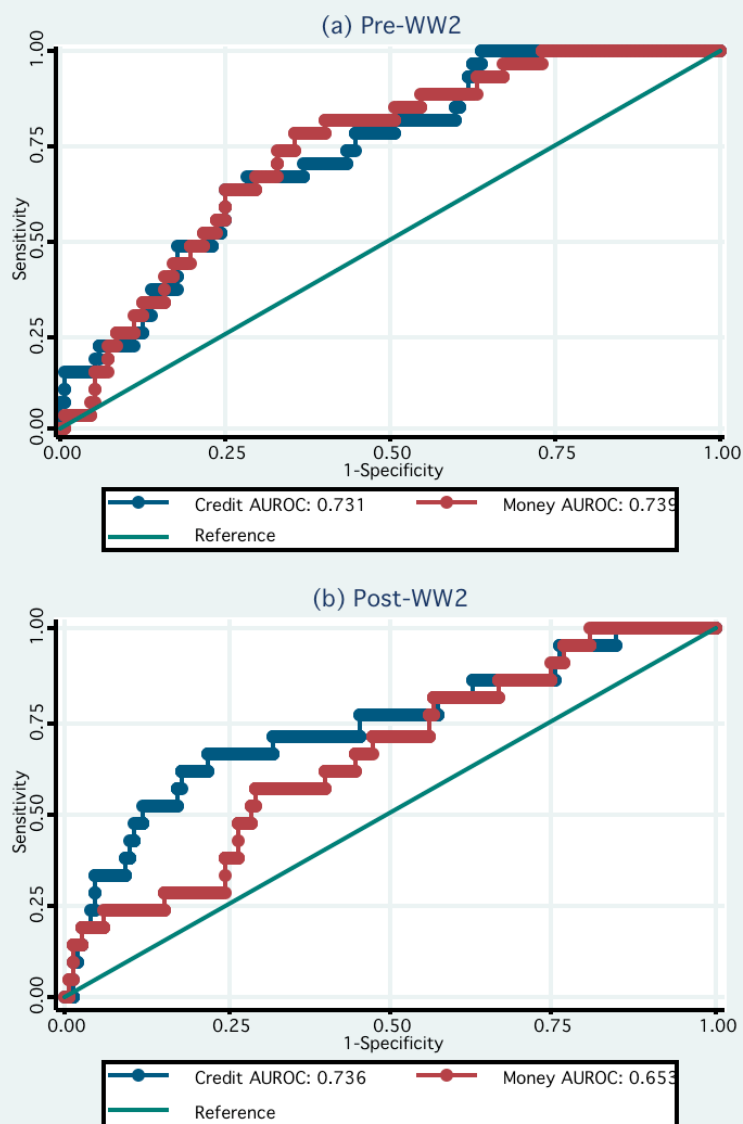


Figure 7. ROC Comparisons for Credit and Money Models



0.16). We also find that of the four ROCs in Figure 7, only the Post-WW2 money model fails the Kolmogorov-Smirnov test, so its maximal height above the diagonal (TP minus FP) is not statistically different from zero at conventional levels, which is also highly discouraging.

How do we interpret these results? The findings mesh well with our overall understanding of the dramatic changes in money and credit dynamics after the Great Depression. In the summary data for the pre-WW2 sample, we saw how broad money and credit moved hand in hand, so that a Friedman “money view” of the financial system, focusing on the liability side of banks’ balance sheets, was an adequate simplification. After WW2 this was no longer the case, and credit was delinked from broad money aggregates, which would beg the question as to

which was the more important aggregate in driving macroeconomic outcomes. At least with respect to crises, the results of our analysis are clear: credit matters, not money.

These findings have potentially important policy implications, especially for central banks that still embrace the oft forgotten idea of using quantitative indicators as a “pillar” of monetary policymaking. If this pillar is there as to support price stability goals, then indeed a monetary aggregate may be the right tool for the job; but if financial stability is a goal, then our results suggest that a better pillar might make use of credit aggregates instead and their superior power in predicting incipient crises.

