was acquired by Bank of America in 2008 in a "shotgun marriage"), and the now defunct Lehman Brothers, as well as large universal banks (with

retail bases) such as Citybank, all saw their profits soar. The size of the U.S. financial sector (which includes banking and insurance) more than doubled, from an average of roughly 4 percent of GDP in the mid-1970s to almost 8 percent of GDP by 2007.

Reinhart and Rogoff (2009) discuss that a few years back, many people would have said that improvements in financial engineering and the conduct of monetary policy had done much to tame the business cycle and limit the risk of financial contagion. They continue that both in the run-up to the recent crisis and in its aftermath, the United States have driven straight down the quantitative tracks of a typical deep financial crisis. Reinhart and Rogoff (2009) discuss that there had globally been a brief tranquil period in banking crisis since 2002 before it came to an abrupt halt in the summer of 2007 when the subprime crisis in the United States began in earnest, soon transforming itself into a global financial crisis.

As can be perceived about the crisis descriptions, above, there are many theories or opinions of the causes of the crises. Though, two of the “main” theories, the Money View and the Credit View, are explained more thoroughly in Chapters 3 and 4, some other interesting views and models are explained shortly in the following paragraphs. There are described models or views from Fisher (1923, 1933) who have defined the “Dance of the dollar” and debt deflation theories; Samuelson (1967) who argues that income and employment fluctuate due to investments; and Minsky (1992) who has his financial-instability hypothesis that considers also debt as a factor in financial fluctuations.

Regarding his theory of business cycle, Fisher (1923) argues that the business cycle is largely a “dance of the dollar”. He further suspects that the principal force affecting the cycle is the real rate of interest, the difference of the money rate of interest and the rate of appreciation (positive or negative) of the purchasing power of the dollar. Therefore, Fisher (1923) suggests that, instead of price level itself, the rate of change in price level should be observed. He continues that it is clear that the price level grow with the growth of the country. Fisher (1923) proposes that business is interesting in direction of the changes in prices not in the level of prices. He defines that rising prices stimulate business because the prices a producer can get outrun his expenses for interest, rent, salaries and wages, while falling prices depress trade. Fisher aims at convince his claim by Figure 1 and 2 which are both mainly from the time of the First World War. In Figure 1, the upper curve P plots the index number of the United States Bureau of Labour Statistics of the actual price level while the lower curve, P', plots its rate of rise or fall. The curve P', unlike P, oscillates about the zero line. The rate of rise or fall is found for each month by taking the two index numbers for the months following and preceding, and dividing the former by the latter, and subtracting unity.

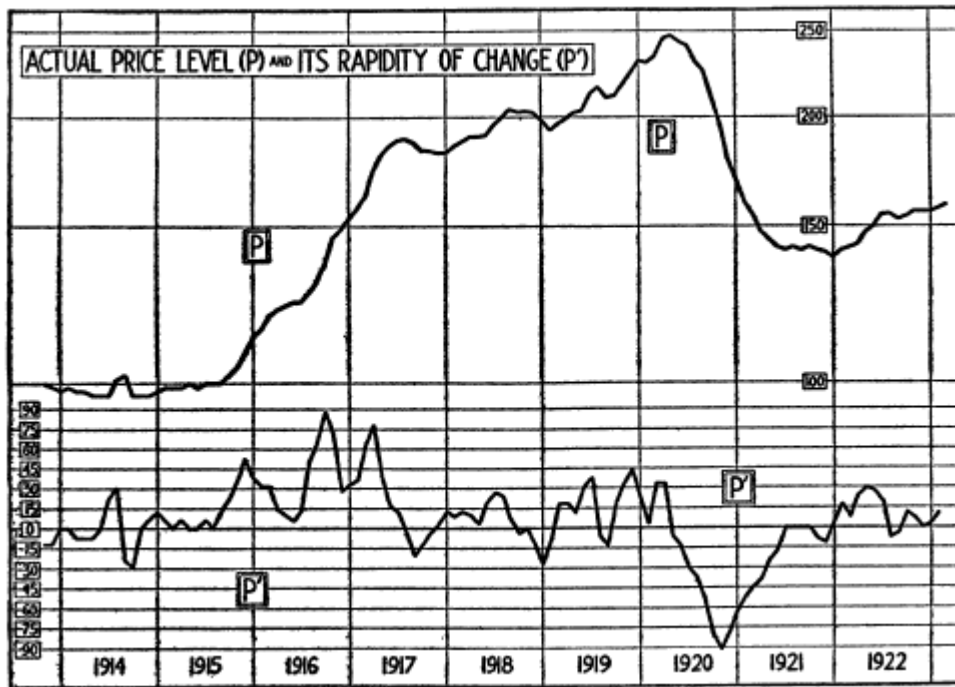


Figure 1: Actual Price Level (P) and Its Rapidity of Change (P') 1914 - 1922 (Source: Fisher, 1923)

In Figure 2, Fisher (1923) has combined a curve representing business (T) i.e. the physical volume of trade (duly corrected for seasonal and secular changes) and a curve (P' with upper bar) representing the rapidity of change of the price level. Curve T plots the business barometer of the American Telephone and Telegraph Company (which was the nearest approach, yet available by Fisher) to a barometer of physical volume of trade. Curve P' (with upper bar) is the curve plotting the rapidity of rise or fall of the price level. Fisher notes that the ordinates of the curve P' (with upper bar) are plotted four months ahead of the date of the eighth or last of the ordinates of the “derivate” P' of which it is the average.

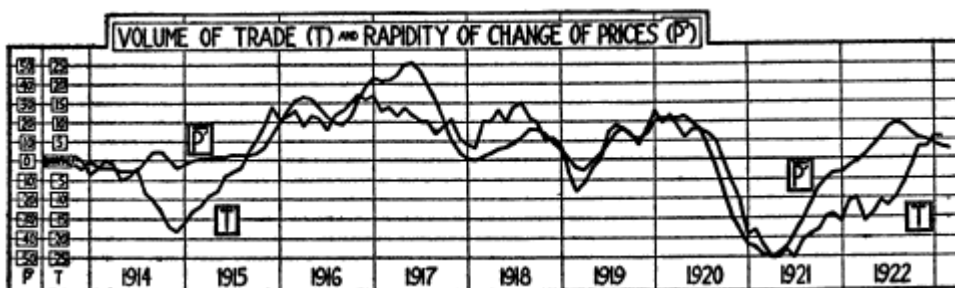


Figure 2: Volume of Trade (T) and Rapidity of Change of Prices (P') 1914 - 1922 (Source: Fisher, 1923)

Fisher (1923) argues that since P' (with upper bar), in Figure 2, plots the rate of change of prices and so of the purchasing power of the dollar, we may say that it pictures “the dance of the dollar” while T pictures “the dance of business”. He continues that the 79 per cent correlation tells us that business dances attendance on the dollar. Fisher (1923) further argues that, in Figure 2, rapidity of price movement during the period 1914-1922 seems to account, almost completely, for the ups and

downs of business, the chief exceptions being readily ascribable to other disturbances. He adds that in the large swings of the last three years the “lag” between “the dance of the dollar” and “the dance of the business” is greater than usual.

Later on, Fisher (1933) discusses that the old and apparently still persistent notion of “the” business cycle, as a single, simple, self-generating cycle (analogous to that of a pendulum swinging under influence of the single force of gravity) and as actually realized historically in regularly recurring crises, is a myth. He continues that instead of one force there are many forces and, specifically, instead of one cycle, there are many co-existing cycles, constantly aggravating or neutralizing each other, as well as, co-existing with many non-cyclical forces. He adds that cyclical tendencies may be “forced” or imposed on the economic mechanism from outside e.g. by yearly rhythm, or cyclical tendencies may be “free” cycles that are self-generated. He further continues that the “free” cycle is usually considered as “the” business cycle. Fisher (1933) assumes that the forced cycle, like yearly cycle, may more nearly approach a perfect cycle.

Fisher (1933) proposes that there may be an equilibrium which, though stable, is so delicately poised that, after departure from it beyond certain limits, instability ensues, just as, at first, a stick may bend under strain, ready all the time to bend back, until a certain point is reached, when it breaks. He suggests that the simile probably applies when a debtor gets “broke,” or when the breaking of many debtors constitutes a “crash,” after which there is no coming back to the original equilibrium. Fisher (1933) proposes also that, at most times, there must be over- or under-production, over- and under-consumption, and over or under everything else. He concludes that it is absurd to assume that, for any long period of time, the variables in the economic organization, or any part of them, will “stay put,” in perfect equilibrium.

Fisher (1933) suggests that the important variables which may, and ordinarily do, stand above or below equilibrium are: (a) capital items, such as homes, factories, ships, productive capacity generally, inventories, gold, money, credits, and debts; (b) income items, such as real income, volume of trade, shares traded; (c) price items, such as prices of securities, commodities, interest. He argues that most of the alleged explanations commonly offered, may suffice to explain small disturbances, but all of them put together have probably been inadequate to explain big disturbances. He doubts the adequacy of over-production, under-consumption, over-capacity, price-dislocation, mal-adjustment between agricultural and industrial prices, over-confidence, over-investment, over-saving, over-spending, and the discrepancy between saving and investment. Fisher (1933) further argues that, in the great booms and depressions, each of the above-named factors has played a subordinate role as compared with two dominant factors, namely over-indebtedness to start with and deflation following soon after. He adds that where any other factors do become

conspicuous, they are often merely effects or symptoms of these two. Fisher (1933) sums up that the big bad actors are debt disturbances and price-level disturbances and continue that he has a strong conviction that these two economic maladies, the debt disease and the price-level disease (or dollar disease), are, in the great booms and depressions, more important causes than all others put together. He further continues that, thus, over-investment, over-speculation and over-confidence are often important; but they would have far less serious results were they not conducted with borrowed money. Fisher (1933) proposes that disturbances in these two factors - debt and the purchasing power of the monetary unit - will set up serious disturbances in all, or nearly all, other economic variables. He still adds that if debt and deflation are absent, other disturbances are powerless to bring on crises comparable in severity to those of 1837, 1873, or 1929-33.

Fisher (1933) lists nine variables that he thinks are secondary variables affected by the two primary ones, debt and deflation; like debts, circulating media, their velocity of circulation, price levels, net worth, profits, trade, business confidence, interest rates. He aims to show the chief interrelations between the nine chief factors by deriving deductively, and assuming, that general economic equilibrium is disturbed by only the one factor of over-indebtedness, and, in particular, assuming that there is no other influence, whether accidental or designed, tending to affect the price level. He adds that there should also be assumed that, at some point of time, a state of over-indebtedness exists, this will tend to lead to liquidation, through the alarm of debtors or creditors or both.

On the basis of the mentioned assumptions, Fisher (1933) deduces the chain of consequences in nine links:

(1) *Debt liquidation* leads to *distress selling* and to

(2) *Contraction of deposit currency*, as bank loans are paid off, and to a slowing down of velocity of circulation. This contraction of deposits and of their velocity, precipitated by distress selling, causes

(3) *A fall in the level of prices*, in other words, a swelling of the dollar. Assuming, as above stated, that this fall of prices is not interfered with by relation or otherwise, there must be

(4) *A still greater fall in the net worth of business*, precipitating bankruptcies and

(5) *A like fall in profits*, which in a "capitalistic," that is, a private-profit society, leads the concerns which are running at a loss to make

(6) *A reduction in output, in trade and in employment* of labour. These losses, bankruptcies, and unemployment, lead to

(7) *Pessimism and loss of confidence*, which in turn lead to

(8) *Hoarding and slowing down still more the velocity of circulation.* The above eight changes cause

(9) *Complicated disturbances in the rates of interest,* in particular, a fall in the nominal, or money, rates and a rise in the real, or commodity, rates of interest.

Fisher (1933) adds that there may also be other interrelations but one of the most important is the direct effect of lessened money, deposits, and their velocity, in curtailing trade, as evidenced by the fact that trade has been revived locally by emergency money without any rising of the price level. He still adds that except for the first and last in the “logical” list, namely debt and interest on debts, *all the fluctuations listed come about through a fall of prices.* He further continues that when a deflation occurs from other than debt causes and without any great volume of debt, the resulting evils are much less. It is the combination of both - the debt disease coming first, and then precipitating the dollar disease - which works the greatest havoc. Fisher (1933) argues that the two diseases act and react on each other; over-indebtedness leads to deflation; and deflation caused by the debt reacts on the debt. He continues that each dollar of debt still unpaid becomes a bigger dollar, and if the over-indebtedness with which we started was great enough, the liquidation of debts cannot keep up with the fall of prices which it causes. He further continues that in that case, the liquidation defeats itself: while it diminished the number of dollars owed, it may not do so as fast as it increases the value of each dollar owed. Fisher (1933) concludes that *the very effort of individuals to lessen their burden of debts increases it, because of the mass effect of the stampede to liquidate in swelling each dollar owed.* He adds that the chief secret of most great depressions is that *the more the debtors pay, the more they owe.*

Fisher (1933) creates his theory of debt deflation of great depressions during the Great Depression. He argues that the Great Depression is an example of a debt-deflation depression of the most serious sort, and adds that the debts of 1929 were the greatest known, both nominally and really, up to that time. He continues that by March, 1933, liquidation had reduced the debts about 20 per cent, that is the debt measured in terms of commodities, was increased about 40 per cent  $[(100\% - 20\%) \times (100\% + 75\%) = 140\%]$ . Fisher (1933) proposes that controlling of the price level is important but he continues that price level control, or dollar control, would not be a panacea. He adds that the over-indebtedness must have its starters and suggests that new opportunities to invest at a big prospective profit or the idea of the new era psychology may be good candidates for a starter.

As mentioned before, Friedman and Schwartz (1963a) refers to the Fisher’s theory of the Dance of dollars in their Money View definition but the theories rather vary from each other than are similar. In their book of the economic history of the United States, Friedman and Schwartz (1963b)

discuss that the contraction shattered the long-held belief, which had been strengthened during the 1920's, that monetary forces were important elements in the cyclical process and that monetary policy was a potent instrument for promoting economic stability. They suggests that the opinion shifted almost to the opposite extreme, that "money does not matter"; that it is a passive factor which chiefly reflects the effects of other forces; and that monetary policy is of extremely limited value in promoting stability. Friedman and Schwartz (1963b) argue that the evidence, suggests that these judgments are not valid inferences from experience. They propose that the monetary collapse, in times of the Great Depression, was not the inescapable consequence of other forces, but rather a largely independent factor which exerted a powerful influence on the course of events. Friedman and Schwartz (1963b) conclude that the failure of the Federal Reserve System to prevent the collapse reflected not the impotence of monetary policy but rather the particular policies followed by the monetary authorities and, in smaller degree, the particular monetary arrangements in existence. Friedman and Schwartz's (1963a) theory of crisis, the Money View, is presented in Chapter 3.

Friedman and Schwartz (1963a) created their "Money View", partly, as a counterargument to the view of crises of Samuelson (1967 [1955]). Samuelson (1967) argues that most economic activities move up and down together but based on his investigations (a period of 1946-1966) he observes that investment items seem to be "early movers" and originators of causal movements. Based on a figure, Samuelson (Samuelson, 1967, p. 241) has created, he also argues that the three investment series (new orders of durable goods, changes in inventories, housing starts) seem to be more volatile than the two series of retail sales and personal income and that production and profit fluctuations coincide with investment fluctuations. He continues that, by their nature, durable goods are subject to violently erratic patterns of demand: in bad times their new purchase can be indefinitely postponed; in a good year, everyone may suddenly decide to stock up on a 10-year supply of the services of durable goods. Samuelson (1967) proposes that our first clue to the nature of the business cycles lies, then, in the fact that it is the durable- or capital-goods sector of the economy which shows by far the greatest cyclical fluctuations. Friedman and Schwartz (1963a) criticize this view and argue that in that view investment is the motive force, its effects spread through time and amplified by the "multiplier," and itself partly or largely is a result of the "accelerator." Friedman and Schwartz (1963a) continue that, money, if it entered at all, played a purely passive role. Samuelson (1967) further discusses that there may be both external and internal factors that are roots of the business cycles. He continues that external factors are something outside the economic system and the internal factors are some mechanism within the economic system. Samuelson (1967) concludes that most economists today believe in a combination of external and internal theories.

Regarding the Great Depression and the attitude before it, Samuelson (1967) argues that it is too earlier to suggest as some experts in 1929, just before the great stock-market crash that the country (the United States) is as in a “new era” of perpetual prosperity. He continues that most economists would pretty much agree with the formulation: the probability of a great depression - a prolonged, cumulative, and chronic slump like that of the 1930s, 1890s, or the 1870s - has been reduced to a negligible figure. Still, he proposes that, the reason for virtual disappearance of great depressions is the new attitude of the electorate. He continues that, by the C + I + G analysis, economic science knows how to use monetary and fiscal policy to keep any recessions that break out from snowballing into lasting chronic slumps. Samuelson (1967) believes that democracy by elections pressurizes parties to take the expansionary actions that can keep great depressions from occurring. He emphasise that most scientists take a more cautious attitude regarding the future crises and summarise:

A mixed economy (govern by different political parties) may still be subject to occasional recessions: inventory fluctuations can still occur; changes in cold-war spending can have initially destabilizing effects upon general business activity; attempts to bring inflation under control may sometimes result in downturns. Nevertheless, now that the tools of income analysis are understood and their use is politically mandatory, the probability of recession in any one year is less in the mixed economy than it used to be. Expansion periods tend to be longer and fuller than in the past: the periods of recession shading tend to be less frequent and shorter. Perhaps only half the customary number of recessions will take place; and many of them may last scarcely a year.

In contrast to the Samuelson’s optimistic view of better economic era, Minsky (1992) has created a financial-instability hypothesis (starting from 1975). He argues that, from time to time, capitalist economies exhibit inflations and debt deflations which seem to have the potential to spin out of control. He defines that the capitalist economy has expensive assets and a complex, sophisticated financial system. He still continues that the capital development of a capitalist economy is accompanied by exchanges of present money for future money. Minsky (1992) argue that the present money pays for resources that go into the production of investment output, whereas the future money is the “profits” which will accrue to the capital asset owning firms (as the capital assets are used in production). He continues that as a result of the process, by which investment is financed, the control over items in the capital stock by producing units is financed by liabilities - these are commitments to pay money at dates specified or as conditions arise. He further continues that for each economic unit, the liabilities on its balance sheet determine a time series of prior payment commitments, even as the assets generate a time series of conjectured cash receipts. Thus,



he argue, in a capitalist economy the past, the present, and the future are linked not only by capital assets and labour force characteristics but also by financial relations.

Minsky (1992) further determines the financial instability hypothesis, and argues, it is a theory of the impact of debt on system behaviour and also incorporates the manner in which debt is validated. He continues that, in contrast to the orthodox Quantity Theory of money, the financial instability hypothesis takes banking seriously as a profit-seeking activity. Thus, he still continues, bankers (using the term generally for all intermediaries in finance), whether they are brokers or dealers, are merchants of debt who strive to innovate in the assets they acquire and the liabilities they market. Minsky (1992) conclude that this innovative characteristic of banking and finance invalidates the fundamental presupposition of the orthodox Quantity Theory of money to the effect that there is an unchanging “money” item whose velocity of circulation is sufficiently close to being constant: hence, changes in this money’s supply have a linear proportional relation to a well defined price level.

Minsky (1992) identifies three distinct income-debt relations for economic units: hedge, speculative, and Ponzi finance regarding the financial instability theory. He explains that hedge financing units are those which can fulfil all of their contractual payment obligations by their cash flows; speculative finance units are units that can meet their payment commitments on “income account” on their liabilities, even as they cannot repay the principle out of income cash flows. For Ponzi units, he explains, the cash flows from operations are not sufficient to fulfil either the repayment of principle or the interest due on outstanding debts by their cash flows from operations but such units can sell assets or borrow. Minsky (1992) continues that borrowing to pay interest or selling assets to pay interest (and even dividends) on common stock lowers the equity of a unit, even as it increases liabilities and the prior commitment of future incomes. He further continues that a unit that Ponzi finances lowers the margin of safety that it offers the holders of its debts. He (1992) suggests that if hedge financing dominates, the economy may well be an equilibrium seeking and containing system.

Minsky (1992) argues that the first theorem of the financial instability hypothesis is that the economy has financing regimes under which it is stable and financing regimes in which it is unstable. He further argue that the second theorem is that over periods of prolonged prosperity, the economy transits from financial relations that make for a stable system to financial relations that make for an unstable system. He continues that, in particular, over a protracted period of good times, capitalist economies tend to move from a financial structure dominated by hedge finance units to a structure in which there is large weight to units engaged in speculative and Ponzi finance. Minsky (1992) suggests that if an economy with a sizeable body of speculative financial units is in

an inflationary state, and the authorities attempt to reduce inflation by monetary constraints, then, speculative units will become Ponzi units and the net worth of previously Ponzi units will quickly evaporate. He continues that units with cash flow shortfalls will be forced to try to make position by selling out position, which is likely to lead to a collapse of asset values. Minsky (1992) conclude that the financial instability hypothesis is a model of a capitalist economy which does not rely upon exogenous shocks to generate business cycles of varying severity.

As may have been noted of the models above, there is not a unanimous view what causes the crises among the economic scientists. Fisher (1923) define that crisis is “a dance of the dollar”. Samuelson (1967) argues that income and employment fluctuate due to investments. Kindleberger (2013 [1975]) defines three factors which turn up in many crises: panic, the power of contagion, and the importance of hegemony. One of the most famous theories of the crises is the “Money View” by Friedman and Schwartz (1963a) where main roles in the crises play the money stock itself and the changes in it, and this is one of the theories discussed more thoroughly, in this thesis. Minsky (1992) has his financial instability hypothesis that considers, especially, debt as a factor in financial fluctuations. The “Debt View” is discussed in many latest papers after the financial and banking crisis in 2007 - 2009 (e.g., Reinhart and Rogoff, 2009, 2010, 2011; Bordo and Haubrich, 2009; Schularick and Taylor, 2012; Jordà, Schularick, Taylor, 2013). The most famous study of the “Debt View” has been done by Reinhart and Rogoff (2009, 2010, 2011). This thesis discusses the “Credit View” based on papers and book of Reinhart and Rogoff (2009, 2010, 2011). Schularick and Taylor (2012) study both money and debt fluctuations over the long run with the intention of finding causes of crises. They argue that, in the past, there have been an Age of Money and, now, we live in a different world, an Age of Credit, where financial innovation and regulatory ease broke that link, setting in train an unprecedented expansion in the role of credit in the macro economy. They propose that the use of credit aggregates, rather than monetary aggregates, is of crucial importance. Schularick and Taylor (2012) continue that when we look at the long run data systematically, monetary aggregates are *not* that useful as predictive tools in forecasting crises, in contrast to the correct measure, total credit. Bordo and Haubrich (2009) suggest that credit market distress arises in its more virulent form only in certain monetary environments, and has its most extreme effects when it exacerbates a business downturn. They argue that their empirical results complement the cross country evidence of Reinhart and Rogoff. Still, Bordo and Haubrich (2009) continue that the cycles in the quantity of money appear not to be synchronised with business cycles, but when the cycles do coincide, monetary tightening has a significant effect and seems implicated in major recessions. Jordà, Schularick, and Taylor (2013) study the interactions between

private and public debts from a long-run historical perspective and conclude that, in advanced economies financial stability risks originate in the private sector, not in the public sector.

As described above, there are different opinions about the main causes of financial crises in the economic discussion and literature but, there is a growing amount of evidence which supports the view that the “Money View” and the “Credit View” as models of crisis are the most important ones. In this thesis, these two views, the “Money View” and the “Credit View” of financial and banking crises are discussed. The “Money View” is created by Friedman and Schwartz (1963a). The second, the “Credit View”, is addressed here as defined by Reinhart and Rogoff (2009, 2010, 2011).

## **1.1 Research objectives**

As mentioned above, this thesis studies two main views of the crisis, the Money View and the Credit View within the framework of the two great crises. There is hardly any research which studies both, the Money view and Credit view, and compares the basic features of the theories and the phenomena of the great crises in a small amount of countries. There are papers that study larger group of the countries; however, their focus has been to create a general picture of the causes of economic crises. A key question still remains to be answered how the phenomena of theories and the crises appear in various sizes of countries. This thesis makes a comparison of appearance of the crises and the theories between three countries, Finland, Sweden and the United States. It may be valuable to investigate more closely how the both theories are able to explain the Great Depression and Great Recession, in Finland, Sweden and the United States. Though, it should be kept in mind that the theories cannot by watertight be evaluated by only two crises. The purpose of this thesis is to investigate the basic phenomena of the both Money view and Credit view and of the Great Depression and the Great Recession and evaluate them using the data from Finland, Sweden and the United States. The studies in the original papers of the theories are not repeated, in this thesis.

The study of the theories of crisis will be a review of the literature. The basic phenomena of the crises are investigated using statistical material. The data used in this thesis are found on the web pages of the researchers (Reinhart and Rogoff; Maddison (Bolt and van Zanden); Bordo et al.), and the central banks like Federal Reserve Bank, Riksbank and Suomen Pankki. The idea of using statistical data from Finland, Sweden and the United States is to identify similarities and differences between the countries from the crises and the theories point of view. The features of the major crises are mainly defined based on the big countries like the United States in the international literature so it is also interesting to investigate if the features of crises differ between a big (U.S.) and two small “peripheral” countries (Sweden and Finland). In the time of the Great Depression, Finland was classified as a developing country in a contrast to the other two countries. In addition,

now Finland belongs to the Euro area, so Sweden and the United States have possibilities to use monetary policy to ease effects of the latest crisis, but not Finland.

## **1.2 Structure of the thesis**

This thesis is organized into nine chapters. Chapter 2 describes the basic terms. Chapters 3 and 4 review the two economic theories of crisis, the Money View and the Credit View, respectively. Chapter 5 introduces basic descriptions of the crises in 1930s and 2000s by literature. Chapter 6 presents the used statistical data and methods. After that, Chapter 7 presents the findings of the economic and banking crises based on the statistical data. In Chapter 8, the issue of the thesis is discussed based on the economists' models and interpretations of the crises in light of the statistical results. Finally, in Chapter 9, the conclusions of the reviewed literature and the statistical studies are presented.

## **2 Basic Terms and Theories**

This section describes basic terms and theories that will help to understand the following discussion of the Money and Credit views.

### **2.1 Money stock and money supply**

Money stock or money supply represents typically a classification of the money containing notes and coins, and deposits owned by non-financial public. The classifications vary between countries. Regarding this thesis, in Euro area (Finland) the classification has M1, M2 and M3; in Sweden are defined M1 and M3; and in the United States are M1, and M2. So called high-powered money contains notes and coins in circulation and in bank vaults and bank reserves in central banks.

### **2.2 Quantity theory of money**

The quantity theory of money defines a relation between the amount of money and the price level: the price level is rising when the amount of money in an economy is rising. The rising price level causes inflation. The quantity of money is calculated by the Fisher equation:  $MV = PT$ , where M denotes money supply, V denotes velocity of circulation, P represents average price level and T is the volume of transactions of goods and services.

### 3 The Money View

This section describes the Money view as a crisis theory that Milton Friedman and Anna Schwartz (1963a, 1963b) discuss it in their book and articles. The following first subsection outlines an overall picture of the theory. The next subsection describes more comprehensively the basic features of the model. Then there will be some other argumentation for the model. Finally there are expressed some criticism of the model.

#### 3.1 Short overall description

This subsection gives a short overall description of the main principles of the Money view created by Friedman and Schwartz (1963a). They aim to show, in their paper of the theory, that the money stock varies with systematic cyclical behaviour<sup>2</sup> as do other factors in an economy, and that change in the money stock is a remarkable factor in income fluctuations. They seek to show how the money stock and its determinants have cyclical movements and how they move in relation to the income. The data they use in their studies concerns only the United States. The money in their article is defined as (1) including currency plus adjusted deposits in commercial banks (both demand and time<sup>3</sup>) held by the nonbanking public (i.e., excluding both balances of the federal government and of banks<sup>4</sup>); and (2) from 1914 on, a narrower total which excludes time deposits. Friedman and Schwartz (1963a) use in their investigations so-called reference cycles<sup>5</sup> defined by the National Bureau of the United States to substitute business cycles. Friedman and Schwartz (1963a) argue that, based on their investigations, there is strong evidence that the money stock has an active role in the business fluctuations, especially, in the deep cycles. Regarding the timing, they argue that the cycles of money reach their peaks and troughs before the reference cycles. They continue that their studies show how the amplitude<sup>6</sup> of the cycles of money stock closely correlates with the cyclical movement in general business though the amplitude is only a half of the amplitude of money income. However, in spite of the results of their studies, Friedman and Schwartz (1963a) argue that they cannot say whether “the changes in money stock” are a cause or consequence in the changes of money income. They anyway infer that for major movement sizeable changes in money stock are necessary and sufficient condition<sup>7</sup> for sizeable changes in the rate of change in money

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<sup>2</sup> Systematic cyclical behavior denotes that the value or growth of a factor fluctuates from peaks to troughs.

<sup>3</sup> Demand deposit is a saving that can be withdrawn any day. Time deposit is a saving agreed for a certain time and cannot be withdrawn before maturity without costs.

<sup>4</sup> Excluding both balances of the federal government and of banks represent that the money and other assets held and owned by banks or Federal government are not included in the stock of money.

<sup>5</sup> The National Bureau has created and chronicled reference cycles that are average patterns for various factors.

<sup>6</sup> Amplitude of a business cycle represents how much the cycle moves vertically from bottom of a trough to top of a peak or vice versa.

<sup>7</sup> Assertion that one statement is a necessary and sufficient condition of another denotes that the former statement is true if and only if the latter is true.

income. For minor movements the evidence is less strong, but they believe that the connection shows that money has an independent role in crises beside other possible factors.

### 3.2 Features of the model

This subsection describes the features of the Money View model based on the “facts” that Friedman and Schwartz (1963a) list in their article. They aim to affirm their claim of the money stock as a main cause of crises by presenting these facts that “seem reasonably well established about the cyclical behaviour of money and related magnitudes”. They use data on:

- cyclical pattern of the money stock,
- cyclical pattern of the rate of change in the money stock,
- cyclical timing of the rate of change in the money stock,
- amplitude of movements in the rate of change in the money stock,
- cyclical behaviour of velocity,
- cyclical behaviour of proximate determinants of the money stock and
- relative roles of money and investment in the cycle.

As a fact of the *cyclical pattern of the money stock*, Friedman and Schwartz (1963a) argue that, as shown in Figure 3, below, the stock of money has tended to rise during both cyclical expansions and cyclical contractions<sup>8</sup>, except for some deep depressions. Friedman and Schwartz (1963a) observe that, in its cyclical behaviour, the money stock is like other series with a sharp upward trend - such as population, the total stock of houses. Figure 3, below, shows the stock of money, in billions of dollars, held by the nonbanking public (i.e. excluding both balances of the federal government and of banks) in periods 1898 - 1929 (upper figure) and 1929 - 1960. The straight (upper) line describes the changes in the currency held by the public, plus demand deposits adjusted, plus commercial bank time deposits, and the broken (lower) line describes the currency held by the public, plus demand deposits adjusted. The figures are seasonally adjusted, and dated as of end of month, for 1898-1946; for 1947-1960 currency plus demand deposits are adjusted in an average of daily figures, and commercial bank time deposits are a 2-month moving average of last-Wednesday-of-month figures, for a month centred at midmonth. The time period shown here, is shortened from the original due to the era interested in this thesis. The time of the Great Depression is visible, as a clear decline in the stock of money, in the beginning of the lower figure of Figure 3. The percentage decline was 35,2 per cent during the Great Depression, in 1929 - 1933. The second highest decline in the stock of money was 5,8 per cent, in a depression in 1892 - 1894.

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<sup>8</sup> Expansion and contraction are periods when business becomes larger and narrower, respectively, and cyclical denotes movements via troughs and peaks.

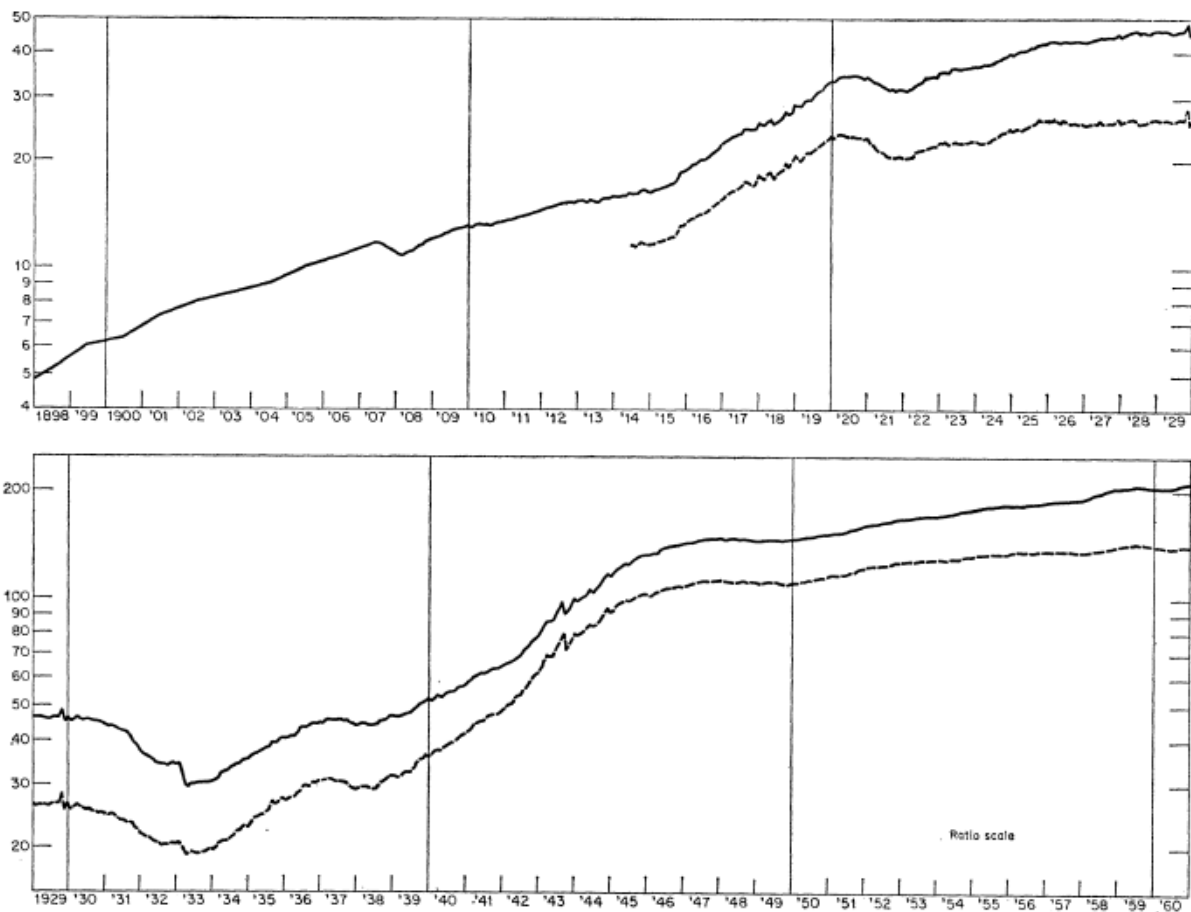


Figure 3: Money Stock, in billions of dollar, including commercial bank time deposits, 1898 - 1960, and currency plus demand deposits adjusted, 1914 - 1960 held by the nonbanking public. (Source: Friedman and Schwartz, 1963a)

On their way to show how monetary factors, as Friedman and Schwartz (1963a) them define, the stock of money and changes in the stock of money, behave cyclically, Friedman and Schwartz (1963a) create patterns of the cycles of the money stock in a deep and a mild depression based on their statistical data and a model<sup>9</sup>, used in National Bureau. Figure 4 shows the average reference-cycle patterns of money stock for mild and deep depressions. The patterns are separate for the period before and after 1907 because the data for the first time period is at annual or semi-annual dates, while, from 1907 on, monthly. So, the pattern for the period, before 1907, is five-point pattern and, after 1907, nine-point pattern. Friedman and Schwartz (1963a) argue that the pattern for the mild depression cycle may only have a lower rate of growth from mid-expansion to mid-contraction than during the rest of the cycle. Whereas, for deep depression cycles, Friedman and Schwartz (1963a) conclude that the cyclical pattern is more like the stereotype of a rise during

<sup>9</sup> The National Bureau (Burns and Wesley, 1946) derives the reference-cycle pattern using, as a base, monthly data. The monthly data is, first, seasonally adjusted; secondly, the seasonally adjusted data is located in the average standing of the successive stages of reference cycles; third, step-line of trend are defined for that average standing of the successive stages of reference cycles; fourth, each reference cycle of the average standing in successive stages are estimated as percentage of the average value for the cycle. The result is average reference cycle patterns for mild and deep depression cycles.

expansion and a fall during contraction, which indicates that mild and deep depressions are members of different species with respect to the behaviour of the stock of money.

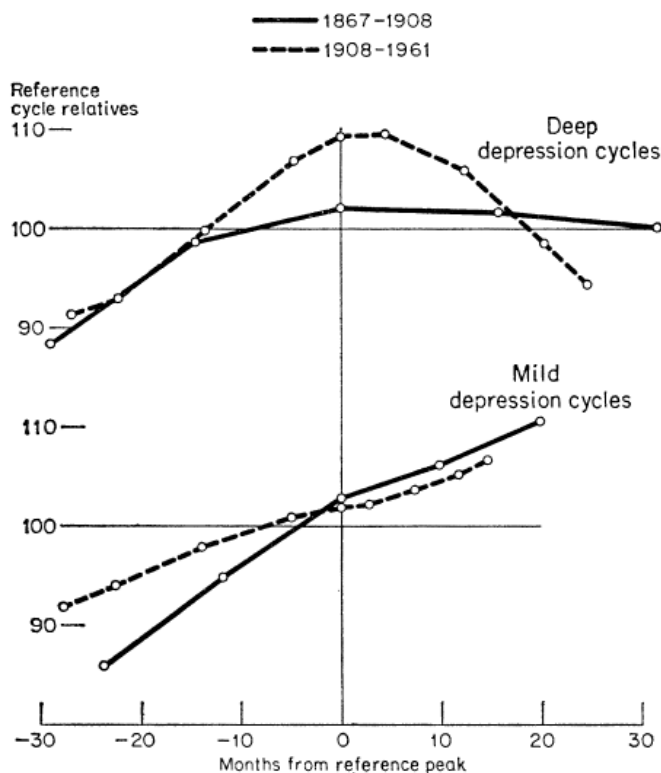


Figure 4: Money Stock: Average reference cycle patterns for mild and deep depression cycles, 1867-1961. (Friedman and Schwartz, 1963a)

The vertical line, in Figure 4, signifies a peak in the reference cycle. The use of the baseline of 100, indicates that the pattern is expressed as relatives to the average for the cycle. The numbers related to the horizontal axis defined amounts of months before and after the peak. The War cycles, 1914-1919 and 1938-1945, are not shown in Figure 4. Friedman and Schwartz (1963a) determine six deep depression cycles, as 1870-79, 1891-94, 1904-08, 1919-21, 1927-33 and 1933-38, and all others they define mild depression cycles.

