Financial Instability and Banking Crises in a small open economy

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DISCUSSION PAPER

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Abstract

The present paper seeks to investigate the importance of financial instability during four banking crises, with focus on the small open economy of Norway. The crises elaborated on are the Post First world war crisis of the early 1920s, the mid 1920s Monetary crisis, the Great Depression of the 1930s and the Scandinavian banking crisis of 1987-1993.

The paper firstly offers a brief description of the financial instability hypothesis as applied by Minsky, Kindleberger, and in a new explicit dynamic financial crisis model. Financial instability creation basically happens in times of overheating, overspending and over lending, i.e., during significant booms, and have devastating effects after markets have turned into a state of crises.

Thereafter, the paper tests the validity of the financial instability hypothesis by using a quantitative structural time series model. The test reveals upheaval of financial and macroeconomic indicators prior to the crises, making the economy overheat and create asset bubbles due to huge growth in debt. These conditions caused the following banking crises.

Finally, the four crises are discussed qualitatively. The conclusion is that significant increase in money supply and debt caused overheating, asset bubbles and finally financial and banking crises which spread to the real economy.

Keywords: Financial crises, banking crises, financial stability, macroeconomic, economic history, monetary expansion

JEL-Classifications: E44, E51, E52, F34, G15, N24

Research problem

The present paper examines four financial crises in the mirror of the financial instability hypothesis promoted by Minsky and Kindleberger. They argue that loss of financial stability might lead to overheating of the economy, with huge debt and thereafter financial crises as consequences.

More precisely, the paper uses a Minsky-Kindleberger inspired explicit seven-step dynamic model for financial crises by Grytten and Hunnes as a framework for examining four banking crises in the small open economy of Norway. The crises under investigation are:

1. The Post-First world war depression in the early 1920s
2. The Monetary crisis in the mid-1920s
3. The Great Depression in the 1930s
4. The Scandinavian banking crisis 1987-1993

The paper firstly gives brief definitions of key terms used in its analysis. Thereafter it discusses the theoretical framework of the analysis, i.e., how financial instability may pave the way for financial crises by gearing, overheating, and thereafter contraction. Thirdly, the paper discusses the financial development of markets and the macro economy, evolving into financial instability creation, causing overheating and crises. Thus, each crisis and their foreplays are discussed and examined by looking at relevant macroeconomic indicators. The development is then used to examine to what extent the financial instability hypothesis as described in a Minsky-Kindleberger inspired seven-step dynamic model for financial crises might serve to explain empirical developments of crises.

Literature

There is no common definition of financial crisis. However, most scholars do agree on certain characteristics. Claessens and Kose state that financial crises often revolve around four parameters:[1]

1. Significant fall in credit volumes and prices of assets
2. Disruption of external financing and financial intermediation
3. Negative asset balances
4. Need of substantial financial support from governments

This paper recognizes these characteristics and defines financial crises as incidents where financial institutions are not able to provide necessary means of payment, due to heavy losses. Goldsmith defines financial crises as "sharp, brief, ultra-cyclical deterioration of almost all financial indicators, short-term interest rates, asset prices, commercial insolvencies and failure of financial institutions".[2]

[1] Stijn Claessens and M. Ayhan Kose, Financial Crises Explanations, Types, and Implications (IMF Working Papers, 2013) 13/28. https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Financial-Crises-Explanations-Types-and-Implications

[2] Raymond W. Goldsmith, Comment on Hyman P Minsky. The Financial Instability Hypothesis. In Charles P. Kindleberger and Jean-Pierre Laffargue (eds.), *Financial Crises, Theory, History and Policy* (Cambridge, Cambridge University Press, 1982), pp. 41-43.

Banks constitute the core of a financial system and until the mid 1900s, financial crises were often considered equivalent to credit crunches and bank crises. The paper's definition of a bank crisis is that the bank industry is unable to solve its duties by providing sufficient credit to the economy, due to heavy financial losses. Hence, bank crises occur when negative shocks in financial markets are causing lack of credit to the economy.

Several definitions of financial stability exist. Most of these emphasize that financial stability represents well-functioning financial systems, which do not fail to function in bad times and is resilient to stress. According to the World Bank stable financial systems can be characterized by their efficient allocation of resources, and they are capable of manage financial risk. Financial stability also implies maintaining of employment close to the natural rate, and they should be able to eliminate product price and asset price movements which can affect monetary stability. Financial systems are stable when they dissipate financial imbalances. Furthermore, financial stable systems will absorb external and internal shocks primarily via self-corrective mechanisms, and by doing so they will prevent disruptive effects on the system and the economy. Hence, financial stability makes the financial systems in a sound balance even in booms and busts. This implies there might be a kind of counter-cyclical element in the state of financial stability.

The World Bank also argue that financial instability can be considered the opposite of financial stability. During episodes of financial instability, financial institutions may be too eager or too reluctant to provide credits. Thus, asset prices may deviate significantly from their fundamental values. Also, markets could overflow or dry out of liquidity. Significant financial instability may lead to bank runs, high or even negative general or asset inflation, e.g., market crashes with rapidly falling asset prices. Such situations may undermine confidence in the financial and the general economic system.[3]

According to Minsky and Kindleberger, financial crises most commonly start with what one might denote pre-crisis financial instability, where financial markets are exposed to disturbances ending in lost long-term sustainable equilibriums (Minsky, 1982, 1986).[4] This approach to explain the upbuilding of financial crises is often denoted as the instability hypothesis. Kindleberger argues that such episodes might typically evolve through significant exogenous macroeconomic shocks, making extended credits causing the economy to run faster.[5] Minsky argues that endogenous factors within the system itself, might make financial instability evolve in times of mismatch between short-term and long-term sustainable equilibriums.

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[3] The World Bank, Financial Instability: https://www.worldbank.org/en/publication/gfdr/gfdr-2016/background/financial-stability, (2016).

[4] Hyman P. Minsky, The Financial Instability Hypothesis: Capitalist Processes and the Behaviour of the Economy. In Charles P. Kindleberger and J. P. Laggargue (eds.), *Financial Crises: Theory, History, and Policy* (pp. 13-39). Cambridge, Cambridge University Press 1982), 13-39, Hyman P. Minsky, *Stabilizing an Unstable Economy* (Yale, Yale University, 1986).

[5] Charles P. Kindleberger, *Manias, Panics and Crashes: A History of Financial Crisis* (3rd ed.), (Hobokoen NJ, Wiley, 1996).

Both agree that positive expectations and lack of financial stability may cause demand for credit to over expand. Thus, positive credit and asset bubbles can arise. Speculation in continuous growth in asset prices influence bubbles to increase further until markets turn due to negative shifts in expectations. The turning point is often called the "Minsky Moment", since it is central in Minsky's model explaining financial crisis. Now, expected losses make markets fall deeper facing crashes, credit crunches and recessions.[6] Tornell and Westermann conclude that the financial instability approach can be applied for most financial crises since financial liberalization tends to cause boom-bust cycles.[7] Eichengreen finds that financial instability may cause illusive stability, defined as temporary financial market stability mismatching long-term sustainable stability.[8] This coincides with the findings of Reinhart and Rogoff.[9]

Theory

Minsky applies a three-step financial taxonomy as a departure to explain his model. This implies that hedge financing, basically drawing on business surpluses and normal borrowing, is dominant in stable times. In times of rapid expansion and credit growth, speculative finance, resting on expectations of future increase in asset prices, is more common. Finally, Ponzi finance, which he interprets in a wide meaning, becomes more common when capital emissions are necessary for further growth. Monetary or credit expansion bring markets to overheating and asset bubbles arise or grow stronger. When market expectations change from positive to negative, asset prices fall, markets contract and go into a state of post-crisis financial instability causing the markets to contract more than normal correction would imply.