To underscore the value of our model based on the “credit view”, and to guard against omitted variable bias, in Table 6 we subject our baseline specification to several perturbations that take the form of including additional control variables X as described above. Specifications 15 adds 5 lags of real GDP growth. Specification 16 adds 5 lags of the inflation rate, since inflation has been found to contribute to crises in some studies (e.g., Demirgüç-Kunt and Detragiache 1998). Neither set of controls can raise the fit and predictive performance of the model slightly. However, the inclusion of these terms has little effect on the coefficients on the lags of credit growth, their quantitative or statistical significance, and their substantive contribution to the model’s predictive ability. Specifications 17 and 18 add 5 lags of the nominal short-term interest rate or its real counterpart, since some studies find that high interest rates, e.g. to defend a peg, can help trigger crises (e.g., Kaminsky and Reinhart 1999); only the lags of the *real* interest rate are just significant at the 5% level, but they do not alter the baseline story and the credit effects remain strong.

Finally, in specification 19 we add 5 lags of the change in the investment-to-GDP ratio, to explore the possibility that the nature of the credit boom might affect the probability that it ends in a crisis. For example, according to arguments heard from time to time, if credit is funding “productive investments” then the chances that something can go wrong are reduced—as compared to credit booms that fuel consumption binges or feed speculative excess by households, firms, and/or banks.¹¹ Our results caution against this rosy view. Over the long run, in our developed country sample, most of the lags of investment are not statistically significant at the conventional level, and the only one that is actually has a “wrong” positive sign, suggesting that crises are slightly more likely when they have been funding investment booms as opposed to other activity.¹² If this is the case, then the suspicion arises that when banks originate lending, they may be almost equally incapable of assessing repayment capacity in all cases, with investment loans having no special virtues, and possibly some vices.

¹¹ The argument has often been applied to foreign capital flows manifest in current account deficits. The argument that capital flowing into investment booms does not matter has been variously stated as the “Lawson doctrine,” “Pitchford critique,” or “consenting adults view.” See Edwards (2000) for a survey of this area.

¹² The sum of the lags on investment is positive, so crises are marginally more likely in an investment boom, controlling for credit growth.

TABLE 6 MORE ROBUSTNESS CHECKS

Specification (Logit country effects)	(15) Baseline plus 5 lags of real GDP growth	(16) Baseline plus 5 lags of inflation	(17) Baseline plus 5 lags of nominal s.t. int. rate	(18) Baseline plus 5 lags of real s.t. int. rate	(19) Baseline plus 5 lags of change in I/Y
L.Dlog(loans/P)	1.192 (2.19)	-0.937 (2.33)	0.735 (2.16)	-1.206 (2.61)	-0.205 (2.20)
L2.Dlog(loans/P)	8.131*** (1.99)	10.15*** (2.16)	8.634*** (2.22)	10.77*** (2.26)	7.290*** (2.13)
L3.Dlog(loans/P)	3.065 (1.90)	0.0626 (1.84)	1.748 (2.17)	0.233 (2.04)	1.214 (2.02)
L4.Dlog(loans/P)	1.500 (1.50)	1.270 (1.63)	-0.674 (1.87)	1.948 (1.74)	1.357 (1.62)
L5.Dlog(loans/P)	2.030 (1.67)	-0.157 (2.02)	1.204 (2.32)	-0.378 (1.97)	2.482 (2.12)
Marginal effects at each lag evaluated at the means	0.030 0.206 0.078 0.038 0.051	-0.024 0.256 0.0016 0.032 -0.004	0.022 0.263 0.053 -0.021 0.037	-0.035 0.308 0.007 0.056 -0.011	-0.005 0.187 0.031 0.035 0.064
Sum	0.403	0.262	0.355	0.325	0.312
Observations	1285	1285	1028	1021	1231
Groups	14	14	14	14	14
Avg. obs. per group	91.79	91.79	73.43	72.93	87.93
Sum of lag coefficients se	15.92*** 4.298	10.39*** 3.356	11.65*** 3.650	11.37*** 3.570	12.14*** 3.942
Test for all lags = 0, c^2 p value	22.86*** 0.0003	26.51*** 0.0000	20.48*** 0.0010	27.33*** 0.0000	16.75*** 0.0050
Test lags of added vbl. = 0, χ^2 p value	18.90*** 0.0020	21.26*** 0.0007	7.168 0.2080	15.88*** 0.0072	10.25* 0.0683
Test for country effects = 0, χ^2 p value	8.106 0.837	8.903 0.780	10.39 0.662	8.763 0.791	8.525 0.808
Pseudo R^2	0.0891	0.0943	0.0833	0.1090	0.0896
Pseudolikelihood	-186.6	-185.6	-169.4	-164.3	-181.7
Overall test statistic, χ^2 p value	43.11*** 0.0067	57.15*** 0.0000	50.35*** 0.0008	55.63*** 0.0002	47.94*** 0.0017
Predictive ability, AUROC se	0.711*** 0.0472	0.756*** 0.0424	0.712*** 0.0495	0.744*** 0.0472	0.737*** 0.0494

