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Comments

Working Paper 12-03

There's No Place Like Home

Joy A. Buchanan, Steven Gjerstad, and Vernon L. Smith

The U.S. economy is stuck in a painfully slow recovery. Neither the accommodative monetary policy nor the fiscal stimulus has catalyzed a strong recovery. We explore why, and indicate a feasible path to robust growth. We first assess the normal impact of monetary policy on the course of an economic cycle. We then consider a number of factors that distinguish the Great Recession from the typical economic cycle, with a view toward identifying important causes of the recession, but also in order to determine the factors that have limited the impact of monetary policy and impeded recovery from the recession. Finally, by examining comparable financial crises and balance sheet recessions in other countries, we present evidence that fiscal consolidation and the resulting exchange rate depreciation is an effective response to these crises, and is more likely than a program of government stimulus to generate a robust recovery.

How monetary policy normally works: the 1980 and 1981-82 recessions as exemplars

Our analysis of the 1980 and 1981-82 “double-dip” recessions demonstrates the sharp impact that monetary policy has on mortgage lending, new home sales, and residential construction. These were “natural experiments” in which monetary policy was tightened and relaxed twice in quick succession. With each shift in monetary policy, expenditures on new housing units responded more quickly and with larger magnitude than output in any other major sector of the economy. These recessions also demonstrate that housing sales and construction are reliable leading indicators of a coming downturn. As shown in Figure 1, from the peak of housing construction in the third quarter of 1978 until the peak of the economic cycle six quarters later, expenditures on new single-family and multi-family housing units (which we refer to hereafter as “housing construction” or “housing”) fell 21.7%. When housing construction reached its first trough in the third quarter of 1980 it had fallen 40.6% from its peak. The decline in new home sales was even more precipitous: from a peak in the second quarter of 1978 until the peak of the economic cycle seven quarters later, new home sales fell 37.1%. From the peak of new home sales in the second quarter of 1978 until the first trough in the middle of the 1980 recession, new home sales fell a total of 45.6%. One quarter after monetary policy was relaxed (i.e., when the Effective Federal Funds rate was reduced from 19.4% in early April 1980 to 9.0% in mid-June 1980), new home sales shot up 35.9% in the next quarter; one quarter after that housing construction increased. When monetary policy was tightened again toward the end of 1980, new home sales dropped sharply and two quarters later housing construction began another decline. In the second housing decline, which lasted

from the second quarter of 1981 to the second quarter of 1982, housing construction fell 36.0%. Over an almost four year period, from the third quarter of 1978 to the second quarter of 1982, housing construction fell 55.2%. Each shift in monetary policy quickly had an impact, first on new home sales and then on residential construction, and each foreshadowed what followed in the overall economy. These shifts are depicted in Figure 1.

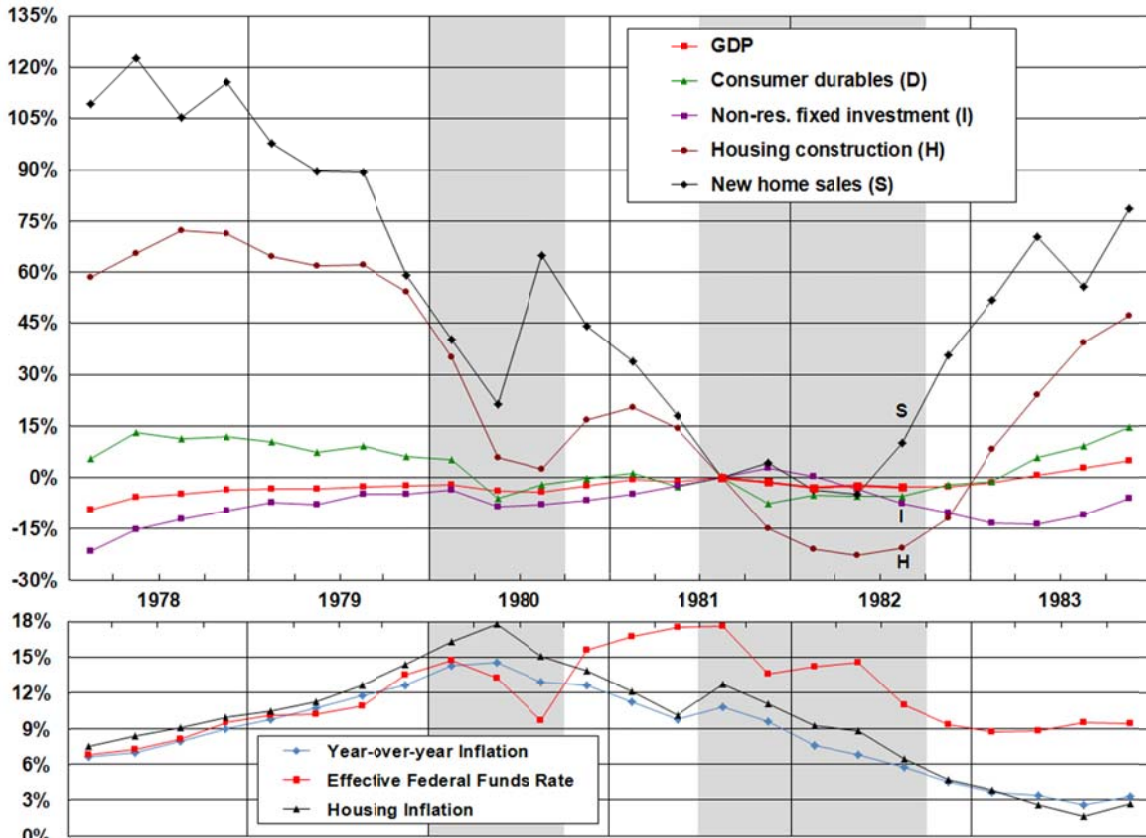


Figure 1: Percentage changes to GDP and its major components from 1978 to 1983. The housing construction series (H) indicates the percentage difference between real expenditures on new housing units in the indicated quarter and its level at the start of the recession in the third quarter of 1981. For example, housing was 72.3 percent higher in Q3 1978 than it was in Q3 1981; it was 14.7 percent lower in Q4 1981 than it was in Q3 1981. Other series are interpreted similarly. Monetary policy was tightened and relaxed twice in succession between late 1979 and late 1982; each shift produced a corresponding shift in mortgage finance, new home sales, and residential construction.

