140 Years of Financial Crises:
Old Dog, New Tricks

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Abstract

Looking at 140 years of modern financial history, this paper analyses what is new and what is old about the 2008/09 financial crisis. I identify a number of traits common to most financial crises in 19th and 20th century economic history. First, systemic banking crises are typically credit booms gone bust, i.e. they are preceded by periods of marked expansions of the balance sheets of financial intermediaries. Second, despite much more active central bank policies, financial crises have remained costly for the real economy. Third, increases of public debt in the aftermath of banking crisis are nothing new, but there are some indications that the costs have increased over time. However, this time was also different in three respects: first, the dependence of the financial system on wholesale funding markets is a historically new phenomenon with major implications for financial stability and monetary policy. Second, the crisis was closely linked to the emergence of global imbalances and unprecedented reserve accumulation. Third, the global credit boom since the late 1970s did not feed into higher investment rates, which raises questions about the economic benefits of the strong increase in financial intensity in recent years.

JEL codes: E44, E51, E58, F30, G20, N10, N20.
Keywords: banking, financial globalization, central banking, monetary policy, financial stability.

Before the financial crisis of 2008/09 there had been no less than 71 systemic banking crises in the past 140 years (1870-2009) in the 14 countries for which we have a detailed body of historical financial data.[1] The unconditional probability of encountering a severe banking crisis in any given year was about four percent. Against this historical backdrop, this article tries to spell out what is historically new and what is old about the financial crisis of 2008/09. I argue that economic history has important insights to offer to the contemporary policy debate about the roots of the crisis and the implications for macroeconomic policy and regulation. If we want to draw the right lessons from the recent crisis, we need to take account of economic and financial history. This is because the tricks might be new, but the dog is old.

On the most general level, financial crises represent disruptions in the financial intermediation process. In contemporary macroeconomic thinking, financial crises are often modeled as "exogenous shocks" to the financial intermediation process that manifest themselves for instance in a sudden widening of credit spreads.[2] Such models enhance our understanding of policy options in the face of disruptions, but they cannot teach us why crises occur so frequently. Treating financial crises as exogenous events is a luxury economic historians do not have.

Thinking about the financial intermediation process and its instabilities exposes important fault lines in modern macroeconomics. Some schools of thought treat finance as a veil and hold the view that details of the financial intermediation (including disruptions) process are of no particular relevance for economic outcomes, a theory that can be traced to the ideas of Modigliani and Miller.[3] In recent decades this position has been associated with the real business cycle school. But for many economists and economic historians the notion that the financial system does not matter remained too radical. Since the 1980s, a so-called “credit view” has gradually become the middle ground of mainstream macroeconomic thinking. This view draws on ideas dating back to Irving Fisher and is associated with the work of Mishkin, Bernanke and Gertler.[4] In these models, the financial system, its aggregate balance sheet, and its leverage matter for macroeconomic outcomes. The financial system can amplify the monetary transmission mechanism through a financial accelerator effect; but there might also be a financial fragility

[1] The countries covered in this article are: Australia, Canada, Denmark, France, Germany, Great Britain, Italy, Japan, Netherlands, Norway, Spain, Sweden, Switzerland, United States. See below on the definition of systemic financial crises.

[2] See for instance *V. Curdia/M. Woodford*, Credit Spreads and Monetary Policy, New York 2009.

[3] *F. Modigliani/M. Miller*, The Cost of Capital, Corporation Finance and the Theory of Investment, in: American Economic Review 48(3), 1958, pp. 261–97.

[4] *F. S. Mishkin*, The Household Balance Sheet and the Great Depression, in: Journal of Economic History 38, 1978, pp. 918–37; *B. S. Bernanke*, Nonmonetary Effects of the Financial Crisis in Propagation of the Great Depression, in: American Economic Review 73(3), 1983, pp. 257–76; *M. Gertler*, Financial Structure and Aggregate Economic Activity: An Overview, in: Journal of Money, Credit and Banking 20(3), 1988, pp. 559–88.

effect induced by collateral constraints, when declining asset values impair lending and cause further declines in asset values.[5]

Yet for some economists, the credit view was also too benign. The BIS view – associated with economists working at the Bank for International Settlements – is that financial-accelerator models are also insufficient because in them the financial system remains by and large passive as a propagator of shocks, not as an independent source of shocks.[6] This is because the standard macroeconomic model had assumptions that economies would exhibit a strong tendency to converge towards steady-state equilibrium. Waves of overoptimistic lending that Hyman Minsky and Charles Kindleberger described would axiomatically be cut short by forces pulling the system back to equilibrium.[7] By contrast, the BIS view is that pro-cyclical credit provision by financial institutions strengthens the upswing and often supports the formation of asset bubbles. During the expansion, the quality of financing degrades, setting the stage for a painful bust when the central bank begins to tighten. Such views about the behavior of financial intermediaries differ from the mainstream in that they allow for prolonged periods of overoptimistic, quasi-irrational behavior by financial market participants. [8]

Economic history has a role to play in this debate. It is clear that with the crisis economic theories detached from careful empirical analysis have lost much of their aura.[9] Based on 140 years of financial data, the aim of this paper is to establish empirically what is new and what is old about the crisis of 2008/09. In the following section, I identify a number of empirical traits common to most financial crises in the past 140 years: first, systemic financial crises are typically credit booms gone bust, i.e. they are preceded by periods of marked expansions of the balance sheets of financial intermediaries. Second, despite central bank interventions, financial crises remained costly for the real economy. Third, also the large increase of public debt following the 2008/09 events is not a new phenomenon, but some evidence exists that the fiscal costs of financial crises have risen over time.

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[5] *B. S. Bernanke/M. Gertler/S. Gilchrist*, The Financial Accelerator in a Quantitative Business Cycle Framework, in: Handbook of Macroeconomics 1, 1999, pp. 1341–93. See also the seminal paper by *N. Kiyotaki/J. Moore*, Credit Cycles, in: Journal of Political Economy 105(2), 1997, pp. 211–48.

[6] *C. Borio/C. Furfine/P. Lowe*, Procyclicality of the Financial System and Financial Stability. Issues and Policy Options, 2001 ; *C. Borio/P. Lowe*, Asset Prices, Financial and Monetary Stability: Exploring the Nexus, 2002; *C. Borio/W. R. White*, Whither Monetary and Financial Stability: The Implications of Evolving Policy Regimes, in: Proceedings, Federal Reserve Bank of Kansas City, 2003, pp. 131–211; *C. Borio/P. Lowe*, Imbalance or "Bubbles?" Implications for Monetary and Financial Stability, in: *W. C. Hunter/G. C. Kaufman/M. Pomerleano* (eds.), Asset Price Bubbles. The Implications for Monetary, Regulatory, and International Policies, Cambridge 2003, pp. 247–70; See also the discussion in *M. Hume/A. Sentence*, The Global Credit Boom: Challenges for Macroeconomics and Policy, in: Journal of International Money and Finance 28(8), 2009, pp. 1426-1461.

[7] *C. P. Kindleberger*, Manias, Panics, and Crashes: A History of Financial Crises, New York 1978; *H. P. Minsky*, The Financial Instability Hypothesis: An Interpretation of Keynes and Alternative to Standard Theory, in: Challenge March/April 1977, pp. 20–27.

[8] Such a view is also taken by *R. Tilly*, Banking Crises in Comparative and Historical Perspective: The Nineteenth Century, in: Bankhistorisches Archiv 1, 2008, pp. 1–17.

[9] *B. Eichengreen*, The Last Temptation of Risk, in: The National Interest, May/June 2009, pp. 8–14.

In the second section of the paper, I will discuss what I consider to be the historically new features of the 2008/09 crisis. I argue that "this time was different" in three respects: first, the crisis of 2008/09 was a crisis of wholesale financial markets. The strong growth of non-monetary liabilities of banks stands out as a historically new phenomenon. Second, the crisis was closely linked to the emergence of global imbalances, or what Niall Ferguson and I have called "Chimerica", a period of uphill flows of capital in the world economy when poor countries' savings were financing a consumption boom in the west.[10] Third, the global credit boom since the late 1970s was atypical in the sense that it was not a lending boom feeding into elevated rates of capital formation. Investment rates have stayed flat while the boom predominantly financed rising land values.

A few upfront definitions are necessary. There is no commonly accepted definition of systemic financial crises, nor is the timing of crises uncontroversial. In line with the previous studies, I define systemic financial crises as events during which a country's banking sector experiences bank runs, sharp increases in default rates accompanied by large losses of capital that result in public intervention, bankruptcy, or the forced merger of major financial institutions.[11] For the post-1960 period detailed crisis histories can be found in the databases compiled by Laeven and Valencia[12], as well in the evidence described by Cecchetti et al.[13] For the earlier years I relied on the coding of financial crisis episodes based on documentary descriptions in Bordo et al. and Reinhart and Rogoff, two widely-used historical data sets (a table showing the crisis events by country can be found in the appendix).[14] A good part of the financial data presented in this paper are based on the cross-country historical database that Alan Taylor and I compiled for our recent study on credit cycles and financial crises.[15]

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[10] *N. Ferguson/M. Schularick*, Chimerica and the Global Asset Market Boom, in: International Finance 10(3), 2007, pp. 215-239; *N. Ferguson/M. Schularick*, The End of Chimerica (Harvard Business School Working Paper 10-037, 2009).