Summing up the results from Table 6, we conjecture that, although some of the auxiliary control variables may matter in some contexts—perhaps in other samples that include emerging markets—for the developed economies these other factors are not the main signal of financial instability problems. Rather the key indicator of a problem is an excessive credit boom. Indeed, the sum of the lag loan coefficients (or their marginal effects) is even higher in Table 6 columns (15)–(19) than in the baseline specification (6), so credit effects are amplified here, rather than being diminished by the added controls; and the Pseudo R^2 values range between 0.0833 and

0.1090, compared to the 0.0596 value in the baseline case, showing that the greater fraction of the model's fit is always due to the credit terms.

To conclude, a predictive analysis of our large long-term, cross-country dataset lends support to the idea that, for the most part, financial crises throughout modern history can be viewed as “credit booms gone wrong” (Eichengreen and Mitchener 2003). From our regressions, past growth of credit emerges as the single best predictor of future financial instability, a result which is robust to the inclusion of various other nominal and real variables. Moreover, credit growth seems a better indicator than its nearest rival measure, broad money growth, especially in the postwar period. In light of the structural changes of the financial system that we documented above, this comes as no surprise. As credit growth has increasingly decoupled from money growth, credit and money aggregates are no longer two sides of the same coin. This brings us back to the crucial questions raised at the beginning of this section—should central banks pay attention to credit aggregates or confine themselves to following inflation targeting rules? Historical evidence suggests that credit has a constructive role to play in monetary policy. Valuable information about macroeconomic and financial stability would be missed if policy-makers chose to ignore the behavior of credit aggregates, although how this information is included in the overall policy and regulatory regime is an open and much debated question.

Our results also strengthen the idea that credit matters, above and beyond its role as propagator of shocks hitting the economy. The credit system is not merely an amplifier of economic shocks as in the financial accelerator model of BGG. The importance of past credit growth as a predictor for financial crises and the robustness of the results to the inclusion of other key macro variables, raises the strong possibility that the financial sector is quite capable of creating its very own shocks. In this sense, our historical data vindicate the ideas of scholars such as Minsky (1977) and Kindleberger (1978) who have argued that the financial system itself is prone to generate economic instability through endogenous credit booms.

6. Conclusions

Our ancestors lived in an Age of Money, where aggregate credit was closely tied to aggregate money, and formal analysis could use the latter as a reliable proxy for the former. Today, we live in a different world, an Age of Credit, where financial innovation and regulatory ease has permitted the credit system to increasingly delink from monetary aggregates, setting in train an unprecedented expansion in the role of credit in the macroeconomy. Without an adequate historical perspective, these profound changes are difficult to appreciate, and one task of this paper has been to document the nature of this evolution and its ramifications over the last 140 years for a group of major developed economies.

