

# Inequality and Banking Crises: A First Look<sup>1</sup>

A B Atkinson, Nuffield College, Oxford and London School of Economics

Salvatore Morelli, University of Oxford

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The paper was written while one of the authors (ABA) was visiting the Department of Economics, Harvard University, and one (SM) was visiting the NBER. The hospitality of these institutions is gratefully acknowledged. The paper is based on a data-base for 25 countries covering 100 years described in Atkinson and Morelli (2010), which draws on earlier research by Atkinson (2003), Brandolini (2002) and by the authors of the country studies in the top incomes project published in Atkinson and Piketty (2007 and 2010). None of these authors or institutions should be held responsible for the ways in which we have used the data or for the views expressed.

## 1. Introduction: inequality and financial crises

### 1.1 Inequality ⇔ crisis

Many people, governments, and international organisations are concerned about the impact of the recent financial upheaval on inequality. What is the distributional impact of a banking crisis? If banking crises are associated with boom and bust, do we see inequality following the same path of rise and fall? Is there, as we call it here, a “classic”  $\Lambda$  relationship? Does this mean that we are likely to see less inequality in the immediate future? If, in the United States, the year 1928, just before the Great Crash of 1929, marked a high water mark for top income shares and income inequality fell subsequently in the US, will we experience the same today? Is a financial crisis a “defining moment”?

The period prior to the 2007-8 financial crisis did see rising income inequality in a number of OECD countries, notably an increased share of total income accruing to those at the very top. Has the current crisis reversed this trend? Or has the classic relationship been replaced by one where the rich gain, not lose, from financial crises? In seeking to answer these questions, can we distinguish between the impact of the initial crisis and that of the policy responses of governments and monetary authorities? Can we distinguish between the impact of the financial crisis and that of the macro-economic downturn that has followed? Does one (the financial crisis) mainly affect the wealthy and the other (the recession) mainly affect the rest of the population? Is the impact of a financial crisis on inequality different from any other occasion when the stock market fell precipitately? (Here we should note that we are using the term “inequality” generically at this stage, to include, for example, poverty, gender inequality and inequality of opportunity; the different concepts are distinguished later.)

The distributional effect of banking crises is the first of the two major questions addressed in this paper. The second major question is concerned with the reverse relationship between inequality and financial crises. Is the present financial crisis the result of inequality? This may appear an outlandish suggestion, since most mainstream accounts of the origins of financial crises give no role to distributional considerations. The indexes to three authoritative studies of financial crises, by Kindleberger and Aliber (2005), Krugman (2009) and Reinhart and Rogoff (2009), contain neither “inequality” nor “income distribution”. Inequality does not appear in Robert Shiller’s *The Subprime solution* (2008) until 3 pages before the end (in the Epilogue). The US Financial Crisis Inquiry Commission, set up in 2009 to investigate

“the most significant financial crisis since the Great Depression”, was charged with examining 22 specific areas. None of these refer to inequality.<sup>2</sup>

On the other hand, a number of economists including Joe Stiglitz, former Chief Economist of the World Bank, Raghuram Rajan, former Chief Economist of the International Monetary Fund, and Jean-Paul Fitoussi, have begun to argue that income inequality was a contributory factor leading to the *occurrence* of the 2007-8 US financial crisis. The Stiglitz (2009) hypothesis is that, in the face of stagnating real incomes, households in the lower part of the distribution borrowed to maintain a rising standard of living. This borrowing later proved unsustainable, leading to default and pressure on over-extended financial institutions. The thesis is spelled out in greater detail by Fitoussi and Saraceno, there was

“an increase in inequalities which depressed aggregate demand and prompted monetary policy to react by maintaining a low level of interest rate which itself allowed private debt to increase beyond sustainable levels. On the other hand the search for high-return investment by those who benefited from the increase in inequalities led to the emergence of bubbles. Net wealth became overvalued, and high asset prices gave the false impression that high levels of debt were sustainable. The crisis revealed itself when the bubbles exploded, and net wealth returned to normal level. So although the crisis may have emerged in the financial sector, its roots are much deeper and lie in a structural change in income distribution that had been going on for twenty-five years” (2009, page 4).

According to Rajan, “growing income inequality in the United States stemming from unequal access to quality education led to political pressure for more housing credit. This pressure created a serious fault line that distorted lending in the financial sector” (2010, page 43). In *The Economist* discussion of his ideas, however, they have been rejected by other leading economists; for David Laibson, for example, “income inequality was not a major contributor”. And, even if we entertain the possibility that inequality may indirectly have contributed, we have to clarify whether it is *growing* inequality that is responsible or whether it is the *high level* of inequality that is the cause. The policy implications could be quite different.

What is the empirical evidence to support the charge that inequality contributed to the occurrence of the current crisis? In the case of the argument by Stiglitz and Rajan, the implicit reference is to the rise in US inequality in recent decades. However, as has been stressed by Krugman (2010), any such empirical association does not imply causality. Both rising inequality and the occurrence of financial crises may be the common result of a third, causal, factor. For example, it

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<sup>2</sup> The closest is a reference to the compensation of employees in the financial sector compared with those with similar skills in other sectors.

has been argued that the probability of financial crises has increased as a result of financial liberalisation: “the number of banking crises per year more than quadruples in the post-liberalisation period” (Kaminsky and Reinhart, 1999, page 476). Financial liberalisation may, at the same time, have increased earnings in the financial sector (see Philippon and Reshef, 2008), and hence contributed to rising income inequality. The way in which increased international financial integration has affected inequality has been investigated in Morelli (2007 and 2008). Or, on the “classic” business cycle view, a banking crisis may be precipitated by the ending of a period of economic expansion, and the subsequent downturn (Gorton, 1988). Inequality may too follow the cycle, but with no causal link in either direction to the banking crisis.

There is, therefore, much to discuss.

## 1.2 Aim and structure of the paper

In order to investigate both the crisis to inequality hypothesis (C to I, for short) and the inequality to crisis hypothesis (I to C, for short), we need first to clarify what we mean by “inequality”. Inequality of what and among whom? Newspaper coverage has tended to focus on top income shares, whereas Stiglitz and Rajan refer to the lower part of the income distribution. Which is relevant today? Should we be looking at inequality of income or consumption? Is it income or wealth?

These questions are taken up in Section 2. The same section considers what is required empirically when measuring inequality, and emphasises that we cannot simply take the necessary data “off the shelf”. In his *The Subprime solution*, Shiller (2008, page 31) describes his surprise in discovering that there were no data on the long-term performance of house prices. The same applies to data on inequality. Long-term data on inequality have to be assembled. This paper makes use of a data-set, covering the hundred years from 1911-2010, described, together with the sources, in Atkinson and Morelli (2010). The new data-set is based on a number of valuable building blocks. In particular the studies of top incomes, largely resulting from the project organised by Atkinson and Piketty (2007 and 2010), provide an anchor for the empirical analysis. But we wish also to cover, as far as possible, the distribution as a whole, and to follow what happens to poverty as well as riches. The series that we present therefore show not only top income shares but also measures of overall inequality and measures of low incomes. Here we are able to draw on the collection of historical data assembled over the years by Atkinson and Brandolini (see for example, Brandolini, 2002). We wish to consider the separate roles of labour income and capital income, and have therefore shown the long-term changes in the distributions of earnings and wealth. While the end result falls short of our ambition of covering in full, and for all dimensions, a hundred year period, the data set used here provides a long-term perspective on the evolution of inequality.

This new data set is used in Sections 3 and 4 to examine the empirical evidence about the extent of increasing inequality and the timing of changes in relation to macro-economic crises. How far do the two go together? In this Introduction, we have focused on the US, and we start with the US, as the epi-centre of the current crisis, in Section 3. Was the 1929 Great Crash a “classic”  $\Lambda$ -shaped crisis? How does it compare with the Savings and Loan crisis of the 1980s? Is today’s crisis more like the 1980s or like 1929? The paper goes on in Section 4 to consider in detail two other groups of countries that have seen major crises - the Nordic countries and Asia. These include the “Big Five crises” in developed countries (apart from Spain (1977)), and two of the “Big Six” in the 1997-1998 Asian financial crisis (see Reinhart and Rogoff, 2009, page 225). The paper then presents summary evidence for a further set of countries around the world. In all, our data set covers 25 countries, chosen on account of the availability of distributional data.<sup>3</sup>

Looking across countries is valuable for several reasons. The comparative experience of different countries, with differing institutions, is a potential source of evidence about the two relationships we are investigating. As one of us has shown in earlier work (Morelli, 2007 and 2008), the impact of crises on inequality differs across countries (and across time). In how many cases do we find a  $\Lambda$ -shaped pattern for the movement in inequality before and after a banking crisis? Iceland 2007 seems to be following this pattern (Olafsson and Kristjansson, 2010), but how common is it? In selecting the countries covered, we have sought to include those from whose experience we can learn about economic crises. These include those countries that have not experienced financial crises, since non-events are also informative. We have also chosen those for which evidence is available over a long run of years. This limits the geographic coverage, and our set of countries is weighted towards the OECD, but it does include 11 countries outside North America and Europe. A global reach is important, since financial crises have - historically and today - a major international dimension. Global contagion means that we may have to seek causal factors abroad. If US inequality causes a US financial crisis that spreads across the world, then it has global ramifications. A crisis may stop of being global, but have wide regional ramifications. Singapore, for example, is not recorded as having a banking crisis in 1997, but was undoubtedly influenced by the crises in neighbouring countries. Equally, within a country such as the United States, the crisis may originate in certain states, and it may be misleading to look just at the aggregate picture (as we do here).

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<sup>3</sup> The countries covered are Argentina, Brazil, Australia, Canada, Finland, France, Germany, Iceland, India, Indonesia, Italy, Japan, Malaysia, Mauritius, Netherlands, New Zealand, Norway, Portugal, Singapore, South Africa, Spain, Sweden, Switzerland, the UK and the US.

It should be stressed that *long-term data* are essential. As noted by Reinhart and Rogoff, much of the literature, in their case on debt and default, draws on data for recent decades, since that is readily available, but the study of financial crises requires a much longer run of years: “a data set that covers only twenty-five years simply cannot give one an adequate perspective” (2009, pages xxvii and xxviii). In a different, but related context, Barro and Ursúa note that pinning down the probability of economic “disasters” requires long time series for many countries since they are dealing with rare events (2008, page 255). Here too long-run data are essential. We have to place the changes in inequality around banking crises in the context of the longer-run evolution of economic inequality. In order to identify the impact of crises, we need to abstract from the longer-run developments. Inequality changes over time. The hypothesis of Kuznets - that inequality first rises and then falls in the process of industrialisation - has been replaced by the notion that we have witnessed a U-shape, with inequality in OECD countries first falling and then rising over the course of the second half of the twentieth century. We need to see how far this was in fact true, since the impact of a banking crisis has to be seen against the background of longer-term change.

At the same time, when considering the distributional consequences of past crises, we do not assume that history will repeat itself. The recent study by Roine, Vlachos and Waldenström using data covering the period 1900-2000 for 16 countries concluded that a banking crisis would reduce the share of the top 1 per cent by about 0.2 percentage points for each year of the crisis (2009, Table 7) (they find no significant relation with currency crises). But are the effects of a banking crisis today the same as those in the past? A plethora of books have been published (or republished) on the subject of the Great Crash of 1929. But post-war crises may have been different, and the events of the 1980s and 1990s may not be a good guide to the consequences of the 2007-8 crisis. There may be grounds for supposing that “this time it is different”. The pattern of inequality before and after the crisis may have taken the form of a “hiatus” where the banking crisis caused a pause in an otherwise increasing degree of inequality, or the pattern may have been an “uptick”, where inequality began to rise after a period of stability, as it did in Singapore after the 1997 Asian financial crisis.

The evidence for different countries is summarised in the form of “clear-glass window” plots. These plots, standard in the crisis literature, show for each country the evolution of inequality around each financial crisis. The plots are described as “clear-glass”, since they show the data as they simply appear to the naked eye. No allowance is made for the changes that might otherwise have been expected. For this reason, the summary in Section 5 is described as providing “initial” conclusions. We need to consider the underlying mechanisms before we can draw final conclusions, and these mechanisms will be the subject of the next stage of our research. There is much “unfinished business” in terms both of research and of policy.

### 1.3 Identifying crises

When we embarked on this project on the inequality/crisis relationship, we envisaged that we could take over from the macro-economic literature an “agreed” list of systemic banking crises and their dates, and in this way not add any further selection bias.<sup>4</sup> The identification would be independent of our prior knowledge of the distributional data. However, this belief was rapidly proved to be naïve. We soon discovered that the term “crisis” means different things to different researchers. Even where people are agreed that a crisis has occurred they may disagree about its timing. We have referred above to the “2007-8 crisis”, reflecting the fact that for some it started in 2007, for others the crisis began with the collapse of Lehman Brothers in mid-September 2008.

We need first to be clear as to what we are seeing to measure. Two points should be emphasised. First, we are concerned with *systemic* banking crises, not events limited to a single bank or a few banks. So, for example, the failure of Barings in the UK in 1995 is not classified as a banking crisis. Secondly, we are concerned with banking crises not with stock market collapses. Banking crises are typically associated with stock market crashes, but the converse is not true. There have been many steep falls in share prices that have not threatened the stability of the financial system. Stock prices fell sharply in the US in 2000, but this was not associated with a banking crisis (see Mishkin and White, 2003).

The definition of Laeven and Valencia spells out well what is involved: “under our definition, in a systemic banking crisis, a country’s corporate and financial sectors experience a large number of defaults and financial institutions and corporations face great difficulties repaying contracts on time. As a result, non-performing loans increase sharply and all or most of the aggregate banking system capital is exhausted. This situation may be accompanied by depressed asset prices (such as equity and real estate prices) on the heels of run-ups before the crisis, sharp increases in real interest rates, and a slowdown or reversal in capital flows. In some cases, the crisis is triggered by depositor runs on banks, though in most cases it is a general realization that systemically important financial institutions are in distress” (2008, page 5). As we have emphasised, our concern is with systemic crises, and for this reason we have not included those cases (for 2008) that they (Laeven and Valencia, 2010) classify as “borderline”.

The classification of Laeven and Valencia (2010), which builds on earlier work (Caprio and Klingebiel, 1996, and Caprio, Klingebiel, Laeven, and Noguera, 2005), is one of the three on which we base our analysis. Their data set does not however start until 1970. The two other major data sets on which we draw go back much further in

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<sup>4</sup> As has been discussed in the literature on financial crises, the “event method” used to identify banking crises may incorporate other forms of selection bias (see Morelli, 2010).

time. These are the widely-used databases on systemic banking crises of Bordo et al (2001),<sup>5</sup> and Reinhart and Rogoff (2008, 2009, and Reinhart 2010). The main features are summarised in Table 1. In many cases, these sources coincide in their identification of banking crises, but there are a substantial number of disagreements. The latter reflect in part differences in approach and in part differences in judgment. The US Savings and Loans crisis provides an example. Bordo et al identify it as a banking crisis, and give 1984 as the start date. Reinhart-Rogoff give the same start date, but describe it as a non-systemic crisis (it is listed in italics), although they comment that “it is just a notch below the ‘Big Five’” protracted large-scale financial crises that they examine (Reinhart and Rogoff, 2008, page 340). Laeven-Valencia identify it as a “systemic banking crisis”, but give the date as 1988.

Our aim has been to combine these different sources in an objective manner. We have therefore followed the following “majoritarian” rules for a particular country and year:

- a) where there are three sources, we identify a banking crisis where it is identified as such by at least 2 of the 3 sources;
- b) where there is a single source, we follow the identification;
- c) where there are 2 sources, we follow the identification where they are in agreement (the treatment of cases of disagreement is described below).

In applying the rules, we have in the case of Reinhart-Rogoff only taken crises described as “systemic” in Reinhart (2010). Thus, in the case of the US Savings and Loan, we do not count Reinhart-Rogoff (but it is still identified by our rules as a systemic crisis, since the other two sources agree in so classifying it). On the other hand, in the case of the United Kingdom, Reinhart and Rogoff (2009, page 388) refer to a “secondary “banking crisis in 1974-6, to the failure of Johnson Matthey in 1984, of BCCI in 1991 and of Barings in 1995. However, Reinhart (2010) lists 1974 and 1984 as only “non-systemic”, and has no entries for the 1990s. And no banking crises are registered in the UK in the post-war period by Bordo et al (2001) or by Laeven and Valencia (2010). Taking the majority view, we have therefore treated the UK as not having had a systemic banking crisis in these years.

We have applied the majoritarian rules to the 25 countries studied here. In the greater part of cases, the identification is determined by rules a) and b). In case c) there are a number of ties. These mostly arise where the crisis was identified by Reinhart-Rogoff but not by Bordo et al. We note here that the latter “dropped crises

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<sup>5</sup> In this database, the restriction to “systemic” banking crises is implicit, in that they refer to Caprio and Klingebiel (1996 and 1999) and adopt their dates.



for which there was insufficient data to estimate the years required to return to the pre-crisis rate of GDP growth (because of the intervention of a war or because of data problems)” (2001, Web Appendix, page 3). These cases are not identified as such in the Bordo et al database, and we therefore decided to include all tied cases. We have however dropped 1914 for the US. 1914 was “tied”, with Bordo et al (2001) not indicating a systemic crisis, but it being included by Reinhart (2010). The New York Stock Exchange was indeed closed from July to December in response to the war, but Reinhart and Rogoff indicate clearly that “a banking crisis was averted” (2009, page 390). It does not therefore seem to us that this can be treated as a banking crisis.

A full list of the resulting 72 systemic banking crises as defined by these rules is given in Table 2. Of these, 5 cases are of banking crises that occurred when the country was engaged (or about to be engaged) in a world war (France and India in 1914, Japan in 1917, and Finland and the Netherlands in 1939). There are evident problems in dissociating the distributional consequences from those of the war, and in our analysis we drop these cases. On the same grounds, we drop India 1947, since that was the year in which India became independent, and before and after cannot readily be compared. Dropping these cases (shown in italics and underlined in Table 2) reduces the total to 66 cases. Of these 66, 6 relate to 2007-8.

It may be seen that our sample of 25 countries includes 3 countries where there are no recorded systemic banking crises, and a number of countries that enjoyed long periods without a crisis. These countries are nonetheless worth studying. To begin with, the absence of crises is of itself of interest. As Sherlock Holmes famously remarked, the dogs that do not bark may be as interesting as those that do. Secondly, the consequences of banking crises may cross national boundaries, so that when studying, for example, the 1997 Asian financial crisis it is important to include countries that were not recorded as directly experiencing systemic banking problems.

The identification of a systemic banking crisis in our data set is based on the start date.<sup>6</sup> A number of authors have also attempted to identify the duration of crises. Eichengreen and Bordo (2002), for example, attach the value 1 for the years 1930 to 1933 inclusive in the US. But here there is even less agreement. In order to decide on the timing, there is first need for conceptual clarification. Different classifications may be needed for different purposes. If we are interested in the role of past (possibly lagged) inequality in causing financial crises, then the relevant date may be that at which the crisis can be said to have commenced. On the other hand, when examining the impact of the crisis on inequality, we may be concerned with the duration and intensity of the crisis. If the crisis has a contemporaneous impact on

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<sup>6</sup> There is disagreement about the start date in a number of cases. We have for example followed Reinhart (2010) rather than Laeven and Valencia (2010) in taking 1987 as the start date for Norway, rather than 1991, and 2007 as the start date for Germany and Iceland, rather than 2008. Specific cases are discussed further in the text below.

inequality, then the appropriate indicator may be one that takes the value 1 for the duration. Or if the crisis has a continuing effect we may want to take a value capturing the peak of the crisis (possibly with a staged build-up). In the case of the US Savings and Loans crisis, Haugh et al (2009) say that this “came to a climax in 1988”. In what follows, we return to the issue of duration on a case by case basis.

Banking crises are often associated with depressed (or even crashed) stock and real estate markets. Mishkin (1991) argued that US crises occurring in the 19th and early 20th centuries typically started with a stock market crash, and the same is true for the period covered here. Mishkin and White (2003) identify stock market crashes by reference to 1929 and 1987, the benchmark being that a crash takes place where there is a fall of at least 20 per cent (in nominal terms) is recorded. However, the identification varies depending on which index of stock prices is employed and on the time window used. The Dow Jones Industrials index (based on 20, later 30, large companies) is the only one available for the whole century on a daily and weekly basis. Using the window of a 1 or 2 days, or a week, the Dow-Jones only identified 1929 and 1987 as crashes. Using a window of a year, the Dow Jones identifies over the period since 1911 the following: 1914, 1915, 1917, 1920, 1921, 1930-33, 1937, 1938, 1970, 1974, and 1988. The 12 months window would certainly include also 2008 as Dow went down around 20 per cent from October 2007 peak to June 2008 and by more than 50 per cent up to March 2009. The Standard and Poor’s 500 index (previously the Cowles index), which much broader coverage of the stock market, and applying a 12 month window, identifies ten out of fifteen of the same years, and an additional four: 1918, 1941, 1947 and 1975. Combining these with the NASDAQ index, covering smaller and high-tech firms, Mishkin and White (2003) arrive at a list of thirteen major stock market crashes in the period since 1911: November 1917, December 1920, October 1929, September 1937, June 1940, September 1946, April 1962, May 1970, November 1973, October 1987, August 1990, August 2000, and October 2007 (which we have added). Matching our assembled crises dataset with information provided in Mishkin and White (2003) provides evidence that US banking crises since 1900 have indeed been all associated with a form of stock market crash. Conversely, for ten of the thirteen major stock market crashes there was no associated systemic banking crisis.

The sources described above also identify currency crises and debt crises. As has been emphasised by Reinhart and Rogoff, “crises often occur in clusters” (2009, page xxvi). They stress the systemic risks posed by excessive debt accumulation, where the international dimension is particularly important. Banking crises are often linked to balance of payments problems (Kaminsky and Reinhart, 1999). It can be argued that many of the crises identified here as banking crises are better considered as originating as currency crises. The difference may be important when considering the I to C hypothesis, since the mechanism invoked - such as increased poverty leading to higher rates of loan default - may be specific as a cause to the case of banking crises. The other way round, the C to I hypothesis, is less affected unless there are systematic differences between the distributional impact of banking crises that are

linked to currency crises and those that are not linked. Morelli (2007 and 2008) has controlled for currency crises when investigating the relationship between increased financial integration and inequality.

The negative macro-economic consequences of banking crises have been much discussed: “downturns following banking crises are found to be more protracted with larger output losses” (Haugh, Ollivaud and Turner, 2009, Abstract). These authors focus on the “Big Five” crises plus the US Savings and Loan crisis. Starting from the opposite direction, Barro and Ursúa (2008) have identified consumption and GDP “disasters”, where there were cumulative declines from peak to trough of at least 10 per cent. They identify 95 consumption disasters (in 24 countries) and 152 GDP disasters (in 36 countries) over the period since 1870. Of the 60 banking crises identified here (excluding those in 2007-8), 22 are associated with consumption or GDP disasters as defined by Barro and Ursúa (2008). These are discussed further below.

**Table 1 Three approaches to the identification of systemic banking crises**

Bordo, Eichengreen, Klingebiel and Martinez- Peria	They identify currency and banking crises from a survey of the historical literature. For an episode to qualify as a banking crisis, it must imply either bank runs, bank failures and the suspension of convertibility of deposits into currency (a banking panic), or else significant banking-sector problems (including failures) that are resolved by a fiscally underwritten bank restructuring. They assign value of 1 to the categorical variable for the duration of the crisis. Their data cover the period 1880-1998.
Reinhart- Rogoff	Following Kaminsky and Reinhart (1999), they have dated banking crises using an approach based on a chronology of events. They mark a banking crisis by two types of events: (1) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions (as in Venezuela in 1993 or Argentina in 2001); and (2) if there are no runs, the closure, merging, takeover, or large-scale government assistance of an important financial institution (or group of institutions), that marks the start of a string of similar outcomes for other financial institutions (as in Thailand 1996-97). They date the beginning of a banking crisis. We have used the identification of “systemic” banking crises in Reinhart (2010), where the data typically start in the nineteenth century.
Laeven- Valencia	The authors classify an event as a <b>systemic banking crisis</b> , when country’s corporate and financial sectors experience a large number of defaults and financial institutions and corporations face great difficulties repaying contracts on time. As a result, non-performing loans increase sharply and all or most of the aggregate banking system capital is exhausted and this situation may be accompanied by depressed asset prices (such as equity and real estate prices). By combining quantitative data with some subjective assessment of the situation, they identify the starting year of systemic banking crises around the world, excluding banking system distress events that affected isolated banks. Their data cover the period

Table 2 List of systemic banking crises

Country	1911-1944	1945-1979	1980-2010
Argentina	1914, 1931, 1934		1980, 1989, 1995, 2001
Australia	1931		
Brazil	1914, 1923, 1926, 1929	1963	1990, 1994
Canada	1912, 1923		
Finland	1921, 1931, <u>1939</u>		1991
France	<u>1914</u> , 1930		
Germany	1925, 1931		2007
Iceland			2007
India	<u>1914</u> , 1921, 1929	<u>1947</u>	1993
Indonesia			1992, 1997
Italy	1914, 1921, 1930, 1935		1990
Japan	<u>1917</u> , 1923, 1927		1992
Malaysia			1985, 1997
Mauritius			
Netherlands	1914, 1921, <u>1939</u>		2008
New Zealand			
Norway	1921, 1931, 1936		1987
Portugal	1920, 1923, 1931		
Singapore			1982
South Africa			
Spain	1920, 1924, 1931	1977	2008
Sweden	1922, 1931		1991
Switzerland	1921, 1931, 1933		
UK			2007
US	1929		1984, 2007

Note: cases shown in italics and underlined are not covered by our analysis since the countries were engaged (or about to be engaged) in a world war or became independent (India, 1947).

## 2 The what and which of inequality measurement

“Inequality”, like “crisis”, means many different things to different people. And, as with the definition of crises, there are problems in empirical implementation. These are the subject of this section.

### 2.1 Inequality of what?

Inequality is a controversial subject. This is not because people disagree about its importance. Most people agree that concern for equality is a key goal of a democratic society. Where they disagree, as Amartya Sen has stressed, is about the question posed in the title of this section. Inequality of what? Equality before the law and equality of political rights are enshrined in the typical modern constitution, to which there is wide assent. But there is less agreement about the degree to which societies should be concerned about economic and social inequalities. How extensive should be the dimensions of equality?

In seeking to establish the range of possible answers to this question (and hence the variables to be considered), we need to distinguish between *instrumental* and *ultimate* concerns for inequality. It can be argued, for example, that equality of political rights cannot be achieved if there is excessive economic inequality. Economic power generates political power, as is evident from observing U.S. electoral campaigns. As Mark Hanna (C19 Senator) remarked, “there are two things that are important in politics. The first is money and I can’t remember what the second one is”. This means that we should investigate those dimensions of economic inequality that give rise to unequal political influence. Wealth and income may be more relevant than consumption.

In the present context, the I to C hypothesis is concerned with inequality for instrumental reasons. The answer to the question - inequality of what? - depends in this case on the nature of the causal mechanism. If the origin of the crisis is seen to lie in households becoming over-extended as a result of borrowing to maintain their living standards in the face of falling incomes, the relevant variable is the distribution of disposable income. With a political influence explanation, the key variable is more likely to be the stock of wealth. Since we have not yet considered in detail the possible theoretical bases for the I to C hypothesis, we cannot at this stage draw conclusions about the appropriate definition of inequality. Instead, we summarise a (non-exhaustive) menu from which choices can be made. Economic inequality has many dimensions. Below we list 7 such dimensions, and, as is briefly identified, within each there are further choices to be made.