[11] *L. Laeven/F. Valencia*, Systemic Banking Crises: A New Database (IMF Working Paper 08/224, 2008).

[12] Ibid.

[13] *S. G. Cecchetti/M. Kohler/C. Upper*, Financial Crises and Economic Activity (NBER Working Papers 15379, 2009).

[14] *M. Bordo/B. Eichengreen/D. Klingebiel/M. Soledad Martinez-Peria*, Is the Crisis Problem Growing More Severe? In: Economic Policy 16(32), 2001, pp. 51–82; *C. M. Reinhart/K. S. Rogoff*, This Time is Different: Eight Centuries of Financial Folly, Princeton 2009. To give an example for those familiar with German financial history, there are only two recorded systemic financial crisis after the First World War – in 1931 and 2008. Neither the collapse of the Herstatt Bank nor the (regular) problems of the various Landesbanken or the problems of HypoVereinsbank in the early-2000s pass the threshold of being a systemic crisis.

[15] *M. Schularick/A. Taylor*, Credit Booms Gone Bust: Monetary Policy, Leverage Cycles, and Financial Crises (NBER Working Paper No. 15512, 2009).

2. Continuity in Crisis

In this section of the paper I highlight a number of commonalities with regard to financial crises in the past century. Three empirical regularities deserve particular attention. First, banking crises occur after a period of rapid acceleration of credit growth. Boom and bust are closely linked. Second, disruptions of financial intermediation have real economic costs. These real economic effects remain large despite the much more activist policy interventions by central banks in the second half of the 20th century. Finally, financial crises lead to marked increases in public debt– although there are some indications that the costs have risen in recent decades.

2.1. Credit Booms Gone Bust

In the 2008/09 crisis, as in every previous crisis, many causes for the crisis have been identified. Limits to liability and a short-term bonus culture have been cited as a reason for excessive risk taking.[16] Some have pointed to political incentives for excessive risk taking as part of a mistaken social policy agenda.[17] Others have blamed the Greenspan doctrine and Federal Reserve policy that kept interest too low in the wake of the 2001 recession.[18] Others have identified flaws in the reigning doctrine of inflation targeting.[19] Yet another school of thought puts the blame not on short-term interest rates controlled by central banks but on international developments that impact on the term structure of the interest rates.[20] For instance, Ben Bernanke and Mervin King have linked the crisis to capital inflows from developing into developed economies[21], mainly in the form of reserve accumulation by emerging markets. This capital flow bonanza, driven by developing countries' desire to insure against the risks of financial globalization could have distorted long term interest rates.[22]

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[16] *H.-W. Sinn*, Kasino-Kapitalismus. Wie es zur Finanzkrise kam, und was jetzt zu tun ist, Berlin 2009; *P. Alessandri/A. Haldane*, Banking on the State, Bank of England, Mimeo, 2009; *M. Hume/A. Sentance*, The Global Credit Boom: Challenges for Macroeconomics and Policy, in: Journal of International Money and Finance 28(8), 2009, pp. 1426-1461.

[17] See *C. Calomiris*, Banking Crises Yesterday and Today, in: Financial History Review 17(1), 2010, pp. 3-12.

[18] *J. B. Taylor*, Housing and Monetary Policy (NBER Working Paper Series 13682, 2007).

[19] *L. Christiano/R. Motto/M. Rostagno*, Two Reasons Why Money and Credit May be Useful in Monetary Policy (NBER Working Paper No. 13502, 2007). Similar concerns were voiced by *C. Goodhart*, Whatever Became of the Monetary Aggregates? Peston Lecture, delivered at Queen Mary College, London, on February 28, 2007.

[20] *M. Obstfeld*, The Immoderate World Economy, in: Journal of International Money and Finance 29, 2010, pp. 603-614.

[21] *B. Bernanke*, Four Questions About the Financial Crisis, Chairman of the Board of Governors of the US Federal Reserve System, Speech at the Morehouse College, Atlanta, Georgia, 14 April 2009; *M. King*, Governor of the Bank of England, Speech at the University of Exeter, January 19, 2010.

[22] See below. This point is made among others by *Ferguson/Schularick*, Chimerica; *Obstfeld*, Immoderate World Economy; See also *M. Schularick*, Touching the Brakes after the Crash: A Historical View of Reserve Accumulation and Financial Integration, in: Global Economy Journal 9(4), 2009.

I propose to take a slightly different perspective. I want to distinguish between the "deep" and the "proximate" causes of banking crises. I will point to an empirical regularity that underlies most of these episodes: the historical record shows that the proximate cause of financial crises is typically an accelerated rate of credit creation. In other words, whatever the deep cause, systemic financial crises are usually preceded by a period of rapid rise in bank (and potentially other intermediaries') lending: financial crises are credit booms gone bust. The idea is not new. The story underlies the oft-cited works of Minsky and Kindleberger[23], and it has been put forward as a factor in the current crisis[24] but also to explain the Great Depression.[25]

In a paper written with Alan Taylor we have explored this link quantitatively building on a large dataset.[26] We assembled a new annual dataset covering 14 countries over the years 1870–2008. The key data series we worked with is the end-of-year amount of outstanding domestic currency lending by domestic banks to domestic households and non-financial corporations (i.e. excluding lending within the financial system). Banks were defined broadly as monetary financial institutions and include savings banks, postal banks, credit unions, whenever the data are available.[27] Compiling the dataset was no easy task. We are indebted to our many colleagues who provided advice and assistance.[28]

Using these data we could test the credit-crisis link in a basic forecasting framework. We asked a simple question: does a country's recent history of credit growth help predict a financial crisis, and is this robust to different specifications, samples, and control variables? Our predictive analysis of long-term trends in credit creation lent support to the idea that financial crises can be viewed as "credit booms gone wrong".[29] 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 this sense, our historical data vindicate the ideas of scholars such as Minsky and Kindleberger

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[23] *Kindleberger*, Manias, Panics, and Crashes; *Minsky*, Financial Instability.

[24] *E. G. Mendoza/M. E. Terrones*, An Anatomy of Credit Booms: Evidence From Macro Aggregates And Micro Data (NBER Working Papers 14049, 2008).

[25] *B. Eichengreen/K. Mitchener*, The Great Depression as a Credit Boom Gone Wrong (BIS Working Paper No. 137, 2003).

[26] *Schularick/Taylor*, Credit Booms.

[27] We excluded brokerage houses, finance companies, insurance firms, and other financial institutions. It is important to point out that the definitions of credit, money, and banking institutions vary profoundly across countries. This makes direct cross-country comparisons of levels difficult and the focus is on the rates of change of the credit aggregates.

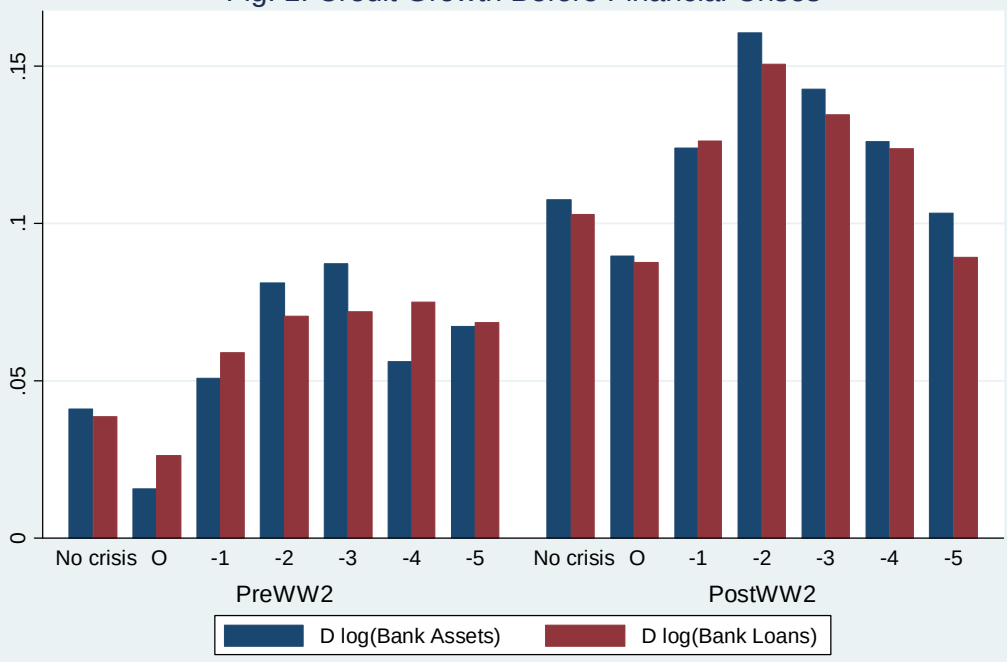
[28] We are grateful to a number of colleagues who shared their data or directed us to the appropriate sources. We wish to acknowledge the support we received from *Joost Jonker* and *Corry van Renselaar* (Netherlands); *Gianni Toniolo* and *Claire Giordano* (Italy); *Kevin O'Rourke* (Denmark); *Eric Monnet* and *Pierre-Cyrille Hautcoeur* (France); *Carl-Ludwig Holtfrerich* (Germany); *Rodney Edvinsson* (Sweden); *Youssef Cassis* (Switzerland); *Pablo Martin Aceña* (Spain); *Ryland Thomas* (Britain). In addition, we would like to thank *Michael Bordo* and *Solomos Solomou* for sharing monetary and real data from their data collections with us. *Kris Mitchener* directed us to the sources for Japan; *Magdalena Korb* and *Nikolai Baumeister* helped with translation.

