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THE SAVINGS AND LOAN INSOLVENCIES AND THE COSTS OF FINANCIAL CRISIS

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ABSTRACT

At the time they occurred, the savings and loan insolvencies were considered the worst financial crisis since the Great Depression. Contrary to what was then believed, and in sharp contrast with 2007–2009, they in fact had little macroeconomic significance. Savings and Loan (S&L) remediation cost between 2 percent and 3 percent of Gross Domestic Product (GDP), whereas the Troubled Asset Relief Program (TARP) and the conservatorships of Fannie and Freddie actually made money for the US Treasury. But the direct cost of government remediation is largely irrelevant in judging macro significance. What matters is the cumulative output loss associated with and plausibly caused by failing financial institutions. I estimate output losses for 1981–1984, 1991–1998, and 2007–2026 (the latter utilizing forecasts and projections along with actual data through 2015) and, for a final comparison, 1929–1941. The losses associated with 2007–2009 have been truly disastrous – in the same order of magnitude as the Great Depression. The S&L failures were, in contrast, inconsequential. Macroeconomists and policy makers should reserve the word crisis for financial disturbances that threaten substantial damage to the real economy, and continue efforts to identify in advance financial institutions which are systemically important (SIFI), and those which are not.

Keywords: Savings and loans; financial crisis; recessions; output gaps

JEL Codes: E32; E44; G21; G28

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1. INTRODUCTION

The extraordinary financial crisis of the early 21st century and subsequent recession and slow recovery invite, indeed almost compel us to reexamine past history in the light of new benchmarks. Prior to 2007–2009, the 1982 recession was the most severe the US economy had experienced since the Great Depression, and the savings and loan insolvencies considered our worst financial disturbance since those dark days. The S&L failures and their consequences – now more than a quarter century in the past - are a natural object for reassessment.

When they occurred in the late 1980s and early 1990s, the insolvencies were considered a very big deal. The legacy of the earlier consensus is revealed by this: it is difficult even today to say or write the words "savings and loan" without following them with the word "crisis." The language used in numerous articles, monographs, reviews, and book length treatments reinforced and reflected this designation. James Barth, Martin Lowi, and Lawrence White each published books in 1991, and each used the word debacle in their title. So too did Ned Eichler in 1989, as well as the authors of the 1993 report of the National Commission on Financial Institution Reform, Recovery, and Enforcement.[1] Pizzo, Fricker, and Muol (1991), one of the best journalistic accounts, described the events as "the biggest financial disaster since the Great Depression" (p. 4), words echoed in Calavita, Pontell, and Tillman: "one of the worst financial disasters of the 20th century" (1997, p. 1). This evaluation was shared by the general public, policy makers, and scholars, including academic, business, and government economists.

A 1992 Congressional Budget Office study employing typically hyperbolic language reflected contemporary assessments: The amount the crisis had already cost the economy was "startling" (p. ix) and "exorbitant" (p. 1); the waste was of "incredible magnitude" (p. 1). Federal payments and borrowing associated with remediation were "huge"; the 1980s real estate bubble was "giant" (p. 11). The accumulated losses for the deposit insurance funds were "humongous" (p. 13) and the thrift crisis had "reduced the economy's overall output severely since the early 1980s" (p. 29).

The 2007–2009 financial crisis and ensuing recession and slow recovery, however, offers a new standard of comparison, at least for the post-Depression period in the United States. In the S&L retrospectives written in the late 1980s and early 1990s, the predominant concern was the impact of the insolvencies on the US Treasury. The focus was on the cost of remediation and how it might have been lessened by a different set of policy actions. A subsidiary theme was the misallocation of physical capital and wasted resources during the boom, which arguably influenced the subsequent trajectory of potential output (Congressional Budget Office, 1992; National Commission, 1993, p. 5).[2] There was, however, virtually no consideration given to the possible role of financial

disturbances in triggering a recession and slow recovery associated with a prolonged output gap and significant cumulative output loss.

Here is the central argument of this paper: If financial disturbances, whether remediated or not, pose little threat to the real economy, they should not be considered a financial crisis.[3] This criterion was simply not considered in the postmortems on the insolvencies conducted in the 1990s, and differs from the definition of financial crisis offered by Laeven and Valencia (2012), as summarized in Jordà, Schularick, and Taylor (2014, p. 19): "a situation in which there are significant signs of financial distress and losses in wide parts of the financial system that lead to widespread insolvencies or significant policy interventions." The essence of the difference is this: It is possible to have widespread distress and insolvencies without significant output loss, as well as the opposite: a deep recession, such as one brought about by restrictive monetary policy, that is not preceded by widespread financial disturbances.

A reexamination of the S&L insolvencies, what led up to them, and what their consequences were focuses attention on the desirability of identifying ex ante systemically important and, by exclusion, systemically unimportant financial institutions. Systemically unimportant institutions can fail, or threaten to fail, without holding the real economy hostage.

At the time they occurred, the savings and loan insolvencies were considered the worst financial crisis since the Great Depression. Contrary to what was then believed, and in sharp contrast with 2007–2009, they in fact had little macroeconomic significance. S&L remediation cost taxpayers considerably, between 2 percent and 3 percent of GDP, whereas TARP and the conservatorships of Fannie and Freddie actually made money for the US Treasury. But the cumulative output loss associated with the 1991 recession was modest, and the link between the insolvencies and that recession tenuous. This stands in sharp contrast with 2007, where the subsequent output loss may ultimately be of the same order of magnitude as that associated with the Great Depression, and where the link between the financial disturbances and recession and slow recovery is clear.

Here are lessons to be drawn. The direct cost of government remediation is largely irrelevant in judging macro significance. What matters is the cumulative output loss associated with and plausibly caused by failing financial institutions. It is important to differentiate between disturbances posing a significant (and possibly catastrophic) threat to the real economy, and those that "merely" involve criminal misconduct and struggles over the allocation of losses among creditors and/or taxpayers. This differentiation is greatly facilitated if systemically important financial institutions (SIFIs) are identified in advance.

Section 2 discusses the background and dimensions of the S&L insolvencies. Section 3 reviews recent research exploring possible linkages between financial disturbances and recessions, with special attention to the treatment of the

insolvencies within this literature. Section 4 makes the case that designating a set of financial disturbances as a crisis should require the threat or actuality of significant cumulative output loss. Section 5 asks whether financial disturbances should be considered to have triggered either the 1980–1982 or the 1990–1991 recessions, and estimates the cumulative output loss associated with the 1980–1982 downturns. Section 6 explores the widespread preoccupation with the costs of remediation and their impact on the Treasury, and the ways this preoccupation has influenced interpretations of the S and L insolvencies.

Section 7 describes the tenuous links between the insolvencies and the economic downturn that began in 1990, and estimates the cumulative output loss associated with the 1990–1991 recession. Section 8 does the same for 2007–2009, also includes an estimate of the loss associated with the Great Depression, and provides a table summarizing the output losses incident upon the four recession/depression episodes examined. Section 9 reviews mechanisms on both the aggregate demand and aggregate supply side that may cause financial disturbances to precipitate recession as well as damage the growth trajectory of potential output. Section 10 considers policy lessons, explores more speculatively why the S&L insolvencies were originally considered such a big deal, and reflects on what may be their lasting impact.

2. THE SAVINGS AND LOAN INSOLVENCIES: BACKGROUND, MAGNITUDES, TIMING

The S&L meltdown reached its full efflorescence at the end of the 1980s and early 1990s, a period during which the number of federally insured S&Ls decreased by almost half, from 3,234 to 1,645. From 1986 until its demise in 1989, the Federal Savings and Loan Insurance Corporation (FSLIC) closed or otherwise resolved 296 institutions with assets of $125 billion. Between 1989 and 1995, the Resolution Trust Corporation did the same for 794 institutions with assets of $394 billion. Curry and Shibut (2000) date the episode as running over the 10-year period 1986–1995, measuring from the year in which the FSLIC was first declared insolvent to the year in which the Resolution Trust Corporation wound down its operations. Focusing on the years of the worst abuses, Caprio and Klingebiel (1997) situate the events between 1984 and 1991. This is also the frame favored by Boyd, Kwak, and Smith (2005) as well as Reinhart and Rogoff (2009, Table A.4.1, p. 390). Laeven and Valencia (2012, p. 26) identify 1988 as the start and end year of what they describe as a "borderline" financial crisis, a characterization also accepted by Jordá, Schularick, and Taylor (2012). Lindgren, Garcia, and Saal (1996, p. 34) describe the entire period stretching from 1980–1992 as marked by "significant" banking problems. Whatever the exact time period identified, the roots of these developments can be traced at least as far back as the 1960s and 1970s (Strunk & Case, 1988).

Savings and Loans, to an even greater degree than commercial banks, specialized in borrowing short and lending long, which they did principally in the form of mortgages with fixed nominal interest rates. The Banking Act of 1933 (Glass-Steagall) prohibited interest on checking accounts, and gave the Federal Reserve power to limit interest rates paid by commercial banks on time deposits. During the repressed financial conditions and low inflation of the 1950s S&Ls were, on balance, financially healthy institutions, and contributed to financing the postwar housing boom. In the 1960s, however, inflation began to creep up, and in 1966, as inflation and interest rates rose along with spending on the Vietnam War, Regulation Q caps were extended to S&Ls and mutual savings banks. The intent was to preserve a healthy spread between rates paid on deposits and rates earned on (new) loans, assisting thrifts in overcoming losses on previously issued fixed rate mortgages that resulted from rising interest rates. The financial condition of S&Ls had become much more fragile; Samuelson (1967) termed them "technically insolvent" during the 1966 credit crunch.

Their financial health continued to deteriorate in the 1970s, particularly after 1977. Accelerating inflation and rising nominal interest rates interacted with Regulation Q to produce widespread disintermediation: an outward flow of deposits which, if unstaunched, forced a fire sale of illiquid assets. Lowi estimates that in 1981 four out of five thrift institutions were losing money, and "virtually all," if marked to market, were underwater (1991, pp. 14, 34, 72; see also Pilzer, 1989, p. 71). There is wide agreement that by the time of the 1980 and 1982 recessions, most S&Ls were market or balance sheet insolvent (Kane, 1985, Table 4.6; Admati & Hellwig, 2013, p. 54).

The parlous condition of the industry in the early 1980s, which set the stage for the even more disastrous period that followed, was principally due to interest rate risk, not bad loans or fraud. Pizzo et al. (1991, p. 323) argue that had Adjustable Rate Mortgages (ARMs) been allowed nationally in the 1970s (as they were in California starting in 1974) and had subsequent regulatory/legislative changes been limited to eliminating caps on deposits rates and not included an expansion of asset powers, the industry might have remained healthy and retained its niche position in the financial ecosphere. Black (2005), appears to support this view, although one should note that the subsequent relaxation of restraints on what kinds of mortgage products financial institutions could offer did not, in the 2000s, end happily. During the 1970s ARMs were repeatedly blocked in Congress, under pressure from both homebuilders and consumer groups. They became available nationally in 1982, under the terms of the Garn-St. Germain Depository Institutions Act.

Between 1981 and 1986 the sections of Regulation Q specifying maximum interest rates payable on time deposits were eliminated. This ameliorated the disintermediation problem, but at the cost of a rapidly rising cost of funds, which meant that operating income, properly accounted, remained generally in the red. At the same time, regulatory and legislative changes at the state and federal level

greatly expanded asset powers. These changes combined with the increase in deposit insurance ceilings from $40,000 to $100,000 per account (1980) and the removal of the 5 percent limit on the ratio of brokered to total deposits (1982) created a dangerously explosive political and economic environment.[4]

A common narrative is that insolvent institutions with little to lose could outbid solvent institutions for deposits and at the same time offer lower interest rates to borrowers, ultimately worsening the losses of the insolvent institutions and sapping the financial health of those with remaining positive equity. The "gambling for resurrection" language, though colorful, is, however, too sanitized. It assumes a unitary actor view of S&L institutions and, reflecting the ethically neutral language of moral hazard common to economics and insurance law, soft-pedals the contributions of insider looting (Akerlof & Romer, 1993), other forms of misconduct, and political corruption.

During the 1980s, unscrupulous individuals established new S&Ls or acquired existing ones using very little of their own money (and sometimes just land with an inflated appraisal), and took advantage of the new rules and absence of supervision to pursue huge gains. These individuals were drawn by the opportunity to fund their consumption and investment projects cheaply, not "forced" into risky behavior by impersonal macroeconomic trends or ill-considered government rules.

If the sorry state of the industry in 1980 was the consequence of interest rate risk, its situation in 1990 was, from an accounting perspective, the result primarily of the impact of very risky and/or poorly underwritten loans and investments on asset quality at a time when funds to lend were increasingly easily available. The moderation of inflation and consequent reduction in nominal interest rates (because of the fall of the inflation premium) did unwind some of the balance sheet damage inflicted between 1977 and 1982.[5] As nominal interest rates declined and the economy improved in 1983, the market value of mortgage loans made at low rates in the 1970s recovered substantially, although refinancings limited this effect.[6] Still, between 1982 and 1983 total accumulated losses in the S&L industry decreased by about 75 percent. In retrospect, the best thing to have done then would have been to have ceased regulatory forbearance and resolved those institutions then underwater. This would have cost at that time approximately $25 billion (National Commission on Financial Institution Reform, Recovery, and Enforcement, 1993, p. 2)

Instead, the balance sheets and income statements of insolvent S&Ls were made to look healthier than they were by a variety of regulatory and legislative initiatives (Margavio, 1993, pp. 17–19). The continuation of regulatory forbearance allowed zombie (insolvent but still operating) institutions to remain open, forestalling resolution, and encouraged the formation of new institutions. With equity absent or gone, officers, directors, and owners had little incentive not to engage in risky lending or, if they were fraudulently minded, not direct it toward themselves or their collaborators.