- a) *individual gross earnings*, where this may relate to hourly earnings (or wage rate), weekly earnings, or annual earnings (affected by periods of unemployment or non-employment);
- b) *total family or household gross earnings*, where the unit may be the narrow nuclear family (husband, wife, partner), may extend to include other relatives living in the household (for example, grown-up children), or to cover all household members;
- c) *total family or household gross income*, where to gross earnings are added non-earned income from capital (interest income, dividends, or rents) and from transfers (for example, unemployment benefit, state or private pensions, child benefit), which can be defined in different ways (inclusion or exclusion of income in kind, non-cash benefits, capital gains and losses), in each case an adjustment may be made for household size and composition via an equivalence scale;
- d) *total family or household disposable income*, as under c), after the subtraction of direct taxes and social insurance contributions;
- e) *total household consumption*, where consumption may or may not include durable goods and housing;
- f) *net worth*, the value of assets minus liabilities, covering financial and real assets, and which may be extended to include the value of pension rights, and which may be defined on an individual or a family or a household basis;
- g) *lifetime economic status*, defined as a measure of total resources (or consumption) over a person's life, discounted at an appropriate rate and possibly with an adjustment for the length of life.

In what follows, we seek to provide evidence about several of these dimensions, but we are naturally limited by what is available. In particular, there are no regular time series on the distribution of lifetime economic status, and official statistics tell us much less about consumption than about income. To have items that are “off the menu” is frustrating to any diner; here they should be seen as reminders of the limitations of the choices made.

Examination of the C to I hypothesis also depends on the definition of I. Which of the possible variables listed above is of concern? Here the answer depends, not on economic mechanisms, but on social judgments, and different people will give

different responses. The same applies to the question - with *which* inequality should we be concerned?

## 2.2 Which part of the parade should we be watching?

The well-known (and tall) Dutch economist, Jan Pen, introduced the idea of envisaging the income distribution as a parade, where people appeared in turn in the order of their income, with their height stretched or shrunk to represent the extent of their income. The first people would be very small, with some of them walking upside down. After quite a long time, more than half the parade, we get to people with average income, who would be 5 foot 9 inches or 5 foot 4 inches, depending on whether they were men or women. Heights then begin to rise. People with three times the average would be around 16-17 feet tall. The President of Harvard would be about 22 yards tall, and top hedge fund managers could reach a mile or more. More prosaically, this is the inverse of the cumulative distribution, showing the income corresponding to different percentiles of the distribution, as shown in Figure 1. Pen introduced the parade as a way of showing who was where in the distribution. Here we want to ask - which part of the parade should we be watching?

For some people, it is not inequality as such that is their concern, but *poverty*: the fact that families or households have an unacceptably low level of resources or standard of living. It is the first part of the parade that we should be watching. As it was expressed by Martin Feldstein in his Presidential Address to the American Economic Association, in the context of social policy, “to the extent that distributional concerns motivate the design of social insurance, the emphasis should be on eliminating poverty and not on the overall distribution of income or the general extent of inequality” (2005, page 12). Poverty may be defined in terms of either low income or low consumption, and measured either relatively (e.g. 60 per cent of median) or absolutely (\$X in terms of purchasing power), or more broadly in terms of social exclusion. But, however it is measured, the concern is with the lower part of the distribution.

Despite the biblical assertions to the contrary, it may be quite possible for a rich society to reduce poverty. Indeed, a number of governments have set poverty reduction targets, including, in its Europe 2020 Agenda, the European Union. Achievement of this goal is however consistent with considerable remaining differences in economic status, and there are those who, unlike Feldstein, are concerned with what happens in the rest of the parade. The proportion of US household income that takes the form of transfers has increased in recent years, and we may be concerned with who is paying for this redistribution. The burden may have fallen on those in the lower middle income ranges. From the income parade, we can locate *where* in the distribution inequality is rising or falling. We can distinguish “top inequality”, affecting only the upper percentiles. We can see whether the middle



income groups have lost out to those at the tails - sometimes referred to as polarisation - in which case the Lorenz curve moves upwards at the bottom, but downwards at the top. Or it may be that crises hit both those at the top, whose earnings and capital incomes are more sensitive to the business cycle, and those at the bottom who lose their jobs.

When looking at the whole distribution, we can make use of another graphical device: the Lorenz curve showing the percentage of total income received by the bottom  $x$  per cent. One advantage of the Lorenz curve is that we can get everyone into the picture. In Pen's parade the top income groups disappeared off the top of the page, whereas the high incomes of hedge fund managers or others form part of the share of the top 5 per cent. The Lorenz curve is a useful diagnostic device, but it does not reduce overall inequality to a single number. A single number is often called for in policy debate. The EU includes in its agreed common social indicators a measure of income inequality based on the shares of quintile groups (fifths of the population): the ratio of the share of the top 20 per cent to the share of the bottom 20 per cent (referred to as S80/S20, since the top 20 per cent start at the 80<sup>th</sup> percentile). In this way, it may be seen as encapsulating both "bottom inequality" (a low share of the bottom 20 per cent) and "top inequality" (a high share of the top 20 per cent). But the EU also includes in its agreed common indicators the Gini coefficient, an alternative measure of inequality that is most simply explained in terms of the "mean difference", which is the average difference between the incomes (or any other variable) of all pairs of 2 people chosen from the population. The Gini coefficient is half the mean difference divided by the mean (arithmetic average). In other words, a Gini coefficient of 30 per cent means that, if we chose 2 people at random, then the expected difference in their income is 60 per cent of the mean.

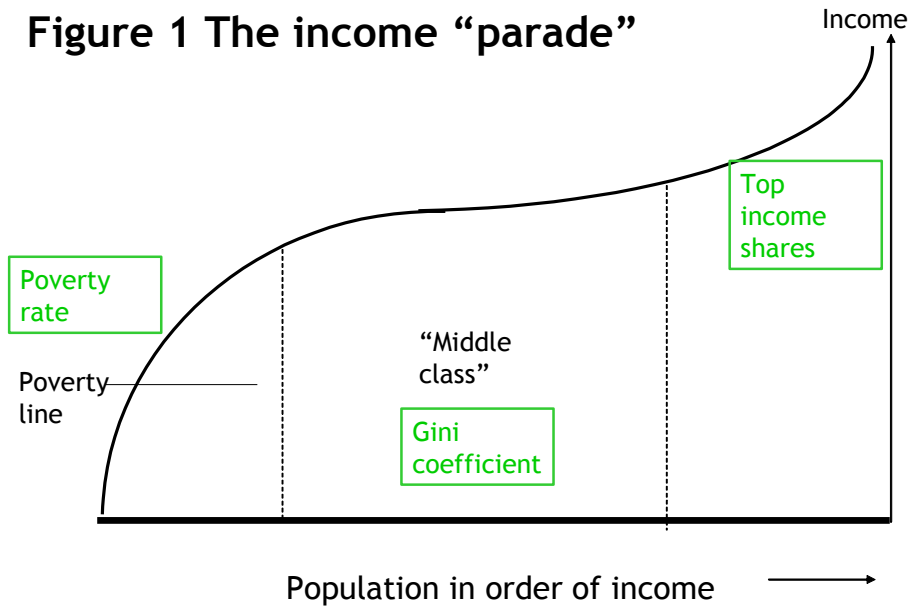
The fact that the EU uses *two* inequality measures reflects the fact that there is no single index that summarises the whole information about the distribution. The income distribution among 120 million US households cannot be reduced to a single number. Any single index involves judgments about which inequalities are more important. The S80/S20 ratio is a top/bottom measure. It does not capture what is happening to the "middle" income groups. In contrast, the Gini coefficient, while sensitive to what happens at the tails,<sup>7</sup> gives more weight to redistributions in the

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<sup>7</sup> If we consider the top population share  $P$ , with an income share  $S$ , and the Gini coefficient within this group is  $G_{top}$  and the Gini coefficient within the remaining  $(1-P)$  of the population is  $G_{bottom}$ , then the overall Gini coefficient is  $S \cdot P + (1-P)(1-S)G_{bottom}$  (see Alvaredo, 2010). If we suppose that  $G_{top}$  is zero, and that  $G_{bottom}$  is 30 per cent, then a rise in the share of the top 5 per cent from 20 to 30 per cent would raise the overall Gini from 38 to 45 per cent. Allowing for inequality within the top 5 per cent would increase this figure, but it may be seen that the additional effect is less than  $\frac{1}{2}$  percentage point (10 per cent times 0.05 times the Gini, which is less than 1).

middle of the distribution. It is the Gini coefficient that is most commonly used in official statistics, and it will be the main overall summary statistic employed here.

**Figure 1 The income “parade”**



### *Horizontal inequalities*

The account given so far of inequality is a “vertical” one, but there are also important concerns about horizontal inequalities. People differ in a large number of ways. Many of these dimensions are, rightly, regarded as irrelevant in assessing social justice. No country, to our knowledge, publishes statistics on the incomes of those people who are colour-blind compared with those who are not. At the same time, there are important dimensions where we would be concerned if people with a particular characteristic systematically found themselves lower down the economic scale. It is for this reason that the US Census Bureau publishes poverty rates by ethnic groups: white, black, Hispanic, and Asian. It is for this reason that the Italian government publishes poverty statistics by region. In the cases of ethnic and regional inequity, there may be concerns about the fragmentation of society, and for political stability. In many countries there is concern about gender inequality. Attention has largely focused on unequal pay - the difference in the earnings distribution - but gender differences are also significant with regard to other forms of income and in the distribution of wealth.

In our present context, we need to ask whether there is there any reason to suppose that economic crises affect unequally these different groups. Are particular ethnic groups, or regions, bearing a disproportionate share of the burden? Is the crisis hitting women more than men? In each case, we are interested in the differences both on average and in the distribution. The gender pay gap usually quoted is that for mean or median earnings, but the distribution of earnings is also different. We need to examine whether women are becoming more concentrated among the low-paid, and whether at the top the “glass ceiling” is becoming less permeable. One group that has received particular policy attention in the EU is that of children. The EU, and a number of Member States, have identified child poverty as a major source of concern, and the EU has discussed “children mainstreaming”, a process that highlights the impact of policy on the circumstances and prospects of children (Marlier et al, 2007). This brings us to a further horizontal difference - that between generations. Even macro-economic models based on identical representative agents allow for differences between age cohorts. Financial crises may have a markedly different effect on different generations and indeed individual age groups (Glover et al, 2010). In his book *Dollars and Dreams*, Levy highlights the significance of the second part of his title: “as I was beginning this book, I had a conversation with an old friend about his early career ... he twice repeated elementary school grades. ‘I always thought ... that the two lost years hurt my early career. ... I graduated college in 1932. In 1932 you couldn’t find a job. The boys who got out in 1930 had a much easier time and by ’32 they were far enough up the ladder to hang on’” (1987, page 213). This anecdote underlines the point that, to this juncture, we have considered inequality in *outcomes*, whereas we are also concerned with inequality of *opportunities*. By

focusing on the immediate distributional impact, we may be missing the longer-term implications for life chances.

The final aspect of “among whom?” concerns the geographical scope of inequality. Does the parade of incomes concern only the members of a particular country, or does it have an international dimension? The ILO has, since the onset of the recent crisis, tracked the global impact. As noted above, there are major spillover effects, affecting many countries that were not directly involved in a systemic banking crisis. Poorer countries that have not experienced a banking crisis are still affected by what has happened in the US and other rich countries. At the same time, the consequences have been highly diverse. In this paper we consider only the distribution within countries, but the between-country implications are potentially an important part of the story.

### 2.3 The data challenge

Little has been written to date on the *consequences* of the present crisis, on account of the delays with which distributional information becomes available. When the chair of the International Association for Research in Income and Wealth (IARIW), Andrea Brandolini, tried to organise a session on the distributional effects of the crisis at the IARIW conference in August 2010, he concluded that there were insufficient up-to-date data. For example, the European Union (EU) has introduced an important new statistical instrument, the European Statistics on Incomes and Living Conditions (EU-SILC), which provides evidence about income inequality, financial poverty, and material deprivation for some 30 European countries. This will provide a valuable reference source for charting the impact of the crisis. However, at the time of writing (Autumn 2010), the most recent estimates were those from EU-SILC 2008, where the income data related to the calendar year 2007.<sup>8</sup> There is a striking contrast with the macro-economic data. While the EU-SILC data on inequality in the autumn of 2010 were no more recent than 2007, at the same date, the Eurostat website contained data on GDP for the second quarter of 2010. The problem of lack of timeliness has been widely recognised. The OECD organised an early (March 2009) Roundtable on “Monitoring the effects of financial crisis on vulnerable groups of society”. The report (OECD, 2009, and the Background Note by Nolan, 2009) contained a number of

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<sup>8</sup> With the exception of Ireland and the United Kingdom. In Ireland, the survey is continuous and the reference period is the last twelve months. In the UK, current income is collected and annualised with the aim of referring to the current (survey) calendar year - i.e. weekly estimates are multiplied by 52, monthly estimates by 12.

valuable recommendations, but to date little progress has been made in securing more timely data.

Time is moving on, and, even given the delays, we are now able to begin to see how inequality changed during the crisis period. The US is to the forefront. In September 2010, the U.S. Census Bureau published estimates of income inequality and poverty for the calendar year 2009, based on the Annual Social and Economic Supplement (ASEC) to the Current Population Survey. For the United Kingdom, data are available for 2008-9, the financial year ending in March. But for other countries, the distributional data are still not available beyond 2008, and, as we have noted, the currently available EU-SILC data relate to 2007.

Examination of the I to C relationship, in contrast to the C to I relationship, requires data on past inequality. In Section 1 we have already described the lack of the necessary long-term data. In the case of inequality, the problems are even greater. Even for recent periods, we cannot simply download annual data on inequality. We need annual data in order to trace changes before and after a financial crisis. There is a contrast, again, with macro-economic statistics, where there are data banks of annual figures for GDP. It is not possible simply to download a table with, say, annual data on Gini coefficients of income inequality for OECD countries. The EU-SILC data only begin relatively recently.<sup>9</sup> There are sources going further back in time, but they either do not provide annual data or else are not updated regularly. The OECD work involves “a regular data collection ... through a network of national consultants” (2008, page 47), but this is conducted at broadly 5-year intervals. The results in the OECD report *Growing Unequal?* (OECD, 2008) relate to the mid-80s, mid-90s, and mid-2000s. Such decadal observations are valuable but of limited use in tracking the evolution over time in relation to the crisis. The Luxembourg Income Study (LIS) has pioneered the production of income inequality data standardized across countries. It has more frequent observations, approximately semi-decadal: currently Waves I (around 1980), II (around 1985), III (around 1990), IV (around 1995), V (around 2000) and VI (around 2004). But the data are not annual. The UNU-WIDER database on income inequality was last updated in May 2008, and for most countries contains no data more recent than 2006. The World Bank’s *World Development Indicators (WDI)* shows in its 2010 edition estimates of the distribution of income or consumption for over a hundred countries in the form of the Gini coefficient and the shares of income quintile groups (World Bank, 2009, Table 2.9). However, the current data for OECD countries are often remarkably out of date: for Japan the estimate relates to “survey year” 1993, for France, 1995, for the Netherlands and the UK, 1999, and for German, Italy, Spain and the United States, 2000.

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<sup>9</sup> The official starting date for EU-SILC was 2004 for EU-15 (minus Germany, Netherlands and the UK, plus Estonia), with income reference year 2003. So that this source, valuable in prospect, cannot be used to place the change in inequality in full historical perspective.

For this paper, we have drawn on a new annual dataset on inequality that we have assembled from national data sources.<sup>10</sup> The criteria applied are lexicographic. The first, over-riding, consideration is for consistency over time. To this end, we have adjusted the national data to ensure, as far as possible, a continuous series. This has typically involved linking series where there are discontinuities. Discontinuities are indeed frequent, even where series are published as continuous. The US Census Bureau “selected measure of household income dispersion” cover the period 1967 to 2008 but there are no fewer than 17 footnotes indicating changes in the processing method. This is more than one every third year. In some cases these indicate a move to new Census population controls, but others involve substantial revisions. The single most important was that in 1993 when the data collection method changed from pencil and paper to computer-assisted interviewing, and when there were increases in the top-coding limits for selected income variables. The share of the top 20 per cent and the Gini coefficient of inequality both increased by 2 percentage points, which represents about a third of the total increase over the period 1967 to 2007.<sup>11</sup>

The second consideration is extent of coverage over time. Our aim in this paper is to set the recent events in historical perspective. We have therefore sought to go back, wherever possible, to the beginning of the twentieth century. This criterion is, on occasion, in direct conflict with the first criterion, in that the earlier data may be hard to compare with those for recent years. In a number of cases, we have shown separate series. We have also had to depart quite some way from our ambition of securing an annual series. We should stress that there are dangers in drawing conclusions about trends from estimates of inequality for isolated years, and that one should be particularly cautious where there are long gaps in the series.

The third consideration is for comparability across countries. While the published national series are not fully comparable, we have tried to make use of series that are as comparable as possible. At the same time, since comparisons of levels of

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<sup>10</sup> This data-set is the basis for a book in course of preparation, which will provide a fuller analysis of the relation between economic crises and inequality.

<sup>11</sup> The circumstances that led to the 1993 discontinuity in the US mean that there is no overlap in the series to provide a basis for adjustment. In this case, we have assumed that half the difference between 1992 and 1993 is attributable to the change in method, in order to link the series. The assumption is an arbitrary one, but it is undoubtedly better than ignoring the break in the series. Where there is an overlap, so that we have values for one year on both old and new basis, we have constructed a continuous series by working back from the most recent and linking using the ratio of the two series at the overlapping year. This procedure is only valid on the assumption that the revision in method or source data had a purely multiplicative effect. There is no necessary reason for preferring this assumption to any other (such as an additive effect).

inequality across countries are not our primary concern here, the reader should not use them for this purpose.

### 3 Inequality and crises in historical perspective: the US as epicentre

Our aim here is to examine how inequality changed before and after banking crises, and to set these changes in the context of the long-run evolution of inequality over the past 100 years. This Section is devoted to the US as the epi-centre of the current crisis. We then go on to consider in Section 4 evidence for 24 other countries. The 100 years from 1911 saw three major systemic banking crises in the US: the 1929 Great Crash, the Savings and Loan (S+L) crisis, and 2007-8 (shown as 2007 in Figure US1).<sup>12</sup> We have already discussed the problems in timing the S+L crisis, where different authors identify it as starting in 1984 and 1988. In view of this, we have shown the S+L crisis in Figure US1 as a rectangle from 1984 to 1988 inclusive. The same applies, following Reinhart and Rogoff (2009) to the Great Crash, which is shown as covering 1929 to 1933. It should be noted that Bordo et al (2001) date the crisis as starting in 1930, reflecting the fact that, while 1929 was the year of the stock market crash, bank failures only began to rise steeply in 1930.

These crisis events are shown in conjunction with key macro-economic time series. Three conclusions stand out. The first concerns the long-run evolution of average real disposable income per person. As is well known, the 1929 Crisis initiated a period that was the only major departure from the long-term upward trend (the scale is logarithmic). The Brookings Institution study at the beginning of the 1930s referred to the preceding three decades as ones of “general expansion” (Leven et al, 1934, page 4). Preceding the 2007-8 Crisis were six decades of general expansion. There is room for debate about the choice of price indices, but there has undoubtedly been a substantial rise in real incomes per head: nearly 6-fold according to the series shown in Figure US1. The second conclusion from Figure US1 concerns unemployment. Figure US1 makes use of the adjusted series proposed by Romer (1986), which may, as Balke and Gordon (1989) pointed out, understate volatility in earlier years on account of the omission of farm workers. On the other hand, it is not disputed that the 1929 financial crisis was followed by a rise in unemployment unmatched in the 100 year period. The 2010 unemployment rate is high - comparable only with that in the early 1980s - but a long way short of the rates recorded in the Great Depression. The third conclusion concerns wealth. The series for average real household wealth per head

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<sup>12</sup> As noted above, we do not treat 1914 as a banking crisis. Reinhart (2010) shows 1914 as a systemic banking crisis, and the New York Stock Exchange was closed from July to December 1914. This was however in response to the outbreak of the First World War in Europe, and, according to Reinhart and Rogoff, “a banking crisis was avoided” (2009, page 390). Eichengreen and Bordo (2002) do not show 1914 as a banking crisis.

follows the income series in broad outline, but there are noticeable divergences that mean that the wealth/income ratio has varied considerably. The wealth series starts by rising faster up to 1929, with the consequence that the wealth ratio increases from around 5 to around 8. After the fall in 1929, average wealth rises more slowly than average income, which means that the wealth-income ratio is falling. In the mid-1970s, the ratio is around  $4\frac{1}{2}$ . But then, again, before the 2007-8 Crisis the wealth income ratio climbs back to  $6\frac{3}{4}$  before falling sharply. An important factor is the level of share prices, shown relative to consumer prices in Figure US1 (end of year prices). The rises in the wealth income ratio before 1929 and before 2008 were both associated with climbs in the stock and real estate markets.

### 3.1 Income inequality

What matters to individuals and families is how these aggregate events are distributed. We look in detail at the three features of the income parade identified above: the Gini coefficient of overall income inequality (Figure US2), the behaviour of top income shares (Figure US3), and different measures of the poverty rate (Figure US4). The sources are described in Atkinson and Morelli (2010). The figures become less reliable the further we go back in time, but they cover most of the last 100 years. In each case, the precise definition of “income” needs to be borne in mind, since - as we shall see - different variables may give rather different impressions. The “headline” Gini coefficient reported by the US Census Bureau (shown in Figure US2) is based on income including cash transfers but not including non-cash benefits such as food stamps, Medicare and Medicaid, the benefits from subsidised public housing or employer-provided benefits and before deduction of individual income tax and payroll contributions. The same definition applies to the “headline” poverty figures in Figure US4. The top income shares in Figure US3 relate to gross income, before deduction of individual income tax and payroll contributions, and exclude non-taxable cash transfers. The shares are shown both excluding and including realised capital gains. This feature should be emphasised, since the figures record money income from capital, not making any allowance for its decreased purchasing power. As discussed (for example in Atkinson, 1983, and Heady, 2010), there are good reasons for counting only “real” income from capital, deducting inflationary losses (or adding gains when prices fall, as between 2008 and 2009).

#### *The 1929 Great Crash*

The 1929 Great Crash and the ensuing banking crisis appear at first sight to be a clear example of the classic  $\Lambda$  pattern. According to Kennedy, “the increasing wealth of the 1920s flowed disproportionately to the owners of capital” (1999, page 21). According to Temin, “the distribution of income worsened in the 1920s. In fact, inequality reached its peak just at the start of the Great Depression” (2000, page



303). The three graphs provide initial support for this view. The Gini coefficient of overall inequality rose - by some 8 percentage points - in the 1920s, and was lower in the mid to late 1930s than in 1929. The share of the top 1 per cent (including capital gains) which had been 15 per cent in 1920, rose to 24 per cent in 1928, and then fell back to 15½ per cent in 1931 and 1932. There is an almost perfect **Λ** pattern. The proportion of the population with income below 60 per cent of the median, a relative poverty line, is estimated (Figure US4) to have risen in the 1920s.

At the same time, when examined more closely, the picture is less clear. To begin with, the relative poverty estimates do not indicate a fall in poverty in the 1930s. Given the fall in overall income (Figure US1), this implies a falling living standard, and the estimates of Plotnick et al, applying a poverty line obtained by extrapolating backwards the later official (absolute) poverty standard, found a rising proportion in poverty from 1929 until 1932, and that the poverty rate did not return to the 1929 level until 1940 (2000, Appendix D). Here, it is important to bear in mind the limitations of the available statistical data. In fact, in reaching their main conclusions, Plotnick et al did not use the pre-war estimates of the overall US income distribution, but based their poverty rates and Gini coefficients on a backwards projection from the second half of the century. They projected the Gini coefficient backwards from the post-war period using the top income share series of Kuznets (1953) (in Figure US3 we use the more recent estimates of Piketty and Saez, 2003) and the unemployment rate: a 1 per cent rise in unemployment is estimated to raise the Gini coefficient by between 0.4 (household basis) and 0.6 (family basis) percentage points. This however begs the question whether unemployment had the same effect pre-war as post-war. As we have seen from Figure US1, the rate of unemployment rose between 1929 and 1933 from 5 per cent to 25 per cent, an increase not observed in the remainder of the century. Did this really lead the Gini coefficient to rise by 8 to 12 percentage points after 1929? If so, it would have been remarkable.

In order to avoid such a backwards extrapolation, we have made use of the earlier attempts to estimate the overall US income distribution. These estimates are hedged by qualifications, but so too are those for 1929, and none of the pre-war figures are comparable with those that became possible with the introduction of the Current Population Survey. They cannot therefore be compared in terms of *level*; it is however interesting to examine the *changes over time*. The first comparison is between 1918 and 1929.<sup>13</sup> The estimate for the size distribution of income among

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<sup>13</sup> Earlier estimates were made by Spahr for 1890 and by King for 1910. The strengths and weaknesses of these estimates, and those for 1918 and 1929 used here, are extensively discussed by Merwin (1939). The 1910 estimates of the size distribution are criticised by Williamson and Lindert (1980, pages 89-92) who conclude that “it is better to pass over these” and that the remaining clues “imply that inequality levels on the eve of World War I resembled the wide gaps of 1928-1929 much more than the narrower gaps prevailing after World War II” (1980, page 92). We agree that the 1910 estimates are not easy to compare with those that

income recipients for 1918 resulted from the project of the just-chartered National Bureau of Economic Research (NBER) on “income in the United States”, its first field of investigation. Combining data from the income tax<sup>14</sup> with evidence from other sources, it was a pioneering “synthetic” estimate. The Gini coefficient for 1918 in Figure US2 has been calculated from the detailed tabulation by ranges of gross income among income recipients (unadjusted for family size) (Mitchell, 1921, Table 26). It is compared with that for 1929 calculated from the distribution constructed by the Brookings Institution in a study that built on the NBER work (Leven, Moulton and Warburton, 1934, Tables 37 and 39), where we have taken the distribution for income recipients excluding capital gains and losses. In the latter distribution, the top shares are close to those found by Piketty and Saez (the share of the top 5 per cent is 31.9, compared with 33.1 per cent); for 1918 the NBER estimates of top shares are lower (the share of the top 5 per cent is 25.8, compared with 29.3 per cent). It is therefore possible that income inequality in 1918 is under-stated in these estimates.<sup>15</sup> But even so, the large difference - some 8 percentage points - bears out the conclusion that the Roaring Twenties were a period of rising overall inequality.

What happened after 1929? For the 1930s we have an estimate of the size distribution (in this case among families and unattached individuals), based for the first time on a source comparable with those used today: the nation-wide survey of 1935-6. This was the basis for the article “Size distribution of income since the mid-thirties” by Goldsmith et al (1954). This study looked back to 1929, noting that the Brookings estimate for 1929 (taking now their estimate for families and unattached individuals) was not comparable on the grounds of the inclusion of capital gains and losses (not included above) and of the sizeable adjustments for income under-statement. In Figure US2 we have shown the Gini coefficient for the distribution as re-worked by Goldsmith (1958), which is relatively close to that we have used directly from the Brookings study. On this basis, the Gini coefficient was lower in 1935-6 than in 1929. We have the second part of the **Λ**-shape, although it is of course possible that the comparison of 1935-6 with 1929 may mask a rise in inequality followed by an immediate fall.

What about the top income shares? The evidence in Figure US3 suggests that the left hand part of the **Λ** shape applies to the US 1929 crisis: “from 1921 to 1928

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became possible after the federal income tax data began on a regular basis; our focus here is on the changes after the First World War.

<sup>14</sup> This means that the estimates may be affected by tax avoidance (see below), but the year in question (1918) was less affected by the fall in high income returns (there were over 600,000 returns in excess of \$300,000).