Kindleberger's neo-classical model is inspired by Minsky. Kindleberger starts with an exogenous shock, leading to monetary and credit expansion, which the financial markets are not able to deal with under the umbrella of financial stability. This leads to the creation of bubbles followed by a downward correction, which may lead to panic in financial markets with asset crashes, credit crunch and limitation of liquidity. On the way up the markets can be characterized by pre-crisis financial instability and on the way down with post-crisis financial instability.

Kindleberger puts attention to financial hegemonial powers. Due to their power, size, standing and role, they can influence markets significantly. Thus, they might be decisive for financial stability and instability, and thereby the development of financial and even real economy crises. A Minsky-Kindleberger approach to financial crises is summed up in chart 1.

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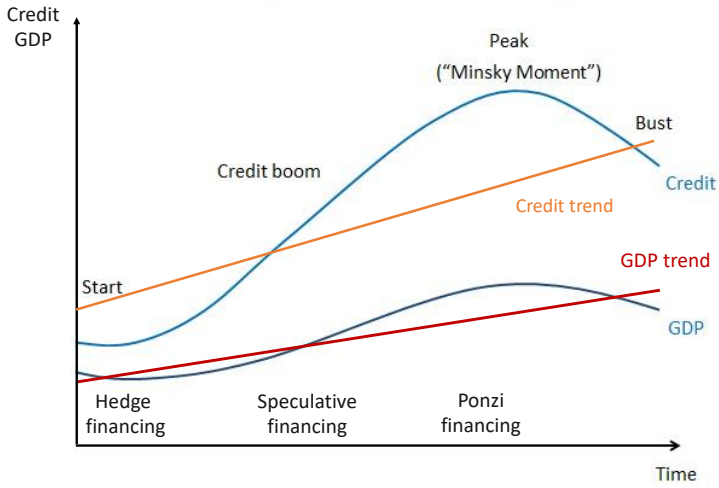
[6] Charles P. Kindleberger and Robert Z. Aliber, *Manias, Panics and Crashes: A History of Financial Crises* (3rd ed.) (Basingstoke/New York, Palgrave Macmillan, 2015), pp. 33-76

[7] Aaron Tornell and Frank Westermann, *Boom-Bust Cycles and Financial Liberalization* (Cambridge, Mass, MIT Press, 2005).

[8] Barry Eichengreen, *Elusive Stability: Essays in the History of International Finance, 1919-1939* (Cambridge: Cambridge University Press, 1993).

[9] Carmen M. Reinhart and Kenneth S. Rogoff, *This Time Is Different: Eight Centuries of Financial Folly* (Princeton NJ, Princeton University Press, 2009).

Chart 1. Credit cycle during financial instability



Source, Cooper (2019), Koilo and Grytten (2021), 62-79.

Model

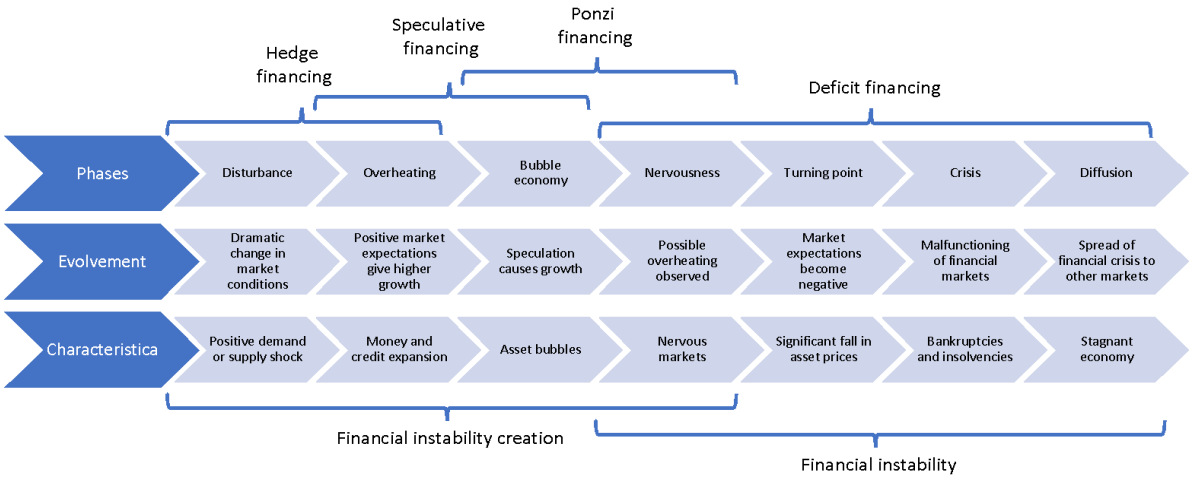
Combining Minsky's and Kindleberger's theories with empirical research on mapping macroeconomic indicators relative to crisis, a study by Grytten and Hunnes ended up with a formal seven phases dynamic model for the development of financial crises.[10] They agree that shocks or disturbances to the economy, which the system is not able to handle in a consistent and relevant way, most often marks the start of the foreplay of crises. They define typical financial crises as evolving to go through up to seven different phases. However, they also conclude it is possible to skip some of these phases on the way to the doldrums.

After the first phase of disturbance, they find that the next step is very likely to be overheating due to a positive shift in market expectations, which releases significant economic growth. Thirdly, overheating often gives pace to speculation fueled by credit expansion, and by that, the third phase, i.e., bubble economy. When asset markets reach very high values based on high lending, markets often become nervous, which is the fourth phase. After a period of nervousness, when the markets are very volatile, they will finally turn downward, which is the fifth phase. Losses on significant falls in asset prices leads to a crisis in financial markets, as phase six. Finally, if this crisis is deep and of a certain duration, it often leads to diffusion to other markets and the real economy as the last phase.

The four first phases are mirrored in less importance of hedge financing and increasing importance of speculative and ponzi financing. When deficit financing evolves during the last four phases. At the same time the four first phases represent a period of financial instability creation, and the four last a period of financial instability. The model is summed up in chart 2.

[10] Ola Honningdal Grytten and Arngrim Hunnes, *Krakk & Kriser i historisk perspektiv* (Oslo: Cappelen Damm, 2016), 175-188.

Chart 2. Seven Phases Dynamic Financial Crises Model



Source, Grytten and Hunnes (2016), 51-56.

To investigate what patterns the crises in question followed, we use macroeconomic indicators, such as time series of money and credit volumes, asset prices, general prices, and gross domestic product. These are basically taken from the Norwegian central bank's project on creating historical monetary statistics.[11]

Method

The paper examines to what extent there is a relationship between financial instability created through rapid money and credit expansion and an overheated economy with asset bubbles and thereafter crises, and in particular banking crises. This is basically done by studying deviations from polynomial trends in relevant financial and macroeconomic time series. Thus, structural time series analysis is used to separate observed time series (x_t) into trend (g_t), cycle (c_t), seasonal (s_t), and irregular (i_t) components:

$$(1) \qquad x_t = f(g_t, c_t, s_t, i_t)$$

Transformed to an arithmetic function which leads to the following equation:

$$(2) \qquad x_t = g_t + c_t + s_t + i_t$$

It would be natural to consider i_t as a residual:

$$(3) \qquad i_t = x_t - (g_t + c_t + s_t)$$

In the present analysis i_t and s_t are seen as parts of c_t. Thus, one has the two conditions:

$$(4) \qquad i_t \subseteq c_t \ \wedge \ s_t \subseteq c_t \ \Rightarrow \ i_t + s_t \subseteq c_t$$

A reduced form of equation (2) will then be as in equation (5):

[11] Øyvind Eitrheim, Jan T. Klovland and Jan F. Qvigstad (eds), *Historical Monetary Statistics for Norway, 1819-2003* (Oslo: Norges Bank, 2004), Øyvind Eitrheim, Jan T. Klovland and Jan F. Qvigstad (eds), *Historical Monetary Statistics for Norway – Part II* (Oslo: Norges Bank, 2007).

