Balance Sheet Crises:
Causes, Consequences, and Responses
Steven Gjerstad and Vernon L. Smith

> Being the managers rather of other people's money than of
> their own, it cannot well be expected, that they should watch
> over it with the same anxious vigilance with which [they]
> frequently watch over their own.

> —Adam Smith

Balance sheet crises, in which the prices of widely held and highly
leveraged assets collapse, pose distinctive economic challenges. An
understanding of their causes and consequences is only recently
developing, and there is no agreement at all on effective policy
responses. A preliminary purpose of this article is to examine in detail
the events that led to and resulted from the recent U.S. housing
bubble and collapse, as a case study in the formation and propagation
of balance sheet crises. The primary objective of the article is to eval-
uate similar events around the world with a view toward assessing the
economic performance of countries that have pursued varied alter-
native policies.

We propose that the Great Depression beginning in 1929 and the
Great Recession starting in 2007 were both household-bank balance

---

sheet crises—events that were quite distinguishable from the recessions appearing between them. Each episode, we hypothesize, was preceded by unsustainable rises in expenditures on construction of new housing units and in mortgage credit for purchases of new and existing homes. In both cases housing values rapidly collapsed by more than 30 percent but mortgage debt obligations fell only very slowly, so that housing equity fell sharply.[1]

Between these two economic calamities were 12 smaller recessions. Nine of the ten recessions between World War II and the Great Recession were led by declines in new housing expenditures and in all of those the interaction between Federal Reserve monetary policy and the housing-mortgage market was a clearly discernible feature. Federal Reserve monetary policy between the fall of 1979 and the summer of 1982 is a prominent example of this interaction effect, and an excellent "natural experiment" on the impact of monetary policy on the mortgage and housing markets. Examination of the normal impact of monetary policy and the contrast with economic conditions in the aftermath of the housing bubble suggests why monetary policy has had so little effect on the money supply and the economy over the past five years. When households are awash in debt, banks face a continuing legacy of impaired assets and damaged balance sheets, and there is a large inventory of unsold and foreclosed homes hanging over the housing market, low short-term interest rates don't stimulate lending to nearly the extent that they do in normal times. Consequently, monetary policy doesn't have its normal effect during a balance sheet crisis. We also provide direct evidence from other countries that fiscal stimulus has not been a part of the recovery process in many countries that have had robust growth soon after a balance sheet crisis. In fact, most countries that have recovered rapidly have first contended with a rapid increase in government deficits but have soon reduced both government expenditures and government deficits.

Widely differing approaches have been taken regarding the recognition of losses on the impaired assets of financial institutions.

---

[1]Although the Great Depression data we present in Gjerstad and Smith (forthcoming) support the hypothesis, the evidence we provide is not definitive. What we do see as definitive, in the light of the housing bubble and crash into the Great Recession, is the need to reevaluate the expansion period leading up to the Great Depression.

One approach is to shore up financial institutions and allow them to slowly recognize past losses. The opposite approach is to force lenders to recognize losses, even to the point of wiping out equity holders and forcing "haircuts" on bondholders. We evaluate the effects of confronting balance sheet problems, especially in financial institutions, by contrasting Sweden, which aggressively addressed the impaired conditions of its banks, with Japan, which allowed its banks to stretch out recognition of losses on bad assets for over a decade. Sweden recovered quickly while Japan languished for over a decade.

Market currency depreciation is a prominent feature of recovery in many countries. We discuss and chart three disparate examples—Finland, Thailand, and Iceland—that illustrate and explicate their significant, and common recurring, features.

Fiscal responses have also differed widely. Most countries that have experienced an asset market bubble and collapse have incurred deficits of about 10 percent of GDP per year afterward—due to declining revenues and increased expenditures—to address the financial crisis and loss of income. Japan is an extreme example of Keynesian deficit spending that has continued for well over a decade after the crisis began. At the other extreme, some countries have brought deficits below 2 percent of GDP within two or three years. The results have almost uniformly favored the countries that have controlled their deficits.

Housing and Mortgage Credit in the Depression

Aside from the large inflows of foreign capital that supported the housing bubble during the Great Recession, the development of the Great Depression and the course of the Great Recession included many common elements. In the next two sections, we demonstrate the parallels between the housing expansion and early collapse phases of the two episodes.

Proposition 1: The Great Depression and Great Recession were disequilibrating housing market and mortgage credit booms.

Figure 1 plots annual observations from 1922 through 1937 for the following expenditures: gross national product (GNP), nondurable consumption spending (C), consumer durable goods spending (D), nonresidential fixed capital investment (I), and new housing

FIGURE 1
MAJOR EXPENDITURE CATEGORIES, 1922–37
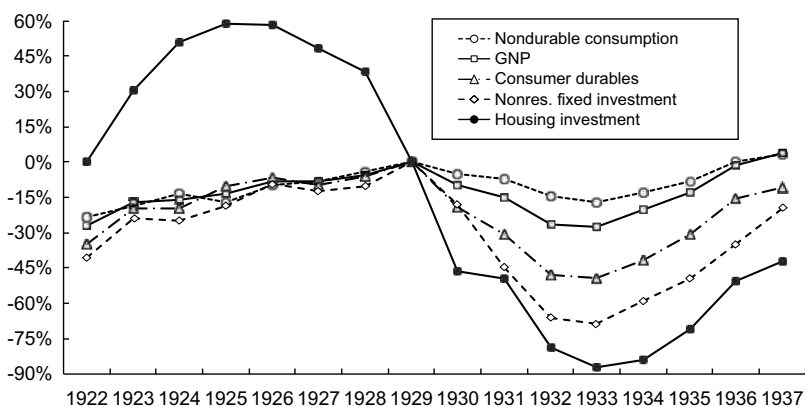
SOURCES: GDP, consumer durables, and nonresidential fixed investment: Swanson and Williamson (1972); housing investment: Grebler, Blank, and Winnick (1956).

construction expenditures (H). As a vehicle for conveying the relative changes in each of the various measures, each point is plotted as a percentage of its level in 1929, the year the Great Depression started.[2]

Most notably, a major housing investment collapse preceded the Great Depression by over two years yet all other major expenditure categories continued to rise. Housing expanded rapidly by nearly 60 percent from 1922 to 1925, leveling out in 1926 and then began its long descent, not bottoming out until 1933. In 1929 new housing expenditure had returned to its 1922 level before any of the remaining expenditure categories had declined more than small temporary amounts. GNP and each of its major components declined in 1930. Uncharacteristically, as recessions play out, even nondurables declined, although less steeply than every other category of expenditure.

Figure 2 shows the net flow of mortgage funds from 1900 to 1940. The solid curve is the exponential trend growth of mortgage lending

[2]Data on national product accounts for the interwar period were reported originally in Kuznets (1941). We used the revision by Swanson and Williamson (1972) to construct the series in Figure 1. Housing investment for that period is drawn from Grebler Blank, and Winnick (1956), Table M-1.

FIGURE 2
NET FLOW OF MORTGAGE FUNDS, 1900–40
(Billions of Dollars)
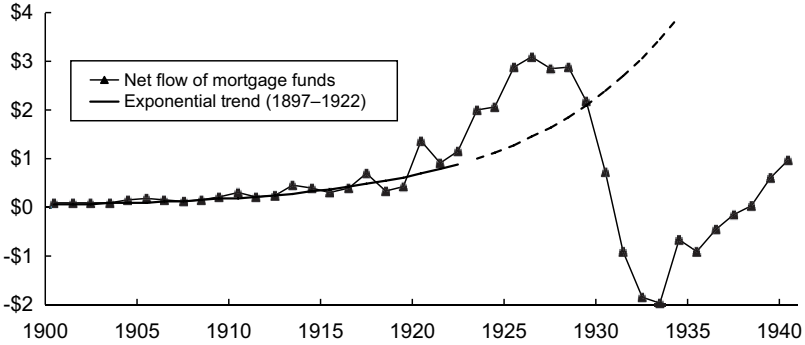
SOURCE: Authors' calculation from data in Table L-3 in Grebler, Blank, and Winnick (1956).

from 1897 through 1922. The dashed curve is the extension of the trend forward into the boom years of the 1920s and into the collapse during the Great Depression. In the residential mortgage lending data that we have from 1897 through early 2013, the only collapse like that of 1929–33 came in the second quarter of 2006 and persisted through the first quarter of 2013 at low negative net flow rates.

The initial decline in housing construction from 1927 to 1929 (Figure 1) preceded the sharp decline in the net flow of mortgage credit beginning in 1929, indicating that the contraction in new housing expenditures came well in advance of the reduced flow of credit into the housing market. The suspended two-year lag of mortgage credit behind the decline in the rate of investment in new house construction implies increasing leverage for home purchases in 1927 to 1929. Gjerstad and Smith (forthcoming) provide other disaggregated evidence of increasing leverage in the later years of the 1920s boom.