Twenty-year phase in rules for a 3 percent capital requirement allowed a newly chartered S&L to hold just .15 percent equity against its assets during its first year, with the rest of its assets funded by insured deposits – permitting a leverage ratio of 665:1. Under these circumstances a tiny increase in the value of assets could be enormously profitable to owners. Even a 5-year old S&L could hold as little as three quarters of a percent capital against its assets, implying a leverage ratio of 132. Existing S&Ls also benefitted from a 5 year averaging rule: the 3 percent capital requirement applied not to current deposits but to the average held over the previous 5 years. This put an additional premium on rapid growth, since an S&L growing at 25 percent per year could reduce its effective capital requirement to 2 percent.[7]

These initiatives invited increasingly reckless lending,[8] and a continued flow of funds to doomed projects, causing a major deterioration in the quality of assets. Combined with the gradual demise of Regulation Q and the rise of brokered deposits in an environment in which all accounts were federally insured up to $100,000,[9] a situation that at the time seemed catastrophic developed, particularly in the states of Texas and California. The 1987 stock market crash gave the distressed industry an additional infusion of funds as individuals pulled money from equities and invested in S&L certificates of deposit.

In Texas, brokered deposits fueled lavish executive compensation and risky and imprudent lending on undeveloped land and commercial office construction. Transactions, particularly in failed institutions, were permeated with self-dealing, artificially inflated land values, and other forms of fraud and theft. California S&Ls used brokered deposits and newly expanded asset powers to make large interest rate bets on mortgage backed securities. In the early 1980s no one knew which way rates would go: some S&Ls took long positions in bonds; others short; it was largely a zero sum game. But there was an asymmetry: when rates fell those taking the long position won, and had their financial health restored. Those taking the other side lost, but ultimately it was the deposit insurance fund and taxpayers that absorbed the loss. California S&Ls also used millions of dollars of insured deposits to invest in risky junk bonds, as well as fuel speculative land development in other states such as Arizona (see Pilzer, 1989, chs. 5 and 6).[10]

The bottom line, generalizing across some of the regional differences, is that the positive balance sheet effects of nominal interest rate declines in the early 1980s were swamped by the massive deterioration in the quality of loans and investments made in the remainder of the decade. By 1989, accumulated losses due to the post-1983 deterioration of asset quality exceeded those attributable to the high interest rates of the late 1970s and early 1980s (Ely, 2008, based on data from the FSLIC and the Resolution Trust Corporation). If fraud played a small role in bringing the industry to its condition at the start of the 1980s, it, along with political corruption, was omnipresent in the worst failures thereafter.[11] The cost of remediation, along with the salience of misconduct and political corruption, is part of why so many at the time thought that these insolvencies were such a big deal.

In 1993 the National Commission on Financial Institution Reform, Recovery, and Enforcement identified federal deposit insurance as the primary enabling cause of the S&L debacle, and recommended that such insurance be limited to "Monetary Service Companies" – essentially mutual funds holding short term easily valued public and private paper. Such funds would be marked to market on a regular basis, required to hold reserves, have access to the Fed's discount window, and be subject to risk-based capital requirements and deposit insurance levies. The burdens of providing effective regulation and supervision would be dramatically reduced because the insurance would be limited to these institutions. This, the report authors believed, would eliminate the likelihood of future debacles. What the report authors (and many other authors) meant by a debacle has become clearer with the benefit of hindsight. It was not necessarily the failure of systemically important institutions posing threats of major cumulative output loss. Rather it was raids on the US Treasury by corrupt lenders and insured depositors with no incentives to monitor lending behavior.

Insured deposits may have contributed to the S&L debacle, but it is questionable that they were the primary culprit. In their absence the flow of brokered deposits chasing high yields would have been attenuated. But eliminating or reducing deposit guarantees would not necessarily have reduced the likelihood either of financial institution failures or of macroeconomically significant crises. For example, it is generally agreed that financial disturbances were among the factors precipitating the Great Depression (for a perspective on onset, see Field, 1984). Yet all of that preceded federal deposit insurance. And more recently, many of the institutions implicated in the 2007–2009 crisis funded themselves using liabilities other than insured deposits.

3. THE SAVING AND LOAN INSOLVENCIES AND RECENT ECONOMIC LITERATURE

Following the 2007–2008 financial crisis a number of influential papers and books explored the macroeconomic consequences of financial crisis. These included Reinhart and Rogoff (2009), Cecchetti, Kohler, and Upper (2009), and Schularik and Taylor (2012). These works brought together two literatures, financial economics and financial history on the one hand and macroeconomics and macroeconomic history on the other which, at least after the 1930s, had, in the developed world, evolved largely independently of each other. As Ng and Wright (2013, p. 1122) wrote in 2013, "In conventional business cycle analysis, emphasis is placed on the fluctuations of macroeconomic variables alone. Asset prices, financial variables and the financial system are a sideshow." Another indication of this traditional bifurcation: none of the variables considered by the National Bureau of Economic Research (NBER) business cycle dating committee is a financial variable referencing money or credit markets.

US economic historians knew that financial disturbances were recurring features of the 19th century, and during the 20th century had significant consequences in 1907 and again during the Great Depression. James, McAndrews, and Weiman (2013) make a strong case that the panics of 1873, 1893, and 1907, each of which was associated with a suspension of specie payments, disrupted the payments system, leading in each instance to a downturn in real activity and significant cumulative output loss. Even if the 1929 stock market crash is no longer considered a major precipitator of the Depression, Friedman and Schwartz (1963) made four waves of bank failures central to their explanation of why the Depression became so much worse in 1932 and 1933. Bernanke (1983), emphasizing the resultant loss of information about the credit worthiness of borrowers, enriched their argument.

But, as Schularik and Taylor (2012) demonstrate, the world really did change after the Great Depression, and not just in the United States. On the one hand, the introduction of federal deposit insurance and New Deal legislation that tightened and increased the transparency of the regulatory system, along with a half century without (in the United States) comparable financial crisis, led many to push the issue off their radar screens. Financial crises came to be perceived as events that happened in other times and other places. While this complacent view took hold, a parallel system of non-bank financial institutions grew quietly in the shadows, funding itself with repo and other non-deposit liabilities. Credit aggregates, no longer closely linked to trends in monetary aggregates, grew much faster than GDP. Deposit insurance and aggressive monetary interventions, reflecting lessons learned from the Great Depression, now rendered the mechanisms identified by Friedman and Schwartz, Bernanke, and James, McAndrews, and Weiman largely irrelevant. Nevertheless, it turned out that the United States and much of the rest of the world was still vulnerable to financial crises that could still bring about significant cumulative output loss.

Misplaced confidence that this was not the case was reflected in the first line of Richard Sylla's (2007, p. 115) contribution to *Government and the American Economy*: "Most informed observers today would agree that the United States has just about the best financial system in the world. Its problems are newsworthy because they arise in the context of a well-functioning financial order, not one that is disorderly."

If the timing of Sylla's essay was unfortunate, Reinhart and Rogoff's was not, since it was clear by the time their book appeared (2009) that financial crises were not just events of historical interest or that occurred in other countries with less developed or robust financial systems. Nevertheless, Reinhart and Rogoff (2009, p. 142) persisted in viewing most banking crises as transmission and possibly amplifying mechanisms, with a "real shock …typically trigger(ing) the crisis." They thus played down the possibility that a financial crisis could have its own independent dynamic, and exercise a causal influence on economic activity in its own right. Schularick and Taylor and Ceccetti et al, in contrast, were more receptive to this possibility.

All of these researchers, however, took advantage of the fact that prior to the 2007 crisis, a number of financial historians had tried to define more precisely what a financial crisis was, and using these definitions, develop databases and chronologies of crises and crisis periods. Reinhart and Rogoff, and to an even greater degree, Schularick and Taylor and Ceccetti et al., took and in some cases refined these panel datasets and engaged them with standard macroeconomic variables in order to explore the possible macro consequences of crises.

Their work was influential, since these authors developed empirically an argument to which then current events had made many receptive. As a result, many now accept that the growth of credit aggregates, leverage, and financial fragility matter in understanding the depth and duration of subsequent recessions and slow recoveries, as well as the damage these may inflict on the trajectory of potential output. That said, it is worth stepping back and asking what may be at stake from a research perspective in the arguments developed in this paper.

Both Reinhardt/Rogoff and Schularick/Taylor consider the S&L insolvencies to have been a financial crisis. Caprio and Klingebiel had earlier classified it as such, although viewing the S&L experience as a "borderline or smaller" financial crisis (1997, p. 7).[12] Reinhart and Rogoff (2009, p. 215) also hedged, describing the insolvencies as "one of 13 financial crises in rich countries representing more minor event[s]…that were not catastrophic", and date it as running from 1984 through 1981. But, when push came to shove, they included the insolvencies as one of two financial crises experienced by the United States since 1945 (2009, Table 10.4, p. 153).

Schularick and Taylor (2012, Table A1) did the same, listing 1984 as one of seven post-Civil War crisis dates for the United States (they identified start but not end dates). In making their classifications they relied on multiple chronologies, including Laeven/Valencia and Reinhart/Rogoff. The former (2012, p. 26) had identified 1988 as the beginning and endpoint of a "borderline" financial crisis. Schularick and Taylor followed Caprio/Klingebiel and Reinhart/Rogoff as opposed to Laeven/Valencia in the dating here.

Cecchetti et al. did not consider there to have been any financial crises in the United States between 1980 and 2007, and they concluded that "most, but not all, systemic banking crises coincide with a sharp contraction in output from which it takes several years to recover" (2009, p. 2). Although placing less emphasis on the possibility that recessions were the consequence of financial disturbances that could have their own dynamic, Reinhardt and Rogoff (2009, p. 165) made a similar statement: "The fact that most banking crises, especially systemic ones, are associated with economic downturns is well established in the literature."

By removing from the crisis category events only tenuously linked to a recession with modest cumulative output loss, insistence that the S&L insolvencies were *not* a financial crisis would strengthen the measured empirical association between financial crisis and output loss reported in Reinhart/Rogoff and Schularick/Taylor. But the definition of financial crisis proposed in this paper

raises a broader issue. Econometric methods test hypotheses as well as estimate relationships or parameters. These various works do both: their null hypothesis, which they wish to reject, is that financial disturbances and what predisposes to them are neutral with respect to the macroeconomy. Because definitions of financial crisis, such as those offered by Laeven and Valencia, make no reference to macroeconomic variables, this looks like an interesting and informative empirical exploration.

The problem with financial crisis chronologies, however, is that, in spite of the efforts to tighten definitions, classification remains highly subjective. These are not hard and fast determinations. People shade their decisions, distinguishing between (ordinary?) financial crises, "borderline" crises, and systemic crises. One of the challenges in dating banking crises precisely is that, as Frydl (1999, p. 1) notes, unlike currency crises, they are "spread out over time, with no clear beginning or end." Preconditions evolve over years, and these can be as important in understanding outcomes as what we might identify as an immediate trigger.

The central argument of this paper is that macroeconomists should reserve the crisis designation for financial disturbances that coincide with or threaten substantial damage to the real economy. Financial disturbances, even if widespread, that do not satisfy this criterion should not be considered systemic nor, from a macroeconomic perspective, a crisis. They don't belong in the crisis database, at least not one used by a macroeconomist. This is a delicate matter in real time, because when financial institutions run into trouble, no matter what the politics of their executives, they hunger for a government rescue. And the standard argument for rescue is that failure to do so will cause significant cumulative output loss (let us fail, and the economy goes down with us). Determining an institution's systemic importance needs to be done before it gets into trouble.

If the criterion proposed in this paper is rigorously adhered to, we can retire the category of *systemic* financial crisis by recognizing it as involving redundant wording. All, not just most systemic banking crises would then coincide with a sharp contraction in output from which it takes several years to recover. The difference between all and most would reflect the removal of previously misclassified events. We will no longer be testing the null hypothesis, because we will explicitly have referenced left hand (macro) variables in selecting right hand side regressors (periods of financial crisis). Non-neutrality of true crisis events will have become part of the maintained hypothesis: our focus will be entirely on estimating how large is the effect. The excluded financial disturbances may still be of interest to financial historians, just as the demise of Data General or the Digital Equipment Corporation is to historians of the computer industry. But not to macroeconomists.

Before developing the argument that the insolvencies in the S&L industry don't warrant designation as a financial crisis, because they don't measure up in terms of their associated cumulative output loss, two controversies regarding the chronology of post-World War II financial disturbances in the United States require exploration. Lopez-Salido and Nelson (2010) vigorously protest

the Caprio and Klingebiel (1997)/Reinhart and Rogoff (2009) identification of 1984–1991 as crisis years, arguing instead for 1982–1984 and 1988–1991. 1988–1991 is justified on the grounds that, indeed, most of the S&L insolvencies were concentrated in those years.

The argument for 1982–1984 is more problematic. Lopez-Salido and Nelson argue that August of 1982, when the Mexican government threatened default on its sovereign debt, marked the beginning of a 2-year period of financial crisis in the United States. But the US economy was already well into a severe downturn by August, and whatever the vulnerability of US commercial lenders to their less developed countries (LDCs) lending, there is no way the 1982 Mexican crisis can plausibly be held responsible for the depth of the recession that year.[13]

The second and related question is this. The 1982 (and 1980) recessions are generally not considered to have been recessions accompanied (or caused) by financial crisis?[14] Should they be? This question took on more than historical importance because of the rapid recovery after 1982 in comparison with the experience in 2007–2009. Did the postponement of reckoning in the early 1980s – the band aids represented by regulatory "forbearance" and accounting "innovations" that allowed S&L institutions to avoid being shut down or merged – disguise a reality, that the two sharpest post-Depression downturns (1982 and 2007–2009) are more similar than has been acknowledged, in the sense that the former as well as the latter was associated with financial crisis?

The classifications of both the 1982 and 1990–1991 recessions have implications for the generalization that recessions accompanied by financial crisis experience weaker and much longer recoveries to potential than do those which are not. The 1982 recession was very deep – indeed, as measured by the peak unemployment rate, it was deeper than 2007–2009. But recovery from it was also very rapid (Bordo & Haubrich, 2010). It was a V-shaped recession, and the comparatively slow recovery from 2007 to 2009 became an issue in the 2012 Presidential election. Some attributed the slow recovery to Obama's "failed" economic policies, while others pointed out that 2007–2009 was accompanied by a severe financial crisis whereas 1982 was not. For a number of reasons, it will be important to judge whether the recessions of the early 1980s were accompanied and perhaps precipitated by (disguised) financial crisis, as well as the more central question of whether the relatively mild recession of 1990–1991 can be causally linked to the S&L insolvencies.