To further demonstrate the cyclical behaviour of the money stock, Friedman and Schwartz (1963a) create *cyclical patterns for changes in the stock of money*. They start by creating a month-to-month rate of change in U.S. money stock from 1867 to 1960, as shown in Figure 5, though, the figure shows only the period of 1898 - 1960 due to the time period interested in this thesis. In that Figure, Friedman and Schwartz (1963a) eliminate the strong upward trend of the stock of money in order to reveal the cyclical behaviour more clearly. They continue that they take logarithmic first differences of the money stock which, they say, is equivalent to using the percentage rate of change from one time unit to the next. They further continue that, as the method used usually does, the series are highly jagged with a saw tooth appearance. As a reason for the appearance, Friedman and



Schwartz (1963a) propose that independent errors of measurement in the original stock series introduce negative serial correlation into first differences. They used this data to create the reference cycles for changes in the money stock using method, defined by National Bureau (see footnote 9). In Figure 5, the solid vertical lines represent reference cycle troughs and the broken lines, peaks, while dots represent peaks and troughs of the specific cycles. The horizontal broken lines represent high and low steps in the rate of change. In the annual or semi-annual segment, here 1898 -1907, the change in natural logarithm from one date to the next, in the data underlying Figure 3, is divided by the number of months intervening, and the quotient is plotted at the middle of the month halfway between. In the monthly segment, 1907-60, the month-to-month change in natural logarithm is plotted in the middle of the second month. The reference dates<sup>10</sup> are from the National Bureau. The period of the Great Depression (1929-33) is located in the beginning of the lower figure.

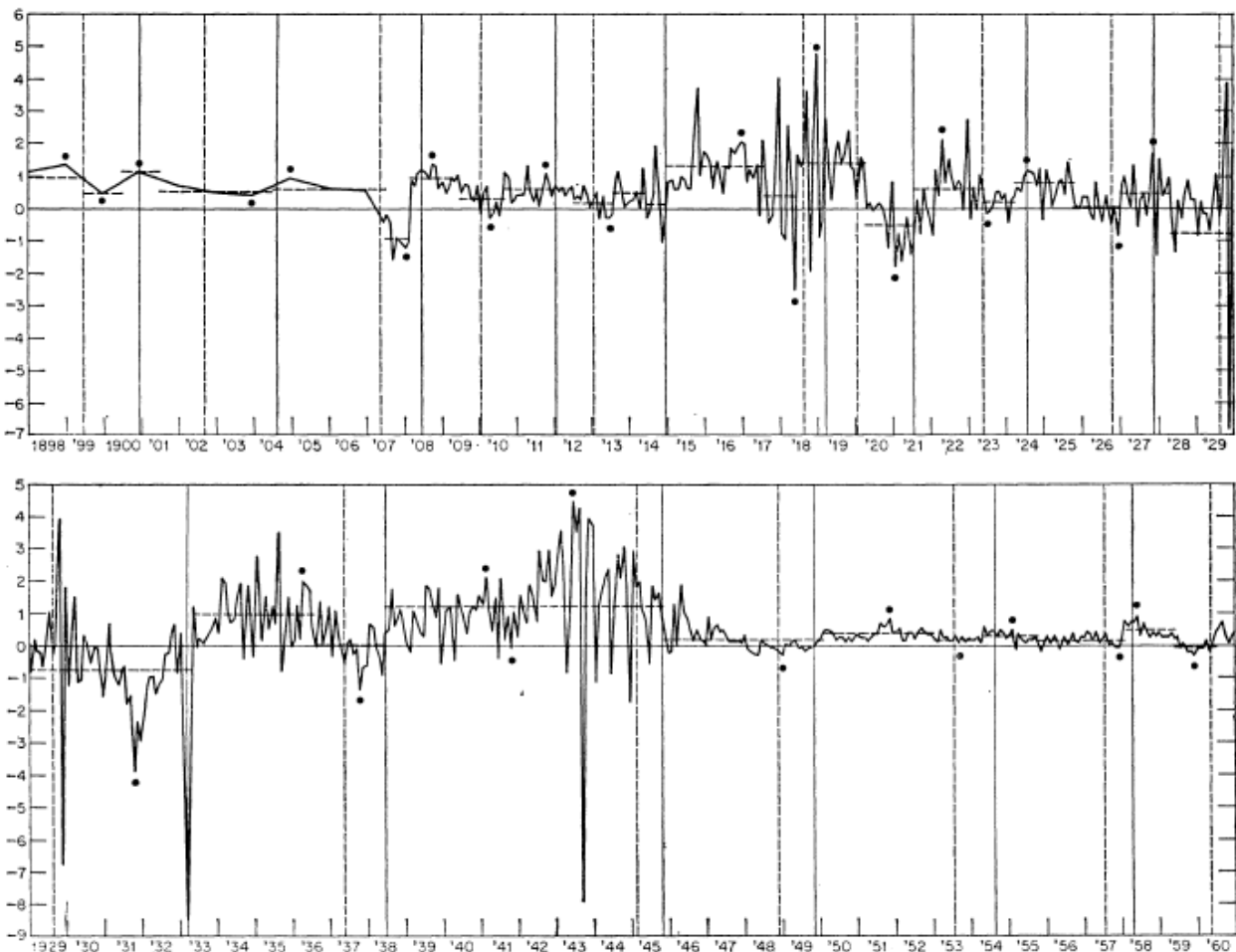


Figure 5: Month-to-Month Rate of Change in U.S. Money Stock, 1898 - 1960. (Source: Friedman and Schwartz, 1963a)

Figure 6 shows the *cyclical patterns for the rate of change in the money stock* as average reference-cycle patterns for mild and deep depressions in 1867-1961, created on the series shown in Figure 3. Friedman and Schwartz (1963a) argue that the figures show a clear cyclical pattern with

<sup>10</sup> The reference dates are found in Table 1 in Friedman and Schwartz, 1963a.

the mild and deep depression cycles, distinguished by the amplitude which produces them like various members of the same species. They note that the peak rate of change occurs early in expansion and the trough early in recession. Friedman and Schwartz (1963a) suggest that the rate of change series is conforming to the reference cycle positively with a long lead, rather than inversely with a somewhat shorter lag. As in Figure 4, in the following Figure 6, the vertical line signifies the reference peak time and the numbers on the horizontal line describes the time in months before and after the reference peak. In Figure 4, 100 is used as a reference value but, in Figure 6, the reference value is zero<sup>11</sup>. There are separate figures for periods 1867-1908 and 1908-1961 for a reason explained already in connection with Figure 5.

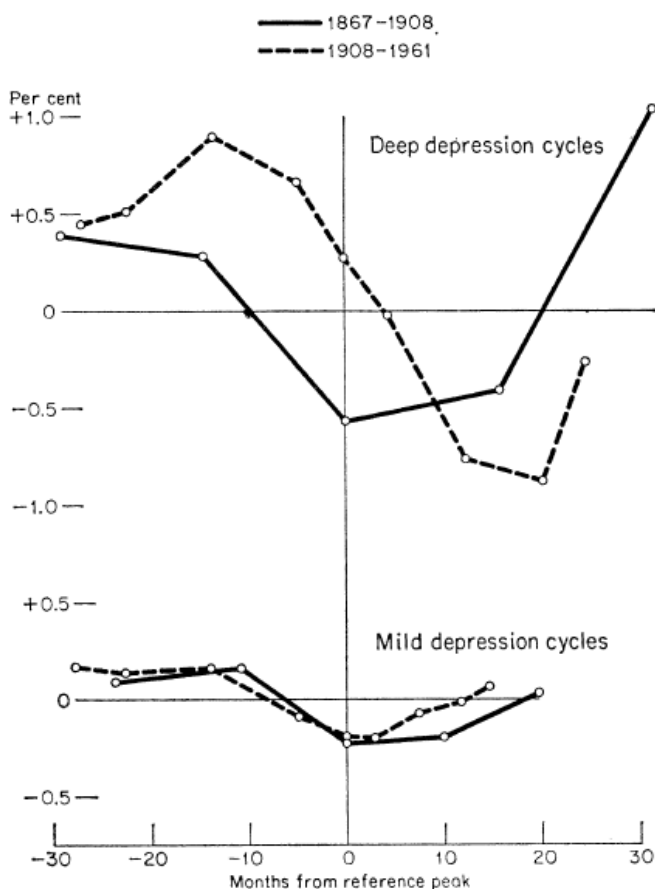


Figure 6: Rate of Change in Money Stock: Average Reference-Cycle Patterns for Mild and Deep Depression Cycles, 1867-1961. (Source: Friedman and Schwartz, 1963a)

To define *cyclical timing of the rate of change in the money stock*, Friedman and Schwartz (1963a) have to date the turning points for the series because there are not clear turning points in the series of the stock of money. They date the rate-of-change series in two ways: (1) they seek to approximate the series by a step function, with successively high and low steps ending in a step

<sup>11</sup> Reference value in Figure 6 is zero because the rate of change series, being the percentage change from month to month, is already in a form that is independent of units of measure. In addition, the rate of change in the money stock can be zero or negative as well as positive. (Friedman and Schwartz, 1963a)

peak or a step trough (the horizontal broken lines defined in Figure 5); (2) they apply the usual National Bureau specific cycle dating procedure to the rate-of-change series, and design specific cycle peaks and troughs (the dots in Figure 5). After that, Friedman and Schwartz (1963a) match both type of peaks and troughs to the dates of the reference cycle turns, defined by National Bureau, and calculate the leads and lags for the peaks and troughs. They report that, for step dates, the average lead for all cycles is 7 months at the peak and 4 months at the trough; for specific cycle dates, the average lead is 18 months at the peak and 12 months at the trough; for step dates, the standard deviation of the lead is 6 months at troughs and 8 months at peaks; for specific cycle dates, the standard deviation of the lead is 6 months at troughs and 7 months at peaks.

Friedman and Schwartz (1963a) argue that the subdivision between mild and severe depression cycles corresponds to a sharp difference in the amplitude of reference cycles in the rate of change. They present three argumentations for the connection between the cyclical movements and the *amplitude of movements in the rate of change in the money stock*. First, they refer to Figure 5 (above) that this result suggests that the amplitude of the changes in the rate of change in the stock of money is related to the severity of cyclical movements in general business, even though the timing of the changes in the rate of change in the money stock is not. Secondly, Friedman and Schwartz (1963a) investigate this relation further by correlating the ranking of the amplitudes of cyclical movements in the rate of change with the ranking of the amplitudes of the corresponding cyclical movements in general business, as measured by two different indicators; one, bank clearings<sup>12</sup> to 1919 and bank debits thereafter; the other, an index computed by Geoffrey H. Moore<sup>13</sup>. Friedman and Schwartz (1963a) propose that the correlations between the rate of change measure and the Moore index are sufficiently high (correlated with NBER Reference; 0.58 and 0.85, in contraction in period 1907-1960, and 1879-1907, respectively; and 0.76 and 0.82, in expansion in 1879-1907, and 1907-1960, respectively) so that, even with the small number of observations on which the values are based, they could hardly have arisen from chance. They continue that there is a less close connection between the clearings-debits figures and the rate of change, especially in expansions. Friedman and Schwartz (1963a) note that the Moore index is

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<sup>12</sup> Clearing-debits; Bank clearings outside New York City, monthly, 1879-1919; bank debits outside New York City, monthly, 1919-61. 1879-1942: Seasonally adjusted from Historical Statistics of the United States, 1789-1945, Bureau of the Census, 1949, pp. 324-325, 337-388. 1943-61: Board of Governors of the Federal Reserve System, Division of Bank Operations, mimeographed table, "Bank Debits and Rates of Turnover" (C. 5, Revised Series, 1943-52), December 23, 1953; thereafter Federal Reserve Bulletin, adjusted for seasonal variation by NBER. Reference cycle analysis follows Burns and Mitchell, op. cit., pp. 160-170. (Friedman and Schwartz, 1963a)

<sup>13</sup> Moore index: see Business Cycle Indicators, G. H. Moore, ed., Vol. 1, p. 104. An average of three trend adjusted indexes of business activity - A. T. & T., Persons-Barrons, and Ayres-each of which was analyzed for specific cycles, suppressing specific cycle turns not corresponding to reference cycle turns. (Friedman and Schwartz, 1963a)

adjusted for trend and reflects primarily changes in physical units and the amplitude of clearings-debits, not adjusted for intra-cycle trend, and are, in their original form, in dollars.

Third, Friedman and Schwartz (1963a) investigate the same relation by computing, first, the (natural) logarithmic first differences (i.e. year-to-year percentage changes) of both series and after that the moving standard deviations<sup>14</sup> from these rates of change involving 3<sup>15</sup>, 4, 5, and 6 terms to measure the variability of the rates of change of money and of income. They use annual estimates of net national product<sup>16</sup> and of the stock of money. Friedman and Schwartz (1963a) argue that it is clear, from the Figure 7 (below), that there is a close relation between the variability of money and of net national product. They point out that the parallelism of the series of money and income is important for the purposes of their studies, not the character of their common fluctuations. They report that income has become more variable relative to money over the period covered. They assume that a reason may be the changing statistical character of the NNP estimates. Friedman and Schwartz (1963a) use natural logarithms of the series to compute logarithmic first differences, and, because of that; the vertical scale can be interpreted directly in terms of percentage points. They note that, aside from removing the effect of intra-cycle trend, another advantage of using the first differences of NNP is that the results would be almost identical for total NNP and NNP per capita which remove the effect of population growth over periods of 3 to 6 years. They add that, for money, the degree of interpolation in the annual estimates is small throughout and the standard deviations are probably overestimates of the “true” standard deviations. In Figure 7, the continuing line describes fluctuations of the money stock and the broken line represents fluctuations of income during 1869 – 1958.

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<sup>14</sup> Moving standard deviation is a measure of the variability of the rates of change. First, for each value is calculated the deviation from the mean value. Then, the standard deviation is a mean value of the deviations. Moving standard deviation is comparable to moving averages.

<sup>15</sup> 3-term moving standard deviation: they took the initial three rates of change (1869-70, 1870-71, 1871-72), computed their standard deviation by the usual statistical formula, and dated the result as of 1870-71; then dropped the initial year and added a year, computed the standard deviation for the resulting triplet of rates of change (1870-71, 1871-72, 1872-73), and dated the results as of 1871-72; and so on.

<sup>16</sup> Net National Product (NNP) is the total market value of all final goods and services produced by the factors of production of a country minus depreciation.

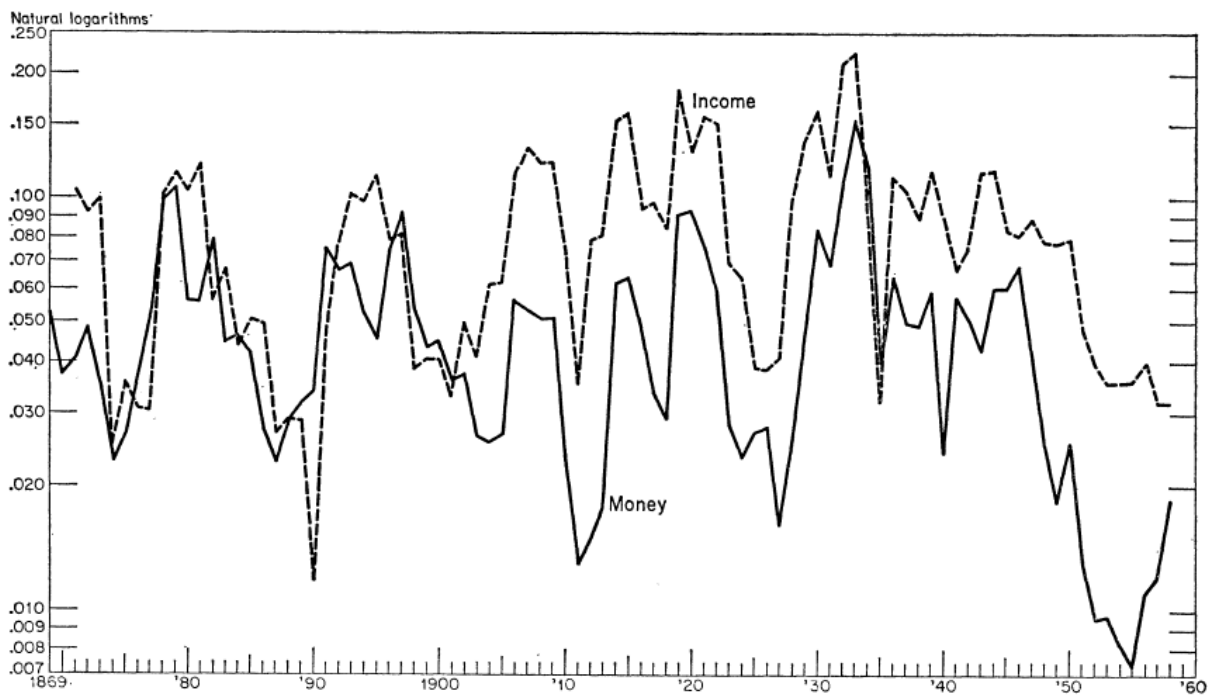


Figure 7: Moving standard deviation of annual rates of change in money, 1869 – 1958, and in income 1871 – 1958, 4-term series<sup>17</sup> (Friedman and Schwartz, 1963a)

Friedman and Schwartz (1963a) argue that the ratio of income to the stock of money, that is the income velocity of money, has been rising in the post-World War II periods. However, they continue that, during over nine decades of their data, it has declined sharply. As a result of their investigations of the *cyclical behaviour of velocity*, Friedman and Schwartz (1963a) propose that velocity has frequently declined during both expansions and contractions in general business. They add that when that has not been the case, velocity has conformed positively to the cycle, rising during expansions and falling during contractions. They further suggest that this cyclical pattern of velocity could be largely, though not wholly, accounted for, by supposing that the amount of money demanded in real terms is linked, not to current measured income and current measured prices, but to longer-term concepts of permanent income<sup>18</sup> and permanent prices. By this interpretation, Friedman and Schwartz (1963a) argue that, as the secular results suggest, the amount of money demanded rises during the expansion phase of a cycle in greater proportion than permanent income.

Friedman and Schwartz (1963a) propose that changes in the stock of money can, arithmetically, be attributed to changes in proximate determinants, to the *cyclical behaviour of proximate determinants of the money stock*. They continue that these determinants are: high-powered money;

<sup>17</sup> 4-term series are created, first, by calculating logarithmic first differences (i.e. year-to-year percentage changes) of series. Then, moving standard deviations (comparable to moving averages) are computed from these rates of change involving e.g. 4-term series and dated the result as of the second year. After that the initial year is dropped and a next year is added and the steps, as described above, are performed again. (Friedman and Schwartz, 1963a)

<sup>18</sup> Permanent income denotes expected long-term average income.

the division of the public's money holdings between currency to deposits; and the relation between deposits and the amount of high-powered money held by banks, so called reserves. They add that high-powered money consists of currency held by the public, plus currency held in bank vaults, plus deposits of banks at Federal Reserve Banks. Friedman and Schwartz (1963a) list that the division of the public's holdings between currency and deposits can be: a ratio of currency to the money stock; of currency to deposits; or of deposits to currency. They define that relations between public deposits and banks' reserves can be either the ratio of reserves to deposits or the ratio of deposits to reserves, and they add that this ratio is mainly determined by banks. Friedman and Schwartz (1963a) cite in Cagan (1965) who finds that the deposit to currency ratio is the most important single contributor. Friedman and Schwartz (1963a) continue that changes in high-powered money are as large in amplitude as changes in the deposit-reserve ratio but much less regular in timing, and, in contrast, changes in the deposit-reserve ratio are regular in timing but relatively small in amplitude.

Milton Friedman, in collaboration with David Meiselman (1963), investigates *the relative roles of money and investment in the cycle*, more exactly, the relative stability of monetary velocity and the investment multiplier. Friedman and Schwartz (1963a) cite in the study and say that, both the stock of money and the level of autonomous expenditures are positively related to consumption and to income over both short and long spans of years. However, they argue that the correlation is generally much higher for money than for autonomous expenditures. They further argue that, moreover, the partial correlation between money and consumption, holding autonomous expenditures constant, is roughly the same as the simple correlation, whereas the partial correlation between autonomous expenditures and consumption, holding the stock of money constant, is on the average roughly zero, being sometimes positive, sometimes negative. They add that similar results are obtained for year-to-year and quarter-to-quarter changes in the stock of money, autonomous expenditures, and consumption.

Friedman and Schwartz (1963a) aim to assure that their money view is true and describe a possible mechanism through which the monetary changes are transmitted. They start with a definition of *an Elysian state of moving equilibrium* in which real income per capita, the stock of money, and the price level are all changing at constant annual rates. They define that the relation between these rates depends on whether real income is rising or falling, whether wealth is remaining constant as a ratio to income or is rising or falling relative to income, on the behaviour of relative rates of return on different forms of wealth, and on the wealth elasticity of demand for money. Friedman and Schwartz (1963a) aim to simplify and say that let us suppose that all interest rates in real terms (i.e., adjusted for the rate of change in prices) and also the ratio of wealth to

income are constant, so that the wealth elasticity of demand for money can be approximated by the elasticity of demand for money with respect to permanent income. They continue about the definitions and suggest: if real income is rising at the rate of  $a_y$  per year, the stock of money demanded will then be rising at the rate of  $\delta a_y$  per year, where  $\delta$  is the income elasticity of demand for money, and prices will be rising at the rate of  $a_P = a_M - \delta a_y$ , where  $a_M$  is the rate of rise in the nominal stock of money per capita.

As an example, Friedman and Schwartz (1963a) explain that if income per capita is rising at 2 per cent a year, and  $\delta$  is  $3/2$ , then prices would be rising at 1 per cent a year. Friedman and Schwartz (1963a) report that these values are roughly the actual values of  $a_y$ ,  $a_P$ , and  $a_M$  over the 90 years 1870-1960 in the United States. They add that these values yield a rather smaller value of  $\delta$  (1.5) than they estimate by multiple regression techniques (roughly 1.8). They further continue their example and discuss that if  $\delta$  and  $a_y$  were to be the same, and the stock of money were to rise at, say, 10 per cent a year, prices would be rising at the rate of 7 per cent a year; if the stock of money were to be declining at 10 per cent a year, prices would be falling at the rate of 13 per cent a year.

Friedman and Schwartz (1963a) discuss that it may seem strange that a 1 percentage point difference in the rate of change of the stock of money produces precisely a 1 percentage point difference in the rate of change of prices regardless of the magnitude of the rate of change of money. They continue that it may be tempting to say, whether there will not be a flight from money as the rate of change in prices and, hence, the cost of holding money rises. They answer that they are comparing states of equilibrium, not the transition from one state to another. Friedman and Schwartz (1963a) suggest that in a world in which prices are rising at 7 per cent a year, the stock of the money will be smaller relative to income (i.e., velocity will be higher) than it would, in a world, in which prices are falling at 13 per cent a year. However, they argue that, in both, velocity will be changing only in response to the change in real income, which is, by assumption, the same in the two worlds. Of course, they add, it is possible that  $\delta$  is different at different levels of cost of holding money; but that would be an effect of a rather subtler kind.

Friedman and Schwartz (1963a) summarize the results, and argue that the statistical evidence on the role of money in business cycles, assembled in their paper, demonstrates, beyond any reasonable doubt, that the stock of money displays a systematic cyclical behaviour. They continue that the amplitude of the cyclical movement in money is closely correlated with the amplitude of cyclical movements in general business and is about half as large as the amplitude of cyclical movements in money income. Friedman and Schwartz (1963a) argue that the stock of money is much more closely and systematically related to income over business than is investment or autonomous expenditures. They further argue that there is a close relation between the variability of

the stock of money and the variability of income (See Figure 7). Friedman and Schwartz (1963a) suggest also that appreciable changes in the rate of growth of the stock of money are a necessary and sufficient condition for appreciable changes in the rate of growth of money income; and this, they continue, is true both for long secular changes and also for changes over periods roughly the length of business cycles. In addition, they conjecture that the longer-period changes in money income produced by a changed secular rate of growth of the money stock are reflected mainly in different price behaviour rather than in different rates of growth of output; whereas the shorter-period changes in the rate of growth of the money stock are capable of exerting a sizable influence on the rate of growth of output as well.

### **3.3 Further Argumentation**

This subsection presents further arguments Friedman and Schwartz believe to support their theory. Friedman and Schwartz (1963a) refer typically to Phillip Cagan (1965) who made his research into the determinants and effects of changes of money at the same time. They have used the results of the Cagan's investigations in their paper. However, their opinions may also differ from Cagan (1965) who e.g. say that the public decisions about the proportion in which it divides its money balances between currency and deposits is an important link in the feedback mechanism whereby changes in business affect the stock of money. Friedman and Schwartz (1963a) argue that it seems to be more from money to business than vice versa.

They agree with Cagan (1965) who analyse in detail the contribution of changes in each of the three proximate determinants to the cyclical fluctuations in the rate of change in the money stock. He argues that the deposit-currency ratio is the most important single contributor. Cagan (1965) calculate that throughout the period from 1877 to 1954, it accounted on the average for roughly half the cyclical fluctuations in the rate of change in the money stock. Based on the investigations of Cagan (1965), the main deviation in contribution of the deposit-currency ratio played a dominant role was at times of money panics.

### **3.4 Criticism**

This subsection presents the criticism levied against the "Money View" presented by Friedman and Schwartz (1963a). Friedman and Schwartz (1963a) discuss that their interpretation and results about the cyclical behaviour of velocity have been criticized for giving too tiny role for interest rates. Especially, Henry A. Latané (1960) argues that the whole of the movement of velocity, both over longer periods and over the cycle, can be accounted for by changes in interest rates. Friedman and Schwartz (1963a) answer to the claim that Latané's analysis covers a shorter period than their



does (Friedman & Schwartz: 1867-1961; Latané: 1909-1958). Friedman and Schwartz (1963a) continue that the deviation spring up from the different definitions of the money.

Latane (1960) discusses that Friedman finds that the stock of money generally rises over long periods at a decidedly higher rate than money income does and that income velocity therefore declines secularly as real income rises. Latane propose that this finding arises in part because Friedman and Schwartz include time deposits with money. He continues that time deposits have increased relative to demand deposits; consequently the relative money turnover has fallen. Latane (1960) argues that time deposits are not means of payment and so do not fulfil the major function of money. He continues that there is no reason, in theory, why they should be included in money if savings bank deposits, building and loan shares, and short-term government obligations, for example, are excluded. He suggests that the only explicit reason given by Friedman for the inclusion of time deposits in money is that reliable data on demand deposits are not available before 1914. He further continues that it is not clear why Friedman considers national income estimates going back to 1870 more reliable than early demand deposit estimates. He further argues that the demand deposit estimates before 1914 are based on bank call data and are published by the Federal Reserve Board in *Banking and Monetary Statistics* (1943), and the national income data used by Friedman are based on annual estimates by Simon Kuznets and not published by Kuznets except in the form of ten-year overlapping averages because Kuznets did not consider them satisfactory. Latane (1960) proposes also that a second reason Friedman gets a downward secular trend in velocity is his choice of time period, as Friedman bases his calculations on the period 1870 to 1954. He continues that in this period interest rates declined from 6.4 per cent to 2.9 per cent, so that the opportunity cost of holding cash balances was much lower in the latter than in the earlier years and when adjusted for opportunity cost, there is no evidence of a change in the demand for proportionate cash balances.

Minsky (1963) argue that, in their paper, Friedman and Schwartz (1963a) are not explaining very precise what are the channels by which monetary changes lead to output changes. He continue that according to the view of Friedman and Schwartz (1963a), however, the monetary event that calls the tune for economic activity is neither the supply of money nor a change in the supply of money; rather, it is a change in the rate of change in the supply of money that is the critical variable. Minsky (1963) continues that the accelerator view of the way in which monetary changes operate to affect the economic activity can be linked to an accelerator formulation of business cycle behaviour quite easily by way of the need to finance externally part of the induced investment during period of expansion. He further continues that as Friedman and Schwartz (1963a) show no interest in integrating their explorations of the supply of business cycles, this possibility is ignored.

Bernanke (1988) proposes that the prevailing economic wisdom traces out the following “monetary transmission mechanism”: (1) the Fed adds reserves to the banking system; (2) banks create more money; (3) the added liquidity reduces market interest rates; and (4) the lower market rates and greater liquidity encourage new spending. He continues that this chain of reasoning has led to the popular focus on the money supply and market interest rates as indicators of Fed policy. Bernanke (1988) concludes that this standard “money view” has proven misleading on occasion, and recently some economists have begun to take a different perspective on how policy works.

## 4 The Credit View

The analysis of the Credit View, in this thesis, is based on the book; *This Time is Different* and related articles. The book describes the “Credit View” as a crisis model by Reinhart and Rogoff (2009). Reinhart and Rogoff (2009, 2010, 2011) argue that based on their cross-country aggregates and individual country histories there is a strong connection between debt cycles and economic crises. Because the book (2009), “*This Time is Different*,” is more like describing story of the factors of crises than proposing “facts” this thesis presents the features of the Credit View based on the Reinhart and Rogoff (2011). The following first subsection outlines an overall picture of the model. The next subsection describes more comprehensively the basic features of the model. There will then be some further argumentation for the model. Finally, there are expressed some criticism of the model.

### 4.1 Short overall description

This subsection creates a short overall description of the Credit View model of crisis. Reinhart and Rogoff (2009) argue that based on their studies an essential phenomenon in financial crisis is excessive debt accumulation. They emphasize that often the phenomenon is accumulation of government debt, but it may also be debt accumulation of banks, corporations, or consumers<sup>19</sup>. Regardless of problems in accumulation, Reinhart and Rogoff (2009) remark that debt instruments are crucial to all economies. Reinhart and Rogoff (2009) investigate history of financial crises in the world even since 17<sup>th</sup> century. They argue that there are usually remarkable similarities with past experience in current crises. They say: “We have been here before.”

In their studies Reinhart and Rogoff (2009) consider different types of financial crises: sovereign defaults, banking crises, exchange rate crises, and high inflation. In a sovereign default a government fails to meet payments of its domestic or external obligations or both. Reinhart and Rogoff (2009) mention that, in a typical banking crisis some of banks, in a country, become

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<sup>19</sup> See debt definitions in APPENDIX 1.

insolvent after investment losses, and if people do not trust on a banking system they may withdraw their money from banks in a panic. In an exchange rate crisis a currency may suddenly lose its value significantly. Rapidly unexpected high inflation cause increase in housing price level and stock prices. Reinhart and Rogoff (2009) add that inflation allow debtors to pay their liabilities by currency that has lower purchasing power than in time of borrowings were committed, which is a source of default.

Reinhart and Rogoff (2009) concentrate in sovereign debt and banking crises because in their opinion these types of crises are the most relevant crises today. They justify that both have histories that span centuries and cut across regions. They mention also that sovereign debt crises are common to the emerging markets and have also been common for the western countries in their past when they go through government insolvency. From this thesis point of view the United States has had its government debt defaults, but Sweden and Finland not, based on the information of Reinhart and Rogoff (2009). In emerging markets, however, they argue that recurring (or serial) default remains a chronic and serious disease.

The other one, banking crisis, is common for every countries still today. Reinhart and Rogoff (2009) study banking crises from bank runs and bank failures in Europe during the Napoleonic Wars to the recent global financial crises that began with the U.S. subprime crisis of in 2007. Reinhart and Rogoff (2009) argue that the standard indicators of the United States showed all the signs of a country ending up in a crisis before the subprime crisis. They name these standard indicators as asset price inflation, rising leverage, large sustained current account deficits, and a slowing economic growth. They add that the way out can be quite perilous as the aftermath of systemic banking crises<sup>20</sup> involves a protracted and pronounced contraction in economic activity and puts significant strains on government resources.

The focus of analysis of Reinhart and Rogoff (2011) is on three hypotheses that they test at both “world” aggregate levels and on an individual country basis. Their hypotheses are: (1) external debt surges are an antecedent to banking crises; (2) banking crises (domestic and those in international financial centres) often precede or accompany sovereign debt crises; (3) public borrowing surges ahead of external sovereign default, as governments have “hidden domestic debts” that exceed the better documented levels of external debt. They argue that there seems to be a strong link between banking crises and sovereign default across the economic history of great many countries.

Reinhart and Rogoff (2010) use long (even two centuries) historical time series data on public debt and “modern” data on external debts in analysis of the cycles underlying serial debt and

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<sup>20</sup> See APPENDIX 2 for more information.

banking crises (for studying debt and banking crises, inflation, and currency crashes). Their data covers seventy countries in Africa, Asia, Europe, Latin America, North America, and Oceania. The data contains variables like external and domestic debt, trade, GNP, inflation, exchange rates, interest rates, and commodity prices. They say that it is a combination of data from several scholars and new data from diverse primary and secondary sources. The data of two centuries allows, Reinhart and Rogoff (2010) mention, to study role of repeated extended debt cycles in explaining the observed patterns of serial default and banking crises. They point out that many economists who are studying the financial crises are using data with a too narrow window provided by standard datasets that do not reveal the underlying cycles of half centuries and more.

## 4.2 Features of the model

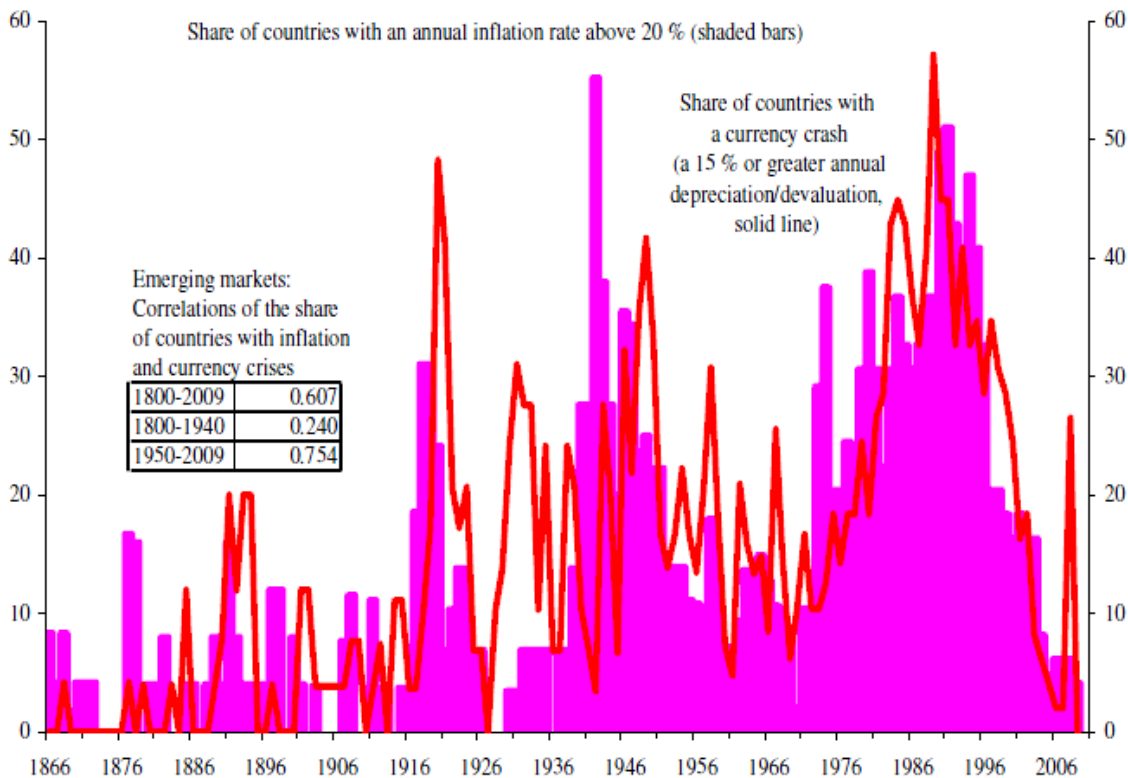
This subsection describes the features of the model based on the main hypotheses that Reinhart and Rogoff (2011) list in their article. There are three hypotheses that Reinhart and Rogoff (2011) focus on to test at both “world” aggregate levels and on an individual country basis. This is a distinction between the Money View by Friedman and Schwartz (1963a) and the Credit View by Reinhart and Rogoff (2009, 2011); Friedman and Schwartz, in the Money View, emphasise the national, domestic view of the great crises and Reinhart and Rogoff (2009, 2011), in their version of the Credit View, look the great crises more as the international phenomena. Their first hypothesis is that *external debt surges are an antecedent to banking crises*. Their second hypothesis is that *banking crises (domestic and those in international financial centres) often precede or accompany sovereign debt crises; they help predict them*. Their third hypothesis is that *public borrowing surges ahead of external sovereign default, as governments have “hidden domestic debts that exceed the better documented levels of external debt*. These hidden debts include domestic public debt (which prior to our data were largely undocumented) and private debt that become public (and “publicly” known) as the crisis unfolds. Reinhart and Rogoff (2011) argue that quantifying public contingent liabilities is beyond the scope of this paper. There is also a fourth related hypothesis which they document but do not test which says that during the final stages of the private and public borrowing frenzy on the eve of banking and debt crises and (most notoriously) bursts of hyperinflation, the composition of debt shifts distinctly toward short-term maturities (see Rodrik and Velasco, 2000).