Comparing Figures 1 and 2, the key feature that requires emphasis is that the 60 percent increase in the rate of new home construction expenditures from 1922–25 was matched by a 200 percent increase (from $1 billion to $3 billion) in the net flow rate of mortgage credit. Moreover, this large net credit flow continued through 1928 before it collapsed. Consistent with a relatively elastic supply of new home construction in the 1920s, the housing price data available

441

from the years leading up to 1925–26 (before expenditures start to fall) do not show an increase comparable to the recent price bubble. But we suggest that large house price increases are not a necessary condition for severe subsequent household-bank balance sheet stress. A more elastic supply means that more units are being added to the stock to be impacted by a price turn, even if the impact on each unit is smaller—that is, more balance sheets will be in distress although each will be less severely stressed than if the price run-up had been larger and housing output smaller. The large home price decreases came after 1930.

Housing, Mortgage Credit, Foreign Capital Inflows, and the Great Recession

Much of the above Great Depression narrative was, and is in process of being, repeated in the Great Recession. The year 2012 marks the fifth year since the recent downturn, corresponding to 1934 in Great Depression clock time. Figure 3 charts the same measures as Figure 1, except that we report GDP for the Great Recession

FIGURE 3
MONETARY POLICY AND THE HOUSING CYCLE, 2003–12
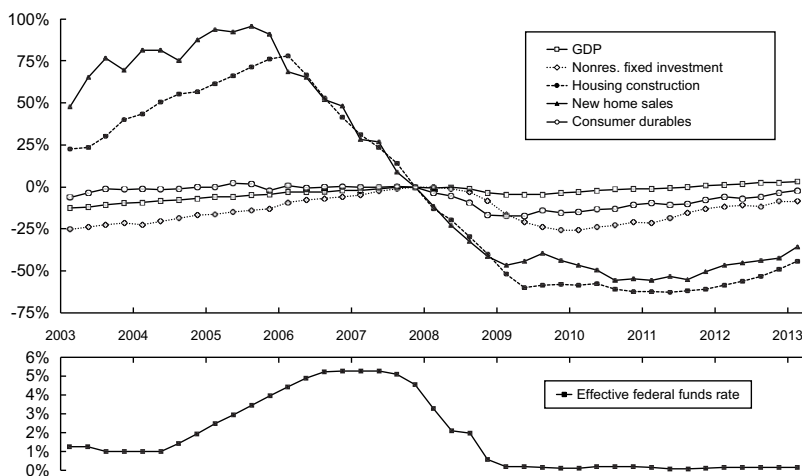
SOURCE: Department of Commerce, National Income and Product Accounts and Census Bureau.

rather than the GNP measure of aggregate output that we reported for the Great Depression.[3] We also drop nondurable consumption (C) from the chart since its behavior so characteristically follows a damped version of GDP in a slump.[4] And we have added a plot of unit sales (S) of new homes. Again, housing provided substantial lead time for the impending recession that began in the fourth quarter of 2007: expenditures on construction of new homes peaked seven quarters before the recession began, and unit sales peaked nine quarters before the recession. The devastation that followed is apparent in that it was not until the third quarter of 2011 that GDP recovered to its recession peak—the longest GDP downturn in the United States during the post WW II period.

Unit sales of homes declined while expenditures continued to rise because prices and the flow of credit continued to rise unabated. Builders tend to cut back on their output as the inventory of unsold homes rises. Behaviorally, neither the builders nor existing home sellers cut prices when demand softens; they simply stretch the time that their homes are listed for sale. Although sales of new homes

---

[3]National accounts data for the periods from 1978 to 1983 and for 2003 to 2012 are from the Department of Commerce National Income and Product Accounts (NIPA) Tables 1.1.5 and 1.1.6. In order to have a series on housing construction that is comparable for the period from 1919 to 1928 and the period from 1929 to the present, we use data from Table B-3 in Grebler, Blank, and Winnick (1956) for 1919 to 1928 and NIPA Table 5.3.5 for 1978 to 2012. The more commonly used series on residential construction from NIPA Table 1.1.5 and 1.1.6 include items such as brokers' commissions on real estate and dormitories that do not appear in the series for the earlier years from Grebler, Blank, and Winnick (1956).

[4]Consumer nondurables and services have constituted just over 75 percent of private product (GDP less government expenditures) over the past 15 years, and do not constitute a root source of economic instability. In contrast, the roots of private economic instability typically involve the remaining 25 percent of GDP, most prominently housing—the most durable and storable of all consumer goods and a highly volatile component of GDP. Laboratory experiments for over 50 years have established empirically the proposition that markets for nondurable goods and services are characterized by the ability of market participants to rapidly discover equilibrium prices and allocations. These markets have the distinguishing features that the consumed items cannot or are not bought for resale and one's role as a buyer or seller does not change with changes in prices, which stands in sharp contrast with durable goods such as houses, and intermediate instruments like securities. For a recent experimental examination of these issues and references to the literature, see Dickhaut et al. (2012). The demand for a more durable good like housing is more sensitive to future price expectations, and, when financed by credit, a collapse in the price of housing creates a banking system pathway through which a collapse is transmitted to the economy generally.

peaked in 2005, the nominal Case-Shiller national price index had fallen only 1.6 percent by the first quarter of 2007. The total value of residential structures in the United States rose considerably from 1997 to 2005, leveled off in 2006, and then fell precipitously. By the end of 2008, the nominal Case-Shiller national price index was down 27.0 percent from its peak.

The great housing-mortgage market boom started in 1997. New house expenditures reached their peak in early 2006 and began their long decline into 2011. After the financial crisis, the government stimulus and special programs to lower interest rates and subsidize new buyers had almost no perceptible recovery impact on the housing market. Echoing the Great Depression, housing expenditures peaked in early 2006 almost 80 percent above their fourth quarter 2007 level when the Great Recession began; expenditures on new housing then fell to 64 percent below the Q4 2007 level in 2011. The five-year decline was almost as large as the seven-year decline from 1927 to 1934 in the Great Depression.

The lower panel in Figure 3 charts the effective federal funds rate, and tells only a piece of the story that constitutes the saga of the interaction between inflation, monetary policy, and the housing cycle that plays out in the post WW II period. We will encounter it again in the double-dip recessions of 1980 and 1981–82 that we analyze later. The inflation rate moved up from under 2 percent in early 2004 to 4 percent in 2005; the Fed dutifully raised the target federal funds rate, which slowed inflation only temporarily in late 2006; in 2007 inflation resumed. But the high and rising federal funds rate served to help arrest and reverse the housing boom, bringing to an end the housing bubble of 1997 to 2006.

The upper panel of Figure 4 plots the net flow of mortgage funds from 1971 through the second quarter of 2012. Two pulses in credit fueled house price increases that peaked in the late 1970s and '80s; both of these pulses were dwarfed by the outsized surge in mortgage credit between 2002 and 2006. The solid exponential curve in the top chart shows the trend growth in mortgage credit from 1952 to 1998; the dashed curve shows the extension of that trend into 2012. The lower panel of Figure 4 plots the excess flow of mortgage funds (relative to trend) on the same scale as the net inflow of foreign investment funds. This panel shows clearly that our growing foreign trade deficit from 1997 to 2006 found its way directly or indirectly

FIGURE 4
NET FLOW OF MORTGAGE FUNDS AND
FOREIGN INVESTMENT, 1971–2012
(Billions of 2005 Dollars per Quarter)
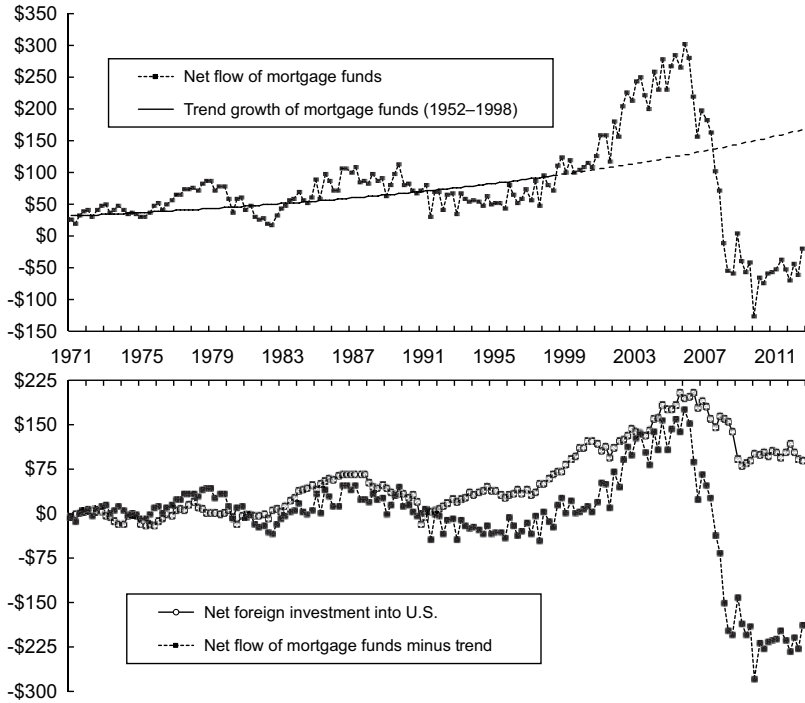
SOURCE: Federal Reserve Flow of Funds: residential mortgage data are from Table F.218; net foreign investment data are from Table F.107.

into mortgage credit and supported the great housing bubble after the stock market technology bubble ended in 2000.[5]

The surge in the net flow of mortgage credit shown in Figure 4 and its impact on the level of residential construction shown in Figure 3 echo the surges in mortgage credit and residential construction during the Great Depression shown in Figures 1 and 2. The collapses of residential construction and the net flow of mortgage credit

---

[5]These data led us to modify our first report on the housing bubble, where we had emphasized the role of monetary policy (Gjerstad and Smith 2009), as we came to appreciate the important role that international capital flows play in many housing bubbles.

during the Great Depression and the Great Recession were both much larger than at any other time in the United States during the last 90 years, with the single exception of 1942–44, when building materials were unavailable due to the war effort and strict controls limited construction to essential needs in support of the war effort.