<sup>15</sup> It should also be noted that the 1929 data have not been re-ranked to take account of the deduction of capital gains and losses; the Gini coefficient would be increased by re-ranking.

there was a tendency towards concentration, mainly caused by rising values of securities and other productive property” (Tucker, 1938, page 586). However, we have, as pointed out by Smiley (1983), to take account of the major shifts in tax rates that took place during the period. Marginal tax rates had been increased during the First World War: the top marginal rate was 15 per cent in 1916, but 67 per cent in 1917, and had reached 73 per cent by 1921. The top rates were then reduced to 58 per cent (1922), 46 per cent (1924) and 25 per cent (1926). Alongside these changes in top rates were changes, in the opposite direction, in the number of returns in excess of \$300,000: from 1.3 million in 1916, down to 246,000 in 1921, and up again to 1.6 million in 1926. If we take the 1916 figure as the benchmark, rather than 1920, then the share of the top 1 per cent still increases but by only 1 percentage point (or 4½ percentage points for the series including capital gains). Moreover, as we can see from Figure US7, discussed below, the share of the top 1 per cent in total wealth did not increase over the 1920s. The impact of marginal tax rates is a factor that needs to be included in explanatory models of top income shares.

Turning to the post-crisis period, we may note from Figure US3 that the sharp fall from their peak in 1928 in top income shares came to an end *during* the period identified as a banking crisis by Bordo et al (2001) and Reinhart and Rogoff (2009). Top shares (0.1, 1 and 5 per cent) rose and then subsequently fell, before levelling off. This has two important implications. The first is that the top shares appear at this time to have varied cyclically. Parker and Vissing-Jorgensen (2009 and 2010) have recently drawn attention to the increased income cyclicality of high income households. But a feature of the results of Parker and Vissing-Jorgensen that they do not stress is that, over the century as a whole, the degree of vulnerability has first decreased and then increased. They highlight the increased responsiveness of top income shares to aggregate fluctuations since the 1980s, but there was also a greater degree of sensitivity from 1924 to 1938 than in the post-war period.<sup>16</sup> As is shown in Morelli (2010), with respect to the movements in the stock market there may be a U-shaped relation over time: the degree of sensitivity of top shares to the stock market has first become less and then risen. This is important, since Parker and Vissing-Jorgensen (2010) attribute the greater sensitivity since 1980 to the greater proportion of earned income and the impact on top labour earnings of the ICT revolution, whereas in the earlier period earnings from capital were more important.

The second conclusion regarding top shares during the inter-war period is that the end of the 1930s saw top shares not very different from those before the First World War. It is true that the very top group shares were smaller in 1939, the share of the top 1 per cent being 15 per cent rather than 18 per cent (in 1913), but the next 4 per cent had increased their income share, so that the share of the top 5 per cent was

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<sup>16</sup> See Table 1 in Parker and Vissing-Jorgensen (2010). In interpreting the changes in the early 1920s, account has to be taken of the large changes in top tax rates, as discussed above.

actually higher in 1939 than in 1917. The share of the 5 per cent just below the top 5 per cent was higher than it had been at any time in the 1920s. The largest fall in the top shares happened *after* 1939: between 1939 and 1945 the share of the top 1 per cent fell from 15 to 11 per cent, and the share of the top 5 per cent fell by 8 percentage points. The Second World War was the only period in the 100 years studied when there was a sustained reduction in top income shares in the US.

To sum up, the Great Crash is often viewed as a “defining moment”, but the distributional consequences are less sharp than this might suggest. The major reduction in income inequality in the US may have come a decade later, when top shares fell in a sustained manner and when relative poverty fell (from 1941 to 1944).

### *The post-war period and the Savings and Loan crisis*

The fall in overall inequality from 1929 to the mid-1940s has been the basis for the conclusion that the US went through a major shift in income distribution. Arthur Burns, later Chairman of the Federal Reserve, introduced his annual report to the National Bureau of Economic Research in 1951 with the statement that “the distribution of the national income is always a vital concern of a free and progressive people seeking to raise their plane of living”. He went on to describe “the transformation in the distribution of our national income that has occurred within the past twenty years - a transformation that has been carried out peacefully and gradually, but which may already be counted as one of the great social revolutions of history” (1951, pages 3 and 4).

Burns concluded that further substantial redistribution could not be expected. In this he was correct as a forecaster. The subsequent period was broadly one of stability in the overall income distribution. The great social revolution in terms of income inequality, if it had been that, had come to an end by the end of the 1940s. As Miller concluded in his monograph based on the 1960 Census of Population, “the statistics show no appreciable change in income shares for nearly 20 years” (1966, page 2). As may be seen from Figure US2, the Gini coefficient in 1951 was virtually the same as at the end of the 1970s. The Gini coefficient then began to rise, reversing much of the previous decline. If the fall from 1929 to the mid-1940s was some 8½ percentage points, the rise from 1979 to 2007 was around 7 percentage points. This means that the second crisis considered here - the Savings and Loan crisis of 1984-1988 - has to be viewed against the background of a rising trend. The same applies to top income shares. As is well known, top income shares have risen in the past 30 years in the US. Between 1979 and 2007 the share of the top 1 per cent more than doubled. The share of the top 5 per cent in 2007 was only 1 percentage point lower than its previous peak in 1928.

What happened to poverty? The answer depends on how poverty is defined. In Figure US4, we show with the heavy squares the long-standing official US poverty

series, defined on the basis of a poverty standard that is in principle adjusted according to prices. In that sense it is absolute, and the proportion can be expected to fall in a society where, as we have seen in Figure US1, average real incomes per head have risen substantially: by a factor of nearly four since the starting point of the poverty series in 1948. As is noted in the official report (US Census Bureau, 2009, page 20), the official poverty standard does not take account of rising standards of living; on the other hand, “the empirical implementation of price index numbers, such as the CPI-U, has proved to be highly problematical” (Jorgenson, 1998, page 86). If, as found by the Boskin Commission (Boskin et al, 1996),<sup>17</sup> and by Slesnick (1993), the price index is biased upwards, then the official poverty standard has moved upwards in real terms, moving it closer to the relative poverty lines also shown in Figure US4. The relative poverty indicators in Figure US4, measured with a threshold set as a proportion of median income, as in the EU Structural Indicators, show the effect of taking a different approach.

The second rectangles in Figures US2, US3 and US4 show the period of the Savings and Loan crisis. Inequality increased in the early 1980s, before the S+L crisis, but afterwards there was a period of hiatus (the length of this hiatus period is discussed further below). In interpreting the movements in top income shares, we have to take account of the reduction in marginal tax rates in the 1986 Tax Reform Act. If we take the view that this caused a once-for-all increase in the declared top shares, then - ignoring in effect what happened within the rectangle in Figure US3 - we can conclude again that the S+L crisis was preceded by a rise in top shares, and followed by a period of hiatus. Finally, we can see from Figure US4 that the official poverty series shows a fall during the period of the S+L crisis, but that there was a subsequent rise and that the relative poverty rate follows the rise/h hiatus pattern.

### *Recent inequality trends and the 2007-8 crisis*

What about the 2007-8 crisis? Here the series is much more flat in the preceding ten years. If the “headline” Gini coefficient in Figure US2 (marked by triangles) rose 4 percentage points in the ten years leading up to the S+L crisis, it rose only 1½ percentage points between 1996 and 2006. It has indeed been argued that the upward trend in inequality had come to an end: “not only has the increase in inequality been exaggerated, but it has ceased” (Gordon, 2009a, page 32). This conclusion is reached in part on the grounds that the headline series suffers from a number of shortcomings. Notably, the estimates refer to income gross of tax and

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<sup>17</sup> On the price index bias, see, among others, Slesnick (1993) and Meyer and Sullivan (2010). It is argued by Hausman (2003) that the Boskin Commission under-estimated the extent of the downward bias.

without allowing for benefits in kind.<sup>18</sup> In Figure US2 we illustrate the potential impact of revisions (series indicated by crosses), showing an alternative series that subtracts income tax and social security contributions, and adds the benefits from the earned income tax credit and from in-kind transfers. This too is relatively flat over the decade leading up to the 2007-8 crisis, indicating only a small increase in overall inequality: the 2006 value is less than 1 percentage point higher than that for 1996.

To the extent that inequality was increasing, it was at the top of the distribution. Comparing 1996 and 2006, the poverty rate was either stable (relative poverty measure) or lower in 2006 (the official poverty measure). At the top, we can see from Figure US3 the cyclical variability already discussed, but the period leading up to the 2007-8 crisis was one of rising top shares: between the peak in 2000 and the peak in 2007, the share of the top 5 per cent rose by 2 percentage points. At the same time, the share for those who made the top 10 but not the top 5 per cent increased by only a quarter of a percentage point: their share was exactly the same in 2007 as in 1997.

What can we say about the post-2007 developments? Taking account of capital losses, the share of the top 1 per cent fell by 2½ percentage points. *Newsweek* had a headline “How the mighty have fallen” (11 July 2009). However, we should not read too much into the fall. The share of the top 1 per cent without capital gains and losses fell by less than 1 percentage point, and the shares of the percentile groups below the top 1 per cent hardly changed. The official poverty rate rose by nearly 2 percentage points between 2007 and 2009. The change in the overall distribution - a more than 1 percentage point rise in the headline Gini coefficient between 2007 and 2009 - suggests that there was a worsening at the bottom offsetting the reduction in inequality at the top. Again however we should stress the fact that this relates to a particular definition of income. Between 2006 and 2008 (the most recent years for which we have official alternative estimates), the Gini increased when measured in terms of gross incomes before taxes and transfers, but decreased in terms of income after tax and transfers (including transfers in kind). We need fuller and more up-to-date information before we can extrapolate from the fall in top shares.

### 3.2 Alternative lenses

What lies behind these changes in the overall distribution of income? Here we focus on the composition of income, illustrated in Figure US5, and the distribution within total wages and total capital income. The data are from the official National Income and Product Accounts, which date from 1929, and show the proportions of

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<sup>18</sup> There are other potentially important issues not discussed here, such as differential movements in prices for different income groups.

total personal gross income from different sources.<sup>19</sup> In 1929, income came 72 per cent from earnings, 27 per cent from capital income, and 1 per cent from transfers. It should be noted that these measures do not include capital gains or losses when calculating capital income, nor is any adjustment made for inflation.

Figure US5 shows that there have been marked changes in the composition of personal disposable income. As Goldsmith pointed out in 1957, “since 1929 there has been a striking increase in the percentage that wages and salaries and transfer payments constitute of the personal income total” (1957, page 508). This has however to be nuanced. Immediately following 1929 there was in fact a decline in the share of earnings, with a modest rise in transfers. The large rise in the share of earnings began later in the 1930s, and was particularly marked between 1939 and the mid-1940s. The capital income share fell markedly and transfers began to rise. There then followed a long period when transfers continued to become a higher percentage, but at the expense of the labour share, while the capital share remained broadly constant.

In the early 1980s, in the years preceding the S+L crisis, there was a rise in the recorded capital share and a fall in the labour share. Since then, however, the capital share has remained broadly constant (with some cyclical variability). The main shift has been between labour income and transfers. It may be noted that the 2 years since 2007 have seen a 2 percentage point fall in the labour share, and a 2+ percentage point rise in the share of transfers. Compared with ten years ago, the labour share is 3½ percentage points lower.

The impact of changes in factor shares on income inequality depends on where the recipients are located in the overall distribution. If all capital income goes to rentiers in the upper income groups, then changes in its share will show up at the top of the parade; if a substantial part finances the retirement of the elderly then the impact may be quite widely diffused. The location has undoubtedly changed over the period considered here. In the 1920s, the top 0.1 per cent received 60 per cent of their income from capital; by the beginning of this century the proportion had fallen to around 20 per cent (Piketty and Saez, 2003). Stock ownership has become more widespread. In 1934 the US Senate Committee on Banking and Currency estimated that only 1 family in 20 had been actively associated with the stock market in 1929 (Galbraith, 1954, page 78). By 1989, the proportion of households with direct or indirect ownership of stocks had reached 32 per cent, and by 2007 it was a half (51 per cent) (Moore and Palumbo, 2010, Table 3).

### *Earnings dispersion*

How has the total of labour earnings been distributed? The period starting in 1939 (see for example Goldin and Katz, 2007) has received particular attention in the

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<sup>19</sup> Proprietors' income is allocated 70 per cent to earnings, and 30 per cent to capital income.

labour economics literature. In Figure US6, we show the distribution of earnings, linking together evidence from the Census of Population from 1939, and the Current Population Survey, which was instituted after that Census. The diagram shows the earnings at different points on the earnings tree: for example those at the tenth percentile (bottom decile), labelled P10, or at the ninetieth percentile (top decile) labelled P90. In each case, the earnings are expressed as percentages of the median. It should be noted that this relates to individual earnings, not the total earnings of all members of a family or household. The husband may be in the bottom decile and the wife in the top decile.

As is well known, the bottom decile lost ground relative to the median in the 1980s, and the upper percentiles have been gaining ground on a sustained basis. In 30 years, the fifth percentile rose from 2.3 times the median to over 3 times the median (off the scale at the top). The recent rise in US earnings dispersion is very largely a matter of the upper part of the distribution. In the shorter-run, the S+L crisis was followed by a hiatus when the upward trend in upper earnings percentiles was briefly interrupted; and the bottom decile ceased losing ground. The bottom decile, expressed as a proportion of the median, remained stable in the period preceding the 2007-8 crisis, but at the top the pattern was different: the top decile increased from 221 per cent of the median in 1997 to 233 per cent ten years later. Again the action is at the top.

What is less well known is that this rise in dispersion began long ago, just after what Goldin and Margo call the “Great Compression”: “when the United States emerged from war and depression, it had not only a considerably lower rate of unemployment, it also had a wage structure more egalitarian than at any time since” (1992, page 2). This is illustrated in Figure US6 by the rise in the bottom decile and the fall in the top decile. Earlier, Lydall (1968) had employed the same Census of Population data to conclude that “it is clear that there was a substantial fall in dispersion of employee earnings in the United States from 1939 to 1949” (page 177). But this compression came to an end after the war and began rapidly to be unwound. According to Miller, “the substantial changes in the relative distribution of wage income took place during the war years. ... the years immediately following World War II (1947 to 1949) did not see any change in the relative distribution” (1958, page 356). Miller made use of the tabulations of the March CPS that date back to the 1940s, and these are the basis for the series in Figure US6. The available data relate to all workers, full time and part time, and part year as well as full year, and for this reason the bottom decile is not given, but the figures for the upper part of the distribution show clearly that widening dispersion began in 1950. Burtless concluded that “earnings inequality rose for both men and women over the 1950s” (1990, page 89).<sup>20</sup>

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<sup>20</sup> The estimates of Burtless (1990) show the Gini coefficient for male earners as rising from 30.7 per cent in 1951 to 37.6 per cent in 1964, a rise of over a fifth, and the ratio of average



There was perhaps a pause at the end of the 1960s and in the 1970s, but there has been a longstanding widening in the upper part of the earnings distribution. The impact of financial crises has to be seen against a backdrop where the earnings distribution has long been widening at the top.

How far can such a continuing rise in earnings dispersion be related to the apparent stability of the overall income distribution that we noted earlier? There are several factors that may have caused the two distributions to move differently. Household income depends on the joint distribution of the earnings of individual household members, and there are other sources of income: capital income and transfers. Disposable income is after direct taxes. In his 1972 study, Henle addressed the divergent movement of the distributions of individual earnings and of total income by families. He concluded that these different trends could largely be accounted for by changes in other sources of income, notably increased transfer payments, and by the increasing proportion of families with two or more earners.

Figure US6 starts in 1939. What happened to earnings before and after the Great Crash? The evidence here is fragmentary, but interesting. Goldin and Margo have collected data on the earnings of clerical workers relative to unskilled/labourers, and conclude that the premium to education may have widened during the 1920s (1992, page 23). Following 1929, there was a distinct rise in the premium, that reached a peak around 1934 (1992, Table VII) and was then reversed, so that the 1939 values were close to those in 1929. Evidence of a different kind is provided by the study of the remuneration of top executives by Baker (1939), who made of information collected by the Federal Trade Commission on all companies listed on the New York Stock Exchange from 1928. The median executive compensation for 51 large industrial companies fell, in money terms, by 30 per cent between 1929 and 1932. During the same period the wages of unskilled workers fell by 18 per cent (Carter et al, 2006, Table Ba4218). Wages of unskilled labour had recovered by 1936, but median executive compensation remained 20 per cent below the 1929 level. This suggests that there had indeed been some levelling at the top of the earnings tree.

### *Income from capital*

What about income from capital? In Figure US7, we show the distribution, not of capital income, but of the wealth that generates such income. The evidence comes from three different sources. The longest series is based on the wealth of decedents as reported in the estate tax returns, where these are multiplied up by the inverse of the relevant mortality rate. In other words, if the mortality rate for men aged 65 is 2 per

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earnings in the top tail to the average earnings of the middle quintile group as rising from 174.1 per cent to 199.8 per cent, an increase of 15 per cent.

cent, it is assumed that, corresponding to each reported estate in a given year there are 49 living wealth-holders with the same size and composition of wealth. Where care is taken to allow for differences in the mortality rate by wealth class, this method has in the past yielded estimates that seem reasonably consistent with external evidence (see Atkinson and Harrison, 1978). More recently, evidence on wealth has been collected in sample surveys, notably, in the US, in the Survey of Consumer Finances (SCF) carried out by the Federal Reserve. Finally, there are the lists produced by *Forbes Magazine*, of the 400 wealthiest in the US.

The top wealth shares show a different pattern of change over time from the top income shares. During the 1920s there was no increase in concentration, which lends support to the view that the rise in top income shares between 1916 and the early 1920s reflected, at least in part, tax avoidance. Top wealth shares did fall, very sharply after 1929, suggesting a high degree of sensitivity to stock prices. The fall, which took the share of the top 1 per cent from around 40 per cent in 1929 to around 30 per cent in 1933, continued up to 1950. There was a step change downward followed by a downward trend, although the trend was largely limited to the very top: the share of the top 0.1 per cent was halved over this period. Since the figures relate to individual wealth, this is consistent with there having been a re-arrangement of wealth within the family, with wives holding a proportion of the joint wealth (see below).

The period prior to the S+L crisis was marked by a rise in the concentration of wealth, a rise that might have been anticipated given the rising income inequality and top earnings. The rise was followed by a hiatus, but not by a downturn comparable with that in 1929.

### *The distribution of consumption*

How far are the conclusions affected by the way in which we have chosen to represent inequality? We have focused on income (and stocks of wealth). What would we have found if we had concentrated on the distribution of consumption? In Figure US4, we show the implications of measuring poverty in terms of household consumption, rather than income. The poverty estimates are based on the results of Jorgenson (1990 and 1998) and Slesnick (1993), and Meyer and Sullivan (2010). As these authors emphasise, the long-run findings are rather different: “official U.S. poverty statistics based on household income imply that the War on Poverty ended in failure ... However, poverty estimates based on household consumption imply that the War on Poverty was a success” (Jorgenson, 1998, page 79). Meyer and Sullivan find that “consumption poverty rates often indicate large declines, even in recent years when income poverty rates have risen” (2010, Abstract). These long-run conclusions have important implications for policy; here we focus on the implications in relation to financial crises.

From Figure US4 it may be seen that the consumption-based estimates agree with the income figures in showing a rise in poverty before the 1984-1988 S+L crisis, and the Meyer/Sullivan estimates agree with the income figures in indicating a rise in poverty rates after the end of the crisis. For this episode, there appears to be no difference. On the other hand, from 2000 there is a striking divergence in the trends in the consumption and income series. The consumption-based series does not indicate that the 2007-8 crisis was preceded by rising poverty. The same conclusion is reached if we look at the relative poverty measure, also shown in Figure US8, defined as consumption below 50 per cent of the median. Meyer and Sullivan discuss possible reasons for the difference. Interestingly, they conclude that the most obvious explanation - that the income poor are financing higher consumption via dissaving - may apply to those households with a head aged 65 or over, but that not to most other groups. "Dissaving does not seem to be the dominant explanation" (2010, page 36). On the other hand, they conclude that measurement error - increased under-reporting of income - is an important part of the explanation. These conclusions are particularly relevant here, since one of the justifications for the I to C hypothesis is that the crisis was precipitated by excessive borrowing to maintain what would otherwise have been falling living standards. What happened after the crisis? Here the 2008 figure in Figure US8 shows a continued fall, but Meyer and Sullivan note that this misses "the brunt of the latest recession" and they predict that consumption poverty will rise considerably in 2010.

Differences between consumption- and income-based measures have been stressed, not just with regard to poverty but also overall inequality, but the evidence is mixed. The study by Cutler and Katz concluded in fact that "changes in the distribution of consumption correspond closely to changes in the distribution of income over this period" (1992, page 546). In particular, they find that the consumption-based Gini coefficient rose (by 1.5 percentage points) between 1980 and 1984, and was essentially unchanged between 1984 and 1988. The time path is therefore similar to that in the income-based Gini coefficient, although the 1980-84 rise is half the size. On the other hand, using more recent data, Krueger and Perri conclude that "the recent increase in income inequality in the U.S. has not been accompanied by a corresponding rise in consumption inequality" (2006, page 163). Their Gini coefficient for consumption is essentially flat from 1990 to 2003 (2006, Figure 1). It should be noted that their analysis is restricted in two important respects: (a) their measure of income, called LEA+, is limited to after-tax labour earnings plus transfers, and (b) they restrict attention to a sub-sample of the population, excluding all households where the head is aged under 21 or over 64, where LEA+ is zero or negative, where weekly wages are below half the minimum wage, and all rural households. But the results of

Meyer and Sullivan (2010a), covering the whole population, also show a stable level of consumption inequality from 1990 to 2006, followed by a fall up to 2008.<sup>21</sup>

We have discussed earlier the reasons why income-based and consumption-based statistics may show differing pictures of poverty. When considering possible differences in the trend in the overall distribution, we have to look particularly at the top. Since we have seen that it is at the very top that income inequality has increased since 1990 (Figure US3), it is not perhaps surprising that inequality in measured consumption shows no overall upward trend. The marginal propensity to consume may simply be a declining function of income at high incomes. Or, more generally, the definition of consumption may fail to capture the ways in which the top income groups exercise their purchasing power. As has been stressed by Gordon and Dew-Becker (2008), the standard measure fails to incorporate forms of consumption such as political influence and charitable donations.

### *Gender*

The move from income to consumption, or vice versa, is an important, but relatively modest, shift in our vantage point. As noted earlier, there are other significant dimensions to inequality. Here we concentrate on just one of these - differences by gender.

Much of the attention on gender inequality has focused on earnings. In Figure US6 we show the ratio of female median earnings to male median earnings over the period since 1960. The ratio was around 60 per cent and has risen over the four and a half decades since the Equal Pay Act came into force in June 1964 to be around 75 per cent. (This is the gross ratio, not allowing for any differences in educational qualifications, age, or other variables that may affect earnings.) Much of the rise took place during the 1980s, but there is no reason to suppose that this was associated with the Savings and Loan crisis. In this century, the ratio has been essentially flat. Going back in time, we can see from Goldin (1990, Figure 3.1) that the ratio rose from under 50 per cent in 1890, reaching 65 per cent by 1950, but then falling back in the 1950s. The Great Compression of the early 1940s seems to have been associated with a narrowing of the gender gap.

Gender inequality is less commonly considered in relation to capital income or wealth. The taxation of couples as a unit in the US makes it difficult to separate the incomes of men and women (it is possible in those countries that have independent

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<sup>21</sup> These studies use data from the survey collecting interview recall data on consumption. Attanasio et al (2004) show that the consumption data collected in a separate survey in the form of a diary show a different direction of the trend in inequality. This difference is discussed further by Gordon and Dew-Becker (2008).

taxation, such as the UK). The same applies to family-based surveys of wealth-holdings, such as the Survey of Consumer Finances. On the other hand, the estate data do allow the distribution to be analysed by gender. The study by Lampman (1962, Tables 79 and 80) showed rather remarkably that in 1953 women outnumbered men in the highest wealth classes: they were in majority in the top 0.025 per cent (above \$2 million at that time). As noted above, this is consistent with wealth coming to be more equally held between husbands and wives. However, women are no longer in a majority. Edlund and Kopczuk (2009) show that the share of women among the very largest estates peaked in the late 1960s, and they argue that this reflects a reduced importance of inherited wealth since that time. They also show that women make up a declining proportion of the *Forbes* list of the 400 richest Americans: from 18 per cent in 1982 to 13 per cent in 2003 (2009, Table 4). Over the same period the proportion with inherited wealth has fallen from 36 per cent to 16 per cent.

### 3.3 Commonalities and differences across crises

At first sight, the two earlier US systemic banking crises in the last 100 years - Great Crash of 1929 and the Savings and Loan crisis 1984-1988 - have elements in common. They were preceded by rising income inequality, and followed by a fall or a hiatus. If 1929 provides an illustration of the “classic”  $\Lambda$ -pattern, the S+L crisis may be seen as combining the  $\Lambda$  pattern of a rise pre-crisis and a fall post-crisis with an underlying upward trend. The pattern is rotated anti-clockwise. Does this mean that we can simply assume that the 2007-8 crisis will follow a similar pattern?

In fact, these conclusions need to be nuanced. We have seen that the rise in overall inequality prior to 2007 was not evident in the case of consumption nor in the poverty rate. Income inequality as measured by the Gini coefficient rose by less than 1 percentage point over the preceding 10 years; the increase in income inequality appears to have been confined to the very top of the distribution. In this respect, the lead-up to the recent crisis was different. The trend since 2007 is not evident, but the evidence to date suggests that the distribution is affected at both top and bottom, with top shares falling and the (income) poverty rate rising.

It has been argued that top shares are now more sensitive than in the 1980s, which may account for the fact that the S+L crisis was followed by a hiatus rather than a fall in top shares. We have argued that, if top shares are more cyclically sensitive today, they may also have been so in the pre-war period. But this does not mean that the two situations can be compared. As we have seen, there have been major changes in the sources of income and the exposure to the stock market.

The 1929 Great Crash may have been associated with a fall in inequality, but we have seen that this may have been limited to the top shares, and that the fall was not sustained. Much of the reduction in overall inequality - the “social revolution” of Burns - took place between 1935 and 1944 and cannot be attributed to the banking

crisis. Poverty may well have risen, rather than fallen, after 1929. The period 1940-1945 was the only one in which there was a sustained reduction in top income shares. If there was a defining moment, it came later.