As definitions of types and dates of crises Reinhart and Rogoff (2011) draw boundaries that, they say, are consistent with the existing empirical economics literature which segments them by the different types of crises. Reinhart and Rogoff (2011) define an inflation crisis using a threshold of 20 per cent per annum<sup>21</sup>. If annual inflation rate exceeds 500 per cent it is hyperinflation. In case of

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<sup>21</sup> Phillip Cagan’s classic definition of a monthly inflation rate is 50 per cent or more.

currency crashes, Reinhart and Rogoff (2010) follow a variant of Frankel and Rose (1996), and they say to focus exclusively on exchange rate depreciation. They suggest that the definition of currency crashes does not rely on other variables, such as reserve losses and interest rate hikes. They count the exchange rate depreciation for an entire period in which annual depreciations exceed the threshold of 15 per cent per annum. Reinhart and Rogoff (2010) argue that currency crashes and inflation crises go hand in hand (See Figure 8).



Sources: Reinhart and Rogoff (2009), sources cited therein and authors' calculations.

Notes: An inflation crisis is defined as a year where inflation exceeds 20 percent, while a currency crash is an annual depreciation (devaluation) greater than or equal to 15 percent per annum. The correlations of inflation and exchange rate crises are contemporaneous.

Figure 8: The Tight Connection between Currency Crashes and Inflation Crises: Emerging Markets, 1865-2009 (Sources: Reinhart and Reinhart (2010))

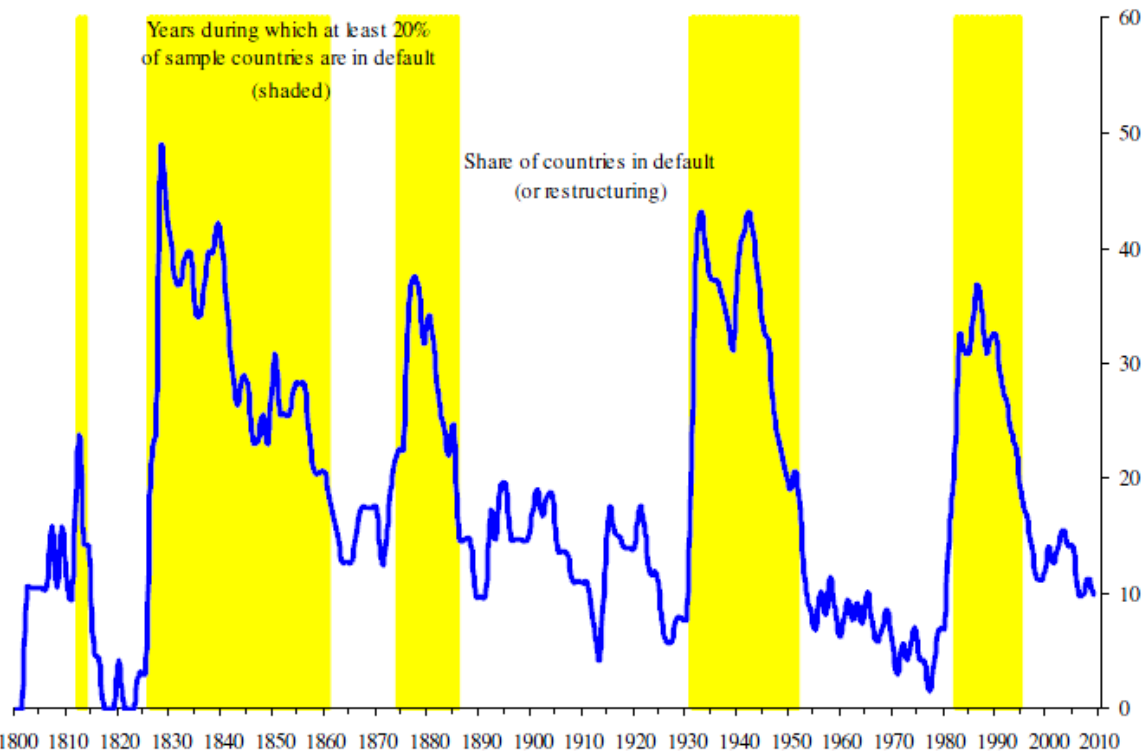
Reinhart and Rogoff (2011) discuss that external debt crisis, as outright defaults on payment of debt obligations, incurred under foreign legal jurisdiction, repudiation, or the restructuring of debt into terms less favourable to the lender than in the original. In case of default, Reinhart and Rogoff (2011) mention that the happening of the default can easily be timed but the final resolution of the default may take a very long time and in some cases cannot be timed. If there is not a final resolution to a default or it takes long time to solve it Reinhart and Rogoff (2011) define the date of a crisis as its first year a default enters. Reinhart and Rogoff (2011) suggest that domestic debt crises typically occur in worse economic conditions than the average external default. They add that

domestic debt crises may go unnoticed due to external creditors not involved, and the end of domestic default may remain unknown.

Reinhart and Rogoff (2011) argue that lack of quantitative information hamper in dating banking crises. They say that e.g. the relative price of bank stocks (or financial institutions relative to the market) could be used as an indicator of banking crisis, but it is not easy to receive such time series, especially for the earlier part of their sample and for developing countries. They continue that if a banking crisis begins with a bank run or withdrawals it is easier to date by the changes in bank deposits. However, Reinhart and Rogoff (2010) mention that often banking problems do not arise from the liability side of the bank's balance sheet, but from a protracted deterioration in asset quality. Because of the limitations in data, Reinhart and Rogoff (2010) define the banking crisis by two types of events: (1) (systemic, severe) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions; or (2) (milder) if there are no runs, the closure, merging, takeover, or large-scale government assistance of an important financial institution (or group of institutions), that marks the start of a string of similar outcomes for other financial institutions. Reinhart and Rogoff (2010) use data from different authors for different periods for cross-country dating the crises.

Reinhart and Rogoff (2010) define serial default as an experience of multiple sovereign defaults, while, debt intolerance, they argue, manifests itself in the extreme duress to default that is common to many emerging markets. They argue also that their studies show that controllable debt thresholds for highly debt intolerant emerging markets are surprisingly low (even fifteen to twenty percent), and these thresholds depend heavily on a country's record of default and inflation. Reinhart and Rogoff (2010) continue that debt intolerance of developing countries may be caused by weak institutional structures and of a problematic political system that makes governments to avoid hard domestic decisions and then to borrow from external sources. They add that that may cause global investors become suspicious about the government's motive.

Figure 9 plots the percentage of all independent countries, for the years 1800 to 2009, in a state of default or restructuring during any given year (2009 the dataset is most complete). In Figure 9, below, the shaded bars describe the times when at least 20 per cent of the sample countries are in default. The solid line shows the share (right axis) of countries in default or restructuring. During the Great Depression over 40 per cent of the independent countries of the sample were in default or restructuring the debts. The difficulties seemed to continue many years maybe due to the World War II. During the Great Recession the share of countries in default or restructuring was somewhat over 10 per cent.



Sources: Lindert and Morton (1989), Macdonald (2003), Purcell and Kaufman (1993), Reinhart, Rogoff, and Savastano (2003), Suter (1992), and Standard and Poor's (various years).

Notes: Sample includes all countries, out of a total of 70 listed in Appendix Table 1, that were independent states in the given year. Specifically, the number of countries increases from 19 in 1800 to 32 in 1826, as Latin American colonies gained independence; following World War II, newly-independent Asian states swell the number to 58 and in the following decades as African nation-states are born the number of sovereign increases to a total of 70—the full sample.

Figure 9: Global Sovereign External Default Cycles: 1800-2009. Share of countries in default or restructuring. (Source: Reinhart and Rogoff, 2010)

Reinhart and Rogoff (2011) argue that aside from the current lull, there are long periods where a high percentage of all countries are in a state of default or restructuring. Indeed, they continue there are five pronounced peaks or default cycles in Figure 9. From this thesis point of view the most interesting periods are the Great Depression (1930-1933) and the Great Recession (2007-2009). As Reinhart and Rogoff (2010) argue during the Great Depression there were almost half of the independent countries of sample in default or restructuring their debts. It is possible that the difficulties in the Euro area are not yet shown in the data.

Reinhart and Rogoff (2011) propose that: *public debt follows a lengthy and repeated boom-bust cycle. The bust phase involves a markedly higher incidence of sovereign debt crises. Public sector borrowing surges as the crisis nears.* They add that, in the aggregate, debts continue to rise after the default, as arrears accumulate and GDP contracts markedly. Reinhart and Rogoff (2011) suggest also that upturns in the debt ratio usually precede the rise in default rates, as the regressions for the world aggregates shown at the Table 2 (bottom of Figure 10) confirm. Figure 10 shows how sovereign default (pale bars, left axis) and total of domestic plus external public debt (in percent of

GDP, solid line, right axis) have moved together. In the dark bars are shown the percent of countries that have over 20 per cent annual inflation. Reinhart and Rogoff (2011) explain that, as the figure 10 shows, there is an evident positive correlation between rising debt burdens and higher incidence of default. They continue that periods of higher indebtedness are also associated with a higher incidence of inflation crises. They conclude that default through inflation is more prevalent since World War I, as fiat money became the norm and links to gold eroded. Reinhart and Rogoff (2011) propose that *serial default is a widespread phenomenon across emerging markets and several advanced economies*.

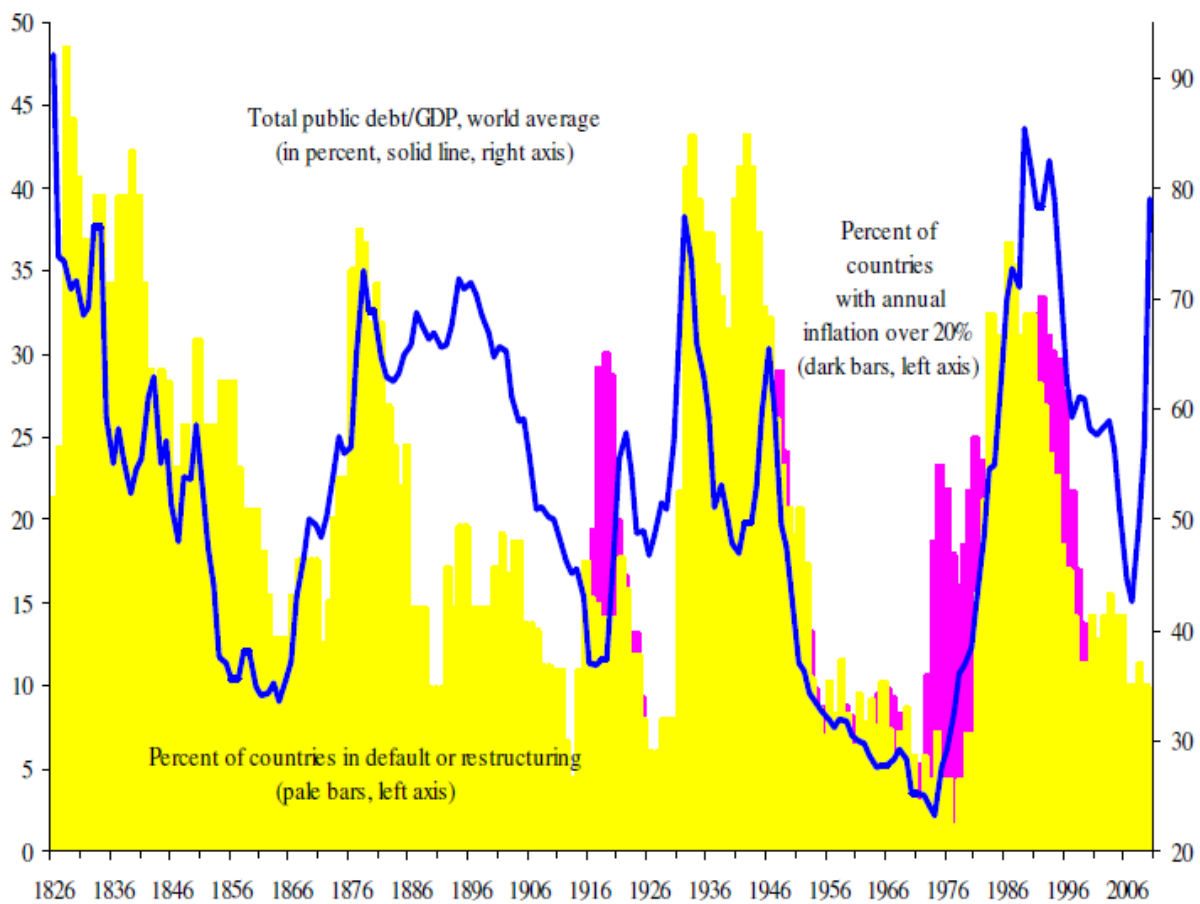


Figure 10: Sovereign Default on External Debt, Total (domestic plus external) Public Debt, and Inflation Crises: World Aggregates, 1826-2010 (debt as a percent of GDP) Source: Reinhart and Rogoff (2010).



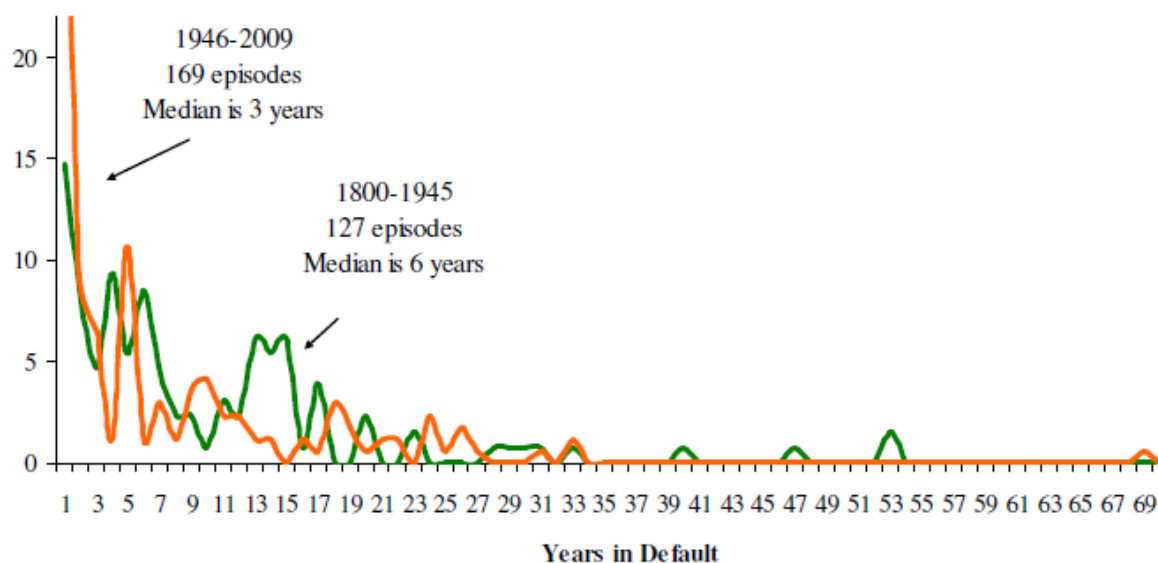
Dependent variable	World: Share of countries in default or restructuring 1824-2009	
Sample		
Independent variables	<i>OLS</i> (robusterrors)	<i>Logit</i> (robusterrors)
World: Public debt/GDP (t-1)	0.346	0.008
<i>p</i> -value	0.000	0.000
Number of observations	184	184
R <sup>2</sup>	0.224	0.246

Sources: Reinhart and Rogoff (2009), sources cited therein and authors' calculations.

Notes: The debt aggregate for the world is a simple arithmetic average of individual countries' debt/GDP ratios. For a few countries the time series on debt and exports are much longer dating back to the first half of the 19<sup>th</sup> century than for nominal GDP. In these cases (Brazil, Canada, Egypt, India, Nicaragua, Thailand, Turkey and Uruguay) the debt/GDP series was spliced (with appropriate scaling) with the to the available debt/GDP data. The split between advanced and emerging economies is made along the present-day IMF classification.

Table 1: Regression table, bottom of Figure 10 (Source: Reinhart and Rogoff, 2010)

Reinhart and Rogoff (2011) propose also that *the median duration of default spells in the post-World War II period is one-half the length of what it was during the 1800-1945* (three years versus six years, see Figure 11). The numbers of the horizontal axis are duration of the default. A bigger number represents a longer duration of the default. The height of the line tells the amount of defaults of the sample (vertical axis). There are separate curves for periods 1800-1945 and 1946-2009.



Sources: Lindert and Morton (1989), Macdonald (2003), Purcell and Kaufman (1993), Reinhart, Rogoff, and Savastano (2003), Suter (1992), Standard and Poor's (various years) and authors' calculations.

Notes: The duration of a default spell is the number of years from the year of default to the year of resolution, be it through restructuring, repayment, or debt forgiveness. The Kolmogorov–Smirnov test for comparing the equality of two distributions rejects the null hypothesis of equal distributions at the one percent significance level.

Figure 11: Duration of Default Episodes: 1800-2009 (frequency of occurrence, percent) Source: Reinhart and Rogoff, 2010)

Reinhart and Rogoff (2011) explain that median duration of defaults may have shortened because the crisis resolution that crisis resolution mechanisms have improved since the bygone days

of gun-boat diplomacy, or when bail-outs are facilitated by the likes of the International Monetary Fund, creditors are more patient with their serial-defaulting clients. Reinhart and Rogoff (2010) note that once debt is restructured, countries are quick to re-leverage.

In case of banking crises Reinhart and Rogoff (2011) propose that *prior to World War II, serial banking crises in the advanced economies were the norm; as the larger emerging markets developed a financial sector in the late 1800s - these economies joined the “serial banking” crisis club*. Reinhart and Rogoff (2011) argue that the frequency of banking crises drops off markedly for both the advanced economies and the larger emerging markets post-WWII. They continue, however, all except Portugal experienced at least one post-War crisis prior to the current episode. Reinhart and Rogoff (2011) conclude that despite dramatic differences in recent sovereign default performance, the incidence of banking crises is about the same for advanced economies as for emerging markets. They add that as financial markets have developed in the smaller, poorer economies, the frequency of banking crises has increased, though; regarding their studies, their definition of financial crises in poor countries may be incomplete due to lack of information.

Based on their investigations, Reinhart and Rogoff (2011) propose that *ahead of banking crises, private debts (external debt, broader private capital inflows, domestic bank debt) also display a repeated cycle of boom and bust - the run-up in debts accelerates as the crisis nears*. They suggest furthermore that having debts (public or private) is a prerequisite to default but it is not a tautology. They add that the pattern that emerges is not indicative of a gradual (linear) accumulation in debt in advance of a banking crisis or a sovereign default. Reinhart and Rogoff (2011) emphasize that when they discuss “rising debts ahead of the crisis” they are referring to surges in capital inflow or in any kind of debt (domestic or external). They add that this nonlinear pattern in borrowing ahead banking and debt crises is documented in its multiple manifestations in their many figures (see e.g., Figures 12 and 13 of this thesis or Figures 9-13 in Reinhart and Rogoff, 2011).

Figure 12 presents average gross external public and private debts as percent of GDP in emerging markets during years 1970-2009 (solid line, right axis), sovereign default as percent of countries in default or restructuring (shaded) and percent of countries with systemic banking crises (black bars, left axis). External debt/GDP in advanced economies in 1999-2009 is shown in the inset only. Reinhart and Rogoff (2011) point out that the regression (Table 3 at the bottom of Figure 12) confirms the outcome of the visual inspection of the time series plotted in Figure 12. Reinhart and Rogoff (2011) estimate using OLS and fractional logit how the external debt/GDP ( $t - 1$ ) ratio of emerging markets is affecting the share of countries in default or restructuring or in systemic banking crises in emerging markets during 1971–2009. The results are statistically significant. They continue that increases in external debt systematically help predict increases in the share of

countries in default and the comparable share of emerging markets with systemic banking crises. They add that the small inset shown in Figure 12 also depicts a similar surge in public and private external debts for the 22 advanced economies in their sample, over the decade leading to the global financial crisis which began with the subprime debacle in the United States in 2007. Reinhart and Rogoff (2011) note that the year 2008 is the advanced-economy counterpart to the years 1981 and 1998 for emerging markets.

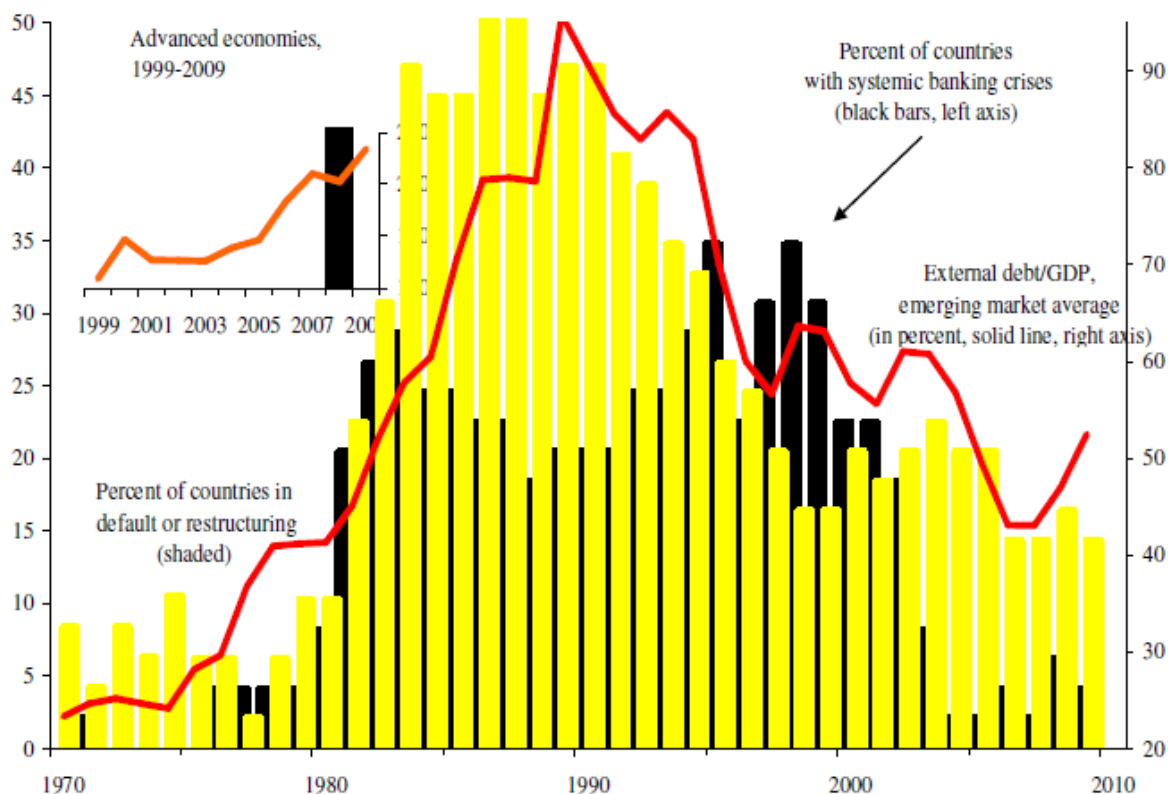


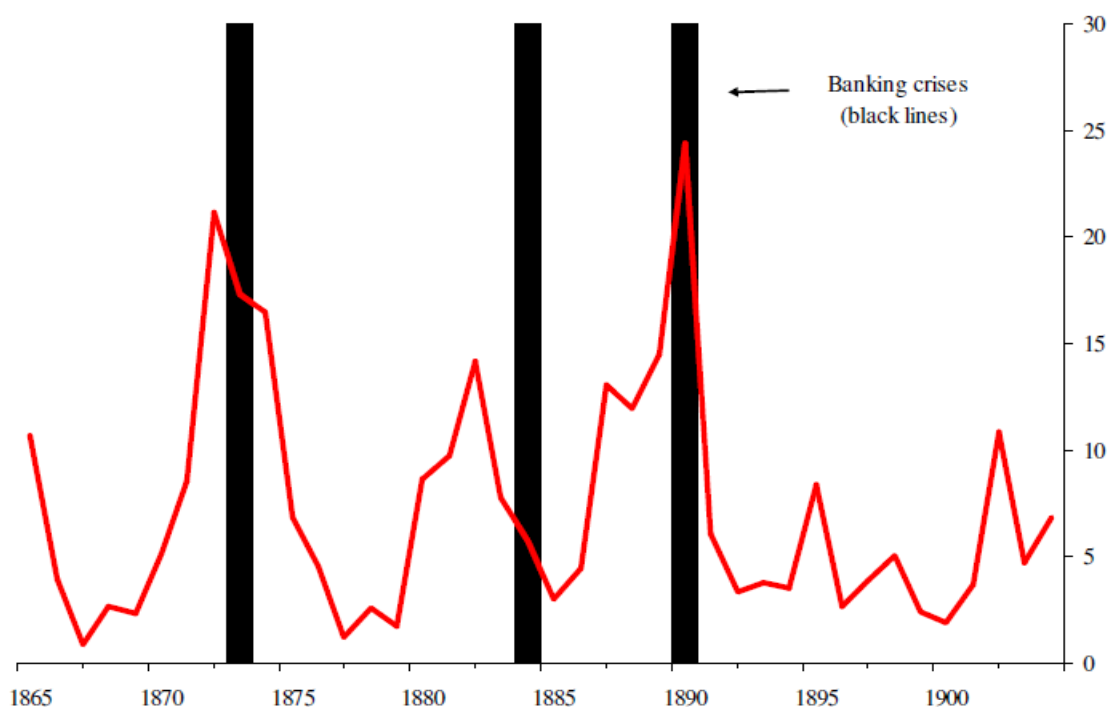
Figure 12: Gross External Debts (public and private), Sovereign Default and Systemic Banking Crises: Advanced Economies (inset only) and Emerging Markets, 1970-2009 (debt as a percent of GDP) (Source Reinhart and Rogoff, 2010)

Dependent variable	Emerging Markets: Share of countries in default or restructuring	
Sample	1971-2009	
Independent variables	<i>OLS</i> (robusterrors)	<i>Logit</i> (robusterrors)
Emerging Markets:		
External debt/GDP (t-1)	<i>0.574</i>	<i>0.013</i>
<i>p</i> -value	<i>0.000</i>	<i>0.000</i>
Number of observations	39	39
<i>R</i> <sup>2</sup>	0.615	0.595
Dependent variable	Emerging Markets: Share of countries in systemic banking crises	
Sample	1971-2009	
Independent variables	<i>OLS</i> (robusterrors)	<i>Logit</i> (robusterrors)
Emerging Markets:		
External debt/GDP (t-1)	<i>0.383</i>	<i>0.007</i>
<i>p</i> -value	<i>0.000</i>	<i>0.000</i>
Number of observations	39	39
<i>R</i> <sup>2</sup>	0.479	0.514

Sources: Reinhart and Rogoff (2009), sources cited therein and authors' calculations.

Table 2: Regression table from bottom of Figure 12 (Source Reinhart and Rogoff, 2010)

Reinhart and Rogoff (2011) argue that taking into account the facts on about the external debt, and debt and banking crisis, it is not surprising that capital flows display the boom-bonanza phase in the years prior to the crisis and the Dornbusch-Calvo-type sudden stop syndrome<sup>22</sup> just before or during the year of the crisis. Figure 13 shows how the capital inflow to the United States from the United Kingdom and banking crises co-operate during years 1865-1914. In Figure 13 the solid line describes private capital inflows as a percent of exports (right scale) from the United Kingdom to the United States during 1865-1914. The black vertical lines are the first years of banking crises in United States.



Sources: Stone (1999), Reinhart and Rogoff (2009) and sources cited therein.

Figure 13: United States: Private Capital Inflows from the United Kingdom and Banking Crises, 1865-1914 (capital flows as a percent of exports) (Source: Reinhart and Rogoff, 2010)

Reinhart and Rogoff (2011) propose that *banking crises most often precede or coincide with sovereign debt crises*. They explain that the reasons for this temporal sequence may be the contingent liability story emphasized by Diaz Alejandro (1985) and formalized in Velasco (1986), in which the government takes on massive debts from the private banks, thus undermining its own solvency. They discuss that with this temporal pattern would also be consistent the model of currency crashes, documented by Kaminsky and Reinhart (1999), as currency crash is an integral part of the “twin crisis” (banking and debt crisis) phenomenon. Reinhart and Rogoff (2011)

<sup>22</sup> Dornbusch-Calvo-type sudden stop syndrome represents that capital inflows to an emerging market economy suddenly dry up as global investors shun the country, as explained in Calvo, Izquierdo, and Loo-Kung (2006), for example. (Reinhart and Rogoff, 2010)

continue that if, as Kaminsky and Reinhart (1999) suggest, banking crises precede currency crashes, and the collapsing value of the domestic currency that comes after the banking crisis begins may undermine the solvency of both private and sovereign borrower who have important amounts of foreign currency debts.

Reinhart and Rogoff (2011) refer to their own investigations and say that even if there are not large scale bailouts (and without counting the post-crisis new government guarantees), largely owing to collapsing revenues, government debts typically rise about 86 per cent in the three years following a systemic financial crisis, setting the stage for rating downgrades and, in the worst scenario, default. Reinhart and Rogoff (2011) suggest that a causal chain from sovereign debt crisis to banking crisis cannot be dismissed lightly. Reinhart and Rogoff (2011) argue that a government default, in the circumstances where government has coerced otherwise healthy banks to buy government debt in significant quantities in financial repression, would directly impact the banks' balance sheet. They continue that even if banks are not overly exposed to government paper, the rating of their national government create a "sovereign ceiling" in which corporate borrowers are rated may make banks' offshore borrowing very costly or altogether impossible. They add that if the result is a sudden stop in offshore borrowing that could raise bank insolvencies either immediately or subsequently.

Figure 14 (below) shows incidences of sovereign default on external debt, changes in total (domestic plus external) public debt, and occurrences of systemic banking crises in advanced economies in period from 1880 to 2010. Sovereign defaults are shown as percent of advanced economies in default or restructuring (shaded, left scale). Average public debt/GDP in advanced economies is shown in percent (solid line, right scale). Reinhart and Rogoff (2011) use simple arithmetic averages that are not weighted by a country's share in world GDP. Banking crisis during which 25% or more of advanced economies entered the first year of a banking crisis occur in years 1893, 1907, 1914, 1931, and 2008. The banking crises are shown as black bars in Figure 14. There are a few countries whose time series on debt and exports are much longer dating back to the first half of the 19th century than for nominal GDP. In these cases (Brazil, Canada, Egypt, India, Nicaragua, Thailand, Turkey and Uruguay) Reinhart and Rogoff (2011) splice the debt/GDP series to the available debt/GDP data. In addition, Reinhart and Rogoff (2011) make the split between advanced and emerging economies along the present-day IMF classification, even though several countries were "emerging markets" during most of the pre-World War I period.

Reinhart and Rogoff (2011) estimate the impact of public debt to GDP (t-1) ratio to share of countries in default or restructuring and also to share of countries in systemic banking crises in advanced economies (sample of 1880-2009). Based on the results of OLS and logit, it seems that

the public debt to GDP ratio affect on average more possibility of default or restructuring than a systemic banking crisis. The results are statistically significant, especially in case of default. The results are shown in the regression table (Table 4) in the bottom of Figure 14 above.

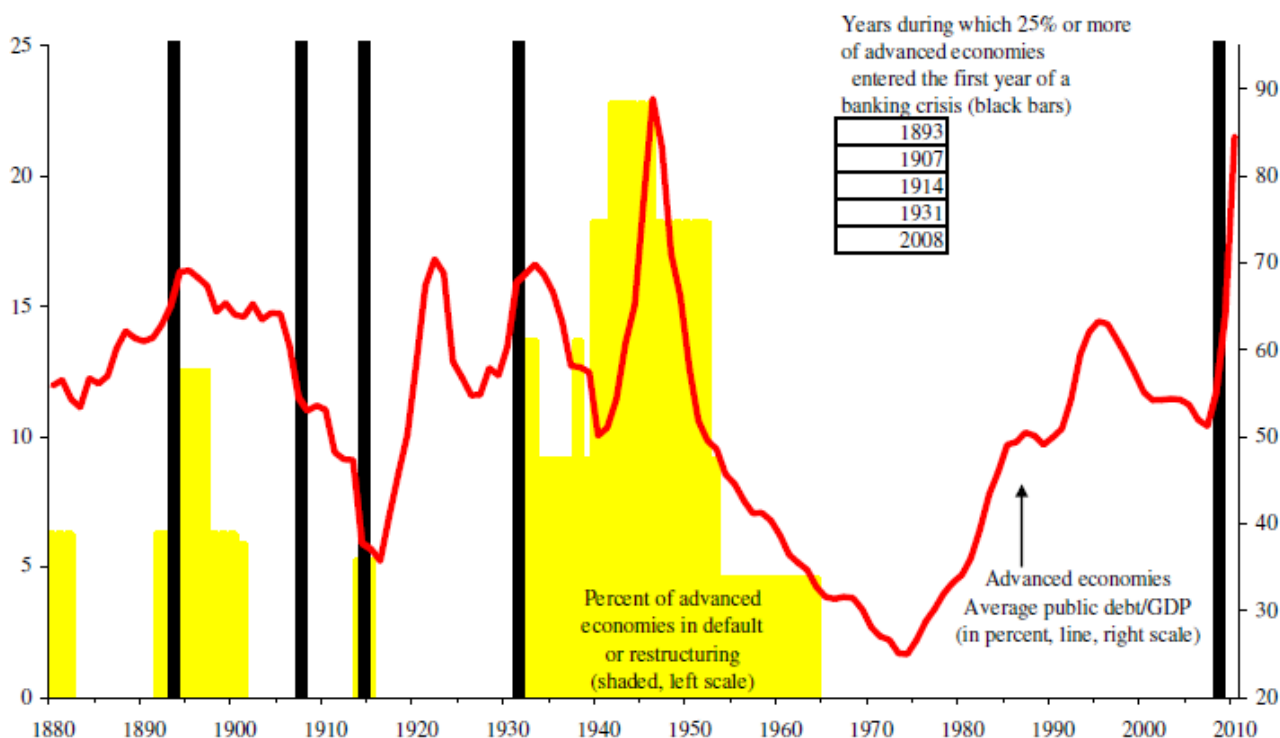


Figure 14: Sovereign Default on External Debt, Total (domestic plus external) Public Debt, and Systemic Banking Crises: Advanced Economies, 1880-2010 (debt as a percent of GDP) (Source: Reinhart and Rogoff, 2010)

Dependent variable	Advanced Economies: Share of countries in default or restructuring	
Sample	1880-2009	
Independent variables	<i>OLS</i> (robusterrors)	<i>Logit</i> (robusterrors)
Advanced Economies:		
Public debt/GDP (t-1)	0.209	0.002
<i>p</i> -value	0.000	0.000
Number of observations	130	130
R <sup>2</sup>	0.176	0.167
Dependent variable	Advanced Economies: Share of countries in systemic banking crises	
Sample	1880-2009	
Independent variables	<i>OLS</i> (robusterrors)	<i>Logit</i> (robusterrors)
Advanced Economies:		
Public debt/GDP (t-1)	0.057	0.002
<i>p</i> -value	0.002	0.006
Number of observations	130	130
R <sup>2</sup>	0.047	0.050

Sources: Reinhart and Rogoff (2009), sources cited therein and authors' calculations.

Notes: The debt aggregates for the advanced economies and the world are simple arithmetic averages (not weighted by a country's share in world GDP) of individual countries' debt/GDP ratios. For a few countries the time series on debt and exports are much longer dating back to the first half of the 19<sup>th</sup> century than for nominal GDP. In these cases (Brazil, Canada, Egypt, India, Nicaragua, Thailand, Turkey and Uruguay) the debt/GDP series was spliced (with appropriate scaling) with the to the available debt/GDP data. The split between advanced and emerging economies is made along the present-day IMF classification, even though several countries, such as New Zealand, were "emerging markets" during most of the pre-World War I period.

Table 3: Regression table of bottom of Figure 14 (Sources: Reinhart and Rogoff, 2010)

In their observations on the composition of debts, Reinhart and Rogoff (2011) propose that *short-term debts escalate on the eve of banking crisis*. They evaluate the ratio of short-term gross external debt (public and private) in emerging markets in the period from 1970 to 2009. Figure 15 shows the results, and as Reinhart and Rogoff (2011) observe the ratio of short-term debt to total debt about doubles from 12 to 24 per cent in 1981. In Figure 15, the single black vertical lines show the incidences of banking crises and the shaded area incidences of defaults when 20 percent or more of countries in the sample were hit by crisis. Reinhart and Rogoff (2011) argue that a similar pattern emerges in the run-up to sovereign defaults. They add that based on their investigations, for example, in Iceland, the share of short-term debts raised from about 17 to 49 percent from year 2005 to 2009. They argue also that on the way to hyperinflation the long-term debts may disappear totally. Reinhart and Rogoff (2010) propose that *private debts become public debts after the crisis*.