[29] See *Eichengreen/Mitchener*, Great Depression.

who have argued that the financial system is prone to generate economic instability through credit booms.[30]

I illustrate these findings in figure 2 which shows the growth rates of bank loans and aggregate bank credit in normal times ("No Crisis"), in the three years following a banking crisis ("O"), and in the five years preceding a financial crisis ("-1,-2..."). I divide the sample into a pre- and postwar panel to account for the substantial changes in the regulatory and policy environment. Three points become clearer. First, credit growth during and after a systemic financial crisis is much lower than usual. Financial institutions restrict lending and repair their balance sheets. Second, this "deleveraging" process was much stronger (relative to trend) before World War II. Third, there is a clear difference between credit growth in normal times and during the five years preceding a financial crisis. The growth rate of the credit aggregates is about 25-50 percent higher than trends in these boom years.

Fig. 1: Credit Growth Before Financial Crises



Source: Schularick and Taylor (2009)

Table 1 displays the cumulative increase of three key monetary and financial variables (broad money, total bank loans, total bank balance sheets) in the 5 years before a systemic financial crisis compared to the trend growth rate. Credit growth accelerates markedly in the 5 years before financial crises. In levels, real credit is about 16 percent higher than trend and statistically highly significant. In addition, while bank lending and monetary aggregates show very similar behaviour before World War 2,

[30] A related point is made *by J. Geanakoplos*, The Leverage Cycle (Cowles Foundation Discussion Papers 1715, Yale University, 2009).

post-1945 growth of the money supply is no longer a good leading indicator of financial crises. This suggests that money and credit aggregates have divergent paths in the postwar era – a point that I will return to later.

In sum, 140 years of evidence suggests that financial crises are often credit booms gone bust. While there are many potential reasons for the acceleration of credit growth – easy monetary policy, overoptimistic lending, or microeconomic incentives for risk taking – the proximate cause for crises very often is an expansion of the balance sheets of financial intermediaries. Moreover, the statistical significance of credit growth prior to financial crises episodes implies that this information can be used for early warning purposes.[31] This is a lesson from history that central banks should keep in mind. Credit can play a constructive role for monetary policy and financial stability purposes. Valuable information would be lost if policymakers choose to ignore the behavior of credit aggregates. It is a historical mishap that prior to the crisis of 2008/09 the reigning doctrine had sentenced it to playing no role in monetary policy.

TABLE 1: CREDIT GROWTH BEFORE FINANCIAL CRISES

Cumulative log level effect over 5 years before a crisis, versus non-crisis trend:	Pre–World War 2	Post–World War 2	All Years
Real bank loans	0.156***	0.088**	0.101***
	(0.043)	(0.038)	(0.027)
Loans/GDP	0.057***	0.103***	0.063***
	(0.016)	(0.019)	(0.012)
Real money	0.126***	0.047*	0.083***
	(0.028)	(0.028)	(0.019)

Notes: *** denotes significance at the 99% level, ** 95% level, and * 90% level; standard errors in parentheses. Source: own calculations based on the dataset from Schularick and Taylor (2009).

2.2. The Costs of Crises

In the past 140 years, the real economic costs of financial crises have been large and have remained so despite more active central bank interventions in the second half of the 20th century. There is already an established body of literature in economics that suggests a crisis entails substantial costs.[32] This being

[31] The use of credit aggregates for such predictive models and further tests of predictive power are explored in greater detail in *Schularick/Taylor*, Credit Booms, as well as in *C. Borio/M. Drehman*, Assessing the Risk of Banking Crises, in: BIS Quarterly Review, March 2009, Bank for International Settlements, pp. 29-46.

[32] See *G. L. Kaminsky/C. M. Reinhart*, The Twin Crises: The Causes of Banking and Balance-of-Payments Problems, in: American Economic Review 89(3), 1999, pp. 473–500; *M. Obstfeld/A. M. Taylor*, Global Capital Markets: Integration, Crisis, and Growth, Cambridge 2004; *V. Cerra/S. C. Saxena*, Growth Dynamics: The Myth of

said, the output costs of financial crises are inherently difficult to measure. If financial crises are to some degree the result of unsustainable deviations from a normal development path – driven by asset bubbles, credit booms, and the like in the years before the crisis as I have argued above – then one would expect some downturn to take place irrespective of the disruption in financial intermediation that occurs during a banking crisis. In other words, countries headed towards a crisis may have fundamental economic reasons why, whether they enter a crisis or not, they should be expected to have lower economic growth. In such circumstances, it would be wrong to attribute the entire output loss to disruptions in financial intermediation.[33] All attempts to improve on such event analyses would require that we explicitly model the endogenous element of the crisis – a very difficult task that is beyond the scope of this article.

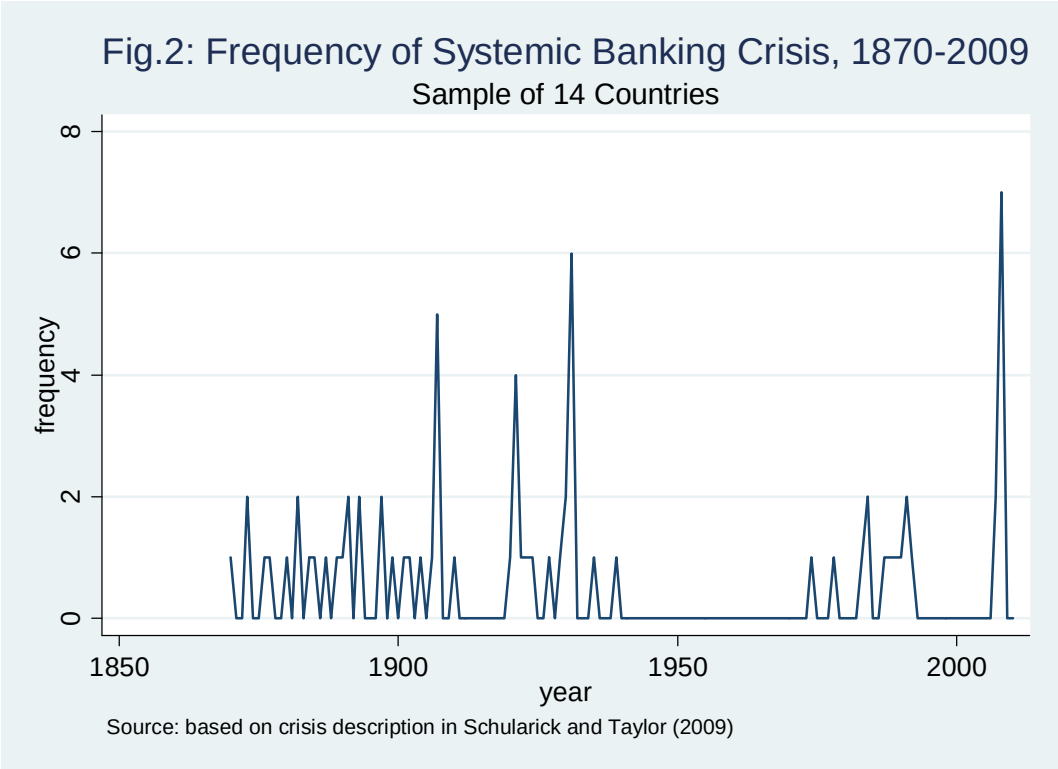
What I propose to do instead is to examine how the costs of financial crises have evolved over time. Specifically, I want to ask whether there is evidence that the costs of financial crises have decreased, potentially as a result of more active central banking. Crisis prevention and management was a crucial reason for the establishment of modern central banks. This motive is particularly clear in the US case where the 19th century was crisis-prone.[34] The Federal Reserve was established in 1913 with the specific aim of preventing banking crises. Through liquidity provision and Lender of Last Resort functions central banks are in a position to support the banking system in times of distress and potentially reduce the economic impact of financial crises. It is therefore a natural question to ask whether the rise of central banking in the 20th century has significantly impacted on the frequency and the severity of financial crises.