(5) $$x_t = g_t + c_t$$

By using a Hoderick-Prescott (HP) filter one might identify both cycle and trend, since the filter minimizes any variance of c_t subject to a penalty for variation in the second difference of g_t:

(6)

$$\min_{g_t} \sum_{t=1}^{T} (x_t - g_t)^2 + \lambda \sum_{t=2}^{T-1} [(g_{t+1} - g_t) - (g_t - g_{t-1})]^2$$

Here $(x_t - g_t)$ denotes the cycle component of the time series, when $[(g_{t+1} - g_t) - (g_t - g_{t-1})]$ denotes the difference in the growth trend from period t to $t+1$. The smoothing parameter, λ, decides the smoothness of the trend component of the time series.

One can have five estimates of the cycle component by deducting estimated trend from the observed time series:

(7) $$c_t = x_t - g_t$$

To calculate relative cycles, one might use *logs*, more precisely natural logarithms, *ln*, of the parameters x_t and g_t, which implicitly gives log values of c_t.

(8) $$ln(c_t) = ln(x_t) - ln(g_t)$$

By using the HP-filter (6) in equation (7) one arrives at the following relationships:

(9)

$$\min_{g_t} \sum_{t=1}^{T} (x_t - g_t)^2 = x_t - \lambda \sum_{t=2}^{T-1} [(g_{t+1} - g_t) - (g_t - g_{t-1})]^2$$

where the cycle component $\min_{g_t} \sum_{t=1}^{T} (x_t - g_t)^2$ constitutes the residual. Applying this on equation (8) which results in relative cycles:

(10)

$$ln(c_t) = ln(x_t) - ln(\lambda \sum_{t=2}^{T-1} [(g_{t+1} - g_t) - (g_t - g_{t-1})]^2)$$

Smoothing parameters close to zero implies the series can be explained almost by trend developments only. High smoothing parameters offer trends with less fluctuations than low parameters. Thus, high smoothing parameters make cycles large, while low smoothing parameters make cycles limited.

Data

To examine the possible relationship between overexpansion and contraction in money and credit parameters and key macroeconomic indicators, the paper seeks to map booms and busts with the help of the HP-filter within nine parameters:

1. Money Supply (M2)
2. Total gross debt (C3)
3. Bank loans (loans from all banks and similar institutions)
4. Private bank loans (loans from private banks)
5. Gross domestic product (GDP) per capita
6. Manufacturing value added (VA)
7. Manufacturing output
8. Unemployment rate
9. Bankruptcies

The analysis consists of annual data due to lack of valid and reliable monthly and quarterly data for several series for the three first crises. Stocks are excluded due to significant noise from the First world war for the same three crises.

It is considered healthy using smoothing-parameter of λ = 100, λ = 1,600, and λ = 14,400 for annual, quarterly, and monthly figures, respectively. Since the historical data limits one to use annual data, the study uses λ = 100 for most parameters, except for the two GDP series and housing, where a 25-times higher λ-value is often used. Thus, the paper applies $\lambda = 2500$ for these latter parameters.

Results

Testing by using these data in the structural time series model to find cycles from trends, one arrives at the statistical results reported in table 1.

Table 1. Cycle values of financial and key macroeconomic variables as percentages connected to financial crises.

		Post-war crisis Early 1920s		Monetary crisis Mid-1920s		Great Depression 1st half 1930s		Nordic bank crisis 1987-1993	
	Lambda	Peak	Through	Peak	Through	Peak	Through	Peak	Through
Money supply (M2)	100	22.6	-11.4	22.6	-8.8	22.6	-5.9	7.5	-5.7
Total gross debt (C3)	100	23.2	-8.1	23.2	-6.1	23.2	-10.0	14.6	-8.8
Bank loans	100	25.2	-8.3	25.2	-11.5	25.2	-6.6	20.2	-10.4
Private bank loans	100	28.0	-10.9	28.0	-11.8	28.0	-8.6	20.8	-9.9
GDP per capita	2500	6.1	-6.7	2.6	-4.8	4.2	-6.3	4.1	-4.9
Manufacturing VA	2500	6.2	-19.1	3.5	-10.0	8.9	-12.2	5.5	-6.0
Manufacturing output	100	4.5	-28.7	7.5	-4.5	13.8	-15.8	6,9	-3.7
House prices	2500	23.0	-45.1	23.0	-24.7	21.6	-17.0	33.6	-35.2
Unemployment	100	-61.6	51.6	-32.6	17.2	-21.1	23.9	-41.4	23.5
Bankruptcies	100	-60.9	49.8	-6.2	36.4	-19.3	8.9	-40.4	41.6

Sources, Eitrheim et al (2004), Eitrheim et al (2007).

This shows that significant positive cycles in money supply, debt and loans arose before all the three banking crises. These were mirrored in booms in GDP, manufacturing production, manufacturing value added, and house prices, when unemployment and bankruptcies stood at very low levels compared to their trends. During the busts, one can see very clear developments in the opposite directions for all the parameters.

Clearly, this exercise confirms that the financial instability hypothesis by Minsky and Kindleberger as formulated in the seven-step dynamic financial crises model applies for the four banking crises under investigation in this paper. A closer analysis is done by discussing the historical development for each boom-bust cycle is in the following section.

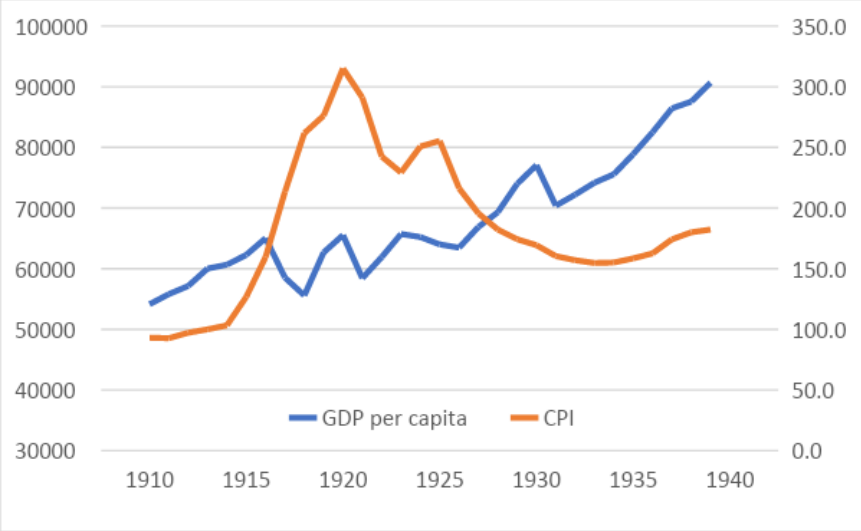
Discussion

Aiming at concluding with a higher certainty in our analysis, we also analyze the data qualitatively by going deeper into the build-up and evolvement of each of the four banking crises.

Post-First world war crisis of the early 1920s

The financial crisis during the early 1920s represents a typical post-war financial crisis. During this crisis both GDP and prices contracted. The First world war (1914-1918) saw international financial instability created in several aspects. Governments abandoned gold redemption when the war started in August 1914 to avoid an onslaught on national gold reserves. At the same time, central banks reduced interest rates and increased credit volumes. In addition, the governments overspent to meet the financial requirements of the war.[12] Thus, there was a huge increase in product demand.

Chart 3. GDP per capita in 2015 US$ (left scale) and consumer price index (CPI), 1913=100 (right scale).