4. CUMULATIVE OUTPUT LOSS AND THE DEFINITION OF FINANCIAL CRISIS

There is little dispute that the S&L insolvencies represented a debacle of some sort. But were they macroeconomically significant? I define a set of financial disturbances as macroeconomically significant, if and only if they threaten to trigger a recession and slow recovery that together result or would result in

substantial cumulative output loss. Otherwise the disturbances, though they may threaten the survival of individual firms, should be of no more concern to policy makers than the prospective failure of a computer company.

Competition is not a tort. The birth and death of enterprise is an expected feature of a vibrant economy. In most cases, threatened failure does not warrant government action or intervention. Financial institutions have, however, often been considered an exception to this rule and, as a consequence, have generally been more heavily regulated. Whether or not the failure or prospective failure of a financial institution justifies remediation depends on whether such failure threatens serious damage to the real economy. This in turn depends on whether or not the enterprise(s) about to fail are systemically important: how large and interconnected they are, and whether they provide services for which there are no close substitutes.

There is an ex ante and an ex post perspective on this. Ex post, if a set of financial disturbances can plausibly be said to have triggered a recession and slow recovery with substantial cumulative output loss, that is sufficient evidence of both systemic importance and macroeconomic significance. The Dodd–Frank bill tries to get out in front of this, by requiring the identification in advance of SIFIs. Unremediated or partially remediated failures of SIFIs are macroeconomically significant by definition, since prior designation as such means a high likelihood that failure would ultimately cause significant cumulative output loss. This paper argues that the failure or threatened failure of financial institution(s) that *do not* meet this criterion cannot usefully be described as a financial crisis. If we argue otherwise, we will likely bias policy in favor of socializing losses that should in fact remain private.

Many definitions of financial crisis or financial instability do not directly reference cumulative output loss.[15] Laeven and Valencia (2012, p. 4), for example, identify a banking crisis as displaying "significant signs of financial distress in the banking system (as indicated by significant bank runs, losses in the banking system, and/or bank liquidations)" and "significant banking policy intervention measures in response to significant losses in the financial system." There is no explicit reference to impacts on the real economy.

Neither the historical fact, ex post, of remediation, nor the cost of such remediation to the Treasury, will necessarily tell us much about whether or not the failure(s) in question was (were) systemically important.[16] In some cases institutions that were remediated could have failed with only minimal damage to the macroeconomy. In such cases direct remediation, which transfers wealth from some households to others, will have had little impact on the real economy. In other cases remediation (or its absence) can have enormous impacts on the trajectories of output and employment. The degree of systemic importance of failing institutions influences the sensitivity of output loss to the character, amount, and timing of remediation. Even where failing institutions are systemically unimportant, there will be individuals whose assets will be impaired by a failure who will exercise political pressure to be made whole. As the sequence

of decisions involving Lehman Brothers and AIG revealed, policy makers need to know in advance into which category (systemically important or not systemically important) the threatened failure of a financial institution falls. This is one of the lacunae Dodd–Frank aimed to fill; Das (2016) offers a promising methodology that might be used to implement this.

The critical question to be asked in each instance is whether unremediated failure would have, or would have had, major effects on output and employment, in other words, to use an older term, if such failures would be, or would have been, *non-neutral* with respect to these variables. If unremediated failure would have been *neutral,* it is not useful for macroeconomists to call the failures or threatened failures a crisis, even though there may be loud and persistent voices arguing the contrary, and even though the failures may in fact have been remediated. Many firms face crises which are financial in the sense that the firms face insolvency. From a macroeconomic policy perspective, however, the term crisis should be reserved for failures or incipient failures that threaten or cause deep recessions and slow, drawn out recoveries. I am thus sympathetic to a definition of financial instability offered by Eric Rosengren (2011): "Financial instability occurs when problems (or concerns about potential problems) within institutions, markets, payment systems, or the financial system in general significantly impair the supply of credit intermediation services – *so as to substantially impact the path of real economic activity*". The importance of acknowledging directly the link between financial disturbances and the possibility of output loss was reflected in the increased post-2007 emphasis on the desirability of macroprudential regulation.

In retrospective or historical analysis, the fact of remediation complicates the task of identifying which sets of financial disturbances were macroeconomically significant. Consider pure cases (remediation either happens or it does not). If disturbances were not remediated, and plausibly caused a subsequent recession and slow recovery with significant cumulative output loss, we would know that the disturbances were indeed macroeconomically significant. If they were not remediated, and were associated with little subsequent damage to the real economy, we would know that they were systemically unimportant. However, if it were possible for remediation to completely avoid damage to the real economy resulting from the failure of institutions receiving a prior designation of systemically important, we could have a problem. It would be impossible to tell, after the fact, among those disturbances that were remediated, which, had they been left unremediated, would have damaged the real economy. It is the same problem faced in assessing the effectiveness of a medical treatment in the absence of controlled double blind clinical studies.

Fortunately for the task at hand, there is broad consensus that fully effective remediation of impaired SIFIs is likely to be rare. Policy makers have generally been more proactive in fighting fires than in preventing their outbreak.[17] Because of this, examining cumulative output loss following candidate financial

disturbances is useful in considering whether, retrospectively, they should be considered to have been macroeconomically significant.

Determinations of which failures could pose a threat to the macroeconomy cannot be made easily in the heat of what might be a crisis. They must be done ex ante – which is why Dodd–Frank represented a step forward, even if the aspiration never to bailout again probably reflected wishful thinking. We should now be equally vigorous in purging our historical databases of financial disturbances that did not in fact threaten the macroeconomy. The S&L insolvencies are a case in point. Had Dodd–Frank been in place in the 1980s, the S&Ls would not have been labeled as systemically important.

5. THE 1982 AND 1990–1991 RECESSIONS

With respect to the early 1980s and the early 1990s, either both the 1982 and the 1990–1991 downturns should be treated as recessions triggered by financial crisis (few dispute this classification for 2007–2009), or neither, or one should be but not the other. In assessing macroeconomic significance, one must judge first whether an accompanying recession was triggered by financial disturbance and second, what sort of cumulative output loss resulted. This section considers the 1980–1982 recessions.

The downturn in GDP growth and rise in unemployment in the early 1980s are widely attributed to the tight money policies adopted by Federal Reserve Chairman Paul Volcker to reduce the inflation rate. Volcker eventually succeeded (with an assist from collapsing oil prices), although, contrary to predictions of rational expectations theorists, it came at the expense of what was then perceived to be a very substantial loss of output. Using Congressional Budget Office estimates of potential and Bureau of Economic Analysis estimates of actual, we can calculate the cumulative output loss between 1981Q2 and 1984Q2 at $993 billion 2009 dollars, or about 14.1 percent of average potential GDP during that period.[18] This can be viewed as the cost of reducing inflation from almost 10 percent in the late 1970s to 4 percent and lower in the 1980s and thereafter.

According to conventional wisdom, especially that reflecting the assumption of adaptive expectations, this was a garden-variety recession, albeit severe, but one (unlike 1974–1975) easily understood as driven by aggregate demand mechanisms. Is it possible that the conventional wisdom nevertheless missed something? If the S&L sector was already insolvent in 1982, is it possible that the 1982 recession should also be classified as one accompanied by financial crisis? Lindgren et al. (1996, p. 34) treat the 13-year period stretching from 1980 to 1992 as marked by "significant" banking problems, pointing out that during this period 1,395 banks closed, as well as 1,142 S&Ls. Their classification of banking problems as "significant" indicates a lower degree of severity than crisis, although it also suggests considerable continuity across the entire period,

which makes a difference if we end up classifying the late 1980s and early 1990s as crisis.

Many banks (as well as S&Ls) did indeed close. But most failed banks were small. Between 1980 and 1994 the Federal Deposit Insurance Corporation (FDIC) supervised the shuttering of 1,617 commercial banks. Their assets, however, totaled less than 9 percent of total commercial bank assets.[19]

As noted, there is still lack of agreement among scholars about exactly what is meant by a financial crisis, but consensus in distinguishing within this category among banking, sovereign debt, and currency crises. Since none of the episodes under discussion here (the 1982 recession, the S&L meltdown/1990–1991 recession, or the 2007–2009 recession and slow recovery) was associated with flight either from US government debt or the US dollar, we can begin by agreeing that the type of disturbances under consideration involved banking (or, more generally, financial institutions).

One symptom of a banking crisis will be the failure, or delayed failure of financial institutions, and on these counts, one could argue that both 1982 and 1986–1995 qualify. The preponderance of S&Ls were already "zombie" institutions by the early 1980s. They were kept alive (made to appear solvent and profitable) by regulatory accounting gimmicks, and almost half of then failed or otherwise disappeared during the subsequent decade. As noted, commonly accepted criteria for identifying banking crises typically emphasize runs on financial institutions, often but not always accompanied by government bailouts (Government Accountability Office, 2013, p. 9). The S&L meltdown meets these standards (bailout and runs on state insured banks in Ohio and Maryland, and in California at IndyMac), and arguably casts a penumbra over both the 1982 and 1990–1991 recessions.

But to qualify as an event with macroeconomic significance and justify designation as a financial crisis, we need more. Some banking crises (broadly understood) occur in institutions that are not systemically important and whose impact is highly localized, and they do not engender or threaten a significant downturn in real economic activity. The S&L insolvencies fall into this category.

Systemic banking crises are often defined as those in which most or all of the banking system's capital is exhausted (Boyd et al., 2005, p. 981).[20] This is likely to be accompanied, on income statements, by a sharp drop in aggregate financial sector corporate profits, both in absolute terms, and in relation to nonfinancial profits. Although Fig. 1 shows 2007–2009 clearly qualifying on this account, neither the 1982 recession nor the mild 1990–1991 recession show much evidence of this. A very large number of S&Ls, of course, did exhaust their capital, and continued to lose large amounts of money. This was not, however, true for the banking sector as a whole.

2007–2009 now provides a benchmark for what a systemic (and, by my definition, macroeconomically significant) financial crisis and its aftermath looks like in the post-World War II United States. In particular, this episode

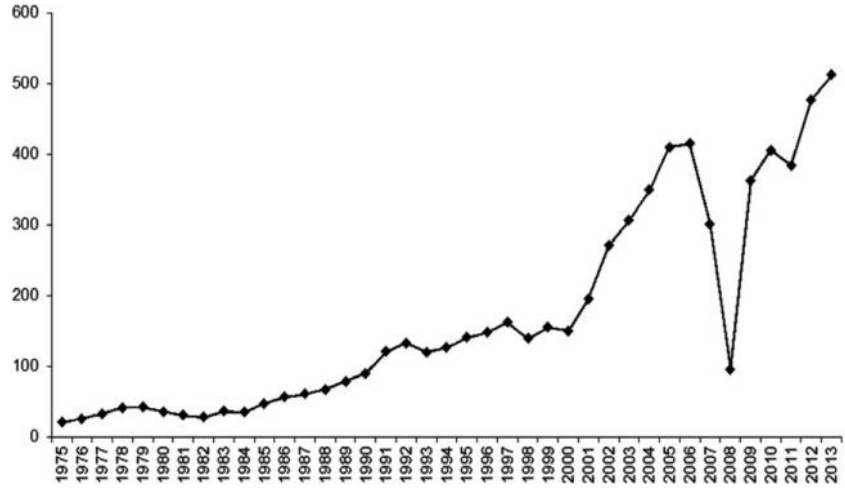

Fig. 1. Domestic Pretax Profits, Financial Sector, United States, 1975–2013. Units: billion. *Source*: Board of Governors of the Federal Reserve Board, Flow of Funds Accounts (2014, June 5 release), Table F-7, lines 11-12.

evidenced a very large decline in pretax corporate profits reported in the financial sector, from a peak of $415.1 billion in 2006 to $95.4 billion in 2008. In contrast, financial sector profits declined from $41.8 billion in 1979 to $27.2 billion in 1982, a slippage of 35 percent as opposed to 77 percent.

Moreover, the decline in financial sector profits in 1982 should be understood as largely a consequence of a recession that had its sources elsewhere, in the efforts of the Federal Reserve System to reduce inflation by slowing the growth rate of the money stock. The resulting negative aggregate demand shock increased nonfinancial business bankruptcies, which increased bad loans and understandably took a toll on the profits of the financial sector. The causality ran principally from recession (whose origin was to be found in the conference room of the Board of Governors of the Federal Reserve System) to decline in financial sector profits.

In contrast, it was financial crisis that drove the US economy deep into recession in 2008. Whereas John Taylor and others have suggested that monetary policy was too loose between 2001 and 2004, no one has suggested that the 2007–2009 recession was caused by tight monetary policy, or that it was a recession originating outside of the financial sector that produced distress within it.[21] In this fundamental respect 1982 and 2007–2009 were very different.

As far as the period of the S&L meltdown itself (during which losses were finally recognized, and the institutions were allowed or forced to merge or fail), between 1986 and 1995 financial sector profits *increased*, with the exception of

a slight decline (under 10 percent) between 1992 and 1993. If we treat financial sector profits as a barometer indicating aggregate stress on the financial system, the S&L "crisis," in contrast with 2007–2008, hardly registers (Fig. 1).

Another way to consider the significance of financial disturbances is to look at the share of financial sector corporate profits in total pretax domestic corporate profits. Once again, there is no doubt about the sizable footprint of the more recent set of events: after peaking at 43 percent in 2002, that share fell to 10 percent in 2008. The general trend in that ratio has been upward since 1975, and we do see a gradual decline from 34 percent in 1992 to 24 percent in 1994, but it is not nearly as large proportionally (Fig. 2).

A related measure of the impact of a recession triggered by financial crisis is the effect on private sector bond prices and yields. In a garden-variety recession (one not associated with financial crisis), yields will generally fall and prices will strengthen, with the exception of very risky bonds. In contrast, as we know from 2008, in a recession triggered by a macroeconomically significant financial crisis, prices of virtually all private sector debt plummets, as a flight to quality drives Treasury yields down and all other yields up. There is little evidence of this either in 1990–1991 or for that matter in 1982.