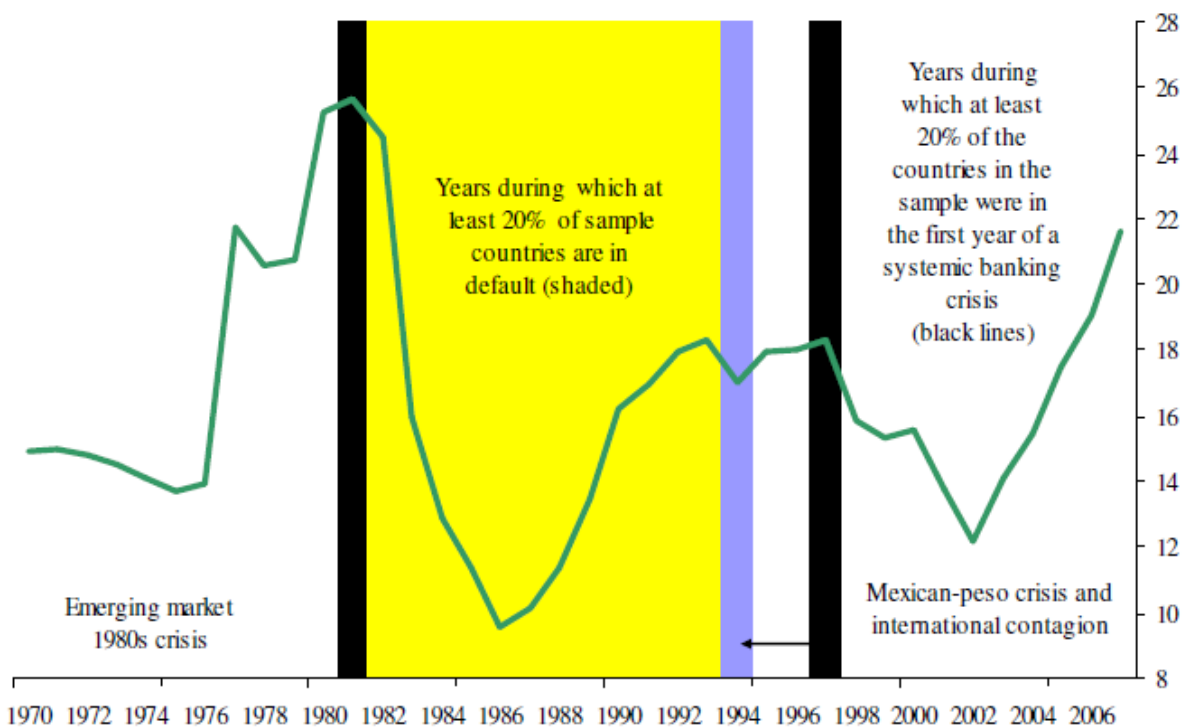


Figure 15: Share of Short-term Gross External Debt (public plus private): Emerging Markets, 1970-2009 (in percent)

As mentioned before, Reinhart and Rogoff (2011) suggest that there is a strong connection between debt cycles and economic crises. They note three factors: (1) public debts rise markedly as a sovereign debt crisis draws near; (2) private debts exhibit a similar nonlinear build-up ahead of banking crises; and (3) public debts may or may not contribute to the pre-crisis surge in indebtedness on the eve of banking crises. They suggest also that banking and debt crises often occur simultaneously (or in close proximity of one another) and, more often than not, banking crises anticipate (temporally preceded) debt crises.



As conclusions Reinhart and Rogoff (2010) suggest that their analysis document some of the links between public and private debt cycles and the recurrent pattern of banking and sovereign debt crises over the past two centuries. They argue too that banking crises are importantly preceded by rapidly rising private indebtedness. However, they continue that banking crises (even those of a purely private origin) directly increase the likelihood of a sovereign default in their own right (according to our findings) and indirectly as public debts surge. Still, they add there is little to suggest in this analysis that these debt cycles and their connections with economic crises have changed appreciably over time.

### 4.3 Further Argumentation

Further argumentation considers different items e.g., theoretical issues that Reinhart and Rogoff (2011) believe to support the model describe above and theoretical underpinnings of “*This Time is Different*” syndrome. Reinhart and Rogoff (2010) discuss theoretical underpinnings of “This Time is Different” syndrome and, they say, that is rooted in the firmly-held belief that financial crises do not happen here and now, and we do things better and we are smarter than people before. Reinhart and Rogoff (2011) aim to determine an explanation to the remarkable universality of serial defaults and serial financial crises across time, place, cultures, institutions and political systems. As possible explanations, they discuss multiple equilibrium rationales, short-term bias, hidden debt, and other models of leverage and behaviour.

Reinhart and Rogoff (2011) discuss multiple equilibrium and study whether multiple equilibrium models, and related refinements, would appear to offer an explanation of one central feature of the “This Time is Different” syndrome: it is typically much easier to identify when an economy is vulnerable to a financial crisis than to assess the probability or the timing of the collapse. They mention that the generic multiple equilibrium model is a variant of Diamond and Dybvig’s (1983) analysis of bank runs. Reinhart and Rogoff (2010) point out that Diamond and Dybvig’s (1983?) analysis suggests that any entity that uses short-term borrowing to fund holdings of illiquid assets (from construction loans to future tax revenues) can be vulnerable to crises of confidence (runs). They continue that models that explain government debt crises as arising from multiple equilibrium include Sachs (1984), Calvo (1988), and Obstfeld and Rogoff (1995, ch. 6), among others. Reinhart and Rogoff (2010) add that, in addition to bank runs and sovereign debt crises, there is also a large literature suggesting multiple equilibria models of inflation and exchange rate crises (e.g., Obstfeld, 1994.).

Reinhart and Rogoff (2011) continue to search explanation for the “This Time is Different” syndrome and argue that, at one level, the multiple equilibria explanation has some very attractive



features. They mention that multiple equilibriums in financial markets, especially, debt markets are fairly generic, and therefore consistent with the near universality of crises. They continue that the build-up in short-term debt, perhaps to economize on interest rate costs as debt rise, is certainly consistent with a multiple equilibrium story. Reinhart and Rogoff (2011) propose that with a “This Time is Different” mentality, politicians and investors may not recognize that the economy has its back to a proverbial cliff, until it is too late. They continue that, moreover, sunspot triggers to such crises, as they may be related to investor confidence, could potentially hit many countries at once. However, Reinhart and Rogoff (2011) note that, unfortunately, multiple equilibrium models have their limitations as difficult to assess the degree of risks across different economies. Reinhart and Rogoff (2011) argue that but even setting aside the difficulty of testing or applying multiple equilibrium models of financial crises, they beg the deeper question of why politicians, regulators, and indeed voters, do not take steps to reduce their economy’s vulnerability.

Reinhart and Rogoff (2011) assume that there may be short-term bias among the politicians due to temporary nature of their term in office referring to some other studies (see Alessina and Tabellini, 1989; or Persson and Tabellini, 1990) tragedy of commons (Amador, 2008), limited horizons (Amador, 2002; Laibson, 1997), or high discount rates for governments (Aguiar and Gopinath, 2006). Reinhart and Rogoff (2011) continue that another reason for the short-termism in financial governance may be caused by higher returns in booms and so higher influence over politicians so that regulation may be looser.

Reinhart and Rogoff (2011) suggest that based on the results of their studies there should be more attention paid to *hidden debt and liabilities*. They continue that, in a crisis, government debt burdens often come pouring out of the woodwork, exposing solvency issues about which the public seemed blissfully unaware. They add that an example was found in the latest financial crisis (the Great Recession) where the U.S. government was “routinely” guaranteeing the debt of quasi-government agencies, the mortgage giants Fannie Mae and Freddie Mac. They further continue that many governments find in a crisis that they are forced to deal not only with their external debts (owed to foreigners) but those of private domestic borrowers as well. Reinhart and Rogoff (2011) conclude that hidden debt has loomed large in many sovereign defaults over history.

Reinhart and Rogoff (2011) explain that the reasons for the temporal sequence may be the contingent liability story emphasized by Diaz Alejandro (1985) and formalized in Velasco (1986), in which the government takes on massive debts from the private banks, thus undermining its own solvency. Reinhart and Rogoff (2011) argue that like every other measure of indebtedness that we could find, domestic credit climbs sharply prior to the banking crisis and unwinds afterward. Reinhart and Rogoff (2011) find that the most comprehensive in terms of country coverage is

Mendoza and Terrones (2008), who find most booms are followed by currency crises, banking crises or both. Their results are along the lines of the observations made here.

In their list of potential supporting explanations for the crises, Reinhart and Rogoff (2011) refer e.g., to analysis of leverage cycles of Fostel and Geanakplos (2008), and to the arrogance and ignorance that underlie most financial crises by Winkler (1933), or to overconfidence in the sense of underestimating the variability of future shocks by behavioural economists Kahneman, Slovic and Tversky (1982). Reinhart and Rogoff (2011) argue that such false confidence could lead agents to hold insufficient buffer stocks of assets, or equivalently, to hold too much debt.

#### 4.4 Criticism

In this subsection are presented criticism that other scientists are pointed out against the claims of the model of the Credit View, based on Reinhart and Rogoff (2009, 2011) as an explanation of the crisis. The model of debt accumulation has been criticized due to aggregating debts across eight centuries of experience and from the selection of the debts of the both emerging and developed countries for a comparison. (See blog of L. Randall Wray (2013) in EconoMonitor.)

### 5 The Great Crises

This chapter discuss basic phenomena of the great crises, during the Great Depression and the Great Recession, in Finland, Sweden and the United States. The Great Depression which occur in 1930s and the Great Recession, in 2000s, are regarded as truly international crises. Table 4 shows how much the countries differ based on the countries' share of world real GDP in 1913 and 1990. As shown in Table 4, Finland was a developing country in 1930s and the smallest of the countries, concerned in this thesis, has caught up with Sweden to some degree by 1990 compared with the year 1913. The share of world real GDP in 1990 measured in 1990 Geary-Khamis dollars<sup>23</sup>.

Region and country	Year of independence (if after 1800)	Share of world real GDP (1990 Geary-Khamis dollars)	
		1913	1990
Finland*	1917	0.23	0.31
Sweden*		0.64	0.56
United States		18.93	21.41

Sources: Correlates of War (n.d.), Maddison (2004)

Note: An asterisk (\*) denotes no sovereign external default or rescheduling history.

**Table 4: Share of world real GDP of Finland, Sweden and in the United States. (Source: Reinhart and Rogoff, 2009)**

<sup>23</sup> 1990 Geary-Khamis dollars (more commonly known as the international dollar) is a hypothetical unit of currency that has the same purchasing power parity that the U.S. dollar had in the United States at a given point in time.

The following sections describe the basic phenomena of the Great Depression and the Great Recession, respectively.

## 5.1 The Great Depression

This chapter discusses basic phenomena of the Great Depression especially in Finland, Sweden and the United States in 1930s. During that time the United States was a strongly growing economy and Sweden was a small and “peripheral” but a developed economy. Finland was a small “peripheral” developing country. After the World War I, the world was in “disorder”. As mentioned before, Kindleberger (2013 [1973]) argues that the City of London was interested in restoring its pre-war position as a world financial centre, but it succeeded only to a degree. Therefore, Kindleberger (2013 [1973]) argues that, after the World War I, the international economic and monetary system was without a leadership, who would have helped to stabilise the economy of the world. The Great War, as Montgomery (1938) calls the World War I, was just finished and international trade was heavily restricted. He (1938) points out that, after the war, there was first a violent rise in prices and that turned to a severe deflation crisis that marked the years 1920-1922. As mentioned before, Kindleberger (2013) discusses that like war reparations payments, war debts exacerbated international economic relationships during the 1920s and the depression. He argues that the United States, for example, tried to use other economic considerations, such as access to the New York capital market, as a means of applying pressure to collect the debts and to use the debts to accomplish other economic ends, such as the stabilization of the pound in 1932. He continues that reparations may not have been directly responsible for the depression but together with war debts they complicated and corrupted the international economy at every stage of the 1920s and during the depression through to 15 June 1933.

Montgomery (1938) discusses that in 1922-1923 the situation seemed to show signs of brightening in a number of countries including England which especially has been playing an important part in the economic development of the Northern countries, like Finland and Sweden. He continues that also in the United States, which by this time held a leading position; it looked as if deflation had come to an end. Nevertheless, Montgomery (1938) adds that the situation in England remained somewhat obscure because of plans to return to the gold standard but the pound had not yet fully regained its gold parity. England, as also Finland, returned to the gold standard in 1925, whereas, Sweden and U.S. had already returned, in 1922, to the gold standard. Montgomery (1938) argues that after a slight set-back in years 1925-1927 the international situation began more definitely to assume the character of a boom at the period around 1927-1928.

Montgomery (1938) discusses that falls in prices still continued after the deflation crisis of 1920-1922, and it acted as a stimulus to more intensive rationalisation and checked any rapid improvement on the labour market. He adds that analogous tendencies arose in many other countries as well, whereas in Finland, which had escaped the violent deflation, the labour market seems to have developed on about the same lines as before the World War I. Montgomery (1938) argues that the decade before the Great Depression was a time of mechanisation and rationalisation in industry. Rationalization and largely successful adjustment for lower price level helped Sweden, argues Montgomery (1938), to gain substantially in competitive power during the last years of the 1920's, for instance, in comparison between the Swedish and Finnish export figures. He continues that the favourable industrial development in Sweden resulted in a decline of unemployment in 1927 which, gauged by post-war standards, could be regarded as quite normal. Even so, he argues, in Sweden as in a number of other countries, the unemployment figures were higher than before the War, so far as can be judged from available statistics. Montgomery (1938) argues that the increase in unemployment that may have taken place since pre-war days perhaps was mainly caused by heavy disturbances of the price level after the War.

Montgomery (1938) reports that considerable restrictions on international capital movements were imposed, as early as, in 1928, and countries that had to resort to importing capital in order to supplement their own capital resources were severely affected by this incipient tightening-up of the credit market. However, he adds that in Sweden the market situation remained, on the whole, fairly easy, and the gradual raising of interest rates effected in 1928 - from 3 ½ to 4 ½ in the case of rediscounting - left the Swedish discount rate at a somewhat lower level than the Federal Reserve rate and at the same level as the bank rate in England, which however was raised in February 1929 to 5 ½. Montgomery (1938) argues that the adverse change that came over the international economic situation in the autumn of 1929 did not at first seem to result in a severe crisis. He continues that a fairly optimistic view was at first taken of the situation in most quarters, and some months after the American Stock Exchange crisis it was still quite generally anticipated that the business decline would not prove very serious.

Montgomery (1938) explains that during the course of 1930 matters began to assume an alarming aspect, and in countries like the United States and Germany, which are of such vital importance to e.g. Finnish and Swedish exports, the business curve now took a steep downward turn. However, he argues that, in Sweden, e.g. home building markets continues its boom until 1932 further than other industry areas. He proposes that it may have indicated improvement in the standard of living of the broad strata of the population. It may have been consequences of the 1920s rationalisation, mechanisation and electrifications. Yet, Montgomery (1938) reports that during

1931 the export figures continued to decline and production in the export industries likewise reacted more strongly than before. He adds that the decline was more marked in the export industries than in those producing mainly for the home market.

In Finland, the crisis has begun a year earlier than in other countries. Hjerpe (1988) proposes that a reason was the crop failure in 1928, and another reason could be that the Soviet Union has started to compete in sawmill industry with Finland and Sweden with low prices. Kuusterä (1995) argues that the reduced export and increasing import cut down Finland's foreign exchange reserves and, thus, tightened the domestic money market. He continues that the depression affected the hardest people in the countryside because of the competition in the sawn timber with the Soviet Union. Kuusterä (1995) adds that, in the countryside, the unemployment increase, and the wages in sawmill industry and the prices of sawn timber and farm products decreased considerably. As Montgomery (1938), also Kuusterä (1995) proposes that abandoning of the gold standard, in 1931, helped in reviving of export. Ikonen et al. (1992) suggest that due to government work policy the depression was not deep in Finland measured by the GDP. They continue that the depression had the largest effect on the export industries as the industry production decreased more than the GDP. They still continue that the competitiveness improved after the devaluation of the currency in connection with the abandoning of the gold standard, though, the export increased not until the most important export countries of Finland recovered from the depression in 1933.

Friedman and Schwartz (1963b) propose that the contraction from 1929 to 1933 was by far the most severe business-cycle contraction during the near-century of U.S. history covered in their studies and it may well have been the most severe in the whole of U.S. history. They add that the contraction was sharper and more prolonged in the United States than in most other countries, but it was worldwide in scope and ranks as the most severe and widely diffused international contraction of until 1960's. To convince the above, Friedman and Schwartz (1963b) report some measures like: U.S. net national product in current prices fell by more than one-half from 1929 to 1933; net national product in constant prices, by more than one-third; implicit prices, by more than one-quarter; and monthly wholesale prices, by more than one-third. Friedman and Schwartz (1963b) add that more than one-fifth of the commercial banks in the United States holding nearly one-tenth of the volume of deposits at the beginning of the contraction suspended operations because of financial difficulties. They continue that voluntary liquidations, mergers, and consolidations added to the toll, so that the number of commercial banks fell by well over one-third.

As a reason for the Great Depression, Friedman and Schwartz (1963b) suggest that the failure of the Federal Reserve System to prevent the collapse reflected not the impotence of monetary policy but rather the particular policies followed by the monetary authorities and, in smaller degree, the

particular monetary arrangements in existence. They propose that the contraction is, in fact, a tragic testimonial to the importance of monetary forces. Friedman and Schwartz (1963b) agree that, as events unfolded, the decline in the stock of money and the near-collapse of the banking system can be regarded as a consequence of nonmonetary forces in the United States, and monetary and nonmonetary forces in the rest of the world. However, they continue, everything depends on how much is taken as given. But, they still suggest, it is hardly conceivable that money income could have declined by over one-half and prices by over one-third in the course of four years if there had been no decline in the stock of money.

## 5.2 The Great Recession

This chapter discuss basic information of crisis phenomena during the Great Recession, especially, in Finland, Sweden and the United States in 2000s. In these days, the United States is a leading economy and a centre of the financial markets in the world. Both, Finland and Sweden, belong to the European Union but only Finland belongs to the Euro area. Therefore, Finland cannot use its own monetary policy, in contrary to, Sweden and the United States whom are able to use monetary policy in answer to economic crises.

Reinhart and Rogoff (2009) show that there had globally been a brief tranquil period in banking crisis since 2002 before it came to an abrupt halt in the summer of 2007 when the subprime crisis in the United States began in earnest, soon transforming itself into a global financial crisis. (They argue that the U.S. financial crisis of the late 2000s was firmly rooted in the bubble in the real estate market fuelled by sustained massive increases in housing prices, a massive influx of cheap foreign capital resulting from record trade balance and current account deficit, and an increasingly permissive regulatory policy that helped propel the dynamic between these factors. Based on their investigations, Reinhart and Rogoff (2009) suggest that, since 1891, the first year in their housing price series, no housing price boom has been comparable in terms of sheer magnitude and duration to that recorded in the years culminating in the 2007 subprime mortgage fiasco. They continue that between 1996 and 2006 (the year when prices peaked), the cumulative real price increase was about 92 percent - more than three times the 27 percent cumulative increase from 1890 to 1996! Reinhart and Rogoff (2009) point out that by mid-2007, a sharp rise in default rates on low-income housing mortgages in the United States eventually sparked a full-blown global financial panic.

Reinhart and Rogoff (2009) argue that in 2007, although U.S. growth had slowed, it was still more closely aligned with the milder recession pattern of the average for all crises. They further argue that, in 2008, developments, in the United States, took a turn for the worse, and the growth slowdown became more acute. They continue that the huge run-up in housing prices - over 100

percent nationally over five years - should have been an alarm, especially as it was fuelled by rising leverage. Reinhart and Rogoff (2009) still continue that, at the beginning of 2008, the total value of mortgages in the United States was approximately 90 percent of GDP. They add that efforts to maintain growth and prevent significant sharp stock market declines had the effect of taking the safety valve off the pressure cooker. Reinhart and Rogoff (2009) believe that because the United States is a leading financial market, the market forces treated it, actually, just the opposite than if it has been an emerging market, whose exchange rate would have plummeted and its interest rates soared. They continue that in United States during the first year following the crisis (2007) the dollar appreciated and interest rates fell as world investors viewed other countries as even riskier than the United States and bought Treasury securities copiously.

As shown in Figure 20 (below in Findings section), GDP declined more than in other countries. Finland's Ministry of Finance reports in Economic Survey September 2010 the 2009 recession will go down as one of the deepest ever in Finnish economic history. Ministry of Finance reports further that, in 2009, total output plummeted by a record 8.4%, the equivalent of a fall of around EUR 13.3 billion from 2008 and this fall compares closely to the 9½% collapse that was seen during the recession in the early 1990s over a three-year period. However, the report continues although the drop in output was almost as steep, the labour market has reacted very differently as in 2009 employment decreased in the whole economy by more than 70,000 persons, whereas in 1990–1993 more than 400,000 jobs were lost. The report adds that exports of goods and services declined by one-fifth, and private investment fell by more than 17%.

In Sweden, The Swedish economy Statistical perspective reports that GDP growth was 2.6 percent in 2007, which was the slowest since 2003. In the report is continued that rising interest rates and rising prices of raw materials and energy have lead to signs of increasing inflation in 2007 that was, the inflation rate according to CPI, 3.1 percent, in February, while the underlying inflation according to CPIX was 2.0 percent. Statistics Sweden reports in, the Swedish economy - statistical perspective, 4th quarter 2008, that the gross domestic product (GDP) for the fourth quarter of 2008 showed the largest decrease since the first quarter of 1993, compared to corresponding quarter of the previous year. Both exports and imports developed very unfavourably. There in report is continued that drop in household consumption coupled with the continued increase of disposable income resulted in record high household savings and the rapid decline of inventories held back GDP growth as well.

## 6 Data and Methods

This thesis utilises data, found in the web pages, of the authors of the cited papers as Reinhart and Rogoff (2009, 2010, 2011), and Bordo, Eichengreen, Klingebiel, and Soledad Martinez-Peria (2001) and sources like Maddison project (Bolt and van Zanden, 2013), and the central banks of the United States (Federal Reserve Bank), Sweden (Riksbank), Finland (Suomen Pankki), Statistics Finland and Eurostat of European Union. As mentioned in Introduction, the basic phenomena of the crises are investigated using statistical data. The purpose of the investigations is to identify similarities and differences between the countries from the crises and the theories point of view in Finland, Sweden and the United States. It is interesting to see whether the phenomena vary between the big (the United States) and smaller countries (Finland and Sweden) and whether they vary from the features defined in the Money View and the Credit View. The features of the major crises are mainly defined based on the big countries, like the United States, in the international literature. In addition, there is the view of developed (the United States and Sweden) and developing (Finland) countries in the time of the Great Depression, and, as well, now Finland belongs to the Euro area, so possibilities to use monetary policy during the latest crisis in Finland differed from Sweden and the United States.

### 6.1 Data

This thesis uses data to identify the appearance of the factors of the Money View and the Credit View and the basic phenomena of the great crises, the Great Depression and the Great Recession. These factors and phenomena contain some general business cycle indicators like GDP, inflation, price level and unemployment. The factors of the Money View are e.g. money stock or money supply and deposits to currency ratio. The factors of the Credit View are e.g. accumulation of the private and public debt and the debt to GDP ratio. There are factors and phenomena of various kinds that it is not possible to collect data from a source. Another matter is the time period which should cover crises, the Great Depression in 1930s and the Great Recession in 2000s. In addition, some data, though, mainly covers a long period may still has shorter periods or gaps in some data. The measurement frequencies may also vary in data like money aggregates may be per month data and e.g. GDP is typically per year data. Some of the data have to had collected e.g. from central banks of each countries. This kind of data may not be totally comparable between countries. Besides that, there are various definitions from e.g. money supply which differ in all the three countries, in question.

Data of GDP is collected from Maddison project (Bolt and van Zanden, 2013) and partly from Bordo et al. (2001). Maddison data has only GDP data from long past until 2010 and Bordo et al.



until 1997. The Maddison data just covers the Great Recession in 2007 - 2009, but Bordo et al. data not. The data, related to Bordo et Al. (2001), contains data of real GDP (Finland), GNP (Sweden and U.S.) and its growth rate; money stock as M2 (Finland), combination of M2 and M3 (Sweden), and combination of M2 and quasi-money (U.S.), and data of growth in money stock. That data is used in areas covering the time from 1920 until 1997.

Reinhart and Rogoff (2009, 2011) data covers following five items: (1) Dates for banking crises, currency crashes, sovereign domestic or external default (or restructuring), inflation crises, and stock market crashes: 1800-2010, (2) Debt-to-GDP ratios, (3) Inflation, (4) Exchange rates, exchange rate regimes, gold standard dates and related, (5) Real GDP, population, growth and related. This thesis utilise data of 1-3, and 5. Basically, the data is from as long past as possible but some data covers just a few decades. Reinhart and Rogoff (2009, 2011) data covers mainly the period far before the Great Depression until the year 2010 (the Great Recession 2007 - 2009).

The data from the central banks (Federal Reserve Bank, Riksbank, and Suomen Pankki) contain mainly information of the money supply (M1, M2, and M3) and debt accumulation. This data covers mainly the nearest decades. The data does not cover the days of the Great Depression. The same matter the data from Eurostat - it just covers the time of European Union or Euro area. Data of GDPs, unemployment, and price levels have also been looked for, concerning the Great Recession, from the Eurostat. That data do not always contain information of the United States. In addition, partly, data of the government debt in Finland is from Statistics Finland.

## 6.2 Methods

This thesis uses rather simple methods in investigations regarding the research question that is whether there are similarities and differences between the countries, in question, from the theories and the great crises point of view. The main method is to create pictures of the statistical data. So, most of the data is used to create figures or tables from some factors investigated in the original papers (Friedman and Schwartz, 1963a; Reinhart and Rogoff, 2011). The purpose is to create overall pictures about the times of the crises (the Great Depression in 1930s and the Great Recession in 2000s) in three countries (Finland, Sweden and the United States). The purpose is not to repeat the studies performed in the papers of the theories presented in Chapters 3 and 4. The aim is to identify only some of the basic phenomena of the theories, the Money View and the Credit View. This thesis uses statistical data to investigate how the money supply changes, regarding the crises and countries, in question, from the Money View point of view. Concerning the Credit View, this thesis studies how private credit and public debt are accumulating.

## 7 Findings

This chapter describes the findings regarding the investigations into the phenomena of the Great Depression and the Great Recession, and of the Money View and the Credit View, in each country, Finland, Sweden and the United States. As mentioned before, the idea is only to study the basic phenomena and factors of the theories and the crises to create an overall picture how the phenomena, on the one hand, appear similarly and, on the other hand, vary in the countries, in question. The findings of the countries that are shown here vary with the data available for each country.

Before the findings some background information about the countries and the age of 1930s. The United States and Sweden have been considered as advanced economies for a longer time than Finland. Finland was centuries under control of Sweden and about a century under the control of Russia. Finland becomes independent in 1917. Especially, when Finland was under the control of Sweden there may have been few possibilities to create independent “domestic” markets in Finland. Whereas, under the control of Russia Finland get an autonomy and was partially able to create its own domestic economy. In the 1920s, the world has just been recovering from the World War I. Finland has had its civil war, and was creating and improving its institutions after becoming an independent country. In the time of the Great Depression, Finland was classified as a developing country in a contrast to the other two countries.

In the beginning of the 20th century, England was a leading economy in the world, and an important foreign trade partner for Finland, Sweden and the United States. During the early decades of the 20th century the United States increased its international power. The decade, before the Great Depression, has been period of mechanisation, rationalisation and electrification, as Montgomery (1938) defines. At the same time, it was a time of defective deflation. At the time of the Great Depression, in 1930s, U.S. stock and financial markets were already competing with the European financial centres. The U.S. “central bank”, The Federal Reserve System, began its operations in 1914, which was considerably later than in Sweden (Riksbank 1867) and in Finland (“Suomen Pankki” 1811). Ikonen, Autio and Elonen (1992) explain that Finland’s Bank was founded, among other things, to manage currency change from Swedish krona to Russia rouble, after the change in “conqueror”. Montgomery (1938) says that Sweden has been able to create its “independent” financial markets before 1930s. The United States is nowadays a big country and a centre of the financial markets, and Sweden and Finland are two small, “peripheral” but developed countries. Finland belongs nowadays to the Euro area, where monetary policy is implemented by European Central Bank (ECB), and so the money supply is endogenous in Finland, contrary to Sweden and the United States.

The following sections discuss, first, the basic phenomena of the crises in the countries, in question; secondly, the findings of the crises are reported from the Money View point of view; and finally, the findings of the crises are reported from the Credit View point of view.

## 7.1 General Findings

This section discusses the general findings of the crises in the countries, in question, such as GDP per capita, growth of GDP, inflation rates, and unemployment and price levels. These items are discussed shortly and based on the data available for this thesis. The aim is to discern some similarities and variations on the crises phenomena.

Figure 16 shows how the GDP per capita has developed, during the years 1860 - 2010, in Finland, Sweden, England and the United States. After the World Wars the GDP per capita, in the United States, has “definitively” exceeded the GDP per capita in England based on the Maddison data of GDP per capita (Bolt and van Zanden, 2013). This may partly indicate the time when the United States has become the most powerful economy in the world. Though, the scale of Figure 16 is small it seems that Sweden has progressed clearly better than Finland in period from 1900 to 1975. After that Finland has again been able to close somewhat the difference.

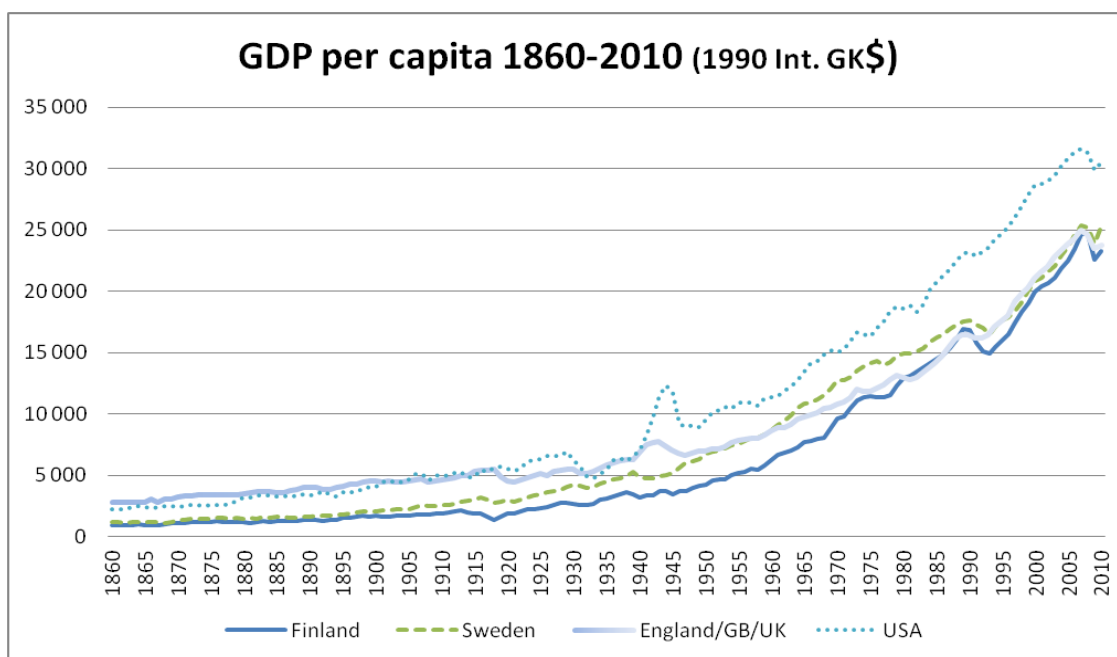


Figure 16: GDP per capita (1990 Int. GK\$) in Finland, Sweden, England and USA in 1860-2010 (Source: Bolt and van Zanden, 2013)

As seen, in Figure 17, below, the GDP per capita, in the United States, decreases from 6899 in 1929 to 4777 in 1934 which is about 30 per cent. At the same time, it decreased in Finland (1929 - 1933) and Sweden (1930 - 1933) about 6,1 and 6,4 per cent, respectively. Figure 17 demonstrates that the Great Depression influenced heavily the United States, measured by GDP per capita. Though, Finland was classified as a developing country in the era of the first half of the 20<sup>th</sup> century

the progress of the GDP per capita in Finland does not seem to deviate from the GDP per capita in Sweden, otherwise than in volume. The percentages are calculated by subtracting the former value from the latter and dividing the result by the former value.

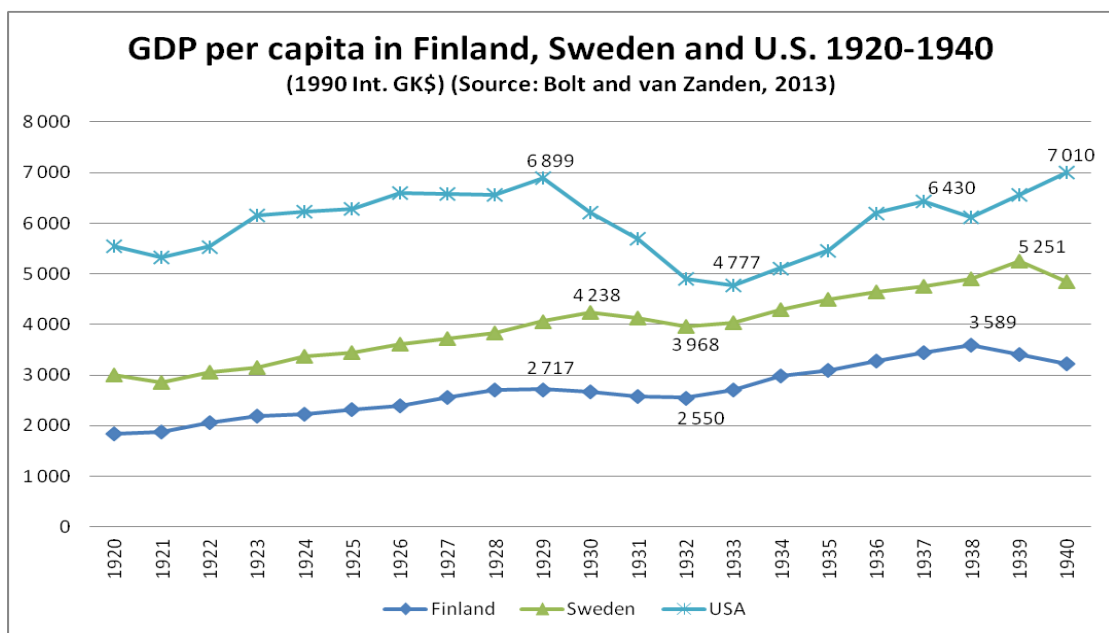


Figure 17: GDP per capita (1990 Int. GK\$) in Finland, Sweden and USA in 1920-1940.

Figure 18 shows the same as Figure 17 but in the nominal GDP. Though, considering the scale that mitigates changes in the curves of Finland and Sweden, the nominal GDP (to be precise, GNP) in the United States fluctuated more than the same of Finland and Sweden. However, in fact, as in the United States, based on Montgomery (1938), in Sweden, the nominal GDP does not recover to the level of before the World War I until the end of 1930s. Finland and Sweden followed the example of England and abandoned the gold standard in 1931. Montgomery (1938) argues that release the countries to ease their economy in the great crisis.

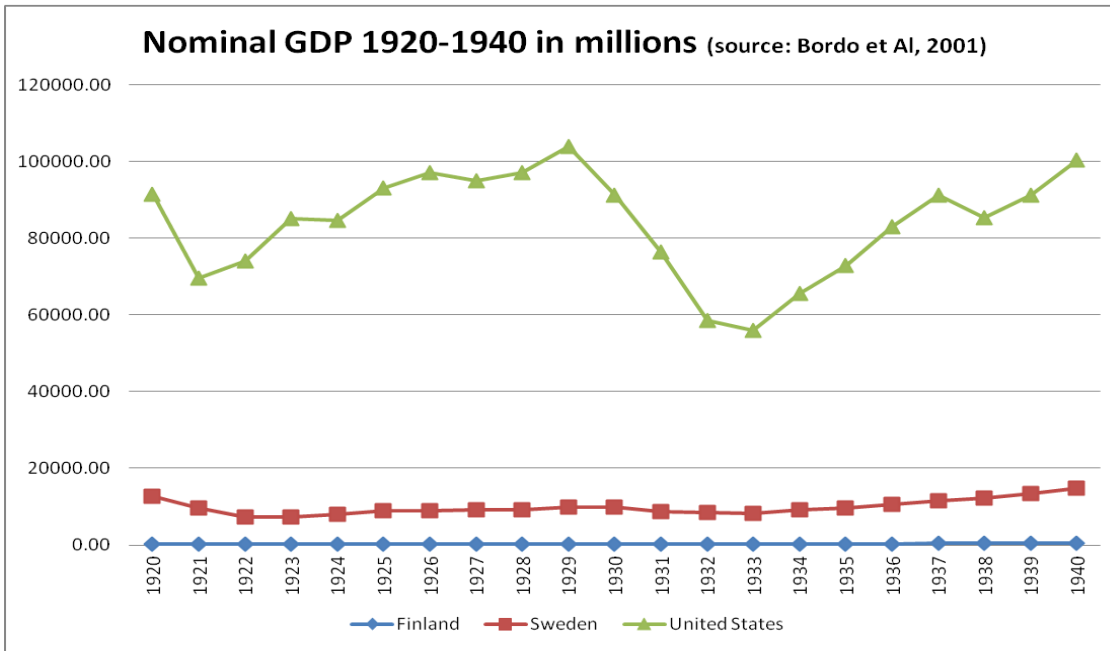


Figure 18: Nominal GDP in Finland, Sweden and the United States in 1920 - 1940, in millions.

In the case of the Great Recession, in 2000s, the curves of the GDP per capita in Finland, Sweden and the United States, in Figure 19, look more similar than at the time of the Great Depression, in 1930s. However, the GDP per capita decreased in Finland 9,4 percent, which is more than the values of Sweden and the United States, 5,9 and 5,5 percent, respectively, measured by the values found, in Figure 19. Note that the vertical axis, in Figure 19, started from 10000.