Sources, Grytten, "Two centuries of economic growth": 1-30, Grytten, "Revising price history": 129-144.

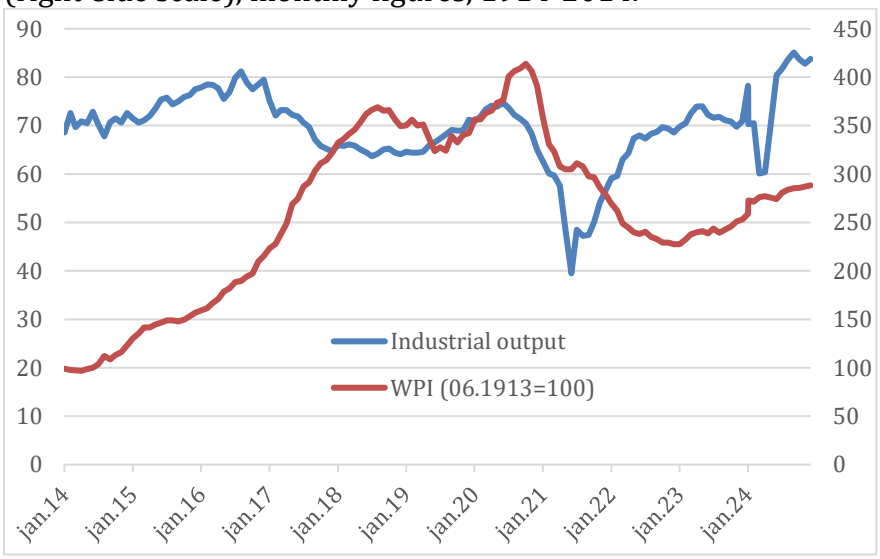
[12] Barry Eichengreen, *Elusive Stability: Essays in the History of International Finance, 1919-1939* (Cambridge: Cambridge University Press, 1993), 14-23.

On the supply side, countries lacked raw materials due to war restrictions. Hence, they saw significant fall in product supply, huge increase in product demand, thus, inflation causing real interest rates to become strongly negative. In Norway, real interest rates before tax dropped to minus 30 percent in 1917, fueling lending.[13]

Both the money stock and credit volumes increased by a multiplier of around 5 in Norway between 1914 until 1920.[14] Consumer prices stepped up by 215%.[15] Despite high inflation, the government was subsidizing production and consumption. Additionally, they introduced maximum prices and maximum profits. Consequently, a huge money surplus evolved. This was invested in asset markets as investment possibilities were limited.

From the beginning of 1915 until the end of 1918, the Oslo Stock Exchange recorded an increase of more than three times for the aggregated stock market index, when maritime stocks stepped up by six times. This basically happened when GDP fell by 14.5% in 1917 and 1918.[16] During the opening of the economy after the war surplus money shifted from stock markets to product markets, causing a stock market crash of 76.4%.[17] At the same time GDP per capita increased with 17.9% 1918-1920. The trade deficit reached 25% of GDP in 1919, and inflation continued to surge.

Chart 4. Industrial output (left-side scale) wholesale price index (right-side scale), monthly figures, 1914-2014.



Sources, Klovland (2013), Klovland (2015).

[13] Ola Honningdal Grytten and Arngrim Hunnes, "An anatomy of financial crisis in Norway, 1830-2010", *Financial History Review* 21, no. 1 (2013): 25-57. https://doi.org/10.1017/S0968565013000279.
[14] Øyvind Eitrheim, Jan T. Klovland and Lars F. Øksendal, *A Monetary History of Norway, 1816-2016* (Cambridge: Cambridge University Press, 2016), 263-300.
[15] Ola Honningdal Grytten, "Revising price history: consumer price index for Norway 1492–2018," *Scandinavian Economic History Review* 68, no. 2 (2020): 129-144, https://doi.org/10.1080/03585522.2020.1714714.
[16] Ola Honningdal Grytten and Arngrim Hunnes, *Krakk & Kriser i historisk perspektiv* (Oslo: Cappelen Damm, 2016), 175-188.
[17] Jan T. Klovland, "Historical stock price indices in Norway 1914-2003," In Øyvind Eitrheim, Jan T. Klovland and Jan F. Qvigstad (eds), *Historical Monetary Statistics for Norway, 1819-2003* (Oslo: Norges Bank, 2004), 329-348

The country rapidly transitioned from being a net creditor to a net debtor. Its currency depreciated swiftly by 50% of its par value by the Autumn 1920.[18] The monetary and credit expansions were causing overheating to the economy. The economy lost its momentum during the Summer of 1920, as debt problems arose.[19] Demand fell, and the world economy went into a post-war recession.[20] Central banks deemed it necessary to introduce deflationary monetary policy to reduce spending and deficits, hoping to stop inflation and currency depreciation.[21]

Consequently, they transferred from inflationary policy during a boom to deflationary policy during a recession. The pro-cyclical policy contributed to transferring the boom into contraction, and the inflation into deflation. Industrial production fell by 47.1% between June 1920 and June 1921, and wholesale prices fell by 45% between October 1920 and December 1922.[22]

At the same time the central bank increased its key interest rate to reduce credit volumes. Real interest rates almost reached 40% before tax in 1921. Between 1919 and 1921, the investment volume fell by 47%. Higher interest rates and deflation caused the Krone to appreciate.[23] Those who had taken up loans under favorable conditions in 1914-1920 became victims to extraordinarily high interest rates, appreciating currencies, and huge contractions of demand. The deflation also caused a delay in investments and consumption. Furthermore, the currency appreciation made Norwegian products more expensive compared to foreign products.

In 1921 GDP per capita fell by 11%.[24] Unemployment soared from 1% to 7.5% and foreign trade contracted by 25%.[25] Bankruptcies multiplied with a factor higher than 4. Banks, which had increased their credits dramatically in 1914-1920, took all time high losses of 7% of GDP in 1923.[26]