The growth of mortgage credit has two clearly distinguishable phases during the housing bubble. Prior to the bubble, from 1990 to 1997, nominal mortgage credit outstanding was growing 5.5 percent per year, almost the same as the 5.3 percent annual growth rate of nominal GDP. From 1997 to 2001, the rates began to diverge: nominal mortgage credit grew 9.8 percent per year while nominal GDP grew only 5.4 percent per year. From 2001 to 2006, the separation accelerated: nominal GDP again grew by 5.4 percent per year, but nominal growth of mortgage credit reached 12.8 percent. If we separate the growth of mortgage credit into the government-sponsored enterprise and private mortgage credit components, we see that there was a distinctive shift in the growth of these two different sources of mortgage credit after 2001. For the combined GSEs, mortgage credit outstanding grew 10.9 percent per year from 1990 to 1997, 15.5 percent per year from 1997 to 2001, and 9.7 percent per year from 2001 to 2006. Private mortgage credit outstanding grew only 3.1 percent per year from 1990 to 1997, 6.1 percent per year from 1997 to 2001, but then it grew at 15.2 percent per year from 2001 to 2006.[6] Just as 1997 was a pivotal year for the growth of mortgage debt, it was also a turning point for the rate of change of house prices. The acceleration of mortgage credit growth between 2001 and 2006 coincided with a sharp increase in the growth rate of house prices. From the first quarter of 2001 to the first quarter of 2006, the annual increase of the nominal Case-Shiller national price index reached 11.6 percent.

Proposition 2. The value/debt ratchet rule: Leverage cuts deeper on the downside than on the upside.

Figure 5 indicates the debilitating effect on home equity that followed the declines in house prices and mortgage lending that developed in 2006. From 1997 through the first quarter of 2006 we

---

[6]These growth figures are calculated from data collected by the Federal Housing Finance Agency, and disseminated as "Enterprise Share of Residential Mortgage Debt Outstanding."

Figure 5
Household Real Estate Assets, Real Estate Equity, and Mortgage Debt
(Trillions of 2005 Dollars)
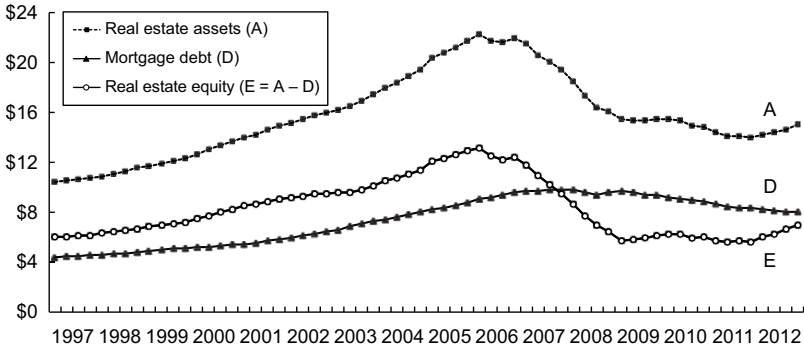
Source: Federal Reserve Flow of Funds Table B.100 (real estate assets) and Table L.218 (household mortgage debt). Equity is the difference between these two series.

observe, unabated, an increasing total market value of households' residential real estate. This increase is due both to increases in the stock from rising construction rates and to increases in the prices of new and existing homes.[7] Aggregate mortgage debt is seen to rise steadily along with the increased asset value of all homes, unperturbed by the minor recession of 2001. Housing wealth reached a peak in the first quarter of 2006, flattened out, fell abruptly throughout 2007 and 2008, bottoming out in the second quarter of 2009. But mortgage debt continued its rise in 2006 and 2007, only gently declining in 2008 and afterward. Observe that by 2009, although housing value had declined to about its level of 2002, home equity had collapsed below its level of 1997, and has wavered around that level into 2012. In 2012, over 22 percent of households lived in homes with negative equity, and as can be seen in Figure 5, total household equity had recovered only to its level back in 1997.

The banks were on the other side of this home equity collapse, heavily invested in mortgages whose collateral (the mortgaged properties) had—for many borrowers—fallen below principal owed

[7]Homes owned by households now constitute just over one quarter of all U.S. wealth and the value of all corporate equity just under one half.

to the banks. The unprecedented intervention by the Federal Reserve and the Treasury in the last quarter of 2008 to rescue the largest banks from failure and to lift some $1.3 trillion of shaky assets off bank balance sheets simply kicked the negative equity can from private to public balance sheets without removing the burden of debt claims on future output from the economy.

The impact of these changes on household balance sheets is reflected in a report by Bricker et al. (2012) from the Federal Reserve that was based on the Survey of Consumer Finances for 2001, 2004, 2007, and 2010. Table 1 summarizes the percent changes in median and mean family income and net worth (the difference between families' gross assets and their liabilities) compared with the previous three-year survey. Table 1 also includes data on the mean value of households' equity in their homes, which is calculated from the same tables in the Flow of Funds as the series in Figure 5.

Between 2001 and 2004, median and mean income changed very little. From 2004 to 2007 there was almost no change in median income, while the mean rose 8.5 percent. But the increase in median net worth, 17.9 percent, was substantially greater than

TABLE 1
CHANGES IN HOUSEHOLD INCOME, NET WORTH, AND
HOUSING EQUITY, 2001–10

Survey Periods Compared	2001 to 2004		2004 to 2007		2007 to 2010	
Measure	Median	Mean	Median	Mean	Median	Mean
Income Change	+1.8%	−2.3%	−0.4%	+8.5%	−7.7%	−11.1%
Net Worth Change	+1.0%	+6.2%	+17.9%	+13.1%	−38.8%	−14.7%

Federal Reserve Flow of Funds: Change in Households' Home Equity

Change in Housing Equity	___	+24.0%	___	−2.1%	___	−43.1%

SOURCES: Income change and net worth change: Bricker et al. (2012); Change in housing equity: authors' calculations from Federal Reserve Flow of Funds, Tables B.100 and L.218.

the increase in the mean, 13.1 percent. Families with lower wealth levels were improving relative to richer families, indicating that housing programs designed to help those of lesser means were working in the direction intended. But all this improvement was reversed between 2007 and 2010: both median and mean income fell to levels prevailing in the 1990s. But even more dramatically, median net wealth declined 38.8 percent, much more than the mean, 14.7 percent. As indicated in the report "Mean net worth fell to about the level in the 2001 survey, and median net worth was close to levels not seen since the 1992 survey" (Bricker et al. 2012: 17). Data on changes in the mean value of households' equity in their homes fell even more dramatically than declines in total wealth, and the downturn came sooner. The timing of the declines is consistent with the hypothesis that a downturn in household wealth, particularly housing equity, was a causal factor in the broader economic downturn.

For the most recent years, 2007 to 2010, the report further elaborates these striking changes in the median and mean measures of income and net worth:

> The decline in median income was widespread across demographic groups, with only a few groups experiencing stable or rising incomes. Most noticeably, median incomes moved higher for retirees and other nonworking families. The decline in median income was most pronounced among more highly educated families, families headed by persons aged less than 55, and families living in the South and West regions. . . . The decline in mean income was even more widespread than the decline in median income, with virtually all demographic groups experiencing a decline between 2007 and 2010; the decline in the mean was most pronounced in the top 10 percent of the income distribution and for higher education or wealth groups [Bricker et al. 2012: 1].

These data reinforce the picture of households in Middle America as having achieved temporary gains in net wealth after 2000, only to see those median net wealth gains erode rapidly back to the 1990s baseline—mean gains fell below their 2001 level but were now encumbered by negative equity—leaving households, along with their banks, mired in disequilibrium. The early gains were the product of what may have been well-intended public and private

programs to help those of lesser means, but being financed by the most dangerous form of other peoples' money (OPM)—credit—they were vulnerable to a rapid reversal if the value of the mortgaged homes fell substantially.