One of the signature features of the 2007–2009 episode was a dramatic spike in the TED spread, in which the gap between the short term Treasury bill rate and the rate at which banks were willing to lend Eurodollars to each other soared to over 300 basis points. Is there evidence of stress in this measure associated with the S&L troubles? The Federal Reserve Economic Database

Fig. 2. Financial Sector Share of Pretax Domestic Corporate Profits, United States, 1975–2013. *Source*: Board of Governors of the Federal Reserve Board, Flow of Funds Accounts (2014, June 5 release), Table F-7, lines 11-12.

(FRED) has information on the TED spread (TEDRATE) going back to 1984, and if one takes a quick look at the chart, it appears that there might be, since one sees a big spike to 300 basis points in late 1987. Indeed, this was the record prior to 2007–2009. This earlier spike, however, was entirely related to the 1987 stock market crash, which featured the largest (22.6 percent) 1-day percentage decline in stock market history (October 19, 1987). The TED spread reached 292 basis points on that day and then peaked on Tuesday, October 20, 1987 at 302 basis points before subsiding. There are no suggestions that the S&L insolvencies – threatened or actual – had anything to do with the stock market crash, and therefore with this spike in the TED spread.

The 1990–1991 recession was relatively mild, associated in part with the temporary spike in oil prices accompanying the first Gulf War (Fig. 3). By 1992, TED spreads were at some of their lowest rates in the last 30 years. In the shadow of 2008, and with knowledge of the course of the economy in the 1990s, the claim that the S&L insolvencies were macroeconomically significant is problematic, both because at the aggregate level the recession was mild, and because there is little evidence linking it to the S&L travails. And the suggestion that 1982 should be considered a recession triggered by a (disguised) financial crisis seems, in the light of the data, to be something of a reach for those who wished, in highlighting the contrast between the sharp economic recovery from 1982 and the sluggish recovery from 2007–2009, to place the Obama administration's recovery record in a more unfavorable light.

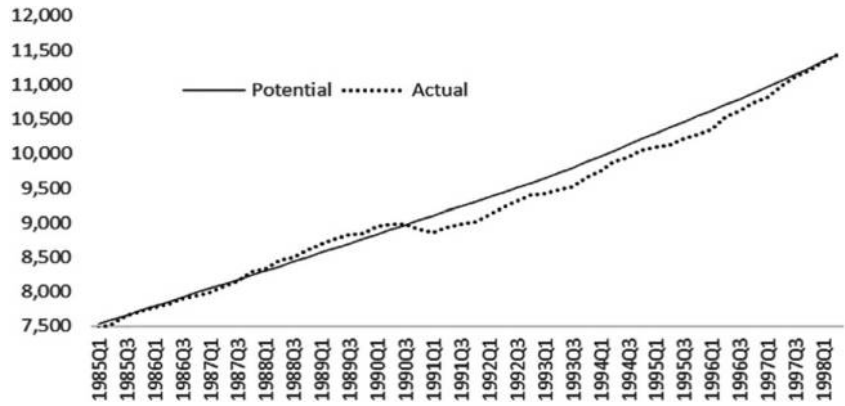

Fig. 3. Actual and Potential Output, United States, 1985Q1-1998Q2. Units: billions. Chained 2009 $. *Sources*: Congressional Budget Office (2016) and US Bureau of the Census (2016). Quarterly CBO estimates of potential output available at https://www.cbo.gov/about/products/budget_economic_data#6; actual output at http://www.bea.gov, NIPA Table 1.1.6. Accessed on March 23, 2016.

According to the criterion advanced in this paper, for a financial crisis to be macroeconomically significant, it is sufficient for it to be followed by an economic downturn and slow recovery generating a substantial cumulative output loss, *and* for there to be a strong case that the crisis not only accompanied the recession but also caused it. Both the 1982 and the 2007–2009 recessions saw sharp downturns.[22] But while there is good reason to believe that the latter recession was triggered by financial crisis, there is little evidence to suggest that this was true in the case of the former.[23]

Calculating the cost of a financial crisis requires both a plausible case linking a recession and slow recovery to the financial disturbances and an estimate of the cumulative output loss. Other suggested markers, such as the rise in unemployment or the unemployment rate (Better Markets, 2012) represent in a sense double counting: in these cases, we are simply observing correlates of the rising output gap. Given the National Income and Product Accounts (NIPA) accounting identities, the lost income of those no longer at work (as well as their lost expenditure) is equal to the value of lost output.

6. PREOCCUPATION WITH THE COST OF REMEDIATION AND THE IMPACT ON THE TREASURY

Much attention has focused on estimates of the cost of remediation associated with the S&L insolvencies as well as the distress facing much larger institutions in 2007–2009 (there is little discussion of such costs for 1982, when bank failures were easily handled by the FDIC). Debating the size of taxpayer funded remediation, is likely, however, to tell us little about the true costs of a financial crisis for an economy.[24] What is more important is whether financial distress plausibly caused or heavily influenced a subsequent economic downturn and slow recovery, and if so, what was the cumulative output loss associated with this deviation from the trajectory of potential output.

Remediation involves transfers from some groups or individuals to others. Focusing on costs to "the average taxpayer" obscures the benefits many receive. S&L remediation was associated with transfers to creditors of failed institutions as well as to institutions that took over the assets and liabilities of those that had failed (which had much the same effect). To the degree that some of the remediation represented the disbursement of insurance premia previously remitted by S&L institutions, there was no additional burden on taxpayers, although of course the insolvency and ultimate demise of the FSLIC in 1989 reflected the fact that these funds were hardly sufficient to make good on the guarantees.

The preferred approach to considering cost has been to total up federal disbursements, sometimes excluding and sometimes including payments from government operated but industry financed insurance pools such as FSLIC or FDIC. For the S&L insolvencies estimates of the totals (including interest on

debt over a 30–40 year horizon) have come in as high as half a trillion early 1990s dollars (White, 1991, p. 197). In 1994, GDP was approximately $7 trillion so by that measure the bailout cost about 7 percent of 1 year's GDP.

There is a strong argument, however, that the cost of remediation should be reckoned independently of how it is financed, and it is therefore not appropriate to include interest on borrowed money in these tabulations.[25] When the government costs out a major weapons system, it doesn't include interest charges assuming the money used to acquire the weapons is borrowed (Curry & Shibut, 2000, p. 29). If one just looks at direct costs (assuming, say, that the transfers were financed with taxes), we are closer to 3 percent. Caprio and Klingebiel (1997) provide 3.2 percent of 1 year's GDP as an estimate of the resolution costs of the 8-year episode they see running from 1984 through 1991. Lindgren et al. (1996) come up with 2.4 percent for the 13-year period. 1980–1992 they identified as associated with "significant" banking problems. Frydl (1999) treats these as upper and lower bounds of the costs of resolution.

In 2007–2009, remediation was more multifaceted. It included traditional FDIC resolutions, the largest of which was of Washington Mutual, and these were similar in mechanism and effect to what had transpired in the S&L cases. But for larger financial institutions, deemed too big or too interconnected to fail, remediation consisted of government (Treasury) injections of equity (the Capital Purchase Program portion of TARP), which were funded by tax revenues or borrowing. TARP funds were also used to acquire equity positions in the insurance company AIG as well as major automobile companies, with the exception of Ford. In a separate operation, the Treasury took Fannie Mae and Freddie Mac into conservatorships.

Remediation can also be thought of as including various Federal Reserve liquidity facilities that helped banks and other financial institutions (many of which were by any reasonable measure insolvent as well as illiquid) meet current demands for cash, affirmative action by the Fed to acquire mortgage backed securities (a major factor after 2009 in extending the Fed's balance sheet), the payment of interest on deposits by member institutions at the Fed, which by 2014 was transferring approximately $6.5 billion annually of additional revenue to banks,[26] the temporary extension of deposit insurance to money market funds, support of the commercial paper market, and other guarantees.[27] Some writers include countercyclical fiscal policy, such as the American Recovery and Reinvestment Act (2009) as another dimension of remediation: by mitigating the depth of the recession it helped the asset side of financial institutions' balance sheets to recover.

Remediation targeted directly at financial institutions operated on both sides of balance sheets (the Fed generally on the left hand (assets) side, the Treasury on the right (liabilities/net worth)). These efforts partially insulated the United States (and to a lesser degree the world) financial system from what might otherwise have been a much greater cumulative output loss. From a

macroeconomic perspective, however, it is of little consequence whether the remediation programs ended up costing the Treasury money.

It is in fact likely that none of them will. The question of whether the TARP program would ultimately turn a profit remained for a time contentious, with the Treasury taking a highly optimistic view and the Office of the Special Inspector General for the TARP taking a much more pessimistic and critical view (SIGTARP, 2013). By January 31, 2014 the Capital Purchase Program portion of TARP had returned $225 billion to the Treasury in repayments, dividends, interest, and warrant income, compared with disbursements of $205 billion in equity injections to financial institutions in 2008 (GAO, 2014). The TARP program overall included the Capital Purchase Program for financial institutions as well as the Treasury's portion of the AIG rescue (the New York Fed also participated), and the positions taken in automobile companies. By April 30, 2014, beneficiaries had returned $438.5 billion to the Treasury, exceeding the total disbursements of $423.7 billion[28] (US Department of the Treasury, 2014).

The other big Treasury operation was the conservatorship of Fannie and Freddie. The 2008 equity injections required outflows from the Treasury of $189 billion. An October, 2012 *Wall Street Journal* story suggested that the actual taxpayer cost would be about $78 billion, down from earlier administration estimates of $130 billion. By March of 2014, returns to the Treasury from the two GSEs *exceeded* disbursements of $189 billion by $15 billion.

But do the apparent profits on the two major Treasury operations indicate that the financial crisis didn't actually cost the government (or the economy) anything? Of course not. First of all, on the narrower question, although the TARP bailouts have been repaid, taxpayers were not compensated for the very large ex ante downside risk they bore. Moreover, TARP expenditures were a fraction of the costs to the Treasury (and the states) of the financial crisis, since the ensuing recession and slow recovery meant a loss of tax revenue that would otherwise have been collected. Total receipts at all levels of government fell from $4.2 trillion in 2007 to $3.7 trillion in 2009. Total current receipts for the Federal government declined from $2.66 trillion to $2.23 trillion between these 2 years.

The S&L remediation "cost" the economy roughly 3 percent of GDP (remember, these were transfers, and many individuals, often high net worth, benefitted) while the response to the 2008 crisis may ultimately make money for the Treasury. Those outcomes, however, have almost no bearing on which of the two sets of financial disturbances was more macroeconomically significant.

Here are the important facts: The first financial crisis of the 21st century caused a recession and slow recovery that resulted (and continues to result) in a very large cumulative output loss.[29] In contrast, the S&L insolvencies had almost no connection to the subsequent recession and slow recovery which, in any event, resulted in a modest cumulative output loss.

7. CUMULATIVE OUTPUT LOSS: 1990–1998

The US economy did experience a recession in 1990–1991, part of which might be attributed to the decline in construction spending, particularly in Texas and California. But the declines in aggregate magnitudes were relatively small. Residential construction dropped from $239.5 billion in 1989 to $205.1 billion in 1991 before recovering. Housing starts dipped from a peak of 1.6 million in January of 1989 (all numbers are at an annualized rate) to a trough of 798 thousand in January of 1991, but quickly recovered to over 1 million, as they had in the 1982 recession (Congressional Budget Office, 2008, p. 34). In contrast, starts collapsed from a peak of over 2.2 million in January of 2006 to a trough of 478 thousand in April of 2009, considerably below where they had been at the depths of either the 1982 or 1990–1991 recessions. Recovery of housing starts after 2009 took a very long time. Starts averaged just over 900 thousand in the first 8 months of 2013, and in April of 2014, they were barely over 1 million on an annualized basis. In August of 2015, at just over 1.1 million, they were still barely half their peak more than 8 years earlier (http://research.stlouisfed.org/fred2, series HOUST, accessed March 23, 2016). In September they broke 1.2 million, but remained somewhat below that through February of 2016.

Perhaps we should focus on nonresidential construction. But here the percentage decline in the 1990–1991 recession was even smaller. Nonresidential construction for the country as a whole dropped from $622.4 billion in 1990 to $598.2 billion in 1991 before recovering (all magnitudes nominal, from NIPA Table 1.1.5). The Federal Reserve Board's Senior Loan Officer Opinion Survey on Bank Lending showed a modest decline during the 1990–1991 recession, comparable to what was seen in 2001, but overshadowed by the precipitous fall in 2008 (Congressional Budget Office, 2009, p. 10). There is little evidence of deterioration in this measure during the 1982 recession, (although a large negative spike in 1980 associated with the imposition of credit controls).

There are multiple channels whereby financial failures may adversely affect the real economy. The most potentially devastating is through the credit channel. If failures threaten or cause to seize up flows of lending, as was the case with the failure of Lehman Brothers, the damage to capital formation and to the real economy can be very serious indeed. The data at the national level on construction spending, the component of gross private domestic investment we would most expect to be affected by S&L failures, do not suggest such an impact.

Congressional Budget Office data (2011, p. 28) show output roughly at potential between 1985 and 1990, then dropping below potential between 1990Q4 and 1998Q2 (Fig. 3). Real GDP fell a slight 0.2 percent between 1990 and 1991, probably influenced by the direct effect of the rise in oil prices associated with the first Persian Gulf War, and the indirect effects on spending due to

related drops in consumer and business confidence. Output recovered relatively rapidly in 1992, although a diminishing output gap remained until mid-1998 (Fig. 3). In absolute terms the loss is reflected in the rise of the unemployment rate from 5 percent in March of 1989 to 7.8 percent in June of 1992. A 2.8 percent point increase is not trivial, although it pales in comparison with the increase from 4.5 percent in March of 2007 to 10 percent in October of 2009 or from 2.9 percent in 1929 to 24.9 percent in 1933. Moreover, after its June 1992 peak, the unemployment rate dropped almost as quickly as it had risen, and then continued to decline in the 1990s, reaching a nadir of 3.8 percent in April of 2000.