In addition to the large changes in sales of new housing units and in expenditure on new housing units, declines in housing and consumer durables came before investment declines and exceeded the size of investment declines over the same period.¹ In the 1980 recession, real

¹ For brevity we refer to households' durable goods expenditures (NIPA Table 1.1.5 line 4) as 'durables' (D), non-residential fixed investment (NIPA Table 1.1.5 line 9) as 'investment' (I), and expenditure on new single-family and

(i.e., inflation adjusted) expenditures on housing fell \$88.3 billion, whereas real non-residential fixed investment fell only \$29.6 billion.² Over the course of the two combined recessions, housing fell \$120.9 billion, the sum of housing and consumer durables fell \$201.7 billion, and investment fell \$131.5 billion. Households' interest-rate-sensitive components of consumption therefore had a stronger impact on the development of this downturn than non-residential fixed investment: housing plus durables peaked 12 quarters before investment, and the dollar amount of their decline exceeded the investment decline by 53.4%. The timing and the magnitude of these events reveal that housing and households' durable goods consumption play a crucial role in economic cycles.

The usual impact of monetary policy

One of the key observations from this episode is that, under normal circumstances, monetary policy has its sharpest impact on mortgage finance and consumer lending. When the Federal Reserve increases its purchases of short-term Treasury securities, that pushes their price up, lowering short-term interest rates. This has two effects on depository institutions. It brings down their cost of funds: since Treasury bills – a close substitute for demand and time deposits – have a low yield, banks can pay a low interest rate and still attract deposits. At the same time, mortgage and other interest rates fall much more slowly, so open market purchases by the Federal Reserve open up a gap between the lending and borrowing rates of depository institutions. Consequently, open market purchases by the Federal Reserve encourage lending, primarily to households and to small businesses who rely on financial intermediaries for access to credit.³ When mortgage lending increases, that immediately leads to sales of new homes, which in turn leads to construction of new homes to replenish the depleted inventory. When lending to consumers increases, consumer durable good sales increase. These effects are clearly demonstrated in Figure 1, which shows that each shift to short-term interest rates led to a corresponding shift in new home sales and also to a change in residential construction and

multi-family housing units (NIPA Table 5.3.5 line 19) as 'housing' (H). (Many researchers take NIPA Table 1.1.5 line 12 as their measure of residential construction, but that category includes brokers' commissions on real estate sales and other miscellaneous items.) All series are converted from nominal to real figures by dividing by GDP deflators. GDP deflators are calculated by dividing NIPA Table 1.1.5 line 1 by Table 1.1.6 line 1. In addition to GDP and some of its components from the NIPA, we also graph new home sales which are compiled by the Census Bureau and reported at <http://www.census.gov/const/soldreg.pdf>.

² Unless otherwise noted, dollar amounts in this article are inflation adjusted to 2005 dollars.

³ While households and small businesses rely on financial intermediaries, large corporations typically have access to corporate bond markets especially for their long-term financing requirements. Consequently they are less affected by shifts in monetary policy that primarily affect the incentive of financial intermediaries to lend.

consumer durable goods purchases, but monetary policy shifts had a much more limited effect on *non-residential* fixed investment.

Why monetary policy isn’t working: effects of the mortgage finance bubble and collapse

The recent recession is widely attributed to a housing bubble that began with a strong recovery of house price appreciation in 1998 but turned into a strong mortgage-financed bubble between 2002 and 2005.⁴ During the period of most rapid price increases – between July 2003 and July 2005 – the Case-Shiller composite index of housing prices in 20 U.S. cities increased 35%.⁵ Notably this was also a period of historically high flows of mortgage finance (measured as a percentage of GDP).

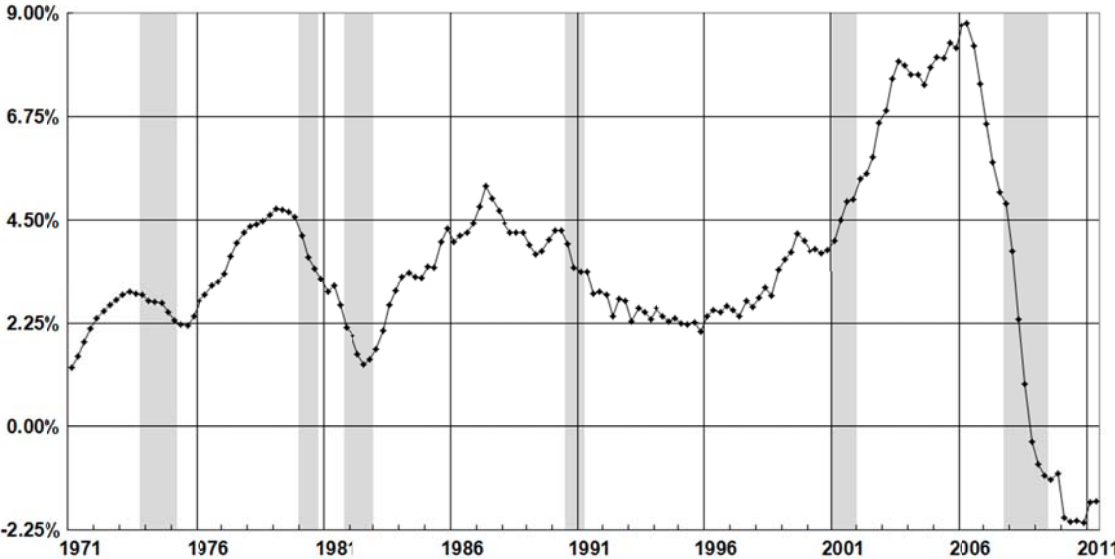


Figure 2: The net flow of household mortgage credit as a percentage of GDP. The figures are one year moving averages of quarterly figures.

This large increase in mortgage lending provided the impetus to the rapid rise in home prices. Between the first quarter of 2002 and the first quarter of 2006 the real mortgage debt of U.S. households rose from \$5.97 trillion to \$8.97 trillion, an increase of just over 50%. Figure

⁴ Between 1996 and 2006, annual rates of real house price appreciation were -1.1% (in 1996), 2.5% (1997), 5.4% (1998), 5.4% (1999), 6.1% (2000), 5.7% (2001), 8.2% (2002), 8.6% (2003), 10.9% (2004), 10.5% (2005), -2.2% (2006), and -11.9% (2007). The early years of price rises were associated with increasing net flow of mortgage credit, while the years of double digit price increases were associated with historically high levels of mortgage credit, as Figure 2 shows.