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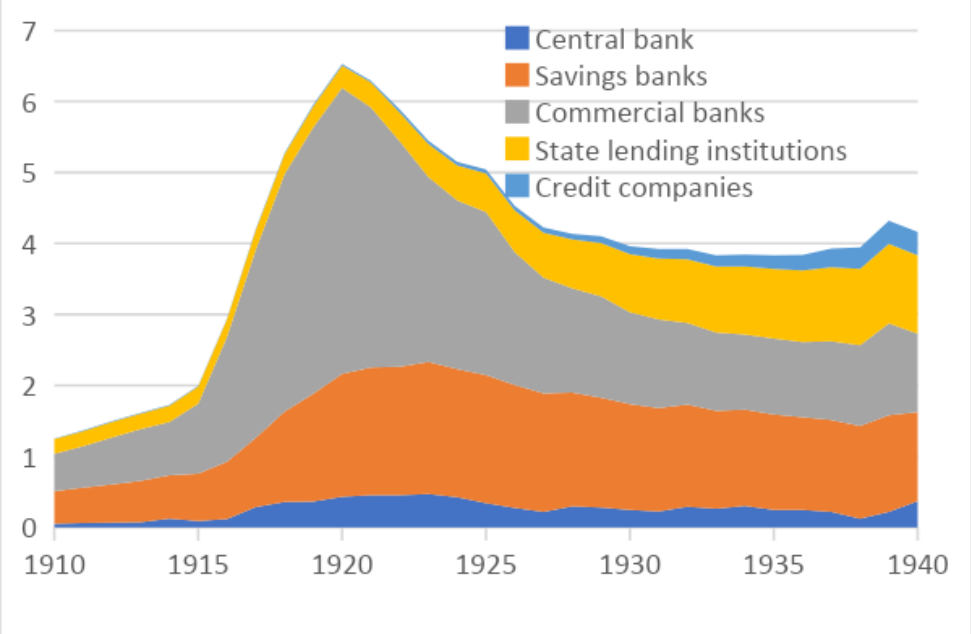
[18] Fritz Hodne, *Norwegian Economy, 1920-1980* (London: Croom Helm, 1983), 24-31.
[19] Derek Aldcroft and Steven Morevood, *The European Economy Since 1914* (London: Routledge, 2013), 11-75.
[20] Stephen Broadberry and Mark Harrison, "The Economics of World War I: an Overview", in Stephen Broadberry and M. Harrison (eds.), *The Economics of World War I*. (Cambridge: Cambridge University Press, 2005), 3-40.
[21] Tore Jørgen Hanisch, "Om virkninger av paripolitikken," *Historisk tidsskrift* 58, no. 3 (1979): 223-238.
[22] Jan T. Klovland, "Measuring Trends and Cycles in Industrial Production in Norway 1896-1948," Working paper 18/2015 (Oslo: Norges Bank, 2015), 3-88, Jan T. Klovland, "Contributions to a history of prices in Norway: Monthly price indices 1777-1920," Working paper 23/2013 (Oslo: Norges Bank, 2013), 3-201.
[23] Einar Lie, Jan T. Kobberød, Eivind Thomassen and Gjermund F. Rognved, *Norges Bank 1816-2016* (Bergen: Fagbokforlaget, 2016), 191-203.
[24] Ola Honningdal Grytten, Revising growth history: new estimates of GDP for Norway, 1816–2019. *The Economic History Review*. (2021) https://doi.org/10.1111/ehr.13085
Ola Honningdal Grytten, "Two centuries of economic growth: Norwegian GDP 1816-2020," Discussion paper 10/2020 (Bergen: Department of Economics, NHH, June 2020): 1-30. https://doi.org/10.13140/RG.2.2.13698.71362.
[25] Ola Honningdal Grytten, "The scale of Norwegian interwar unemployment in international perspective," *Scandinavian Economic History Review* 43, no. 2 (1995): 226-250, https://doi.org/10.1080/03585522.1995.10415902.
[26] Sverre R. Knutsen and Einar Lie, "Financial Fragility, Growth Strategies and Banking Failures: The Major Norwegian Banks and the Banking Crisis, 1987-92," *Business History* 44, no. 2 (2002): 88-111. https://doi.org/10.1080/713999267.

Monetary Crisis of the mid 1920s

European countries, like Denmark, the Netherlands, Norway, Switzerland, and the United Kingdom experienced a new slump in the mid-1920s. The build-up started with credit expansion during 1914-1920. The Parliament decided to support the banks and pause the deflationary policy from March 1923. Deflation temporarily turned into moderate inflation, the number of bankruptcies shrunk, and economic growth regained strength. However, several countries still struggled with foreign debts and weak national currencies, The Norwegian Krone depreciated to less than 50 percent of its gold parity until February 1924.[27] The depreciation was against the monetary target. Thus, the central bank aimed for lower demand, deflation, and appreciation of the Krone back to parity. This demanded a tight monetary policy in years of stagnation.[28]

Between August 1922 and November 1923, the central bank key interest rate increased from 5% to 7%.[29] The policy implied strongly positive real interest rates, surpassing 30%. This made public and private debt a devastating burden.[30]

Chart 5. Norwegian domestic credit by source in billion NOK, 1910-1940.



Source, Klovland (2004)

The tightening of the monetary policy paved the way for a dramatic fall in product demand. Debtors suffered in three fields. Firstly, a stronger currency made their loans *de facto* increase in value. Secondly, financial costs increased due to real high interest rates. Thirdly, demand shrunk, and thus did income. These factors combined brought about a substantial depression and bank crisis. Export industries suffered from the appreciation

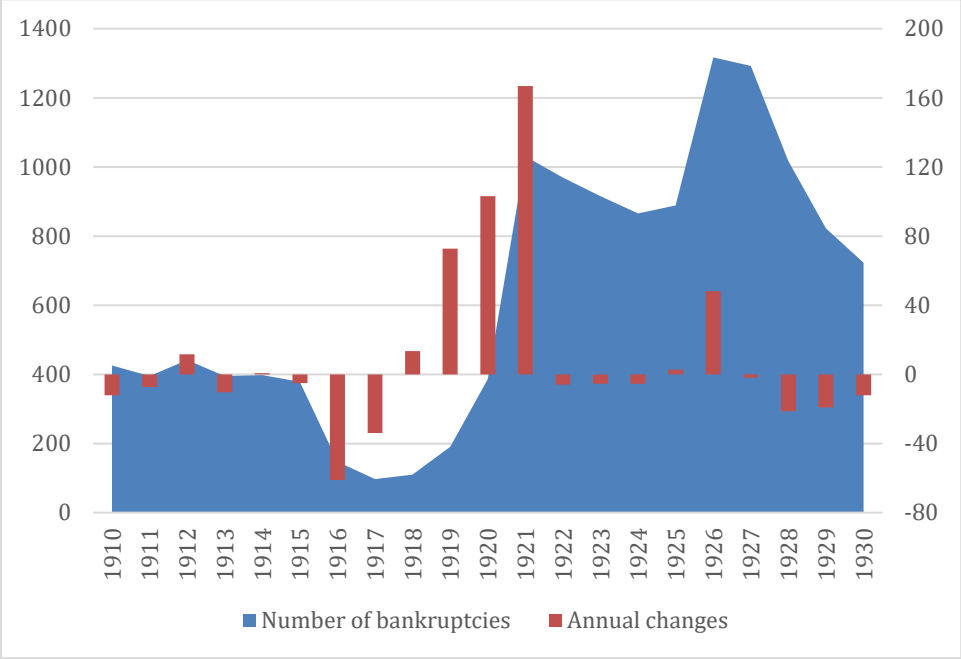
[27] Tore Jørgen Hanisch, "Om virkninger av paripolitikken," *Historisk tidsskrift* 58, no. 3 (1979): 223-238.
[28] Ola Honningdal Grytten and Arngrim Hunnes, *Krakk & Kriser i historisk perspektiv* (Oslo: Cappelen Damm, 2016), 175-188.
[29] Helge W. Nordvik, «The Banking System, Industrialization and Economic Growth in Norway, 1850-1914," *Scandinavian Economic History Review* 41, no. 1 (1993): 51-72.
[30] Ola Honningdal Grytten, "Public finances, governance control and economic growth: a macroeconomic history approach," *Investment Management and Financial Innovations* 16, no. 1 (2019): 189-202. doi:10.21511/imfi.16(1).2019.15

of the Krone, making Norwegian products more expensive to foreign products.[31] The economy went into a negative spiral.

Finally, a favorable international business cycle came to the rescue, and Norway obtained balance in its foreign trade due to increasing international demand. This made the Krone to appreciate. The market expected a return to par gold value, and from May 1924 until the Autumn of 1925, the Norwegian currency appreciated from 50 to 78% of its gold parity.

The negative consequences were mirrored in bank losses, again amounting to 7% of GDP in 1925. Unemployment almost hit 9% in 1926-1927, i.e., around eight times higher than during the post-war boom.[32] The number of bankruptcies was almost seven times higher in 1926 than in 1919. Debt collection increased from 5000 to 30000.[33]

Chart 6. Bankruptcies in Norway 1910-1930.



Source, Klovland (2004).