Looking at the frequency of systemic financial crises in the past 140 years, an interesting picture emerges (Fig.2). The frequency of banking crises was relatively high before the Second World War. In the three decades after WW2, between 1945 and 1974, not a single systemic banking crisis occurred. After this long, crisis-free interlude, the crisis frequency increased again in recent decades. The high incidence of banking crisis in the late 19th and early 20th century might partly be explained by insufficient liquidity provision and the absence of Lender of Last Resort actions by the central banks. But this does not help to explain the high incidence of banking crises in the past 30 years. Other factors – financial deregulation and international capital market integration come to mind – must have also played a role.

Economic Recovery, in: American Economic Review, 98(1), 2008, pp. 439-457; *C. M. Reinhart/K. S. Rogoff*, This Time is Different: Eight Centuries of Financial Folly, Princeton 2009.

[33] E.g. *Cerra/Saxena*, Myth of Recovery.

[34] See *Tilly*, Banking Crises.



But what about the real economic costs of crises? A very simple approach to account for the costs is to compare the growth rates of GDP and investment in normal times (akin to a trend growth rate) with those in the years following a systemic financial crisis and then add up the foregone output.[35] These effects are shown in Figure 3 which compares the "normal" behaviour of the variables with their behaviour after crises.[36] First, it is clear that output costs remain substantial despite reactive central banks. The chart suggests that in absolute numbers, the impact of financial crises was somewhat smaller in the postwar era. However, the decline in the rate of growth is comparable relative to trend (which was higher on average, mainly driven by the post-war reconstruction boom evident in this sample, but maybe some of the higher growth is also due to central banks). The decline in real investment activity was also somewhat more pronounced before WWII. Yet all in all, financial crises do not seem to have been much less severe in the post-1970 period than under the "barbarous" gold standard.

[35] See *Cerra/Saxena*, Myth of Recovery. Such estimates could err on the high side if GDP and investment are significantly inflated by a pre-crisis boom. I have tested whether GDP and investment are significantly higher in the years leading up to a crisis analogous to the tests carried above for credit growth. The coefficient estimates are small (albeit mostly positive) and statistically insignificant.

[36] Charts and tables are based on the analysis by *Schularick/Taylor*, Credit Booms. A more detailed discussion can be found there.

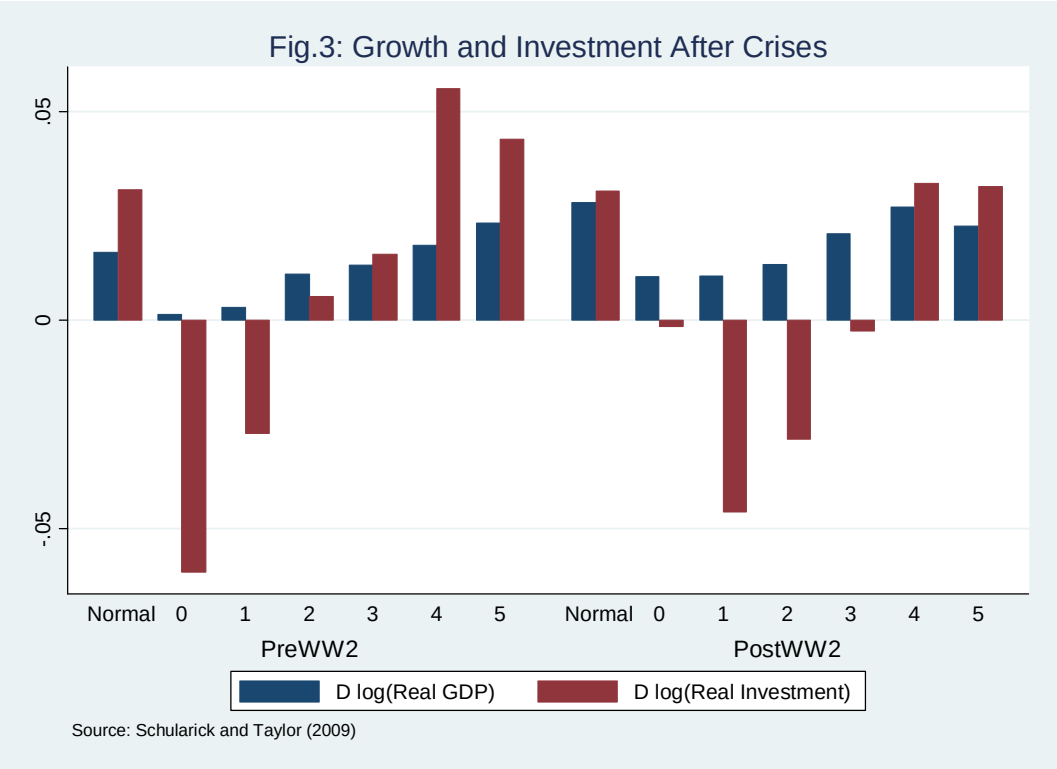


Table 2 displays the cumulative effects over the five years following a crisis. In the aftermath of financial crises post-1945 output dropped a cumulative 6.2 percent relative to trend, and real investment by more than 22 percent. These numbers are broadly comparable with those reported by Cerra and Saxena.[37] The prewar output decline effect is somewhat smaller (-4.5 percent), but this largely an artefact of the Great Depression. Excluding the 1930s (column 2), the cumulative real output and investment declines after crises were smaller and not statistically significant before 1945.

This is a particularly interesting result if seen against the background of potentially much stronger policy interventions by central banks in the post-1945 period. To look at this question in greater detail, table 2 also shows the behaviour of broad money and prices in the two periods. Financial crises in the prewar era were associated with pronounced deflation (for three years), and a significant fall in broad money growth. The reason is that after the Great Depression policy makers have reacted much more strongly to financial crises. The lessons of inaction in the depression of 1929-1931 were learned.

But why have financial crises remained so costly in real terms despite more activist economic policies? One reason is that the financial sector has grown in size. As a result, the shocks hitting the financial sector might now have a larger impact on the real economy. This finding is also consistent with the view that economies suffered less from nominal rigidity, especially before 1913, as compared to the

[37] Ibid.

1930s.[38] But there is also the potential for reverse causality. Implicit government insurance and the prospect of rescue operations might have contributed to the growth of finance and helped create more of the very hazards they were intending to eradicate.

TABLE 2: CUMULATIVE EFFECTS AFTER FINANCIAL CRISES

Cumulative log level effect, after years 0–5 of crisis, versus trend, for:	Pre–World War 2	Pre–World War 2, excluding 1930s	Post–World War 2
Log real GDP	–0.045**	–0.018	–0.062***
	(0.020)	(0.020)	(0.017)
Log real investment	–0.203**	–0.114	–0.222***
	(0.094)	(0.093)	(0.047)
Log broad money	–0.141***	–0.103***	–0.062
	(0.027)	(0.029)	(0.039)
Log price level	–0.084***	–0.047*	+0.009
	(0.025)	(0.027)	(0.028)

Notes: *** denotes significance at the 99% level, ** 95% level, and * 90% level. Standard errors in parentheses. Source: *Schularick/Taylor*, Credit Booms Gone Bust.