We have shown how the stable relationship between money and credit broke down after the Great Depression and World War 2, as a new secular trend took hold that carried on until today's crisis. We conjecture that these changes conditioned, and were conditioned by, the broader environment of macroeconomic and financial policies: after the 1930s the ascent of fiat money plus Lenders of Last Resort—and a slow shift back toward financial *laissez faire*—

encouraged the expansion of credit to occur. The policy backstop also, to some degree, insulated the real economy from a scaling up of the damaging effects that prior crises had wrought in days when the financial system played a less pivotal role. However, implicit government insurance and the prospect of rescue operations might also have contributed to the spectacular growth of finance and leverage within the system, creating more of the very hazards they were intending to solve. Aiming to cushion the real economic effects of financial crises, policy-makers have prevented a periodic deleveraging of the financial sector resulting in the virtually uninterrupted growth of leverage we have seen up until 2008. The important structural changes that have taken place in the financial system over the past decades have led to a greater, not smaller role of credit in the macroeconomy. It is mishap of history that just at the time when credit mattered more than ever before, the reigning doctrine had sentenced it to playing no constructive role in monetary policy.

In terms of lessons for policymakers and researchers, history demonstrates that they ignore credit at their peril. The behavior of credit aggregates contains valuable information about the likelihood of future financial crises. It is not, of course, a perfect predictor, and there may be fundamental reasons why, in some periods, especially in eras of financial development and innovation, credit expands to support real economic gains. At the same time, the long-run record shows that recurrent episodes of financial instability have more often than not been the result of credit booms gone wrong, most likely due to failures in the operation and/or regulation of the financial system. For economists, adherence to the money view, not to mention the irrelevance view, has been seriously called into question by the crisis, and the evidence in this paper serves to amplify these doubts amid talk of a “paradigm shift.”¹³ For policymakers, a complacent attitude towards the growth in the scale and riskiness of the credit system now looks like a misguided choice that ignored history.¹⁴

Our quantitative analysis clearly suggests that the credit system matters above and beyond its role as propagator of shocks as in the financial accelerator model. The credit system seems all too capable of creating its very own shocks, judged by how successful past credit growth performs as a predictor of financial crises. Not all of this might sound surprisingly new to financial historians who have pointed for a long time to recurrent episodes of financial sector-driven instability in modern economies. But we are hopeful that some of the evidence we have assembled will inform new avenues of research into the role of credit in the macroeconomy.

¹³ See Mark Whitehouse, “Crisis Compels Economists To Reach for New Paradigm,” *The Wall Street Journal*, November 4, 2009.

¹⁴ Notable examples being the critical reaction and laissez faire response to precrisis warnings sounded at the Jackson Hole conferences by Borio and White (2003) and Rajan (2005). However, policymakers are now taking a harder look at how to regulate credit and the procyclicality of the financial system (e.g., Turner 2009).

Appendix A: Figures and Tables

Appendix Figure 1. Raw data



Graphs by iso

APPENDIX TABLE 1 BANKING CRISIS DEFINITIONS

Country	ISO	Financial crisis (first year)
Australia	AUS	1893, 1989
Canada	CAN	1873, 1906, 1923, 1983
Denmark	DNK	1877, 1885, 1902, 1907, 1921, 1931, 1987
France	FRA	1882, 1889, 1904, 1930, 2008
Germany	DEU	1880, 1891, 1901, 1931, 2008
Italy	ITA	1887, 1891, 1907, 1931, 1930, 1935, 1990, 2008
Japan	JPN	1882, 1907, 1927, 1992
Netherlands	NLD	1897, 1921, 1939, 2008
Norway	NOR	1899, 1921, 1931, 1988
Spain	ESP	1920, 1924, 1931, 1978, 2008
Sweden	SWE	1876, 1897, 1907, 1922, 1931, 1991, 2008
Switzerland	CHE	1870, 1910, 1931, 2008
United Kingdom	GBR	1890, 1974, 1984, 1991, 2007
United States	USA	1873, 1884, 1893, 1907, 1929, 1984, 2007