The Great Depression of the 1930s

Despite a boom in many countries in the 1920s, there were still major structural problems. These were brought about by overproduction in agriculture, incipient market saturation of consumer durables, and imbalances in international trade, currencies, and debt. During the last years of the decade, Norway took part in the boom, and recorded growth rates around 5% in 1927-1930. Subsequently, the Great Depression hit Western Europe in the third quarter of 1930. The slump came in consequence of money and

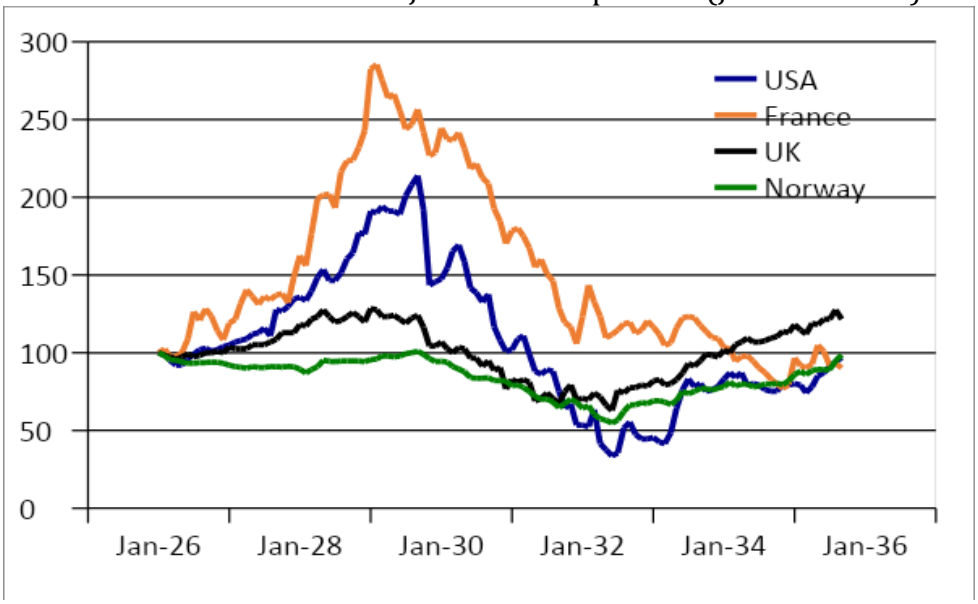
[31] Fritz Hodne, *Norwegian Economy, 1920-1980* (London: Croom Helm, 1983), 27-36.
[32] Ola Honningdal Grytten, "The scale of Norwegian interwar unemployment in international perspective," *Scandinavian Economic History Review* 43, no. 2 (1995): 226-250, https://doi.org/10.1080/03585522.1995.10415902.
[33] NOS, *Historical Statistics 1994,* (Oslo: Statistics Norway 1995), 194.

credit expansion, creating financial instability, overheating, and asset bubbles, which crashed in the US from the Autumn of 1929.

After the First World War, Germany had to pay war reparations equivalent to 33 billion US Dollars. Inter-allied debts amounted to 26.5 billion US Dollars.[34] Payments required a significant German trade surplus. However, international tariff barriers were raised. Additionally, both the German Mark and the British Pound were overvalued, whereas the American Dollar and the French Franc were undervalued. This left the US and France with a relative price advantage in international trade, and a corresponding disadvantage to the UK and Germany.[35] Gold accumulated in New York and Paris, and international liquidity was squeezed.

Germany failed to fulfill her obligations, and she had to draw on short-term credits from American banks to pay her debt. The stock market collapse at the end of October 1929 induced a dramatic worsening of the European debt crisis as US banks lost liquidity and were not able to renew their short-term credit to European banks.[36]

Chart 7. Stock market indices Jan 1926 – Sept 1935 (Jan 1926=100).



Source, League of Nations, *Statistical Yearbook*, (Paris: Statistical Office, League of Nations, 1927-1937)

World trade contracted from 5.4 to 1.9 billion US dollars between 1929 and 1933.[37] Lack of trust led to risk hedging by panic sales of German Marks and Austrian Schillings. The gold and foreign exchange reserves in Vienna and Berlin were drained, and they suspended free currency convertibility to gold in June 1931.[38]

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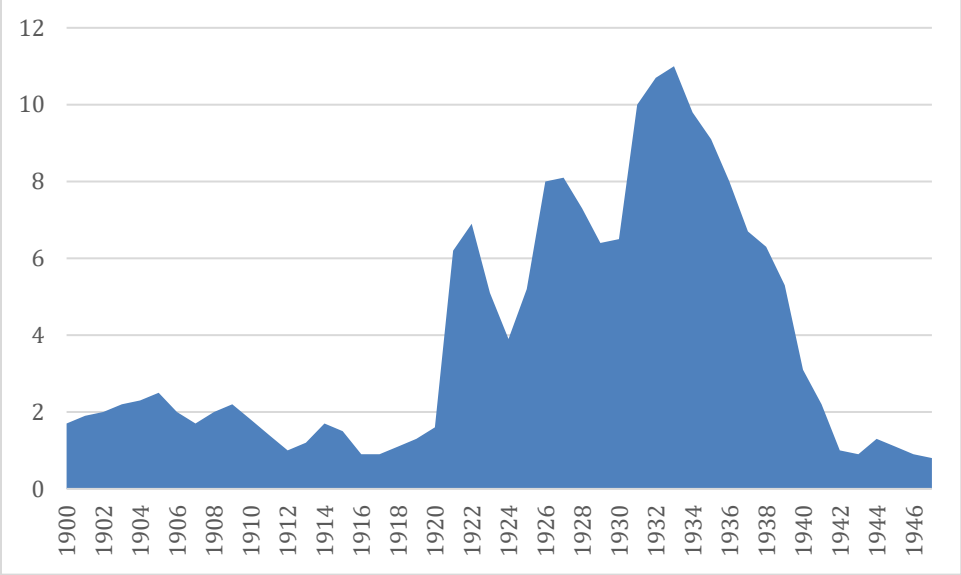
[34] Karl Heinz Roth, "German Reparation Debts After the Second World War - A Research Summary," *Critique* 48, no. 2-3 (2020): 133-148, https://doi.org/10.1080/03017605.2020.1759859
[35] Barry Eichengreen, *Elusive Stability: Essays in the History of International Finance, 1919-1939* (Cambridge: Cambridge University Press, 1993), 239-270.
[36] Charles P Kindleberger, *The World in Depression 2013* (Berkeley: University of California Press. 2013), 217-273.
[37] Michael Graff, A.G. Kenwood and A.L. Lougheed, *The Growth of International Economy 1820-1980: An Introductory Text* (London: Routledge, 2015), 222-235.
[38] Marcus Nadler, "The Partial Abandonment of the Gold Standard, 1931-1932," *The Annals of the American Academy of Political and Social Science* 165 (1933): 202-206. Accessed December 8, 2020. http://www.jstor.org/stable/1018181.

The lack of renewal of credit spread to European banks, which lost large sums in support positions in German and Austrian banks. On September 21, 1939, the UK temporarily suspended gold redemption of the Pound. The Nordic countries followed between September 27th and October 12th. To avoid further weakening of the Krone, the Norwegian central bank raised the key interest rate from 4 to 8%, and the stock exchange was closed for a few days.[39] In March 1933, Norway joined the Sterling Area, pegging the Krone to Pound Sterling after a formal devaluation of 10% to the Pound. Thereafter, it followed the Sterling depreciating in the markets.

After the Norwegian central bank suspended gold, the economy witnessed another shock later that year. The two largest commercial banks accounting for a third of the industrial companies' credit announced large losses. They were dependent on capital emissions and were granted a three-month debt moratorium.

The central bank followed up with credits and guarantees totaling NOK 150 million for the next two years for Norwegian banks. The key interest rate was reduced from 8% to 3.5% between September 1931 and May 1933.[40]

Chart 8. Unemployment in Norway in percent of work force 1900-1947.



Source, Grytten (1995), 226-250.