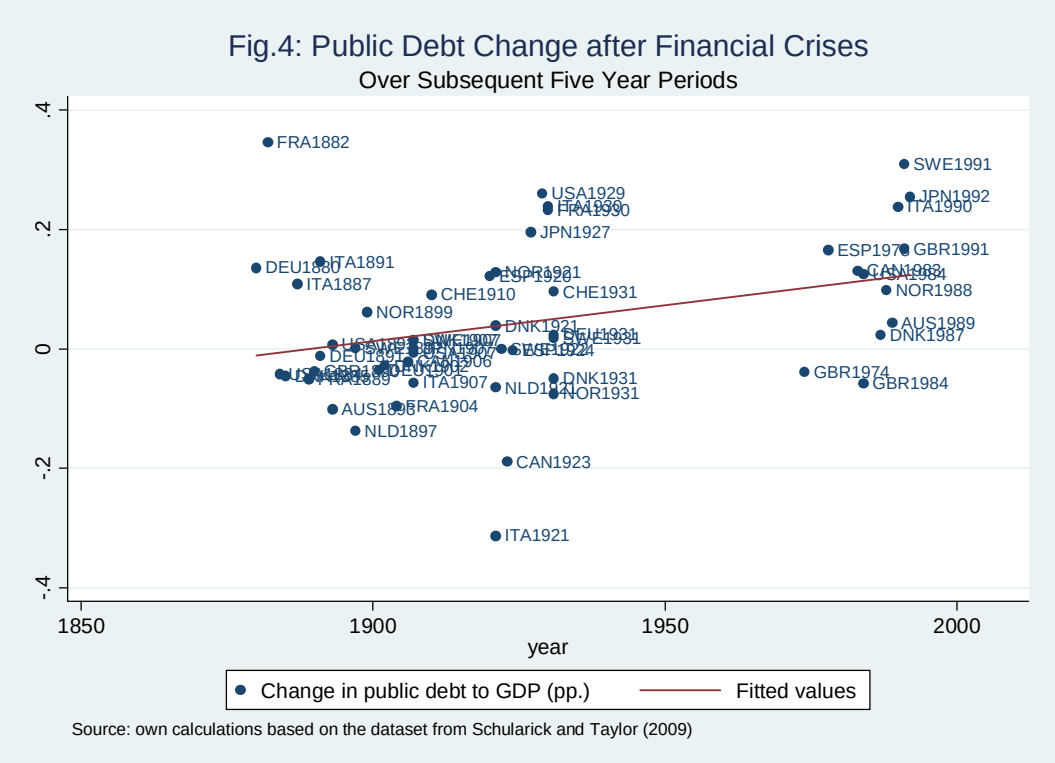
2.3. Financial Crises and Public Debt

The fiscal costs of banking crises stand very at the centre of the contemporary debate. The increase of public debt after crises is a function of the cost of direct bail-outs for financial institutions, but also a function of the support for the ailing economy. Reinhart and Rogoff have analysed the record of public debt deterioration after financial crises in great depth.[39] Their historical narrative demonstrates that financial crises usually involve government intervention, which leads to a considerable worsening of public debt ratios. In this sense, the socialization of the costs of public interventions after banking crisis that we have seen in the 2008/09 crisis is nothing new. More specifically, Reinhart and Rogoff find that on average the real public debt burden increases by 86 percent in the three years following a banking crisis. Yet these numbers look high and depend on the initial level of public debt.[40] The percentage point deterioration in the debt-to-GDP ratio is somewhat less frightening, but still substantial: on average public debt increased by 9 percentage points relative to GDP in the three years after a financial crisis. However, emerging market banking crises figure prominently in the work of Reinhart and Rogoff and there could be fundamental reasons such as foreign currency exposure or dependence on capital inflows why banking

[38] *N. Chernyshoff/D. S. Jacks/A. M. Taylor*, Stuck on Gold: Real Exchange Rate Volatility and the Rise and Fall of the Gold Standard, 1875–1939, in: Journal of International Economics 77, April 2009, pp. 195–205.
[39] *Reinhart/Rogoff*, This Time is Different.
[40] See also *D. Furceri/A. Zdzienicka*, The Consequences of Banking Crises on Public Debt, (Working Paper No. 1015, June 2010).

crisis in emerging markets and in developed countries are different. It is therefore interesting to perform a similar exercise for the 14 countries in the present sample. I ask two questions. First, looking the past 140 years of financial instability, what has been the average increase in public debt after a financial crisis? Second, how have the costs developed over time?

Fig. 4 shows the increase in the public debt to GDP ratio 5 years after a financial crisis (14 country sample). The average financial crisis leads to an increase of the debt ratio by about 5 percentage points, lower than the 9 percentage point figure calculated by Reinhart and Rogoff. The difference could reflect higher costs of banking crisis in emerging markets or their focus on late 20th century crises. The distribution over time is highly unequal. Before 1945, public debt barely increased after financial crises. The mean over all cases is about 2 percentage points. However, after the Second World War, the increase in public debt 5 years after financial crises is a whopping 12 percentage points, close to the 9 percentage point number of Reinhart and Rogoff. In sum, inflation of public debt as a result of banking crisis is nothing new, but the costs seem to have risen over time, potentially reflecting larger financial sectors that impose higher costs on the economy when they run into problems.



Source: own calculations based on the dataset from Schularick and Taylor (2009)

3. New Elements of the Crisis of 2008/09

In the second part of the paper, I turn to the historically new elements of the 2008/09 crisis. I present three main arguments. First, there has been a tectonic shift in the structure of financial intermediation in recent decades. Banks have increasingly relied on non-monetary forms of funding resulting in a large and growing discrepancy between credit and money. Second, the crisis of 2008/09 was closely linked to globalization, international imbalances and the insatiable appetite of emerging markets for financial assets denominated in US dollars. Lastly, the credit boom of the past 30 years has not (or to no meaningful degree) led to higher aggregate investment in productive capacity, contrary to standard models of financial intermediation.

3.1. A New Age of Credit

A number of important structural changes have occurred in the financial intermediation process during the past 30 years. These changes are central to understanding the financial 2008/09 crisis and represent an important "new" element. In a standard model, a bank issues deposits to the public and lends these out to businesses and other households (and the government). Banks' assets consist of loans to the economy and securities purchased. The liability side of banks' balance sheets consists of deposits – the public's money. A fixed part of the deposits is held as reserves with the central bank under reserve requirement rules. A key implication of such a model is that money and credit co-vary identically (at least when capital ratios are fixed). This model of financial intermediation lies is foundational to the monetarist doctrine associated with the seminal contributions of Friedman and Schwartz.[41] If the liabilities of the banking sector are first and foremost monetary, the central bank can exert influence over total lending by steering the aggregate liabilities of the banking sector, i.e. the money supply.

Yet this model describes the world of yesterday. New forms of non-monetary funding of the banking sector have developed and loosened considerably the link between money and credit. This is a new trend that many central banks were progressively confronted with starting in the 1980s, as Friedman and Kuttner have documented.[42] With regard to the 2008/09 crisis, important policy actions such as the Federal Reserve back-stop of the commercial paper market in October 2008 or the FDIC's Temporary Liquidity Guarantee Program in November 2008 that enabled banks to issue debt securities with government guarantees can only be appreciated in this context. The Federal Reserve, in a communication on October 7th 2008 stated:

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[41] *M. Friedman/A. Schwartz*, A Monetary History of the United States: 1867–1960, Princeton 1963.
[42] *B. M. Friedman/K. N. Kuttner*, Money, Income, Prices, and Interest Rates, in: American Economic Review 82, 1992, pp. 472–92.

"The commercial paper market has been under considerable strain in recent weeks as money market mutual funds and other investors, themselves often facing liquidity pressures, have become increasingly reluctant to purchase commercial paper, especially at longer-dated maturities. […] A large share of outstanding commercial paper is issued or sponsored by financial intermediaries, and their difficulties placing commercial paper have made it more difficult for those intermediaries to play their vital role in meeting the credit needs of businesses and households."[43]

The Federal Reserve justified intervention in wholesale financial markets – in this case in the commercial paper market where financial institutions issued wholesale liabilities to pension funds, insurance companies and other financial institutions – by arguing that such action was vital for the financing of the American financial sector and the credit provision of American businesses and households. No mention is made of the money supply and customer deposits. The panic that policy makers had to address was in wholesale markets that have grown to systemic importance.[44]

One can again put these developments in a historical perspective, which Alan Taylor and I have done in greater detail in our recent study. [45] Figure 5 displays the trends in credit and money aggregates (relative to GDP) for 14 countries between 1870 and 2008. Between 1870 and 1940, money and credit were volatile but they maintained a stable relationship to each other and relative to the size of the economy. In the 1930s, both money and credit aggregates collapsed. Yet overall, money growth and credit growth were essentially two sides of the same coin before 1940. The monetarist model of Friedman and Schwarz adequately describes the macroeconomy during these years. However, important changes occurred after WWII. First, credit began a long recovery after the dual shocks to the financial sector from the Great Depression and the war. Loans and bank assets display a very rapid upward trend in the Bretton Woods era and surpassed their pre-1940 highs by about 1970. Second, credit grew not only strongly relative to GDP, but also relative to broad money after WWII. This widening gap between the credit and money aggregates reflects the increasing reliance of financial institutions on new, non-monetary forms of financings such as interbank markets, bonds, repo transactions or the commercial paper markets. After 1970, loan-to-GDP and asset-to-GDP ratios continued ever higher. In the year 2000, they reached levels that were about +0.750 log points (or about two times in level terms) higher than their prewar average.

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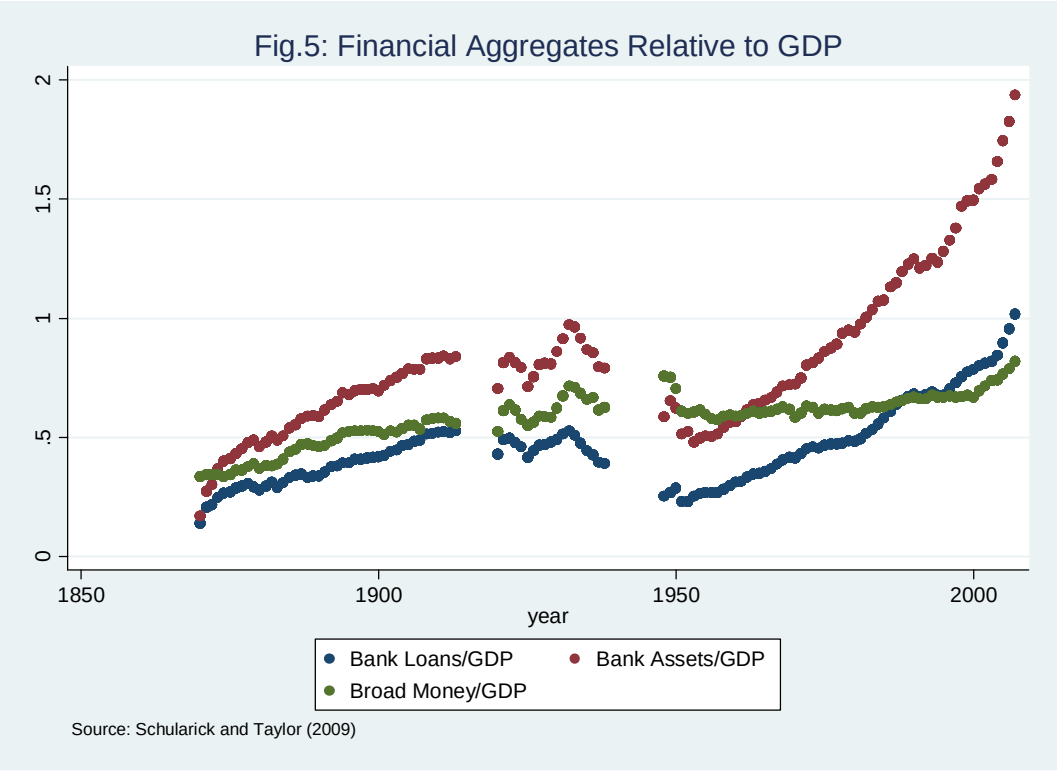
[43] Board of Governors of the Federal Reserve, Press Release October 7, 2008. Available at http:// http://www.federalreserve.gov/