Notes: As described in the text, our crisis coding follows previous work, notably Reinhart and Rogoff (2009, RR), and Bordo, Eichengreen, Klingebiel, and Martinez-Peria (2001, BEKM). We corroborated the coding with Laeven and Valencia (2008) as well as Cecchetti et al. (2009). There are only three major cases where these sources differ and which we need to discuss briefly:

1. We code the USA in crisis from 1984, following RR who have the US in the S&L crisis from 1984. Some other studies, e.g. Laeven and Cecchetti code the S&L crisis starting in 1988 only. Yet the number of bank failures had started to increase rapidly earlier.
2. We do not code the Barings crisis in the UK 1995, but RR do. We consider it to be an isolated event, not a sufficiently widespread crisis.
3. RR and BEKM code a banking crisis in Germany in 1977. We did not find sufficient evidence for a widespread banking crisis in Germany in that year.

Appendix B: Data Sources

RGDP: Real GDP per capita from Angus Maddison, [Statistics on World Population, GDP and Per Capita GDP, 1-2006 AD](http://www.ggdc.net/maddison/). <http://www.ggdc.net/maddison/>.

CPI: unless stated otherwise all data from Taylor, Alan M. (2002), [A Century of Purchasing-Power Parity](#), *Review of Economics and Statistics*, vol. 84(1): 139-150; data for 2000-2008 from International Financial Statistics (IFS);

GDP and I/Y: unless stated otherwise below pre-1945 data come from Brian R. Mitchell, (1993), *International Historical Statistics: The Americas 1750–1988*, Second Edition, New York, Macmillan; Brian R. Mitchell, 1992, *International Historical Statistics: Europe 1750-1988*. London, Macmillan; complemented by investment data from Jones, Matthew T., and Maurice Obstfeld. 1997. "Saving, Investment, and Gold: A Reassessment of Historical Current Account Data," NBER Working Paper 6103. Dataset: <http://www.nber.org/databases/jones-obstfeld/>; post-1945 data from IFS.

STIR: short-term interest rate – unless otherwise stated the pre-WW2 data come from the dataset of Obstfeld, M., J. C. Shambaugh, and A. M. Taylor (2005). "The Trilemma in History: Tradeoffs among Exchange Rates, Monetary Policies, and Capital Mobility." *Review of Economics and Statistics* 87: 423–38, and from the League of Nations Statistical Yearbook, various issues; data for the postwar period are taken from IFS.

L: total domestic currency loans of banks and banking institutions to resident companies and households (excluding other financial institutions);

C: total domestic currency assets of banks and banking institutions; of which: claims on government and the public sector for 1950-2008 were taken from IFS.

NM: narrow money (M0 or M1); M: broad money (M2 or M3);

Australia

L/C: 1870-1945 - table 1, total assets within Australia and total advances in Australia. S.J. Butlin, A.R. Hall, R.C. White, *Australian Banking and Monetary Statistics, 1817-1945*, Sydney 1971; 1953-2008 – total loans and bank assets from Reserve Bank of Australia, *Australian Economic Statistics 1949-50 to 1996-97*, http://www.rba.gov.au/statistics/op8_index.html; 1997-2008 - Reserve Bank of Australia, *Assets of Financial Institutions*, table D02 and B01.

NM/M: 1870-1983 – PF 57-71 from David Pope, *Australian Money and Banking Statistics*, Canberra, Australian National University, 1986; 1984-2008 – IFS.