The cumulative output loss between 1990Q4 and 1998Q2 played a role in the 1992 Presidential election,[30] but was nevertheless small compared to what has and will be experienced in the aftermath of the 2007–2008 financial crisis. It is important in estimating the macroeconomic cost of a downturn not to limit ourselves to the periods of recession identified by the NBER business cycle dating committee. The economy can return to growth and thus be characterized as having emerged from its downturn, but in levels remain substantially below the prior trajectory of potential.

The NBER determined that the economy was in recession for 8 months from the third quarter of 1990 through the first quarter of 1991, but we must consider as well the recovery period during which the economy remained below potential. The calculations that follow reference the period from 1990Q4 through 1998Q2, when the economy returned to potential. I compare the CBO's series for real potential output in chained 2009 dollars with actual output using the same metric, and cumulate the output gaps. This comes to $1.4 trillion, which can be compared with average potential output during this period of $10.246 trillion. We can therefore say that this period of below potential output at the start of the 1990s cost approximately 13.8 percent of 1 year's GDP.

From the perspective of the questions posed in this paper, however, the size of this number is almost beside the point, because there is at best a tenuous connection between the output shortfall between 1990 and 1998 and the S&L troubles. Stephen McNees (1992) hardly mentioned the S&L sector in discussing the genesis of the downturn. Robert Hall (1993), echoing Olivier Blanchard (1993), concluded that the downturn had something to do with the response of consumer and business confidence to the Iraq war and the spike in oil prices. There is no mention at all of the S&L difficulties in his list of eight possible causes of the recession. Carl Walsh (1993) argued that if there was a cause it was restrictive monetary policy. David Geltner (2013) concluded that commercial real estate, which was differentially implicated in fraudulent S&L lending, did not play a major role in causing the recession or influencing recovery in the early 1990s.[31] The main contrary view I could find is in an article on http://thebalance.com by Kimberly Amadeo entitled "The History of Recessions in the United States" (Amadeo, 2017): Regarding the 1990–1991

recession she wrote: The Savings and Loan Crisis caused it full stop. Her statement reflected a popular view, presumably derived from the observation that the recession and slow recovery followed the bulk of the S&L insolvencies, but one not shared by most although not all academic economists. More recently, Ng and Wright (2013, p. 1129), claimed that the 1990–1991 recession "was caused by the savings and loan crisis," although they provided no analysis, explanation, or evidence to back this up.

The fact that virtually everyone in the early 1990s, including academic, government, and business economists thought the S&L insolvencies were a debacle and a crisis, yet very few[32] found a connection to the subsequent recession and output gap brings into sharp focus the questions raised in this paper about the criteria used in designating a series of events a financial crisis. Can we consider financial disturbances a crisis if they have virtually no impact on the real economy?

If we can link financial disturbance to a recession and slow recovery resulting in significant cumulative output loss we have established sufficient conditions for macroeconomic significance. Conversely, demonstrating that failures were *not* followed by these outcomes provides necessary though not sufficient grounds for concluding that the disturbances had little macroeconomic significance. The evidence is only necessary because there is still the possibility that the character, amount, and/or timing of remediation prevented output loss that otherwise would have occurred.

Determining whether the output trajectory might have been sensitive to the nature of remediation represents essentially the same challenge as determining whether the impaired institutions were systemically important. As noted, the Dodd–Frank act requires ex ante identification of SIFIs. The act mandates, in advance, tagging those institutions whose failure would have significant negative consequences for the macroeconomy.

Whether a financial institution is systemically important depends on how large is its asset base, how enmeshed it is in chains of intermediation (a function of its degree of leverage and the nature of its liabilities), and how available are substitute intermediation services. The potential for contagion is important, and there are several mechanisms whereby it can occur. The simplest is direct interconnection. If A fails, and has borrowed from B, so that A's liabilities are B's assets, then B may be in jeopardy. And if B fails, and has borrowed from C, C can be vulnerable. Like a row of falling dominoes, the failure of one institution might generate a cascade of other failures.

Contagion can also occur in the absence of direct interconnection. If A fails, holders of B's short-term liabilities might run, not necessarily because B actually holds A's liabilities, but due to lack of knowledge of "where the bodies are buried": fears that B's asset portfolio is similar to A's and/or that apparently similar deposit guarantees are wobbly.[33] B's solvency might also be threatened if, with an asset profile similar to A's, fire sales of A's assets drive down the market value of B's assets.

Widespread collapse of financial institutions can damage the real economy through multiple channels. New and existing businesses dependent on external finance and lacking direct access to capital markets may find themselves deprived of credit. Some, with viable plans for business expansion, will not be able to undertake them. Others, relying on credit for ongoing operations, may not be able to make payroll or purchase materials, and industries whose customers depend on credit may not be able to purchase goods or services. Firms normally accessing external finance by issuing commercial paper or corporate bonds may find these markets chaotic, and accessible only on penalty terms if at all. Consumption and gross private domestic investment will be lower, aggregate demand will suffer, output and employment will fall, and more business failures may ensue, further weakening financial institution balance sheets. Declining profits and weakened earnings constrain firms that otherwise might finance expansion internally; even where funds are available new projects may now appear unattractive in the context of a deepening recession.

Failures may also generate negative wealth effects. When financial institutions fail, depositors, bondholders, and shareholders may all find themselves poorer, and this may adversely affect consumption. In the case of the S&Ls, even had there been no remediation, such wealth effects would have been small. It cost about $200 billion, or roughly 3 percent of GDP, to resolve the insolvencies. This seems like a considerable sum, and it was, but it should be kept in perspective.[34] The dot.com collapse a decade later resulted in a $7 trillion decline in household wealth, an order of magnitude higher in both absolute terms and as a share of GDP than the losses associated with the S&L failures.[35] Job gains between 2001 and 2006 were soft, but the collapse of the NASDAQ does not appear to have had a major macroeconomic impact, in part because the burgeoning housing construction boom took up some of the slack in the economy, but more importantly because the intermediation chain was short, and losses stopped quickly with households owning the assets.

The more leveraged is an institution, and the more contagion threatens, the more vulnerable may be the larger financial system and the macroeconomy to possible failure, and the more sensitive may be the real economy to the character, timing, and amount of remediation. On the other hand, if the asset base is limited and/or losses will stop with the first round of liability holders, and if comparable intermediation services will be available from still solvent institutions, the possible or actual macroeconomic impact of failure will be much less sensitive to the nature, timing, and amount of remediation.

Although, like most financial institutions, S&Ls were highly levered, their liabilities consisted principally of retail and brokered deposits, the latter collected from high net worth individuals by intermediaries such as Merrill Lynch and then funneled to S&Ls willing to pay the highest rates. These flows were supplemented by union pension funds, particularly through corrupt organizations such as Mario Renda's First United Fund. Broker-dealers were not, however, lending to savings and loans on their own account, nor, by and large,

were S&Ls borrowing from banks. Finally, the S&Ls were not providing unique or irreplaceable intermediation services. Some of the biggest problems involved commercial lending, an arena in which S&Ls were novices, and by all accounts, doing a very bad job of underwriting.

Due to the relatively small size of the insolvent institutions, the lack of interconnectedness reflected in their liabilities, and the availability of other institutions capable of lending on real estate, we can state with some confidence that the failed S&Ls were not systemically important. The fact that individually owned insured deposits formed the overwhelming preponderance of the liability structure – often cited as a necessary condition for the "debacle" – guaranteed a very short chain of intermediation and made the institutions systemically unimportant. One can state the hypothesis more broadly: no institution funded entirely by equity and insured deposits provided by individuals is likely to be systemically important. Even had their depositors not been made whole, the macroeconomic damage would probably have been limited, because the losses would have stopped after only one or at most two links in a chain of intermediation.[36]

The FSLIC, unlike the FDIC, did not legally have the full faith and credit of the US government standing behind it. Had backstopping not ultimately been provided in 1989 when the FSLIC ran out of money, losses would have been absorbed by the households that owned deposits of failed institutions and would have stopped there. Thus contagion through directly interconnected balance sheets would have been limited. Contagion to solvent institutions through other mechanisms could have been prevented by providing liquidity to S&Ls deemed merely illiquid and contagion to banks forestalled by making clear that (unlike the FSLIC), the FDIC guarantee stood even if its funds, were exhausted.

I am not saying this necessarily would have been good policy, or fair. But exploring the consequences of a scenario in which depositors were not made whole reinforces the conclusion that the absence of significant cumulative output loss is mostly attributable to the systemic unimportance of the failed thrifts as opposed to the amount or character of remediation.

8. CUMULATIVE OUTPUT LOSS: 2007–2026 (AND BEYOND)

For 2007–2026, there is a much stronger case that the recession and slow recovery was caused by developments in the financial sector.[37] By "cause" I do not necessarily mean a specific "trigger" such as the collapse of Lehman Brothers, but rather an accretion of financial fragility over a number of years, the result of risky and highly leveraged bets made with other people's money. Financial fragility increased over time as these features come to characterize the balance sheets of both depository institutions and the larger penumbra of

the shadow financial system.[38] This fragility created a predisposing vulnerability. The financial system – mostly actors in the private sector – collectively created this vulnerability, through balance sheet decisions within their own institutions, and through the use of lobbyists and trade associations to influence legislative and regulatory actions. If the financial sector had been less vulnerable in the second half of the 2000s, a change in the trajectory of house prices might otherwise have been more easily shaken off.

This state of fragility, particularly as it was hidden in the nether reaches of the shadow system, only imperfectly fathomed by policy makers such as Ben Bernanke (he admitted as much on several occasions), was by and large unrecognized prior to the financial crisis in 2008 but hugely important in understanding and explaining the 2007–2009 recession and subsequent slow recovery. In contrast, it was largely absent and noncontributory in earlier recessions such as 1982 and 1990–1991.

The almost complete lack of anticipation of the coming economic downturn can be appreciated by reexamining the forecast included in the Congressional Budget Office's *The Budget and Economic Outlook: Fiscal Years 2008–2018*, released in January of 2008. This affected the 2008 projection of potential output. The CBO did note the warning signs reflected in rising unemployment claims and the negative yield spread (p. 33), but did "not expect the slowdown in economic growth to be large enough to register as a recession" (2008, p. 21). The report acknowledged that 2008 growth could be weaker than forecast if "the turmoil in financial markets leads to a more severe economy-wide curtailment of lending than CBO anticipates", but that it could be stronger than forecast if "financial institutions (are) able to absorb mortgage-related losses without triggering significant repercussions in the broader economy."

The report went on to say that losses associated with subprime mortgages were uncertain, but "expectations are that the banking system as a whole will not be imperiled…the tightening of credit standards to date has been less extreme than the tightening that occurred during the banking crisis of the early 1990s" (2008, p. 28). The evidence for this appears to have been that at the point the report was written the reduction in lending still seemed modest relative to the mild reduction in commercial and industrial loans evident in the early 1990s (as well as the early 2000s). The report estimated that the fall in residential construction had shaved about a percentage point from GDP growth in 2007, but forecast that falling house prices, by increasing affordability would lead to a reduction of unsold house inventories, producing a revival of housing starts in 2009 (p. 31). The risk of a collapse of business fixed investment (nonresidential construction and equipment and software), such as had characterized the previous two recessions, was "small" (p. 37).

Subsequent to the publication of its 2008 report, and in the face of recession and slow recovery, the CBO repeatedly reduced its estimates of the trajectory of potential output.[39] A number of plausible mechanisms justify attributing these downward revisions to the effects of the recession and slow recovery.

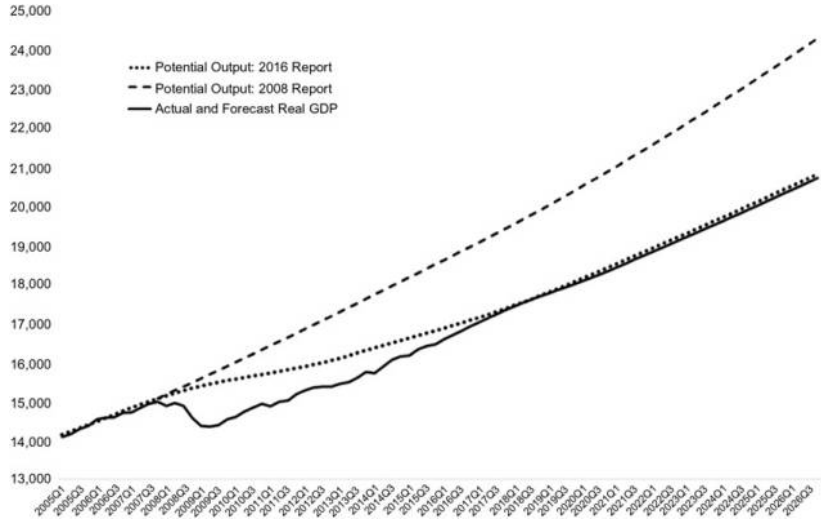

Fig. 4. United States, 2005−2026, Quarterly Real GDP: Actual through 2015 then CBO Forecast. Potential GDP: 2008 and 2016 CBO Estimates. Units: Billions of Chained 2009 Dollars. *Sources*: Congressional Budget Office (2008, 2016) and US Bureau of the Census (2016). https://www.cbo.gov/about/products/budget_economic_data#6; actual output at http://www.bea.gov, NIPA Table 1.1.6. Accessed March 23, 2016.

These include reduced labor market attachment and the atrophying skills of the long-term unemployed as well as physical capital accumulation that didn't take place but otherwise might have.[40] There is a problem, however, in using these revised trajectories to compute cumulative output loss. The correct counterfactual is to compare actual output with what potential would have been in the absence of the downturn (see Fig. 4).

If we grow potential output at rates forecast or projected in the 2008 report (2.7 percent per year for 2008−2013, and 2.5 percent per year for 2014−2018), then continuing at that rate until the end of the window of the 2016 projection (2026Q4), and compare this trajectory with actual through 2015 and then projections of actual through 2026Q4, the cumulative output loss at that point will be $41.7 trillion in 2009 dollars, which translates to 2.15 years of average potential over the entire 2008Q1−2026Q4 period.

