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Consumption and Investment Booms in the 1920s and Their Collapse in 1930

Steven Gjerstad and Vernon L. Smith

As explanations of the so-called business cycle, or cycles, when these are really serious, I doubt the adequacy of over-production, . . . over-confidence, over-investment, over-saving, over-spending, and the discrepancy between saving and investment. I venture the opinion . . . that in the great booms and depressions each of the above named factors played a subordinate role as compared with two dominant factors, namely over-indebtedness to start with and deflation following soon after.

Over-investment and over-speculation are often important; but they would have far less serious results were they not conducted with borrowed money.

The same is true as to over-confidence. I fancy that over-confidence seldom does any great harm except when . . . it beguiles its victims into debt.

—Irving Fisher (1933, 340–41)

3.1 Interpretations of the Great Depression

Similarities between the financial crisis in September 2008 and the collapse of the financial system during the Depression have been widely noted. Yet the comparability of the origins and transmission of the crises have been neglected. The recent downturn, which originated with a pronounced housing boom and collapse, led to severe household balance sheet problems that were transmitted to lenders and mortgage security investors. Damage to household balance sheets weakened household demand—especially for housing and durable goods—which adversely affected employment, production, and nonresidential fixed investment. This pattern, however, is not

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recognized in the dominant view as a possible cause of the Depression. Contrary to prevailing views of the origins of the Great Depression, we argue in this chapter that changes in levels of mortgage finance, residential construction, and the broader economy preceding and during the initial phases of the Great Depression shared many features with the recent Great Recession. Based on data collected in Wickens (1937) we estimate that by the end of the Great Depression, losses on mortgage loans exceeded estimates of losses in the Great Recession, either as a percentage of loans outstanding or as a percentage of aggregate output.

3.1.1 Friedman and Schwartz versus Real Business Cycle Interpretations

The interpretation of the Depression that Friedman and Schwartz articulated in *A Monetary History of the United States* is probably the most influential. Friedman and Schwartz (1963, 300) argued that during the Depression the "monetary collapse was not the inescapable consequence of other forces, but rather a largely independent factor which exerted a powerful influence on the course of events." They further argued that "different and feasible actions by the monetary authorities could have prevented the decline in the stock of money—indeed, could have produced almost any desired increase in the money stock" (301). But they also admit that while "monetary expansion . . . would have reduced the contraction's severity . . . the contraction might still have been relatively severe." Much effort has been expended in efforts to understand the monetary contraction that took center stage in 1931. In this chapter we focus on the background for the stresses that emerged in the financial system. Before the serious deterioration of the banking system developed at the end of 1930, the United States had already experienced a deep downturn in output. In the aftermath of a debt-fueled residential real estate bubble, expansionary monetary policy could not entirely eliminate the effects of the resulting household balance sheet problems, financial sector losses, and the collapse in mortgage lending. Misallocation of resources and investment losses could not be reversed by central bank provision of liquidity in an environment in which a significant portion of households and their lenders faced insolvency.

In contrast to the monetary policy explanation of Friedman and Schwartz, the real business cycle (RBC) literature initiated by Kydland and Prescott (1982) contends that economic downturns have their origin in serially correlated negative productivity shocks that reduce aggregate output. Although this view has been influential, in its current form it is implausible. It would be difficult to argue that the decline in US automobile and light truck production from 10.47 million units in 2007 to only 5.56 million units in 2009 resulted from a shock to productivity. If a productivity shock drove the decline of this magnitude, then the relative scarcity of automobiles should have resulted in an increase in automobile prices, but in fact, the Consumer Price Index component for new cars and light trucks fell 0.5 percent from

2007 to 2009.[1] Construction of new single-family and multifamily residences fell 78.7 percent between Q1 2006 and Q1 2011, during a period when the Case-Shiller National Home Price Index fell 35.5 percent. If the contraction of output in these two sectors resulted from a shock to productivity that disrupted supply, that should have led to rising prices. The pattern of decline seems much more consistent with a demand shock initiated by a shock to household credit.

3.1.2 Economic and Banking Conditions in 1930

The rapid accumulation of mortgage debt, the housing bubble and collapse, and its impact on the financial and real sectors up to the time of the financial crisis in September 2008 share many similarities to events between the end of the 1920 to 1921 recession and the collapse of the banking system that began in late 1930. The fact that the recent financial crisis and recession did not lead to an economic calamity equal to the Great Depression is strong evidence that an aggressive monetary policy response can mitigate the consequences of a financial crisis. On the other hand, the depth and duration of the recent recession and the slow recovery suggest that expansionary monetary policy cannot entirely compensate for the contraction caused by a residential real estate bubble and collapse; it also suggests that there may have been more to the Depression than "a largely independent" monetary collapse, as Friedman and Schwartz argued.

A very serious downturn had already occurred before the first banking crisis. By the end of 1930, GNP had fallen 9.5 percent from its peak in 1929. As Wicker (1996) has noted, the number of bank suspensions and the level of deposits in suspended banks were only slightly higher between January and October 1930 than they had been throughout the 1920s. The wave of bank suspensions in November 1930 was concentrated primarily in the St. Louis Federal Reserve District; in December 60 percent of the deposits of suspended banks were in three banks, two in New York and one in Philadelphia.