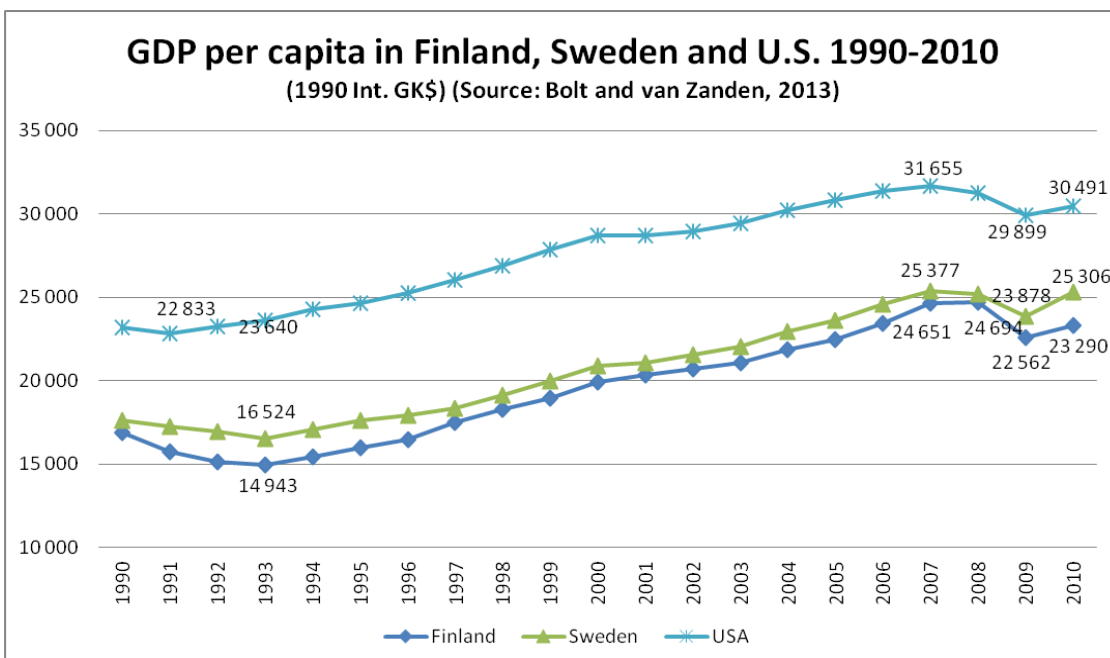
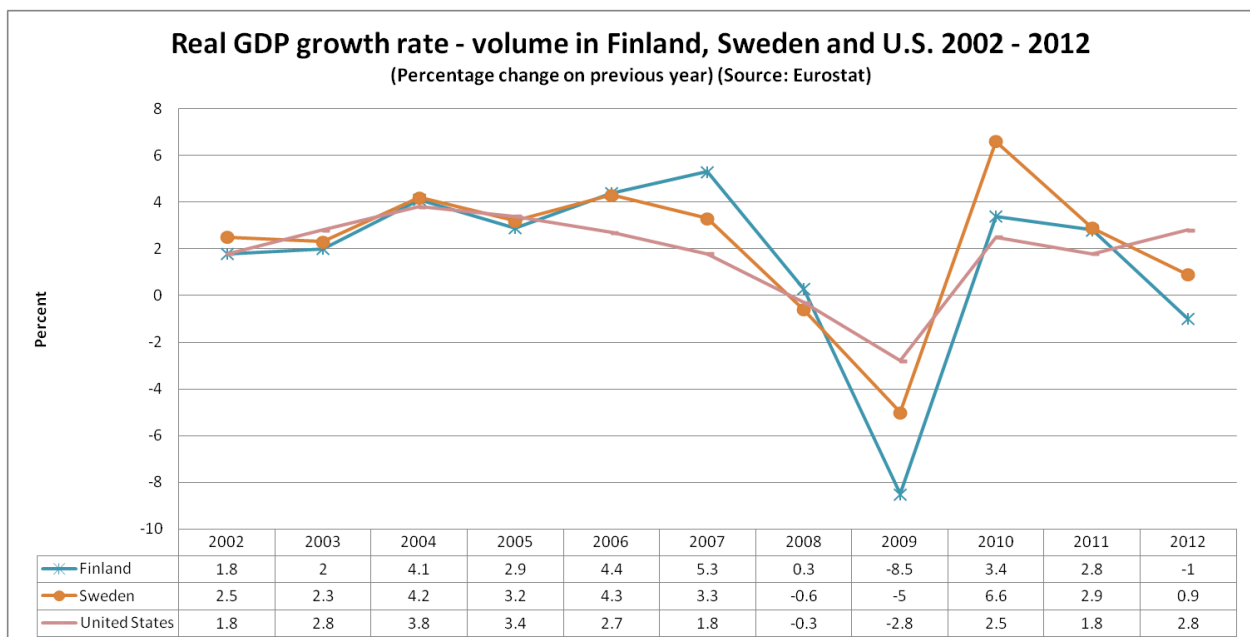


Figure 19: GDP per capita in Finland, Sweden and the United States in 1990-2010, in 1990 Int. GK\$.

Figure 20 shows how the real GDP growth rates<sup>24</sup> changed during years 2002 - 2012. The crisis (2007-2009) seems to have affected the most heavily Finland but the poorest time may also have been, on some level, the shortest in Finland compared with the other countries. However, actual recovery has been slower in Finland than in Sweden or the United States. Based on the data, Finland recovered to the level of 2005 in 2010 but the growth rate of the volume of GDP has again decreased after 2010. As mentioned before, in case of the Great Recession, Finland belongs to the Euro area and does not have possibilities to use its own monetary policy, in contrast to Sweden and the United States. However, the volume of decrease in the growth rate of GDP in Finland cannot directly be interpreted, as a total, consequence of the lack of own monetary policy. Further studies of the reason are not in scope of this thesis.

Based on Figure 20, in Sweden, the decrease in the real growth rate of GDP has started already in 2006, before the crisis started in the United States. Though, in the United States, the real growth rate of GDP started to decrease even earlier, in 2004. Sweden has also recovered quickly, as Finland, and grown in a better level than before, in 2010, but after that, as Finland, the real growth rate of GDP has started to decrease again. While, the United States has after recovery been able to maintain the recovery level.



**Figure 20: Real GDP growth rate - volume, in Finland, Sweden and the United States in 2002 - 2012, percentage change on previous year.**

<sup>24</sup> Gross domestic product (GDP) is a measure of the economic activity, defined as the value of all goods and services produced less the value of any goods or services used in their creation. The calculation of the annual growth rate of GDP volume is intended to allow comparisons of the dynamics of economic development both over time and between economies of different sizes. For measuring the growth rate of GDP in terms of volumes, the GDP at current prices are valued in the prices of the previous year and the thus computed volume changes are imposed on the level of a reference year; this is called a chain-linked series. Accordingly, price movements will not inflate the growth rate.

Figure 21 shows how inflation rates changed in Finland, Sweden and the United States in 1920-1940. The inflation rates are changing quite similarly in the countries, especially in Finland and Sweden, after the beginning of the 1920s and before the World War II. Based on Montgomery (1938), both Sweden and the United States suffered more than Finland, in 1920 - 1922, first from considerable rising in prices and then from falling in prices, as deflation influenced the economy. In Sweden, deflation was smaller than in Finland and the United States during the Great Depression in 1929 - 1933.

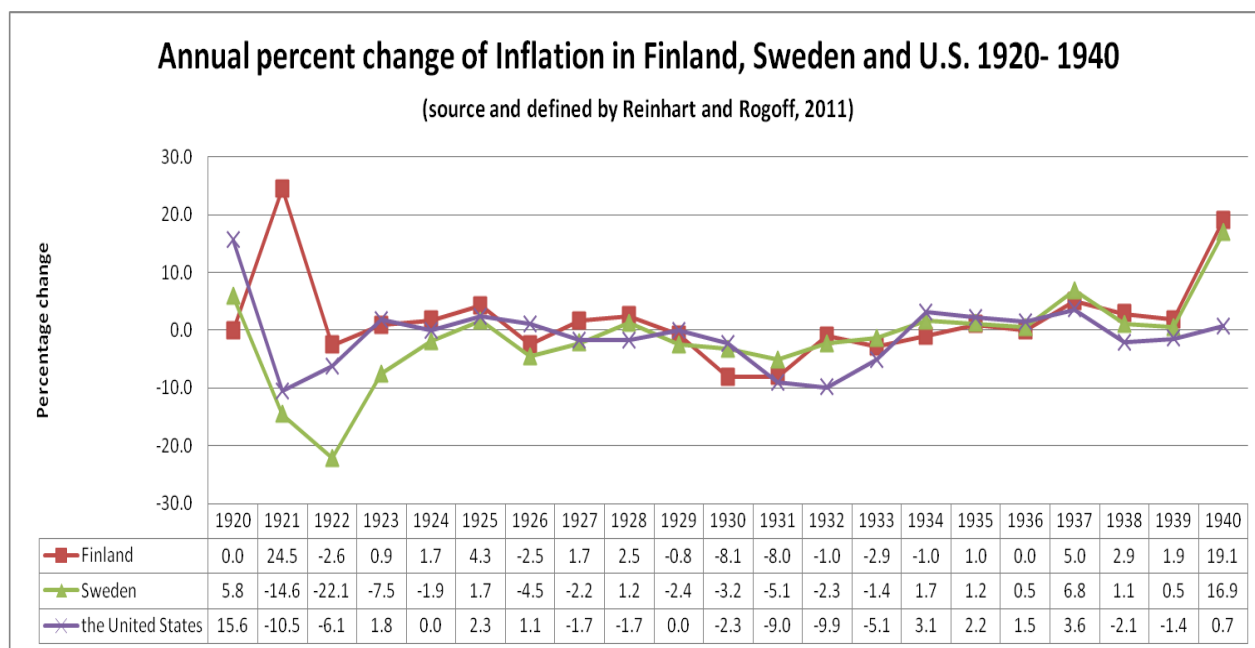


Figure 21: Annual percentage changes in inflation in Finland, Sweden and the United States in 1920-1940, defined by Reinhart and Rogoff (2011).

The annual percentage changes in the inflation rates are more clearly over the zero in the period of 1990 - 2010 than in period of 1920 - 1940, compared Figure 22 with Figure 21. The annual percentage changes in the inflation rates seem to fluctuate less after the beginning of the 1990s in days of the banking crisis, in the countries, in question. A reason may be that, in the monetary policies, central banks have more focused on controlling of the inflation rates, in “modern times,” than in the past.

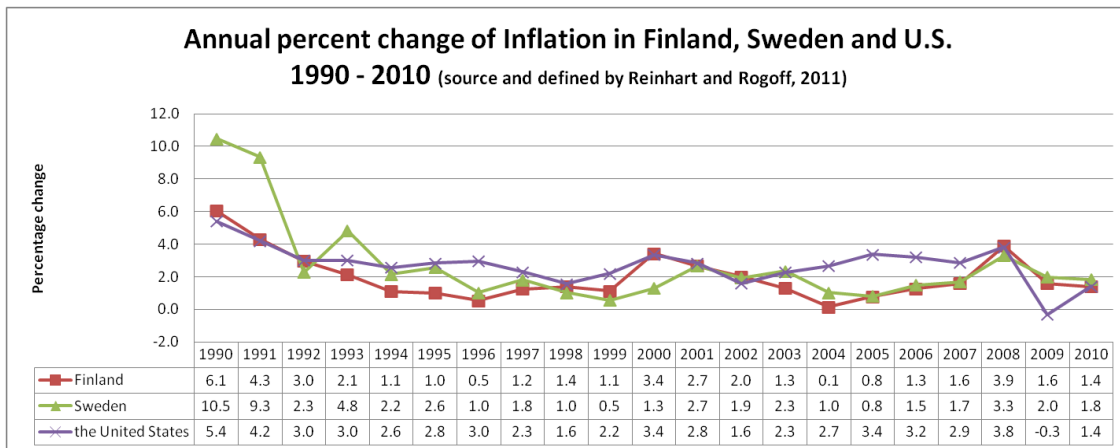


Figure 22: Annual percentage changes in inflation in Finland, Sweden and the United States in 1990-2010, defined by Reinhart and Rogoff (2011).

In Finland, over 50 per cent of the people were still working on primary sector in 1930s. Hjerppe (1988) proposes that unemployment in 1930s, in Finland, varied from unemployment in some decades later because working was more dependent on the weather conditions and people were used to work according to the four seasons. She continues that, regarding the unemployment, it is possible to say that working inputs decreased 10 per cent from 1928 to 1931, in Finland, which, she proposes, shows how severe the depression was. In the United States, Friedman and Schwartz (1963b) note that at the trough of the depression one person was unemployed for every three employed. In Sweden, Montgomery (1938) presents figures about the unemployment amongst trade union members and these unemployment rates changes from 12,4 percent in the second quarter of 1931 to 31 percent in the fourth quarter of 1932. As in Finland, in Sweden, the winter periods were most difficult.

Figure 23 shows the percentage rates of harmonised unemployment for years 1999 - 2014. The Great Recession caused clear increases in the unemployment rates in the countries, in question. As seen, in Figure 23, the unemployment rates in Finland and Sweden have their peaks, each year, in May and in June, respectively, after the terms at schools finish. In addition, though, the movements of the unemployment rates of the countries varied before the crisis and seem to vary also in future, to some extent, during the crisis the movements were somewhat similar. The unemployment rates jumped in the end of 2008 in all the three countries, though, most in the United States but the rate seems to also be recovered slightly better than in Finland and Sweden. In case of Finland, the unemployment rates are still lower than in the end of 1990s.



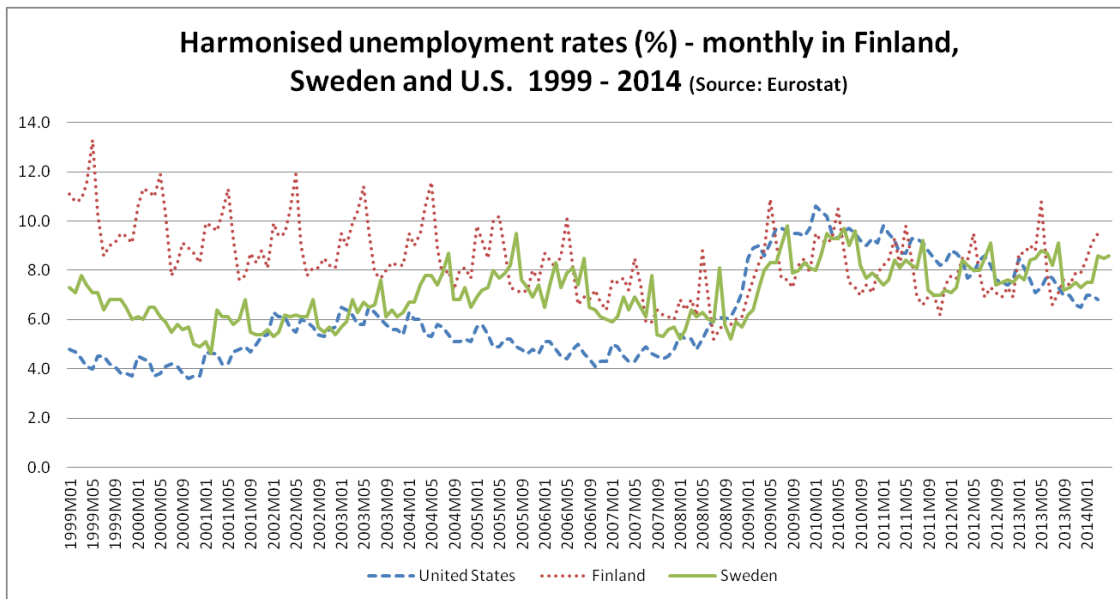


Figure 23: Harmonised unemployment rates (%) - monthly in Finland, Sweden and the United States 1999 - 2014.

Montgomery (1938) discusses that, at the beginning of 1929, in Sweden, the Board of Trade's wholesale price index stood at 144-145 (1913=100); in January 1930 the figure was down at 131 and by the end of the year it had dropped to 117. He continues that the fall in prices was however rather unevenly distributed over the various commodity groups, and on the whole it affected imports more severely than exports. He further continues that according to the Svenska Handelsbanken's index, the export prices in 1929 stood at 144 (1913=100) and the import prices at 126 and, the next year, the figures were 134 and 101. In the United States, Kindleberger (2013 [1973]) argues that in most cases the drop from September to December 1929 was sharp, together with that from March to June 1930 or June to September. He continues that coffee, cotton, rubber and wheat fell more than 50 per cent between September 1929 and December 1930. In Finland, Hjerpe (1988) reports, the wholesale index (1926 = 100) was 101,8 in 1928, 97,3 in 1929, 89,2 in 1930 and in the lowest value for the period, 83,8 it was in 1931. The price index value remained to the level under 100 until it increased from 92,8 in 1936 to 109,9 in 1937.

Figure 24 shows the harmonised indices of consumer prices (HICP) in Finland, Sweden and the United States (2005 = 100). It seems that the price level in the United States has been under the indices of Finland and Sweden, before 2005, but after that year mainly higher than in Finland and Sweden. However, the price levels do not vary largely between the countries, in question, except the "peak" in 2008 in the United States. After the crisis, in 2010, the price levels have been slightly raising more in the United States and Finland than in Sweden.

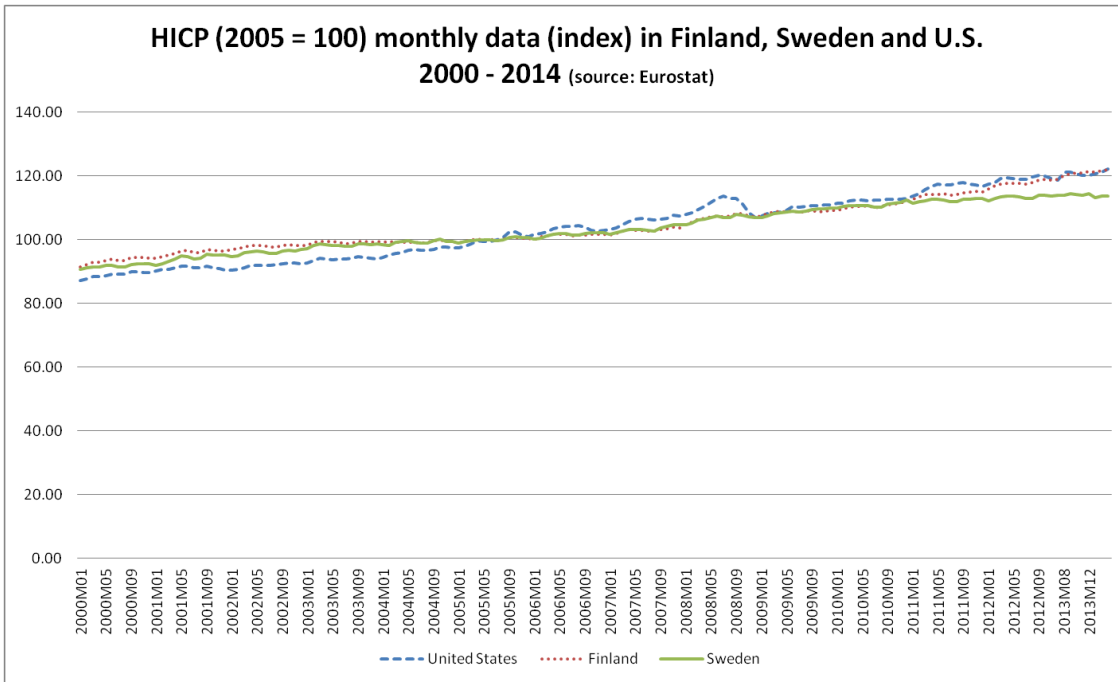


Figure 24: Harmonised Indices of Consumer Prices (HICP) in Finland, Sweden and the United States in 2000 - 2014 (2005 = 100) Monthly Data (Index) (Source: Eurostat)

Figure 25 shows the monthly rate of change in the harmonised indices of consumer prices (HICP) in Finland, Sweden and the United States from 2005 to 2009. The consumer prices have changed in the United States more than in Finland and Sweden. The price levels in Finland and Sweden have changed rather similarly. The monthly changes in the price index have been larger in the United States than in Finland and Sweden. The highest peak has been in September 2005 and the deepest fall in November 2008, in the United States.

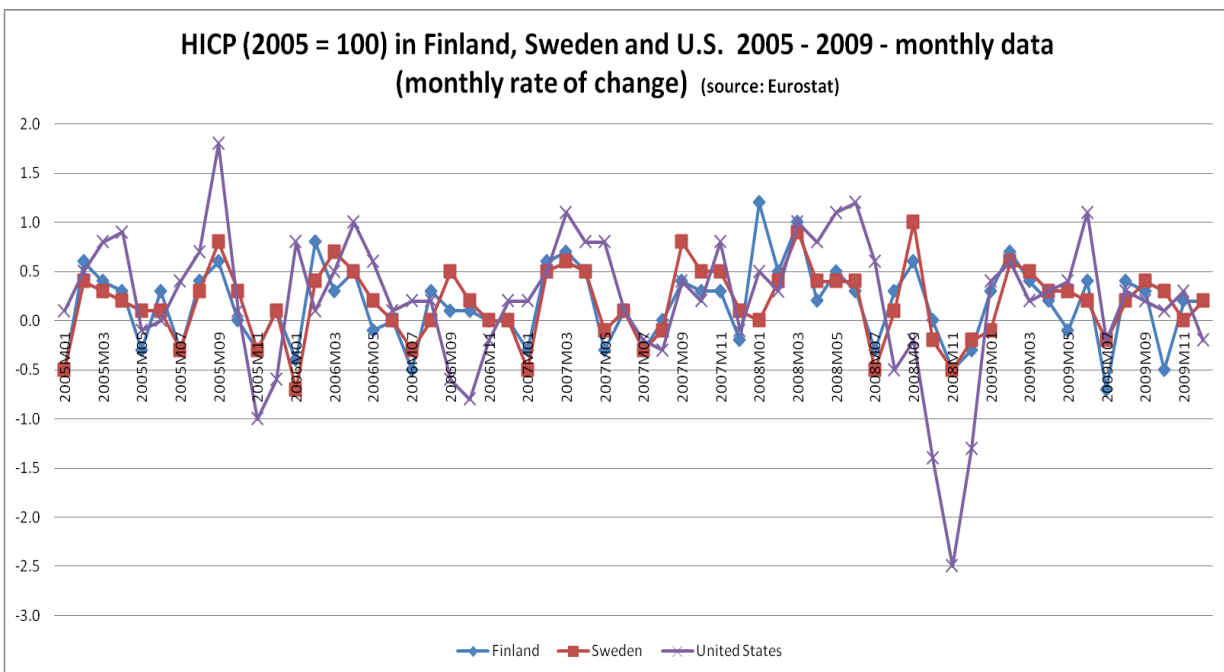


Figure 25: Harmonised Indices of Consumer Prices (HICP) in Finland, Sweden and the United States in 2005 - 2009 Monthly Rate of Change (Source: Eurostat)

In the following sections the findings, regarding the theories, in question, are discussed. First, the findings of the Money view are presented, and after that the findings of the Credit view.

## 7.2 The Money View

This section presents the findings of the investigations into the factors of the Money View theory defined by Friedman and Schwartz (1963b). The main purpose is to investigate how money supply and income (GDP or GNP) are shown during the Great Depression and the Great Recession. Friedman and Schwartz (1963a) show in their paper how the changes in the money stock and in the income (GNP) fluctuate “together” and that is one of their “evidence” of a role in the business cycles. The developments of these items are shown in all the countries together and separately.

Figures 26 and 27 show the money supplies to GDP and the percentage growths of the money in 1920 - 1940 in Finland, Sweden and the United States. Finland and Sweden abandoned the gold standard, in 1931. The money supply classification, though marked as M2, differs between the countries and between time periods. In contrast to Finland, the money supplies in Sweden and the United States have also some M3 elements. In addition, the amounts are in the local currencies and Sweden and the United States have their own monetary policy, contrary to Finland, that belongs to the Euro area. Figure 26 shows the differences in the level of money supply to the GDP, though, because of differences in classifications and local currencies, the curves may just indicate the movements. All the curves are increasing during the Great Depression which, in fact, indicates the decrease in the GDP as noticed in Figures 17 - 18, above. The growth rate of money supply seems to have fluctuated more (amplitude) in the United States than in Finland and Sweden. In Sweden, the rate has mainly increased after the decline during the crisis in 1921 - 1922. In Finland, the growth rate has fluctuated, too, but at the same amplitude as in the United States, except the beginning of the World War II. The money supply decreased after 1928 as in the United States but less than there.

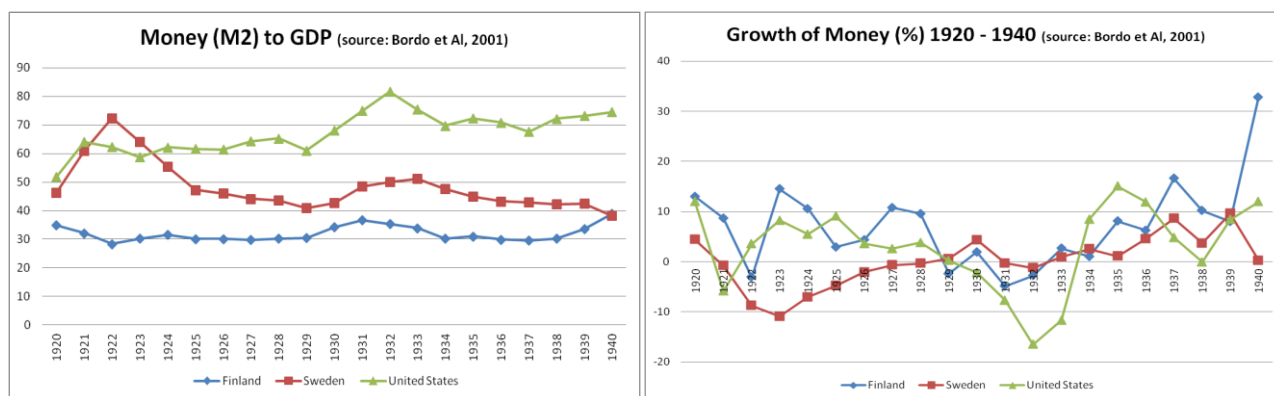


Figure 26: Money to GDP in Finland, Sweden and the United States in 1920 - 1940. (Source: Bordo et Al, 2001)

Figure 27: Percentage Growth of Money in Finland, Sweden and the United States in 1920 - 1940. (Source: Bordo et Al, 2001)

The real growth of GDP and the growth of money supply in percent in Finland in period 1920 - 1940 seem to have moved rather together as shown in Figure 28. Figure 28 is created directly from the statistical data (Bordo et al., 2001) without any modifications. The rgdpgr indicates the real growth of the GDP and the grm the growth of the money supply. The money supply is classified as M2 (by Bordo et al., 2001) in Finland. The changes in the money and also in GDP are fluctuating but the growth rate is not increasing as e.g. money supply in case of Sweden (see Figure 29). If it is possible to deduce based on Figure 28 the growth rate in the money supply has recovered with a lag to the growth rate of GDP after the crises in 1920 - 1922 and 1929 - 1933, in Finland. This is too short period to conclude on behalf of or against the Money View but Friedman and Schwartz (1963a) suggest that the money supply seems rather to lead the business cycles than lag them. See Appendix 7 - Figure 53, for Real Growth of GDP and M2, in Finland, in 1977 - 1997. The data of Bordo et al. ends to year 1997 so it is not possible to show the corresponding data of the time period of 2007-2009.

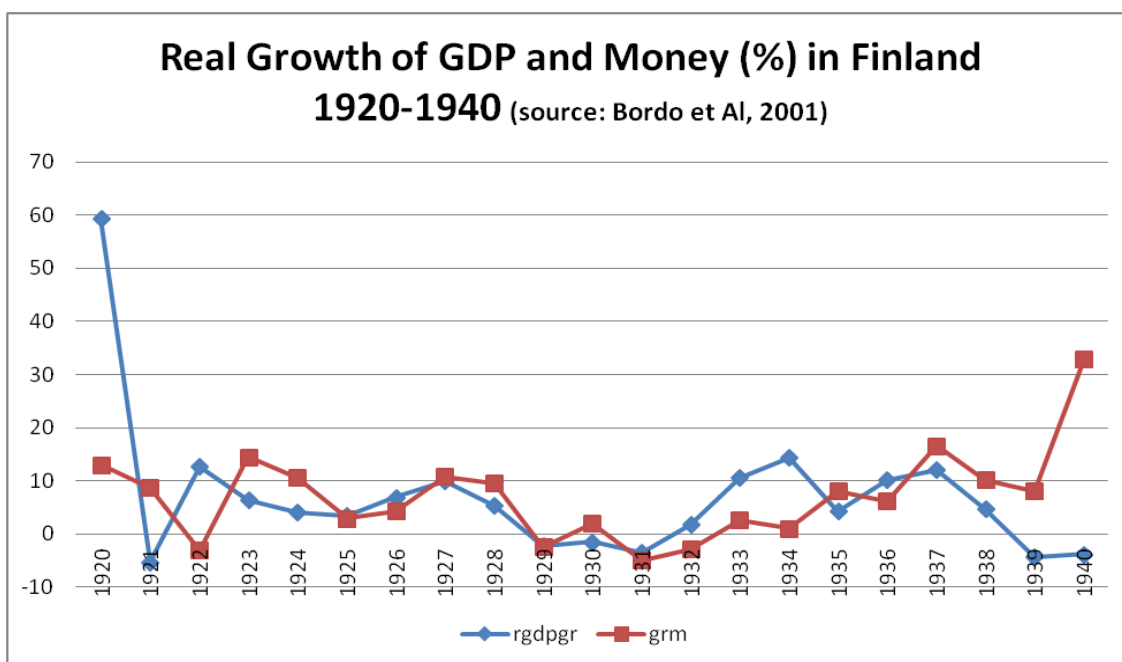


Figure 28: Real Growth of GDP and Growth of Money in Percent in Finland in 1920-1940.

The real growth of GDP and the growth of money supply, in percent, in Sweden, in period 1920 - 1940 have moved less together than in Finland, as can be seen in Figure 29. As in case of Finland, Figure 29 is created directly from the statistical data (Bordo et al., 2001) without any modifications. The rgdpgr indicates the real growth of the GDP, and the grm the growth of the money supply. In the data, the GDP of Sweden is, in fact, GNP. The money supply is classified as M3, in Sweden. In Sweden, there is not the class as M2 in the money supply either nowadays. The money supply, in Sweden, shows an increasing tendency through the period, though; a reason may be the decrease in

the beginning of the period. Montgomery (1938) suggests that Sweden was more like capital exporter in 1920s than an importer. He continues that the industry, in Sweden, was able to finance its investments rather well by their revenues. However, based on this short period the GNP and the money supply have not moved together as Friedman and Schwartz propose, in Sweden. There cannot either be found any clear lead to business cycles denoted here by the changes in GDP. See Appendix 7 - Figure 54, for Real Growth of GDP and M3, in Sweden, in 1977 - 1997. The data of Bordo et al. ends to year 1997 so it is not possible to show the corresponding data of the time period of 2007-2009.

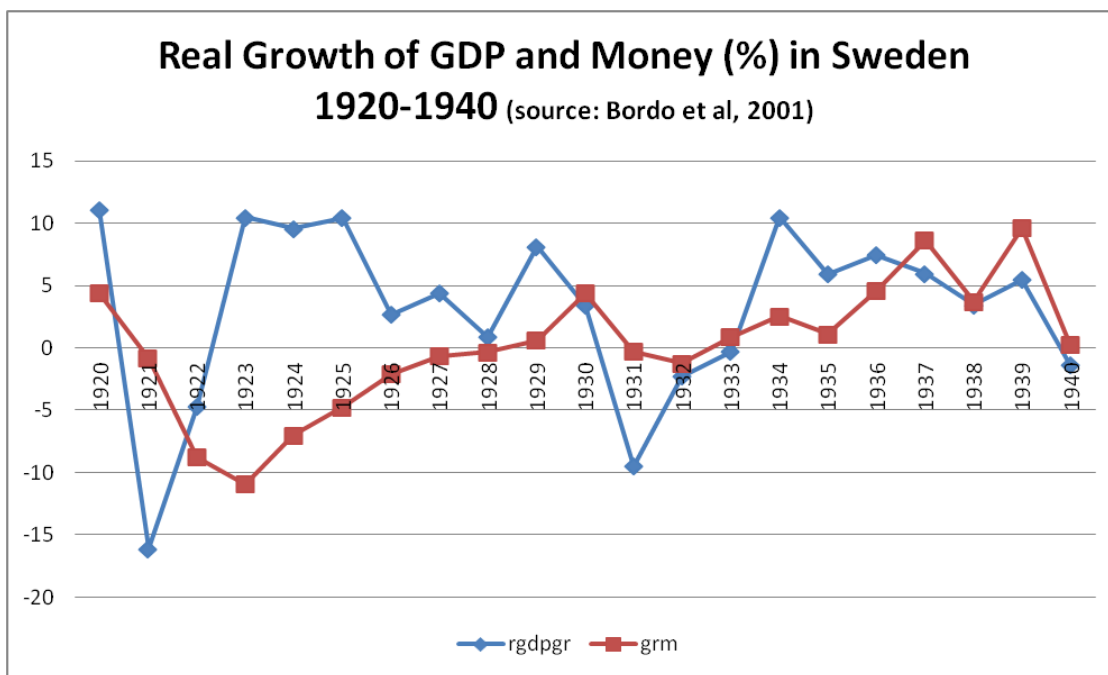


Figure 29: Real Growth of GDP (GNP) and Growth of Money (M3) in Percent in Sweden in 1920-1940.

The real growth of GDP and the growth of money supply, in percent, in the United States, in period 1920 - 1940, likewise in Finland (Figure 28), seem to have moved rather together as shown in Figure 30, below. Figure 30 is created directly from the statistical data (Bordo et al, 2001) without any modifications. The *rgdpgr* indicates the real growth of the GDP and the *grm* the growth of the money supply. In the data, the GDP of the United States is, in fact, GNP and the money supply is classified as M2 but contains also some quasi-money in the data of later periods. As Figure 30 shows, the money supply, in the United States, seems really followed the growth rate of the GNP as in the Money View, Friedman and Schwartz suggests, during the period. Table 5 shows results of a linear regression where is measured how well the growth of money could explain the growth of the GDP. The result is statistically significant and the coefficient is over 0,5. In case of Finland and Sweden, the linear regressions do not end up as statistically significant results, besides; the coefficients were small and negative.

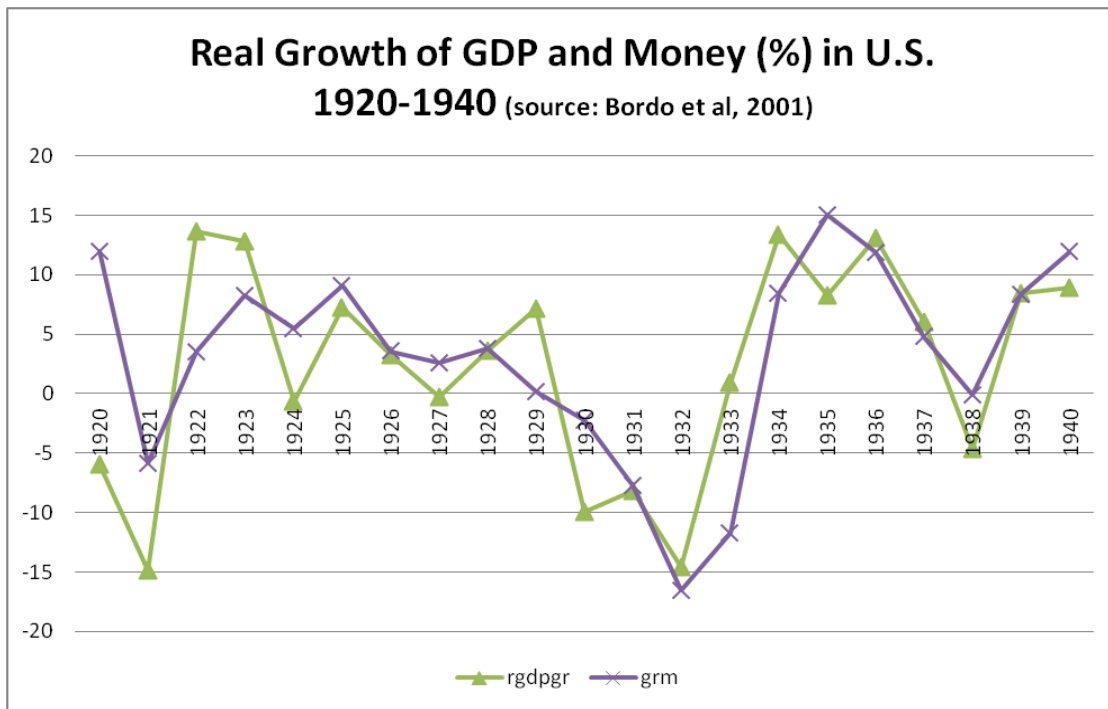


Figure 30: Real Growth of GDP (GNP) and Growth of Money in Percent in the United States in 1920-1940.

Coefficients<sup>a,b</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-,038	,730		-,052	,959
	grm	,529	,079	,534	6,681	,000

a. Dependent Variable: rgdpgr

b. Selecting only cases for which Country = United S

Table 5: Linear regression table for Real Growth of GDP and Growth of Money in the United States in 1920 - 1940.

Figure 31 shows how the nominal GDP (nGDP) and the money aggregate, M2 (monagglc), in natural units (money aggregate in local currency) accumulated, in Finland, in 1920 - 1940. It seems that the nominal GDP was increasing, though, also fluctuating more than the money aggregate. However, the money aggregate was over three times larger in the end of 1930s than in the beginning of the period, 1920. The increase in the nominal GDP was somewhat smaller than in the money aggregate. The movements have the trend of growth but do not move clearly together as the Money View proposes.

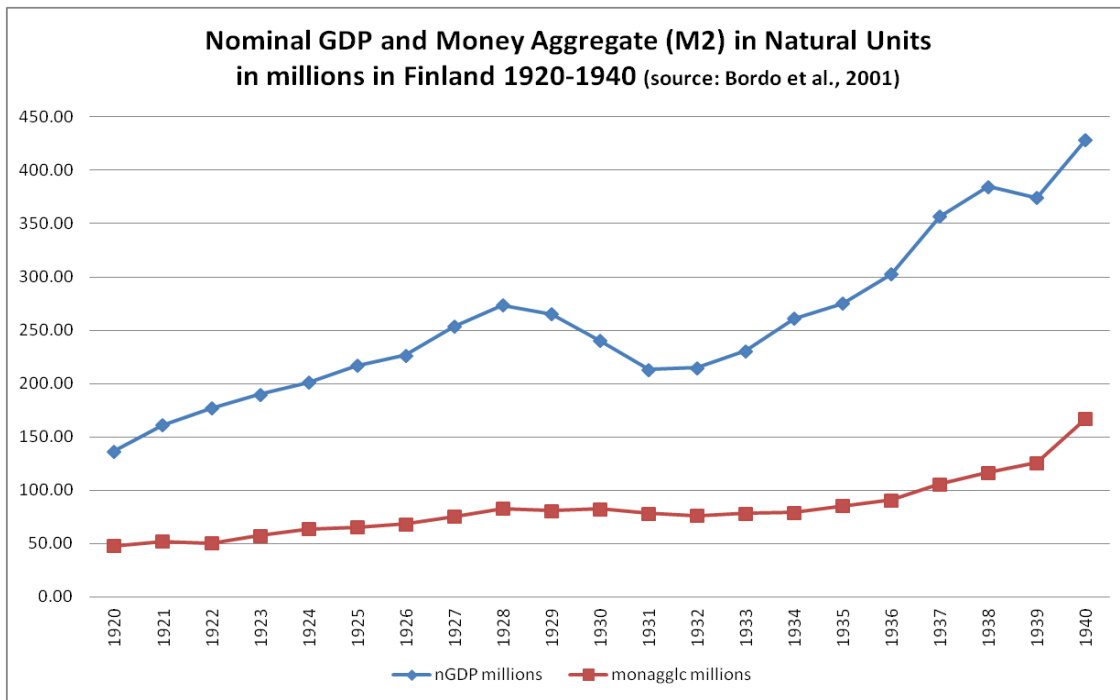


Figure 31: Nominal GDP and Money Aggregate (M2) in Natural Units in millions, in Finland in 1920 - 1940.