During the depression industrial production contracted by 22%, [41] when GDP per capita contracted 8.7%. External trade and investment volumes decreased by 30%.[42]

[39] Fritz Hodne and Ola Honningdal Grytten 2002, *Norsk økonomi I det 20. århundre* (Bergen: Fagbokforlaget, 2002), 103-111.
[40] Tore J. Hanisch, "The economic crisis in Norway in the 1930s," *Scandinavian Economic History Review* 26, no. 2, (1978): 145-155, https://doi.org/10.1080/03585522.1978.10415624.
[41] Jan T. Klovland, "Measuring Trends and Cycles in Industrial Production in Norway 1896-1948," Working paper 18/2015 (Oslo: Norges Bank, 2015), 3-88.
[42] Ola Honningdal Grytten, "Two centuries of economic growth: Norwegian GDP 1816-2020," Discussion paper 10/2020 (Bergen: Department of Economics, NHH, June 2020): 1-30. https://doi.org/10.13140/RG.2.2.13698.71362.

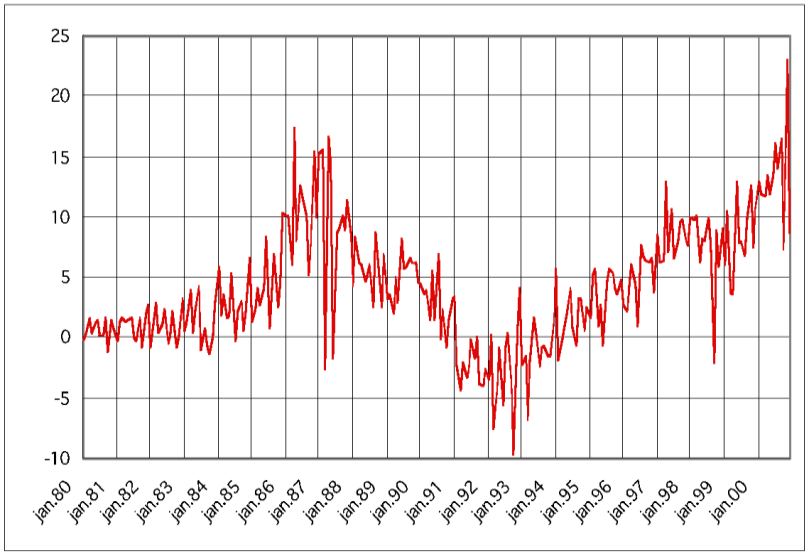
Consumer prices dropped by 13%, and wholesale prices by 20%.[43] In 1931 the real interest rate before tax approached 20%. Profitability in the private sector was negative as 1932 saw a record of 18 260 foreclosures. Unemployment reached new heights of 14% during the Winter of 1932-1933.[44] The recession reached its bottom in December 1932.[45] The bank sector, however, struggled during the entire decade.

The Scandinavian banking crisis of 1987-1993

During 1987-1993 Norway experienced the most severe banking crisis since the inter-war years. The crisis evolved after a wave of credit liberalization, which resulted in a significant boom which ended in asset market crashes, and a lagged contraction of the real economy.[46]

After the Second world war (1939-1945), the governments of the Nordic countries aimed at low interest rates to motivate investments. In Norway, the Ministry of Finance was to set the interest rate level lower than the market rates. In addition, generous tax deductions were admitted on financial costs. This resulted in negative real interest rates after tax.[47] They caused high demand for credits, and the economy was threatened by overheating, high inflation, and a weakening of the Krone. To ensure financial stability, the authorities introduced credit regulations.

Chart 9. Monthly credit inflow (K2) in Norway in NOK billions.



Sources, Statistics Norway and Norges Bank.

[43] Jan T. Klovland, "Contributions to a history of prices in Norway: Monthly price indices 1777-1920," Working paper 23/2013 (Oslo: Norges Bank, 2013), 3-201, Ola Honningdal Grytten, "Revising price history: consumer price index for Norway 1492–2018," *Scandinavian Economic History Review* 68, no. 2 (2020): 129-144, https://doi.org/10.1080/03585522.2020.1714714

[44] Ola Honningdal Grytten, "The scale of Norwegian interwar unemployment in international perspective," *Scandinavian Economic History Review* 43, no. 2 (1995): 226-250, https://doi.org/10.1080/03585522.1995.10415902

[45] Jan T. Klovland, "Monetary policy and business cycles in the interwar years: The Scandinavian experience," *European Review of Economic History* 2, no. 3 (1998): 309-344, https://doi.org/10.1017/S1361491698000148.

[46] Anthony Saunders, and Marcia Cornett, *Financial Markets and Institutions*, (New York: McGraw-Hill Irwin, 2007).

[47] Einar Lie and Christian Venneslan, *Over evne: Ministry of Finance 1965-1992*, (Oslo: Pax, 2010), 430-465.

Stagflation in the 1970s led to falling faith in planning solutions. From 1977 and until the 1990s, measures were taken to abolish credit regulations and liberalize the banking sector. However, the Parliament did not follow a persistent policy as they chose to deregulate the credit market, while interest rates were still subsidized.[48]

The mismatch resulted in instability. The combination of fixed exchange rate policy and free movement of capital had a similar effect. In addition to the liberalization process, the banks circumvented regulations by establishing additional credit and financial institutions. Another factor was that banks were strongly concerned with expansion both domestically and abroad. Furthermore, the expansionary policy in the 1970s had contributed to large growth in the money supply, and demand for credits increased strongly.[49] In Norway, a growing petroleum industry and confidence in the future also contributed to larger demand for credit. Between the third quarters of 1982 and 1986, the investment volume in the mainland economy increased by 40%, while aggregate demand increased by 27%.[50]

The economy entered a powerful upturn drawing on subsidized loans. Asset bubbles were created, financed by a credit bubble. Domestic Norwegian credits more than doubled between 1983 and 1987.[51] The credit volume continued to increase after the peak in the real economy had been reached. Real estate markets showed strong growth, as Norwegian house prices more than tripled between 1980 and 1987. The Tokyo and Oslo stock exchanges nearly quadrupled from January 1983 until September 1987, when the Dow Jones tripled.[52] The focus on expansion took place over security. Norwegian banks' equity ratio was reduced from 10% to 5% from 1945 to 1987.[53]

During the credit liberalization period, banks didn't have capacity to build control bodies that could provide adequate risk assessment. Combined with a race for market shares, this had a devastating effect.[54] In addition, the fixed exchange rate system also caused a pro-cyclical monetary policy. One had to follow the international interest rate level, despite that petroleum dependence meant that Norwegian business cycles tended to be opposite from those abroad. Hence, Norway had to lower the interest rates in good times and increase them in bad times.