Figure US1 The US economy and financial crises 1911-2010

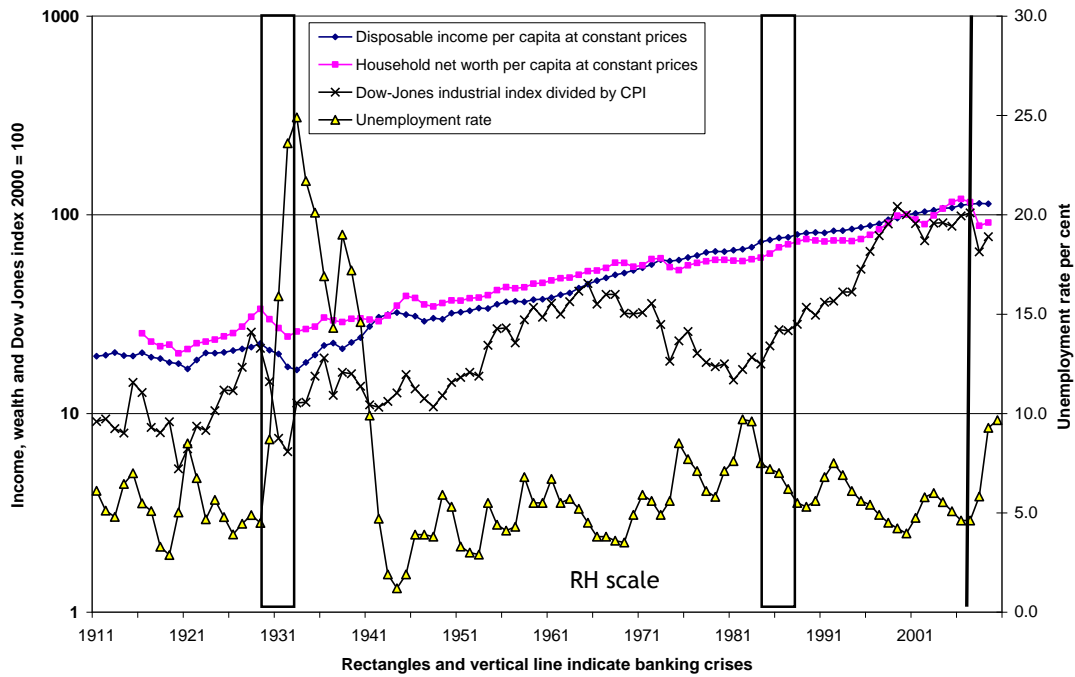


Figure US2 Overall income inequality in US 1911-2009

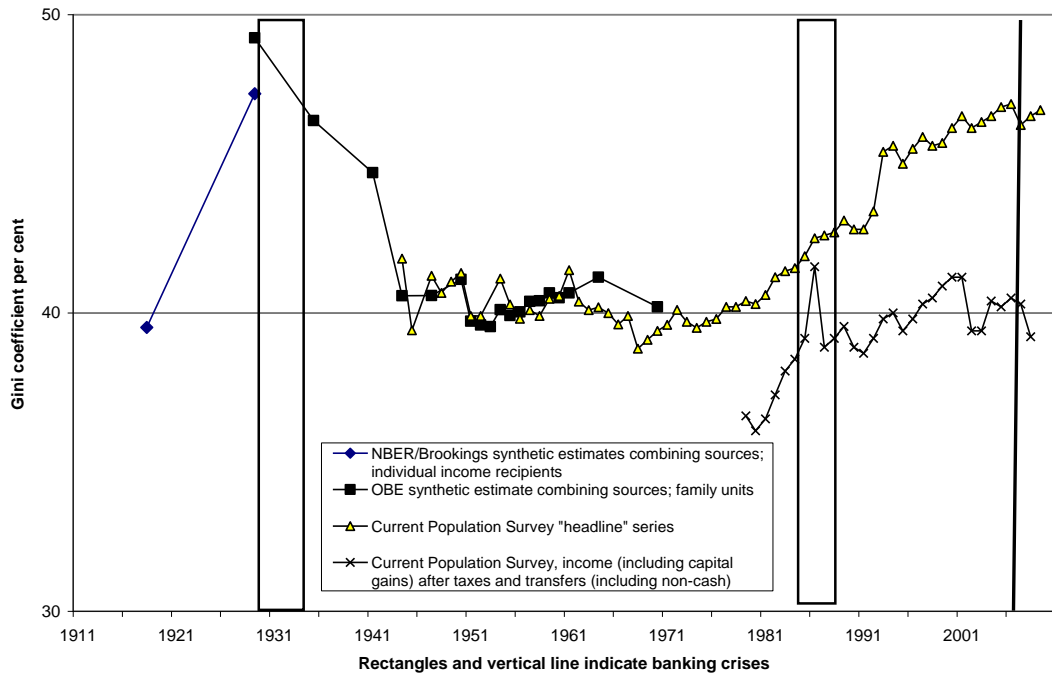


Figure US3 Top income shares and banking crises 1911-2010

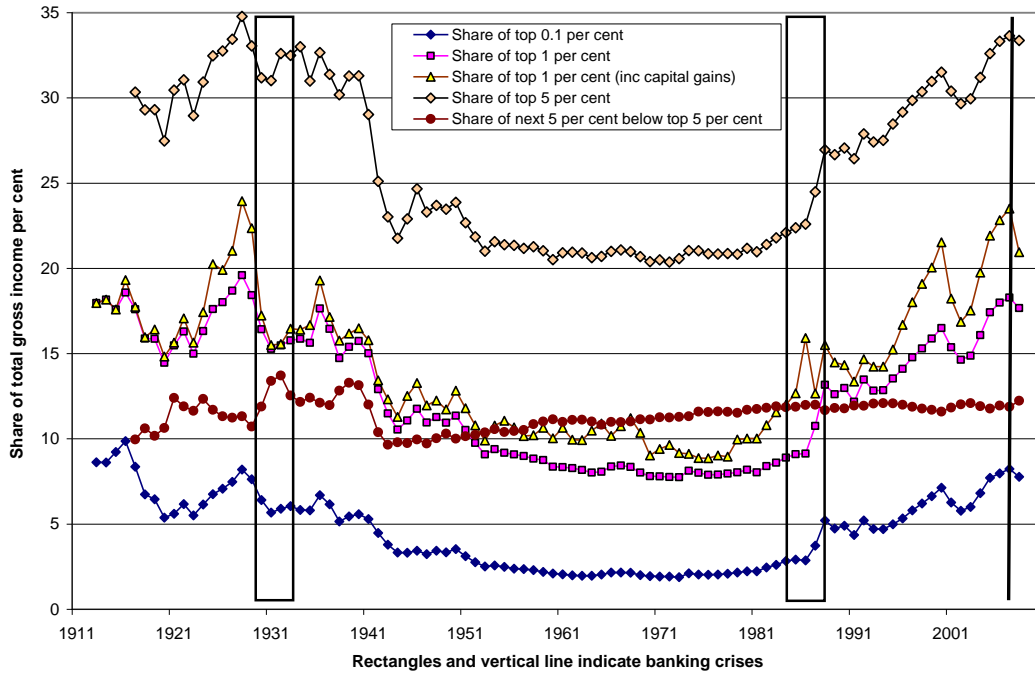


Figure US4 Poverty and banking crises in the US

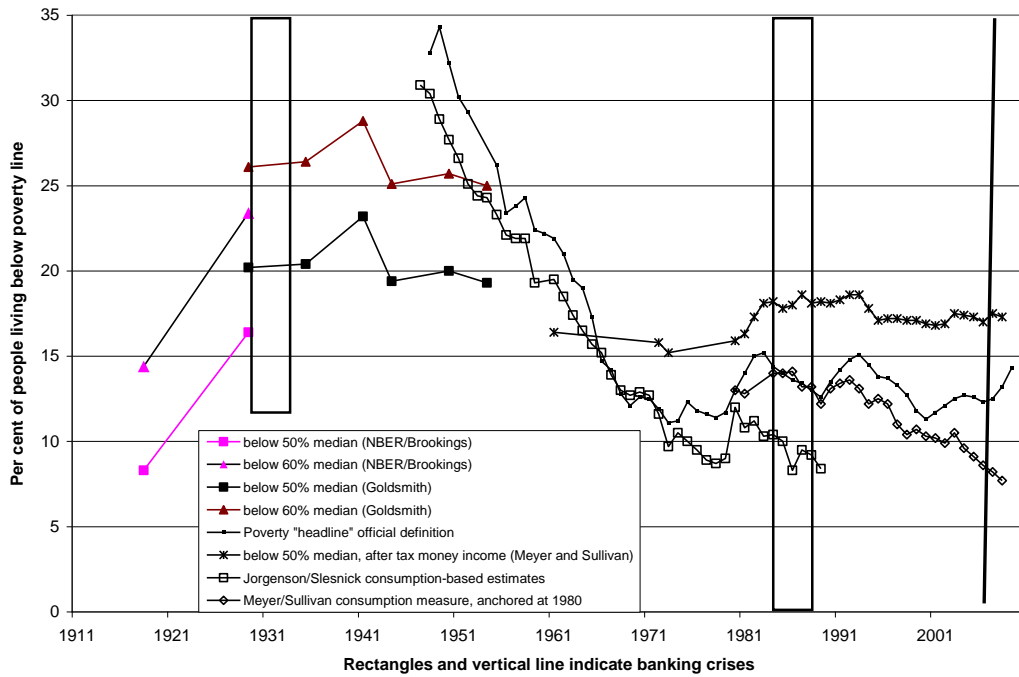




Figure US5 Composition of personal income US 1929-2009

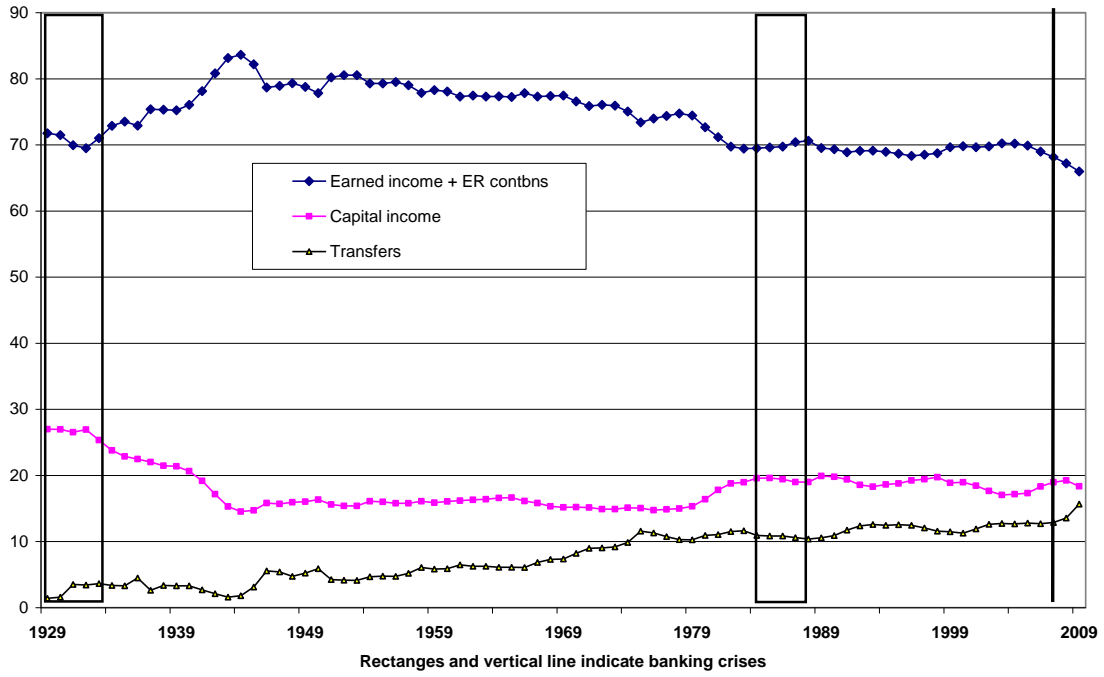


Figure US6 Dispersion of earnings and banking crises in US

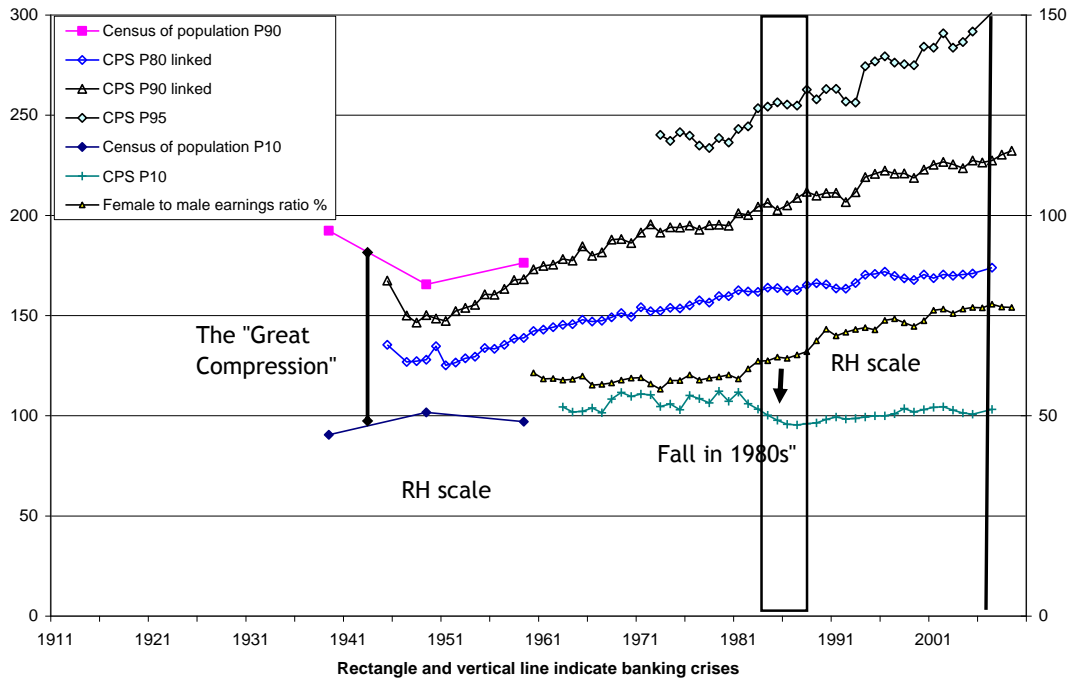
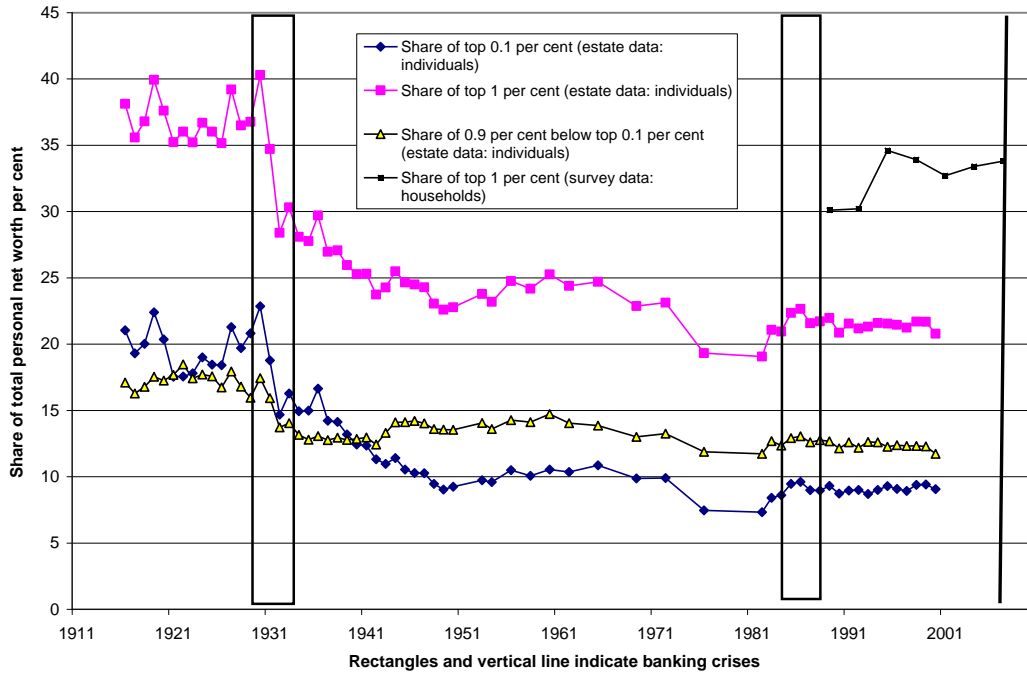


Figure US7 top wealth shares and banking crises in US



#### 4. Inequality and crises in long-run historical perspective: Around the world

The US experience has naturally been the focus of much attention, not least because of its implications for the world as a whole. At the same time, we can learn from the financial crises that have occurred in other countries. We begin with two sets of crises in the 1990s that have been much evoked in debate about the events of 2007-8: the Nordic and Asian crises. We then consider the full set of 35 banking crises (out of 66) for which we have distributional data. The data and sources are described in Atkinson and Morelli (2010).

##### 4.1 The Nordic financial crises

The evidence for the Nordic financial crises of the late 1980s and 1990s, and the Asian financial crises covers a number of countries (3 and 5, respectively), and we cannot go into the same depth as in the previous section for the US. For each country we typically present a single chart recording the evolution of inequality in relation to the occurrence (or non-occurrence) of financial crises. Inequality is measured in terms of income, where we have five indicators:

- Overall inequality (Gini coefficient);
  - Top income shares;
  - Income-based poverty measure;
  - Dispersion of individual earnings;
  - Top wealth shares.
- } Different points on the parade
- } Different sources of income

This is not of course possible in all cases, and it is rare to have data for any variable covering the full hundred years.

##### *Norway*

The Nordic countries have a history of banking crises, as may be seen in the case of Norway (with which we begin) from the vertical lines in Figure NO1. It should

be noted that the two of these (1931 and 1936) are not included in the “three major banking crises” in Norway identified by Gerdrup (2004).<sup>22</sup> He does identify the first, which he describes as the 1920-1928 crisis. For these years we have only limited distributional data. It is however noteworthy that the income share of the top 1 per cent changed little between the figure for 1913 and that for 1938.<sup>23</sup>

Turning to the 1990s, we find that the history of this crisis produced by economists at the Bank of Norway concluded “that there is little doubt that the Norwegian crisis was systemic. During the crisis, banks accounting for almost 60 per cent of bank lending to the non-financial domestic sector were in trouble” (Moe, Solheim and Vale, 2004, page ix). There had been problems in the banking sector from 1987 (the first bank failure was in autumn 1988), “but it appeared that the problems could be handled by mergers and support from the banking industry’s own guarantee funds” (Steigum, 2004, page 34). He goes on to say that “in 1991, however, to everybody’s surprise, a systemic banking crisis broke out, involving all the commercial banks” (2004, page 34). According to Vale (2004, page 2), the crisis reached a peak in the autumn of 1991 with the second and fourth largest banks losing all their capital and the largest bank faced serious difficulties. We have therefore in Figure NO1 shown the crisis as covering 1987 to 1991 (Gerdrup, 2004, refers to the period 1988-1993).

The onset of the Norwegian banking crisis came as the economy entered a downturn. The banking crisis may have lengthened the recession, but it did not precede it: the downturn had already started. The macro-economic decline may have been a causal factor contributing to the banking crisis. On the other hand, there were other factors. Many commentators see the origins of the Norwegian crisis as lying in the abolition in 1984 of the quantitative limits on bank lending, and in 1985 of the cap on lending rates. Vale comments that: “neither bankers nor supervisors had any experience of competitive credit markets. It became evident that many bank managers focused largely on capturing market shares” (2004, page 4). At the same time, the on-site inspection of banks had been scaled back.

How was the distribution of income changing before and after this Norwegian crisis episode? From Figure NO1, it may be seen that the share of the top 1 per cent was essentially flat from 1980, right through to the peak of the crisis in 1991. The deregulation of the banking industry did not appear to lead immediately to a rise in top

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<sup>22</sup> In the case of 1931, he notes that “there were large bank losses in 1931, and some smaller banks failed. Nonetheless, a widespread solvency crisis was avoided “(2004, page 165).

<sup>23</sup> The first of the crises identified by Gerdrup (2004) is the Kristiana Crash of 1899-1905. The revised estimates shown here for that period show the share of the top 1 per cent as falling from 20.3 per cent to 19.5 per cent. This is a much smaller fall than shown by our earlier estimates (Aaberge and Atkinson, 2010), and we wrong to have earlier referred to that crash as having produced a large reduction in top shares.

income shares, nor did the banking crisis lead to a clear fall from 1987. The same is true of the wealth shares. From 1991 onwards (or 1992 in the case of wealth), however, the top shares began to rise steeply. The graph does not show any rise in the top decile of earnings until later (from 1996), but overall income inequality as measured by the Gini coefficient rises by 2½ percentage points between 1991 and 1996. There is an increase in the percentage with incomes below 60 per cent of the median.

In sum, there was a clear rise in all three distributional indicators in the years following the banking crisis of the 1990s, with little apparent upward trend before the crisis period. It does not follow that there is a causal link. The upward movement may, for instance, be a lagged response to the earlier deregulation of the financial system. This could however be expected to show up in terms of increased earnings dispersion, with remuneration in financial services racing away at the top of the earnings distribution, whereas the rise in the top decile as a percentage of the median does not take place until the mid-1990s.

What is happening in the current crisis? According to the report, *Income Statistics for Households 2008* (Statistics Norway, website), “the financial situation of households at the top of the income distribution is strongly influenced by changes in the financial markets. In the wake of the finance crisis, many shareholders sold off shares that had fallen in value. These capital losses led to a weaker growth in household income for those at the top of the income distribution compared to people in the middle of the distribution.” But they also noted that the bottom decile group had weaker income growth than the median.

### *Sweden*

For the earlier banking crises in Sweden, in 1922 and 1931, we have once again little distributional data. From Figure SWE1, it may be seen that the 1921 crisis was preceded by falling shares of the top 1 per cent in wealth and income, and that the shares were lower after the 1931 crisis than before. It is hard to say more.

The crisis of the 1990s followed, as in Norway, a period of boom and rising asset prices. House prices in particular rose rapidly, in part fuelled by tax advantages. The banking crisis emerged later but more sharply than that in Norway. According to Drees and Pazarbaşıoğlu, “the surge of loan losses was particularly abrupt in Sweden” (1998, page 1), reaching 7 per cent in 1992. As noted by Englund, “at least until the autumn of 1989 there were no signs of an impending financial crisis” (1999, page 89). There had been a decline in the stock market from the peak of August 1989, and the real estate market price index had fallen by the end of 1990. Englund describes September 1990 as a key date, when one of the major finance companies found itself unable to roll over its financing, and this spread to cause a number of bankruptcies among finance companies. Bank credit losses rose steadily to reach a peak in April

1992, at which point, bank losses on loans were some twice the operating profits of the banking sector (Englund, 1999, Figure 6). In terms of explanations, “much has been made”, as Englund says, “of the 1985 deregulation” (of the banks and credit markets). He goes on to argue that one has to distinguish the different stages. The prior boom, he concludes, was due more to macroeconomic policies, but that deregulation was important in amplifying the movements of asset prices and leading to the subsequent financial crisis: “deregulation stimulated competition between different financial institutions, where the upside potential from rapid expansion was given too much weight relative to the long-term risks” (1999, page 95).

What was happening to the distribution? As has been shown by Fritzell, Bäckman and Ritakallio (2010), the overall degree of inequality was relatively unchanging at this time. As may be seen from Figure SWE1, the 1991-1993 period may be seen as a hiatus. Up to (and including) 1991, the Gini coefficient and the share of the top 1 per cent had been trending upwards. For the next few years they more or less marked time, with the Gini coefficient in 1995 only fractionally (0.7 percentage point) higher than in 1990. The difference is proportionately larger for the share of the top 1 per cent, which was 4.4 per cent in 1990 and 5.3 per cent in 1995 (an increase of 20 per cent). This indicates that the distributional change may have been different at different points in the income distribution.

There may also have been differences for different types of income. The series for top wealth shares (shown on the right hand axis in Figure SWE1) suggests that the share of the top 1 per cent fell by some 3½ percentage points from 1988 to 1990, and then *rose* from 1990 to 1992. In 1999, the next year in the series, the share was back to its 1988 level. This is consistent with the gains, and then losses, from the asset price boom of the late 1980s having accrued proportionately more to the bottom 99 per cent. In contrast, the distribution of earnings had been relatively stable: the top decile had not greatly varied as a percentage of the median up to 1991. But after 1991, the top decile began a steady rise for the next 10 years. To the extent that this contributed to the movements in overall inequality, it does not seem that it can be attributed directly to the banking crisis (although it may be linked to the deregulation of the financial sector).

### *Finland*

For the earlier banking crises in Finland, in 1921 and 1931 (we do not consider that in 1939 in view of the war), we have annual distributional data on the share of the top 1 per cent. From Figure FIN1, we can see that the former crisis was followed by a fall in the share of the top 1 per cent from 15 to 12 per cent. A fall of a fifth is similar to that between 1928 and 1931 in the share of the top 1 per cent in the US. On the other hand, there was no similar fall following the 1931 crisis. The share of the top 1 per cent in 1938 was little different from its level ten years earlier.

The banking crisis of the 1990s occurred during a period of major macroeconomic turbulence for the Finnish economy. An economic boom, with rapid growth and high inflation, came to an end in 1990. The collapse of the Soviet Union led to a sharp reduction in Finnish exports to Russia. Non-performing loans began to accumulate in 1991, particularly as a result of the depreciation of the currency, combined with the fact that many loans were denominated in foreign currency. The banking problems reached their peak in 1992. The government injected funds to support the banking sector and set up a Government Guarantee Fund in 1992.

What happened to the distribution? In Finland, as in Norway, there is little evidence of an upward trend in inequality before 1991. After the banking crisis, there are again signs that different parts of the distribution are differently affected. Interestingly there was a fall in the proportion below the EU at-risk-of-poverty line (60 per cent of median), suggesting that, at the bottom, incomes were being reduced less sharply. Overall inequality was little changed in 1992 but then began to rise. The top share by 1995 was nearly a fifth higher than in 1991. There is not necessarily a causal link. The upward movement, found in top earnings as well as income, may, for instance, be a lagged response to the earlier deregulation of the financial system. The top decile in Finland did in fact follow a similar time-path to that in Sweden, being relatively flat up to 1991 and then beginning to climb.

What is happening in the current crisis? According to the report, *Income Distribution Statistics 2008*, “the income level weakened at the extreme ends of the income distribution. The income of the highest-income households decreased most and the share of [the top 10 per cent] declined for the first time since 2002, mostly due to reduction in [profits]” (Statistics Finland website). They note that “the recession that started in the latter half of 2008 claimed nearly 15 per cent of households’ property income and almost 7 per cent of their entrepreneurial income ... but wage and salary income still grew by around one per cent” (website of Statistics Finland).

### *Iceland*

No account of financial crises in Nordic countries is complete without reference to Iceland. The distributional data of Olafsson and Kristjansson (2010) are shown in Figure ICE1, where the overall inequality and top share series start in 1992, and the earnings dispersion series covers an even shorter period. But the data do cover the run-up to the 2007 crisis.

The 2007 crisis in Iceland appears to show a “classic” **A**. Income inequality had been rising rapidly during the years preceding the crisis, as had the top decile of earnings relative to the median. Overall income inequality and the top income shares fell sharply the year following the crisis. But it should be noted that the top decile of earnings continued to rise relative to the median.

The magnitude of the distributional changes in Iceland should be underlined. In the five years prior to the crisis, the Gini coefficient rose by 11 percentage points - more than double the increase in the US in the 1980s. The share of the top 1 per cent (in disposable income) more than doubled.

### *Summary for the Nordic crises*

In terms of the I to C hypothesis, it is widely agreed that the Nordic banking crises were not solely due to macroeconomic developments and policies. Drees and Pazarbaşıoğlu concluded, for example, that “factors in addition to business cycle effects explain the financial problems that the Nordic countries have experienced. Although the timing of the deregulation in all three countries coincided with a strongly expansionary macroeconomic momentum, the main causes of the banking crises were the delayed policy responses, the structural characteristics of the financial system, and - last but not least - banks’ inadequate internal risk-management controls” (1998, page 1). Although overall inequality, and top income shares, had been increasing in Sweden before the banking crisis, this was not the case in Finland or Norway. From our reading of the English-language literature, it does not appear that rising inequality has been invoked as a cause of the crises.

In terms of the C to I hypothesis, we have seen that the banking crisis was associated in Sweden with an apparent hiatus in the upward rise in overall inequality and top shares. This “pause” may mean that the top shares, for example, have subsequently been lower than they would otherwise have been (as is implied by the cross-country findings of Roine, Vlachos and Waldenström, 2009). The pattern for Finland and Norway appears rather different. In these countries there had been little prior upward trend, but the period following the banking crisis saw rising overall inequality and top income shares. As we have stressed, it does not follow that there is a causal link. The upward movement, found in top earnings as well as income, may, for instance, be a lagged response to the earlier deregulation of the financial system. Finally, we should note that the later, 2007, crisis in Iceland produced a quite different pattern, one that, in terms of income, is close to the classic  $\Lambda$ , and which in magnitude is very much larger.