Stocks vs. Housing in Balance Sheet Crises: The Exception that Proves the Ratchet Rule?

Ten trillion dollars came off the value of equity in U.S. firms during the technology sector crash between 2000 and 2002, with hardly a dent in bank balance sheets. Output was largely unaffected as well, with only a mild recession in 2001. Similarly, the stock market crash on October 19, 1987, yielded no recession. Only $2.2 trillion came off the value of homes between their peak in the first quarter of 2006 and the third quarter of 2007. In the last year before the crisis, the Federal Reserve undertook significant measures to enhance liquidity, and it also took the extraordinary step of bailing out a large financial institution (Bear Stearns), yet the financial system still buckled under the stress of a relatively small decline in housing asset values.[8]

Why did the decline in the housing market between 2005 and 2007 have such a different result from the decline of the equity market between 2000 and 2002?

Securities Rules, Found and (Largely) Retained

In the stock market, access to OPM is constrained by property right rules. Beginning in April 1928, brokers and their banks began raising minimum margin requirements to 50 percent on DJ stocks; the NYSE required all of its members to institute a 50 percent margin rule in 1933; and the SEC Act codified it in 1934. These limits

---

[8]From August 10, 2007, into September 2008, the Federal Reserve implemented a policy of steadily increasing the size and term length of "liquidity enhancement" actions, implicitly playing out a policy the absence of which had long been thought to be the cause of the Great Depression (Friedman and Schwartz 1963). As we see it, the Federal Reserve under Bernanke tested the Friedman-Schwartz hypothesis that liquidity moves by the Fed were sufficient to prevent a liquidity crisis in 2007–08. But from its inception in 2007, we faced a bank solvency crisis that liquidity moves would be powerless to confine to the financial sector. This recent history raises fundamental challenges to the Friedman-Schwartz reading of the Great Depression that in 1930 the Fed faced only a liquidity problem in the banking system, not a solvency problem.

on OPM plus the fact that broker loans are "call" loans essentially eliminated the ratchet effect in securities markets. The lack of a ratchet effect with loans on securities is demonstrated by the rapid deleveraging of loans to New York Stock Exchange brokerages in the fall of 1929. Loans to NYSE brokers peaked in October 1929 at $8.55 billion. By December 1929, loans had been reduced to $4.02 billion. During those two months, only one brokerage with liabilities estimated at $4 to $5 million went bankrupt.

Mortgage Rules, Found but Lost

Commercial banks in the 1920s made predominantly interest-only and partially amortized mortgage loans with terms of 3 to 4 years. These loans were then either refinanced or a balloon payment was due. Behrens (1952, Table 14, p. 50) reports mortgage lending characteristics from a sample of 116 commercial banks. Between 1920 and 1924, 41.7 percent of their mortgage loans were nonamortized and another 42.0 percent were only partially amortized. Between 1925 and 1929, 45.6 percent of their loans were nonamortized and 37.6 percent were partially amortized. Between 1930 and 1934 their amortization practices were similar. Beginning about 1935 though, a strong tradition emerged supporting amortization of mortgage loans: from 1935 to 1939, 69 percent of commercial bank mortgage loans were amortized. In addition, traditions supported substantial down payments and due diligence in mortgage originations. But by the 1990s these traditions had badly eroded; in 2005, 45 percent of first-time home buyers (National Association of Realtors data) made zero down payments—100 percent OPM.

Similarly, we had the spectacle of upfront fees (OPM again) for mortgage origination. The latter is a prime example of a bad property right rule with a simple fix: the origination fee should be distributed to the originator in proportion to the borrower's repayment of principal. If the loan is interest-only for ten years, then there is no fee payment for ten years; on amortized loans the fee would be distributed from monthly payments along with principal reduction. This would give the originator the same proportional risk exposure, and the same due diligence incentive, as a lender; the market would then determine the fee level and whether or not lending and origination is best combined or separated under this incentive-compatible rule structure.

Proposition 3: Between the Great Depression and Great Recession, there occurred many housing–monetary policy inspired smaller recessions.

The instability of the housing market has been more persistent than indicated by the magnitude of two spectacular events that came almost 80 years apart. This is conveyed most succinctly in Figure 6, which shows new housing expenditures as a percentage of GDP since 1920, with the last 16 recessions and the Depression shown shaded. Eleven of the last 14 recessions were preceded by declines in new housing expenditures. The Great Recession and the Depression are the housing collapse bookends that bracket 12 other less devastating recessions. Yet nine of the ten recessions between the end of WWII and the Great Recession were preceded by a sharp decline in residential construction, as in the Great Depression and Great Recession. And in the nine sustained recoveries that followed those recessions, residential construction increased sharply before any other sector of the economy and accounted for a large share of the recovery. The Great Recession has proven to be the most stubborn exception to the recovery rule, but the exceptionally poor performance of the housing sector is a significant factor in the low-growth recovery.

FIGURE 6
EXPENDITURES ON NEW HOUSING UNITS AS A
PERCENTAGE OF GDP, 1920–2012
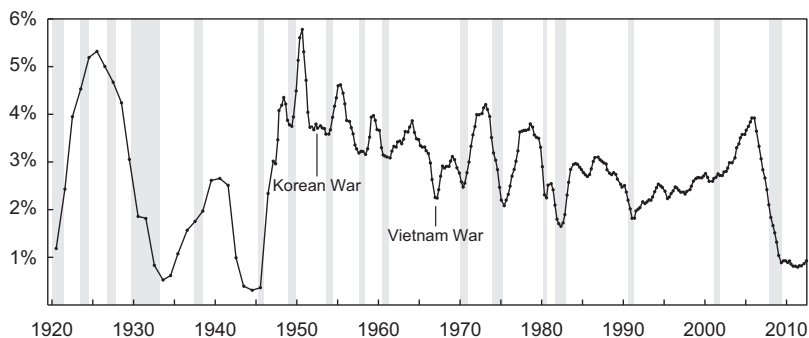
NOTE: Shaded areas indicate the Great Depression and the last 16 U.S. recessions.
SOURCES: Grebler, Blank, and Winnick (1956) Table B-3, column 1, divided by Swanson and Williamson (1972) Table 4, column 1 (1920–28); NIPA Table 5.4.5, line 36, divided by Table 1.1.5, line 1 (1929–57); NIPA Table 5.3.5, line 19, divided by Table 1.1.5, line 1 (1958–2012).

Given this persistent volatility of the housing cycle and its magnitude, as Leamer (2007) put it, "Housing *is* the business cycle." But why has there not been broader recognition of the role of housing and its associated mortgage financing as the key ingredient in understanding economic cycles? This failure perhaps stems from the observation that over the past 65 years expenditures on new housing units averaged only 3.0 percent of GDP. But as Figure 6 indicates, housing is incredibly volatile, varying from less than a half of 1 percent to nearly 6 percent of GDP. The Great Depression was preceded by a drop in new housing construction from 5.3 percent of GDP in 1925 to 2.9 percent in 1929. And the Great Recession was preceded by a decline in construction of new housing units from 3.9 percent of GDP at the end of 2005 to 2.1 percent by the end of 2007.

A benchmark for comparison is useful. Households' real consumption of nondurable goods and services rose in every year between 1948 and 2011, with the single exception of 2009 when they fell by 2.1 percent from $8.22 trillion to $8.05 trillion. On an annualized quarterly basis, consumption of nondurable goods and services peaked in Q2 2008 at $8.29 trillion and bottomed out in Q1 2009 at $7.99 trillion, a decline of about $300 billion. The total decline of residential construction from its pre-recession peak to its recession trough was $393.6 billion. Consumption of nondurable goods and services, which is about 19 times as large as expenditures on new residential structures, declined less in dollar terms than construction of new residential structures and recovered much more quickly.

Volatility in the housing sector, however, interacts with two very powerful leverage/deleverage factors that account for its high derived impact on both prosperity and recession in the economy: housing is (1) the most durable of all consumer goods, and (2) relies on mortgage credit. This is the twin source of the magnified impact on household and bank balance sheets, and it is from this epicenter of distress that trouble spreads to the wider economy.[9] Thus, if 3 percent of the nation's resources are devoted to producing goods

[9]Others have recognized the role of housing in downturns. For example Leamer (2007) describes the role of residential construction in cyclical downturns. Reinhart and Rogoff (2009) note that house price declines are common in serious financial crises around the world. Others, such as Fostel and Geanakoplos (2008), have emphasized the role of deleveraging in cyclical downturns. Analyses of the role of real estate leverage and real estate downturns though have been less common.

that last 50–100 years and are financed predominantly by credit, the stability consequences are far different than where 3 percent of national resources are devoted to producing perishables (like hamburgers and haircuts) paid for predominantly with cash.

In Figure 7 we display changes to GDP and its major components in the double dip recessions of 1980 and of 1981–82 in order to demonstrate the strong effect that monetary policy typically has first on the housing sector and then on other components of GDP.