Figure 32 shows how the nominal GDP (nGDP) and the money aggregate, M3 (monagglc), in natural units (money aggregate in local currency) accumulated, in Sweden, in 1920 - 1940. The money supply aggregate, M3, is larger than M2 in Finland. As it includes also deposits with certain conditions, repurchases, shares in money market funds, and short-term securities, in addition to typical M2, the amount of it may be more dependent on interest rates and business cycles. Figure 32 may not support the idea of GDP and money aggregate to move together, though, as mentioned the money aggregate here differs from the corresponding aggregate, in the Money View of Friedman and Schwartz (1963a). However, the nominal GDP and the money aggregate have shapes like W and U, respectively, during the period. Both decrease during the crisis, in 1920 - 1922, and was again increasing in the end of the period. However, the nominal GDP have also grown during the upswing in the economy in the end of 1920s before the great crisis in 1929 - 1933. Though, the curve of the natural GDP may mitigate the curve of the money supply which, in fact, has also grown in the time before the great crisis. Figure 32 is rather consistent with Figure 29; it may be that the money supply and the GDP (GNP) do not move together in Sweden.

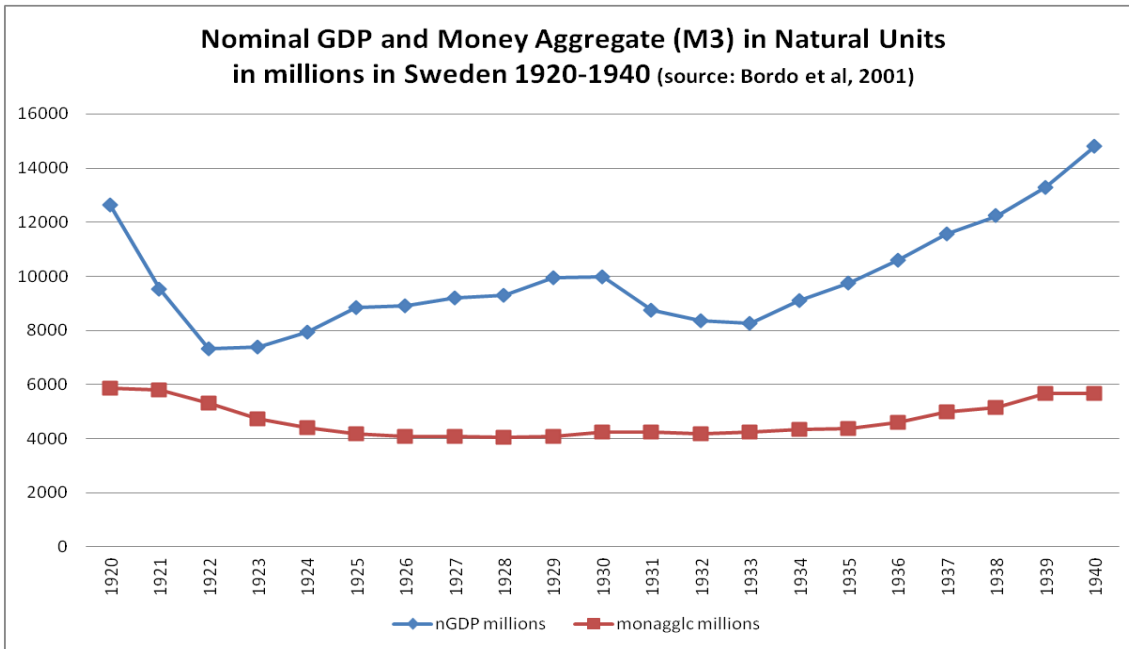


Figure 32: Nominal GDP (GNP) and Money Aggregate (M3) in Natural Units in millions in Sweden 1920 - 1940.

Figure 33 shows how the nominal GDP and the money aggregate (M2) in natural units (money aggregate in local currency) accumulated, in the United States, in 1920 - 1940. It seems that the nominal GDP and the money aggregate have moved more together in the United States than in Finland and Sweden because the shapes of lines are more similar. Both decrease during the crises, in 1920 - 1922, and, in 1930 - 1933, and are increasing again towards the end of the 1930s and the World War II. The timing of the changes seems also to be rather similar in the amount of the nominal GDP and the money supply. The results regarding the United States could more support the Money View than the results of the smaller countries, Finland and Sweden.

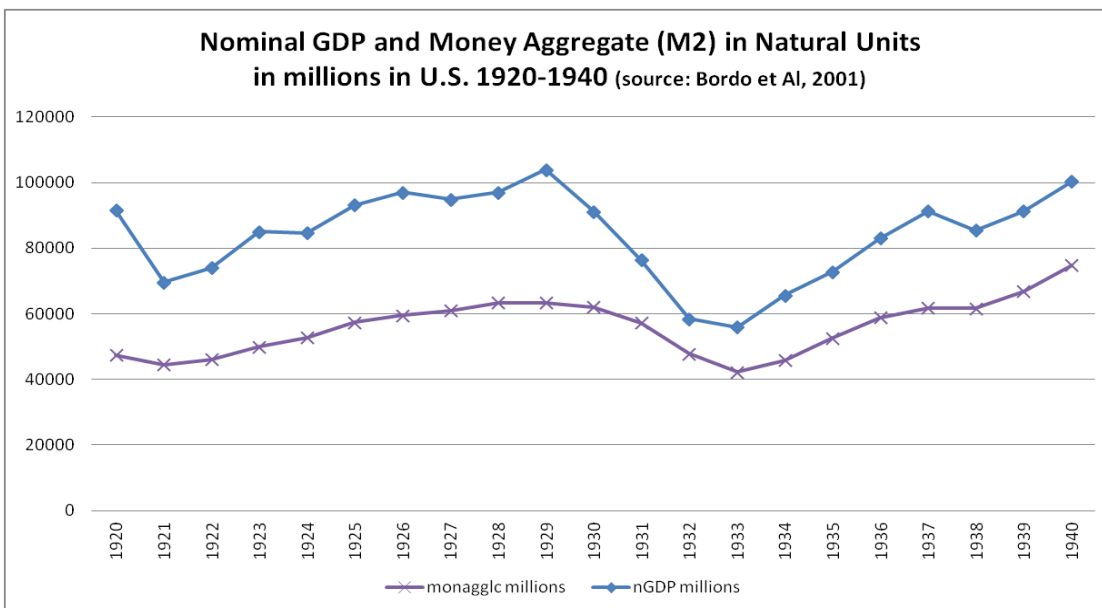


Figure 33: Nominal GDP (GNP) and Money Aggregate (M2) in Natural Units in millions in the United States 1920 - 1940.



Money supply of M2 and M3, in Finland, have increased during the booms and decreased during the recessions as can be interpreted from Figure 34, below. The M1 has partly fluctuated vice versa. During this time, Finland has no possibilities for its own monetary policy because Finland belongs to the Euro area. The time period is too short to make any clear argument on behalf of the Money view, though, the changes in the money stock (M2) seem to have moved together with the business cycle; boom before 2007 and a downturn after that, though, the changes in the growth of GDP is not shown in the same figure due to different measurement frequency (see Figure 20, 36b).

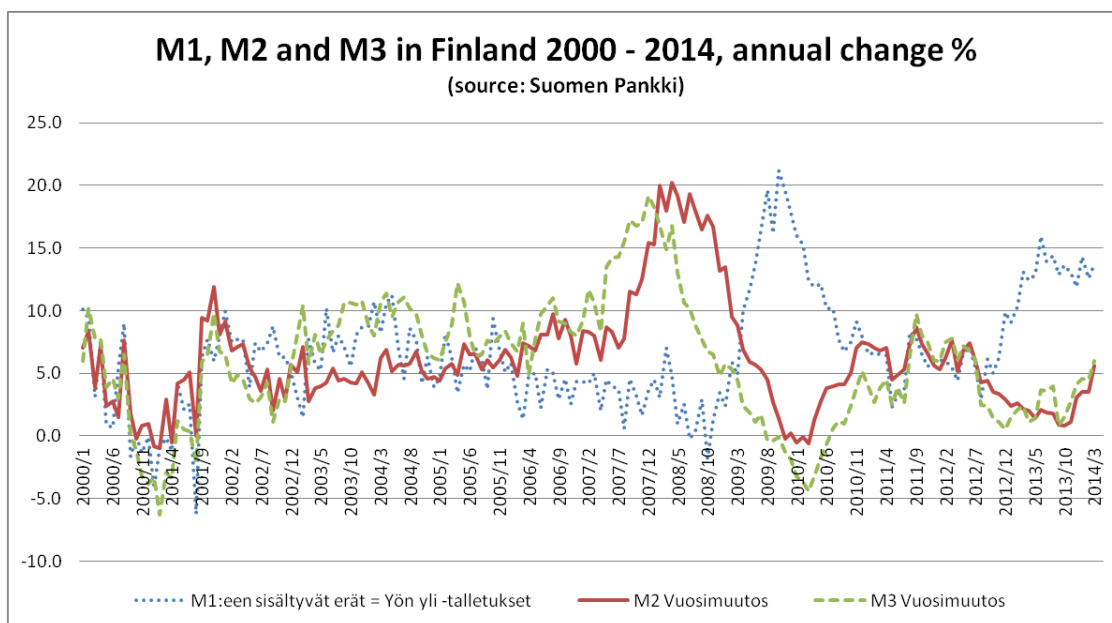


Figure 34: Finland's part of the Money Supply in Euro Area, annual change, in percent, in 2000 - 2014. (Source: Suomen Pankki and Euro System)

Figure 35 shows average monthly changes per year in currency, M1, M2 and M3, in Finland. The peak in the currency supply, in 2002, indicates the introduction of Euro.

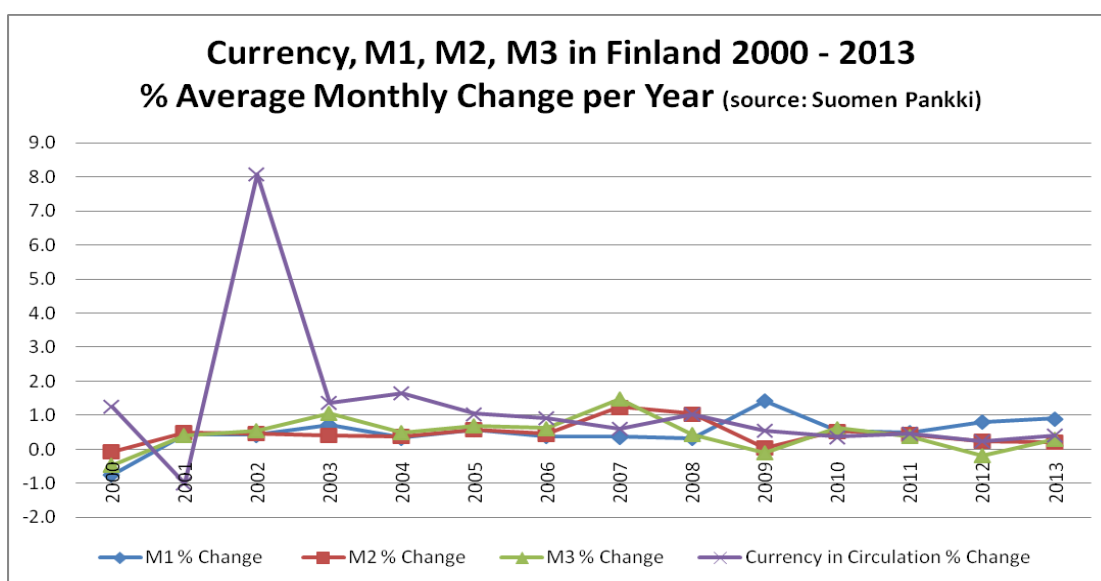


Figure 35: Average monthly changes per year in Currency, M1, M2 and M3 in Finland 2000 - 2013.

Figure 36 a) shows (better than Figure 34 or 35) the average monthly changes per year in M1, M2 and M3, in Finland, during 2000 - 2013. The peaks in changes in M2 and M3 were just before the crisis, in 2007, and in M1, in 2009. As the GDP has not recovered, in Finland, after the crisis, the money supplies have not either recovered to the level of e.g. 2002, in 2013, though; in 2010 it was on the 2002 level. Figure 36 b) shows the real GDP growth rate, in Finland, in 2002 - 2012. There may be similarities in the changes in M2 and M3, and the real GDP growth rate as the Money View suggests, and the amplitude of changes in the real growth of GDP are larger than in monetary units as they suggests.

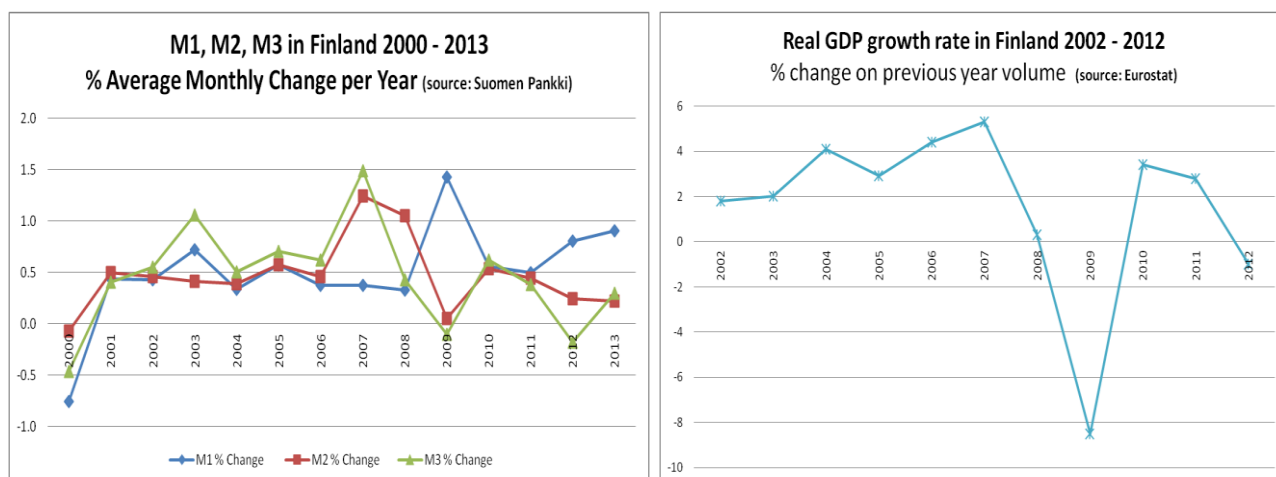


Figure 36: a) Annual percentage changes in M1, M2 and M3 and b) Real GDP growth rate in Finland 2000 - 2013.

Figure 37, below, shows how the deposits to currency ratio, that Cagan (1965) explains to be, an important determinant of the changes in the money stock, in the Money View, has moved from 2003 to the end of 2013. The currency to deposits ratio has declined more rapidly before the crisis than after that, in Finland. The deposits of households, here, cover overnight deposits and deposits with agreed maturity for EUR in all monetary financial institutions operating in Finland. The deposits comprise all euro-denominated deposits vis-à-vis the euro area as a whole, with countries other than Finland accounting for a very small share of total volumes. Reasons for the decline in the deposits to currency ratio may be e.g. decrease in deposits or increase in currency. Though, in Finland, people use nowadays more credit cards than currency. It is also possible that the capital export is higher than the import, in Finland, or it may also indicate that people do not hold money in deposits due to low interest rates and rather invest money abroad or to domestic funds and other securities.

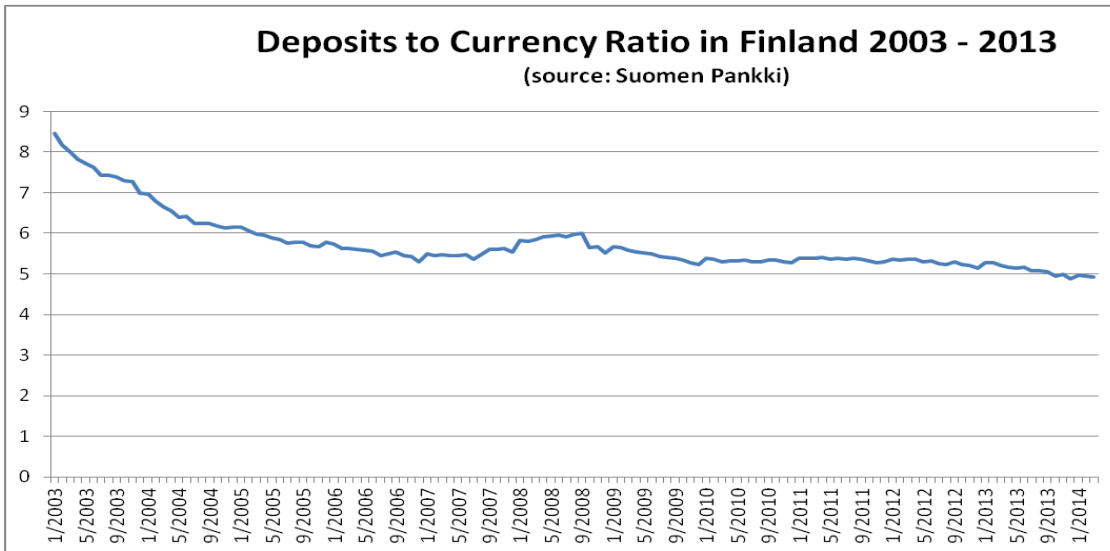


Figure 37: Deposits to Currency Ratio (percent) in Finland 2003 - 2013. (source: Suomen Pankki)

Figure 38 shows that money supply of M3 and partly M1, in Sweden, have increased during the booms (2005 - 2007) and decreased during the economic downturn (2008 - 2009). The M1 has fluctuated partly together and partly the opposite to the M3, as during the crisis. M1 consists of the general public's holdings of bank notes and coins as well as demand deposits by the general public in MFIs (Monetary Financial Institutes) and with the central government. However, the time period is too short to make any clear argument on behalf of the Money view, though; the changes in the money stock (M3) seem to have moved together with the business cycle that, however, is not shown in the same figure because of the differences in the measurement frequency. In contrary to Finland, Sweden can use monetary policy to ease the consequences of the crisis which may be a reason for differences in fluctuations between M1 and M3 than in Finland (M1 and M2 + M3).

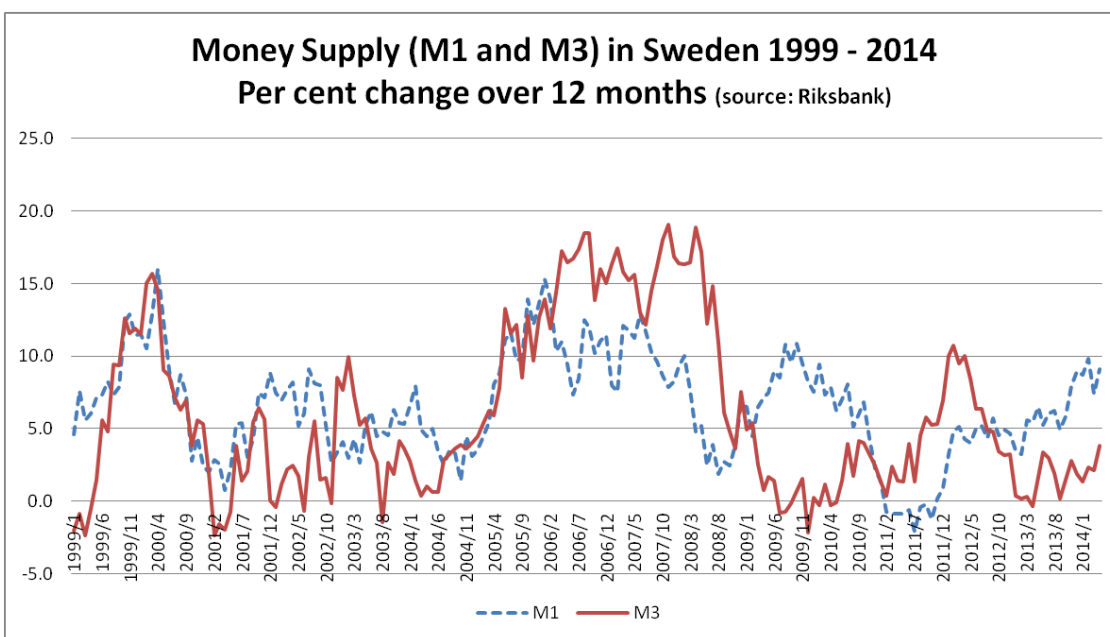


Figure 38: Money Supply, percent change over 12 month, in Sweden, in 1999 - 2014.

Figure 39 shows the annual percentage changes from previous year, in M1 and M3, in Sweden, during 1999 - 2013. The peaks in changes in M1 and M3 were just before the crisis in 2006-2007 and for M1 in 2009, as in Finland. The amount of notes and coins is clearly decreasing during the period 1999 - 2013. Based on Figure 39 may not be able to say that the money supply moves together with the GDP as partly argued, in case of Figure 38, above. So the evidence of Sweden may not support the Money View.

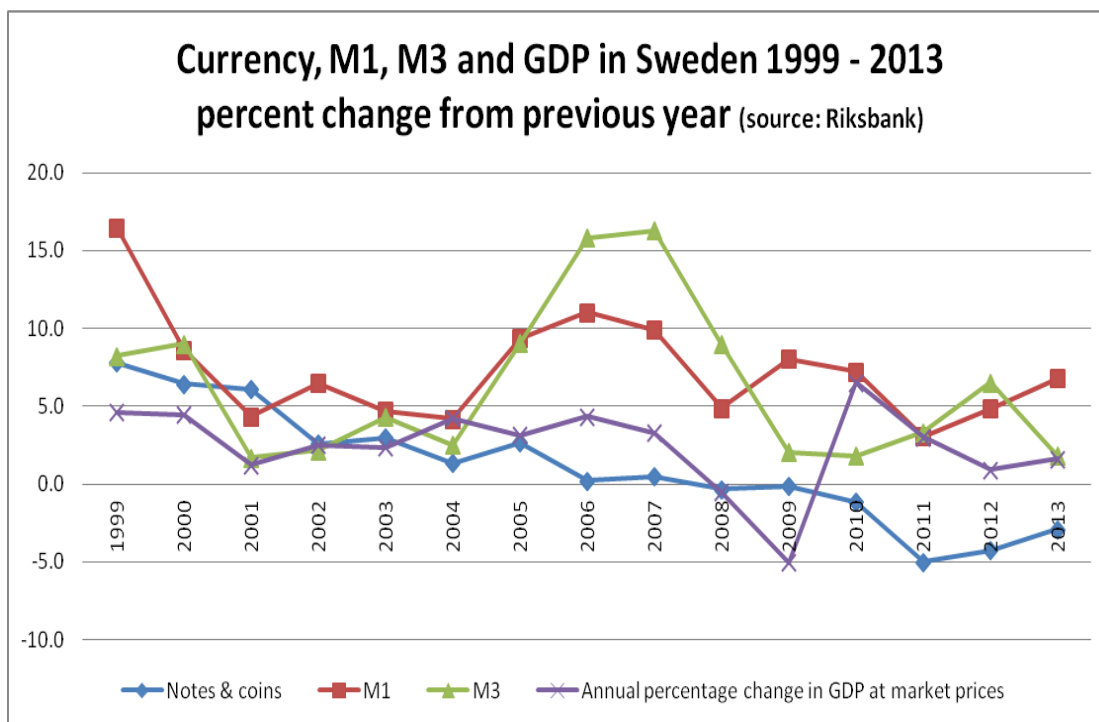


Figure 39: Percentage change from previous year in Currency, M1, M3, and GDP in Sweden 1999 - 2013.

Figure 40 shows the deposits to currency ratio in Sweden. Because of the various classification of the money, the ratio, shown in Figure 40, cannot directly be compared to the same of Finland (Figure 37). The both “deposit” classifications seem to be rising, though; M3 to currency ratio has a little fluctuated. M1 consists of the general public's holdings of bank notes and coins, as well as, demand deposits by the general public in MFIs (Monetary Financial Institutions) and with the central government. In addition to M1, M3 also includes deposits with certain conditions, repurchases, shares in money market funds, and short-term securities. The money supply, in Sweden, seems to have developed opposite to Finland (Figure 37). It might indicate the capital import in Sweden. Another explanation could, of course, be that decrease in the currency in circulation due to prevailing use of credit cards, in Sweden. However, it is possible that people in Sweden hold more money in deposits than e.g. in Finland. Compared to Finland, the M3 includes also some securities but the M1 does not, and it is also increasing.

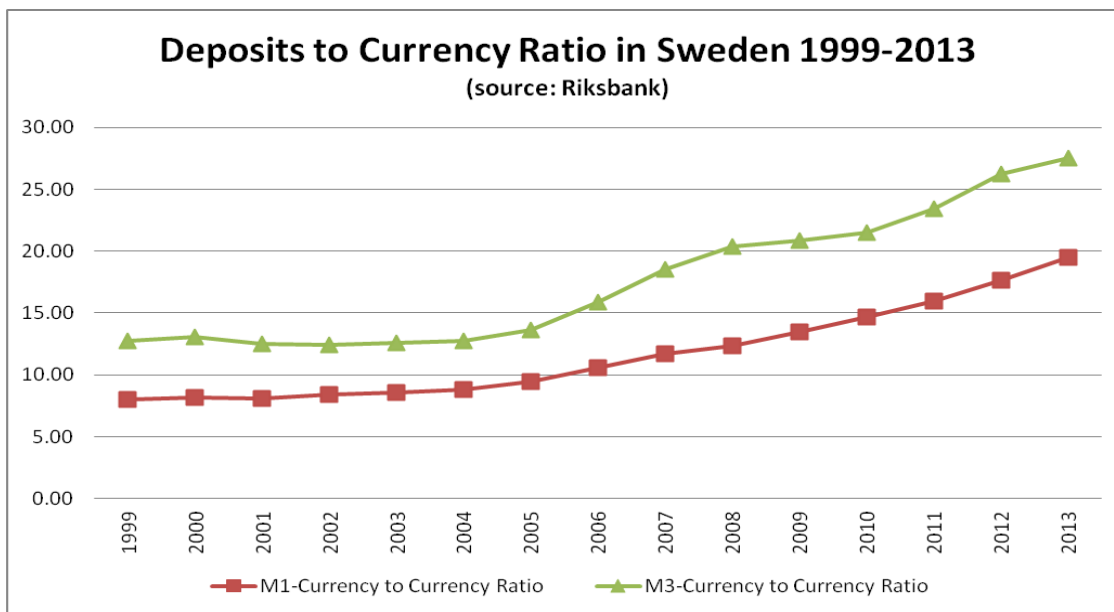


Figure 40: Deposits to Currency Ratio in Sweden in 1999 - 2013.

Figure 41 shows that money supplies of M1 and M2 have fluctuated, in the United States, in period of 2000 - 2014 but the pattern is not as clearly fluctuating with the business cycles as the patterns in Finland and Sweden. There are peaks, in the money supply, but they may also be during the recession. In addition, M1 is fluctuating more simultaneously with the other monetary units than, especially, in case of Finland. If it is possible to conclude anything based on the data, this may not support the Money View as Friedman and Schwartz (1963a) could have suggested.

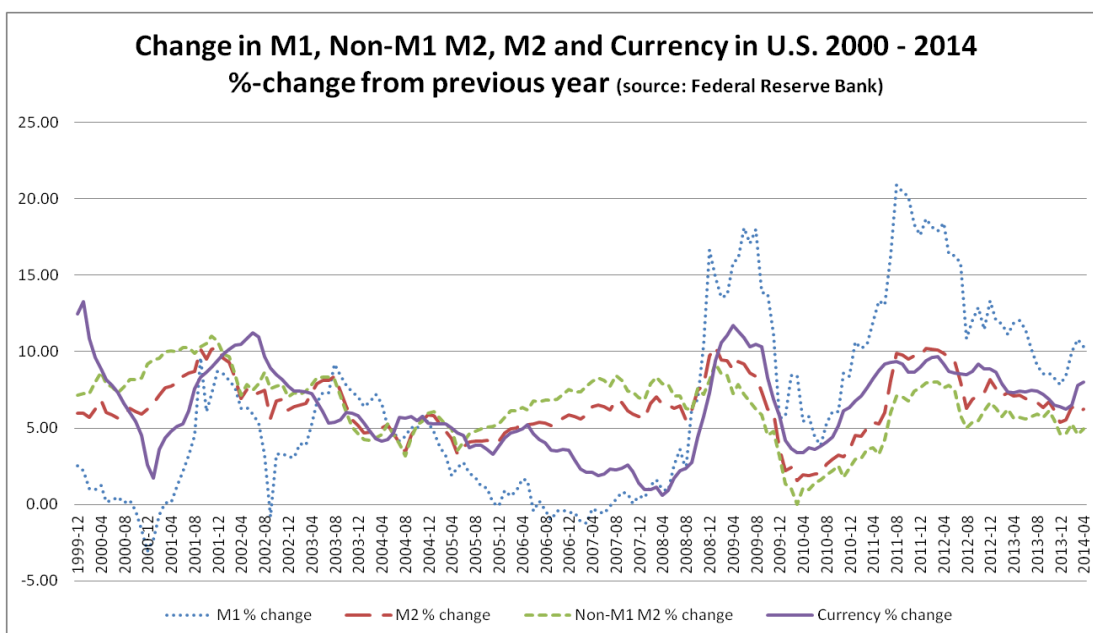


Figure 41: Change in M1, Non-M1 M2, M2 and Currency in the United States in 2000 - 2014, %-change from previous year.

Regarding the Money View, Friedman and Schwartz (1963a) refer to Cagan (1965) who investigated the money stock and its determinants and concludes that deposits to currency ratio is the most important proximate determinant in the money stock. Figures 42 (a, b) show how the

deposits to currency ratio moves in the United States from 1990 to April, 2014. Money value of the deposits is calculated by subtracting currency from the M2. Compared to the ratio of Finland and Sweden, it is not declining as the ratio of Finland (Figure 37) but the ratio seems not to be either clearly increasing as the ratio in Sweden (Figure 40). The other figure shows the same but the vertical axis starts from 7.0 not from zero to show clearly the changes in the ratio. It may be possible that “people” invest more money than before and hold just a stable amount of money in deposits and currency in circulation. The highest peak, in Figure 42b, occurs in April, 2008.

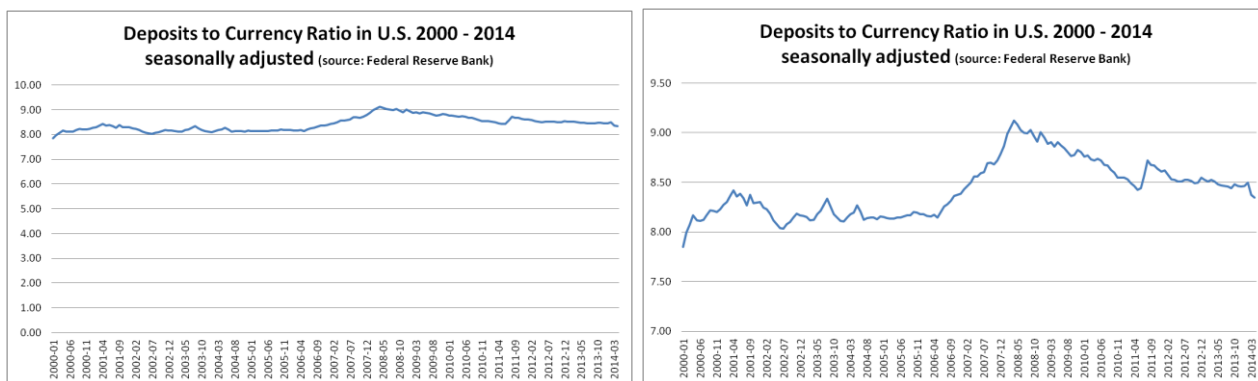


Figure 42: Deposits to Currency Ratio in U.S. 1990 - 2014, seasonally adjusted in Figure b) vertical axis is shortened.

Figure 43 shows annual changes in currency, M1, M2 and Non-M1 M2 in the United States in 2000 - 2013. The period is too short to make any sure conclusions but, at least, during the Great Recession, the money supply and the GDP have moved rather variously. Seasonally adjusted M1 is constructed by summing currency, traveller’s checks, demand deposits, and other checkable deposits (OCDs), each seasonally adjusted separately.

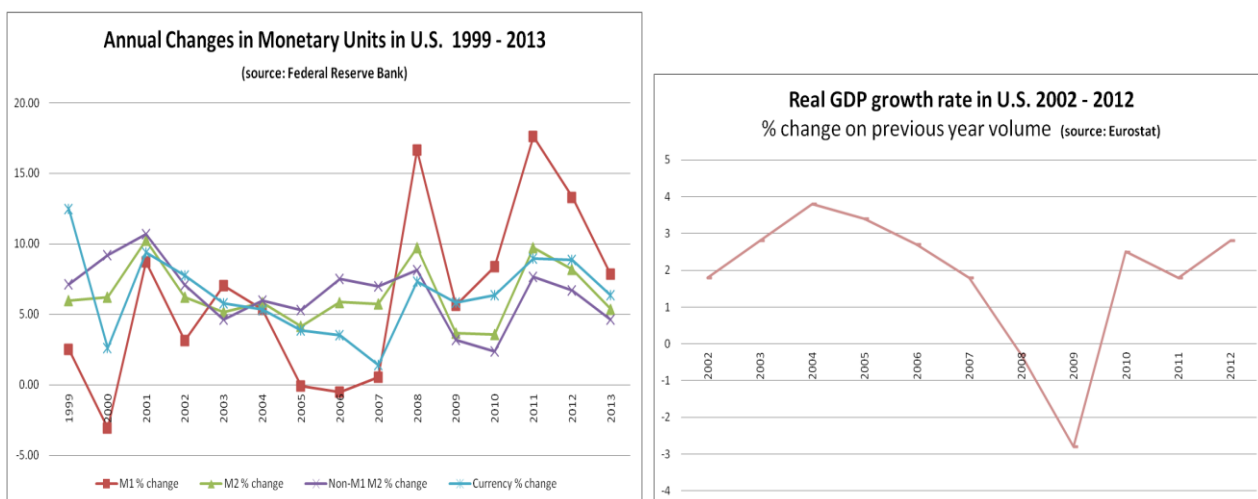


Figure 43: a) Annual Changes in Currency, M1, M2 and Non-M1 M2 and b) Real GDP growth in United States 2000 - 2013.

The following section discusses the findings in factors of the Credit View during the great crises.

### 7.3 The Credit View

This section presents the findings from the Credit View, by Reinhart and Rogoff (2009, 2011), point of view. The purpose is to investigate how private credit and public debt have accumulated in the days of the Great Depression and the Great Recession, compared to the GDP, too.

Figure 44 shows the total (domestic plus external) gross central government debt to GDP ratio in Finland, Sweden and the United States during 1920-1940. The gross central government debt does not contain largely the debt of other public sectors as the gross general government debt. The Great Depression was in 1930 - 1933. Just before this period, in Finland, was the civil war and in the end of the period the “Winter war”, in Finland, and the World War II started. The Great Depression lasted longer in the United States than in Sweden and Finland. Based on Figure 44, the debt to GDP ratios varied between countries only about 5 percent, in 1930, and about 22 percent in 1933, but over 30 percent, in 1938. The highest increase was in the debt to GDP ratio of the United States from 1930 to 1933. As mentioned before, Finland and Sweden abandoned from the gold standard in 1931 following example of England, which may have increased the debt burden in the case of external debts of countries still in the gold standard. After leaving gold standard, governments of Finland and Sweden were more independent to ease the consequences of the crisis. They both, as also the United States, used fiscal policy means like public infrastructure works to revive the economies. That may partly explain the increase in debt but, however; the debts to GDP ratios in those days are significantly lower than nowadays in all of the countries, in question. Data of other debts was not discovered of the days of the Great Depression for the purposes of this thesis. This sample of the debt burden is too small to convince of or deny existence of the Credit View.

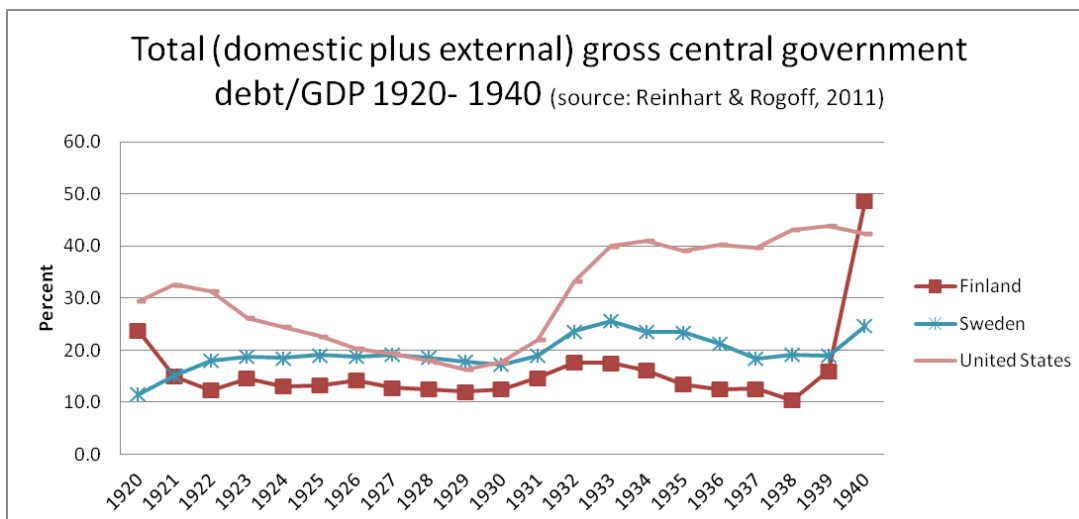


Figure 44: Total (domestic plus external) gross central government debt/GDP in 1920-1940 in Finland, Sweden and the United States. (Data: Reinhart and Rogoff (2011))



Figure 45 shows various debt burdens to GDP ratios, in Finland, in the period of 1990-2010. Note that, Figure 45 does not show the domestic debt burden of the private “group” and the period end in year 2010. The Great Recession began in 2007 (2008) in the United States. The gross general and central government debts to GDP in Finland are mainly less than 50 percent of GDP, but the total (public plus private) gross external debt to GNP ratio is over one and half the GNP. Gross central government debt is a narrower public debt definition than the gross general government debt. The external debt denotes the debt borrowed from foreign countries. It is obvious that the private external debt burden has increased considerably in 20 years that is about a volume of GDP (from 60 to 160 percent of GDP). Because these are external debts, as Reinhart and Rogoff (2009, 2011) argue, there is a high risk that if conditions, in the country, become significantly worse the creditors may require repayment quicker or change the terms of the debts more unkind to debtors.