Figure NO1 Banking crises and income inequality in Norway 1911-2010

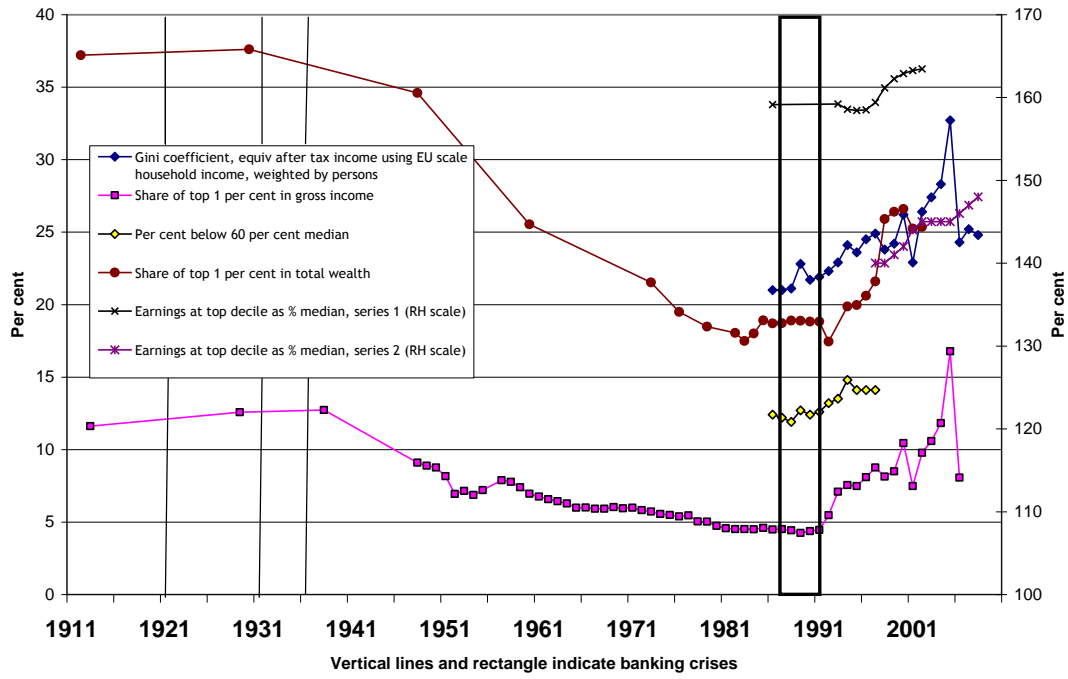


Figure SWE1 Banking crises and inequality in Sweden 1911-2010

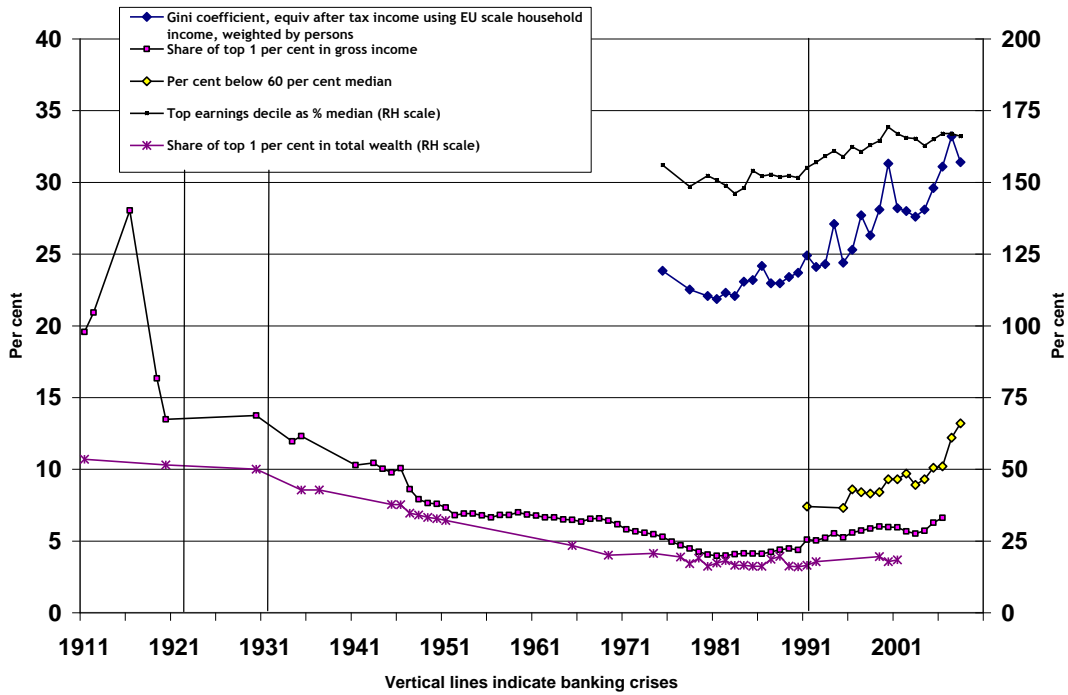


Figure FIN1 Banking crises and inequality in Finland 1911-2010

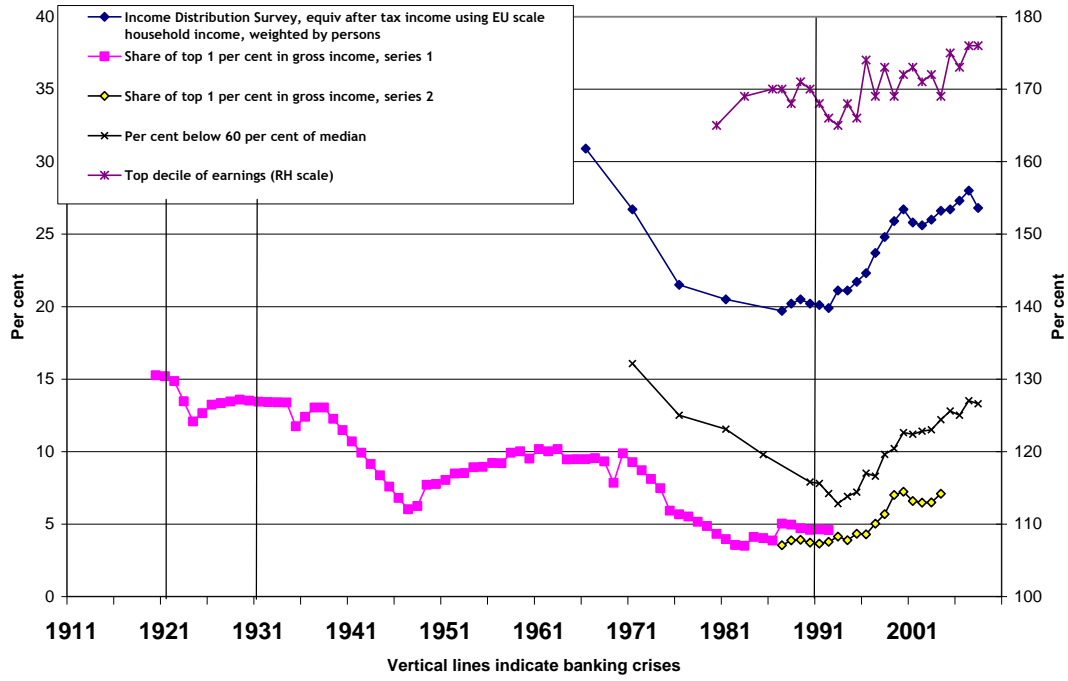
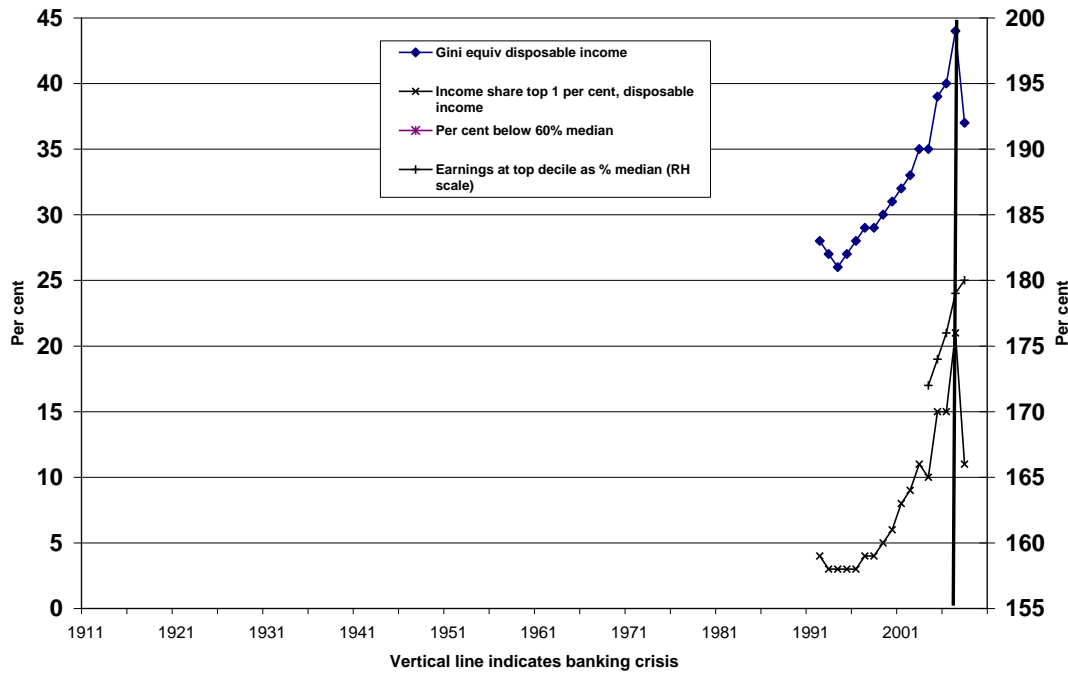


Figure ICE1 Iceland banking crises and income inequality 1911-2010



## 4.2 Asian financial crises

Financial crises have a long history in Asia. In the period covered here, both India and Japan had three systemic banking crises in the period before the Second World War. Two occurred during the First World War (1914 in India and 1917 in Japan) and are not examined here. For three of the remaining four, we have distributional information relating to the top income shares, drawing on the work of Banerjee and Piketty (2005) and Moriguchi and Saez (2008), respectively. (The top income series for India only starts in 1922, so that we do not cover the 1921 banking crisis.)

The 1923 banking crisis in Japan occurred after a period of increases in the shares of the top 1 and 0.1 per cent, and it was followed by a fall in top shares. (We have no evidence about overall inequality for this period.) It has a classic  $\Lambda$  shape. It was also the time of the Great Kanto earthquake, which led to financial problems as a result of the actions taken by the Bank of Japan to rediscount “earthquake bills”. This led to a second banking crisis, the Shōwa crisis, in 1927, that was not evidently connected with a downturn in the real economy, and there was no such  $\Lambda$  pattern.

After the Second World War, Japan had no major banking failures until the financial crisis of the 1990s following the asset price bubble. This crisis is dated here as starting in 1992, when there began to be sporadic failures of financial institutions, although it was 1994 before major bank failures occurred (Nakaso, 2001). What happened to the distribution of income? As is clear from Figure JA1, the overall inequality and the top income shares were relatively stable for much of the post-war period. Only the series for the earnings of the top decile relative to the median shows any increase, and this series peaked in 1990. The direction of change up to 1992, or 1994, was in a downward direction; this was followed by a period of broad stability.

In India, the banking crisis of 1929 occurred during the long period of gestation for the Reserve Bank of India.<sup>24</sup> The establishment of the Bank had been proposed in 1926 but it was not established until 1935 (the delay was in part due to unwillingness on the part of the authorities to accept the restriction that the Governor or Deputy Governor should be reserved for an Indian). When he was finally appointed, the first Governor felt that the delay had contributed to the economic difficulties of India at the time (Kumar et al, 1983, page 792). While the banking and currency crises faced by India in the first part of the century were a recurrent concern of the Indian government and of the civil servants of the India Office (who briefly included a young Keynes), there is no indication that the level of inequality in Imperial India

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<sup>24</sup> The identification of the crisis in 1929 follows Reinhart (2010), but it should be noted that, unlike 1914, when there were 42 bank failures and loss of 11 million rupees of bank paid-up capital, and 1923, when there were losses of 46 million rupees, in 1929 there were only 11 bank failures and losses of under 1 million (Kumar et al, page 781). In 1921 there were only 7 bank failures. See *Banking and Monetary Statistics of India*.

contributed to these problems. Nor is there any indication that the crises had a distributional impact, at least as far as top income shares are concerned. The top shares were rising before the Indian banking crisis of 1929, and continued to rise afterwards.

Post independence India had a banking crisis in 1993, a year that saw major changes in banking legislation. From Figure INDIA1, it may be seen that this was preceded by a period of falling inequality, both overall and top income shares; and that it was followed by a period of rising inequality.

The distributional impact of the regional 1997 Asian financial crisis is illustrated here by the graphs for Indonesia, Malaysia, Singapore and Mauritius. The latter two countries are not identified as having a banking crisis in 1997 (and for this reason are not included in the 35 crises studied in the next section), but they were undoubtedly exposed to the regional impact. The graphs also show the effect of the earlier banking crises in Singapore (1982), Malaysia (1985) and Indonesia (1992). In the first of these, there was little distributional change either side of the banking crisis; the second exhibits a (muted)  $\Lambda$  pattern; and the 1992 crisis in Indonesia shows a mixed picture.

What pattern was associated with the 1997 crisis? For Malaysia, inequality, both overall and in top income shares, was rising for 3-4 years before the crisis. In this respect, there is a contrast with Singapore, where there was no crisis and there was little evidence of prior rising inequality (and the top decile of earnings was lower than ten years earlier). The Singapore earlier experience of distributional stability makes even more remarkable the rise in top income shares, overall inequality and top earnings after 1997. Top income shares rose in Malaysia post-1997. These countries provide evidence of banking crises being followed by rising inequality. South Korea is not included in our sample, but formed part of the 1997 Asian financial crisis (it is identified as having a banking crisis in 1997 by Bordo et al (2001), Laeven and Valencia (2009), and Reinhart (2010)). Two studies of the income distribution find that income inequality has increased. "After nearly a decade of either declining or stable trend since the mid 1980s, the family income inequality in Korea sharply increased in the course of the financial crisis, and remained high even after the economy recovered from the recession" (Lee, 2002, page 3). Hagen (2007) investigates "the emerging pattern of social inequality in South Korea since the financial crisis in 1997" and finds that "economic inequality has grown significantly over the past decade" (2007, Abstract). On the other hand, in Mauritius there is no sign of rising inequality post-1997 and overall inequality fell in Indonesia. The latter evidence relates to expenditure, rather than income, and the two dimensions of inequality may have moved in opposite directions.

Figure JA1 Banking crises and inequality in Japan

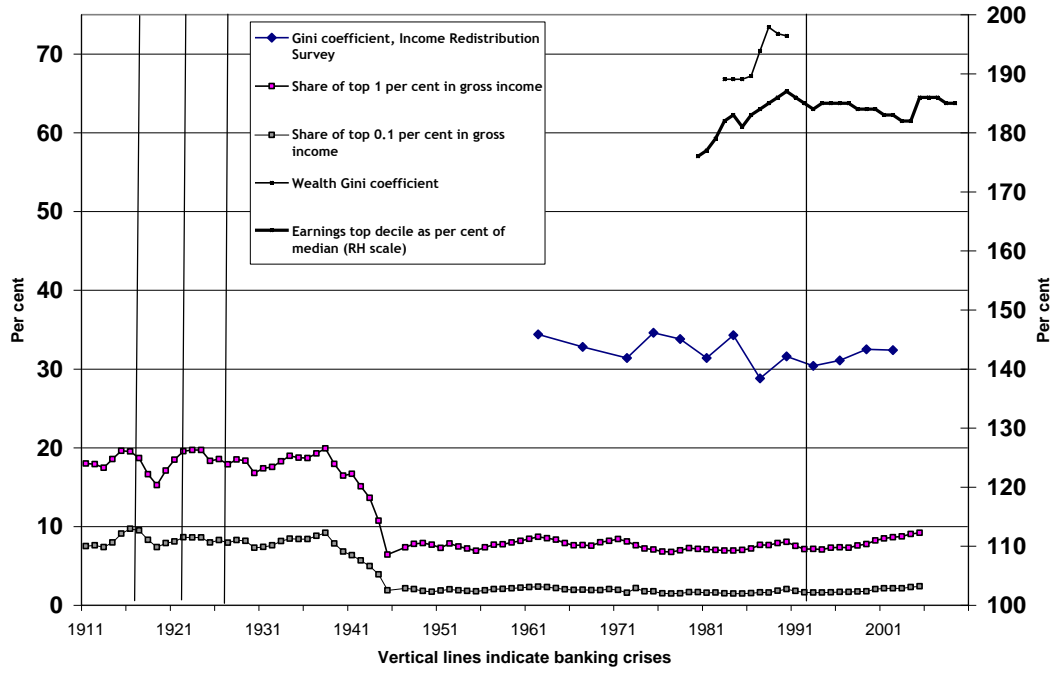


Figure INDIA1 India banking crises and income inequality 1911-2010

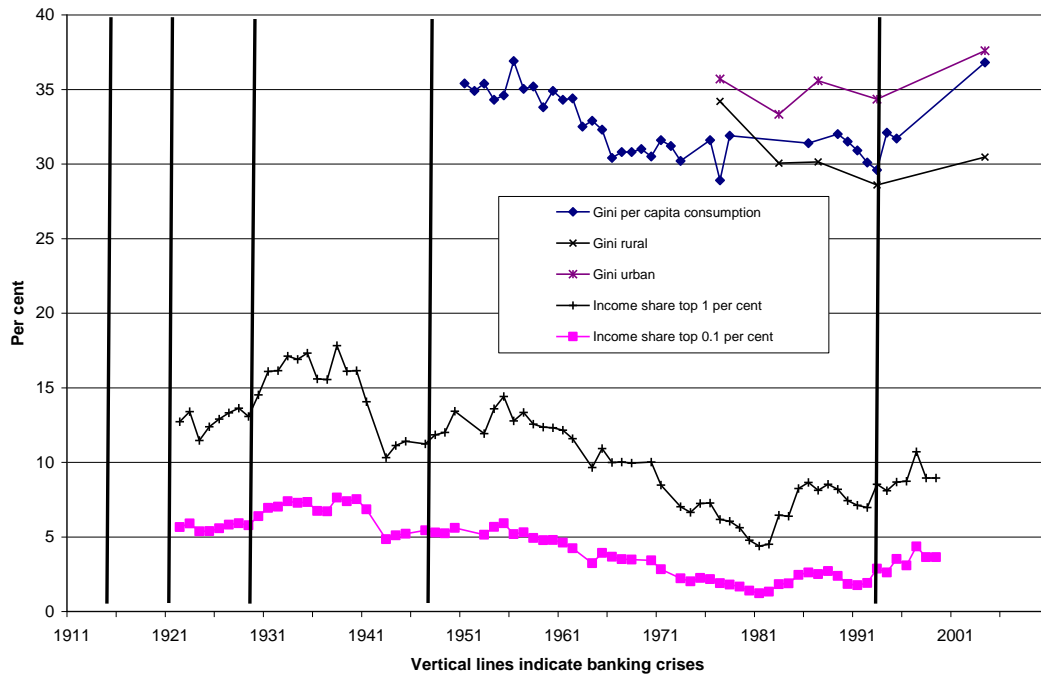


Figure INDON1 Indonesia banking crises and income inequality 1911-2010

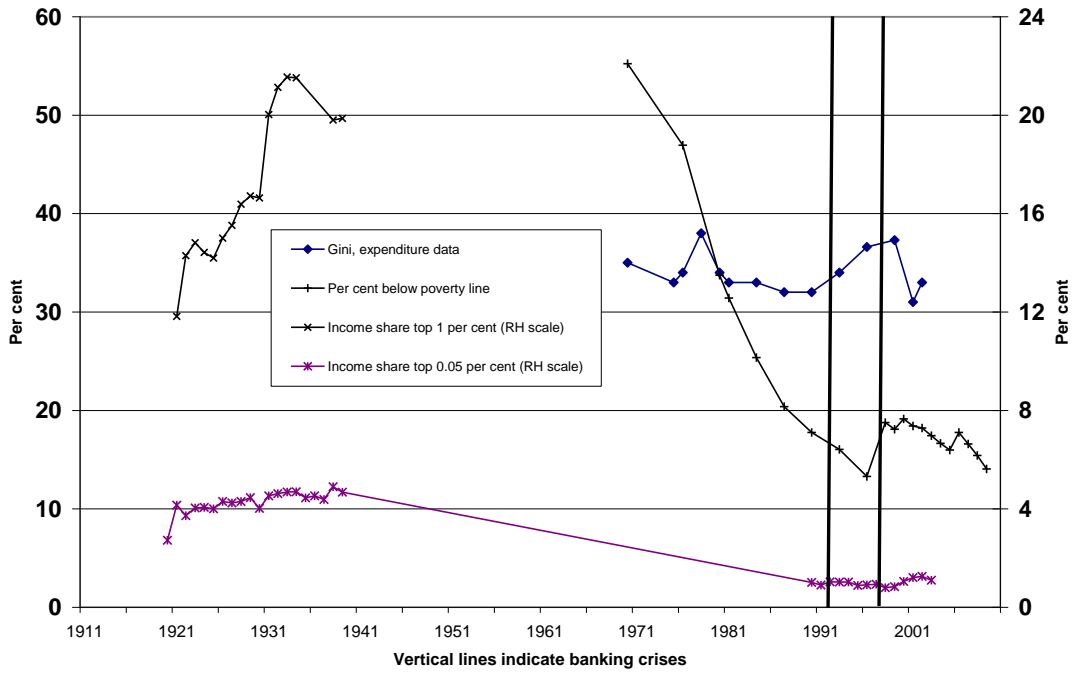


Figure MYA1 Malaysia banking crises and income inequality 1911-2010

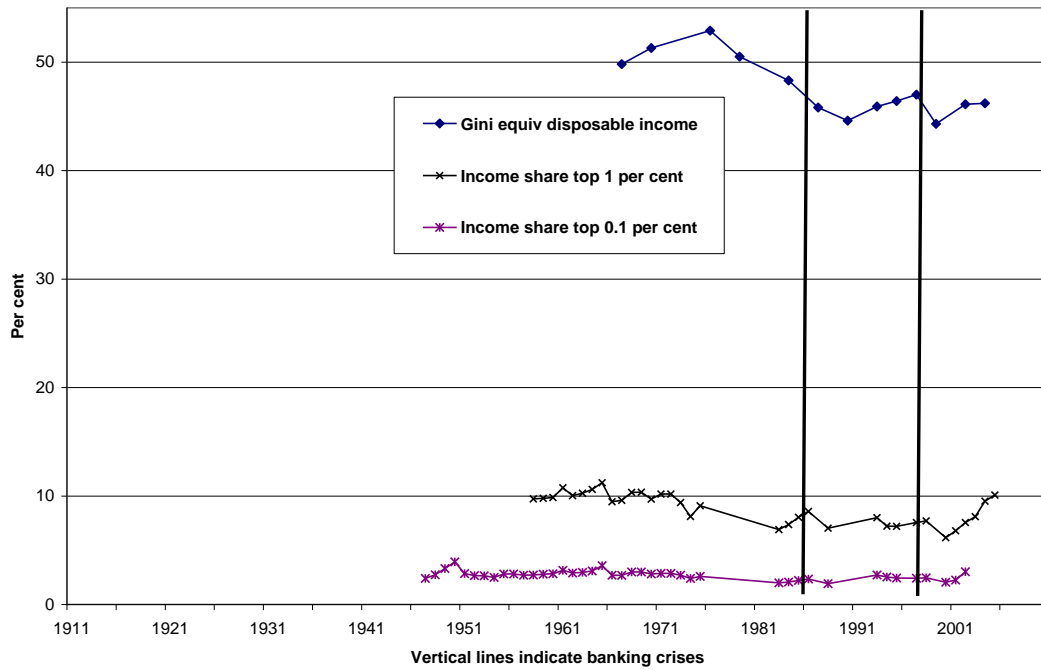


Figure S11 Banking crises and inequality in Singapore 1911-2010

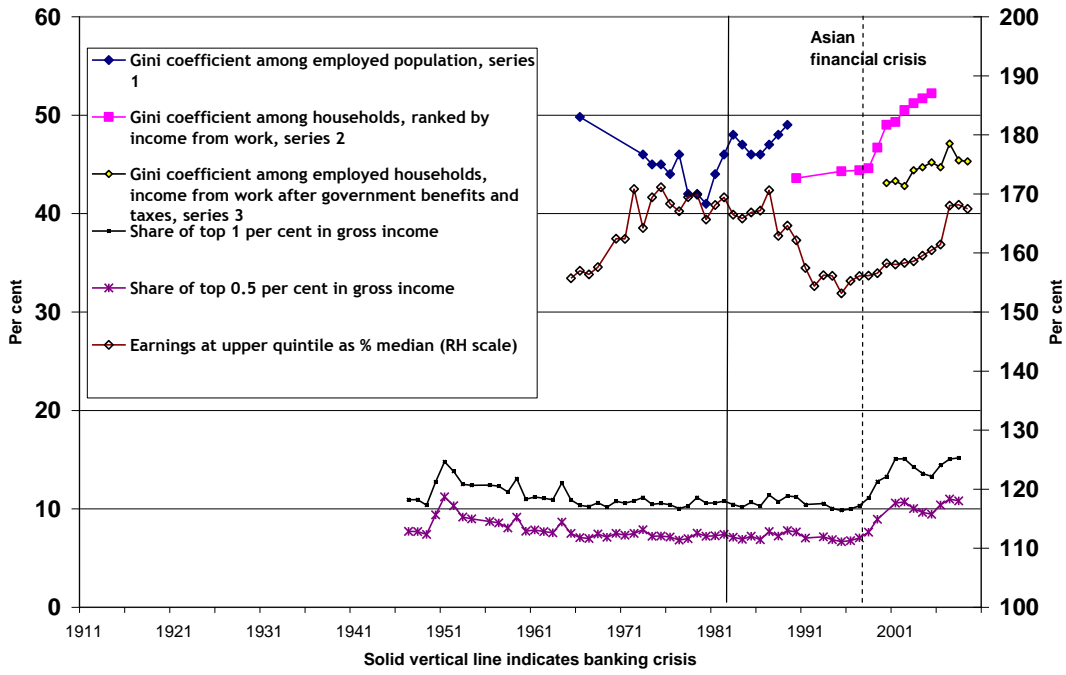
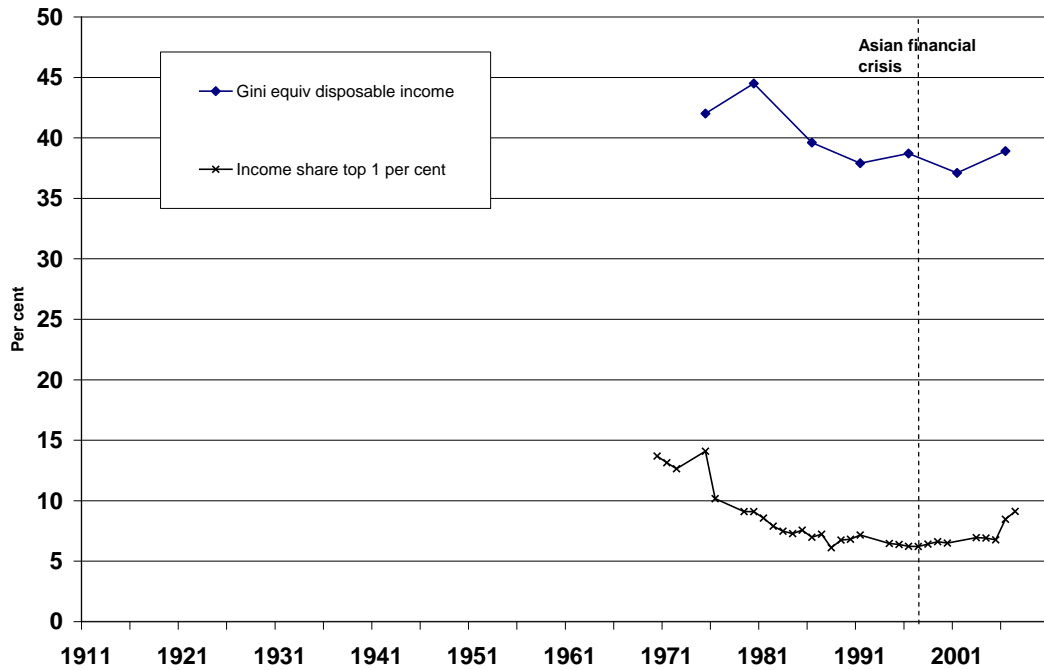


Figure MAU1 Income inequality in Mauritius 1911-2010



### 4.3 A summary of 35 banking crises: clear-glass window plots

We have so far presented distributional evidence covering 19 systemic banking crises. Of the 66 systemic banking crises identified in our set of 25 countries over the period 1911-2010, we have located useable distributional data for 35, slightly over half. As is to be expected, distributional data are more readily available for the post-war period: 21 of the 35 are for years after 1980. The coverage is therefore weighted in this direction. We have distributional data for all but 3 of the post-1980 crises, but only 14 out of 40 crises before 1939. The coverage of OECD countries (23 out of 35) is more or less proportionate to their representation among the identified crises (44 out of 66).