When President Carter appointed Paul Volcker as chairman of the Federal Reserve on August 6, 1979, the Fed targeted money supply growth rates, using the federal funds rate as its instrument to affect the money supply. Volcker increased the federal funds rate from 9.6 percent when he took office to 19 percent eight months later. Monetary tightening had a significant effect, especially on housing, which declined 34.8 percent between Q3 1979 and Q2 1980. By April 1980, the money supply was contracting rapidly, but the Fed had only sought to reduce its growth rate. In an adaptive response to its missed monetary growth target, the Federal Reserve reduced the

FIGURE 7
THE IMPACT OF MONETARY POLICY ON THE REAL SECTOR VIA HOUSING
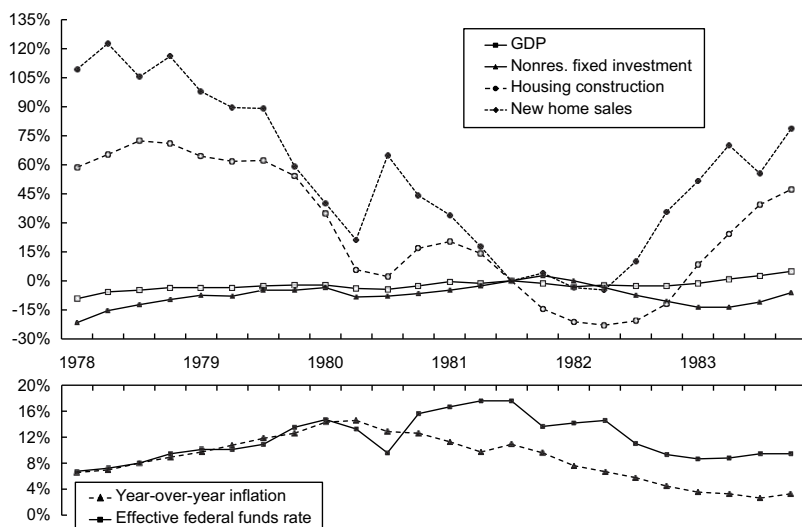
SOURCES: Department of Commerce, National Income and Product Accounts, and Census Bureau.

federal funds rate from 19.4 percent in early April 1980 to 9.5 percent seven weeks later in late May; the Fed then kept the rate below 10 percent until the end of August. The effect on housing was a sharp reversal, and operated with only a one quarter lag on sales of new homes and a two quarter lag in construction expenditures.

The housing decline ended in Q3 1980 and an upturn began the next quarter. Monetary policy, however, was once again tightened with an increase in the federal funds rate from under 11 percent at the end of September 1980 to over 16 percent at the beginning of January 1981. Housing started down again in Q2 1981, this time falling 36 percent in five quarters to a new postwar low of less than 1.7 percent of GDP in Q2 1982.

In the first two quarters of 1980 when Volcker's tightened monetary policy first began to have a strong effect on housing, the inflation rate averaged 14.4 percent. By Q4 1982 when the recovery began, inflation averaged 4.7 percent. Monetary policy had been tight in ten of eleven quarters from Q4 1979 to Q2 1982, bringing inflation under control. When monetary policy was finally eased sharply in Q3 1982, housing again responded almost immediately: housing increased 92 percent between Q3 1982 and Q2 1984.

This episode demonstrates a key argument in Friedman and Schwartz (1963): monetary policy has a clear impact on the real economy—an argument that has been widely accepted for 30 years. But this natural experiment, in which monetary policy was tightened and then eased twice in quick succession, demonstrates another, and more specific proposition: *monetary policy operates primarily through interest rate sensitive components of household consumption, especially housing.*

In contrast with Figure 5 showing the severe impact of household-bank balance sheet damage in the Great Recession, Figure 8 shows the same value, debt, and equity plots for 1972–92, illustrating the proposition that if there is no balance sheet crunch, the recession will be smaller. Real estate assets fell in value in the 1973–75 recession, were flat in the double dip recession, and fell again in the 1990–91 recession. They rose in value sharply in the two expansions between the recessions.

Over the past 20 years many countries have tried a variety of policy responses—both monetary and fiscal—to downturns comparable to the Great Recession; they have also tried a variety of measures undertaken to deal with problems in their banking sectors.

FIGURE 8
Household Real Estate Assets, Real Estate Equity, and Mortgage Debt
(Trillions of 2005 Dollars)
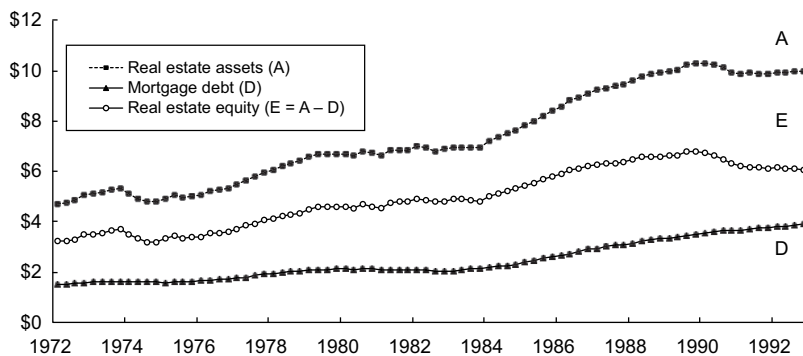
SOURCES: Same as Figure 5.

With regard to fiscal policy, some countries, such as Japan and the United States, have followed standard Keynesian prescriptions of government deficit spending to "fill the gap" left by a collapse of fixed investment and household durable goods consumption. Others, such as Finland in 1992, Thailand in 1997, and Iceland in 2008, have taken steps to reduce government spending and increase tax revenue in order to reign in government deficits.

Attempts to address the damaged financial sector have also varied widely. Banks in Japan accommodated distressed borrowers with increased lending to stretch their loans, and the Japanese government aided distressed banks. Neither of these policies helped to restore damaged household or bank balance sheets. In Sweden, the response was swifter in 1992 and more decisive: failing banks were forced to recognize losses and recapitalize.

Our objective in the remainder of this article is to compare the results of these approaches. We then conclude with a summary of the causes and consequences of a balance sheet recession, indicate the problems with extreme monetary easing, fiscal stimulus, and regulatory forbearance and bailouts as remedies, and review the evidence on alternative policies that have been part of successful recoveries from troublesome and persistent balance sheet recessions in the aftermath of collapsed real estate bubbles.

Bankruptcy and Default versus Forbearance, Bailouts, and Liquidity Enhancements

We've outlined in the preceding part of this paper the impact of unusual credit flows on asset prices, and the problem of loan losses that develop especially when a credit and real estate bubble bursts. The prevalence of high leverage loans and the general illiquidity of real estate markets create risks for mortgage lenders. If assets values fall below mortgage principal and homeowners are unable to service their mortgages, homeowner distress is transmitted into the financial system. When bank losses grow large enough to wipe out their capital, there are two broad routes to address the problems faced by the financial system. One approach is to provide any level of liquidity required by the financial system and to engage in regulatory forbearance. Protecting incumbent investors from the consequences of excesses in housing-mortgage markets has been the centerpiece of U.S. policy since the inception of the downturn: first, when the Federal Reserve moved to relieve the banks of large amounts of their nonperforming mortgage securities and credit default swap insurance on them, and second when Treasury implemented a too-big-too-fail program.[10] The Japanese response to bad loans and to bank insolvency in the 1990s is generically similar to the U.S. approach but contrasts sharply with that of Sweden. Hence, the path followed by Japan provides evidence relevant to understanding why the U.S. economy is mired in slow growth and why that situation might persist.

House prices in Japan peaked in the fall of 1990 and fell 25 percent within 2 years. After 14 consecutive years of decline, house prices had fallen 65 percent by 2004. Although house prices began to fall in 1990, nonperforming loans continued to escalate throughout the decade. Various types of distressed loans remained large in 1998, many years after the initial downturn in the real estate market. One category of loans, which Packer (2000) calls "support loans," were extended to distressed borrowers so that they could

---

[10]Opposite policies were pursued by the Federal Deposit Insurance Corporation (FDIC). The failure of more than 440 small- to medium-sized regional banks was managed by the FDIC from 2008 to June 2012. The FDIC's management of these failures takes a form most similar to the procedures implemented by Sweden in our discussion above.

continue to make their loan payments.[11] In 1998 these loans amounted to about 6.5 percent of all loans issued by major Japanese banks. After a support loan was issued, the original loan could technically avoid classification as a distressed asset. This and other forms of forbearance allowed Japanese banks to stretch out write-downs of ¥95 trillion in loan losses—about 20 percent of annual GDP—over a period of 12 years, from 1993 to 2004. One objective of this strategy was to allow Japanese banks to offset their losses from bad assets with earnings from sound assets as those earnings arrived. The serious consequence of this strategy, however, is that Japanese banks remained hunkered down and unwilling to lend for more than a decade. Whether it was the supply of loans or the demand for them that collapsed, the contrast between outcomes in Sweden and Japan suggests that regulatory forbearance is the less effective policy. The Japanese flow of funds indicates the severity of the downturn in Japanese lending: total lending by private financial institutions fell at an annual rate of 1.7 percent per year between 1992 and 2007. This 15-year decline in lending is an important cause of the extremely sluggish economic growth over this period.