The expansion was accompanied by high petroleum prices. In the early 1980's, oil stood at 40 UD dollars per barrel. During the Winter 1985-1986 oil prices plummeted to 10 US

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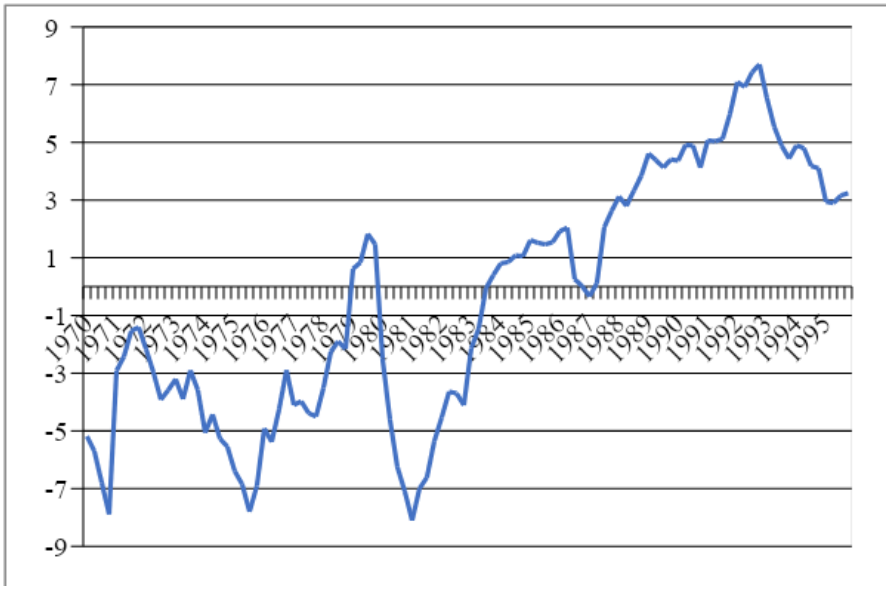
[48] Bjørn Skogstad Aamo, *Læring fra kriser*, (Bergen: Fagbokforlaget, 2016), 13-48.
[49] John Helliwell, "Comparative Macroeconomics of Stagflation", *Journal of Economic Literature* 26, no. 1 (1988): 1-28.
[50] Ola Honningdal Grytten, "Two Centuries of Economic Growth: Norwegian GDP 1816-2020 NHH Dept. of Economics Discussion Paper No. 10 (2020), http://dx.doi.org/10.2139/ssrn.3632902
[51] Ola Honningdal Grytten and Arngrim Hunnes, "An anatomy of financial crises in Norway, 1830-2010", *Financial History Review* 21, no. 1 (2014): 25-57. https://doi.org/10.1017/S0968565013000279.
[52] Mark Carlson, "A Brief History of the 1987 Stock Market Crash with a Discussion of the Federeal Reserve Response," *Finance and Economics Discussion Series* (Washington DC: Carlson Divisions of Research & Statistics and Monetary Affairs Federal Reserve Board, 2007).
[53] Ola Honningdal Grytten and Arngrim Hunnes, *Krakk & Kriser i historisk perspektiv*, (Oslo: Cappelen Damm), 227-242.
[54] Sverre Knutsen and Gunhild J. Ecklund, *Vern mot kriser? Norsk finanstilsyn gjennom 100 år*, (Bergen: Fagbokforlaget, 2000), 269-318.

dollars. Falling oil prices and a foreign trade deficit caused strained liquidity. In response the central bank 10-folded its credits to banks.[55] However, low petroleum prices caused reduced investment activity, weakened demand, and caused unemployment rates climb from 1.5% in 1986 to 6% in 1993.

Chart 10. Real interest rates after tax 1970-1995.



Source, Norges Bank.

During 12 days in October 1987, most western world stock markets fell by 30-45%.[56] From 1987 to 1992, real house prices in Norway fell by 43%, causing significant mortgage losses for the banks.[57]

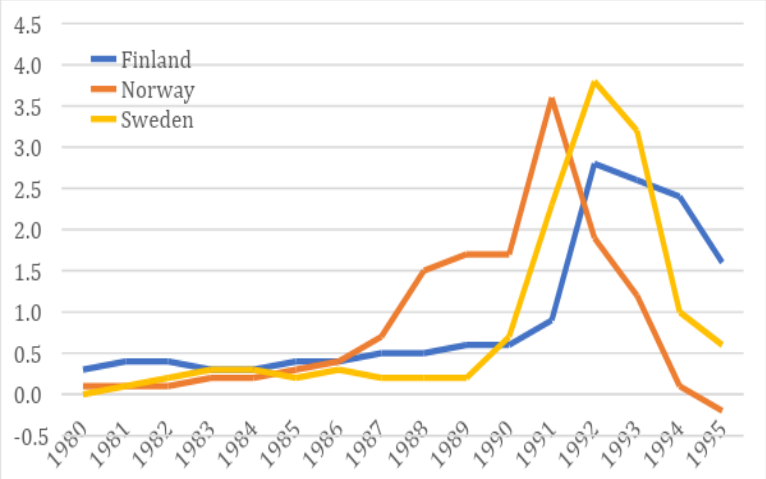
Deficits in public finances forced the government to tighten the fiscal policy. In May 1986, the new Labour government decided to devalue 12%. It was done to ease the pressure on the Krone and obtain improved trade balance. To defend the new exchange rate, one thereafter had to bring inflation down and ensure balance in foreign trade and public finances.

Falling inflation led to an increase in real interest rates. Additionally, a new tax reform was in place in 1992. Less tax deductions were admitted on debt interests. Thus, real interest rates after tax increased further. While one had fueled the economy during the boom of 1983-1986, one now stepped on the brakes during the crisis. Bank failures started to unfold from late 1988. During 1989-1990, the crisis become systemic in nature, causing the entire banking system to falter.[58] In the second quarter of 1991, the commercial banks' losses on loans and guarantees were recorded to 6.3%, compared

[55] Tore J. Hanisch, Espen Søilen and Gunnhild Ecklund, *Norsk økonomisk politikk i det 20. århundre. Verdivalg i en åpen økonomi*, (Kristiansand: Høyskoleforlaget, 1999), 309-313.
[56] Robert J. Shiller, "Investor Behavior in the October 1987 Stock market Crash: Survey Evidence," in Robert J. Shiller (ed), *Market Volatility*, (Boston: MIT Press, 1992).
[57] Ola Honningdal Grytten, "Boligkrakk og finanskrise i historisk perspektiv," *Samfunnsøkonomen* 63, no. 4 (2009): 39-50.
[58] Bent Vale, "The Norwegian banking crisis," in Thorvald G, Moe, Jon A Solheim and Bent Vale (eds), *The Norwegian Banking Crisis*, (Oslo: Norges Bank, 2004), 1-22.

to 2.8% for the savings banks.[59] These were the largest loss provisions since the banking crisis of the 1920s.

Chart 11. Bank losses as a percentage of total assets in Denmark, Norway, and Sweden



Source, Norges Bank.

The authorities' tightening of depreciation on losses during 1988-1991 made the banks' accounting records even weaker.[60] Engagements that could not be fulfilled at the time had to be written off in full even when banks believed the market would pick up later. It turned out that the depreciation rules had been very strict as Norwegian banks reversed significant loss provisions after 1993. Banks zeroed out their equities and had to be rescued by the state taking over the ownership. Since a large proportion of the accounted losses were reversed, this happened to be a profitable engagement for the state.

Conclusions

The paper examines four banking crises in the light of the financial instability hypothesis by Minsky and Kindleberger, refined in a new dynamic financial crisis model. The hypothesis suggests loss of financial stability, defined as the financial institutions' solidity and the ability to provide necessary liquidity and capital in times of stressed markets. The crises are the Post First world war crisis in the early 1920s, the Monetary crisis in the mid 1920s, the Great Depression in the 1930s and the Scandinavian banking crisis of 1987-1993. The small open economy of Norway in international perspective is used as a case study.

A quantitative analysis of cycles in financial and real macroeconomic key variables reveal that significant increase in debt during booms lead to financial instability, overheating and bubble tendencies. This again paved the way for the banking crises. Thereafter historical discussions of each incident confirm that loss of financial instability was decisive four all the four bank crises.

[59] Sverre Knutsen and Einar Lie, "Financial Fragility, Growth Strategies and Banking Failures: The Major Norwegian Banks and the Banking Crisis, 1987-92," *Business History* 44, no. 2 (2002): s. 88-111.
[60] Ola Honningdal Grytten, Elisabeth Bjørsvik and Yngve Nilsen, *Banken i samfunnet: Bergens Privatbank/Bergen Bank* (Bergen: Bodoni, 2013), 325-350.

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