The distributional changes before and after these 35 crises are summarised in “clear-glass window plots” centred on the year(s) of the crisis, where we show the difference in inequality relative to the crisis year. Put simply, was inequality increasing before the crisis, and did inequality fall after the crisis? These plots show the changes relative to the value at the crisis date,  $t$ , over a 5 year “window” either side of  $t$ : i.e. from  $t-5$  to  $t+5$ . This is a “clear-glass” window diagram in the sense that it makes no allowance for the counterfactual, or how the distributional variables would have evolved in the absence of the banking crisis. Inequality may for example have been trending up for many years and irrespective of the banking crisis inequality could therefore be expected to be lower before the crisis and higher afterwards. We are showing in unvarnished form the distribution before and after the start of a banking crisis.

The window plots for the 3 US banking crises are shown here in the text; the remaining 32 are shown in the Appendix (those for Finland 1921 and 1931, Japan 1923 and 1927, and for Netherlands 1914 and 1921, are combined). In what follows, we seek to classify the crises according to the direction of change in inequality. Thus a crisis may be classified as being preceded by rising inequality, shown as /, and followed by a fall in inequality, shown as \, giving an overall  $\Lambda$  pattern. The direction of change is not always easy to characterise, since variables may exhibit volatility, and since different dimensions of inequality may move differently. These cases (5 out of 35) have been classified as “mixed”. There are also 5 cases for which we have insufficient data before (Argentina 1934) or after (the recent crises apart from Iceland).

The remaining 25 cases are classified in Table 3. Some cases are more prevalent: the “classic”  $\Lambda$  shape is, just, the most popular: 5 of the 25 cases (US 1929 (although qualified for the reasons discussed in Section 3), Iceland 2007, Japan 1923, Argentina 2001 and Brazil 1990). The reverse case, the  $V$  shape, is found in only 3 cases: Australia 1931, India 1993, and Netherlands 1914.

What can be deduced from these window plots about the two hypotheses?



### *The I to C hypothesis*

As noted earlier, the precise form of the hypothesis is not typically specified. In particular, we have to distinguish between the effects of *increasing* inequality and the effects of a high *level* of inequality. We should also note that, in this case, it is the clear-glass window that is relevant. The relevant variable is the actual level of, or change in, inequality, not the level, or change, relative to a counterfactual. For the change, we can see from Table 3 that the crises were preceded by rising inequality in 10 out of the 25 cases, of which 3 were in the 1920s. To these we may add the incomplete patterns for Germany 2007 and the UK 2007, both of which were preceded by rising inequality. It is true that there are fewer cases where the banking crisis was preceded by falling inequality (7 out of 25 cases) and that these are drawn more from the pre-1939 period. But, at first sight, this does not provide overwhelming support for the *increase* hypothesis.

What about the level version of the hypothesis? In the case of US 2007, overall inequality may not have been rising markedly, but it was undoubtedly higher than 30 years before. How far was this true in the case of other crises? Making a comparison over 30 years is a “stretch” for our data sources, and we apply the shorter criterion of 10 years, although even this means that we cannot judge of the 35 cases. The different banking crises are classified in Table 4 according to whether or not there was a salient difference in inequality from 10 years earlier. (In the case of the Gini coefficient, we take a 2 percentage point difference as salient; in the case of the share of the top 1 per cent, we take a difference of 3 percentage points as salient.) The availability of data is a serious limitation: in both cases, n/a (not available) comes top, or joint top. But we can see that in both cases, the cases where there was a salient difference are considerably fewer than the cases where there is no salient positive difference (this includes cases where inequality is lower than 10 years earlier). For 8 crises the Gini coefficient was higher, whereas for 12 it was not; for the top shares the “Yes” cases are half the “No” cases: 7 out of the 21 that can be classified.<sup>25</sup> Again there does not appear to be a smoking gun.

What about the dogs that did not bark? Table 5 shows the level of inequality in 2007, compared with 10 years earlier, for the 19 countries (out of 25) that are not identified as having had a systemic banking crisis in 2007-2008. The Gini coefficient was higher to a salient extent in 2 of the 6 cases where a crisis is identified, which is

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<sup>25</sup> This may appear to give the edge to the Gini coefficient as a predictor of a banking crisis, but the numbers are influenced by the pattern of non-availability. If attention is restricted to the 14 cases where information is available for both the Gini coefficient and top shares, then they agree in 10 cases, and where they disagree, the top shares “predict” the crisis 3 times to the 1 for the Gini coefficient. The reader need hardly be reminded that these are small numbers.

exactly the same proportion as among the 15 cases where no crisis is identified (for 4 countries there are no data). (The numbers are summarised in Table 6.) In contrast, the top shares are higher to a salient extent in 3 out of 4 cases of crisis (2 are n/a), compared to equal numbers, 6 out of 12, for the non-crisis cases. On this basis, the level of the top income shares, but not the Gini coefficient, has predictive content.

In order to understand the temporal association, it is the clear-glass windows that are relevant, but this does not mean that we can draw any conclusion about causality. This brings us to the underlying theoretical framework. In his comment in *The Economist*, Laibson says that “the recent financial crisis was primarily caused by asset bubbles, notably in housing and equity. When those bubbles burst, highly levered, unhedged financial institutions went into a tailspin”. He goes on to say, as we have already quoted, that “inequality was not a major contributor”. That does not however seem to be the end of the matter, since inequality could have had an indirect effect in contributing to the asset bubble. The problem here is that most analyses of asset bubbles provide no point of entry for consideration of the role of inequality, so that any consideration of this issue has to start further back. In fact there seem to be several possible routes, and in Table 7 we sketch some of these (the reader can doubtless add further possibilities). It goes without saying that these need to be spelled out formally. It should also be emphasised that we may need a combination of explanations. As was said of the housing bubble by Glaeser et al., “we doubt that any single or simple story can explain the movement in house prices, especially over the past decade” (2010, page 7).

### *The C to I hypothesis*

Testing the hypothesis that banking crises affect inequality clearly requires a counterfactual. The clear-glass window is not satisfactory: we need a refractive lens that adjusts for the direction that the inequality index would have taken. To do this properly would require a good understanding of the evolution of the different indicators that we have been considering.

The standard approach to determining the counterfactual is to specify a number of variables that are expected to influence the extent of inequality and then to estimate the model using panels of countries, such as the data assembled here. On our view, this approach, while interesting, fails to relate the econometric analysis sufficiently tightly to the underlying theoretical model. Such a model should start with the decomposition of income into its major components, since these are subject to different forces. For example, in the case of the US, we discussed the possibility that the degree of sensitivity of top income shares may have first decreased over time and then increased. This could have happened as a result of (a) a shift away from capital income as the principal source for the top 1 per cent towards remuneration, with capital income being more sensitive to the stock market (Morelli, 2010) and (b) a trend

in recent years for remuneration to be more cyclically sensitive at the top as identified by Parker and Vissing-Jorgensen (2009 and 2010). The shift away from capital income reflects the large, and long-standing, upward trend in the upper earnings percentiles relative to the median, which has naturally attracted a lot of attention. We should however enter two notes of caution. First, the upward trend in earnings dispersion is not universal. For 14 of the countries studied here, we have earnings data covering the past 10 years. In half of these, the top decile relative to the median by 5 per cent or more, but for 5 of the 14 the increase was less than 2 per cent or negative. Secondly, capital income should not be neglected. The long-run fall in top wealth shares has reflected the spread of popular ownership in the form of housing, pension rights, and small savings. It has also been accompanied by increased household indebtedness.

We do not attempt to go any further in this paper. Instead we make two observations based on the data presented above. The first is based on Table 3. The diagonal in this table shows combinations where the trajectory was unchanged; above the diagonal are cases where the trajectory “bent” downward; below the diagonal are cases where the trajectory “bent” upward. The former, for example, include cases where inequality was previously increasing, but stabilised after the crisis, cases where it turned downwards, and cases where it had been stable but turned downwards. If our observations are “refracted” in this way, then we have a crude indicator as to which direction inequality has departed after the crisis. It turns out that the numbers either side of the diagonal are equal. There is no presumption. It may be noted that 9 of the 25 cases in Table 3 are identified by Barro and Ursúa (2008) as consumption or GDP “disasters” (almost the same proportion as for all 66 banking crises). Of the 9 cases, one is located on the diagonal, 4 above the diagonal and 4 below. In other words, there is no systematic relation between the inequality outcome and the association with a macro-economic disaster.

The second observation concerns the common statement that there is a general upward trend in inequality. Is that in fact the case? If we return to Table 6, we see that in a majority of countries top income shares are higher (by 3 percentage points or more) than ten years earlier, but it is a bare majority. For 7 of the 16 countries, this was not the case. As far as overall inequality is concerned, cases where the Gini coefficient has increased by 2 percentage points or more are outnumbered 2 to 1 in our sample of 21 countries. Nor is our sample necessarily biased in that direction. Only two Latin American countries are included, whereas a majority of these countries have shown declining inequality in recent years (Cornia 2010 and Gasparini et al, 2009).

Table 7 Possible theoretical models

1. Model of increased consumer debt

Increased demand for consumer borrowing to finance desired consumption to keep up with those whose earnings are rising faster (Duesenberry (1949), Frank et al, 2010) or increased volatility (Iacoviello, 2008). *Change in inequality (overall and bottom) is causal.*

2. Growth of financial sector and asset bubbles

Financial sector attracts skilled workers by sharing rents, and growth drives asset bubbles (Cahuc and Challe, 2009). *Depends on source of growth: causal if Model 1 (inequality at bottom) but co-incident, not causal, if shift in remuneration practices (remuneration tied more closely to sales, so that banks behave more like sales maximisers than maximisers of shareholder value).*

3. Banking model of introduction of securitisation

Change in banking practices with introduction of securitisation (Shleifer and Vishny, 2010), taking on greater risk to an extent that is greater the higher the degree of inequality. *Level of inequality (overall and bottom) is jointly causal.*

4. Political economy models

There are several possible political economy explanations.

De-regulation (1): in response to rise in inequality, government does not increase redistributive tax and benefit policy, but uses deregulation of banking to ease access to credit/mortgages. *Change in inequality (overall and bottom) is causal.*

De-regulation (2): increased inequality at top leads to lobbying for de-regulation. *Change in inequality (top) is causal.*

Pensions and “buy-to-let”: government decides to reduce size of welfare state. Loss of income to current beneficiaries causes inequality to rise. Households respond by saving more in private pensions, driving up equity prices, and by “buy-to-let” purchases of housing, driving up house prices. *Co-incident, not causal.*

**Table 3 Classification of 25 banking crises**

	After \ /	=	/	TOTAL
Before /	5	1	4	10
=	3	2	3	8
\ /	1	3	3	7
TOTAL	9	6	10	25

**Table 6 Level of inequality in 2007 compared with ten years earlier and identification of a banking crisis in 2007-8: contingency table**

	GINI coefficient			Top income shares		
	Identified crisis	No identified crisis	TOTAL	Identified crisis	No identified crisis	TOTAL
Higher inequality	2	5	7	3	6	9
No higher inequality	4	10	14	1	6	7
TOTAL	6	15	21	4	12	16

Table 4 Cases where level of inequality at crisis start date was higher than 10 years earlier		
	Gini coefficient	Top income share
AR 1934	n/a	n/a
AR 1995	n/a	n/a
AR 2001	Yes	n/a
AUS 1931	n/a	No
BRA 1990	Yes	n/a
BRA 1994	No	n/a
CA 1923	n/a	n/a
FI 1921	n/a	n/a
FI 1931	n/a	No
FI 1991	No	No
FR 1930	n/a	No
GER 1925	n/a	n/a
GER 1930	n/a	n/a
GER 2007	Yes	n/a
ICE 2007	Yes	Yes
INDIA 1929	n/a	n/a
INDIA 1993	No	Yes
INDON 1992	No	n/a
INDON 1997	Yes	n/a
IT 1990	No	No
JA 1923	n/a	Yes
JA 1927	n/a	No
JA 1992	No	No
MAL 1985	No	No

MAL 1997	No	No
NL 1914	n/a	n/a
NL 1921	n/a	No
NOR 1987	n/a	No
SI 1982	No	No
SPAIN 2008	No	No
SWE 1991	Yes	No
UK 2007	No	Yes
US 1929	Yes	Yes
US 1984	Yes	Yes (when capital gains included)
US 2007	No	Yes
n/a denotes not available.		
Yes means an increase of 2 percentage points or more in the Gini coefficient		
Yes means an increase of 3 percentage points or more in the share of top 1 per cent		

Table 5 Countries not identified as having banking crisis in 2007/8		
Was inequality higher than 10 years earlier?		
	Gini coefficient	Top income share
Argentina	No	Yes
Australia	Yes	Yes
Brazil	No	n/a
Canada	No	No
Finland	Yes	Yes
France	No	No
India	Yes	n/a
Indonesia	n/a	n/a
Italy	No	n/a
Japan	n/a	No
Malaysia	No	Yes
Mauritius	No	Yes
New Zealand	No	No
Norway	No	No
Portugal	No	n/a
Singapore	Yes	Yes
South Africa	n/a	n/a
Sweden	Yes	No
Switzerland	n/a	n/a
n/a denotes not available.		
Yes means an increase of 2 percentage points or more in the Gini coefficient		
Yes means an increase of 3 percentage points or more in the share of top 1 per cent		



US1929 Window diagram

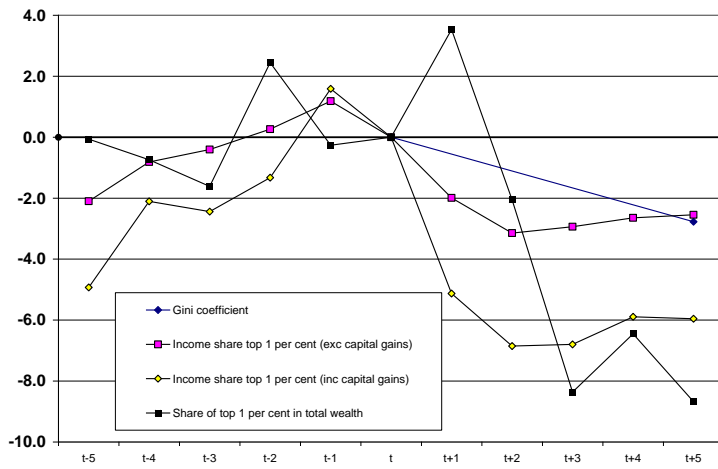


Figure US 1984-88 Window diagram

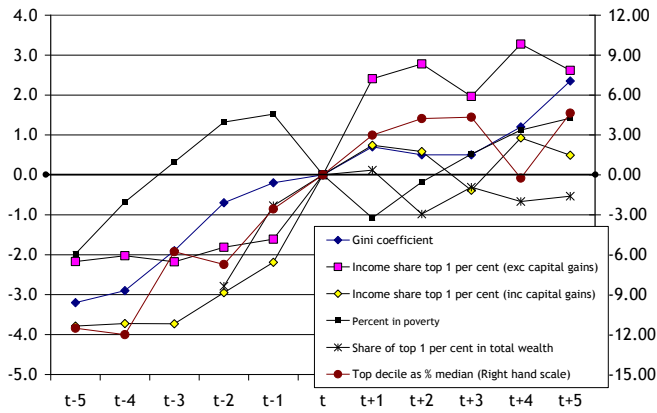
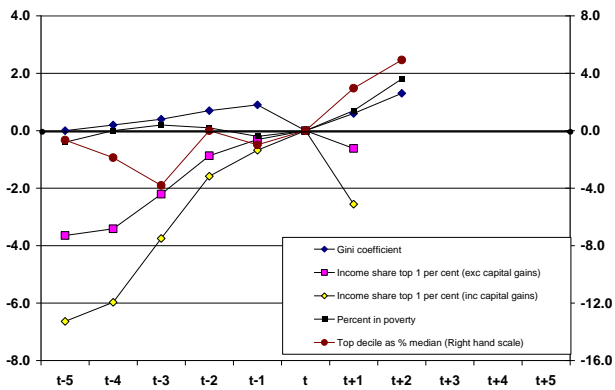


Figure US2007 Window diagram



## 5 Initial conclusions and unfinished business

As emphasised throughout the paper, there are many qualifications surrounding the conclusions, and the removal of these qualifications represents the first part of unfinished business. With this in mind, we may summarise as follows:

- Economic inequality has many dimensions. We have focused on inequality of current income, and its components (earnings and capital income), but other dimensions may be more relevant to social well-being. In particular, we highlight inequality of opportunity, where the most lasting impact of the crisis may be on those cohorts who are at vulnerable stages of the life-cycle for which we should seek other indicators (for example, youth unemployment rates).
- Heterogeneity is important. Different parts of the income distribution react differently, and the conclusions drawn regarding the origins and the impact of the crisis may depend which part of the parade we are watching. The top and the bottom may be the most affected; depending on the theoretical model adopted, either the top or the bottom may be more relevant to understanding the origins of the crisis.
- The origins and the impact of banking crises may differ over time - “this time it may be different”. The three US systemic crises over the past 100 years have superficial similarities but this has to be nuanced. Top income shares may have been more sensitive in the 1920s, and again today, than in the 1980s, but the composition of income has changed.
- Specifically, there was a substantial *rise* in overall inequality in the period leading up to the 1929 and S+L crises in the US, but this was not the case for the present crisis; on the other hand, in terms of the *level* of inequality 2007 resembles 1929 more than 1984.
- Outside the US, the history of systemic banking crises in different countries around the world does not suggest that either rising or high inequality has been adduced as a significant causal factor. While our dataset is not adapted to the comparison of levels of inequality, it is not the case that most countries have seen a salient increase in overall income inequality over the past 10 years.
- The impact of a systemic banking crisis can differ across countries, and there is no clearly identifiable pattern.
- We are still awaiting the distributional evidence required to judge the impact of the 2007-8 crisis; there is an urgent need for more up-to-date information.

There is much unfinished business, but we limit ourselves to two points - one addressed at policy-makers and the other at the economics profession. The differences

in the impact of crises across countries and across time points to the need to investigate the policies pursued. In particular, it is important to examine the role of taxes and transfers and the inter-relation with debt reduction policies. For economists, it is clear that the issues considered in this paper span different fields within the discipline, and there is need for an integrated approach to understanding the underlying mechanisms.

## Appendix A

\* The y-axis of each graph is labelled “Percent”, but due to technical difficulties appears inverted.

This appendix contains the summary graphs of the long-run evolution of inequality 1911-2010 for the 14 countries not covered in the main text: Argentina (Figure AR1), Australia (Figure AU1), Brazil (Figure BRZ1), Canada (Figure CA1), France (Figure FR1), Germany (Figure GER1), Italy (Figure IT1), Netherlands (Figure NL1), New Zealand (Figure NZ1), Portugal (Figure PORT1), South Africa (Figure SA1), Spain (Figure SPAIN1), Switzerland (Figure SWITZ1), and the UK (Figure UK1).