Reinhart and Rogoff (2009, 2011) discuss that if the government’s indebtedness is high it cannot rescue the private groups from disaster without being self in noticeable troubles. Though, based on this cannot be argued that indebtedness is the reason for the Great Recession. Finland is so a small country that its private indebtedness does not cause international crisis. In case of government indebtedness it could be a cause for international crisis at its worst as is seen in the case of Greece. As mentioned before, that based on e.g. Figure 45 cannot be proved the Credit View, but Reinhart and Rogoff’s (2009, 2011) conclusions of the risks in indebtedness appear evident. The private debtors may trust too much in stable, high Euro value, in case of repayment of debts.

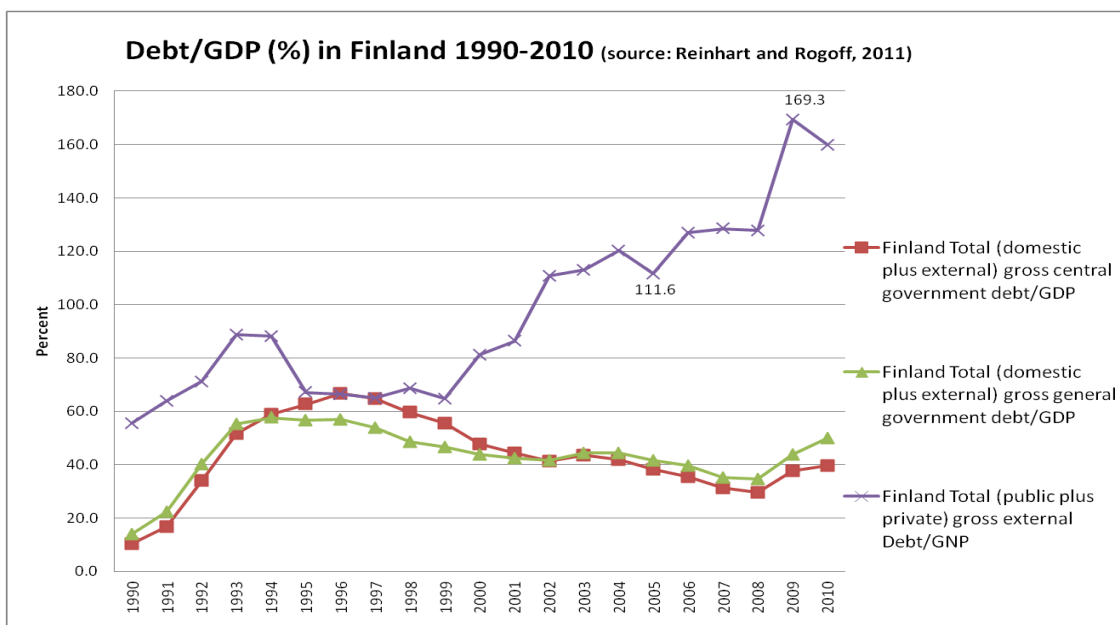


Figure 45: Debt/GDP in Finland (%) in 1990-2010. (Source: Reinhart and Rogoff, 2011)

Figure 46 shows central and general government debt and GDP in billion Euros, in Finland, in 1990 - 2013. Based on Figure 46, GDP (calculated based on ESA95) has grown rather steadily



before the crisis in 2007-2009 but the debt burdens stayed on about the same levels from 1995 until the crisis. After that amounts of the central and general debts have increased like during the bank crisis in the beginning of 1990s. The value of years 2012 and 2013 are preliminary estimates. The highest line describes the GDP in billion Euros.

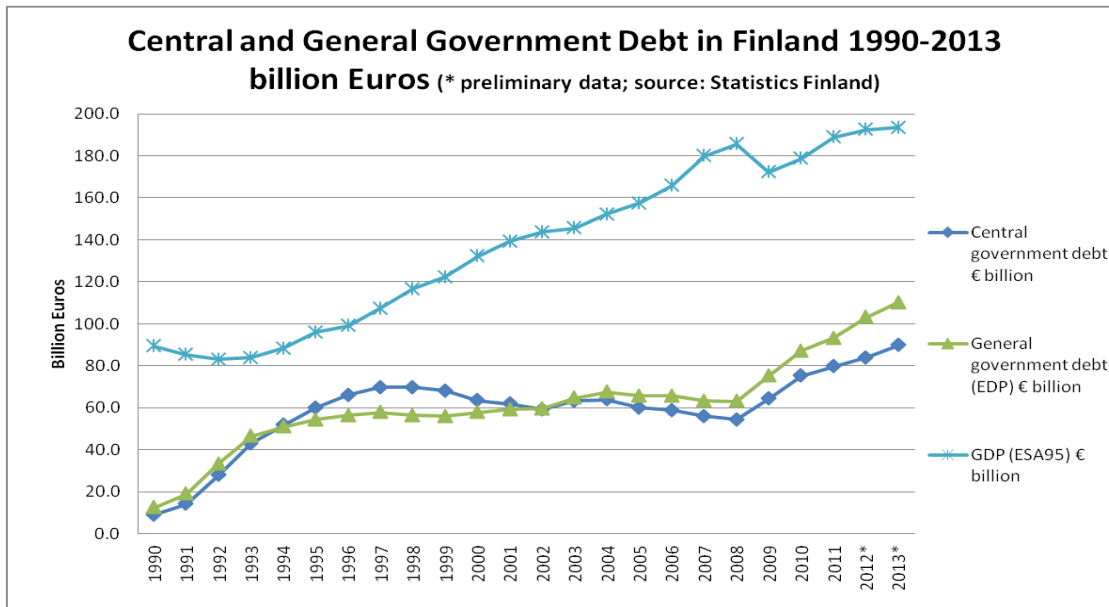


Figure 46: Central and General Government Debt and GDP in Finland in 1990 - 2013.

Figure 47 shows how the central and general government debts to GDP ratios have changed in Finland in 1990 - 2013. The debt ratios were in their lowest value in 2007 since year 1992, though, the lowest values of the period of 1990 - 2013 of the central government debt and the general government debt were, in 1990, as about 10 and 14 percent of GDP, respectively. The general government debt to GDP ratio may be on the level of the peak after the crisis in 1990s (57 percent) if the preliminary estimates are correct. The central government debt (estimation, 47 percent, in 2013) is not at the same level as the peak after the bank crisis (about 67 percent). The value of years 2012 and 2013 are preliminary estimates. As discussed in case of Figure 45, the government indebtedness may be a high risk, especially, in connection with the high private external indebtedness. The worst situation, of course, may be if the government has also a considerable amount of external debts, as Reinhart and Rogoff (2009, 2011) in their Credit View, suggest.

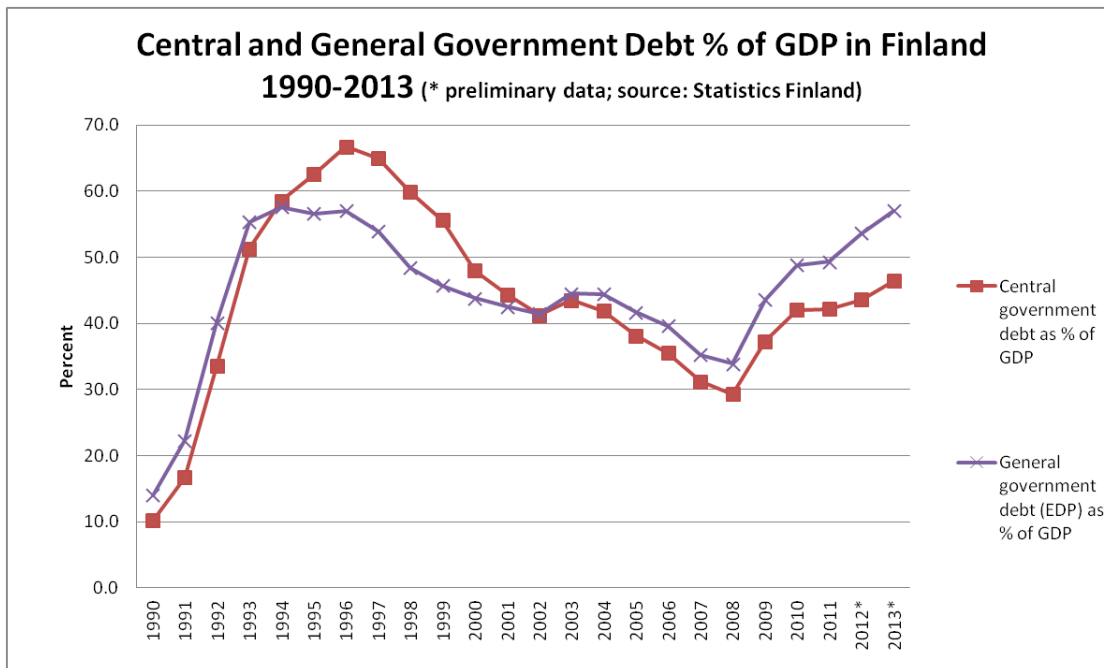


Figure 47: Central and General Government Debt in Finland, percent of GDP, in 1990 - 2013.

Figure 48 shows various debt burdens to GDP ratio, in Sweden, in 1990-2010. Note that, Figure 48 does not show the domestic debt burden of the private “group” and the period end in 2010. The gross general and central government debts to GDP, in Sweden, are, as in Finland, mainly less than 50 percent of GDP in 1990 - 2010, but the total (public plus private) gross external debt to GNP ratio has grown to over twofold the GNP that is higher than the corresponding ratio, in Finland. As discussed, in case of Finland (Figure 45), there are similar risks of external debts, in Sweden, too, as Reinhart and Rogoff (2009, 2011) have argued. The dissimilarity between Finland and Sweden is that Finland belongs to the Euro area that very likely would help Finland with the intention to maintain the trustworthiness of the currency area, by assumption that the Euro area is not largely in troubles. Of course, the Sweden would either be left alone but it might be higher risk, at worst, for a small country with own currency to be in worse situation. But, as discussed, in case of Finland, there is a high risk that if conditions, in the country, become significantly worse the external creditors may require repayment quicker or change the terms of the debts (external creditors cannot be order by debtors government) more unkind to debtors. And again, Reinhart and Rogoff (2009, 2011) discuss that if the government’s indebtedness is high it cannot rescue the private debtors from disaster without being self in noticeable troubles. Sweden does not have a support of stable currency if it is in troubles. Once again, based on this “picture” cannot be argued that indebtedness is the reason for the Great Recession. Sweden is also a small country that its private indebtedness does not cause international crisis but the case could be different with the government indebtedness. The Credit View has some serious observations to keep in mind.

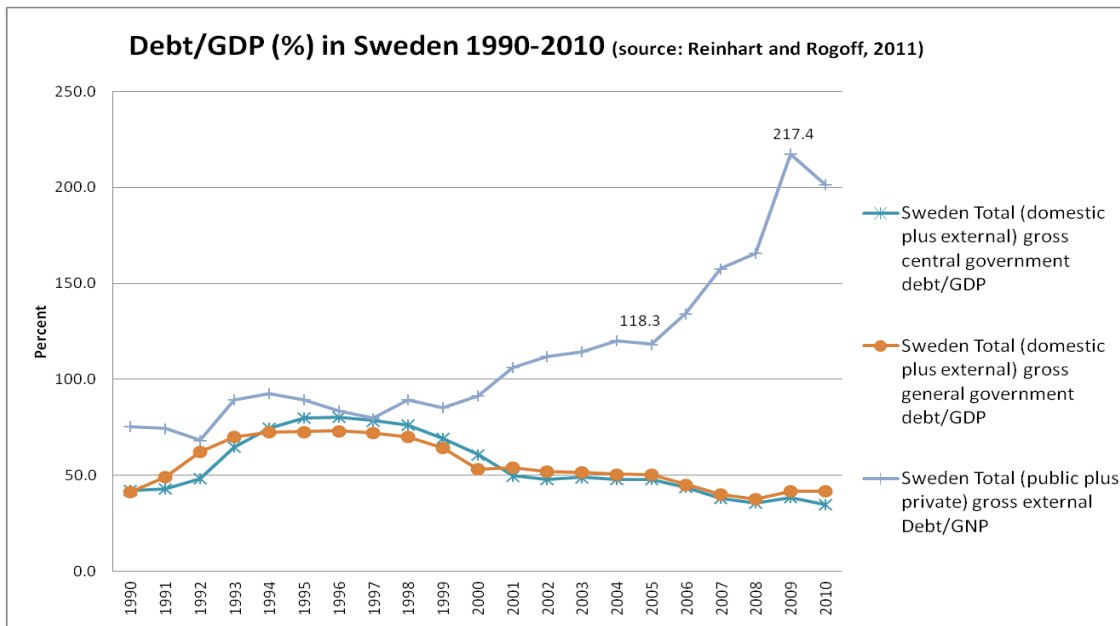


Figure 48: Debt/GDP in Sweden (%) in 1990-2010. (Source: Reinhart and Rogoff, 2011)

Figure 49 shows lending to households including non-profit institutions serving households (NPISH), in Sweden, in 2002-2013, in millions SEK. Lending to the households has continued rather steadily, in Sweden, in 2002-2013, except the sudden drop in housing credit institutions and corresponding increase to the bank lending during 2007. After that both have increased as before. The Great Recession does not seem to have disturbed the private lending, in Sweden, except the sudden changes in the lending of lending institutions. As can be concluded from the highest line the MFIs' lending, to the Swedish households, has raised about threefold, in SEK, in 13 years.

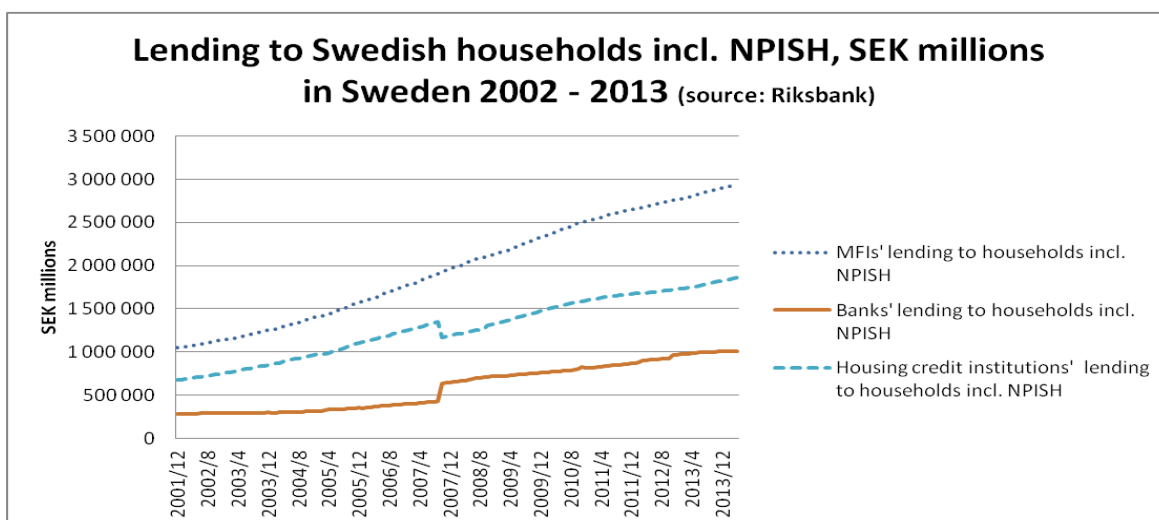


Figure 49: Lending to Households Including Non-profit Institutions Serving Households in Sweden 2002-2013, millions SEK.

Figure 50 shows various debt burdens to GDP ratio, in the United States, in the period of 1990-2010. The gross general and central government debts to GDP, in the United States, are both nearly 100 per cent of the GDP. In contrast to Finland and Sweden, the total (public plus private) gross

external debt burden in volume is about on the same level as the GNP. Both gross central and general government debts (domestic plus external) to GDP ratios have increased dramatically after the crisis started in 2007. At the same time, the increase in the total external private and public debts has stopped and remained on the level almost 100 percent of GDP. That is very interesting phenomena compared to Finland (Figure 45) and Sweden (Figure 48). A reason could be sudden tight restrictions in external lending when external creditors have decreased their credit supply to U.S. households. Figure 50 shows only external debts for private groups not the domestic debts. The stop in external debts may also indicate that the private debtors have changed to borrow from domestic institutions.

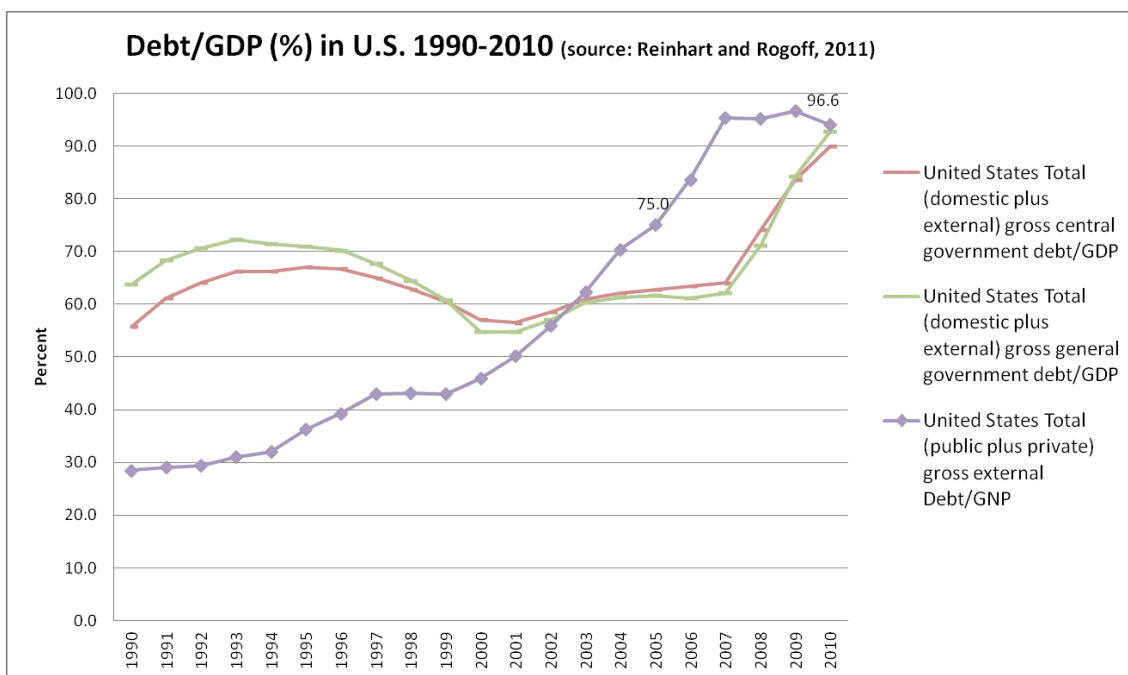


Figure 50: Debt/GDP in the United States (%) in 1990-2010. (Source: Reinhart and Rogoff, 2011)

Figure 51 shows the amounts of the commercial and industrial loans, in the United States, in the period from 1990 to 2013. The amounts of the loans have two times dropped sharply in 2000s but after the drops continued to increase as before the crises. It may indicate that commercial and industrial firms have borrowed from the banks almost as before, except the short drop. The debt figures from the United States are somewhat surprising; on the one hand, borrowing continues as almost any crisis has not occurred and on the other hand seems that borrowing or loaning has stopped totally. From the Credit View point of view, the interpretation could be that the credit does matter, but the oddity of the figures would require more investigations before any further conclusions. See Appendix 5 for more figures of the United States.

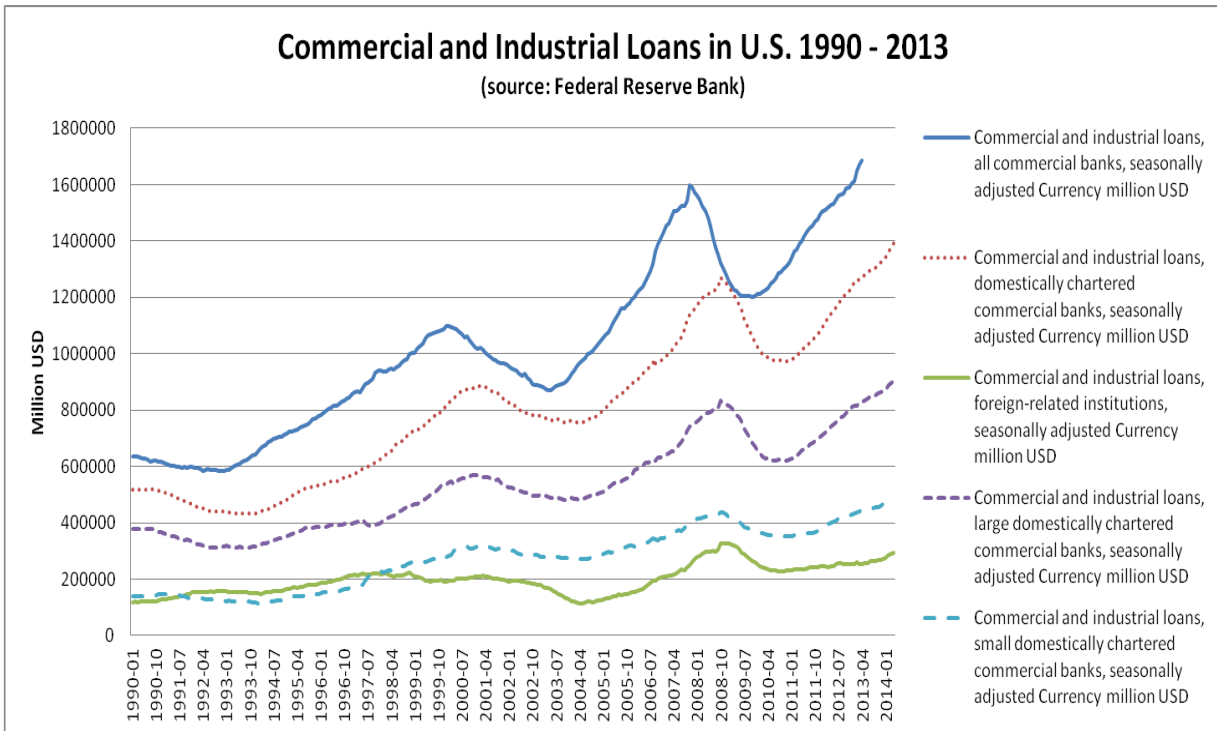


Figure 51: Commercial and Industrial Loans in the United States, in million USD, in 1990 - 2013. (Source: Federal Reserve Bank)

Figure 52 shows the amounts of the real estate loans, in the United States, in the period from 1990 to 2013. The rise in the amounts of the loans has stopped in 2009 and somewhat decreased after that. This phenomenon may partly explain why increase in the amount of the total (public plus private) gross external debt to GNP ratio, in Figure 50, has also stopped.

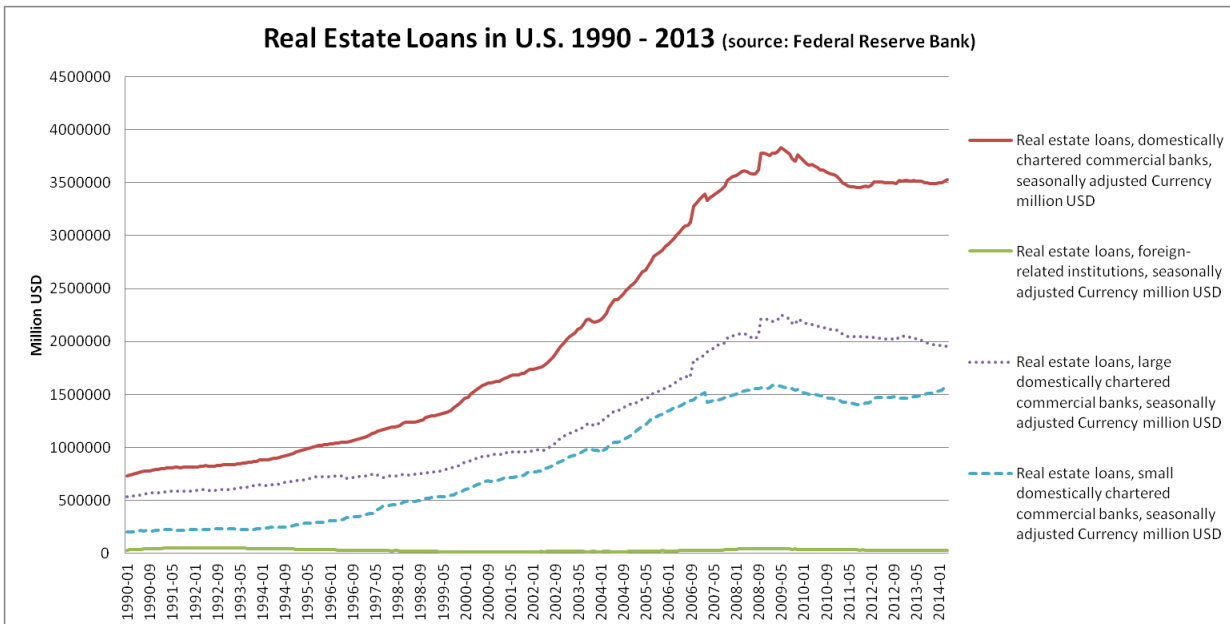
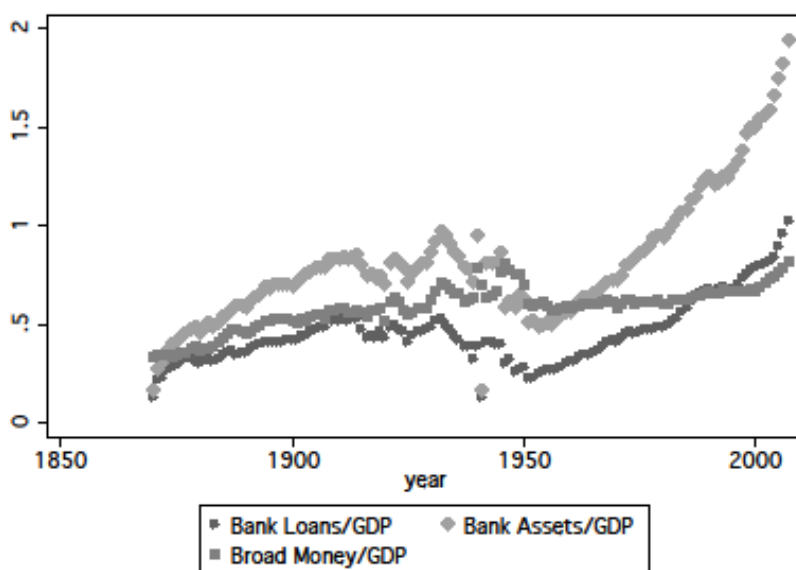


Figure 52: Real Estate Loans in the United States, in million USD, in 1990 - 2013. (Source: Federal Reserve Bank)

## 8 Discussion

As has been mentioned before, there is not a unanimous view what causes the crises among the economic scientists. Fisher (1923) defines that crisis is “a dance of the dollar”. Samuelson (1967) argues that income and employment fluctuate due to investments. Kindleberger (2013 [1975]) defines three factors which turn up in many crises: panic, the power of contagion, and the importance of hegemony. The “Money View” by Friedman and Schwartz (1963a), discuss that the money stock (mainly M2) and changes in it are in main roles in the business cycles. The Money View was one of the theories discussed more thoroughly, in this thesis. Minsky (1992) has his financial instability hypothesis that considers, especially, debt as a factor in financial fluctuations. The factors in the “Debt View” are discussed in many latest papers after the financial and banking crisis in 2007 - 2009 (e.g., Reinhart and Rogoff, 2009, 2010, 2011; Bordo and Haubrich, 2009; Schularick and Taylor, 2012; Jordà, Schularick, Taylor, 2013). This thesis discussed the “Credit View” based on papers and book of Reinhart and Rogoff (2009, 2010, 2011).

Schularick and Taylor (2012) study both money and debt fluctuations over the long run with the intention of finding causes of crises. They argue that, in the past, there have been an Age of Money and, now, we live in a different world, an Age of Credit, where financial innovation and regulatory ease broke that link, setting in train an unprecedented expansion in the role of credit in the macro economy. They propose that the use of credit aggregates, rather than monetary aggregates, is of crucial importance. The figure, below, shows how the assets and liabilities of banks to GDP ratios have changed from 1850 to nowadays.



Source: Schularick, Moritz and Taylor, Alan M. (2009): Credit Booms Gone Bust: Monetary Policy, Leverage Cycles and Financial Crises, 1870-2008. *NBER Working Paper No. 15512*. (Taylor – FinalFigure01.pdf)

Bordo and Haubrich (2009) suggest that credit market distress arises in its more virulent form only in certain monetary environments, and has its most extreme effects when it exacerbates a business downturn. They argue that their empirical results complement the cross country evidence of Reinhart and Rogoff. Still, Bordo and Haubrich (2009) continue that the cycles in the quantity of money appear not to be synchronised with business cycles, but when the cycles do coincide, monetary tightening has a significant effect and seems implicated in major recessions. Jordà, Schularick, and Taylor (2013) study the interactions between private and public debts from a long-run historical perspective and conclude that, in advanced economies financial stability risks originate in the private sector, not in the public sector.

There may be a growing amount of evidence which supports the view that the Credit View as a model of crisis is capturing more supporters than the longer dominating theory of the Money View based on Friedman and Schwartz (1963a) where money is an independent factor in financial and banking crises and credit has only a supporting role. This thesis considered the Credit View from the Reinhart and Rogoff (2009, 2011) point of view. Though, e.g. the Credit View that Bernanke (1988) presents does not conflict with that of Reinhart and Rogoff (2009, 2011), except the view of “the more lending the stronger growth of the economy” by Bernanke (1988). Reinhart and Rogoff (2009, 2011) see the excess indebtedness as a risk to end up in a crisis. Otherwise, Reinhart and Rogoff (2009, 2011) do not discuss the mechanism how the credit is created, which is the object of Bernanke (1988).

This thesis investigates how the factors of these crisis theories may affect development of the crises. There is hardly any research which studied both Money view and Credit view, and focused in comparison with the basic features of the theories and with the phenomena of the great crises in a few countries to reveal similarities and differences. As mentioned before, this thesis focused on only three countries and aimed to reveal the similarities and differences in the crisis point of view between these three countries. Finland and Sweden are small countries compared to the United States. The conditions in Finland have changed from the developing country in 1930s to a country in the Euro area in 2000s. Sweden and the United States have been considered as developed countries already in the days of the Great Depression. There are papers (e.g. Schularick and Taylor, 2012) that study larger group of the countries, and they may find some variety between the countries, however, they focus on revealing some general principles or factors for the Credit or Money views. In addition, this thesis studied the both theories from the Great Depression and Great Recession point of view, though, keeping in mind that the theories cannot totally be evaluated by the data of only two great international crises.

It is not a new idea to discuss the role of credit as a reason for crises (e.g. Fisher, 1933; Bernanke, 1988; Minsky, 1992). However, the Money view was “developed” in the days when money took its role as a medium of exchange. The quantity theory of money defined the relation between the amount of money and the price level: the price level was rising when the amount of money in an economy was rising. However, as mentioned before, Fisher (1923, 1933) has defined, first, his “Dance of the dollar” model and, later, his debt deflation model, in the days of the Great Depression. In the 1960s, Friedman and Schwartz in co-operation with Cagan (1965) investigated the economic history of the United States and developed their theory of changes in money stock in a main role in crises, the Money View. The Great Recession, in 2007-2009, has again inspired economic scientists (e.g. Reinhart and Rogoff, 2009, 2011; Schularick and Taylor, 2012; Bordo et al. 2009, 2013) to study the crises and to conclude that private credit or public debt have bigger than just supporting roles in the crises.

It has been interesting to look more closely the literature of the great crises and review the figures produced by statistical Finnish, Swedish and US data to identify similarities and differences between the countries from the crises and the theories point of view. Based on the literature and the data there seem to be similarities between the crises and the countries, but also differences, especially, between the countries. A similarity may be an optimistic attitude in an economy, as Fisher (1933) argue that, people where thinking there has started a “new era,” and Reinhart and Rogoff (2009) argue the same regarding the Great Recession in 2007, “this time is different”. Another similarity may be the accumulation of the debt as reported e.g. by Reinhart and Rogoff (2009, 2011), Schularick and Taylor (2012) and as discussed the days of the Great Depression e.g. by Eichengreen and Mitchener (2003). Regardless of the purposes of this thesis, this thesis was not exactly able to reveal the indebtedness, especially, in the days of the Great Depression due to lack of data. To reveal the consequences of the indebtedness would have required extending the studies too much from the resources and time schedule point of view.

In addition to the similarities, there is an item that may be in dispute but came to author’s mind, during studies of this thesis, as deflation. In case of the Great Depression, there was violent deflation already in the beginning of the 1920s and again during the depression, as Montgomery (1938) reports. Fisher (1933) discusses the phenomenon as debt deflation, but Montgomery argues that the decade of 1920s was an era of rationalisation, mechanisation and electrification. Prices may also decline because of new, more efficient technologies in production. If the latter have had a role in the deflation it would have a connection to the Great Recession, too, due to huge amount of production in the countries with cheaper cost levels, and so declining prices in consumption goods



and causing huge problems in the countries that have not been able to compete with the lower price levels. This is just a question that would be interesting item for more investigation.

Another item is capital movements as factors in the crises. As Reinhart and Rogoff (2009, 2011) report the capital movements may cause bank crises in countries that, first, receive new capital due to tempting investment views, and, on worsening economic views, the capital leaves the country, again. In case of the Great Depression, there may have also been capital flow to the United States due to problems in the European continent. Though, there were restrictions in capital movements, too however, there were also occasions for speculations. In the times of the Great Recession, the capital flowed into the United States. Yet, the United States is a big country and, as Reinhart and Rogoff (2009, 2011) argue, the markets are treating a big country in a specific means so that its currency and interest rates do not be object of speculations as in a smaller country. However, numerous amount of capital may not only be invested in rational assets and, in addition, excess capital may inspire to develop riskier assets.

Regarding the investigations into the defined targets of this thesis, the results might support the idea that the phenomena of crises differ between a big economically leading country and a small, peripheral country. The Great Depression may have treated the United States heavier than Finland and Sweden (see Figures 17, 18, 26 and 27); however, the case might have been the opposite in the Great Recession (Figure 20). Another difference may be the evidence of the Money view. In case of the United States, regression between real growth of GDP as a dependent variable and the growth of money stock as an explaining variable, in period from the Great Depression to the end of 20<sup>th</sup> century, ended in a statistically significant result (Figure 30, Table 5). However, the same regression concerning the data of Finland and Sweden give negative and not statistically significant results. In the contrast, the money supply in the United States, during the Great Recession, does not indicate the influence of the Money view (Figures 41, 43) compared to Finland (Figure 34, 36) and Sweden (Figure 38).

In case of the Credit view, all the countries had heavy private external debt burdens in days of the Great Recession in 2000s; especially, in Finland (Figure 45) and Sweden (Figure 48) the amount of private external debts have clearly increased during the 2000s. The case of the United States varies from these of Finland and Sweden from private external debt point of view (see Figure 50) as the growth of the cross external private and public debt to GDP has stopped when the crisis started in the United States. The external debt denotes that the debt is borrowed from foreign lenders. So, based on Figure 50, it might be that the external lenders have stopped to loan to the private customs, in question, in the United States.

It is obvious that the private external debt burdens have increased considerably in 20 years compared in volume with the volume of GDP e.g., in Finland: about from 60 to 160 percent of GDP. As Reinhart and Rogoff (2009, 2011) argue that if external debts are significantly accumulated there is a high risk that if conditions, in a country, become considerably worse creditors may require repayment quicker or change the terms of the debts more unkind to debtors. Reinhart and Rogoff (2009, 2011) further argue that if the government's indebtedness is high it cannot rescue the private groups from disaster without being self in noticeable troubles. Though, based on a figure of debt accumulation cannot be argued that indebtedness is the reason for the Great Recession. There should be further investigations of the consequences to the debt markets and lending generally.

Concerning the private external debts in Finland and Sweden there may be a difference in conditions in case of economic troubles with the debts. Finland belongs to the Euro area which, at least, nowadays has a stable and strong currency, but Sweden is a small country and has its own currency. If conditions, in Sweden, become significantly worse and the external creditors require repayment quicker or change the terms of the debts (external creditors cannot be ordered by debtors' government) more unkind to debtors. This is just a speculation, but there is typically a risk, as Reinhart and Rogoff (2009, 2011) argue that the markets may lose confidence, in case in question, to the Swedish markets and the Swedish krona may lose its value. And again, Reinhart and Rogoff (2009, 2011) discuss that if the government's indebtedness is high it cannot rescue the private debtors from disaster without being self in noticeable troubles. Yet, based on this "picture" cannot be argued that indebtedness was the reason for the Great Recession. Though, this thesis is not able to prove the Credit View to be right it has some serious observations to keep in mind.