⁵ Nominal Case-Shiller house price indices increased 72 percent in Las Vegas during this two year period, 62 percent in Phoenix, 56 percent in Los Angeles, 47 percent in San Diego, and 43 percent in San Francisco.

2 shows the net flow of mortgage funds as a percentage of GDP.⁶ This ratio surged to a historical high in the 5 ½ years after the 2001 recession. *In every quarter between the first quarter of 2002 and the second quarter of 2007, the net flow of mortgage credit was almost three times as high as its average level of 3.1% of GDP in the preceding half century.* Excessive lending that combined lax underwriting standards with low down payments pushed house prices well above sustainable levels. When the bubble burst, many mortgages became delinquent and a large part of the loan principal of defaulting borrowers was lost by lenders and investors because of the low down payments and the large price declines. New investment in mortgage credit dropped precipitously from a historical high of 8.8% of GDP in the second quarter of 2006 to -2.0% of GDP four years later.

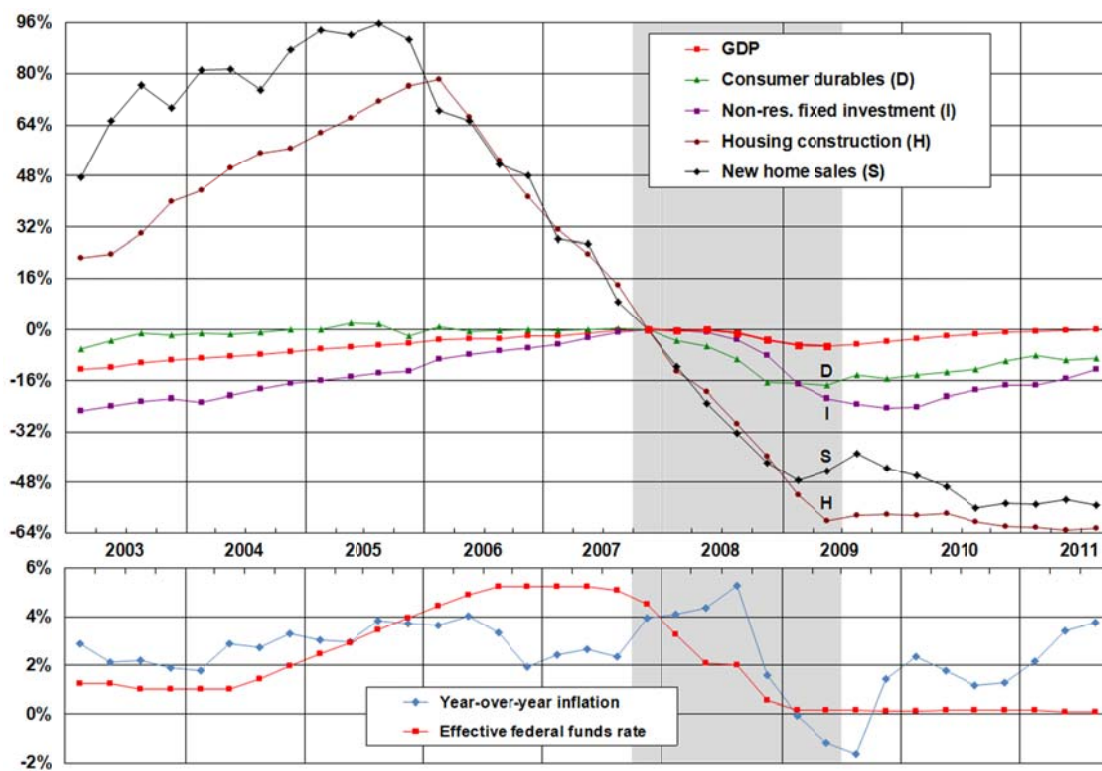


Figure 3: Percentage changes to GDP and its major components before, during, and after the Great Recession. The patterns of decline are typical, but amplified by the collapse of the housing bubble. The pattern of recovery though is atypical: housing normally leads a recovery. A large inventory of foreclosed homes suppresses housing construction, household balance sheet damage (negative equity) limits recovery of durable goods consumption, and suppressed aggregate demand limits the need for non-residential fixed investment. Evidence of all three problems is visible in the graph.

⁶ The net flow of mortgage funds is the change in total mortgage credit outstanding. It is approximately equal to new mortgage originations (including home equity loans) minus mortgage prepayments and mortgage principal payments. These data are taken from the Federal Reserve Flow of Funds, Table F.218, line 2.

Where did the money come from that fueled the large price increases and the large accumulation of mortgage debt between 2002 and 2005? In part it came from the extreme monetary ease from 2001 to 2004,⁷ but in considerable part it came from overseas. In 1997, the current account deficit (the amount of money flowing into the country minus what was flowing out) stood at \$152.8 billion or 1.55% of GDP. By 2006 the current account deficit had ballooned to \$772.9 billion or 5.97% of GDP.⁸

When rapidly escalating mortgage delinquencies revealed the fragility of the housing market in 2006, the flow of mortgage funds abruptly began a sharp decline, and the price collapse accelerated. The impact of these developments on housing is apparent in Figure 3: sales of new homes began a sharp collapse in the first quarter of 2006 and residential construction began to collapse the next quarter. When investment peaked in the first quarter of 2008, housing plus durables had already fallen \$230.9 billion over the previous seven quarters.

The grey area in Figure 3 shows the recession. It was not until the third quarter of 2011 that GDP recovered to its peak level from the first quarter of 2008. *This is the longest downturn in GDP since the end of the Second World War.* The recoveries to investment and consumer durables have been weak, and there has been no recovery in housing, as Figure 3 shows. This lack of response to historically low short-term interest rates has no precedent in the post-war era: residential construction has increased more than any other area of the economy after every recession between the 1948-49 recession and the 2001 recession.

Figure 4 shows the collapse of home equity. The figure shows that the value of homes moved up with mortgage debt from 1997 through the first quarter of 2006.⁹ Afterward, home value began to decline, mortgage debt held steady, home equity plunged, and it is now below its level 1997. Since the banks hold the mortgage debt of households, bank balance sheets have suffered a decline in asset value and this has reduced their willingness to lend.