Canada

L/C: 1870-1953 - M.C. Urquhart, *Historical Statistics of Canada*, Toronto 1965, Cambridge UP. Total loans and total assets of banks: series H55-H160. 1953-2008 StatCan, Table 176-0015: Chartered banks, assets and liabilities.

NM: 1870-1929 – Rousseau and Wachtel; 1930-1940 – League of Nations, *Statistical Yearbook*; 1953-2008 – IFS.

M: 1870-1938 – Based on unpublished datasets from Michael Bordo (henceforth Bordo); 1948-2008 – IFS.

Denmark

L: 1885-1938 – table 6.6, loans of commercial banks 1885-1938, Hans Chr. Johansen, *Dansk Historisk Statistik 1814-1980*; 1951-2008: total lending (excl. MFI's) of commercial banks and savings banks: Kim

Abildgren, Financial Liberalization and Credit Dynamics in Denmark in the Post-World War II Period, Danmarks Nationalbank, Working Papers 47/2007.

C: table 6.6 - assets of commercial banks, Hans Chr. Johansen, Dansk Historisk Statistik; 1981-2008 – series L plus holdings of securities and other assets from OECD (2009).

NM/M: 1870-1940 – table 6.2, 6.6, 6.8 in Hans Chr. Johansen, Dansk Historisk Statistik; 1950-2008 – IFS.

France

L: 1870-1940 from Saint Marc, Michelle, Histoire monétaire de la France, 1800-1980, Paris, 1983, who used credit data for Crédit lyonnais, Société général, Comptoir national d'escompte and Crédit industriel et commercial. She assumed that total loans in the French economy averaged about twice that amount before 1940; 1945 – 2008: data for 1945-1969 from Conseil National du Credit (data kindly shared by Eric Monnet, Paris); 1970-1984 from INSEE (“Crédit à l'économie de caractère bancaire”); 1985-2008 from Banque de France (MFI loans to private sector residents, A20.A.1.U6.2200.Z01). The pre-1895 loan data are subject to very crude rounding errors and are not used.

NM: 1870-1940 from Saint Marc (1983); 1949-2008 from IFS (M1).

M: 1920-1940 from Patat, Jean-Pierre and Michel Lutfalla, Histoire monétaire de la France au XXe siècle, Paris 1986; 1949-2008 from INSEE and Banque de France (M2).

Germany

L: 1880-1940 - table B1 1.05, total loans of Aktienbanken, Sparkassen, Hypothekenbanken and Genossenschaftsbanken; Deutsche Bundesbank, Deutsches Geld- und Bankwesen in Zahlen, 1876-1975, Fritz Knapp: Frankfurt am Main, 1976. 1948-2008 - Bundesbank, Lending to domestic non-banks (All categories of banks, OU01115).

C: 1880-1940 - table A 1.01, total assets of Aktienbanken, Sparkassen, Hypothekenbanken and Genossenschaftsbanken; Deutsche Bundesbank, Deutsches Geld- und Bankwesen in Zahlen, 1876-1975, Fritz Knapp: Frankfurt am Main, 1976. 1950-2008 – Bundesbank: Balance sheet total (All categories of banks, OU0308).

NM: 1876-1940 –Bundesbank (1976); 1950-2008 from IFS (M1).

M: 1880-1940 from Bordo; 1950-2008 from IFS (M2).

Japan

L/C: 1870-1940 – Bank of Japan, Hundred-year statistics of the Japanese economy, Tokyo 1966 (Meiji-Iko Hompo Shuyo Keizaitokei); 1953-1982 – Tamaki, Norio, Japanese banking: a history, 1859 – 1959, Cambridge 1995, and IFS, 1983-2008 – Bank of Japan (series FA'FAABK_FAAB2DBEA40, Loans of domestically licensed banks less loans to other financial institutions); total domestic credit 1953-2008 from IFS.

CPI: 1885-1940 – Obstfeld and Taylor (2003); 1950-2008 – IFS.