In the next section we argue that among countries that have had a large real estate collapse and a financial crisis, those that have had prolonged periods of large fiscal deficits have had an extended period of low growth. The growth rate of real GDP in Japan between the first quarter of 1997 and the third quarter of 2012 has been 0.5 percent. Over a period of $15\frac{1}{2}$ years, the total real growth of GDP has amounted to only 8.4 percent.

Bankruptcy and Default as a Repair and Reboot Process

When bank losses grow large enough to wipe out their capital, recognition of loan losses is essential in order to raise new capital, for at least two reasons. Loan losses of 10 to 15 percent of GDP are not unusual in serious banking crises. For example, in Sweden from 1990 to 1994, loan losses amounted to 10.6 percent of GDP and a slightly larger percentage of total loans. At many banks, losses significantly exceeded capital. In these cases, support for the interests of existing

---

[11]Figure 6.1 in Packer (2000) shows various types of distressed loans from 1993 through 1998 for Japanese banks.

shareholders and bondholders reduces the incentive of potential new capital investors to recapitalize the banking sector, and the economy suffers from the absence of lending.

The extreme case of completely privatized losses illustrates the benefits from achieving a write-down of bad loans and requiring the losses to be borne by shareholders and bondholders. If all bad loans are written down, the losses wipe out a bank's capital and bondholders are forced to take a haircut until liabilities equal assets: at that point the balance sheet of the bank is clean. When new investors provide new capital for the bank, that capital doesn't need to be applied to fill in old holes in the balance sheet, and the investment isn't diluted by claims on it from the previous shareholders. The alternative in which loan losses aren't fully recognized is much less favorable to new capital investors. New capital investments must be applied to filling in the old holes in the balance sheet. If the previous shareholders are protected from loss, they too have a claim on the yield from capital investment of the new investors. Obviously, the objective of restoring the financial system to health and reviving its capacity to lend is facilitated by requiring loan losses to be borne by incumbent shareholders. In Sweden, although bank equity losses were in many cases borne by shareholders, the state took over many of the bad assets rather than requiring their loss to be borne by bondholders. That works to restore the bank's balance sheet, but it transfers to the government losses that incumbent bondholders were legally and justly responsible for as part of the risk they voluntarily accepted to bear after equity holder capital was exhausted.

The result of the Swedish approach was that loan losses fell sharply after they spiked from 1991 to 1993. By 1994 they were at a level only slightly above their more normal levels prior to the crisis. Once the bad loans were written off and new capital was raised, banks could begin lending again. Bank lending bottomed out at the end of 1994, and rose slowly until 1999 when it began a sharp rise that continued unabated for ten years.[12] When banks recapitalize through private markets with new capital going into restructured balance sheets unencumbered by the claims of past investors, the consequence is to greatly facilitate recovery and the restoration of growth in the economy.

[12]For credit market lending, see, for example, Table H in Sveriges Riksbank (2007).

459

Swedish stock market and house price indices both increased sharply once lending recovered. House price increases helped to restore the damaged balance sheets of households. Although the 29.2 percent fall in house prices in Stockholm was almost as great as the U.S. national decline, house prices had recovered to their pre-crisis peak by 1998, only five years after the trough. Recovery in the stock market was faster yet. The contrast with Japan, where bank losses were papered over, is stark.

Learning from Market Currency Depreciation in Three of Many Countries: Finland (1990–93), Thailand (1994–2003), and Iceland (2007–10)

Countries with flexible currency regimes, or whose reserves are inadequate to defend the currency from deprecation, provide a record of market adjustment to balance sheet crises that help to inform a pathway to recovery. These countries have, through market forces, seen resources diverted into new sources of growth and in the process addressed the need for balance sheet repair. We briefly review Finland, Thailand, and Iceland as three of many examples that illustrate this market correction process; in these economies the original excesses were a consequence of large unsustainable flows of capital into fixed investment that ultimately reversed; in each case the capital flow reversal led to currency depreciation that initiated a period of export-led growth. The currency depreciation and export growth reversed the current account deficit, which aided the balance sheet recovery in a way that government borrowing cannot.

One common objection to treating these countries as models for recovery is their small size, but in 1996 Thailand, Malaysia, Indonesia, and South Korea had a combined GDP of $1.07 trillion; the composite of these economies would have been the seventh largest in the world at that time. All four countries experienced financial crises and currency depreciations in rapid succession. Between June 1997 and June 1998 the baht, ringgit, and won all depreciated between 36 percent and 42 percent while the rupiah depreciated 82 percent. During the same period Indonesia, Thailand, and South Korea had improvements in their net export positions between 13.1 percent and 17.5 percent of GDP; between the 1997 and 1998 calendar years Malaysia had an improvement in its net export position of 21.9 percent of GDP.

This process contrasts sharply with the plight of Portugal, Ireland, Italy, Greece, and Spain that no longer have separate currencies, and whose idiosyncratic economic excesses cannot lead to a market currency response independent of the stronger economies, such as Germany and the Netherlands, also on the common euro. These five economies now, in the first quarter of 2013, have an aggregate GDP that is 8.3 percent lower than their GDP five years ago, in the first quarter of 2008, and they are all, with the single exception of Ireland, now at their lowest level of output since 2008. In contrast, we will see that the economies we examined that experienced sharp currency depreciation were far along toward recovery within five years of the start of their downturns.

Our point is not about exchange rate regime policy—whether any country should or should not be on some flexible currency—rather it's about understanding the work accomplished by the depreciation adjustment process in cases of severe balance sheet crises.

Finland

Finnish fixed investment (including housing) started to collapse in the first quarter of 1990 after a long rise accompanied by rising capital inflows and an increasing current account deficit. Figure 9 shows both the rapid rise in fixed investment between 1986 and 1989 and the developing current account deficits. Investment peaked in the last quarter of 1989 at 31.0 percent of GDP, and then declined sharply by the autumn of 1991 when a banking crisis ensued from major deterioration in bank balance sheets. In a typical pattern, suggesting nervous investors, capital inflows diminished before the crisis. Exports, which had long been declining gently as a percentage of GDP, surged from under 23 percent to over 35 percent of GDP within three years of the first devaluation in November 1991 and continued upward. In a pattern that we have documented in many financial crises, when the country's currency depreciated sharply, the growth rate of exports moved sharply ahead of the growth rate of imports.[13]

---

[13]These events typically coincide with IMF fiscal consolidation, but as we see it the critical operant condition is a currency depreciation that coincides with a sharp reduction in capital inflows from abroad into both private and public debt instruments. Currency depreciation then fuels a net export surplus. The opposite of "fiscal consolidation" is a deficit-financed government stimulus which tends to stimulate imports and reduce exports, as with the Obama administration's stimulus. See Buchanan, Gjerstad, and Smith (2012).

FIGURE 9
CHANGES IN GDP AND THE CURRENT ACCOUNT IN
FINLAND, 1984–2000
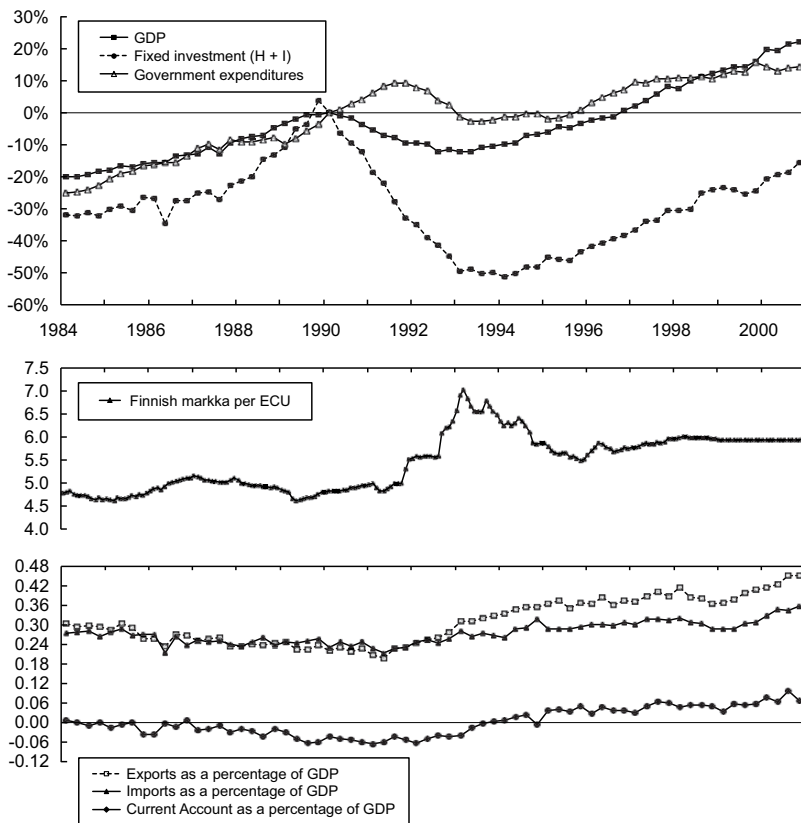
SOURCES: Statistics Finland (quarterly national accounts), Federal Reserve
Statistical Release H.10 (exchange rates), OECD (current account).