An unusually large inventory of homes from foreclosure is suppressing housing construction; damage to household balance sheets is limiting recovery of durable goods consumption; and suppressed aggregate demand is limiting the need for non-residential fixed investment. Evidence of all three problems is visible in Figure 3. Resolution of the first problem takes time: a decrease in the surplus of homes is difficult when slow job creation reduces the rate of

⁷ Note the turnaround and surge in the flow of mortgage credit in Figure 2. The Federal Funds rate was not tightened until the end of 2004 (Figure 3).

⁸ The current account deficit figures are from the Federal Reserve Flow of Funds, Table F.107, line 63.

⁹ Households' residential assets are from the Flow of Funds, Table B.100, line 4. Residential mortgage debt is from the Flow of Funds, Table L.218, line 2. Housing equity is the value of residential real estate minus mortgage debt.

household formation. The second problem also takes time as households slowly reduce their mortgage debt through years of principal payments.

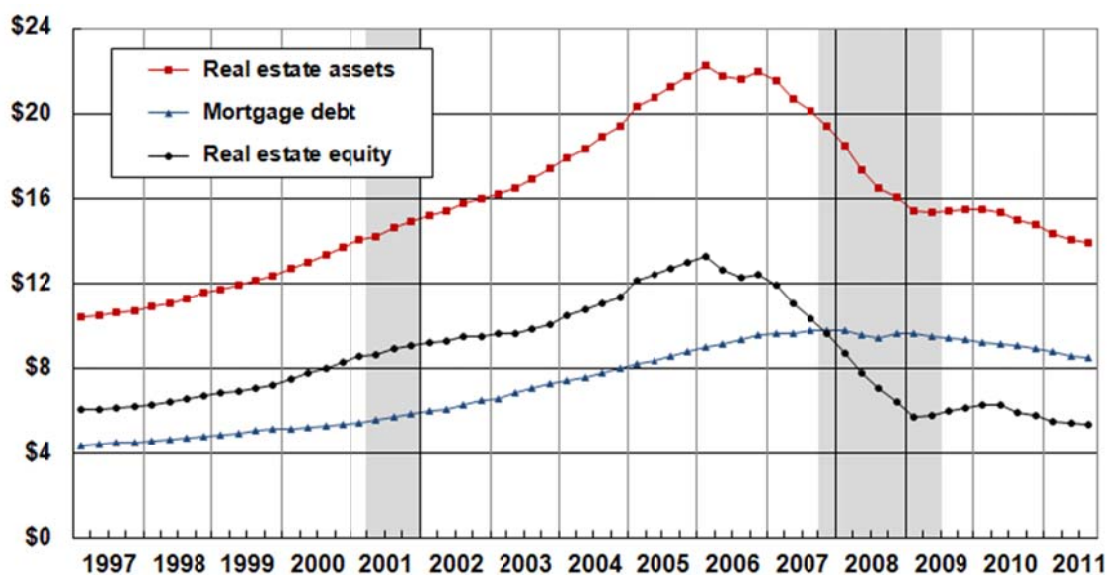


Figure 4: Housing value, mortgage debt, and housing equity (value minus debt) grew steadily during the bubble. After the bubble collapsed, households were left with high mortgage debt loads and diminished equity.

Limitations of monetary and fiscal policy in a balance sheet recession

The accommodative Federal Reserve monetary policy in 2008 combined with the bank bailouts probably prevented a collapse of the financial system like the one that occurred in the Great Depression. To that extent the monetary stimulus has been a success. But it has not generated a robust recovery. Since monetary policy typically has its most pronounced effect on mortgage lending and consumer finance, and since these are both unresponsive now due to households' excessive debt burdens and concerns about the prospect of further house price declines, monetary accommodation is unlikely to generate a quick recovery, in spite of its magnitude. Other direct evidence reinforces this view. Lending and economic performance changed little when the Federal Reserve embarked on its second quantitative easing program (QE2). Between November 17, 2010 and July 6, 2011 the Federal Reserve increased its holdings of U.S. Treasury securities by \$750.9 billion.¹⁰ We've shown that in past recessions, when the Federal Reserve drives down short-term interest rates, banks have an incentive to lend. But during the 7 ½ months of QE2, total lending of commercial banks in the U.S. declined from

¹⁰ We calculate Treasury security acquisition by the Federal Reserve from the difference between line 3 in Table 1 of the July 7, 2011 and the Nov. 18, 2010 H.4.1 releases from the Federal Reserve.

\$6.92 trillion to \$6.56 trillion.¹¹ If, as we argued, it is the gap between lending rates and funding costs that create the incentive to lend, then the lack of response to QE2 is understandable: whatever problems restrained lending before QE2 remained during the QE2 program, because the QE2 program only drove the yield on short-term Treasury debt down from 0.2% to 0.1%. Although it's possible that bank lending would have fallen more without the QE2 program, its ineffectiveness strongly suggests that monetary policy alone cannot rekindle investment and growth in the current environment.

Neither fiscal stimulus nor exceptionally easy monetary policy has been effective in generating a robust recovery. We believe this poor performance relates directly to the severe household and bank balance sheet damage caused by the housing boom and bust. Until that damage is repaired we are unlikely to see robust economic growth. The challenge then is to determine what course of action promotes balance sheet repair. Our examination of past financial crises indicates that fiscal consolidation has triggered exchange rate depreciation in other countries, and depreciation has led to strong recoveries based on export growth.

Financial Inflows and Depreciation

In all of the cases we've examined of economies that experience a boom and collapse, with a financial crisis precipitated by the collapse, a rapid increase in fixed investment has been a significant element of the boom.¹² In most of these cases, substantial support for the boom has come from foreign investment. During a boom, most financial inflows find their way into private investments by either households or firms. After a boom in fixed investment collapses, the demand for private investment instruments (such as mortgage-backed securities) diminishes sharply. If the supply of public investment instruments (i.e., sovereign debt) also declines, there are few instruments that foreign investors can obtain from a country that has been running a current account deficit. This necessitates a change. If foreign investors don't find appealing investment instruments, then financial inflows will cease or even switch direction. The immediate effect of the reduced foreign demand for investment instruments is a decline in the exchange rate. This currency depreciation immediately reduces the price of exports and raises the price of imports; exporters expand output in response to the surge in profit margins. Hence, the reversal of financial and capital account flows translate into a reversal of the current account deficit. And the shift toward exports also adds to total output and generates an added income stream for export-oriented firms, for their suppliers, and for the labor market.

¹¹ The figures on bank lending come from line 9 on page 2 of the H.8 release from the Federal Reserve.

¹² Fixed investments are primarily residential and commercial structures and firms' investments in plants and equipment.