And we will still be well short of a projection of potential based on the 2008 report. The 2008 CBO projection of potential growth was not unreasonably high. In fact it was quite moderate relative to the long run growth rate of the US economy, which had averaged a remarkably stable 3.1 percent since the end of the Civil War. The 2.7 and 2.5 percent rates reflected in the 2008 forecast were therefore significantly lower than historical trend. This was due almost entirely to demographic forecasts of slower growth in (potential) labor force

and hours (about 0.5 percent a year rather than the long run trend of 1 percent per year). The 2008 estimate of long run total factor productivity growth in the private nonfarm economy was what at the time seemed moderate: 1.4 percent per year. Combined with an estimated long run growth rate of capital services of 3.5 percent a year, this yielded a forecast of long run labor productivity growth of about 2.1 percent a year, roughly consistent with the long run historical average.

Between the 2008 and 2016 report, the CBO projections of the long run rate of growth of the potential labor force growth and potential hours in the nonfarm business sector changed hardly at all. But the projection of long run TFP growth declined to 1.3 percent and then in the January 2014 report to 1.2 percent per year. The CBO also dropped its projection of the long run growth of physical capital services in the private nonfarm economy from 3.5 percent in the 2008 report to 3.2 percent per year in the 2014 report.[41]

The lowered forecast of TFP and capital services growth knocked a half a percentage point off the labor productivity growth rate and therefore the projected growth of potential output (arithmetically the sum of the growth of hours and the growth of output per hour). In 2014, the CBO also decided that the economy, rather than reattaining its (lowered) trajectory of potential in 2017Q1 and remaining at potential thereafter, would remain 0.5 percent below potential for the duration of the projection window (through 2024Q4).

If we view the decline in TFP and the decline in capital services growth as entirely the consequence of the financial crisis, recession, and slow recovery, the estimated cumulative loss between 2008Q1 and 2026Q4 of 2.15 years of average potential output would still underestimate the total loss, because we will still in 2026Q4 be $3.6 trillion (2009 $) below a forecast of potential based on the 2008 CBO report. However we ultimately partition the causes of the downward bending of the projected trajectory of potential output subsequent to 2007, assuming it has occurred, we are, in terms of the cumulated loss attributable to the financial crisis, recession, and slow recovery, likely to be in Great Depression territory.[42] A back of the envelope calculation employing Okun's law suggests that cumulative output loss over the 12-year period 1929–1941 approached 3 years of average potential over the period. Assume 5 percent was the nonaccelerating inflation rate of unemployment (this may be too high, since unemployment in 1929 was below 4 percent with little sign of accelerating or for that matter even positive inflation). For each year between 1930 and 1941 inclusive, we can calculate the number of percentage points by which the unemployment rate (Lebergott series) exceeded 5 percent and multiply by two. That's a crude Okun's law estimate of the amount by which actual output fell short of potential in that year. Cumulate these shortfalls and one is at 298 percent. This probably overestimates cumulative loss as a fraction of average potential because potential was rising rapidly and the most severe shortfalls were early in the period. But it is in the right ballpark.

A more refined estimate confirms this. Begin with 1929 through 1941 output in chained 2009 dollars from NIPA Table 1.1.6. Assuming 1929 was at potential, grow 1929 output by 3.64 percent per year (simple compounding) to create a series of estimated potential output (see Field, 2003, 2011, for analysis of why potential grew so rapidly during these years). This leaves 1941 actual output about 9.8 percent below potential, which is what is implied by Okun's law and an assumed NAIRU of 5 percent. Calculate the output gap for each year and cumulate, which yields $3.706 trillion in 2009 dollars, relative to an average potential of $1.321 trillion, for a cumulative output loss of 2.8 years of average potential over the years 1929–1941. If one were to use David Weir's series for employment during the depression,[43] which includes federal emergency workers, for example those in the Works Projects Administration (WPA) and the Civilian Conservation Corp (CCC), unemployment rates would be lower, and so would the cumulated output loss, probably closer to 2 years, which would narrow the difference by this metric between the Great Recession and the Great Depression.

Table 1. Cumulative output losses: Summary of four episodes.

Episode	Cumulative loss 2009$	Cumulative loss in years relative to average potential
1929–1941	$3.7 trillion	2.81
1981–1984	$.9 trillion	.15
1990–1998	$1.4 trillion	.14
2007–2026	$41.7 trillion	2.15

The cumulative loss that is already and will likely be associated with the Great Recession and slow recovery is therefore very large. In absolute terms and as a fraction of average potential GDP it dwarfs the cumulative output loss between 1990 and 1998, almost none of which can be attributed to the S&L insolvencies. It is an order of magnitude higher than losses associated with either the 1990–1991 or the 1982 recessions, and unlike those earlier two episodes, the link between financial crisis and recession and slow recovery is both clear and widely acknowledged. It is a reminder of how important it is to implement a regulatory and supervisory structure likely to reduce the probability of a future disaster comparable in magnitude or perhaps even more severe than that experienced in 2007–2009.[44] Table 1 summarizes the four estimates of cumulative output loss developed in this paper.[45] The research in this paper goes back as far as the Great Depression. The work of James et al. (2013) on the period from 1866 through 1914 additional historical perspective (see also Gorton, 1988).

9. FINANCIAL DISTURBANCES AND OUTPUT LOSS

Estimates of a cumulative output gap are influenced by forecasts and projections of actual as well as potential output. The most volatile private sector

determinants of actual output in the short run are autonomous consumption and the three components of gross private domestic fixed investment: residential construction, nonresidential construction, and producer durables (equipment and software). If any one or a combination of these declines sharply, and if this drop in aggregate demand is not compensated for by an increase in net exports, consumer durables, or government spending on goods and services, a recession is almost certain.

Regardless of the degree of leverage involved in financing the housing construction boom that peaked in 2005, overbuilding would, upon the boom's termination, have depressed residential construction, leading to a modest deficiency in aggregate demand that, unless compensated for by sufficient fiscal and monetary stimulus on the part of the government or Federal Reserve, or increasing net exports, would have driven a wedge between actual and potential. Even allowing for a healthy multiplier, however, this decline is far too small to account for the downturn threatened or actually experienced. The fragility of the financial sector meant that a self-reinforcing set of influences dragged down private sector consumption and investment spending much further.

One channel which has received considerable attention in recent years focuses on the possible effect of financial crisis on intermediation. In 1983, Ben Bernanke published a paper proposing a "credit channel" through which financial crisis might contribute to cumulative output loss. To the degree that crisis led to bank failures there could be systemic loss of information about potential borrowers that would raise the costs of credit intermediation. Bernanke's mechanism, however, is unlikely to be as relevant for the two main episodes considered here as it may have been for the Great Depression and earlier financial crises. For the S&L episode, there were of course hundreds of insolvencies. But those that failed were generally so permeated with self-dealing and other forms of fraud that it is hard to imagine that their departure represented an adverse shock to the macroeconomy in the form of a deterioration in the quality or increase in the costs of credit intermediation. Moreover, output loss was modest between 1991 and 1998, and the links to the insolvencies tenuous. For the Great Depression as well as 2007–2009, output loss was of course substantial. But for 2007–2009, the mechanism also lacks much relevance because, with the exception of Lehman Brothers, remediation largely prevented financial institution failure.

Once a recession deepens and persists, an additional set of effects may influence the trajectory of potential output. These pertain to physical capital, human capital, labor hours and productivity. With respect to physical capital, relaxed standards for granting credit during a boom can result in misallocation, one dimension of which can be long overhangs of residential or nonresidential structures as well as equipment far in excess of current or immediate future needs. More damaging, from the perspective of the evolution of the economy post-disturbances, is the possibility that physical capital will be ill-suited, not just in quantity, but in design, configuration and location with respect to future

needs. Since equipment is by definition moveable, this concern applies particularly to structures. In some cases, poorly chosen investment in structures can render an economy worse off than had the capital formation not taken place (Field, 1992). That is, the physical as well as the financial legacy of the credit boom may contribute to the slow private sector recovery and persisting output gap, thus affecting the post-disturbance trajectory of both actual and potential.

As was emphasized in the 1992 CBO report, misallocation of physical capital during a credit boom may adversely affect the growth trajectory of potential output. But in a credit boom whose termination is associated with a true financial crisis, this damage will almost certainly be dwarfed by the lost output associated with the subsequent recession and slow recovery, losses which can reflect both a persisting gap between actual and potential, and a deterioration of potential resulting from an enduring gap.

If a credit boom can result in an overhang of excess structures and equipment, it is also true that a long period in which output lies below potential will likely result in shortfalls in new physical capital formation as well as consumption compared to what would have transpired in the absence of an output gap. The investment shortfalls do not have the same immediate effect on living standards as do consumption shortfalls, but they may (after overhangs are exhausted) result in a private sector capital stock, and a capital-labor ratio, lower than would have been the case in an environment of smoother and less disrupted physical capital accumulation. This prospect can, but may not, be counterbalanced by the positive supply side influence of fiscal stimulus in the form of well-chosen government R and D or infrastructural investment, which can complement private sector commitments and increase the growth of total factor productivity (Field, 2011). Of course, to the degree such stimulus is undertaken, the cumulative output loss will be smaller and terminate sooner, and the possible detrimental influences of recession on the trajectory of potential output will also be of less concern. As noted, however, it has been rare that the effects on output of a macroeconomically significant financial disturbance have been more than partially mitigated.

With respect to labor, the immediate consequences of a downturn may not be so damaging, since out of work or underemployed workers may conclude that this is a good opportunity to pursue a professional or advanced degree, or pay for additional training. As the downturn proves to be more prolonged, however, pessimism and discouragement generally sets in, as forecasts of the likely returns from such investments are revised downwards. For the long-term unemployed there can be reduced labor market attachment and a decay of job-related skills including but not limited to the psychological discipline necessary for successful participation in the workforce. These effects will show up in a reduction of total factor productivity and labor productivity growth. Older workers discouraged by a long bout of unemployment may leave and never reenter the labor force.

It is also possible that the longer term trajectory of potential output might *benefit* from recession, with adversity stimulating creative responses with persisting positive effects. There is historical evidence for some sectors suggesting the operation of such a mechanism (see Field, 2012). It is highly probable, however, that negative effects of prolonged recession on potential output predominate. That is the rationale for attributing most of the post-2008 downward revision of the trajectory of potential to the cumulative effect of operating the economy below potential for multiple years. If an athlete suffers a serious injury and is bedridden for months, muscle tone and bone density will deteriorate, and there will come a point where some of the effects are irreversible. The athlete's trajectory of potential will bend downward to help close the gap with actual.

10. DISCUSSION AND CONCLUSION

The S&L insolvencies are no longer considered "the worst financial crisis since the Great Depression." That title has been usurped by 2007–2009. But the phrase now refers to something very different in size and significance. As this paper has shown, the two sets of events are an order of magnitude apart in terms of damage to the real economy and/or the sensitivity of possible damage to the timing, character, and amount of remediation. Reassessment of the insolvencies and their consequences underlines how important it is to differentiate between disturbances posing a significant (and possibly catastrophic) threat to the real economy, and those which "merely" involve criminal misconduct and struggles over the allocation of losses among creditors and/or taxpayers. And how important it is to identify institutions that might fall into the former category before the onset of disturbances, when there is an opportunity for calm and judicious inquiry.

Discussions of macroeconomic damage triggered by financial failure were absent in the 1990s postmortems on the significance of the S&L insolvencies. If we agree on the common description of them as a debacle we might well now ask, when is a debacle not a crisis? If we accept this paper's criterion for designating financial disturbances as a financial crisis, the answer is: when it has little or no impact on aggregate output or employment. Imagine that domestic hackers, facilitated by lax security, raided the checking accounts of the US Treasury, making off with $200 billion. A debacle? Perhaps. But not a financial crisis. We'd all likely have to pay a little more taxes, and this would just balance the gains to the thieves. There would be little or no effect on the macroeconomy. Because the S&Ls were not systemically important, their failures, with or without remediation, posed little threat to the trajectory of output and employment.

When confronted with the impending failure of a financial institution, or set of institutions, it has often proved almost impossible for policy makers to determine whether or not it is, or they are, systemically important. This is a hugely important for political as well as economic reasons because bailing out

institutions whose failure would not threaten the macroeconomy is much harder to justify from a national perspective. The Dodd–Frank Act represents a halting and imperfect step toward addressing this problem, in particular by forcing consideration of the consequences of financial firm failure *in advance* of the possible event. As it stands, however, the aims of policy and/or reform continue most of the time to be phrased in terms of the objective of preserving the "stability" of the US financial system which in practice has often meant preserving the firms that comprise it.[46] Preserving financial stability should be a national policy objective only to the degree it prevents significant damage to the real economy. It should not be a public objective in and of itself, any more than should be preserving the stability of the computer industry.

The preamble to Dodd–Frank reads: "An Act to promote the financial stability of the United States by improving accountability and transparency in the financial system, to end "too big to fail," to protect the American taxpayer by ending bailouts, to protect consumers from abusive financial services practices, and for other purposes." Aside from Section 123, which calls for a "study of the effects of size and complexity of financial institutions on capital market efficiency and economic growth," there is no explicit reference to the possible impact of failures on actual or potential output. Perhaps that is considered to be so obvious as to be unnecessary. Yet the reference to the macroeconomy in Section 123 strikes one almost as an afterthought. It should be front and center, and if it is not, we risk losing sight of the crucial distinction between the national interest in protecting the real economy, and the interest of private actors in protecting individual wealth holdings.

If the preservation of large interconnected firms will be justified ex post on the grounds they are analogous to the plumbing or circulatory system of the economy (Blinder, 2013, p. 6), then, like water or sewer lines, they should be publicly owned, or like electric and gas companies, regulated as public utilities. Unlike water, sewer, gas or electric lines, however, there is no obvious case that financial firms are natural monopolies, and therefore no self-evident reason why breaking up some of the larger units would have negative efficiency consequences.[47] There is a road still to travel in our legislative language and in our thinking about these matters. We need to focus more directly and consistently on the potential for damage to the real economy, and less on the "stability" per se of the financial sector.