The fundamental dislocation during the crisis and depression was
a collapse of fixed investment; the recovery consisted primarily in fill-
ing the gap from the reduced fixed investment with export growth.
In Finland, during the three years before the peak of their economic
cycle at the start of 1990, 61.4 percent of the growth was in fixed
capital investment. Over the next four years, fixed investment fell
51.3 percent and most of the GDP decline could be accounted for by
the decline in fixed investment: GDP fell by 12.4 percent whereas
fixed investment fell from 29.7 percent of GDP when the downturn

began to only 17.1 percent of GDP when the downturn reached its bottom 3 years later, a decline of 16.6 percent of GDP.

The turnaround in net exports constituted a large part of the recovery. From the second quarter of 1992—just before the large depreciation starting in August 1992—until the fourth quarter of 1993, the net export position grew by 6.1 percent of GDP. The growth of net exports first arrested the decline in GDP, and then aided the recovery.

A common objection to devaluation is that it will set off a series of competitive devaluations in which countries in succession follow a beggar-thy-neighbor strategy, taking export market share away from other countries. The argument seems to presuppose a government policy decision to devalue a currency, but depreciation driven by currency market responses has not had this result. Imports into Finland rose along with exports after the depreciation of the markka.

In the eight years preceding devaluation, real imports in Finland grew 4.1 percent (only 0.5 percent per year); in the first four years after depreciation real imports grew 38.2 percent (8.4 percent per year) and in the first eight years after depreciation they grew 73.2 percent (7.1 percent per year). In most of the serious downturns that we've examined, including Thailand, Korea, Malaysia, Argentina, and Mexico, imports have increased as a percentage of GDP following depreciation, so this objection to depreciation has no empirical support in the crisis countries that we have evaluated.

Thailand

For many years prior to 1996, Thailand had been the fastest growing economy in the world. But as in Finland, exports began to falter and current account deficits grew in the late years of the expansion. Figure 10 shows the stagnant exports and growing imports prior to the crisis. From 1993 through 1996 Thai current account deficits averaged 7.2 percent of GDP. Investors eventually grew skittish and withdrew. As in Finland, rapidly declining construction and investment were key factors in the downturn. The collapses in construction (down 44 percent from its peak by the time of the currency collapse) and fixed investment (down 20 percent from its peak by the time of the currency collapse) were very pronounced and appeared in advance of the financial and balance-of-payments crises.

FIGURE 10
CHANGES IN GDP AND THE CURRENT ACCOUNT IN
THAILAND, 1994–2003
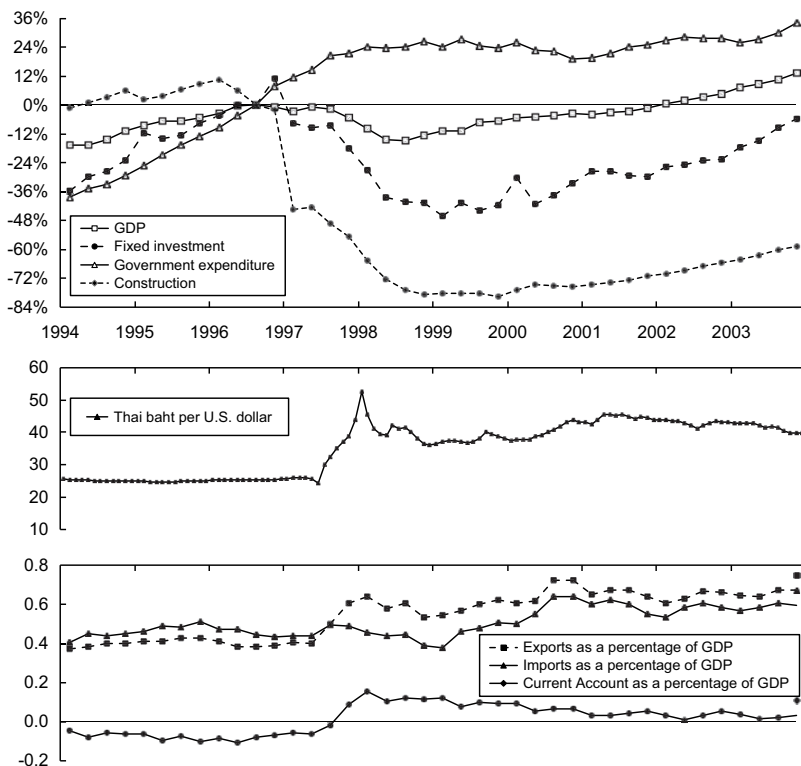
SOURCES: National Economic and Social Development Board (quarterly national accounts), Federal Reserve Statistical Release H.10 (exchange rates), Bank of Thailand Balance of Payments (current account).

In Thailand the same sequence played out as in Finland. If we examine the changes in Thai output during the boom, the collapse, and the recovery, we see that fixed investment contributed importantly to the boom but was responsible for a significant portion of the decline. Thai GDP fell 14.9 percent in the downturn. At the peak in the third quarter of 1996, fixed investment comprised 39.6 percent of Thai output. GDP first recovered its 1996 peak 5½ years later, in the first quarter of 2002. By that time, fixed investment was only 23.0 percent of GDP. As in Finland, the decline of fixed investment was comparable to the total decline in GDP. The increase in net

exports accounted for most of the recovery of output. During the same $5\frac{1}{2}$ year period of collapse and recovery, exports increased by 23.9 percent of GDP while imports increased by 10.6 percent of GDP, so that net exports increased by 13.3 percent of GDP, almost enough to account for the whole recovery. As in Finland, currency depreciation led to an increase in imports. Between the peak of the economic cycle in the third quarter of 1996 and the recovery to the peak in the first quarter of 2002, Thai imports grew from 43.7 percent of GDP to 54.3 percent of GDP.
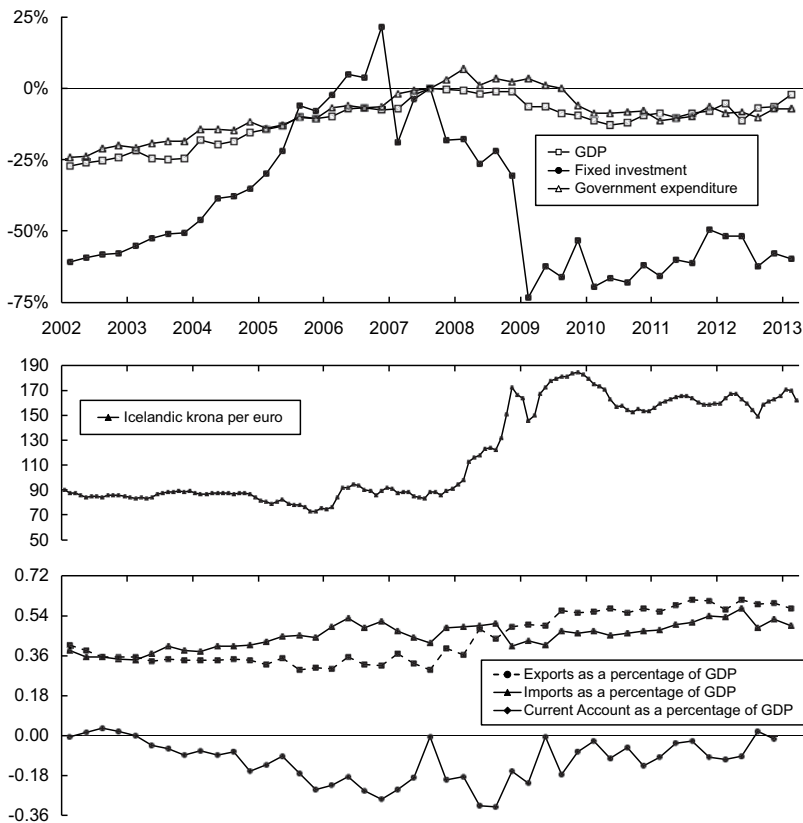
Iceland

The Icelandic crisis was preceded by several years of extraordinary capital inflows that fueled the boom in fixed investment. Figure 11 shows the boom in fixed investment (in the top panel) and the rapid increase of the current account deficit (in the bottom panel). At its maximum, the gap between imports and exports reached 19.9 percent of GDP in the last quarter of 2006. These capital inflows supported equally extraordinary growth of fixed investment. Between the first quarter of 2002 and the fourth quarter of 2006, the annual growth rate of fixed investment in Iceland was 26.8 percent. Growth of fixed investment was the only growth in the Icelandic economy between 2002 and 2006: GDP minus fixed investment declined during that period. When this investment bubble burst, the collapse was even faster than the expansion had been—real fixed capital formation fell 78.2 percent in only nine quarters from the last quarter of 2006 to the first quarter of 2009; by then it was below its level when the rapid expansion began.

