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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, $\chi^2$ 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, $\chi^2$ 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, $\chi^2$ 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.”<sup>13</sup> 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.<sup>14</sup>

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.

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

<sup>14</sup> 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](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, Eitrheim/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](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](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](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/](http://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/](http://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.

## References

- Almunia, Miguel, Agustín S. Bénétrix, Barry Eichengreen, Kevin H. O'Rourke, and Gisela Rua. 2009. From Great Depression to Great Credit Crisis: Similarities, Differences and Lessons. *Economic Policy*. Forthcoming.
- Arellano, Manuel, and Olympia Bover. 1995. Another Look at the Instrumental Variable Estimation in Error-Component Models. *Journal of Econometrics* 68: 28–51.
- Adrian, Tobias, and Hyun Song Shin. 2008. Liquidity and Financial Cycles. BIS Working Papers No. 256, July 2008.
- Adrian, Tobias, and Hyun Song Shin. 2009. Money, Liquidity, and Monetary Policy. FRBNY Staff Report 360, January.
- Barro, Robert J. 2009. Rare Disasters, Asset Prices, and Welfare Costs. *American Economic Review* 99(1): 243–64.
- Bernanke, Ben S., 1983. Nonmonetary Effects of the Financial Crisis in Propagation of the Great Depression. *American Economic Review* 73(3): 257–76.
- Bernanke, Ben S. 1993. Credit in the Macroeconomy. *Quarterly Review*, Federal Reserve Bank of New York, Spring, pp. 50–70.
- Bernanke, Ben S., and Alan S. Blinder. 1992. The Federal Funds Rate and the Channels of Monetary Transmission. *American Economic Review* 82(4): 901–21.
- Bernanke, Ben S., and Mark Gertler. 1995. Inside the Black Box: The Credit Channel of Monetary Policy Transmission. *Journal of Economic Perspectives* 9(4): 27–48.
- Bernanke, Ben S., Mark Gertler, and Simon Gilchrist. 1999. The financial accelerator in a quantitative business cycle framework. In *Handbook of Macroeconomics*, vol. 1, edited by J. B. Taylor and M. Woodford. Amsterdam: Elsevier, pp. 1341–93.
- Biggs, Michael, Thomas Mayer, and Andreas Pick. 2009. Credit and economic recovery. DNB Working Papers 218, Netherlands Central Bank, Research Department.
- Bordo, Michael, Barry Eichengreen, Daniela Klingebiel, and Maria Soledad Martinez-Peria. 2001. Is the crisis problem growing more severe? *Economic Policy* 16(32): 51–82.
- Borio, Claudio. 2008. The financial turmoil of 2007–?: a preliminary assessment and some policy considerations. BIS Working Papers no. 251.
- Borio, Claudio, Craig Furfine, and Philip Lowe. 2001. Procyclicality of the financial system and financial stability: issues and policy options. BIS Papers, no. 1.
- Borio, Claudio, and Philip Lowe. 2002. Asset Prices, Financial and Monetary Stability: Exploring the Nexus. BIS Working Papers 114, Bank for International Settlements.
- Borio, Claudio, and Philip Lowe. 2003. Imbalance or “Bubbles?” Implications for Monetary and financial Stability. In *Asset Price Bubbles: The Implications for Monetary, Regulatory, and International Policies*, edited by W. C. Hunter, G. C. Kaufman, and M. Pomerleano. Cambridge, Mass.: MIT Press, pp. 247–70.
- Borio, Claudio, and William R. White. 2003. Whither Monetary and Financial Stability: The Implications of Evolving Policy Regimes. *Proceedings*, Federal Reserve Bank of Kansas City, pp. 131–211.
- Cecchetti, Stephen G., Marion Kohler, and Christian Upper. 2009. Financial Crises and Economic Activity. NBER Working Papers 15379.
- Chari, V. V., Lawrence J. Christiano, and Patrick J. Kehoe. 2008. Facts and Myths About the Financial Crisis of 2008. Working Paper no. 666, Federal Reserve Bank of Minneapolis.
- Chernyshoff, Natalia, David S. Jacks, and Alan M. Taylor. 2009. “Stuck on Gold: Real Exchange Rate Volatility and the Rise and Fall of the Gold Standard, 1875–1939. *Journal of International Economics* 77(April): 195–205.
- Christiano, Lawrence, Roberto Motto, and Massimo Rostagno. 2007. Two Reasons Why Money and Credit May be Useful in Monetary Policy. NBER Working Paper No. 13502.
- Demirgüç-Kunt, Asli, and Enrica Detragiache. 1998. The Determinants of Banking Crises in Developing and Developed Countries. IMF Staff Papers 45(1): 81–109.