[44] See *T. Adrian/H. Song Shin*, Money, Liquidity, and Monetary Policy, in: Federal Reserve Bank of New York, Staff Report 360, January 2009; *T. Adrian/H. Song Shin*, The Changing Nature of Financial Intermediation and the Financial Crisis of 2007-09, in: Federal Reserve Bank of New York, Staff Report 439, March 2010, pp.1-11.

[45] See *Schularick/Taylor*, Credit Booms; following the approach taken in this study I show the mean of the predicted time effects from fixed country-and-year effects regressions for the dependent variable of interest in order to global average effects. That is for any variable X_{it} we estimate the fixed effects regression $X_{it}=a_i + b_t + e_{it}$ and then plot the estimated year effects b_t to show the average global level of X in year t. Simply speaking, we construct global averages that are independent of the different levels of financial development in each country.



Since the 1970s banks' access to non-monetary sources of finance has become an important factor for aggregate credit provision. What happens in financial markets at large – borrowing conditions, liquidity, market confidence – matters much more than before for financial intermediation. As Adrian and Shin have argued, this could amplify the cyclicality of financing in a major way.[46] The consequences for macroeconomic stability are large, since the conventional transmission mechanisms can be amplified by financial shocks. The increasing dependence of the banking system on access to wholesale funding also means that central banks are forced to underwrite the entire funding market in times of distress in order to avoid the collapse of the banking system as witnessed in 2008/09. The Lender of Last Resort now must step in to confront non-deposit bank runs, which can lead to systemic moral hazard as Farhi and Tirole argue.[47]

This is a paradoxical insight because wholesale funding markets grew so strongly exactly because they offered cheaper funds free from reserve requirements and deposit insurance regulations that made regular deposits relatively expensive for banks. Since the financial crisis of 2008/09, central banks safeguard markets that arose in large part to evade the safety belts of central bank regulation. This

[46] T. *Adrian/H. Song Shin*, Liquidity and Financial Cycles (BIS Working Papers No. 256, 2008).
[47] *E. Farhi/J. Tirole*, Collective Moral Hazard, Maturity Mismatch and Systemic Bailouts (NBER Working Papers 15138, 2009).

represents an obvious inconsistency in the regulatory framework that will have to be closed. If the systemic importance of these wholesale markets is such that they need to be taken under the central bank umbrella in times of stress, reserve requirements, funding rules or other forms of regulations will have to be applied to avoid excess leverage. The 2008/09 crisis exposed these new arteries of financial intermediation.

3.2. Financial Instability, Global Imbalances and Reserve Accumulation

The crisis of 2008/09 was intimately linked to global imbalances and the resulting reverse capital flows, which helped to sustain a credit and consumption boom in the countries at the recipient end of these flows. While international capital flows have played an important role in the run-up to previous financial crises – the Great Depression comes to mind – I will argue that reserve accumulation and uphill capital flows in the world economy represent a new and distinguishing characteristic of the crisis of 2008/09. By depressing global interest rates, mis-pricing risks and financing over-consumption in the world's richest economy, a decade of emerging market reserve accumulation has played a key role in creating and sustaining the global imbalances that made the financial crisis so devastating. In particular China's rapid economic development went hand in hand with growing imbalances in the international economy: Contrary to what standard neoclassical models predict, in the newly integrated world economy capital was not flowing from rich countries to the poor periphery chasing higher returns, but instead it was flowing uphill, from the poor periphery to the rich center economy (mainly to the United States). The country that issues the world's reserve currency became a major recipient of international capital flows, mainly in the form of reserve accumulation, and overdosed on cheap financing.[48]

With the benefit of hindsight, it seems obvious that a world order built on net capital flows from poor to rich countries was prone to generate instability. The accumulation of large war chests of foreign reserves in the periphery opened up a Pandora's box of financial distortions in the world economy. Persistent currency intervention caused a growing distortion in the global cost of capital: the real economic shock of China's integration into the world economy should have led to a lower capital-labor ratio and hence higher real interest rates.[49] But global interest rates – both long-term and short-term – continued to fall. Lower interest rates enabled American households to increase consumption levels and heightened the imbalance between savings and investment in the US. Had it not been for the Chinese willingness to fund America’s consumption, interest rates in America would have been substantially higher, acting as a circuit breaker for the credit bubble. In addition, as foreign savings

[48] For a more detailed historical analysis of the link between imbalances and the crisis see *Ferguson/Schularick*, The End of Chimerica.
[49] See *Ferguson/Schularick*, Chimerica and the Global Asset Market Boom.

were predominantly channeled through government (or central bank) hands into safe assets such as Treasuries, private investors turned elsewhere to look for higher yields. This led to a sharp increase of the price of interest sensitive assets and a re-pricing of financial risk, which led to development of new financial products such as securitized debt instruments.[50] In the words of Mervin King, Governor of the Bank of England:

"The massive flows of capital from the new entrants into western financial markets pushed down interest rates and encouraged risk-taking on an extraordinary scale[…] Capital flows provided the fuel which the developed world's inadequately designed and regulated financial system then ignited to produce a firestorm that engulfed us all." [51]

Reserve accumulation in China and other emerging markets served two goals: first, currency interventions were intended to promote export competitiveness; second, they helped build up reserves as a cushion against the risks associated with growing economic and financial integration, painfully illustrated by the experience of other countries during the 1997-8 Asian Crisis.[52] It is true that export-led growth resulting in growing foreign exchange reserves is nothing new. At first sight, the close analogy between the economic rise of China in recent decades and the experiences of Germany and Japan in the postwar decades is apt. These countries owed much of their rapid growth to manufacturing exports. However, the resemblance ends here. In historical comparison it becomes clear that an unprecedented amount of capital was flooding the US economy in recent decades. The US economy in turn did not hesitate to use the unlimited credit line that was extended by the rest of the world.

According to IMF data, emerging and developing economies had about 630 billion dollars of currency reserves in 1998 when the Asian crisis struck. By 2008, emerging market currency reserves had grown by a factor of 6 to 4.2 trillion.[53] Figure 6 shows the amount of dollar-denominated reserves accumulated by West Germany and Japan from the 1950s to the 1970s and by China since 1990. The accumulated stock of dollar reserves is scaled by U.S. GDP to show the relative size and impact of reserve accumulation on the American economy.[54] The chart demonstrates how outsized China's reserve accumulation has been compared with the experience of Germany and Japan. Capital inflows from the