Figure AR1 Banking crises and inequality in Argentina 1911-2010

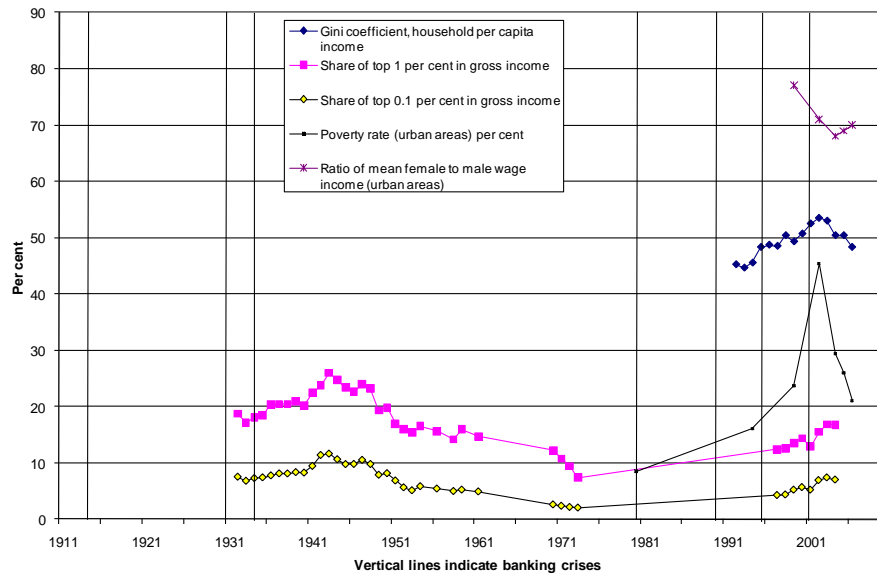


Figure AU1 Banking crises and inequality in Australia 1911-2010

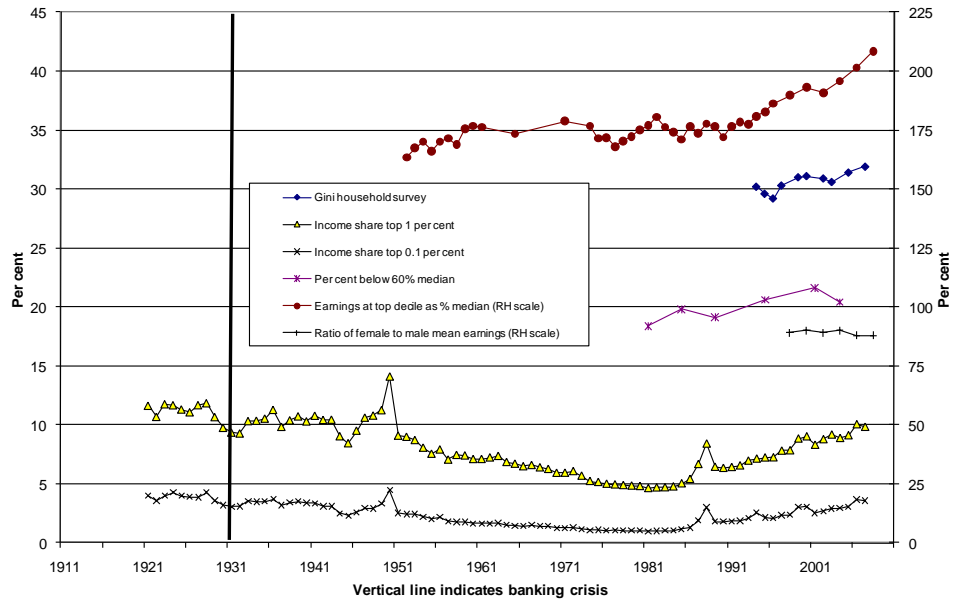


Figure BRZ1 Brazil banking crises and income inequality 1911-2010

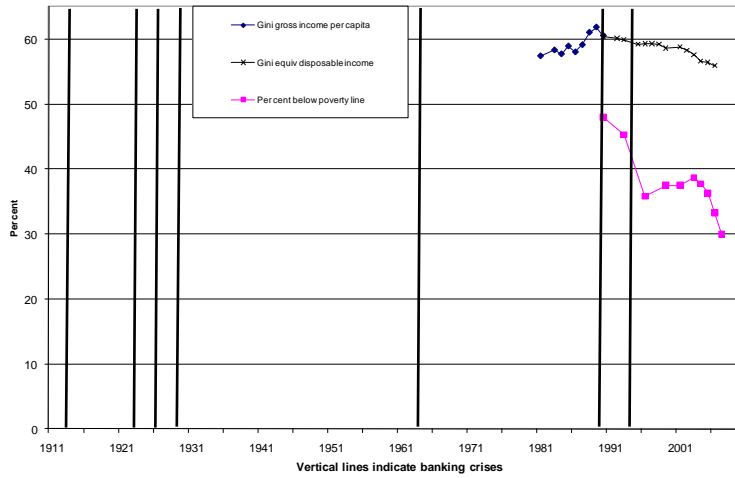


Figure CA1 Banking crises and income inequality in Canada 1911-2010

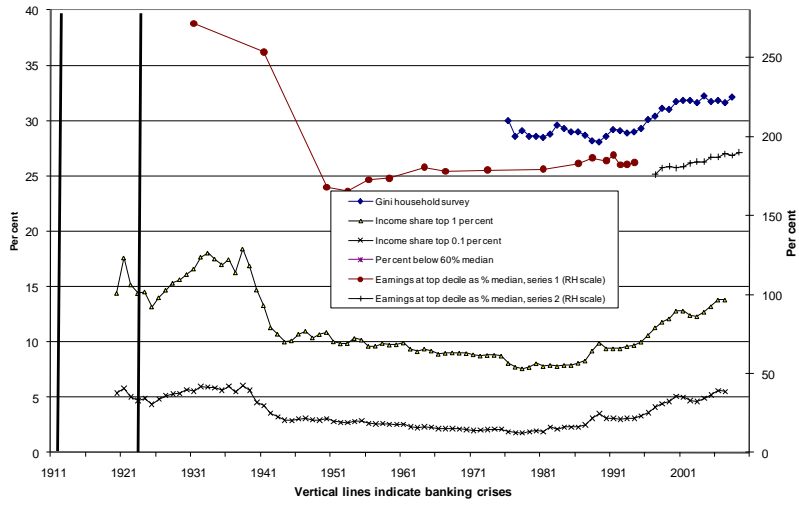


Figure FR1 Banking crises and income inequality in France 1911-2010

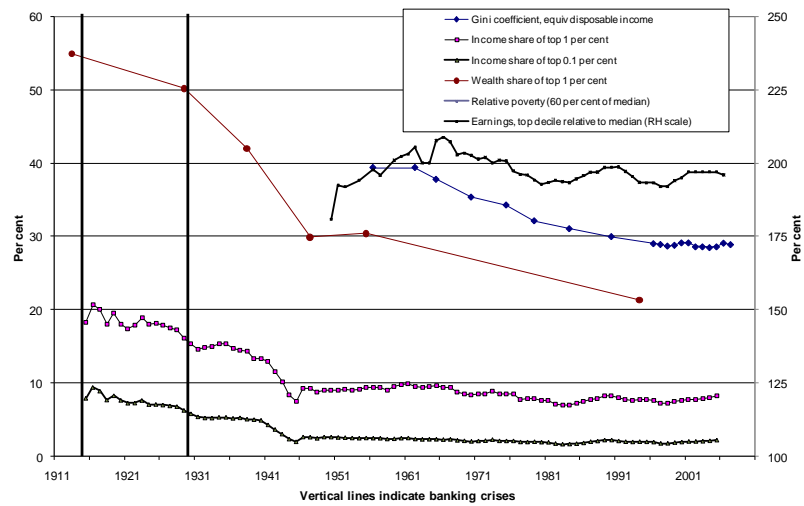


Figure GER1 Germany banking crises and income inequality 1911-2010

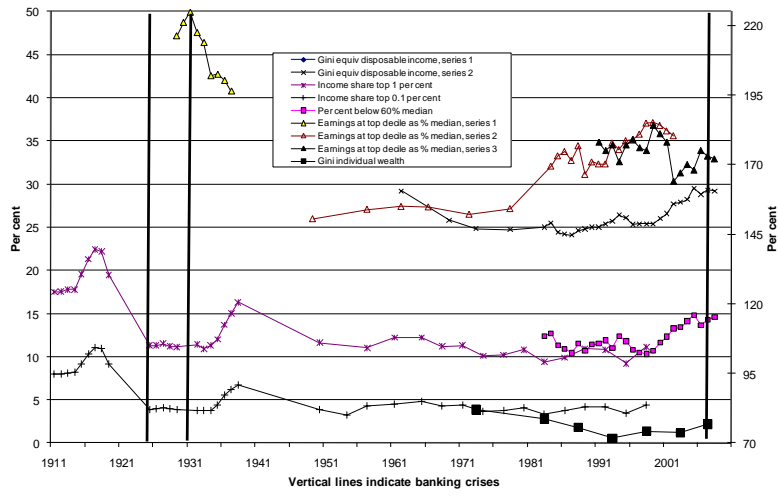


Figure IT1 Italy banking crises and income inequality 1911-2010

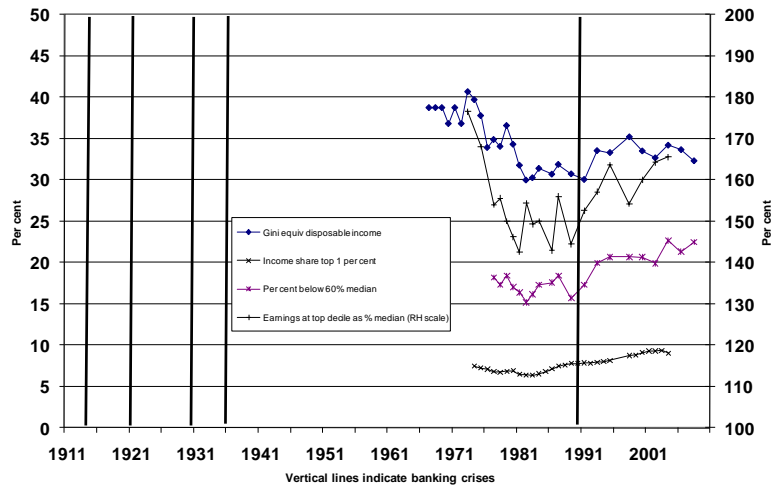


Figure NL1 Netherlands banking crises and income inequality 1911-2010

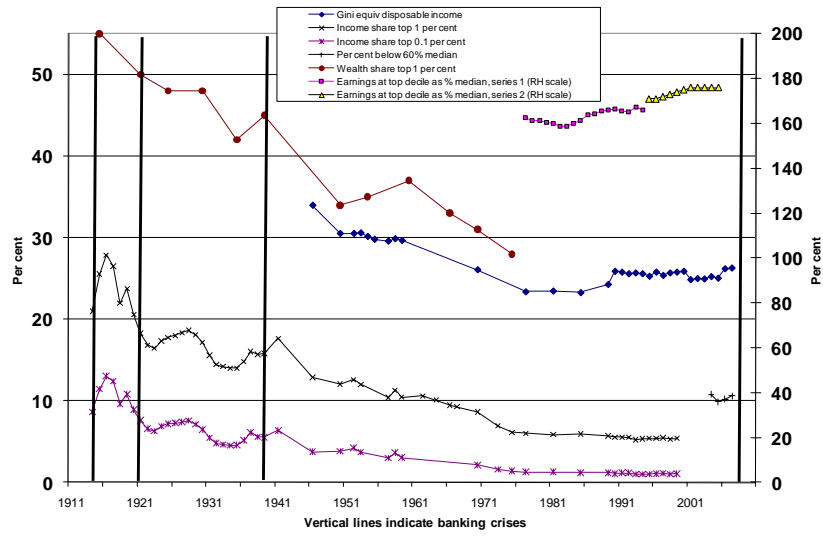


Figure NZ1 Income inequality in New Zealand 1911-2010

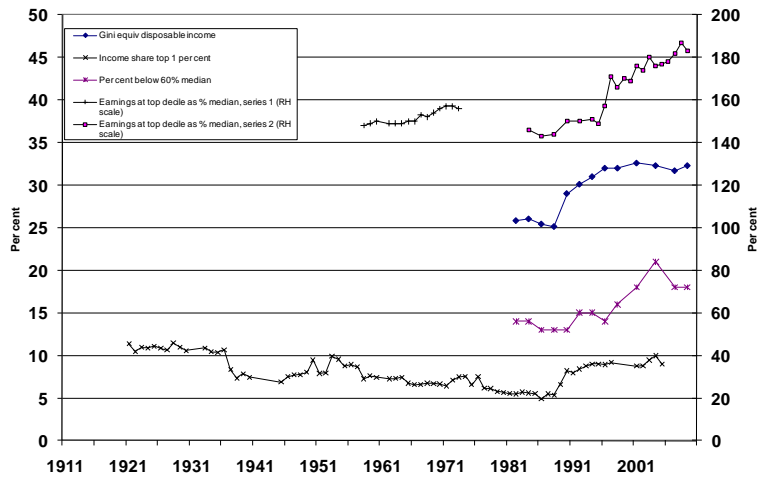




Figure PORT1 Portugal banking crises and income inequality 1911-2010

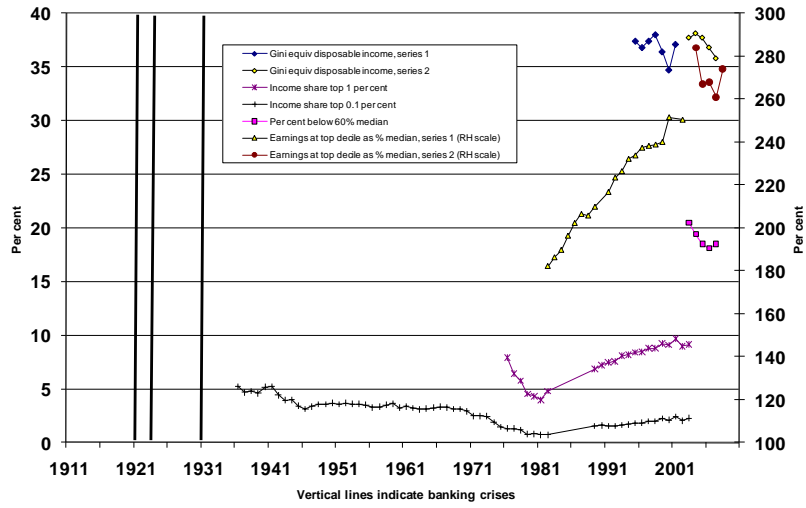


Figure SA1 Income inequality in South Africa 1911-2010

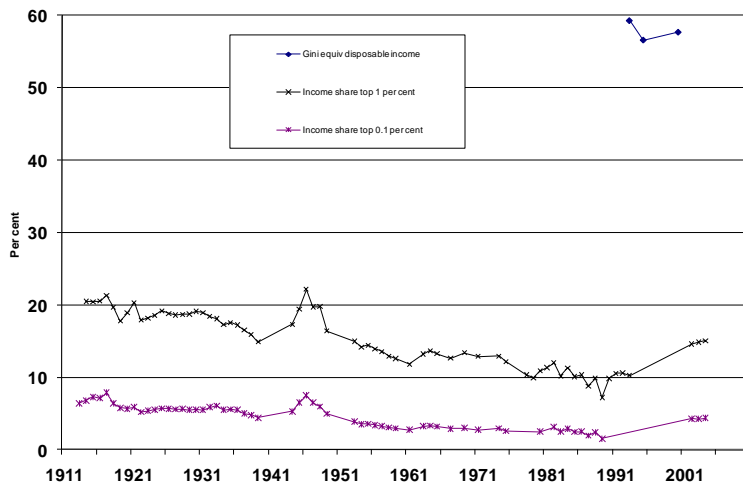


Figure SPAIN1 Spain banking crises and income inequality 1911-2010

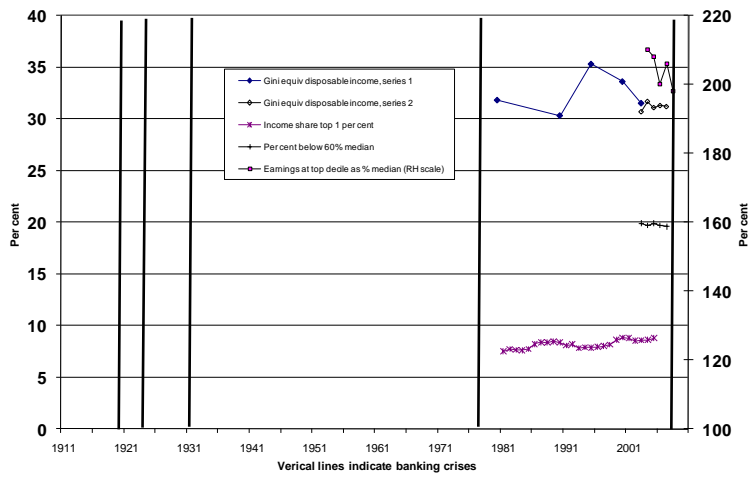


Figure SWITZ1 Banking crises and income inequality in Switzerland 1911-2010

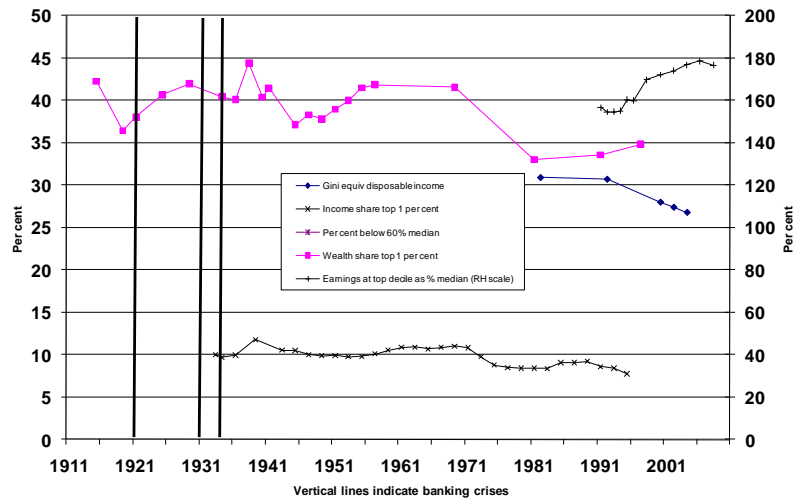
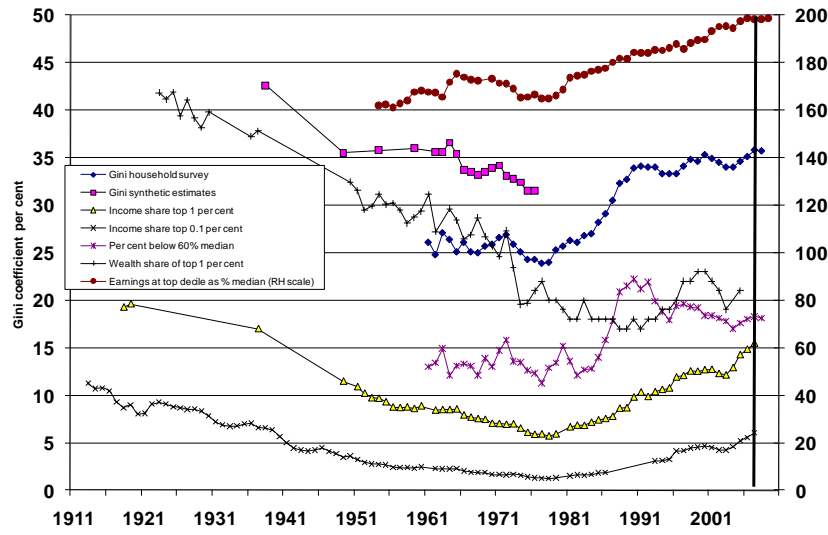


Figure UK1 Banking crises and income inequality in the UK 1911-2010



## Appendix B

\* The y-axis of each graph is labelled “Change in percentage points”, but due to technical difficulties appears inverted.

This appendix contains 29 window plots for 32 banking crises (3 combine two crises): Argentina 1934 (Figure AR2), 1995 (Figure AR3) and 2001 (Figure AR4), Australia 1931 (Figure AU2), Brazil 1990 (Figure BRZ2) and 1994 (Figure BRZ3), Canada 1923 (Figure CA2), Finland 1921 and 1931 (combined in Figure FIN2) and 1991 (Figure FIN3), France 1930 (Figure FR2), Germany 1925 (Figure GER2), 1931 (Figure GER3) and 2007 (Figure GER4), Iceland 2007 (Figure ICE2), India 1929 (Figure INDIA2) and 1993 (Figure INDIA3), Indonesia 1992 (Figure INDON2) and 1997 (Figure INDON3), Italy 1990 (Figure IT2), Japan 1923 and 1927 (combined in Figure JA2) and 1992 (Figure JA3), Malaysia 1985 (Figure MYA2) and 1997 (Figure MYA3), Netherlands 1914 and 1921 (combined in Figure NL2), Norway 1987 (Figure NO2), Singapore 1982 (Figure SI2), Spain 2008 (Figure SPAIN2), Sweden 1991 (Figure SWE2), and the UK 2007 (Figure UK2). With the 3 window plots for the US in the main text, this makes up a total of 35 banking crises for which we have sufficient distributional data to prepare the plots.