The rapid expansion of fixed investment accompanied the large increase in deposits in the Icelandic banking system. According to the Central Bank of Iceland, the liabilities of the Icelandic banking system reached 12.9 times GDP just before the financial crisis. (U.S. banks had liabilities 1.19 times GDP in the third quarter of 2008 when the financial crisis struck.)

Soon after the financial crisis entered its final stage in the U.S., conditions deteriorated sharply in Iceland. The value of the illiquid assets of the Icelandic banking system fell sharply in the last quarter of 2008. Iceland turned to the IMF for loans, and the IMF required fiscal consolidation as a condition of the loans. The krona began to depreciate just before fiscal consolidation was undertaken, and exports quickly overtook imports. As in Finland and Thailand,

FIGURE 11
CHANGES IN GDP AND THE CURRENT ACCOUNT IN
ICELAND, 2002–2011

SOURCES: Statistics Iceland (quarterly national accounts), Federal Reserve
Statistical Release H.10 (exchange rates), OECD (quarterly current
account).

the improvement in net exports has been the major contributor to
the recovery into 2013. As of the first quarter of 2013, output in the
Icelandic economy is almost identical to output in the second quar-
ter of 2007, one quarter before the peak. Over the intervening
23 quarters, fixed investment fell from 26.0 percent of GDP to only
10.9 percent, a decline of 15.1 percent of GDP. Over that same
period, exports have increased by 24.8 percent of GDP and imports
have increased by 5.1 percent of GDP, so net exports have increased

by 19.7 percent of GDP. The improvement in net exports can account for the entire recovery of Icelandic output to its level just one quarter before the peak of the economic cycle. During the economic collapse, Icelandic GDP fell 13.0 percent, so the decline in GDP largely resulted from the collapse of fixed investment, and the recovery has largely consisted of a reorientation from fixed investment to net exports.

Fiscal Consolidation versus Fiscal Stimulus and Deficit Spending

Our discussion of Finland, Thailand, and Iceland in the last section focused on the restructuring of their economies, from growth of fixed investment to growth of net exports, and the role that currency depreciation played in that switch. But the data that we show for these countries also demonstrate that growth of government expenditures—so-called fiscal stimulus—was not a part of any of these recoveries. Most developed countries that experience a financial crisis also face a surge in government deficits soon afterward. But many of the countries where those deficits have persisted have also had poor growth records.

Finnish deficits soared after the financial crisis, from a deficit of 0.4 percent of GDP in 1991, to a deficit of 9 percent of GDP in 1993. But real government expenditures peaked in the third quarter of 1991 and deficits began to fall in 1994. Real government expenditures were lower in each year between 1992 and 1996 than they were in 1991, during the middle of the crisis. By 1997 deficits were brought down to 1.6 percent of GDP, well below the growth rate, so that government debt began to decline as a percentage of GDP. During the first 5 years of the Finnish recovery, the growth rate averaged 4.2 percent per year, and in the first ten years from the bottom of the depression, growth averaged 3.7 percent per year.

The Finnish experience stands in stark contrast to the Japanese experience. Japanese government deficits grew rapidly after their financial crisis in 1997, and have continued at an elevated level for 15 years. According to the Japanese Ministry of Finance, central government debt has grown from 49.5 percent of GDP in 1997 to 147.8 percent of GDP in 2012. Annual deficits averaged 6.8 percent of GDP during this period, while the growth rate of GDP averaged 0.5 percent per year. In Finland, the growth rate during the first

15 years after their financial crisis was 3.6 percent and the government had, on average, a small surplus of 0.5 percent of GDP.

In Thailand after international financial inflows ceased, International Monetary Fund assistance was sought. Loan funds from the IMF were provided with the stipulation that government finances remain on a solid foundation. By mid-August 1997, about six weeks after the collapse of the baht, the government had implemented tax increases and finalized spending cuts as the first steps in its fiscal consolidation plan. Just as the government curtailed its expenditures, the Thai net export position began to improve dramatically. In just two quarters, from the second quarter of 1997 to the fourth quarter of 1997, exports increased by 22.5 percent of GDP, while imports increased by only 6.9 percent of GDP in the same two quarters. In the five years after the Thai crisis, government borrowing averaged less than 2 percent of GDP per year. Over the 14 year period from the end of the crisis in 1998 to 2011, government borrowing averaged 1.1 percent of GDP, while the average growth rate in Thailand has been 3.6 percent.

In the UK, which Krugman (2012) suggests has undergone an austerity program, deficits peaked at 11.4 percent of GDP in 2009 and remained elevated at 8.3 percent of GDP in 2011. With significant deficit spending and an increase in government expenditures of 4.6 percent since peak output in the first quarter of 2008, the growth rate in the UK has been only 0.9 percent per year.

This evidence indicates flaws in the argument that government spending can substitute for private demand, or that tax cuts can stimulate the economy, after a sharp downturn due to a balance sheet crisis. We've seen in numerous cases a clear relationship between deficit spending and prolonged stagnation, and we've also seen evidence that fiscal consolidation is related to renewed growth.

Conclusion

Much of the dislocation during some of the most severe economic downturns in the developed and developing world over the last 20 years has come when asset prices have collapsed and the fixed investment sector of the affected economy has suffered a sharp reduction in output. The Keynesian prescription has been to increase government expenditures and reduce taxes to stimulate growth. But we have described evidence from several countries

that the contrary approach has been successful. A combination of revenue enhancements and expenditure reductions by the government that reduces fiscal deficits seems to prevent a recurrence of capital inflows, which facilitates currency depreciation and export growth. Countries that have followed this approach have experienced a return to strong and sustained output growth, and have generated the foreign income to reduce accumulated debts. Although many of the countries that have followed this path were small- to medium-sized economies, the composite of South Korea, Thailand, Malaysia, and Indonesia was large. All four of them quickly controlled government expenditures and deficits after the East Asian crisis of 1997–98, and all returned to strong and sustained growth quickly. The Keynesian prescription, which has been followed most extensively by Japan, has led to extreme public sector indebtedness and has been associated with a prolonged record of extremely poor growth.

References

Behrens, Carl F. (1952) *Commercial Bank Activity in Urban Mortgage Finance*. National Bureau of Economic Research.

Bricker, J.; Kennickell, A. B.; Moore, K. B.; and Sabelhaus, J. (2012) "Changes in U.S. Family Finances from 2007 to 2010: Evidence from the Survey of Consumer Finances." *Federal Reserve Bulletin* 98 (June): 1–80.

Buchanan, J. A.; Gjerstad, S.; and Smith, V. L. (2012) "Underwater Recession." *The American Interest* 7 (5): 20–29.

Dickhaut, J.; Lin, S.; Porter, D.; and Smith, V. L. (2012) "Commodity Durability, Trader Specialization, and Market Performance." *Proceedings of the National Academy of Science* 109: 1425–30.

Fostel, A., and Geanakoplos, J. 2008. "Leverage Cycles and the Anxious Economy." *American Economic Review* 98: 1211–44.

Friedman, M., and Schwartz, A. J. (1963) *A Monetary History of the United States*. Princeton, N.J.: Princeton University Press.

Gjerstad, S., and Smith, V. L. (2009) "From Bubble to Depression?" *Wall Street Journal* (6 April).

_____ (forthcoming) "Consumption and Investment Booms in the Twenties and Their Collapse in 1930." In *Housing and Mortgage Markets in Historical Perspective*. University of Chicago Press.

Grebler, L.; Blank, D. M.; and Winnick, L. (1956) *Capital Formation in Residential Real Estate*. Princeton, N.J.: Princeton University Press.

Krugman, P. (2012) "The Austerity Agenda." *New York Times* (31 May): A27.

Kuznets, S. (1941) *National Income and Its Composition, 1919–1938*. New York: National Bureau of Economic Research.

Leamer, E. E. (2007) "Housing Is the Business Cycle." Federal Reserve Bank of Kansas City, Jackson Hole Symposium.

Packer, F. (2000) "The Disposal of Bad Loans in Japan: The Case of the CCPC." In T. Hoshi and H. Patrick (eds.) *Crisis and Change in the Japanese Financial System*, 137–57. Boston: Kluwer.

Reinhart, C. M., and Rogoff, K. S. (2009) "The Aftermath of Financial Crises." *American Economic Review* 99: 466–72.

Smith, A. (1776) *The Wealth of Nations*. At www.econlib.org/library /Smith/smWN.html.

Sveriges Riksbank (2007) "The Swedish Financial Market 2007." Available at www.riksbank.se.

Swanson, J. A., and Williamson, S. H. (1972) "Estimates of National Product and Income for the United States Economy, 1919–1941." *Explorations in Economic History* 10: 53–73.