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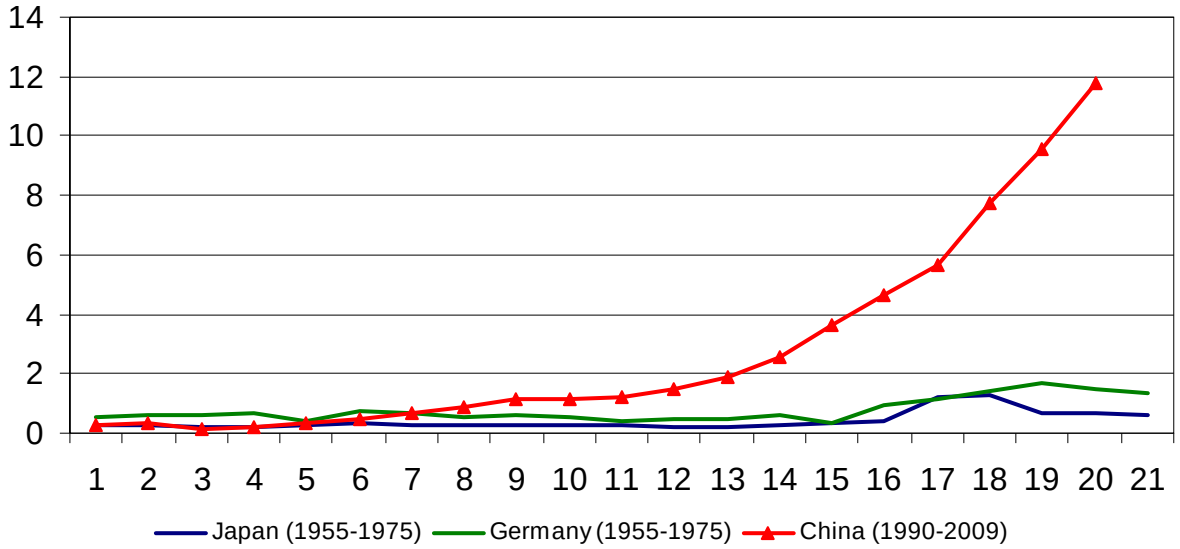
[50] Economic Report of the President, Washington D.C., January 2009; also *C. Hunt*, Financial Turmoil and Global Imbalances - the End of Bretton Woods II, Reserve Bank of New Zealand Bulletin 71(3), 2008.
[51] *M. King*, Governor of the Bank of England, Speech at the University of Exeter, January 19, 2010.
[52] *M. Feldstein*, A Self-Help Guide for Emerging Markets, in: Foreign Affairs 78, March/April 1999; *M. Obstfeld/J. Shambaugh/A. Taylor*, Financial Instability, Reserves, and Central Bank Swap Lines in the Panic of 2008 (NBER Working Paper No. 14826, 2009).
[53] The data come from *International Monetary Fund*, Currency Composition of Official Foreign Exchange Reserves (COFER), 2009.
[54] In China's case I assumed 70 per cent of reserves are held in dollars: for Germany and Japan we assumed all reserves were held in dollars, certainly a generous assumption in this context.

rest of the world, the dominant part of which in the form of reserve accumulation, allowed the United States to outspend its national income cumulatively by about 50% since 2000.[55]

Fig. 6: Foreign currency reserves, per cent of US GDP



Source: Ferguson and Schularick (2009)

Yet the current crisis can be interpreted more generally as a crisis of financial globalization. Looking more closely at the patterns of reserve accumulation in recent years, Maurice Obstfeld and his co-authors have shown that a central motif behind reserve accumulation was insurance against the risks entailed by financial globalization.[56] The more financially integrated a country is, the more it aims to protect itself against the risks stemming from such financial openness. This collective policy of self-insurance against the vagaries of volatile financial flows might have made individual countries safer, but not the world economy as a whole.[57] In the light of the current crisis, the economic case for a world economic order in which capital flows from poor to rich countries is even weaker now than it has been before. On top of doubts about the economic wisdom of withdrawing savings from the developing to the developed world, a new lesson from the crisis is that sizeable reverse capital flows are likely to end up distorting prices and inflating an asset or consumption bubbles of some kind. In this sense, the recent experience adds to doubts about the economic benefits of financial globalization more generally. Financial globalization during the past decade was mainly diversification finance, not development

[55] *H. Reisen*, Shifting Wealth: Is the U.S. Dollar Empire Falling? VoxEu.org, June 20, 2009.
[56] See *Obstfeld/Shambaugh/Taylor*, Financial Instability.
[57] Reserve accumulation might also have been excessive; *O. Jeanne*, International Reserves in Emerging Market Countries: Too Much of a Good Thing? in: Brookings Papers on Economic Activity 1, 2007.

finance in the form of net transfers of capital.[58] As a consequence, countries' openness to international capital flows has not been correlated with domestic investment.[59] Recent theoretical research has also shown that the direct benefits of financial integration are likely to be rather small.[60] This calls for new thinking about the risk and benefits of financial globalization.

3.3. A New Type of Global Credit Boom

Finally, I want show that the structure of the global credit boom in recent decades was unexpected in a number of ways and represents a challenge for economic thinking. Table 3 shows the percentage point change in total bank credit to GDP volumes between 1975 and 2008 for the 14 countries in the sample. On average, bank credit over GDP increased by about 50 percentage points in the past 30 years, while bank assets over GDP increased by about 100 percentage points. These figures would be considerably higher if the growth of assets of shadow banks and other new forms of market-based lending were included.[61] The data show that the credit boom was a global phenomenon. This global nature of the credit boom is a strong argument against explanations of the financial crisis that focus on government-induced distortions to the US housing market.[62] It might be surprising to find the United States – the home of the crisis – at the bottom of the table. But the simple reason for this is that the data presented here refer to banking institutions only. The credit boom in the US has mainly occurred outside the traditional banking system in so-called shadow banks and other market-based forms of intermediation. Including the rise in market-based lending by other financial institutions would put the US near the top of the list. Since 1975, non-bank credit to households and firms expanded by about 80 percentage points relative to GDP.[63] Table 3 also demonstrates that the growth of bank assets (i.e. including securities held on balance sheets) has been far greater than the growth of lending. In countries that did not see a major credit boom, e.g. Germany, the growth of balance sheets has also been strong as banks have purchased financial claims abroad or expanded their securities trading.

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[58] *Obstfeld/Taylor*, Global Capital Markets.
[59] *M. Schularick/T. Steger*, Financial Integration, Investment, and Economic Growth, in: Review of Economics and Statistics, 2010.
[60] *P.-O. Gourinchas/O. Jeanne*, The Elusive Gains From International Financial Integration, in: Review of Economic Studies 73, 2006, pp. 715-741.
[61] *Hume/Sentance*, Global Credit Boom.
[62] *C. Calomiris*, Banking Crises Yesterday and Today.
[63] Ibid.

TABLE 3: THE GLOBAL CREDIT BOOM 1975-2008

Change of credit to GDP, percentage points

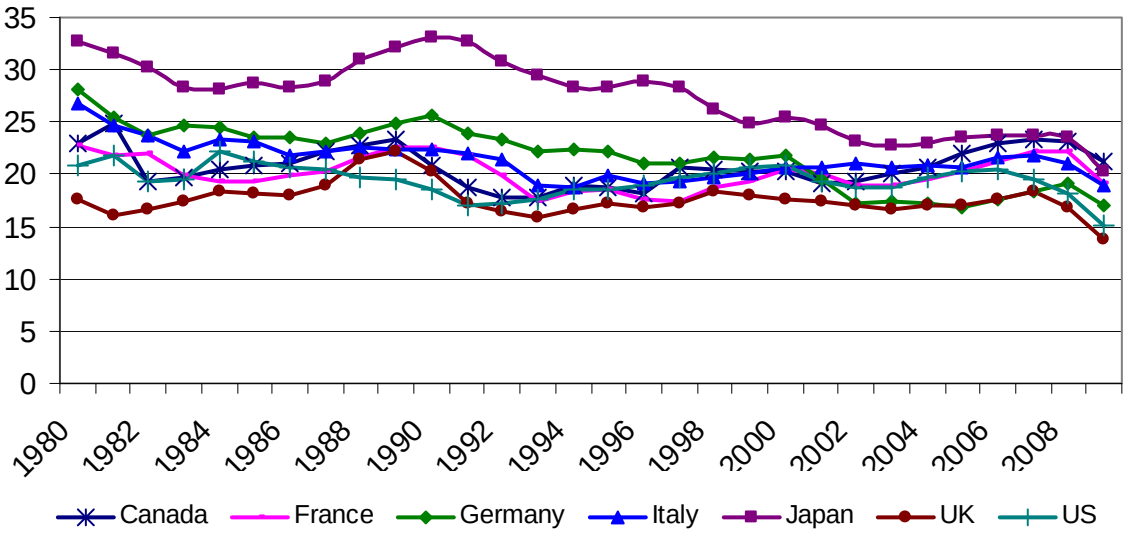
Country	Bank Loans/GDP	Bank Assets/GDP
Denmark	100.56	118.36
Australia	84.69	157.64
United Kingdom	73.97	202.38
Norway	54.47	41.26
Italy	52.31	62.57
Sweden	51.16	176.35
Netherlands	45.65	101.22
Spain	40.29	51.93
Canada	32.88	65.09
France	22.54	40.31
Switzerland	20.35	170.17
Germany	17.49	97.63
United States	15.69	21.77
Japan	11.66	14.47
Average	*44.55*	*94.37*

Source: own calculations based on the dataset from Schularick and Taylor (2009).

What is surprising, however, is that the strong growth in credit and financial intensity of many western economies has, contrary to most economic models, not been accompanied by a rise in investment. Figure 7 clearly demonstrates that the global credit boom of the past decades was not accompanied by a particularly strong investment cycle. Investment rates (including housing investment) have more or less stayed flat in recent decades. Standard models of financial intermediation build on the assumption that the role of the financial sector consists of pooling savings and lending them out for productive investment.[64] This is clearly not a good description of reality in the past decades. Also Austrian business cycle theory – in which recessions and financial crises are typically the result of overinvestment induced by manipulation of interest rates by central banks – does not look validated by recent events.

[64] For a detailed discussion see *A. Turner*, What Do Banks Do? Why Do Credit Booms and Busts Occur and What Can Public Policy Do about It? in: The Future of Finance: The LSE Report, London 2010.