Figure AR2 Window diagram Argentina 1934 crisis

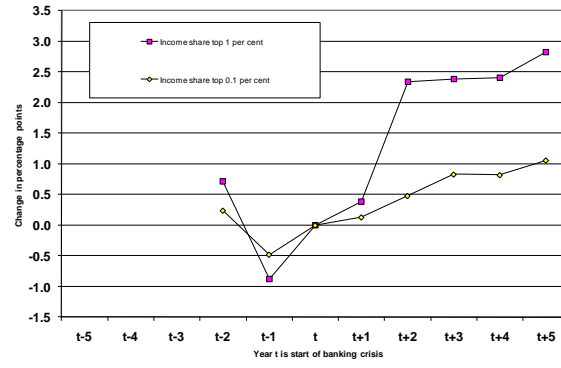


Figure AR3 Window diagram Argentina 1995 crisis

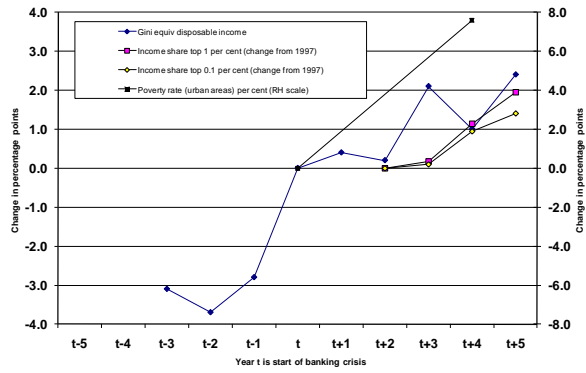


Figure AR4 Window diagram Argentina 2001 crisis

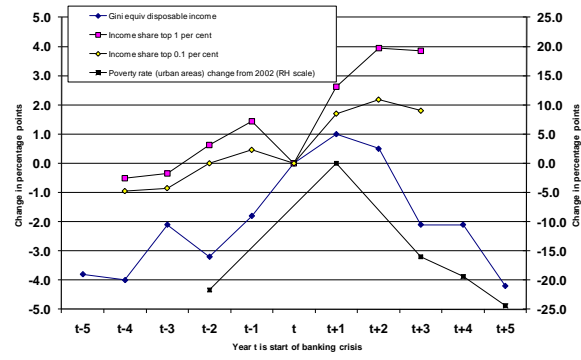


Figure AU2 Window diagram Australia 1931 crisis

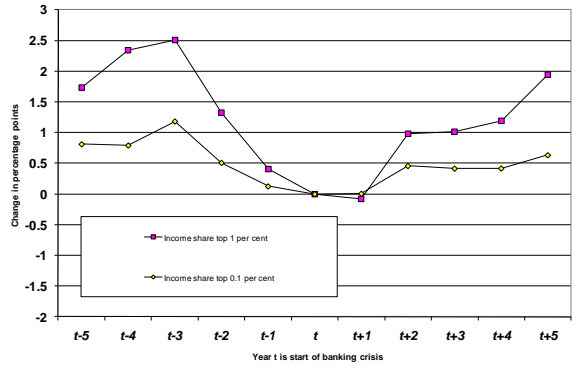


Figure BR22 Window diagram Brazil 1990 crisis

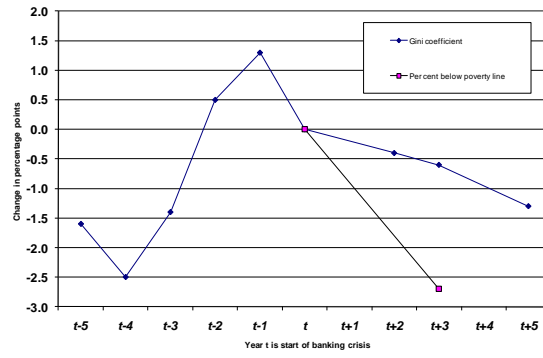


Figure BR23 Window diagram Brazil 1994 crisis

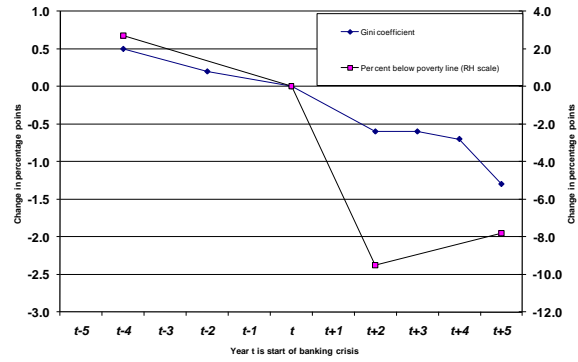


Figure CA2 Window diagram Canada 1923 crisis

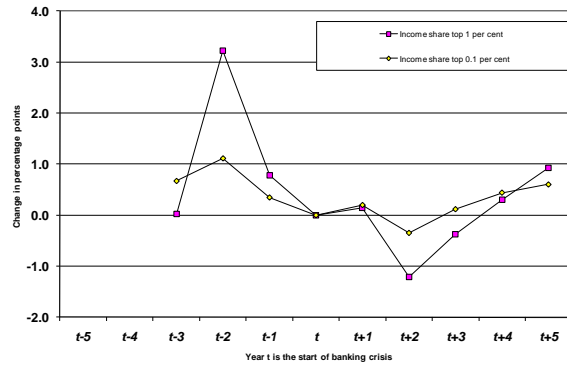


Figure FIN2 Window diagram Finland 1921 and 1931 crises

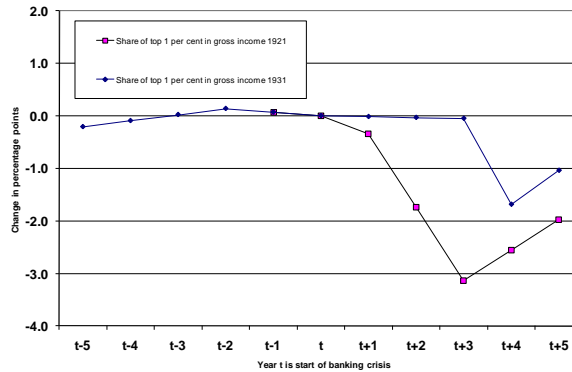


Figure FIN3 Window diagram Finland 1991 crisis

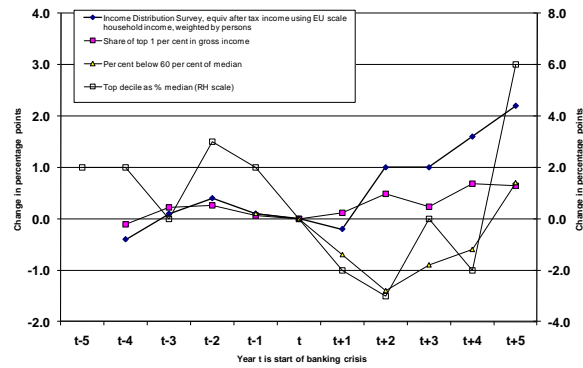


Figure FR2 Window diagram France 1930 crisis

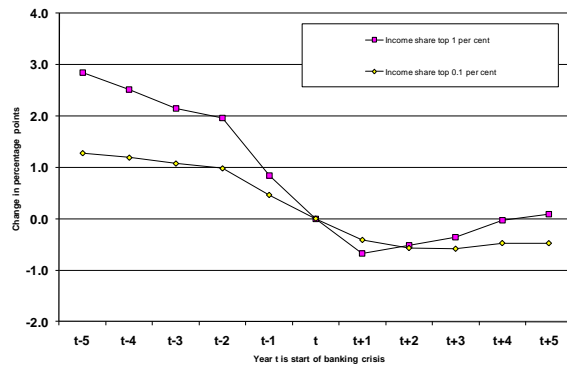




Figure GER2 Window diagram Germany 1925 crisis

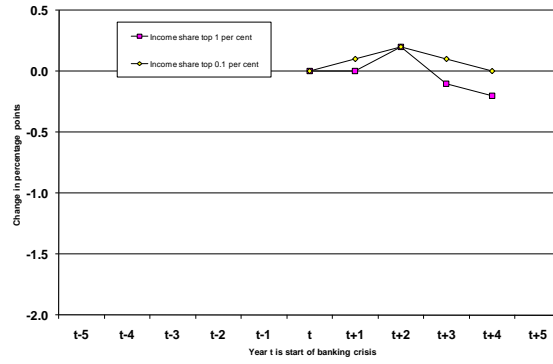


Figure GER3 Window diagram Germany 1931 crisis

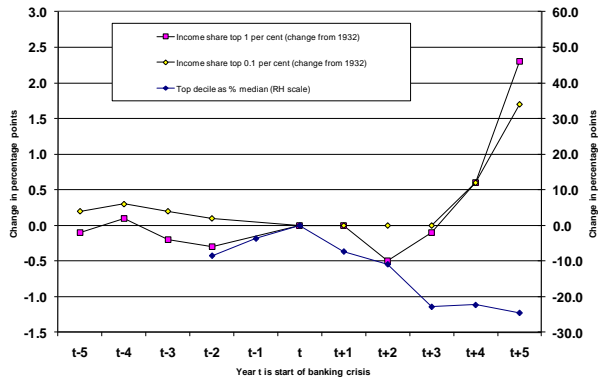


Figure GER4 Window diagram Germany 2007 crisis

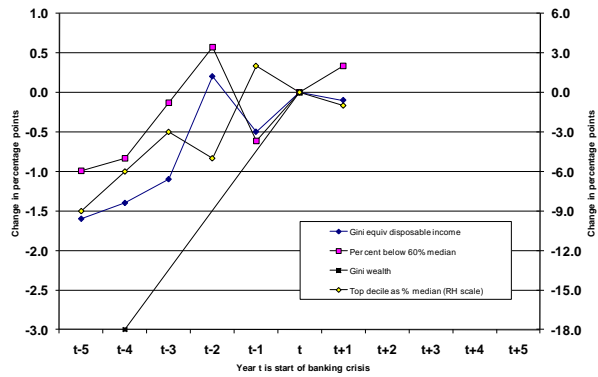


Figure ICE2 Window diagram Iceland 2007 crisis

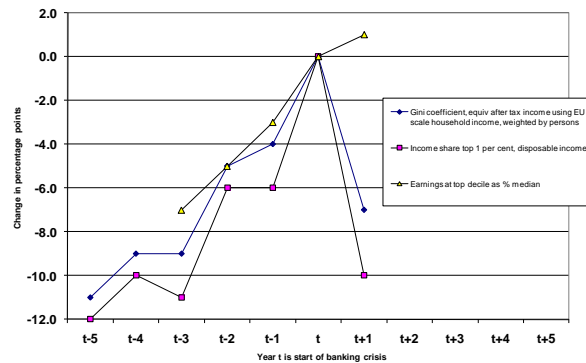


Figure INDIA2 Window diagram India 1929 crisis

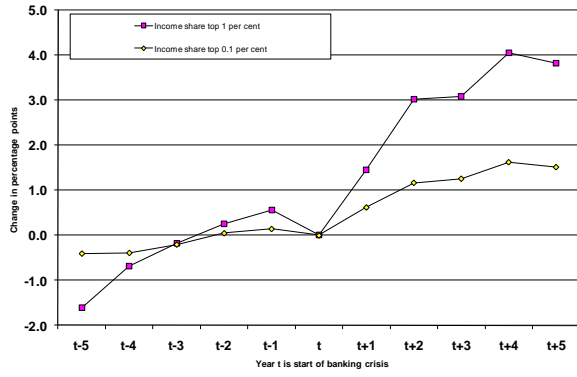


Figure INDIA3 Window diagram India 1993 crisis

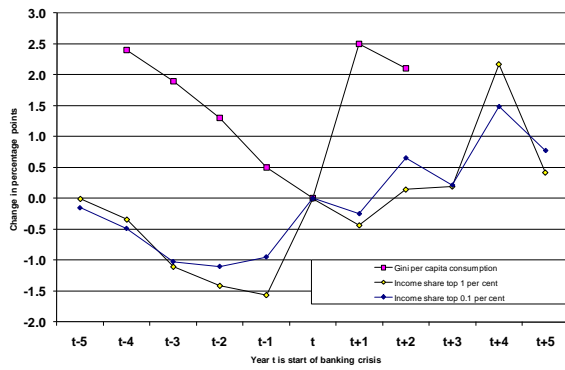


Figure INDON2 Window diagram Indonesia 1992 crisis

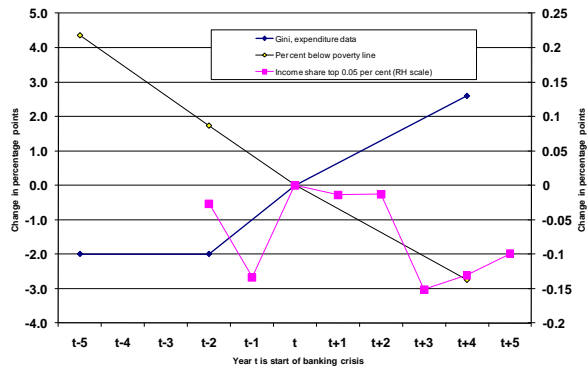


Figure INDON3 Window diagram Indonesia 1997 crisis

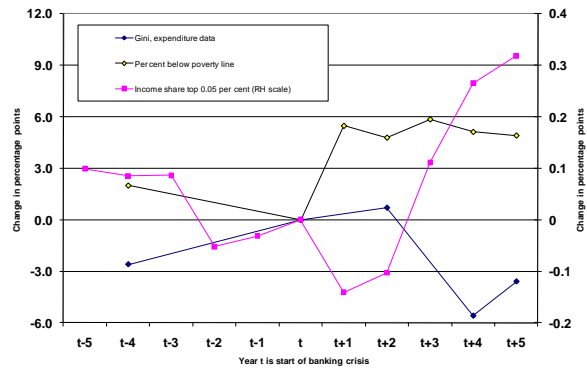


Figure IT2 Window diagram Italy 1990 crisis

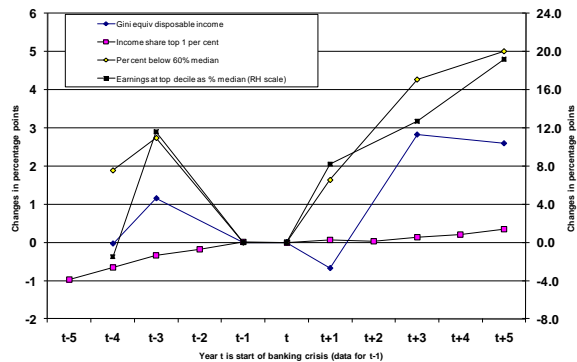


Figure JA2 Window diagram Japan 1923 and 1927 crises

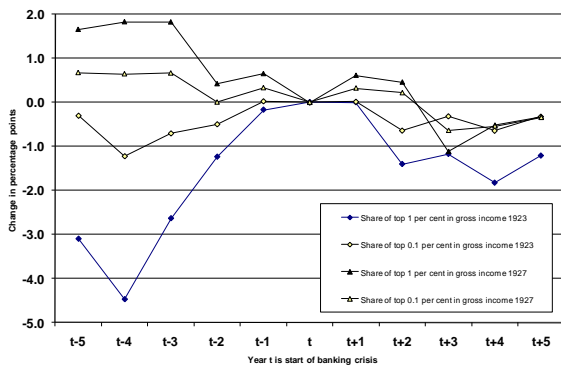


Figure JA3 Window diagram Japan 1992 crisis

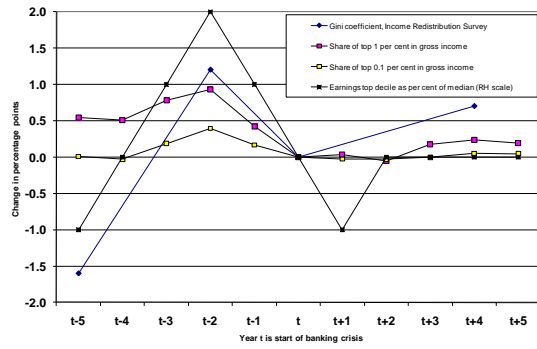


Figure MYA2 Window diagram Malaysia 1985 crisis

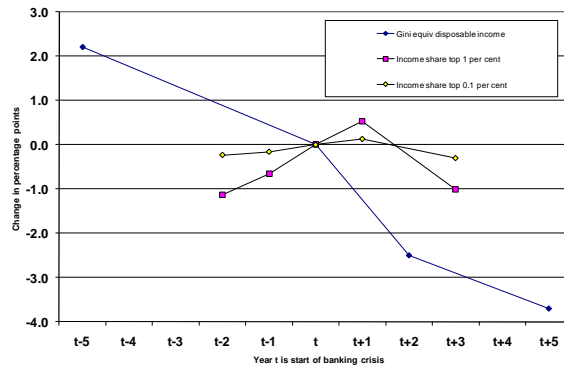


Figure MYA3 Window diagram Malaysia 1997 crisis

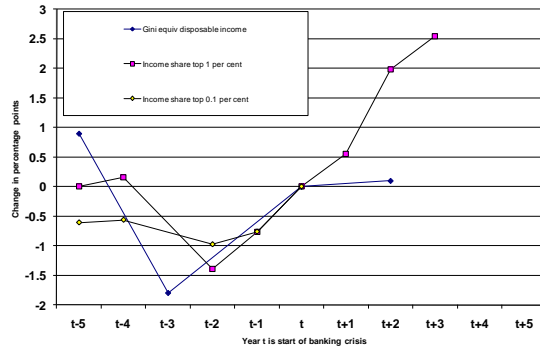


Figure NL2 Window diagram Netherlands 1914 and 1921crises

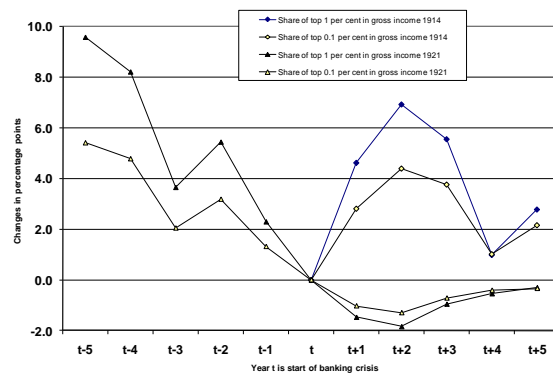


Figure NO2 Window diagram Norway 1987 crisis

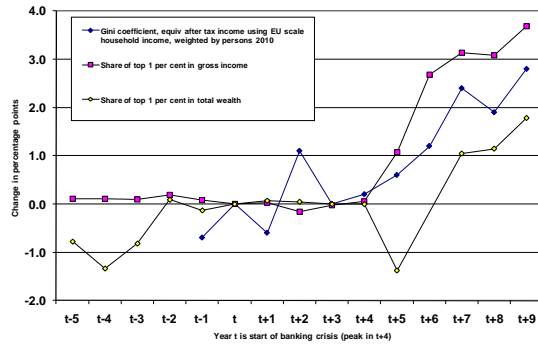


Figure S12 Window diagram Singapore 1982 crisis

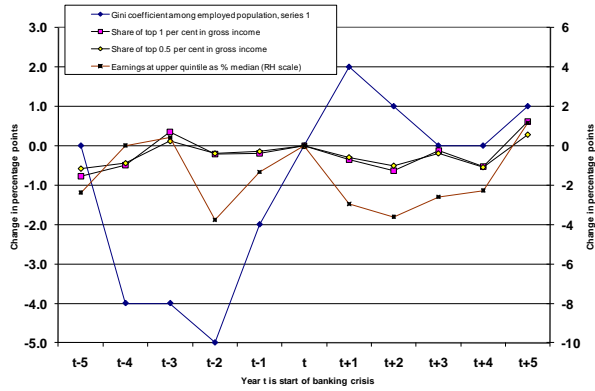


Figure SPAIN2 Window diagram Spain 2008 crisis

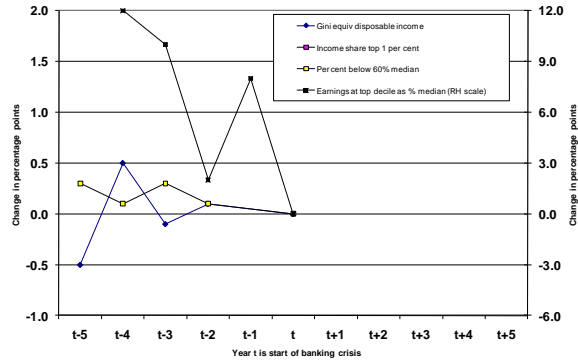


Figure SWE2 Window diagram Sweden 1991 crisis

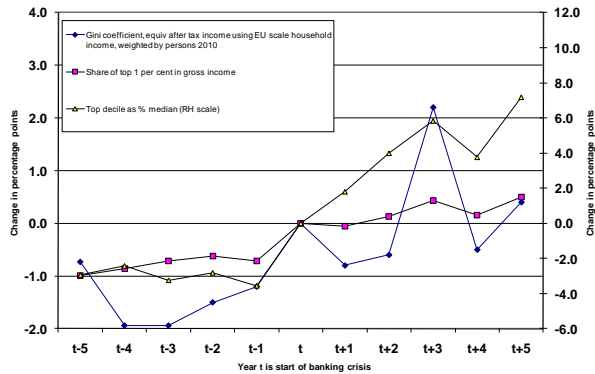
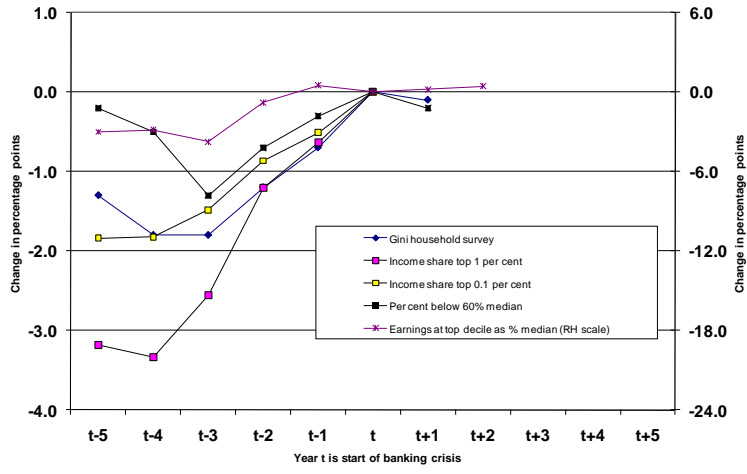


Figure UK2 Window diagram UK 2007crisis



## References

- Aaberge, R and Atkinson, A B, 2010, "Top incomes in Norway" in Atkinson and Piketty, 2010.
- Allen, F and Gale, D, 2007, *Understanding financial crises*, Oxford University Press, Oxford.
- Alvaredo, F, 2010, "A note on the relationship between top income shares and the Gini coefficient", *Economics Letters*, forthcoming.
- Atkinson, A B, 1983, *The economics of inequality*, second edition, Oxford University Press, Oxford.
- Atkinson, A B, 1998, *Poverty in Europe*, Blackwell, Oxford.
- Atkinson, A B, 2003, "Income inequality in OECD countries: Data and explanations", *CEifo Economic Studies*, vol 49: 479-513.
- Atkinson, A B and Harrison, A J, 1978, *The distribution of personal wealth in Britain*, Cambridge University Press, Cambridge.
- Atkinson, A B and Morelli, S, 2010, "An inequality database for 25 countries 1911-2010", discussion paper.
- Atkinson, A B and Piketty, T, editors, 2007, *Top incomes over the twentieth century: A contrast between Continental European and English-speaking countries*, Oxford University Press, Oxford.
- Atkinson, A B and Piketty, T, editors, 2010, *Top incomes: A global perspective*, Oxford University Press, Oxford.
- Attanasio, O, Battistin, E and Ichimura, H, 2004, "What really happened to consumption inequality in the US?", NBER Working Paper 10338, NBER.
- Baker J C, 1939, "Executive compensation payments by large and small companies", *Quarterly Journal of Economics*, vol 53(3): 404-434.
- Balke, N S and Gordon, R J, 1989, "The estimation of prewar gross national product: Methodology and new evidence", *Journal of Political Economy*, vol 97: 38-92.
- Banerjee, A and Piketty, T, 2005, "Top Indian incomes, 1922-2000," *World Bank Economic Review*, vol 19(1): 1-20.
- Barro, R J and Ursúa, J F, 2008, "Macroeconomic crises since 1870", *Brookings Papers on Economic Activity*, 1: 255-350.
- Blank, R M and Greenberg, M H, 2009, "Poverty and economic stimulus", Brookings Institution, 10 February 2009.

- Bordo, M, Eichengreen, B, Klingebiel, D and Martina-Peria, M S, 2001, "Is the crisis problem growing more severe?", *Economic Policy*, 32, Spring 2001: (and web appendix).
- Boskin, M J, 1996, chair, *Toward a more accurate measure of the cost of living*, Final Report to the Senate Finance Committee.
- Boyd, J, De Nicolò, and Loukoianova, E, 2009, "Banking crises and crisis dating: Theory and evidence", IMF Working Paper 09/141, International Monetary Fund, Washington, D.C.
- Brandolini, A, 2002, "A bird's eye view of long-run changes in income inequality", Bank of Italy Research Department, Rome.
- Burns, A F, 1936, "The Brookings inquiry into income distribution and progress", *Quarterly Journal of Economics*, vol 50: 476-523.
- Burns, A F, 1951, "Looking forward", Thirty-first annual report to the National Bureau of Economic Research, New York.
- Burtless, G, 1990, "Earnings inequality over the business and demographic cycles", in G Burtless, editor, *A Future of Lousy Jobs? The Changing Structure of U.S. Wages*, Brookings Institution, Washington, D.C., pp. 77-176.
- Cahuc, P and Challe, E, 2009, "Produce or speculate? Asset bubbles, occupational choice and efficiency", IZA Discussion Paper 4630.
- Caprio, G and Klingebiel, D, 1996, "Bank insolvencies: Cross-country experience", Policy Research Working Paper No 1620, World Bank, Washington, D.C.
- Caprio, G and Klingebiel, D, 1999, "Episodes of systemic and borderline financial crises", World Bank.
- Caprio, G, Klingebiel, D, Laeven, L and Noguera, G, 2005, "Appendix: Banking crisis database", in P Honohan and L Laeven, editors, *Systemic financial crises: Containment and resolution*, Cambridge University Press, Cambridge.
- Carter, S B. et al. 2006, *Historical statistics of the United States: Earliest times to the present*, Cambridge University Press, New York.
- Cheong, K S, 1999, "Economic crisis and income inequality in Korea", Working Paper No 99-6R.
- Cornia, G A, 2010, "Income distribution under Latin America's new left regimes", *Journal of Human Development and Capabilities*, vol 11: 85-114.
- Costa, 2001,



- Cutler, D M and Katz, L F, 1992, "Rising inequality? Changes in the distribution of income and consumption in the 1980s", *American Economic Review*, vol 82: 546-551.
- Drees, B and Pazarbaşıoğlu, C, 1998, *The Nordic banking crises: Pitfalls in financial liberalization?*, IMF Occasional Paper 161, Washington, D.C.
- Duesenberry, J, 1949, *Income, saving and the theory of consumer behaviour*, Harvard University Press, Cambridge, Mass.
- Edlund, L and Kopczuk, W, 2009, "Women, wealth, and mobility", *American Economic Review*, vol 99: 146-178.
- Eichengreen, B and Bordo, M D, 2002, "Crisis now and then: What lessons from the last era of financial globalization", NBER Working Paper 8176.
- Eichner, M J, Kohn, D L and Palumbo, M G, 2010, "Financial statistics for the United States and the crisis: What did they get right, what did they miss, and what should they change?", Finance and Economics Discussion Series 2010-20, Federal Reserve Board, Washington, D.C.
- Englund, P, 1999 "The Swedish banking crisis: Roots and consequences", *Oxford Review of Economic Policy*, vol 15, no 3: 80-97.
- Farmer, R E A, 2010, *How the economy works*, Oxford University Press, Oxford.
- Federal Deposit Insurance Corporation, 1997, *History of the Eighties, Lessons for the future: An examination of the banking crises of the 1980s and early 1990s*, vol 1, Federal Deposit Insurance Corporation, Washington, D.C.
- Feinstein, C H, 1995, editor, *Banking, currency and finance in Europe before the war*, Clarendon Press, Oxford.
- Feldstein, M S, 2005, "Rethinking social insurance", *American Economic Review*, vol 95: 1-24.
- Fitoussi, J-P and Saraceno, F, 2009, "How deep is a crisis? Policy responses and structural factors behind diverging performances", OFCE Document de Travail, 2009-31.
- Frank, R H, Levine A S and Dijk, O, 2010, "Expenditure cascades", working paper.
- Fritzell, J, Bäckman and Ritakallio, 2010, working paper.
- Galbraith, J K, 1954, *The Great Crash, 1929*, Houghton Mifflin, New York.
- Gasparini, L and Cruces, G, and Tornarolli, L, 2009, "Recent trends in income inequality in Latin America", ECINEQ Working Paper 132.

- Gerdrup, K R, 2004, "Three booms and busts involving banking crises in Norway since the 1890s" in Moe et al (2004).
- Glaeser, E L, Gottlieb, J D and Gyourko, J, 2010, "Can cheap credit explain the housing boom?", working paper.
- Glover, A, Heathcote, J, Krueger, D, and Ríos-Rull, 2010, "Inter-generational redistribution in the Great Recession", working paper.
- Goldin, C, 1990, *Understanding the gender gap*, Oxford University Press, New York.
- Goldin, C and Katz, L F, 2007, "Long-run changes in the wage structure: Narrowing, widening, polarizing", *Brookings Papers on Economic Activity*, 2: 135-165.
- Goldin, C and Margo, R A, 1992, "The Great Compression: The wage structure of the United States at mid-century", *Quarterly Journal of Economics*, vol 107: 1-34.
- Goldsmith, S F, 1957, "Changes in the size distribution of income", *American Economic Review*, Papers and Proceedings, vol 47: 504-518.
- Goldsmith, S F, 1958, "The Relation of Census Income Distribution Statistics to Other Income Data", in *An Appraisal of the 1950 Census Income Data*, Studies in Income and Wealth, vol 23: 65-107, Princeton, Princeton University Press.
- Goldsmith, S F, 1958a, "Size Distribution of Personal Income", *Survey of Current Business*, vol 38, No 4: 10-19.
- Goldsmith, S F, Jaszi, G, Kaitz, H and Liebenberg, M, 1954, "Size Distribution of Income since the Mid-Thirties", *Review of Economics and Statistics*, vol 36: 1-32.
- Gordon, R J, 2009, "Misperceptions about the magnitude and timing of changes in American income inequality", NBER Working Paper No 15351, NBER Cambridge, MA.
- Gordon, R J, 2009a, "Has the rise in American inequality been exaggerated?", working paper.
- Gordon R J and Dew-Becker, I, 2007, "Selected issues in the rise of income inequality", *Brookings Papers on Economic Activity*, No 2: 169-192.
- Gordon R J and Dew-Becker, I, 2008, "Controversies about the rise of American inequality: A survey", longer version of (2007).
- Gorton, G, 1988, "Banking panics and business cycles", *Oxford Economic Papers*, vol 40: 751-81.
- Hagen, K, 2007, "The changing faces of inequality in South Korea in the age of globalization", *Korean Studies*, vol 31: 1-18.

- Haugh, D, Ollivaud, P and Turner, D, 2009, "The macroeconomic consequences of banking crises in OECD countries", *OECD Economics Department Working Papers*, No 683, OECD, Paris.
- Hausman, J, 2003, "Sources of bias and solutions to bias in the Consumer Price Index", *Journal of Economic Perspectives*, vol 17, No. 1: 23-44.
- Heady, C, 2010, "Trends in top incomes and income inequality and their implications for tax policy: Further analysis", Note for OECD Working Party Number 2.
- Henle, P, 1972, "Exploring the distribution of earned income" *Monthly Labor Review*, 95(12): 16-27.
- Iacoviello, M, 2008, "Household debt and income inequality, 1963-2003", *Journal of Money, Credit and Banking*, vol 40: 929-965.
- Jappelli, T, Pagano, M, and di Maggio, M, 2010, "Households' indebtedness and financial fragility", CSEF Working Paper 208.
- Jorgenson, D W, 1990, "Aggregate consumer behavior and the measurement of social welfare", *Econometrica*, vol 5: 1007-1040.
- Jorgenson, D W, 1998, "Did we lose the War on Poverty?" *Journal of Economic Perspectives*, vol 12: 79-96.
- Joung-Woo, L, 2002, "The financial crisis and economic inequality in Korea", *Korea Journal*, vol 42: 178-203.
- Kaminsky, G L and Reinhart, C M, 1999, "The twin crises: The causes of banking and balance-of-payments problems", *American Economic Review*, vol 89: 473-500.
- Kennedy, D M, 1999, *Freedom from fear: the American people in depression and war, 1929-1945*, Oxford University Press, New York.
- Kindleberger, C P and Aliber, R, 2005, *Manias, panics, and crashes: A history of financial crises*, fifth edition, John Wiley, Hoboken.
- Kopczuk, W and Saez, E, 2004, "Top wealth shares in the US, 1916-2000: Evidence from the Estate Tax returns", *National Tax Journal*, vol xx: 445-487, longer version in NBER Working Paper 10399.
- Krueger, D and Perri, F, 2006, "Does income inequality lead to consumption inequality? Evidence and theory", *Review of Economic Studies*, vol 73: 163-193.
- Krugman, P, 2009, *The return of depression economics and the crash of 2008*, W W Norton, New York.

Krugman, P, 2010, Inequality and Crises, New York Times blog "The Conscience of a liberal, (June), <http://krugman.blogs.nytimes.com/2010/06/28/inequality-and-crises/>

Kumar, D, Raychaudhuri, T and Desai, M, 1983, editors, *Cambridge Economic History of India*, volume 2, Cambridge University Press, Cambridge.

Kumhof, M and Rancière, R, 2010, "Inequality, leverage and crises", working paper.

Kuznets, S, 1941, *National income and its composition, 1919-1938*, National Bureau of Economic Research, New York, volumes 1 and 2.

Laeven, L and Valencia, F, 2008, "Systemic banking crises: A new database", IMF Working Paper 08/224, International Monetary Fund, Washington, D.C.

Laeven, L and Valencia, F, 2010, "Resolution of banking crises: The good, the bad, and the ugly", IMF working paper 10/146, International Monetary Fund, Washington, D.C.

Lampman, R J, 1962, *The share of top wealth-holders in national wealth, 1922-56*, Princeton University Press, Princeton.

Leven, M, Moulton, H G and Warburton, C, 1934, *America's capacity to consume*, Brookings Institution, Washington, D.C.

Levy, F, 1987, *Dollars and dreams*, Russell Sage Foundation, New York.

Lindert, P H, 2000 "Three Centuries of Inequality in Britain and America" in A B Atkinson and F Bourguignon, editors, *Handbook of Income Distribution*, Elsevier, Amsterdam.

Lydall, H F, 1968, *The structure of earnings*, Clarendon Press, Oxford.

Marlier, E, Atkinson, A B, Cantillon, B and Nolan, B, 2007, *The EU and social inclusion: Facing the challenges*, Policy Press, Bristol.

Merwin, C L, 1939, "American studies of the distribution of wealth and income by size", *Studies in Income and Wealth*, vol 3, National Bureau of Economic Research, New York.

Meyer, B D and Sullivan, J X, 2010, "Five decades of consumption and income poverty", discussion paper.

Meyer, B D and Sullivan, J X, 2010a, "Consumption inequality and income inequality in the U.S.: 1960-2008", slides.

Miller, H P, 1955, *Income of the American People*, 1950 Census Monograph, Wiley, New York.

Miller, H P, 1958, "Changes in the industrial distribution of wages in the United States, 1939-1949", in *An appraisal of the 1950 Census income data*, Studies in Income and Wealth, vol 23: 65-107, Princeton, Princeton University Press.

Miller, H P, 1966, *Income Distribution in the United States*, 1960 Census Monograph, U.S. Government Printing Office, Washington, D.C.

Mishkin, F S, 1991, "Asymmetric information and financial crises: A historical perspective", in R G Hubbard, editor, *Financial markets and financial crises*, University of Chicago Press, Chicago, pp. 69-108.

Mishkin, F S, and White E N, 2003, "U.S. stock market crashes and their aftermath: Implications for monetary policy," in W C Hunter, G G Kaufman, and M Pomerleano, editors, *Asset price bubbles: The implications for monetary, regulatory, and international policies*, MIT Press, Cambridge, Mass, pp. 53-79.

Mitchell, W C, King, W I, Macaulay, F R and Knauth, O W, 1921, *Income in the United States: Its amount and distribution 1909-1919*, Harcourt, Brace, New York.

Moe, T G, Solheim, J A and Vale, B, 2004, editors, *The Norwegian banking crisis*, Norges bank, Oslo.

Moore, K B and Palumbo, M G, 2010, "The finances of American households in the past three recessions: Evidence from the Survey of Consumer Finances", Finance and Economics Discussion Series 2010-06, Federal Reserve Board, Washington, D.C.

Morelli, S, 2007, "Integrazione Finanziaria e Distribuzione dei Redditi", University of Rome "Tor Vergata" M.A. thesis.

Morelli, S, 2008, "How within-country income distribution is related to international financial integration: an Empirical Evidence", London School of Economics M.Sc. Dissertation.

Morelli, S, 2010, "Banking crises and stock market crashes in US: the response of top-income and top-wealth shares in historical perspective", draft (September), University of Oxford.

Moriguchi, C, and Saez, E, 2008, "The Evolution of Income Concentration in Japan, 1886-2005: Evidence from Income Tax Statistics," *Review of Economics and Statistics*, vol 90(4): 713-734.

Muriel, A and Sibieta, L, 2009, "Living standards during previous recessions", IFS Briefing Note BN85, London.

Nakaso, H, 2001, "The financial crisis in Japan during the 1990s: how the Bank of Japan responded and the lessons learned", BIS paper No 6, Bank for International Settlements, Basel.

Nolan, B, 2009, Background paper for OECD Roundtable on "Monitoring the effects of financial crisis on vulnerable groups".

OECD, 2008, *Growing unequal?*, OECD, Paris.

OECD, 2009, "Monitoring the effects of financial crisis on vulnerable groups", Report on Roundtable.

Olafsson, S and Kristjansson, A S, 2010, "Income inequality in a bubble economy: The case of Iceland 1992-2008", Luxembourg Income Study conference, June 2010.

Parker, J A, and Vissing-Jorgensen, A, 2009, " Who bears aggregate fluctuations and how?", *American Economic Review*, vol 99, no2: 399-405.

Parker, J A, and Vissing-Jorgensen, A, 2010," The increase in income cyclicality of high-income households and its relation to the rise in top income shares ", Working Paper.

Philippon, T and Reshef, A, 2008, "Wages and human capital in the U.S. financial industry: 1909-2006", New York University.

Piketty, T and Saez, E, 2003, "Income inequality in the United States, 1913-1998", *Quarterly Journal of Economics*, vol 118: 1-39.

Plotnick, R D, Smolensky, E, Evenhouse, E and Reilly, S, 1998, "Inequality, Poverty, and the Fisc in Twentieth-Century America" , *Journal of Post Keynesian Economics*, vol 21, No 1: 51-75.

Plotnick, R D, Smolensky, E, Evenhouse, E and Reilly, S, 2000, "The twentieth-century record of inequality and poverty in the United States", in S L Engerman and R E Gallman, editors, *Cambridge Economic History of the United States*, volume 2, Cambridge University Press, Cambridge, pages 249-300.

Ragayah, H M Z, 2008, "Income inequality in Malaysia", *Asian Economic Policy Review*, vol 3: 114-132.

Rajan, R G, 2010, *Fault lines: How hidden fractures still threaten the world economy*, Princeton University Press, Princeton.

Ranci re, R, Tornell, A and Westermann, F, 2008, "Systemic crises and growth", *Quarterly Journal of Economics*, vol 34: 359-406.

Reinhart, C M, 2010, "This time is different chartbook: Country histories on debt, default, and financial crises", NBER Working Paper 15815.

Reinhart, C M and Rogoff, K S, 2008, "Is the 2007 U.S. sub-prime financial crisis so different? An international historical comparison", *American Economic Review*, vol 98: 334-339.

Reinhart, C M and Rogoff, K S, 2009, *This time is different*, Princeton University Press, Princeton.

Roine, J, Vlachos, J and Waldenström, D, 2009, „The long-run determinants of inequality: What can we learn from top income data?“, *Journal of Public Economics*, vol 93: 974-988.

Romer, C, 1986, “Spurious volatility in historical unemployment data”, *Journal of Political Economy*, vol 94: 1-37.

Saez, E, 2010, website (July), update of "Income Inequality in the United States, 1913-1998" with Thomas Piketty, *Quarterly Journal of Economics*, 118(1), 2003, 1-39 (Longer updated version published in A.B. Atkinson and T. Piketty eds., Oxford University Press, 2007)

Shiller, R, 2008, *The subprime solution*, Princeton University Press, Princeton.

Shleifer, A and Vishny, R W, 2010, “Unstable banking”, *Journal of financial economics*, vol 97: 306-318.

Slesnick, D T, 1993, “Gaining Ground: Poverty in the Postwar United States”, *Journal of Political Economy*, vol 101(1): 1-38.

Smiley, G, 1983, “Did incomes for most of the population fall from 1923 through 1929?”, *Journal of Economic History*, vol 43: 209-216.

Solow, R M, 1960, “Income Inequality Since the War”, in R E Freeman, editor, *Postwar Economic Trends in the United States*, Harper, New York, 91-138.

Steigum, E, 2004, “Financial deregulation with a fixed exchange rate: lessons from Norway’s boom-bust cycle and banking crisis”, in Moe et al (2004).

Stiglitz, J E, 2009, , “Joseph Stiglitz and why inequality is at the root of the recession”, *Next Left website*, posted 9 January 2009.

Temin, P, 2000, “The Great Depression” in S L Engerman and R E Gallman, editors, *Cambridge Economic History of the United States*, volume 2, Cambridge University Press, Cambridge.

Tucker, R S, 1938, “The distribution of income among income taxpayers in the United States, 1863-1935”, *Quarterly Journal of Economics*, vol 52: 547-587.

Vale, B, 2004, “The Norwegian banking crisis” in Moe et al (2004).

Vale, B, 2004a, "The banking crisis in Norway" in Reidhill, J, editor, "Bank Failures in Mature Economies", Working Paper No 13, Basel Committee on Banking Supervision, Basel.

Williamson, J G and Lindert, P H, 1980, *American inequality: A macroeconomic history*, Academic Press, New York.

World Development Indicators, 2009, World Bank, Washington D.C.