Fiscal Consolidation, Depreciation and Export Growth in the Finnish, Thai, and Icelandic Crises

The course of the Finnish, Thai, and Icelandic bubbles and collapses and their financial crises were similar in many ways to our own experience although the downturns in GDP and in fixed investment were considerably larger in all three than they were in the U.S. GDP fell 12.6% in Finland, 16.0% in Thailand, and 14.3% in Iceland. From the peak of fixed capital investment just before the start of the crises, Finnish fixed investment fell 52.5%, fixed investment in Thailand fell 58.9%, and Iceland's fixed investment fell 77.7%. In Finland, fixed investment peaked in the last quarter of 1989; it was 17 ½ years before fixed investment reached that level again. In Thailand, fixed investment peaked 15 years ago (in the fourth quarter of 1996), yet real fixed investment was still 9.9% below that peak level in the third quarter of 2011. In the third quarter of 2001, real fixed investment in Iceland is 67.7% below the peak it attained in the fourth quarter of 2006. In the U.S., non-residential fixed investment plus investment in residential structures fell 32.5% between its peak in the first quarter of 2006 and its trough in the fourth quarter of 2009; it now stands 23.4% below its peak level. In all of these economies, for a recovery something needs to pick up the slack from the steep declines in fixed investment.

We've seen common patterns in Finland, Thailand, and Iceland. In each of these countries, when fixed investment collapsed, economic output contracted sharply. But in all three cases, capital inflows and the current account deficit continued until government expenditures were curtailed; once government expenditures fell, neither the private sector nor the public sector could absorb capital inflows from abroad. International capital inflows reversed direction, their currencies depreciated sharply, and net exports grew rapidly.

Following depreciation, when exports rapidly increase (and typically overtake imports as they did in Finland, Thailand, and Iceland), that addresses several problems. First, a current account surplus replaces the net capital inflows that existed when the country was running a current account deficit. That is, the income stream generated when exports exceed imports is a form of capital formation that can replace the financial inflows from abroad that prevailed before depreciation and the current account reversal. Second, the capital formation that results from a reversal of the current account can be used to repay the foreign debts accumulated during the period of current account deficits; far from "begging" their neighbors, they are paying them back. Third, export production becomes a source of growth in place of the growth of fixed investments that is so common during a boom. Finally, depreciation creates the inflationary pressure that domestic monetary policy was impotent to create, and typically overcomes the deflationary pressure that is so commonly a part of the collapse of an investment boom. These forces begin mending damaged balance sheets by reducing debt load relative to asset value, and rebuilding equity.

The declines in investment in Finland, Thailand, and Iceland were extremely deep, yet growth rates during the recovery periods in those countries have been considerably higher than in the U.S. since the second quarter of 2009. The annual growth rate in the U.S. in the ten quarters since the bottom of the recession has been 2.4%. In Finland, the annual growth rate over the first ten quarters after the recession was 3.4% and in Thailand it was 5.0%. Iceland is only 5 quarters into its recovery but its growth rate over that period has been 5.5% per year. Our argument is that export driven growth is the most effective course when the collapse of a fixed investment boom leads to losses on assets, a financial crisis, a severe downturn and damaged balance sheets. This constitutes the most powerful argument as to why fiscal consolidation can work to restore growth after a balance sheet recession.

The Finnish Crisis

The Finnish crisis was preceded by a long period with a high level of fixed investment that increased until it peaked at 30.4% of GDP. Fixed investment began to collapse in the first quarter of 1990. By the time of the banking crisis in the fall of 1991, fixed investment had fallen nearly 30%. Government expenditures continued to rise rapidly during the first six quarters of the downturn, but after the financial crisis, government expenditures leveled off in the last quarter of 1991 and began to fall early in 1992. This led to a sharp depreciation of the Finnish markka between August of 1992 and February of 1993. Exports, which had been fluctuating in a narrow range around 25% of the Finnish economy since the last quarter of 1985, began to surge immediately after the depreciation of the markka, reaching 35% of Finnish output two years after the depreciation began. In a pattern that we've seen following financial crises in many countries, when government expenditures were curtailed, the currency depreciated sharply and the growth rate of exports moved sharply ahead of the growth rate of imports. The reduction to government expenditures came at the middle of the depression, but even after the depression ended there was a modest decline in government expenditures that continued until the recovery was well underway.

Soon after government expenditures began to fall, the value of the Finnish markka fell 33.3%. By the time that the sharp depreciation ended, a gap had already opened up between exports and imports. That gap grew over time and by the end of 1993 Finland had entered a current account surplus. (The fact that net exports were almost 4% of GDP in the third quarter of 1993 and the current account was still negative indicates that service costs on external debt were large in Finland after the large capital inflows in the 1980s.)