Fig. 7: Gross capital formation 1980-2009, % of GDP



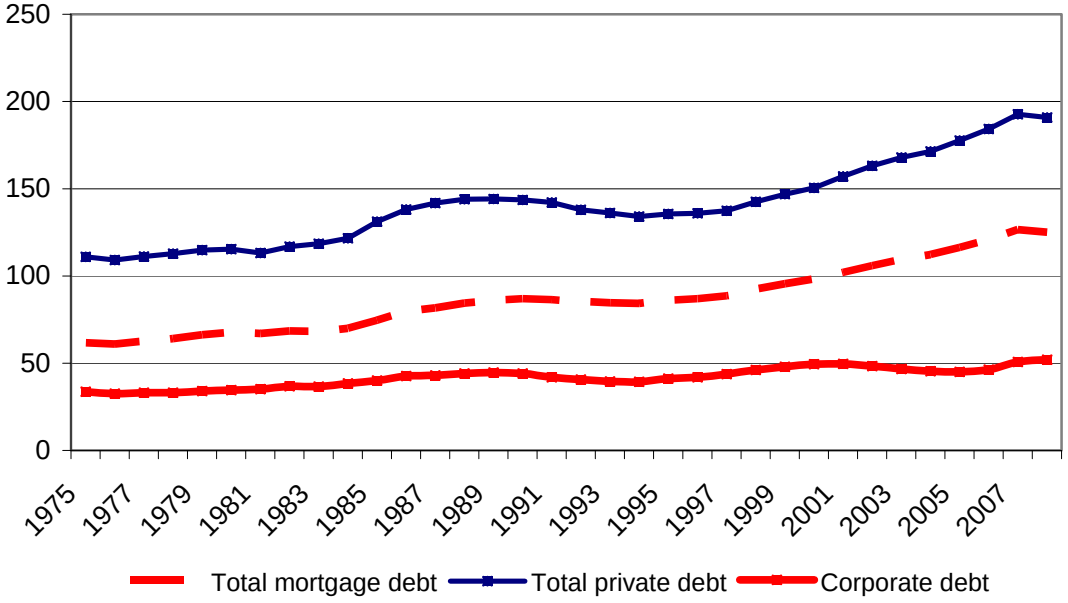
Source: IMF (2010)

But if the rising stock of credit has not financed additions to the capital stock, where has all the lending gone? The answer varies slightly from country to country – but overall it is: into real estate. This is illustrated in figure 8 for the US case. The marked extension of credit has been first and foremost a mortgage boom, both for private and commercial real estate.[65] Yet the predominant function of the boom in mortgage finance was not to enable new housing investment. No doubt, some countries like the United States and Spain have seen construction booms. But the lion's share of the increase in mortgage credit to GDP in the past two decades did not come through a higher net housing stock; it came through a higher market value of housing. Simply put, the value of land has risen very strongly in many countries. While this is not to say that easy access to mortgage finance for the purchase of existing housing stock has no economic value, it nonetheless has implications for how we think about the economic value of the recent credit boom.[66]

[65] *Hume/Sentence*, Global Credit Boom; *Turner*, Banks.

[66] Liquid mortgage markets allow consumers to smooth housing consumption which bring some welfare gains. A similar logic applies to commercial real estate lending – at least to the degree that it has enabled companies to make highly leveraged purchases of existing assets. See *Turner*, Banks.

Fig. 8: US private debt by type of credit 1975-2008, % of GDP



Source: Federal Reserve (2010)

Understanding that the recent credit boom was not closely linked to aggregate investment also has important implications for the debate about future regulation. Thinking about the right levels of capital and liquidity rules for the financial system should include a cost-benefit analysis of stricter regulation. There is general agreement that a key benefit would be greater financial stability. But considerable disagreement exists about the potential costs. The view from economic history is illuminating in this respect: what stands out as a historical fact about credit booms of the past decades and the crisis of 2008/09 is that very little of the new lending in recent decades has gone into productive investment. To the degree that tighter financial regulation could be targeted at addressing these past excesses, it is not certain that tighter regulation would negatively impact the level of investment and hence future growth.

A related question that arises from a longer term perspective is what the economic benefits of the strong growth of leverage and credit in recent decades have been. Positive views of the role of finance have a long tradition in economic history. Authors like Gerschenkron, Goldsmith, and Shaw had little doubt that finance played an important role in the early stages of the modern growth process.[67] Joseph Schumpeter, in his 1939 book on "Business Cycles", characterized financiers as the engine of the development process culminating in the famous statement that the creation of credit is the "monetary

[67] *A. Gerschenkron*, Economic Backwardness in Historical Perspective, Cambridge 1962; *R. W. Goldsmith*, Financial Structure and Development, New Haven 1969; *E. S. Shaw*, Financial Deepening in Economic Development, Oxford 1973.

complement of innovation".[68] But some scholars and policy makers have started to question the positive effects of financial deepening at already high levels of financial development.[69] Lord Turner, the Head of the UK Financial Services Authority, has framed the issue in stark terms: [70]

"There is no clear evidence that the growth in the scale and complexity of the financial system in the rich developed world over the last 20 to 30 years has driven increased growth or stability."

4. Lessons from 140 Years of Financial Crises

In this paper I have tried to describe what is old and what is new about the financial crisis of 2008/09. In doing so, I made two implicit claims. The first is that it is important to look at the crisis though a historical lens and make comparisons over time. Only when we disentangle the common element in financial crisis from the specific can we hope to get a clear picture of what went wrong this time. The second implicit claim I made is that economic and financial history has a useful role to play in the policy debate. For whatever reason, economic and financial historians – with a few notable exceptions – have by and large left the discussion of policy and advice for policy-makers to theoretical and applied economists. Yet economic history, as an empirical science has important contributions to make. What are the key lessons that stem from looking at the crisis of 2008/09 in the long run?

First, history has shown time and again that is right for policymakers to be somewhat skeptical about the inherent rationality of financial markets and to get worried when the financial markets get excited. This does not mean that each acceleration of credit growth is necessarily evil. But acknowledging the inherent tendency of financial players to live though boom and bust cycles and think about implications for leverage limits could be a start. In other words, central banks will have to acknowledge that a Taylor-rule does not contain everything they need to know about the economy. A corollary of this view is that economic history teaches policy makers to be more distrustful of the price signals coming from financial markets. This does not imply that central bankers are better than the market in determining the fundamental value of financial assets. But it implies more critical awareness that the price of an asset does not have to be right even it is produced by competitive markets.

The second main historical lesson for the policy debate is that bank capital should not be the only focus. It is true that capital is slim and that financial intermediaries have dramatically reduced their capital buffers in the course of the 20th century – potentially even in response to repeated government bail-outs:

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[68] *J. Schumpeter*, Business Cycles. A Theoretical, Historical, and Statistical Analysis of the Capitalist Process, New York and London 1939.
[69] See *Hume/Sentence*, Global Credit Boom; *Turner*, Banks.
[70] *Turner*, Banks, p. 6.

heads we win, tails you lose.[71] But this is a rather old problem. Funding leverage constitutes a new feature of the crisis of 2008/09. Western financial systems have never before depended so strongly on access to wholesale financial markets. Central banks have stepped in to protect the public's money for good reasons. But it is not clear why the public has an interest to protect the value of risky investments of insurance companies, pensions, and other professional investment managers.

Our ancestors lived in an age of money where banks' liabilities were monetary assets of the public. We live in an age of credit where credit exceeds money by a large margin. This insight has powerful implications for policy. Banks have become more unstable, because risks now linger on both sides of their balance sheets. In the old days, banks realized losses on their assets when loans went bad, but thanks to the public guarantee of deposits, their funding remained stable. In the new world of wholesale finance, risks on both sides lead to a much less stable system. In this sense, our current banking system shares more in common with the 19th century before deposit insurance was introduced.

The third point that emerges from the historical analysis is the link between the crisis and global imbalances. In a world of high capital mobility, there are risks emanating from the soft budget constraint faced by the issuer of the world reserve currency. This structural weakness of the global monetary system became evident in the crisis. The American quasi-monopoly on issuing the world's reserve currency for international trade and financial transactions has led to a constant flow of funds into the US economy. Just like an emerging market in good times, the US economy partly overdosed on cheap debt.

In this sense, the crisis of 2008/09 was more than just another financial crisis – even if it was a big one. It also represents a crisis of financial globalization that scholars and policymakers will have to consider closely in the coming years: the very mechanism through which countries sought to insure against the risk of volatile global financial flows contributed to the emergence of systemic financial instability on a much bigger scale. Historically, the ups and downs of global capital market integration have been driven by political and economic assessments of the benefits of capital mobility. In light of recent evidence, the question as to whether the benefits of financial globalization outweigh the costs will have to be addressed with new rigor.

[71] *P. Alessandri/A. Haldane*, Banking on the State, Bank of England, Mimeo, 2009.

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, the crisis coding follows previous work, notably Reinhart and Rogoff (2009), and Bordo et al. (2001). Source: Schularick and Taylor (2009).