- Eckstein, Otto, and Allen Sinai. 1986. The mechanisms of the business cycle in the postwar era. In *The American Business Cycle in the Postwar Era: Continuity and Change*, edited by Robert J. Gordon. Chicago: University of Chicago Press.
- Edwards, Sebastian. 2002. Does the Current Account Matter? In *Preventing Currency Crises in Emerging Markets*, edited by Sebastian Edwards and Jeffrey Frankel. Chicago: University of Chicago Press, pp. 21–75.
- Eichengreen, Barry. 2009. The Last Temptation of Risk. *The National Interest* (May/ June): 8–14.
- Eichengreen, Barry, and Mitchener, Kris J. 2003. The Great Depression as a Credit Boom Gone Wrong. BIS Working Paper No. 137, September.
- Eichengreen, Barry, and Carlos Arteta. 2002. Banking Crises in Emerging Markets: Presumptions and Evidence. In *Financial Policies in Emerging Markets* edited by Mario Blejer and Marko Škreb. Cambridge, Mass.: MIT Press, pp. 47–94.
- Farhi, Emmanuel, and Jean Tirole. 2009. Collective Moral Hazard, Maturity Mismatch and Systemic Bailouts. NBER Working Papers 15138.
- Fisher, Irving. 1933. The Debt-Deflation Theory of Great Depressions. *Econometrica* 1(4): 337–57.
- Freixas, Xavier, and Jean-Charles Rochet. 1997. *Microeconomics of Banking*. Cambridge, Mass.: MIT Press.
- Friedman, Benjamin M., and Kenneth N. Kuttner. 1992. Money, Income, Prices, and Interest Rates. *American Economic Review* 82: 472–92.
- Friedman, Milton, and Anna J. Schwartz. 1963. *A Monetary History of the United States: 1867–1960*. Princeton, N. J.: Princeton University Press.
- Geanakoplos, John. 2009. The Leverage Cycle. Cowles Foundation Discussion Papers 1715, Cowles Foundation, Yale University.
- Gertler, Mark. 1988. Financial Structure and Aggregate Economic Activity: An Overview. *Journal of Money, Credit and Banking* 20(3): 559–88.
- Goldsmith, Raymond W. 1969. *Financial Structure and Development*. New Haven, Conn.: Yale University Press.
- Goodhart, Charles. 2007. Whatever Became of the Monetary Aggregates? Peston Lecture, delivered at Queen Mary College, London, on February 28, 2007
- Goodhart, Charles A. E., and Boris Hofmann. 2008. House prices, money, credit and the. macroeconomy. Working Paper Series 888, European Central Bank.
- Gourinchas, Pierre-Olivier, Rodrigo O. Valdes, and Oscar Landerretche. 2001. Lending Booms: Latin America and the World. *Economía* 1 (2): 47–99.
- Gurley, John G., and E. S. Shaw. 1955. Financial Aspects of Economic Development. *American Economic Review* 45(September): 515–38.
- Hume, Michael, and Andrew Sentance. 2009. The Global Credit Boom: Challenges for Macroeconomics and Policy. External MPC Unit Discussion Paper No. 27, Bank of England, June.
- Jermann, Urban, and Vincenzo Quadrini, 2009. Macroeconomic Effects of Financial Shocks. NBER Working Papers 15338, September.
- Jung, Woo S. 1986. Financial Development and Economic Growth: International Evidence. *Economic Development and Cultural Change* 34(2): 333–46.
- Kaminsky, Graciela L., and Carmen M. Reinhart. 1999. The Twin Crises: The Causes of Banking and Balance-of-Payments Problems. *American Economic Review* 89(3): 473–500.
- Kashyap, Anil K., Raghuram G. Rajan, and Jeremy C. Stein. 2008. Rethinking Capital Regulation. *Proceedings*, Federal Reserve Bank of Kansas City, pp. 431–471.
- Kaufman, Henry. 1986. Debt: the threat to economic and financial stability. *Economic Review*, Federal Reserve Bank of Kansas City, December, pp. 3–11.
- Kindleberger, Charles P. 1978. *Manias, Panics, and Crashes: A History of Financial Crises*. New York: Basic Books.
- King, Robert G., and Ross Levine. 1993. Finance and Growth: Schumpeter Might Be Right. *Quarterly Journal of Economics* 108: 717–27.