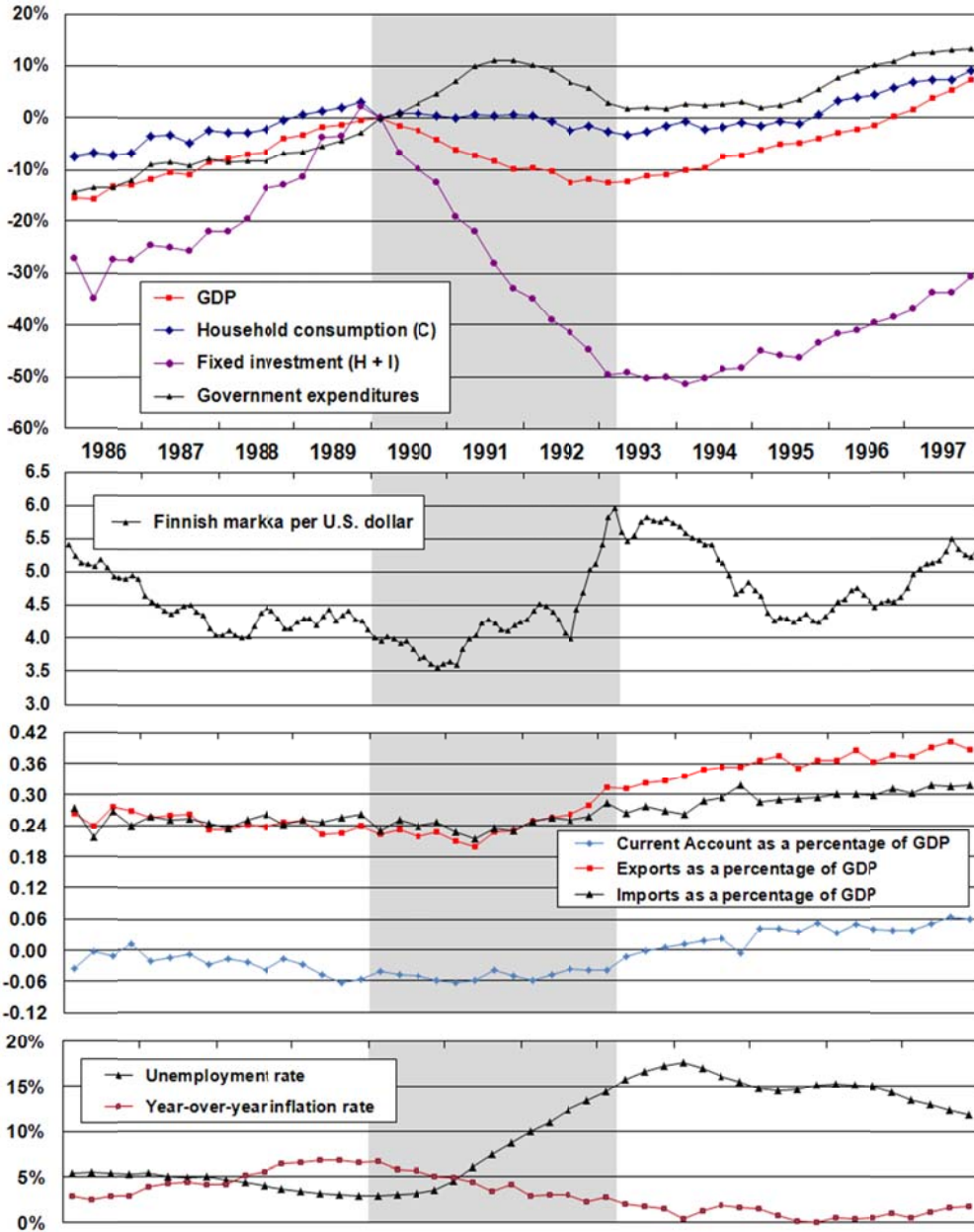


Figure 5: The Finnish depression in 1990-93. The Finnish downturn was nearly 2½ times as deep as the U.S. downturn and their fixed investment collapse, at 14.4% of GDP, was substantially larger than the maximum fixed investment decline of 4.9% of GDP in the U.S.

When the economic cycle peaked in the first quarter of 1990, Finnish exports were 22.4% of GDP. By the time that GDP recovered to its peak level in the fourth quarter of 1996, exports had reached 37.5% of GDP. During the same period imports went from 23.1% of GDP to 31.1% of GDP. Pre-crisis, during the period when the current account is negative, imports typically grow faster than exports. Post-crisis that reverses. The reversal appears to be part of a natural process in which external creditors recognize that capital flows are out of balance and their

investments might not perform well. When the currency depreciates excessive inflows of capital decline and eventually reverse. The fundamental dislocation during the crisis and depression was a collapse of fixed investment; the recovery consisted primarily in filling the gap from the reduction to fixed investment with export growth. Fixed investment was 29.7% of the Finnish economy at the peak of the economic cycle in the first quarter of 1990. When the peak level of GDP was first reached again in the fourth quarter of 1996, fixed investment was 18.2% of GDP. Exports increased by 15.1% of GDP over that period, while imports increased by 8.0% of GDP. Net exports increased by 7.1% of GDP over that period while fixed investment declined by 11.5% of GDP. To a large extent the recovery consisted of a shift from fixed investment to production for export to the rest of the world.

One frequent objection to depreciation is that it will set off a series of competitive devaluations that essentially constitute a zero-sum game in which countries in succession follow a beggar-thy-neighbor strategy, taking export market share away from other countries. But this is not what happened in Finland: 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% (only 0.5% per year); in the first four years after depreciation real imports grew 38.2% (8.4% per year) and in the first eight years after depreciation they grew 73.2% (7.1% per year). In most of the other serious downturns that we've examined, including Thailand, Korea, and Argentina, large import increases have followed depreciation, so this objection to depreciation has no empirical support in the crisis countries that we have evaluated.

The Thai Crisis

We've described linkages from fiscal discipline to currency depreciation, and from depreciation to a shift toward export-led growth in Finland. We next turn to Thailand where the same sequence played out. As in the U.S. over the decade from 1997 to 2006, Thailand went through a long period of large current account deficits. As in the U.S., as investment grew and current account deficits accumulated, investors eventually grew skittish and withdrew. After asset values fell and international financial inflows ceased, the financial crisis developed and International Monetary Fund (IMF) assistance was sought. Loan funds from the IMF were provided with the stipulation that government finances remain on a solid foundation. Restricted access to foreign capital meant that capital was scarce, and that a reversal of the current account from deficit to surplus was the only way to improve liquidity.

In Thailand, the collapses in construction and investment were very pronounced, as was the 16.0% decline in real GDP. Reversal of the current account deficit came early in the Thai depression, and the improvement was extremely rapid and then subsided. If we examine the changes in output from the peak of the economic cycle in the third quarter of 1996 to output

when the economy reached its peak output level again in the third quarter of 2002, we find that, as in Finland, the decline in fixed investment accounted for most of the fall in output, and the increase in net exports accounted for most of the recovery of output.