The Credit View is supported by Fisher (1933), Minsky (1992) and Bernanke (1988). Though Fisher (1933) has his theory from the debt deflation point of view and Minsky (1992) discusses various debt types and how the amount of the most risky Ponzi debts accumulates before the crisis. Bernanke (1988) argues that the standard money view predicts that the banks' portfolio shift from lending to securities would have no effects on the economy at all, but according to the credit view this prediction is unacceptably unrealistic. Banks would like to make portfolio shifts due to different profit possibilities. So, Bernanke (1988) concludes that the Credit View is important but, in contrast to Reinhart and Rogoff (2009, 2011), he proposes that if both are growing strongly, then it is a safe bet that the economy is growing strongly. He continues that if money and credit are sending conflicting signals, then the Fed should concentrate more on controlling the supply of the aggregate that has shown a closer link to aggregate spending and he further continues that, here, credit may have the edge.

## 9 Conclusions

This thesis evaluated two theories of banking and economic crises, the Money view and the Credit view, and reviews them from the Great Depression (1929-1933) and the Great Recession (2008-2009) point of view. The crises were studied by literature and using Finnish, Swedish and U.S. data. The data was used to investigate how some phenomena of the theories and the crises, in question, appear in the data of the countries, in the question. The studies in the original papers of the theories were not repeated. The Money View, considered in this thesis, was based on Friedman and Schwartz (1963a) and the Credit View, in this thesis, was based on Reinhart and Rogoff (2009, 2011). The basic phenomena of the crises were investigated using data from various sources. The idea of using Finnish, Swedish and U.S. data was to identify similarities and differences between the countries from the crises and the theories point of view. The features of the major crises are mainly defined based on the big countries like the United States in the international literature so it was interesting to investigate if the features of crises differ between a big (U.S.) and two small “peripheral” countries (Sweden and Finland). In the time of the Great Depression, Finland was classified as a developing country in a contrast to the other two countries. In addition, now Finland belongs to the Euro area, so Sweden and the United States have possibilities to use monetary policy to ease effects of the latest crisis, but not Finland.

### 9.1 Research summary

Based on the studies of this thesis it seems that the Money View, as Friedman and Schwartz (1963a) it describe, may have had a role in the United States in the days of the Great Depression, in 1930s, but may not have been exactly in the same role, in 2000s, during the Great Recession. The evidence of the Money View is not equally clear, related to the Finland and Sweden, during the Great Depression but money stocks have, at least, raised during the boom and declined after that in the time of the Great Recession. In case of Finland, there may have been slightly evidence of the Money View, during the Great Recession (see Figure 36), than in the other countries.

The Credit view has had a role in many crises, as Reinhart and Rogoff (2009, 2011) report. However, based on this thesis, it cannot be exactly proved either to be the main reason for the crises, in question, in Finland, Sweden and the United States, which may be due to lack of data, especially, from the days of the Great Depression. Yet, it has not been the main purpose of this thesis to prove the theories as a cause of the crises but investigate how the phenomena of the theories appear in the data of the each country, in question. In spite of the results of this thesis, the risks of debt accumulations as Reinhart and Rogoff (2009, 2011) explain may be truly worth of consideration. The Credit View is, anyway, supported by many papers as Bernanke (1988),

Schularick and Taylor (2012) and Bordo and Haubrich (2009). In addition, the Credit View has better elements to explain international crises as e.g. by means of capital movements.

## **9.2 Practical implications**

Regarding the investigations into the defined targets of this thesis, the results might support the idea that the phenomena of crises differ between a big economically leading country and a small, peripheral country. The Great Depression may have treated the United States heavier than Finland and Sweden; however, the case might have been the opposite in the Great Recession. Another difference may be the evidence of the Money view. In case of the United States, the Money View may have been able to explain partly the phenomena during the Great Depression. However, the same seems not to have been the case concerning Finland and Sweden and either in the case of the United States during the Great Recession. In case of the Credit view, all the countries have nowadays heavy private external debt burdens; especially, in Finland and Sweden the amount of private external debts have clearly increased during the 2000s. The case of the United States varies from these of Finland and Sweden from private external debt point of view as the growth of the cross external private and public debt to GDP has stopped. The external debt denotes that the debt is borrowed from foreign lenders. Regarding the Great Depression, in 1930s, the lack data of debts prevent this thesis from any further conclusion but the literature (e.g. Eichengreen and Mitchener, 2003) discuss significant debt accumulations in the era of the Great Depression, too.

## **9.3 Limitations of the study**

As mentioned before, the aim of this thesis was not to prove which of the two theories of crises are “true” but to reveal the appearance of the phenomena of crises and theories using Finnish, Swedish and U.S. data. This thesis used data from various sources so the differences between the data may influence the results more than have been noticed in this thesis. Due to the long time period (from the days of 1920s to nowadays) there were also many gaps in the data. In addition, this thesis has not studied issues like how the excess debt has affected in the progress of the crises in the form of bankruptcies or credit rearrangements in the countries, in question, due to lack of resources.

## **9.4 Suggestions for further research**

There arise some issues that would be interesting to investigate further such as consequences of debt accumulation to the debt markets and lending generally during the crises; international capital flows in the great crises; the sources of deflation in the crises; deflation also from the international division of labour and economy point of view; the impact of great technological changes; and the roles of banks and other financial institutions in future - why lending is moving from banks to other institutions.

## References

- Aguiar, Mark, and Gita Gopinath. 2006. Defaultable Debt, Interest Rates and the Current account. *Journal of International Economics*, 69(1): 64–83.
- Alesina, Alberto, and Guido Tabellini. 1990. A Positive Theory of Fiscal Deficits and Government Debt. *Review of Economic Studies*, 57(3): 403–14.
- Amador, Manuel. 2003. A Political Economy Model of Sovereign Debt Repayment. <http://www.stanford.com/~amador/debt.pdf>.
- Amador, Manuel. 2008. Sovereign Debt and the Tragedy of the Commons. <http://www.stanford.com/~amador/tragedy.pdf>.
- Arellano, Cristina, and Narayana R. Kocherlakota. 2008. “Internal Debt Crises and Sovereign Defaults.” *National Bureau of Economic Research Working Paper* 13794.
- Bernanke, Ben (1988): Monetary Policy Transmission: Through Money or Credit? *Business Review*, Federal Reserve Bank of Philadelphia, Nov/Dec 1988.
- Bolt, J. and J. L. van Zanden (2013). The First Update of the Maddison Project; Re-Estimating Growth Before 1820. Maddison Project Working Paper 4.
- Bordo, Michael D. (2008): An Historical Perspective on the Crisis of 2007-2008. *NBER Working Paper* No. 15389.
- Bordo, Michael D. and Haubrich, Joseph G. (2009): Credit Crises, Money and Contractions: An Historical View. *NBER Working Paper* No. 15389.
- Bordo, Michael D. and Rockoff, Hugh (2013): Not Just the Great Contraction: Friedman and Schwartz’s A Monetary History of The United States 1867 to 1960. *NBER Working Paper* No. 18828.
- Bordo, Michael; Eichengreen, Barry; Klingebiel, Daniela and Soledad Martinez-Peria, Maria (2001): Data for “Is the Crisis Problem Growing More Severe?” in *Economic Policy* April 2001, volume 16, issue 32.
- Burns, Arthur F. and Wesley, C. Mitchell (1946): *Measuring Business Cycles*. National Bureau of Economic Research. Published in 1946 by NBER in NBER Book Series Studies in Business Cycles.
- Cagan, Phillip (1965): *Determinants and Effects of Changes in the Stock of Money, 1875 – 1960*. New York: Columbia University Press.
- Calvo, Guillermo A. 1988. Servicing the Public Debt: The Role of Expectations. *American Economic Review*, 78(4): 647–61.
- Calvo, Guillermo A., Alejandro Izquierdo, and Rudy Loo-Kung. 2006. Relative Price Volatility under Sudden Stops: The Relevance of Balance Sheet Effects. *Journal of International Economics*, 69(1): 231–54.

- Diamond, Douglas W., and Philip H. Dybvig. 1983. Bank Runs, Deposit Insurance, and Liquidity. *Journal of Political Economy*, 91(3): 401–19.
- Diaz-Alejandro, Carlos. 1985. Good-Bye Financial Repression, Hello Financial Crash. *Journal of Development Economics*, 19(1–2): 1–24.
- Eichengreen, Barry (1990), *Elusive stability: Essays in the history of international finance, 1919-1939*. Cambridge University Press.
- Eichengreen, Barry and Mitchener, Kris James (2003), The Great Depression as a Credit Boom Gone Wrong (September 2003). *BIS Working Paper No. 137*. Available at SSRN: <http://ssrn.com/abstract=959644> or <http://dx.doi.org/10.2139/ssrn.959644>
- Minsky, Hyman P. (2008 [1982]): *Financial Crises. Theory, History & Policy*. Edited by Charles P. Kindleberger and Jean-Pierre Laffargue. Cambridge University Press, New York 2008.
- Fisher, Irving (1923): The Business Cycle Largely a ‘Dance of the Dollar’. *Journal of the American Statistical Association*, pp. 1024-1028.
- Fostel, Ana, and John Geanakoplos. 2008. Leverage Cycles and the Anxious Economy. *American Economic Review*, 98(4): 1211–44.
- Friedman, Milton and Schwartz, Anna J. (1963a): Money and Business Cycles. *The Review of Economics and Statistics. Vol 45, No. 1 Part 2. Supplement* (Feb 1963), pp 32-64.
- Friedman, Milton and Schwartz, Anna J. (1963b): *A Monetary History of the United States, 1867 - 1960*. Princeton University Press.
- Friedman, Milton and Meiselman, David (1963): The Relative Stability of Monetary Velocity and the Investment Multiplier in the United States, 1897-1958. *Stabilization Policies*, pp. 165-268, Prentice-Hall for the Commission on Money and Credit. ???
- Friedman, Milton and Schwartz, Anna J. (19XX): *The Great Contraction, 1929 - 1933*. Princeton University Press.
- Hjerpe, Riitta (1988): *Suomen talous 1860–1985: Kasvu ja rakennemuutos*. Suomen Pankki, Helsinki.
- Ikonen, Vappu & Autio, Jaakko & Elonen, Heikki U (1992): *Suomen Pankki ja 1930-luvun lama*. Suomen Pankki, Helsinki.
- Jordà, Òscar, Schularick, Moritz HP. and Taylor, Alan M. (2013): Sovereigns versus Banks: Credit, Crises, and Consequences. *NBER Working Paper No. 19506*.
- Kahneman, Daniel, Paul Slovic and Amos Tversky (1982). *Judgment under Uncertainty: Heuristics and Biases*. Cambridge, MA: Cambridge University Press.
- Keynes, John M. (1972, [1931]): *Essays in Persuasion*. Volume IX, The Collected Writings of John Maynard Keynes, Macmillan St. Martin’s Press.

- Kindleberger, Charles P (2002 [1978]): *Manias, Panics and Crashes, A History of Financial Crises*. Palgrave, 4th edition, Antony Rowe Ltd, Chippenham, Wiltshire.
- Kindleberger, Charles P. (2013 [1973]): *The World in Depression 1929-1939*. 40<sup>th</sup> Anniversary of a Classic in Economic History, University of California Press, 2013, Foreword by J. Bradford DeLong and Barry Eichengreen.
- Kuusterä, Annti (1995): *Aate ja raha: Säästöpankit suomalaisessa yhteiskunnassa 1822-1994*. Kustannusosakeyhtiö Otava, Helsinki.
- Laibson, David. 1997. Golden Eggs and Hyperbolic Discounting. *Quarterly Journal of Economics*, 112(2): 443–77.
- Latané, Henry A. (Nov 1954): Cash Balances and Interest Rate - A Pragmatic Approach, *Review of Economics and Statistics*, pp. 456-460.
- Latané, Henry A. (Nov 1960): Income Velocity and Interest Rates - A Pragmatic Approach, Employment, Growth, and Price Levels, *Review of Economics and Statistics*, pp. 445-449.
- Lindert, Peter H., and Peter J. Morton. 1989. How Sovereign Debt Has Worked. In *Developing Country Debt and Economic Performance Volume 1 the International Financial System*, ed. J. D. Sachs, 39–106. Chicago: University of Chicago Press.
- Macdonald, James. 2006. *A Free Nation Deep in Debt: The Financial Roots of Democracy*. Princeton, NJ: Princeton University Press.
- Minsky, Hyman P. (1992): The Financial Instability Hypothesis. *Levy Economics Institute, Working paper No. 74*.
- Montgomery, Arthur (1938): *How Sweden Overcame the Depression 1930-1933*. New Sweden Tercentenary Publications, Alb. Bonniers Boktryckeri, Stockholm, 1938.
- Obstfeld, Maurice, and Kenneth Rogoff. 1996. *Foundations of International Macroeconomics*. Cambridge, MA: MIT Press.
- Persson, Torsten, and Lars E. O. Svensson. 1989. Why a Stubborn Conservative Would Run a Deficit: Policy with Time-Inconsistent Preferences. *Quarterly Journal of Economics*, 104(2): 325–45.
- Purcell, John F. H., and Jeffrey A. Kaufman. 1993. The Risks of Sovereign Lending: Lessons from History. Unpublished.
- Reinhart, Carmen, and Kenneth Rogoff (2009), *This Time is Different: Eight Centuries of Financial Folly*, Princeton University Press.
- Reinhart, Carmen, and Kenneth Rogoff (2010), From Financial Crash to Debt Crisis, *NBER Working Paper No 15795*.
- Reinhart, Carmen, and Kenneth Rogoff (2011), From Financial Crash to Debt Crisis, *American Economic Review 101 (August 2011): 1676–1706*.

Reinhart, Carmen M., Kenneth S. Rogoff, and Miguel A. Savastano. 2003. Debt Intolerance. *Brookings Papers on Economic Activity*, 1: 1–62.

Sachs, Jeffrey. 1984. *Theoretical Issues in International Borrowing*. Princeton, NJ: Princeton University.

Samuelson, Paul A. (1967): *Economics: An Introductory Analysis*. 7<sup>th</sup> Edition, McGraw-Hill Inc, New York.

Schularick, Moritz and Taylor, Alan M. (2012): Credit Booms Gone Bust: Monetary Policy, Leverage Cycles and Financial Crises, 1870-2008. *American Economic Review* 2012. 102(2): 1029-1061.

Schularick, Moritz and Taylor, Alan M. (2009): Credit Booms Gone Bust: Monetary Policy, Leverage Cycles and Financial Crises, 1870-2008. *NBER Working Paper No. 15512*.

Suter, Christian. 1992. *Debt Cycles in the World-Economy: Foreign Loans, Financial Crises, and Debt Settlements, 1820–1990*. Boulder, CO: Westview Press.

Velasco, Andres. 1987. Financial Crises and Balance of Payments Crises: A Simple Model of the Southern Cone Experience. *Journal of Development Economics*, 27(1–2): 263–83.

Winkler, Max. 1933. *Foreign Bonds: An Autopsy*. Philadelphia: Roland Sway Co.

Wray, L. Randall (2013) <http://www.economonitor.com/lrwray/2013/04/17/no-rogooff-and-reinhart-this-time-is-different-sloppy-research-and-no-understanding-of-sovereign-currency/#idc-container/>

The Swedish economy - statistical perspective, 4th quarter 2008 (17.6.2014) Statistics Sweden. [http://www.scb.se/en\\_/Finding-statistics/Statistics-by-subject-area/National-Accounts/General-statistics/The-Swedish-economy---statistical-perspective/Aktuell-pong/197186/Behallare-for-Press/The-Swedish-economy---statistical-perspective-4th-quarter-2008/](http://www.scb.se/en_/Finding-statistics/Statistics-by-subject-area/National-Accounts/General-statistics/The-Swedish-economy---statistical-perspective/Aktuell-pong/197186/Behallare-for-Press/The-Swedish-economy---statistical-perspective-4th-quarter-2008/)

The Swedish economy - Statistical perspective No 1 2008 (17.6.2014): [http://www.scb.se/en\\_/Finding-statistics/search/?query=Swedish+economy+Statistical+perspective](http://www.scb.se/en_/Finding-statistics/search/?query=Swedish+economy+Statistical+perspective)



## APPENDIX 1: Debt Glossary by Reinhart and Rogoff (2011)

Debt Glossary	
External Debt	<p>Total liabilities of a country with foreign creditors, both official (public) and private.</p> <p>Creditors often determine all the terms of the debt contracts, which are normally subject to the jurisdiction of the foreign creditors or to international law (for multilateral credits).</p> <p>Total government debt (total public debt): total debt liabilities of a government with both domestic and foreign creditors. The “government” normally comprises the central administration, provincial governments, federal governments and all other entities that borrow with an explicit government guarantee.</p>
Government domestic debt	<p>All debt liabilities of a government that are issued under--and subject to--national jurisdiction, regardless of the nationality of the creditor or the currency denomination of the debt (therefore it includes government foreign currency domestic debt, as defined below). Terms of the debt contracts can be market determined or set unilaterally by the government.</p> <p>Government foreign currency domestic debt: debt liabilities of a government issued under national jurisdiction that are nonetheless expressed in (or linked to) a currency different from the national currency of the country.</p>
Central bank debt	<p>Not usually included under government debt (despite the fact that it usually carries an implicit government guarantee). Central banks usually issue such debt to facilitate open market operations (including sterilized intervention). Such debts may be denominated in either local or foreign currency.</p>
Domestic debt	<p>Liabilities of the public and private sector under domestic law. These are comprised of government domestic debt (see above) and private debts, which for most countries in our sample are dominated by debts of households and firms contracted through domestic banking institutions. In our analysis we do not include data on non bank domestic debts (i.e. domestic corporate bonds and commercial paper).</p>
Hidden debt	<p>This is not an accounting definition as in previous categories of debt. Hidden debt includes contingent liabilities of the government these could be (i) explicit guarantees (in which case they are not entirely hidden). While we have not come across any public debt time series that quantify such guarantees, more recent measures of government guarantees are now published under the International Monetary Fund’s Standard Data Dissemination System (SDDS) framework; (ii) implicit guarantees which could extend to all kinds of private sector debts. (iii) Debts of the central bank (see above). (iv) Off-balance sheet debts that arise from transactions in derivative markets. (v) Last, but not least, any liability of the government not included in official debt statistics (thus official statistics would understate true public sector indebtedness) not already included in (i)-(iv) above. After all, if we knew what these debts were, they would not be hidden.</p>

Table 6: Debt Glossary (Source: Reinhart and Rogoff (2010) APPENDIX table 1)

## APPENDIX 2: Defining crises by events: A summary

(Reinhart & Rogoff (2009), 11)

Type of crisis	Definition and/or criteria	Comments
<p><b>Banking crisis</b></p> <p><b>Type I: systemic (severe)</b></p> <p><b>Type II: financial distress (milder)</b></p>	<p>We mark a banking crisis by two types of events: (1) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions and (2) if there are no runs, the closure, merging, take-over, or large-scale government assistance of an important financial institution (or group of institutions) that marks the start of a string of similar outcomes for other financial institutions.</p>	<p>This approach to dating the beginning of banking crises is not without drawbacks. It could date crises too late, because the financial problems usually begin well before a bank is finally closed or merged; it could also date crises too early, because the worst of a crisis may come later. Unlike in the case of external debt crises (see below), which have well-defined closure dates, it is often difficult or impossible to accurately pinpoint the year in which the crisis ended.</p>
<p><b>Debt crisis – External</b></p>	<p>A sovereign default is defined as the failure of a government to meet a principal or interest payment on the due date (or within the specified grace period). These episodes include instances in which rescheduled debt is ultimately extinguished in terms less favourable than the original obligation.</p>	<p>Although the time of default is accurately classified as a crisis year, in a large number of cases the final resolution with the creditors (if it ever did take place) seems indeterminate. For this reason we also work with a crisis dummy that picks up only the first year.</p>
<p><b>Debt crisis - Domestic</b></p>	<p>The definition given above for an external debt crisis applies. In addition, domestic debt crises have involved the freezing of bank deposits and/or forcible conversions of such deposits from dollars to local currency.</p>	<p>There is at best some partial documentation of recent defaults on domestic debt provided by Standard and Poor's. Historically, it is very difficult to date these episodes, and in many cases (such as those of banking crises) it is impossible to ascertain the date of the final resolution.</p>

### APPENDIX 3: Real Growth of GDP and Money Aggregates in Finland, Sweden and the United States in 1977 - 1997.

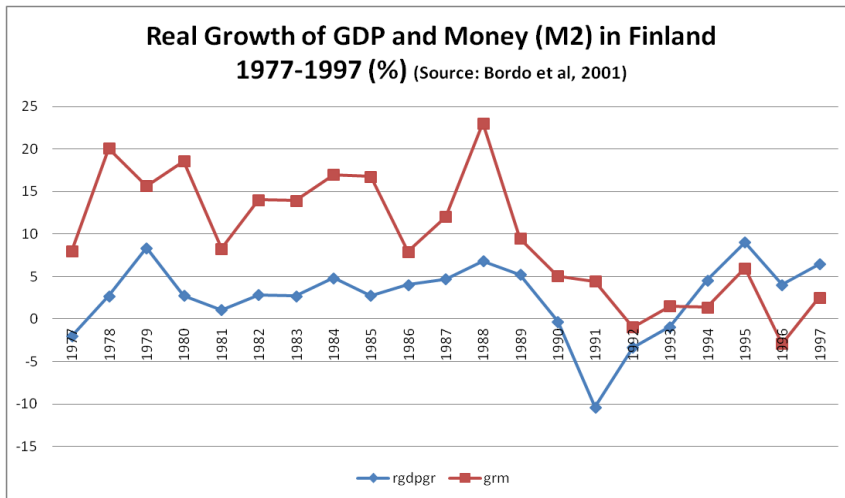


Figure 53: APPENDIX: Real Growth of GDP (rgdpgr) and M2 (grm), in Finland, in 1977 - 1997. (Source: Bordo et al., 2001)

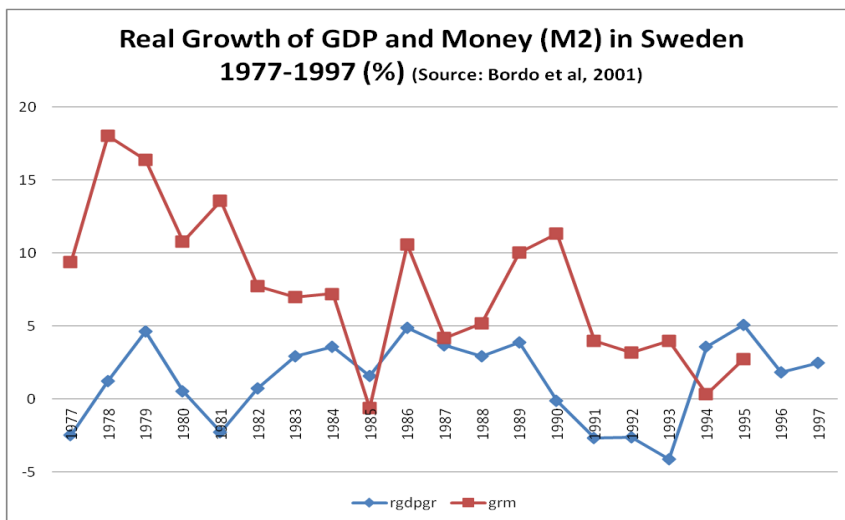


Figure 54: APPENDIX: Real Growth of GDP (rgdpgr) and M3 (grm), in Sweden, in 1977 - 1997. (Source: Bordo et al., 2001)

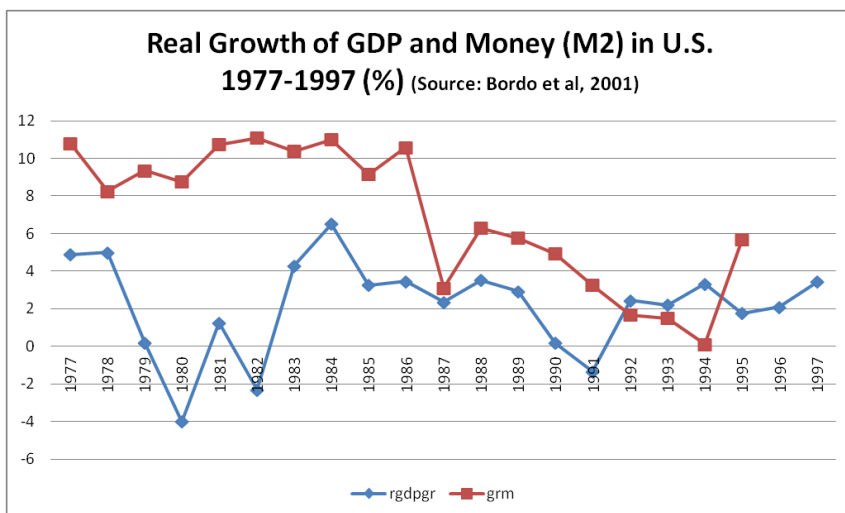


Figure 55: APPENDIX: Real Growth of GDP (rgdpgr) and M2 (grm), in the United States, in 1977 - 1997. (Source: Bordo et al., 2001)

## APPENDIX 4: Inflation and Real Growth of GDP in 1920 - 1940.

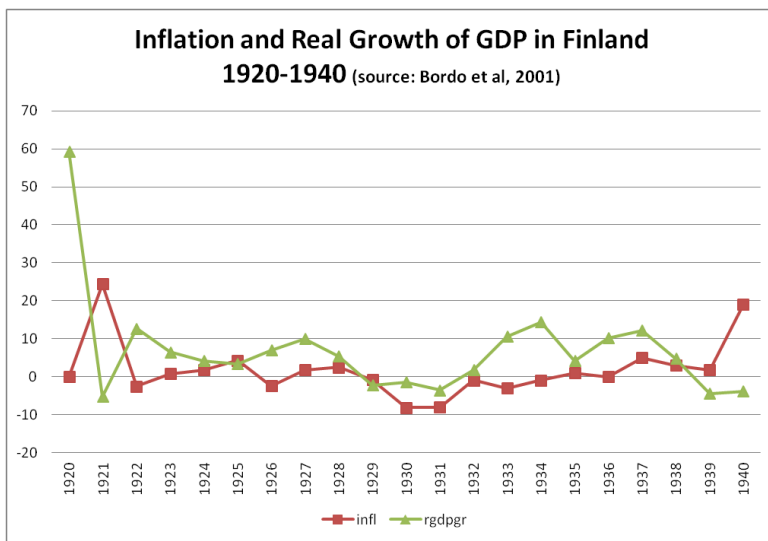


Figure 56: APPENDIX: Changes of Inflation and Real Growth of GDP in 1920 - 1940 in Finland. (Source: Bordo et al, 2001)

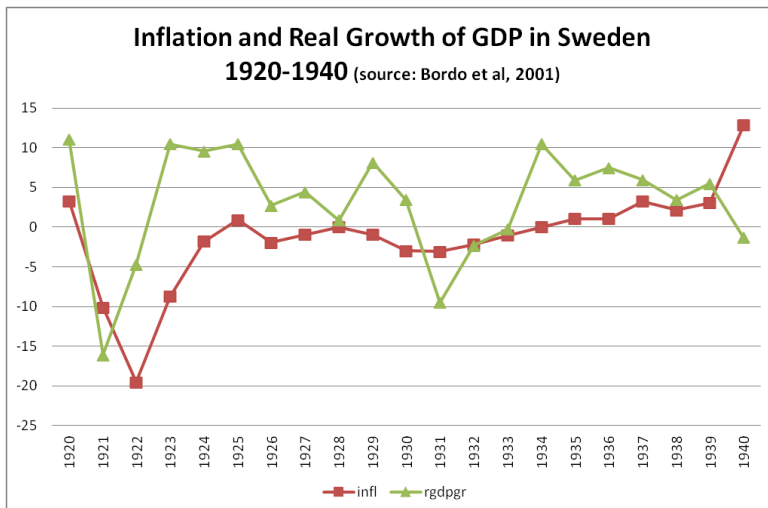


Figure 57: APPENDIX: Changes of Inflation and Real Growth of GDP in 1920 - 1940 in Sweden. (Source: Bordo et al, 2001)

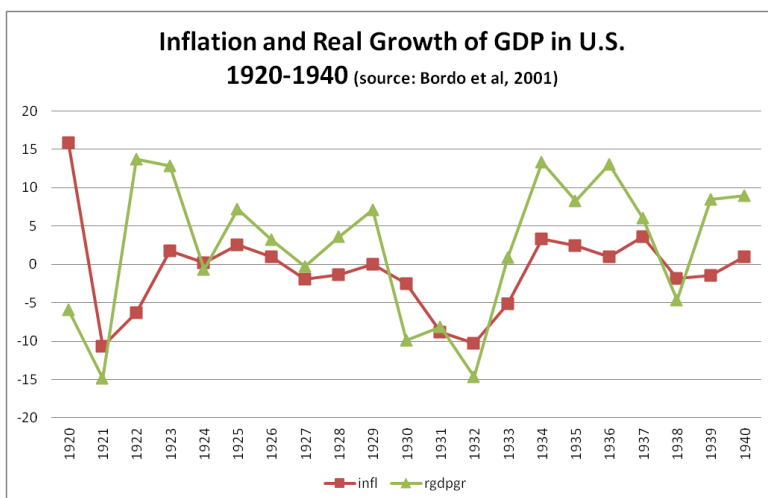


Figure 58: APPENDIX : Changes of Inflation and Real Growth of GDP in 1920 - 1940 in U.S. (Source: Bordo et al, 2001)

## APPENDIX 5: Securitized consumer loans and MBS and Non-MBS in U.S.

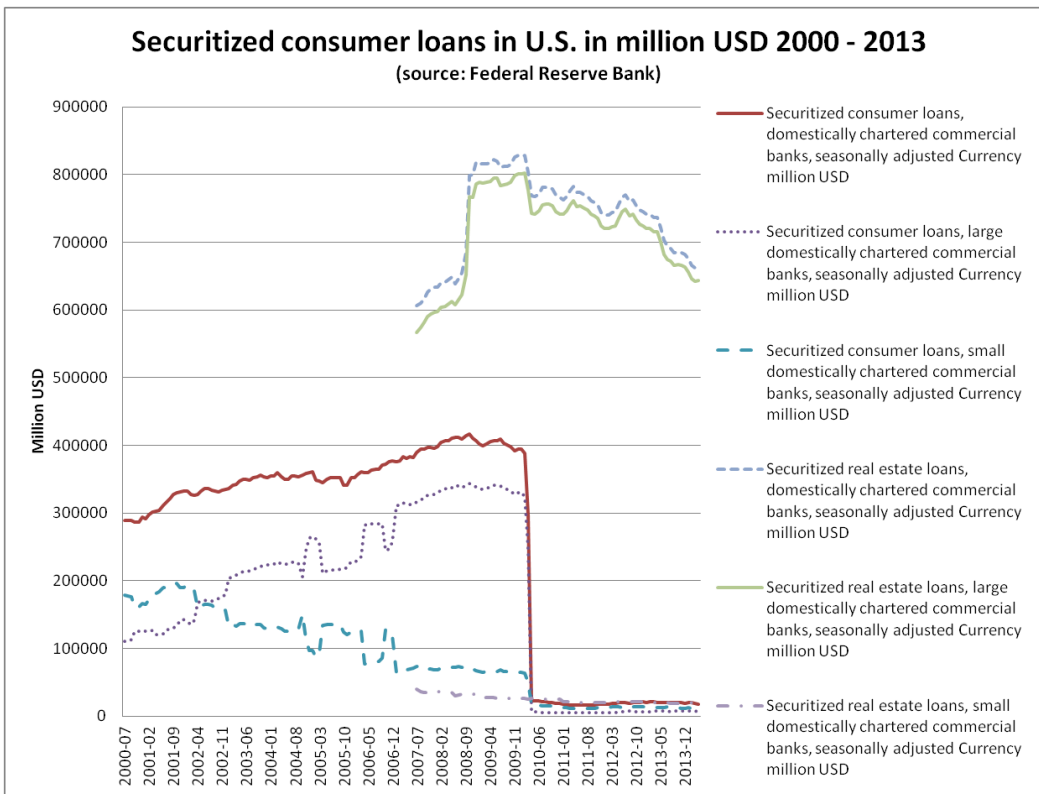


Figure 59: APPENDIX: Securitized consumer loans in the United States in 2000 - 2013, Million USD.

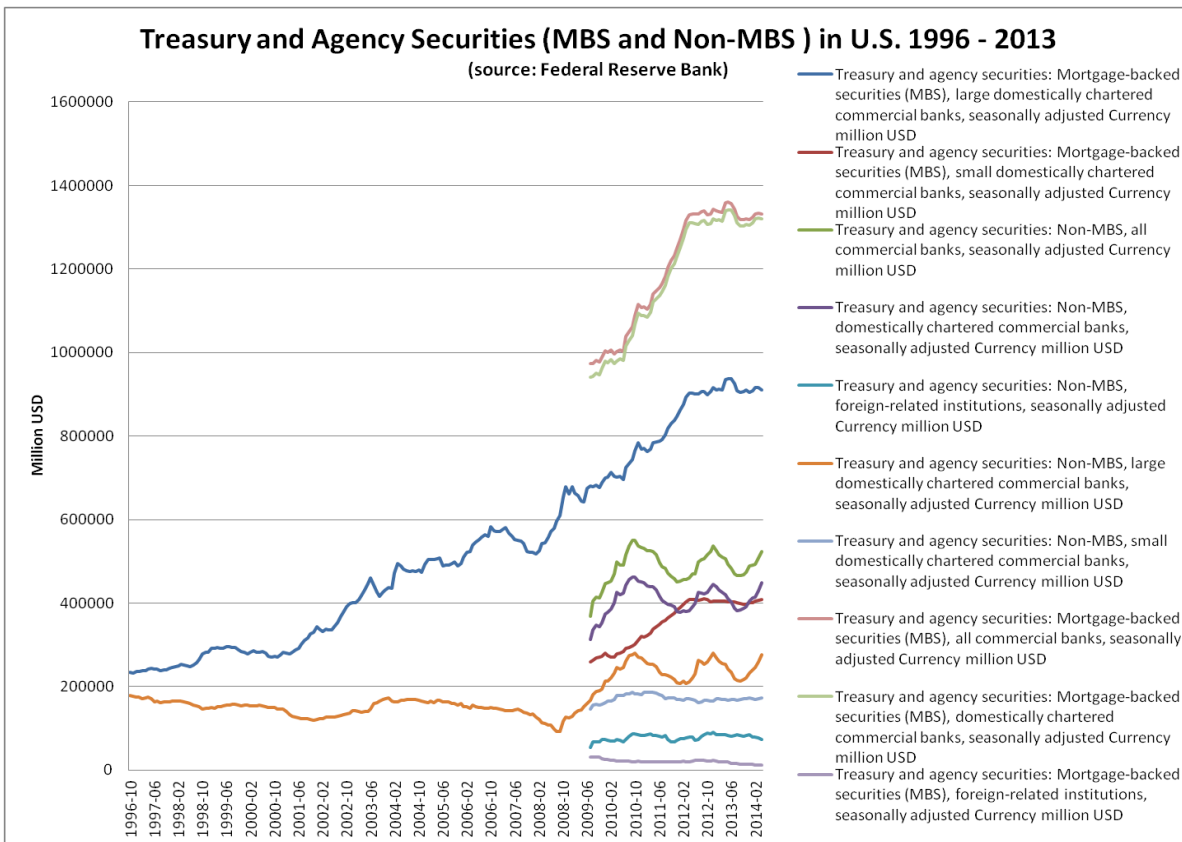


Figure 60: APPENDIX : Treasury and Agency Securities (MBS and Non-MBS) in the United States in 1996 - 2013, Million USD.

## APPENDIX 6: Money Aggregate definitions of Finland, Sweden and U.S.

The United States: source: Federal Reserve System

The Federal Reserve has revised the measures of the money stock and its components to incorporate the results of the Federal Reserve's annual review of seasonal factors and a new quarterly benchmark. This release includes revised monthly and weekly seasonal factors as well as comparisons of the revised monetary aggregates with previously published data. The revisions to the seasonal factors resulted in a lower growth rate for seasonally adjusted M2 in the first half of 2012 and a higher growth rate for seasonally adjusted M2 in the second half. The benchmark incorporates minor revisions to data reported in the quarterly deposit reports, and it takes account of deposit data from Call Reports for banks and thrift institutions that are not weekly or quarterly deposit reporters. These revisions to deposit data start in 2011. In addition, this release incorporates data from Call Reports on the amount of small-denomination time deposits held in individual retirement accounts (IRAs) and Keogh accounts; related revisions to deposit data start in 2011. The benchmark also incorporates revisions to IRA and Keogh balances held at retail and institutional money market mutual funds; these revisions to data on money market mutual funds begin in 2007. This release also incorporates the receipt of historical information from other sources of data. Seasonally adjusted measures of the monetary aggregates and components incorporate revised seasonal factors, which were derived from data through December 2012. Monthly seasonal factors were estimated using the X-12-ARIMA procedure. The effects of both the new benchmark and the revisions to seasonal factors on the growth rates of M1 and M2 are outlined in appendix tables 6 and 7. Historical data, updated each week, are available with the H.6 statistical release at [www.federalreserve.gov/releases](http://www.federalreserve.gov/releases).

Finland: source ECB

M1 consists of (1) currency outside the U.S. Treasury, Federal Reserve Banks, and the vaults of depository institutions; (2) traveler's checks of nonbank issuers; (3) demand deposits at commercial banks (excluding those amounts held by depository institutions, the U.S. government, and foreign banks and official institutions) less cash items in the process of collection and Federal Reserve float; and (4) other checkable deposits (OCDs), consisting of negotiable order of withdrawal (NOW) and automatic transfer service (ATS) accounts at depository institutions, credit union share draft accounts, and demand deposits at thrift institutions. Seasonally adjusted M1 is constructed by summing currency, traveler's checks, demand deposits, and other checkable deposits (OCDs), each seasonally adjusted separately.

M2 consists of M1 plus (1) savings deposits (including money market deposit accounts); (2) small-denomination time deposits (time deposits in amounts of less than \$100,000), less individual retirement account (IRA) and Keogh balances at depository institutions; and (3) balances in retail money market mutual funds, less IRA and Keogh balances at money market mutual funds. Seasonally adjusted M2 is constructed by summing savings deposits, small-denomination time deposits, and retail money funds, each seasonally adjusted separately, and adding this result to seasonally adjusted M1.

Sweden: source Riksbank

M1 consists of the general public's holdings of bank notes and coins as well as demand deposits by the general public in MFIs and with the central government. In addition to M1, M3 also includes deposits with certain conditions, repurchases, shares in money market funds, and short-term securities.