NM: 1880-1940 – Bordo and Eichengreen (2001); 1955-2008 – IFS (M1).

M: 1901-1918 – Bordo; 1919-1940 – Mitchell; 1955-2008 – IFS (M2).

STIR: 1870-1940 from Bank of Japan, Nihon Ginko Hyakunen-shi Shiryo-hen (Bank of Japan: The First Hundred Years-Materials), Tokyo 1986 - <http://www.boj.or.jp/type/pub/hyakunen/hyakus.htm>; 1950-2008 from IFS.

Italy

L/C: 1870-1940 – unpublished workfile: Gigliobianco, Alfredo and Claire Giordano and Gianni Toniolo, “Regulators and Innovators Play Tag: The Italian Historical Experience”, forthcoming. The data sources are De Mattia, R. (1967), I bilanci degli istituti di emissione italiani 1845-1936, Vol. 1, Banca d’Italia: Rome, for the period 1870-1889; Cotula F. et al (1996), I bilanci delle aziende di credito 1890-1936, Editori Laterza: Rome- Bari, for the period 1890-1935; Unpublished data, Bank of Italy, for the period 1936-1973. 1950-1994 – Bank of Italy, total bank loans (S858159), extended 1995-2008 using growth rates from IFS and Bank of Italy (S515363M and S640592M, “lending to domestic non-financial enterprise and households”); assets 1950-2008 - Bank of Italy, series S049387, extended 1997-2008 using growth rates of banking sector assets from Bank of Italy (S463168M).

NM/M: 1870-1939 M0 – Fratianni, M. and F. Spinelli, A Monetary History of Italy, Cambridge 1997; 1880-1945 M3 from Bordo; 1948-2008 - Bank of Italy, M1 and M2 Plus; after 1998 Italian contribution to Eurozone M1 and M3 from the Bank of Italy.

Netherlands

L: 1900-1982 sum of “Korte vorderingen op private sector”, “Onderhandse leningen”, “Hypothecaire leningen”, “Diverse binnenland active”, table 3.1 - De Nederlandsche Bank, Nederlandse financiele instellingen in de twintigste eeuw: balansreeksen en naamlijst van handelsbanken, DNB Statistische Cahiers Nr.3, 2000; 1982-2008 DNB, Banking statistics, table 5.6ek.

C: 1900-1945 Bilans total (excl. foreign assets) of commercial banks, table 3.1 - De Nederlandsche Bank, Nederlandse financiele instellingen in de twintigste eeuw: balansreeksen en naamlijst van handelsbanken, DNB Statistische Cahiers Nr.3, 2000; 1948-2008 IFS (32)

NM: 1900-1992 – Bordo and League of Nations; 1993-2008 – DNB, Table 5.4, Contribution of the Netherlands to euro area monetary aggregates, Guilder M1; 1945-1998 – IFS; 1999-2008 – DNB, Table 5.4, Contribution of the Netherlands to euro area monetary aggregates, Guilder M3.

GDP and I/Y: 1880-1913 – van Zanden et al., National Accounts of the Netherlands 1880-1913; <http://nationalaccounts.niwi.knaw.nl/start.htm>; 1918-1940 – Mitchell; 1948-2008 – IFS.

Norway

L/C: table A2 and A4, Eitheim/Klovland/Qvigstad (eds), Historical Monetary Statistics for Norway, Chapter 10: Credit, banking and monetary developments in Norway, Norges Banks Occasional Papers nr. 35, Oslo 2004. Datafile: http://www.norges-bank.no/templates/article___42927.aspx

NM/M: table 2a, monetary aggregates in Norway, Norges Bank: http://www.norges-bank.no/templates/article___42935.aspx

GDP, I/Y: Norges Bank, The gross domestic product for Norway, http://www.norges-bank.no/templates/article_42937.aspx

Spain

L/C: 1900-2000 – Entidades de credito, table 9.12 from A. Carreras and X. Tafunell (eds.), Estadísticas Históricas de España, Madrid 2005. 2000-2008 – growth rates of loans and assets for MFI's from Bank of Spain - Residentes en España, total prestamos (BE060106) and total activos (BE060102).