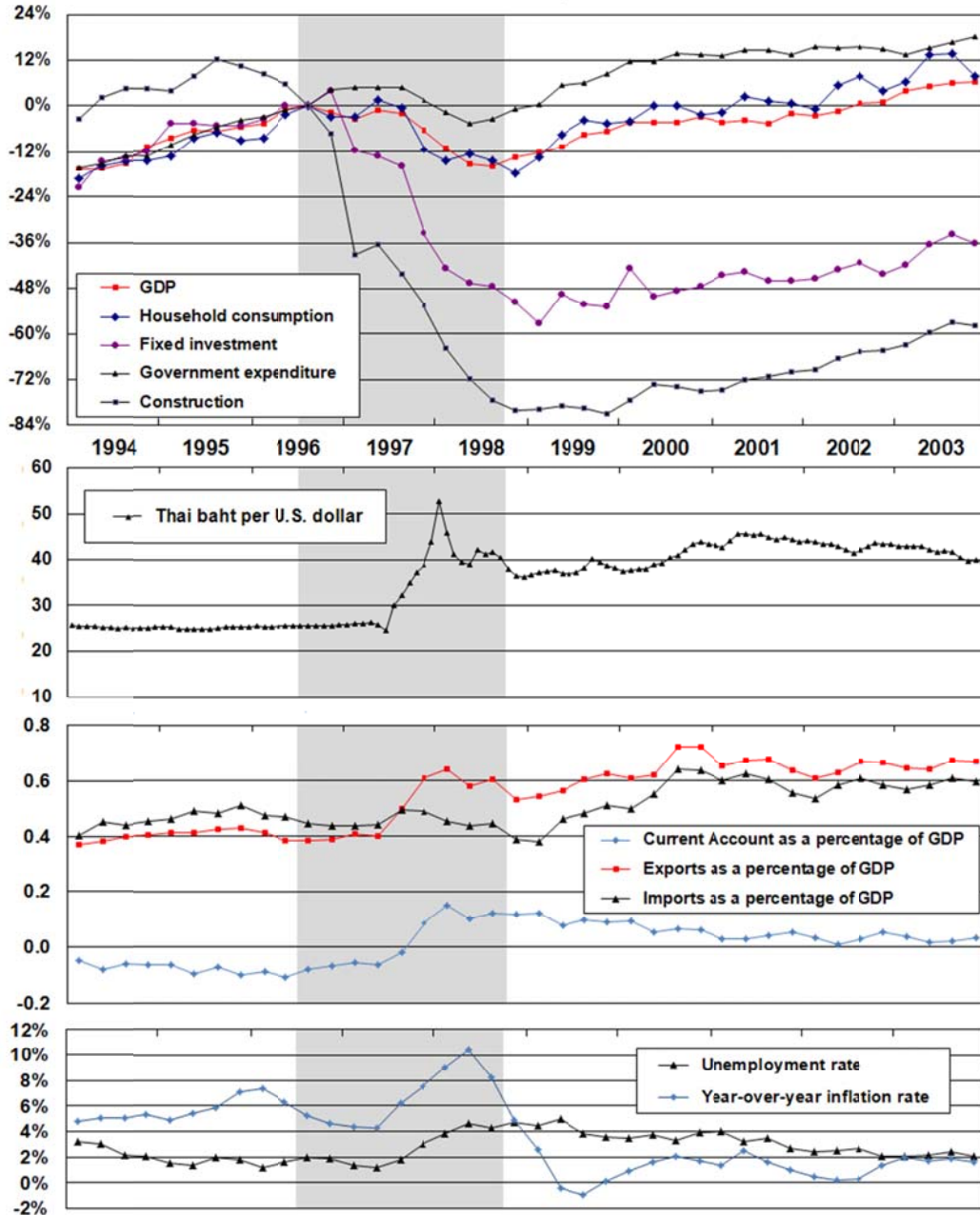


Figure 6: The Thai depression of 1996-98. The Thai downturn was deep, but the quick recovery of their current account facilitated balance sheet repair. The lack of foreign capital investment after the crisis forced devaluation on Thailand because that was the only way to obtain needed funds.

From the peak of the economic cycle in the third quarter of 1996 until that peak output level was finally reached again in the first quarter of 2002, fixed investment fell from 39.6% of GDP to 23.0% of GDP. During the same period, exports went from 37.8% of GDP to 61.7% of GDP, and imports increased from 43.7% of GDP to 54.3% of GDP. As in the Finnish depression, fixed investment fell substantially as a proportion of GDP, and net exports made up for much of the decline. In Thailand the decline in fixed investment was 16.6% of GDP and the increase in net exports was 13.3% of GDP. Clearly it was net exports that made up for most of the decline in fixed investment. Moreover, as in Finland, in Thailand 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% of GDP to 54.3% of GDP.

The Icelandic Crisis

The Icelandic crisis was preceded by several years of extraordinary capital inflows. At its maximum, the gap between imports and exports reached 19.6% of GDP in the second 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%. For perspective, growth of fixed investment exceeded total growth of the Icelandic economy during that period. When the fixed investment bubble burst, the collapse was even faster than the expansion had been – real fixed capital formation fell 77.7% in only 9 quarters – and it fell to a level below its level when the rapid expansion began.

The rapid expansion of fixed investment was fueled by the large increase in the 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 on the eve of the financial crisis. The U.S. has a large banking system, but the liabilities of our financial sector in the third quarter of 2008 when the financial crisis struck was 1.18 times GDP.

Soon after the financial crisis entered its final stage in the U.S. conditions deteriorated sharply in Iceland. The assets of the Icelandic banking system were illiquid and their value 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 after fiscal consolidation was undertaken, and the exports quickly overtook imports. As in Finland and Thailand, the improvement in net exports has been the major contributor to the recovery up to this point. Real GDP in Iceland now (as of the third quarter of 2011) is just above its level in the fourth quarter of 2006 when fixed investment peaked. Over that nearly five year period, fixed investment has fallen from 34.7% of GDP to 11.2% of GDP – a decline of 23.5% of GDP. In that same period, exports have increased by 27.3% of GDP and imports have fallen by 1.5% of GDP,

so net exports have increased by 28.8% of GDP. The improvement in net exports can account for the entire recovery of Icelandic output to a level that it first attained just three quarters before the peak of the economic cycle.