The recession and slow recovery between 1990 and 1998 resulted in a cumulative output loss equal to about 14 percent of average potential GDP at the time, an order of magnitude lower than that associated with 2007–2026 and beyond. The relative magnitudes are, however, only part of the problem, because there is little reason to believe that the output loss during the earlier period had much to do with what had been going on with the S&Ls. Because of this, the timing, character, and amount of remediation is largely irrelevant in considering the subsequent macroeconomic trajectory. The institutions that failed, considered either individually or collectively, were not large enough,

complex enough, or interconnected enough to threaten a global financial crisis. If the postponement of reckoning had dragged on for several more years, the looting would have been worse, the commercial construction boom would have been worse, the drain on some taxpayers would have been worse, the scandals would have been worse, but it would not have threatened to bring down the entire United States and world economy.

It is clear that legislative interventions, particularly the Depository Institutions Deregulation and Monetary Control Act (1980) and Garn-St Germain (1982), in conjunction with regulatory actions of the Federal Home Loan Bank Board initiated under Richard Pratt, postponed the reckoning at a very substantial cost to some taxpayers and the industry itself. And it is also true that the eventually successful efforts of regulators such as William Black in the Federal Home Loan Bank Board and the San Francisco and Dallas Home Loan Banks helped prevent an even larger drain on the federal treasury. Had the country waited another several years, the cost to clean up the industry would have been greater (Black, 2005).

Suppose, however, there had been no remediation of the failed S&Ls. The losers would have been mostly individuals, many of them high net worth rate chasers who had taken advantage of brokered deposits and the federal deposit guarantee. They had not by and large leveraged themselves to acquire these S&L liabilities, and had they had to bear the losses the macroeconomic impact would likely have been small, just as the losses associated with the dot.com collapse appear to have had relatively little macroeconomic impact.

Interconnection matters. When a financial institution fails, it matters whether the losses stop with its immediate creditors, or whether their impairment impairs those who may have lent to them, and so on. Limiting leverage is critical in controlling the threat that too much interconnection can pose to a financial system. It is central to the logic of those advocating higher capital requirements (Admati & Hellwig, 2013).

Although, with the introduction and diffusion of NOW accounts, S&Ls had increasingly come to resemble more traditional depository institutions with which they had been historically contrasted, a trend accelerated by legislative and regulatory changes in the 1980s, their role in the US economy was simply not as central as those whose existence was threatened in 2007–2009.

Why then did the S&L follies attract so much attention? In part because it was a great story. It featured colorful heroes and villains, and many prurient and salacious details. The news industry, having failed to sound alarums during the run up to the insolvencies, compensated in spades when the institutions started failing and the tab for taxpayers began to mount. There was much to get angry about. Ordinary citizens (aside from those holding high interest rate CDs from the failing institutions) were outraged at the cost of the government bailout. And there was much over which to salivate. The narrative featured prostitutes, cocaine, high living, fraud, and real criminals who were actually and eventually put in jail. Before their fall the political reach of individuals like

Charles Keating extended to the upper house of the US Congress, casting a pall over the reputations of a former astronaut (John Glenn) as well as a future presidential candidate (John McCain). Hundreds of white collar criminals went to jail, although many more escaped punishment due to limited prosecutorial resources. All of this created a brew irresistible to vendors of newspapers, magazines, and books, as well as to the scholarly community.

But when we look at the S&L events in the shadow of a financial crisis like 2007–09, we conclude that from a macroeconomic standpoint, it was mostly vapors. The institutions that failed were systemically unimportant. There was no spike in the TED spread. The failures had almost no discernible effect on financial sector corporate profits. The impact of commercial structure overbuilding and/or misallocation was heavily localized. The US did experience a recession and slow recovery that began in 1990 and extended to 1998, but this had little to do with the S&L travails. In any event, the cumulative output gap was a small fraction, relative to contemporaneous GDP, of that associated with 2007–2026. The insolvencies did not usher in a prolonged period of household and financial sector deleveraging retarding recovery.

This verdict on macroeconomic significance applies to the effects on output and employment during the 1990s. Nevertheless, although that impact pales in comparison with the potential and actual damage from what has taken place in the 21st century, the developments and legislation that contributed to the S&L insolvencies are part of a trajectory of financial deregulation and rising ratios of private sector debt to GDP that helped lay the foundations for the truly systemic financial crisis that hit at the end of the 2000s.

The years of greatest S&L excesses in lending contributed to a substantial and sustained upward shift in the ratio of mortgage debt to housing value in the US economy. That ratio remained below 33 percent throughout the 1970s and stood at 31.1 percent in 1984. Over the next 7 years the ratio increased dramatically, to 38.3 percent. It then grew more slowly through 1997, when it peaked at 42.3 percent, remaining at or below this level through 2005, the year housing construction peaked. It shot up to 60 percent in 2009 and remained high thereafter, but this was largely although not entirely due to the more than $6 trillion collapse in nominal housing values between 2006 and 2011.

Fig. 5 plots values through 2005, drawing particular attention to the steep rise in the debt to value ratio between 1984 and 1991, the years of the greatest excesses in the industry. The most highly publicized fraudulent lending was in the area of commercial real estate, but S&L liberality in lending on residential housing between 1984 and 1991 was associated with what became a new normal in terms of the extent of household borrowing on residential housing.

The rise in mortgage debt (debt and nominal house value through 2013 are illustrated in Fig. 6) was an important contributor to the increase in the overall ratio of household debt to income beginning in the 1980s which, along with increased labor force participation, particularly among women, allowed consumption levels for the bottom 80 percent of households to continue to rise in

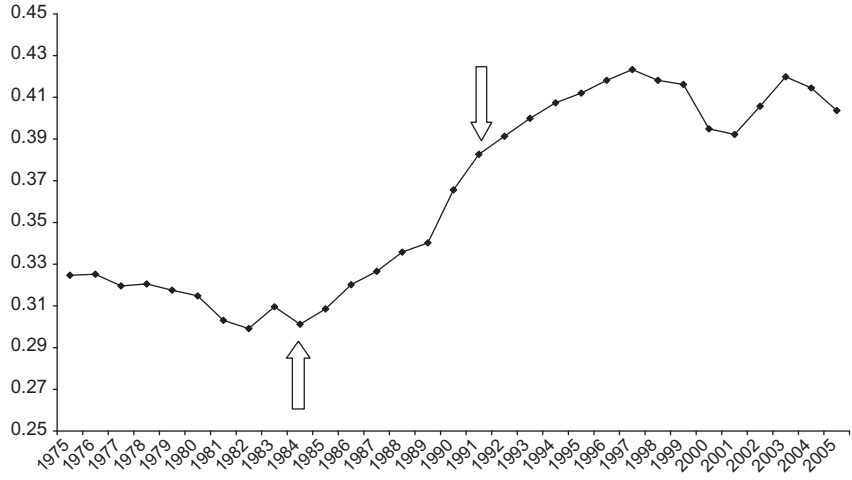

Fig. 5. Debt to Value Ratio, Residential Housing, United States, 1975–2005. *Source*: Board of Governors of the Federal Reserve Board Flow of Funds Accounts (2012), Table B100, lines 4 and 33.

Fig. 6. Nominal House Value and Mortgage Debt, United States, 1975–2015 (Billion Dollars). *Sources*: 1975–2013: Federal Reserve Board Flow of Funds Accounts (2014, June 5 release), Table B100, lines 4 and 33; 2014–2015, Federal Reserve Flow of Funds Accounts (2016, March 10 release), Table B101, lines 4 and 34.

the face of stagnant real hourly earnings and sharply increasing wealth and income inequality. This analysis provides another perspective on the macro financial trends, particularly the growing importance of mortgage lending in financial sector activity identified by Jordà et al. (2014) (see also Field, 2014).

Legislation enacted in response to the S&L insolvencies reflected a philosophical shift away from the consensus that had driven New Deal responses to the 1920s and had given the country a half century of relatively crisis free finance. Faith in the "market" and distrust of government and regulation were a key part of the Reagan administration's ideological armament, and there is continuity of purpose in these policy areas extending through the Clinton years and into the administration of George W. Bush. Regulatory and legislative responses represented way stations in the dismantling of the New Deal regime. An increasingly influential ideology hostile to government and regulation, selectively applied, amplified the effects of the pursuit of gain, both directly through the operation of financial institutions and indirectly through the political process. Liberalized asset powers, the elimination of Regulation Q, cuts in the number of S&L examiners and starving the FSLIC and Federal Home Loan Bank Board of federal funds needed for remediation turned out, hardly surprisingly, to be a recipe for an increased drain on the Treasury.

Financial innovation in the remediation of the S&L insolvencies also contributed to what followed 15 years later. Methods developed by the Resolution Trust Corporation for disposing of distressed commercial real estate assets in the aftermath of the S&L insolvencies, particularly the N-series mortgage trust programs, helped provide the template for the tranched collateralized mortgage backed securities subsequently so enthusiastically embraced (see Geltner, 2013, p. 31). Developed and extended by private firms, these derivative securities were an integral feature of the growing financial fragility that made the United States and world economy so vulnerable when housing prices ceased rising and began to decline after 2005 (Field, 2011, ch. 10, 2014).

An additional legacy of the S&L insolvencies may have been this: because the remediation costs, although much complained about at the time, were comparatively small, because the recession and slow recovery associated with the insolvencies was mild and apparently not connected in any serious way to them, and because the amount of any cumulative output loss associated with the insolvencies, if any, was likely relatively insensitive to the character, timing, and amount of remediation, policy makers may have developed unjustified confidence in the ability of the macroeconomy to weather the consequence of a credit fueled construction boom. They were therefore less inclined in the 2000s to express much interest in the ways in which continuing financial innovation, extensions of the shadow financial system, and their interaction, were creating a far more fragile and potentially explosive system.[48] Once the collapse gathered steam, the fragile system turned out to be very sensitive to the character, timing, and amount of remediation, placing much greater responsibility on policy makers than they had no doubt anticipated. The 2007–2009 financial crisis was very different from the S&L insolvencies because it involved much larger financial institutions whose balance sheets were linked by multiple interconnections. It was in that respect substantially more severe than the financial disturbances associated with the onset of the Great Depression.

NOTES

1. The word "debacle" appeared in the report's title and 70 times in the text (see also Seidman, 1993).

2. In contrast with the excessive attention paid to the cost of remediation, the possible connections between distortions during a boom and the subsequent trajectory of potential warrants further exploration, particularly as it may apply to episodes such as 2007–2009.

3. Failures might be a "crisis" from the point of view of the institutions affected, just as the failure of a computer company might be a crisis for its owners and creditors. In asking whether a set of financial disturbances represents a crisis. I do so from the perspective of the macroeconomy, and policy makers with some responsibility for its functioning.

4. In April of 1982, regulators also eliminated the rule requiring a minimum of 400 shareholders, with at least 125 local citizens, and no individual owning more than 10 percent or "controlling group" owning more than 25 percent of the equity. The granting of a thrift charter had traditionally required broad community support. A related rule modification allowed land rather than cash to be used in capitalizing a thrift. Both changes helped developers, sometimes corrupt, in acquiring failing S&Ls. In addition, Garn-St. Germain increased from 20 percent to 40 percent the share of assets that could be held in (much riskier) nonresidential assets, and allowed loans to borrowers with no money down. Finally, thrifts no longer faced geographic restrictions on where they could make loans.

5. This may have encouraged regulators to continue forbearance, reinforcing unrealistic hopes that the institutions could "grow" their way out of their problems. For many institutions, the only possible path to that outcome was by making very risky loans and investments and hoping they paid off.

6. This apparent strengthening of financial condition was augmented by legislative and regulatory changes in 1980, 1981, and 1982. An S&L in trouble could issue an "Income Capital Certificate" which could be sold to the FSLIC and counted as capital. Those buying an insolvent S&L could count the negative net worth as goodwill, and also include it as capital. Finally, in January, net worth (capital) requirements were reduced from 4 percent to 3 percent. S&Ls were also encouraged to remove money-losing mortgage loans from their balance sheets by selling them. They were then allowed to amortize losses over the projected life of the loan and to offset these losses against taxes paid during the previous 10 years, thereby receiving retroactive refunds from the IRS (Lewis, 1989, p. 121). Major Wall Street firms bought the loans at substantial discounts, securitized them, and in many instances then sold the securities back to S&Ls. In 1982, S&Ls sold off $50 billion worth of low interest rate mortgages, generating $3 billion of tax refunds, and then turned around and acquired $24 billion of mortgage backed securities (National Commission, 1993, pp. 33, 45).

7. In December of 1983, the net worth requirement for a new S&L was raised to 7 percent, but the 20-year phase in for new S&Ls was not eliminated until January of 1985. The 5-year deposit averaging rule also began to be phased out in that year (National Commission, 1993, p. 55).

8. Calavita et al. (1997, pp. 33–42) make a compelling case that the data simply do not support the "minimal fraud" interpretation generally advanced by economists. The entire industry if marked to market was insolvent, yet only a third of institutions engaged in high-risk lending. The portfolios of institutions that did so were remarkably undiversified, often concentrated in ADC (Acquisition, Development, and Construction) loans, direct investments which were among the most risky an S&L could make. To have any hope of making a profit, such loans require strong underwriting and internal

controls, yet these were almost always absent or lax, and LTOB (loan to one borrower) regulations and restrictions on insider lending were routinely violated. Every single institution engaging in high-risk lending failed with large losses; this was as true in the California economy of the mid 1980s as it was in the overbuilt and depressed real estate market in Texas. The fall of oil prices, an impersonal market force often adduced as explanation of why the thrifts struggled in the 1980s, was largely irrelevant in California, yet many of the most dramatic thrift failures were in that state.