NM/M: 1870-1998: A. Carreras and X. Tafunell (eds.), Estadísticas Históricas de España, Madrid 2005, table 9.16; 1998-2008 IFS.

GDP/IY: 1870-2000 Prados de la Escosura, Leandro, El progreso economico de Espana, 1850-2000, Madrid 2003, Appendix M.

Sweden

L: Table 2. Bank lending, monthly figures 1871-1938, Riksbank, Historical monetary statistics for Sweden, 1668-2008, Swedish Monetary History Project.

C: table 8 – Income Statement items of the Swedish commercial banks 1870-2005, total assets of commercial banks (minus foreign assets), Riksbank, Historical monetary statistics for Sweden, 1668-2008, Swedish Monetary History Project.

NM/M: 1871-2008 – Historical monetary statistics for Sweden.

GDP, I/Y: Rodney Edvinsson, Historical national accounts for Sweden 1800-2000 (Historiska nationalräkenskaper för Sverige 1800-2000) Version 1.0

Switzerland

L: 1906-1992 - total loans, Swiss Economic and Social History Online Database (www.fsw.uch.ch/histstat/); 1993-2008 – Swiss National Bank, Banks in Switzerland 2008, <http://www.snb.ch/en/iabout/stat/statpub/bchpub/stats/banken.ch>.

C: 1870-1945 - Franz Ritzmann, Die Schweizer Banken, Bern und Stuttgart 1973; 1948-2008 - Swiss National Bank, Banks in Switzerland (2008): total balance sheet assets (less foreign assets).

NM: 1880-2008 - Swiss National Bank, Historical time series: the monetary base and the M1, M2 and M3 monetary aggregate; <http://www.snb.ch/en/iabout/stat/statpub/hisztz>;

M: 1880-1914 – Bordo; 1914-1950 – M3, Swiss Economic and Social History Online Database (www.fsw.uch.ch/histstat/); 1950-2008 - M3, Swiss National Bank, Historical time series: the monetary base and the M1, M2 and M3 monetary aggregate; <http://www.snb.ch/en/iabout/stat/statpub/hisztz>;

United Kingdom

L/C: 1870-1939 - consolidated total assets of all financial institutions and consolidated bank loans and advances from table 3.4 in: David K. Sheppard, The Growth and Role of UK Financial Institutions, 1880-1962, Methuen & Co, London 1971; 1945-2008 Sterling loans (excl. loans to other financial institutions) from Bank of England; total domestic credit (32) from IFS.

NM/M: 1880-1945 - Sheppard (1962); 1947-2008 - Bank of England.

United States

L: 1896-1941: Total loans and leases of commercial banks from Board of Governors of the Federal Reserve, US All Bank Statistics 1896-1955, Washington D.C. 1959; 1947-2008 - total loans and leases and security investment of commercial banks from the Board of Governors of the Federal Reserve H.8 release.

C: Total bank assets are defined as the sum of loans and leases and security investment. Total assets of banks from Rousseau and Wachtel (1998), series BANKA, taken from: US historical statistics, Bureau of Census (1973); 1929-1940 - Board of Governors of the Federal Reserve, US All Bank Statistics 1896-1955, Washington D.C. 1959; 1950-2008 total domestic credit – IFS.

NM/M: 1870-2008 – monetary base from the Federal Reserve Bank of St. Louis, Adjusted Monetary Base (available at <http://research.stlouisfed.org/fred2/data/AMBSL.txt>); money stock 1880-1918 from Rousseau and Wachtel (1998), 1919-1940 - Bordo; 1945-2008 – data for M2 are from IFS.

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