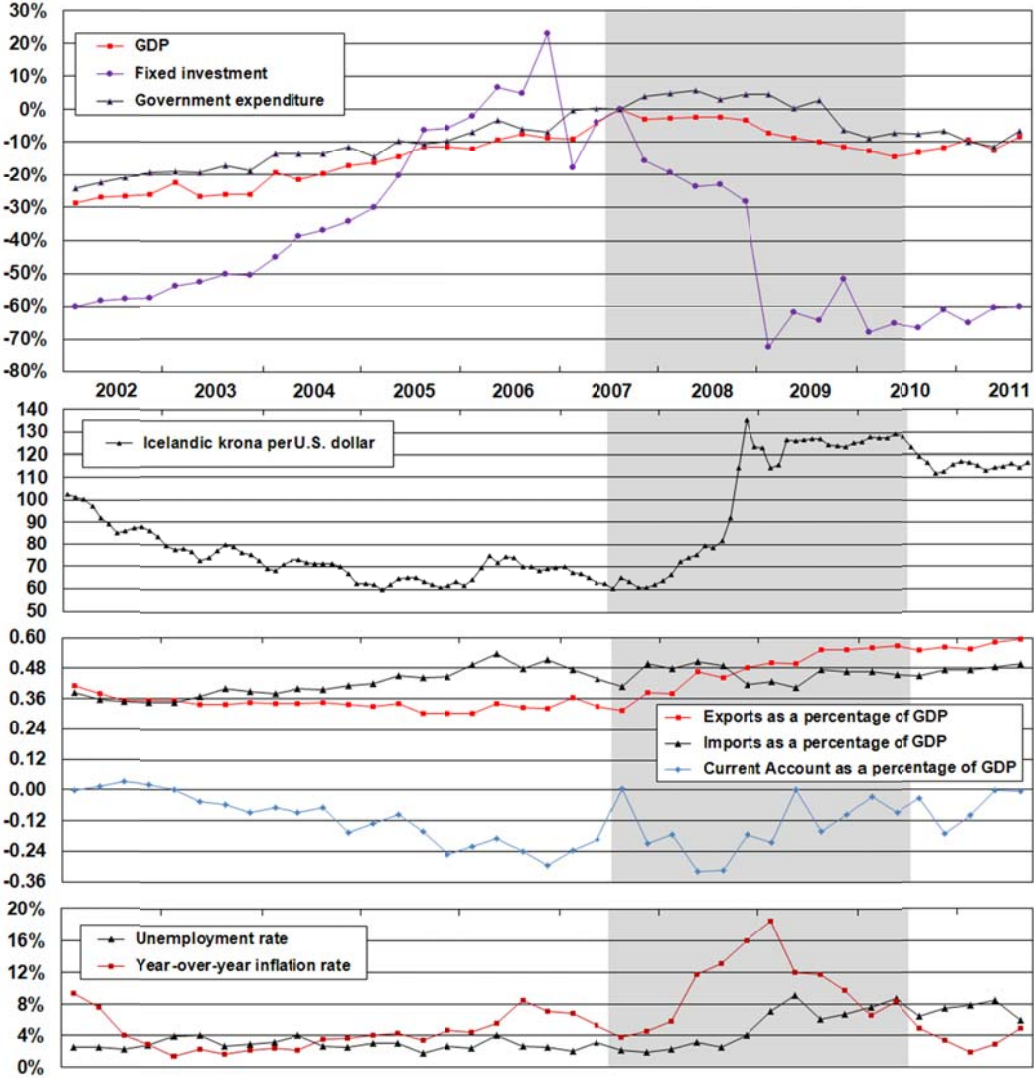


Figure 7: The Icelandic depression of 2007-10. The Icelandic depression was nearly 2½ times as deep as the U.S. downturn and their fixed investment collapse, at 27.0% of GDP, was over 5½ times larger than the maximum fixed investment decline of 4.9% of GDP in the U.S. Nevertheless, their growth rate during their recovery has exceeded the growth rate in the U.S. since our recovery began.

Conclusions

When households and banks suffer from widespread continuing balance sheet damage, the economy's response to both monetary and fiscal stimulus is severely muted compared with what would normally be expected if the household and bank equity positions were strong. The

experience of other countries strongly suggests that in these circumstances fiscal consolidation triggers a mechanism – currency depreciation – that supports recovery of aggregate output.

The fiscal consolidation-currency depreciation mechanism is remarkable¹³; it offers a subtle end-run around the failure of monetary ease to stimulate households' demand for housing and durable goods via the normal route of lowering their financing cost. The effect of depreciation is to immediately increase the solvency and improve the balance sheets in export related industries. It will also tend to be inflationary and this serves to initiate a mechanism for reducing the burden of debt and improving balance sheets generally in the economy.

Although the export increases in Finland, Thailand, and Iceland were very large, comparable increases are not required in the U.S. for at least two reasons. In Finland, fixed investment fell from 30.4% of GDP just before the peak of their economic cycle to only 16.0% four years later. In the U.S., fixed investment (including residential construction) fell from a peak of 15.0% of GDP to 10.1% of GDP. The fixed investment decline in Finland was over 2¾ times as large relative to GDP as it was in the U.S. In the third quarter of 2011, investment in the U.S. is \$380 billion below its peak level. In Finland most of the adjustment took the form of a shift from fixed investment toward a greater emphasis on exports. For the U.S. to replace that investment gap with exports, we would need to see an increase in exports from 13.9% of GDP to 16.4% of GDP. An increase in exports of this magnitude is feasible. Even if the effect is not that large, it would work the right direction, aiding recovery.

Fiscal stimulus serves only to extend a current account deficit from the pre-crash period into the post-crash period, pushing up the value of the dollar, making our exports less competitive on world markets. We've shown three countries that all cut their government expenditures and quickly experienced a sharp depreciation, rapid export growth, and then a robust recovery. All three of these countries experienced a reduction in fixed investment during their crash that was much more severe than our own. In one of these cases, Finland, it took 17 ½ years before real fixed investment recovered to its pre-crisis level; even after it had recovered, fixed investment remained a much smaller part of the economy. At the peak of the investment boom in the last quarter of 1989 fixed investment was 30.4% of the Finnish economy; in the second quarter of 2011 twenty-one and a half years after the collapse began it was 19.0% of their economy. Two decades after the collapse fixed investment has not recovered the role that it had in the Finnish economy before the collapse, and probably never will. Proponents of fiscal stimulus suggest that government expenditures should fill the gap from declining private investment, but this is an enormous gap to fill, and past experience suggests that it would need to be filled for a long time. No government could persist in such a program and remain solvent,

¹³ We saw its opposite occur in the aftermath of the stimulus of 2008-9 which ushered in an increase in the US current account deficit, and worked against an increase in domestic demand and employment.

nor is there any need to do so. The growth and recovery in Finland, as in Thailand and Iceland, came in net exports. Fortunately for the U.S., we had a much smaller decline in fixed investment, from 15.0% of GDP to 10.1% of GDP, so we need a much smaller increase in exports to compensate for the investment decline. But there is good reason to believe that we'll need the growth in exports to compensate for the decline in fixed investment: in the year and a half since fixed investment bottomed out at 10.1% of GDP, it has only risen to 11.1% of GDP. We've only recovered one fifth of the way to the peak of fixed investment when it reached 15.0% of GDP five and a half years ago. Based on our own slow recovery, and on the decade and a half that it has taken other countries to regain declines in fixed investment after fixed investment booms end, it seems clear that something else needs to fill the gap: export-led growth has filled that role in all of the other comparable crashes that we've examined.