9. The increase in deposit insurance from $40,000 to $100,000 per account became effective in March of 1980 with the passage of the Depository Institutions Deregulation and Monetary Control Act (DIDMCA). In the summer of 1982, the Federal Home Loan Bank Board eliminated the prior rule that brokered deposits could comprise no more than 5 percent of total deposits. S&Ls could now attract all the "hot money" they wanted by advertizing for them directly, or by using brokered deposits supplied by Merrill Lynch and others. On top of this a change in rules liberalizing insurance coverage on union pension fund deposits made additional stocks and flows of money, sometimes connected to organized crime, available to S&Ls. Unscrupulous loan brokers, such as Mario Renda's First United Fund, often demanded that S&Ls engage in "linked lending" to specified borrowers in exchange for deposits (see Pizzo, Fricker and Muolo, 1991). Most of these loans, unsurprisingly, were never paid back.

10. Junk bond investments were concentrated in 11 large S&Ls, all of which failed. Overall, however, investments in junk bonds were not a preponderant cause of the S&L failures (National Commission, 1993, p. 4)

11. The profitability of and opportunities for fraud increased with regulatory and legislative changes in the 1980s, attracting to the industry many who were or would became white collar criminals, including some with organized crime connections. The Government Accountability Office (GAO) compared 26 failed institutions with 26 similar institutions that survived. Fraud and insider abuse were evidence in every failed S&L, but only a few of those that survived (National Commission, 1993, p. 70). Not all officers, directors, owners, borrowers, or brokers availed themselves of the opportunities, and there are gray areas separating behavior merely unethical from that which was clearly illegal. That said, economists have often gone out of their way to downplay the significance of criminal misconduct in contributing to the insolvencies (see Calavita et al., 1997, pp. 18–19; 33–42). Lawrence White, a member of the Federal Home Loan Bank Board from November of 1986 through August of 1989, warned in his 1991 book that "any treatment that focuses largely…on fraudulent and criminal activities is misguided and misleading" (1991, p. 117). This language can be defended – obviously there were other forces at play – but is too strong: see Pizzo et al. (1991), Calavita et al. (1997), or Black (2005), among others. Perhaps the most dispositive evidence is this: Calavita et al. (p. 31) report that a criminal referral was filed in two-thirds (455 out of 686) of the institutions under Resolution Trust Corporation control as of May 19, 1992, with an average loss per institution due to fraud of over $12 million. Law breaking was sometimes "insider" (officers, directors, or owners), sometimes "outsider" (borrowers and loan brokers), and sometimes so convoluted as to make it almost impossible to make this distinction. Zingales (2015) challenged academics to acknowledge the law and rule breaking propensities of those in the finance profession. He tabulated the fines paid by financial institutions since the 2008 financial crisis: $138 billion by the end of 2014 (criminal prosecutions had been almost entirely absent).

12. See also Boyd et al. (2005) who reached a similar conclusion, repeating Caprio and Klingebiel's judgment that it was "nonsystemic."

13. Lopez-Salido and Nelson (2010, p. 11) mention the alleged $1 billion exposure of Continental Illinois to Mexican debt. But due to central bank and IMF lending to the Mexican government, that portion of the bank's balance sheet ultimately played a negligible role in its demise. Lopez-Salido and Nelson's claim that the rescue of Continental

in July of 1984 "represented the culmination of the US banking crisis associated with LDC debt problems" does not stand up to scrutiny. 1982–1984 was, moreover, marked by a very strong recovery in the real economy, suggesting that whatever the set of financial disturbances identified in these years, they were not macroeconomically significant.

14. The NBER identifies a recession in 1980 as well as in 1982, the former resulting from the abortive initial efforts by Chairman Volcker to break the backbone of inflationary expectations. For expositional convenience, I will refer to these efforts and their consequences as a single recessionary event.

15. Note that adhering to this criterion rigorously will *guarantee* that recessions following financial crises have longer and more drawn out recoveries, since one will have defined the precipitating variable with reference to the outcome of interest.

16. A broad definition of remediation would include direct efforts to shore up the balance sheets of failing financial institutions through injections of additional equity, insurance of previously uninsured liabilities, or initiatives to increase the value of assets. One could include as well efforts at fiscal or monetary stimulus which can moderate the effects on output and employment of financial institution failure or near failure.

17. As Reinhart and Rogoff (2013, p. 5) concluded in 2013: "Lesson 1: On prevention versus crisis management. We have done better at the latter than the former. It is doubtful that this will change as memories of the crisis fade and financial market participants and their regulators become complacent."

18. Quarterly CBO estimates of potential output at https://www.cbo.gov/about/products/budget_economic_data#6; actual output at http://www.bea.gov, NIPA Table 1.1.6. Potential output data are from the January 2016 estimates. Accessed March 19, 2016.

19. Failed bank assets as a percentage of FDIC-insured commercial and saving banks as of December 31, 1979, plus assets of subsequently chartered institutions as of date of failure, merger, or December 31, 1994, whichever is applicable (FDIC, 1994, p. 156). The exception to the generalization about the size of failed institutions was Continental Illinois (1984), then the eighth largest US commercial bank. Continental Illinois was, until Washington Mutual went under in 2008, the largest bank failure in US history, and its bailout first made commonplace the concept of too big to fail. It got into trouble with oil-related loans in Texas and Oklahoma purchased from the failed Penn Square bank. These loans had not been adequately scrutinized by bank officers (kickbacks and fraud were involved), and when sharply declining oil prices made it evident that the loans would not be repaid, lenders ran on the bank.

20. See also Bordo, Eichengreen, Klingebiel, Martinez-Peria, and Rose, 2001, p. 55: "For an episode to qualify as a banking crisis, we must observe financial distress resulting in the erosion of most or all of aggregate banking system capital."

21. However, as the downturn began the Congressional Budget Office did note the negative yield spread at the end of 2007 (inverted term structure of interest rates) and indicated that this condition had incorrectly predicted a recession "only once since 1955" (2008, p. 30).

22. I include less discussion of the output losses associated with the 2001 recession and subsequent slow recovery, because there are no claims that the collapse of the NASDAQ produced a financial crisis. High margin requirements for stock purchases meant that losses by and large stopped at the households holding the equities. There is no evidence in the financial sector profit data that the fall in stock prices jeopardized financial institutions in the aggregate.

23. Reinhart and Rogoff observe that some financial crises are triggered by an economic downturn leading to defaults of nonfinancial firms which adversely affect financial institution balance sheets (2009, pp. 145–46). They use these words to distinguish such cases: "rather than being the trigger of a recession". There is little reason to doubt, however, that in 2007–2009, in contrast with 1982, financial distress was the trigger of

recession (not vice versa) and almost all contemporaneous commentary reflected this view. The 2011 Congressional Budget Office *Budget and Economic Outlook* report summarized developments in this way: "The economy has struggled to recover from the current recession, which was triggered by a decline in house prices and a financial crisis – events unlike anything this country has seen since the Great Depression" (highlights, p. 28). Or, as Hall (2014, p. 2) put it, "…I take for granted that the financial crisis was the cause of the collapse in product and labor demand and that expansionary policy was unable to offset the collapse." In their study of financial and currency crises, Bordo et al. (2001, p. 64) reject the idea that crises are mere ephemera, reflections of macroeconomic cycles that have their origin and laws of motion elsewhere.

24. Reinhart and Rogoff (2009, p. 404) note that "the traditional emphasis on fiscal cost of bank cleanup is far too narrow."

25. The decision as to whether costs are financed by borrowing or a current levy on taxpayers is in principle separate. If I buy a television for $1,000, that's what it costs me. It doesn't make sense to increase that amount by what I could have earned if I'd invested those funds, or what it would have cost in total had the purchase been financed. In a world without frictions, $1,000 is the present value of the stream of earnings I could get if I lent out the money. It is also the present value of the principal and interest payments owed if the money were borrowed. The S&L bailout did of course have political consequences. The cost of the transfers associated with remediation was part of what led President George H. W. Bush to agree to tax increases, behavior that may have cost him reelection.

26. On February 28, 2014, member banks held approximately $2.6 trillion of deposits at the Fed. The $650 billion estimate is based on this amount and an interest rate of 25 basis points. http://www.federalreserve.gov/monetarypolicy/files/quarterly_balance_sheet_developments_report_201403.pdf, accessed June 17, 2014.

27. Payment of interest on reserves represents an indirect charge on the Treasury, since it reduces the operating revenues the Fed can return to the Treasury at the end of the year. To the degree that the Fed purchased mortgage backed securities that failed to perform, that would also lead to an indirect charge on the Treasury, for a similar reason.

28. TARP was originally authorized for $700 billion, but this was reduced to $475 billion by the Dodd−Frank bill. The large banks' and AIG's ability to pay back equity infusions was due in part to the Fed's massive purchases of mortgage backed securities, and the Treasury's conservatorships of Fannie and Freddie. Both types of actions strengthened banking sector balance sheets independently of TARP.

29. NIPA Tables 3.1 and 3.2, accessed June 13, 2014.

30. In the memorable words of James Carville's advice to Bill Clinton on winning the 1992 election, "It's the economy, stupid."

31. "CRE (commercial real estate) was much more intertwined with the S&L crisis than it was with the 1990−1991 recession…" (Geltner, 2013, p. 1).

32. Akerlof and Schiller (2009, p. 30) do consider the S&L crisis a factor, but say that "the loss in confidence in the wake of the first Iraq war and the spike in oil prices that preceded it were more important." Elsewhere (p. 86) they state that "the failures did not have a major macroeconomic effect." King (1994) attributed the recession of the early 1990s in the United States, the United Kingdom and other countries to excessive credit expansion in the 1980s, particularly among mortgaged homeowners. Their attempt to deleverage in the 1990s explains the sharp decline in consumption, a notable feature of the slump in the United States between 1929 and 1933. In this story the S&Ls do play a role, since they helped fuel the credit expansion.

33. White (2014) distinguishes between cascades (the interconnection mechanism) and contagion; both types of links are often considered to be part of financial contagion.

34. At the time US private depositary institutions held almost $4.7 trillion in assets, and pension funds approximately as much again. Federal Reserve Flow of Funds data, Tables L.109 and L.116. Release of September 18, 2014.

35. GDP was $10.6 trillion in 2001, so we are talking about a decline in stock market wealth equal to about 70 percent of GDP, as opposed to the roughly 3 percent of GDP associated with the S&L remediation. Because of 50 percent margin requirements on new stock purchases, a rule in place since 1974, the impact of stock market declines generally stopped with the households that held the stock. The risk to financial institutions lending on stock is small, except in the unusual event of a catastrophically rapid decline in prices, where there is not enough time to sell out before margin is exhausted. There were likely modest negative impacts on consumption in the early 2000s, but partly because stock is more unequally held than real estate, the consumption hit was lower than when the subsequent real estate bubble burst (because high income and high net worth individuals have lower marginal propensities to consume).

36. For a contrary view, see Adams (1990, p. 53): "(Danny) Wall had scrambled under a threat not known since the Depression: the possibility of widespread bank runs and a general panic." But failures of S&Ls did not threaten contagion, because losses stopped directly at households – retail depositors and holders of brokered deposits. If Lehman Brothers had been funded either by equity (capital) or by brokered certificates of deposit provided by individual households, its failure would have posed much less threat to the financial system and real economy. It was reliance on collateralized borrowing from other financial institutions using the repo mechanism that created a dangerous network of interconnections and made the investment bank systemically important.

37. The use of 2026 as an endpoint in estimating the macroeconomic repercussions of the 2007–2008 financial crisis is arbitrary: It simply reflects the outer boundary of the Congressional Budget Office's 10-year forecast of actual and potential output in their January 2016 report. In 2026, according to the CBO's forecast of actual output, the economy will still be substantially below a trajectory of potential based on the 2008 forecast.

38. I prefer the term shadow financial to shadow banking system, because most of the institutions within it were not banks and generally not depository institutions. See Roubini (2008). Households investing in housing had, of course, also become much more highly leveraged.

39. It also revised downward its forecasts of actual output Congressional Budget Office (2009–2016).

40. In contrast, there was no downward revision of the estimated potential output trajectory as the result of the mild 1990–1991 recession.

41. It makes little sense to attribute slow growth of private sector capital services to government budget deficits when the economy had considerable excess capacity and was at the zero lower bound. The slowed growth of physical capital services was due to a prolonged period of insufficient aggregate demand, which decreased the incentives for new investments in plant and equipment.

42. The downturn between 1929 and 1933 was of course much steeper, in part because of differences in policy responses, although recovery between 1933 and 1937 and particularly after 1941 was very sharp. Still, the cumulated output loss measured as a fraction of average potential GDP associated with the great recession and slow recovery is of the same order of magnitude as and rivals that associated with the Great Depression (considered as running from 1929 through 1941). As Hall (2014) states, "The years since 2007 have been a macroeconomic disaster for the United States of a magnitude unprecedented since the Great Depression." For a cross national perspective on the possible post-2007 operation of hysteresis, see Ball (2014).

43. Carter et al., 2006, *Historical Statistics*, series Ba477.

44. Much of the reform efforts focused around increasing capital requirements. Kane (2014) argued forcefully that this was insufficient, that we also needed to make legal changes, expanding the fiduciary duties of loyalty, competence, and care that financial managers currently owe to stockholders to include taxpayers, who have an (implicit)

equity stake in firms covered by a safety net. At present, duties toward taxpayers are limited to those explicitly covenanted. (Kane also advocated establishing a dedicated academy to train bank regulators). The absence of fear of prosecution allows managers, stockholders and creditors of financial institutions to take money from taxpayers with impunity. But the larger problem is that in pursuit of their objectives, financial sector actors engender and exacerbate the financial fragility that creates significant threats to the real economy.

45. The loss associated with 1974–1975 is not explored here. The causes of that recession were quite different – negative supply shocks associated with the quadrupling of the price of a barrel of crude oil – and financial crisis as a trigger has been neither suggested nor implicated.

46. Blinder (2013) is one of the few who consistently emphasizes this connection.

47. In seeking mergers as the "least cost" means of resolving many failed institutions, the FDIC has contributed to the growth of large units, in a way that may not turn out to be least cost in the longer run. Was it essential on efficiency grounds for JP Morgan Chase to absorb Washington Mutual, or for Wells Fargo to absorb Wachovia? Again, Dodd-Frank involves imperfect steps in the right direction.

48. Thanks to Ken Snowden for suggesting this possibility.

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