- Kiyotaki, Nobuhiro, and John Moore. 1997. Credit Cycles. *Journal of Political Economy* 105(2): 211–48.
- Laeven, Luc, and Fabian Valencia. 2008. Systemic Banking Crises: A New Database. IMF Working Paper 08/224, November.
- McKinnon, Ronald I. 1973. *Money and Capital in Economic Development*. Washington, D.C.: Brookings Institution.
- McKinnon, Ronald I., and Huw Pill. 1997. Credible Economic Liberalizations and Overborrowing. *American Economic Review* 87(2): 189–93.
- Mendoza, Enrique G., and Marco E. Terrones, 2008. An Anatomy Of Credit Booms: Evidence From Macro Aggregates And Micro Data. NBER Working Papers 14049.
- Minsky, Hyman P. 1977. The Financial Instability Hypothesis: an Interpretation of Keynes and Alternative to Standard Theory. *Challenge* (March–April): 20–27.
- Mishkin, Frederic S., 1978. The Household Balance Sheet and the Great Depression. *Journal of Economic History* 38: 918–37.
- Modigliani, Franco, and Merton Miller. 1958. The Cost of Capital, Corporation Finance and the Theory of Investment. *American Economic Review* 48(3): 261–97.
- Nolan, Charles, and Christoph Thoenissen. 2009. Financial Shocks and the U.S. Business Cycle. *Journal of Monetary Economics* 56(4): 596–604.
- Pepe, Margaret S. 2003. *The Statistical Evaluation of Medical Tests for Classification and Prediction*. Oxford: Oxford University Press.
- Rajan, Raghuram G. 2005. Has financial development made the world riskier? *Proceedings*, Federal Reserve Bank of Kansas City, pp. 313–369.
- Reinhart, Carmen M., and Kenneth S. Rogoff. 2009. *This Time is Different: Eight Centuries of Financial Folly*. Princeton, N.J.: Princeton University Press.
- Rousseau, Peter L., and Paul Wachtel. 1998. Financial Intermediation and Economic Performance: Historical Evidence from Five Industrialized Countries. *Journal of Money, Credit and Banking* 30(4): 657–78.
- Shaw, E. S. 1973. *Financial Deepening in Economic Development*. Oxford: Oxford University Press.
- Turner, Adair. 2009. *The Turner Review: A Regulatory Response to the Global Banking Crisis*. London: Financial Services Authority.
- Woodford, Michael. 2003. *Interest and Prices: Foundations of a Theory of Monetary Policy*. Princeton, N.J.: Princeton University Press.
- White, William R. 2006. Is Price Stability Enough? BIS Working Papers, no. 205, April.