Receivers' reports from the liquidation of failed national banks compiled by the Comptroller of the Currency provide strong evidence that the large majority of suspended banks both before and during the Depression were insolvent. After November 1930 the frequency of insolvent banks entering receivership escalated. The contention by Friedman and Schwartz that the banking system was facing only liquidity problems and not solvency problems is difficult to reconcile with the record of liquidated national banks.[2]

1. Automobile production figures are taken from http://oica.net/category/production-statistics/. The CPI new car and light truck component series is CUSR0000SS4501A from the Bureau of Labor Statistics.

2. In an article titled "Bernanke is Fighting the Last War," Carney (2008) interviewed Anna Schwartz. As the title suggests, her position was that circumstances in 2007 and 2008 were quite different from those in 1930 and afterward. "'If the borrowers hadn't withdrawn cash, they [the

The extent of insolvency versus illiquidity during the Depression is placed in context by first examining it during the boom years. The 103 national bank receiverships that were completed in the twelve months ending October 31, 1929 paid only 49.2 cents on each dollar of unsecured liabilities, even after stock assessments were collected that amounted to 9.8 percent of unsecured liabilities. Only 21 of these 103 liquidations resulted in repayment of over 75 percent of unsecured liabilities.[3] Given that asset values had not yet suffered when these liquidations were completed, the results should have been better if there was only a liquidity problem. Insolvency persisted at a similar level in 1930, and became far more prevalent in 1931. For all national banks that entered receivership in the year ending October 31, 1929, 66.1 percent of $41.8 million in unsecured liabilities were paid during liquidation. In 1930, 61.1 percent of $47.0 million in unsecured liabilities were paid. In 1931, the percentage of unsecured claims paid increased to 72.2 percent, but the level of unsecured claims surged to $294.2 million.[4] The percentage of failed banks that were deeply insolvent did not change appreciably from 1925 to 1933, but the number of banks that entered liquidation—and the deposits and other liabilities involved—escalated sharply in the reporting period beginning on November 1, 1930. Although we do not have data on the condition of state banks, they were much more encumbered with illiquid assets, especially real estate, so it is unlikely that their record with respect to solvency was better than that of the failed national banks. The hypothesis that the banking system collapsed due to a contagion of fear and widespread runs on solvent banks seems suspect, so an examination of the sources of banks' losses is warranted. Losses on residential real estate lending were one important category of losses.

3.1.3 Mortgage Leverage and a Housing Collapse Amplify Distress in a Downturn

The same pattern of contraction evident in the 2008 crisis—starting with declining expenditures on residential construction followed first by declining house prices and then by declining nonresidential fixed investment—was clearly present before the effects of monetary contraction appeared late in 1930 and accelerated in 1931. In fact, the 40.4 percent decline in residential construction from 1925 to 1929 was the largest decline from housing peak

banks] would have been in good shape. But the Fed just sat by and did nothing, so bank after bank failed. And that only motivated depositors to withdraw funds from banks that were not in distress. . . . [T]hat's not what's going on in the market now,' Ms. Schwartz says."

3. These data on the results of liquidations that were completed in 1929 are drawn from table 43 in Comptroller of the Currency (1929).

4. These data on the results of liquidations by the year the bank entered receivership are compiled in table 83 in Comptroller of the Currency (1941) for all liquidations closed by October 31, 1941. We have added to these figures by collecting the results of other liquidations that were completed and reported in later years.

to economic cycle peak in any economic downturn between the 1920 to 1921 recession and the 2001 recession.[5]

The typical recession begins with a downturn in expenditures on residential construction, and this directly affects employment and consumption, but if home prices do not decline substantially the problems are not further compounded by households' losses on their real estate assets, with corresponding negative impacts on bank equity.[6] In both the 2007 to 2009 Great Recession and the Great Depression, large house price declines against fixed mortgage debt reduced household wealth, and damaged the balance sheets of financial sector firms. This in turn amplified the usual downturns in consumer durables expenditures and nonresidential fixed investments.

One consequence of the focus on monetary policy mistakes has been a clearer understanding of the importance of an aggressive central bank response to a developing crisis. But another consequence of the focus on monetary factors was a lack of attention to and concern about the housing bubble and the precarious buildup of household debt that accompanied the bubble. If the Federal Reserve had paid more attention to the risk accumulating in the housing and mortgage markets, that might have obviated the need for the aggressive policy measures that it subsequently pursued.

In this chapter we demonstrate that the real estate boom in the 1920s began to unwind three years before the general contraction began: households' consumption of durable goods, firms' investments in inventories, equipment, and structures, the stock market, and output all continued to climb for three years after the contraction in residential real estate began, and the broader economic collapse coincided with the collapse of credit to households that had supported residential real estate purchases and consumer durable goods consumption.[7] These events all preceded the first banking crisis in late 1930 as well as the missed opportunities by the Federal Reserve to try to counteract the declining money supply.

3.1.4 Household Balance Sheet Stress and the Consumption Decline in 1930

Prior to subsequent problems with monetary policy, a serious contraction was already underway in 1930 before the escalation of bank failures in late 1930 and in 1931. Temin (1976) claimed that the consumption decline

5. The only larger decline in residential construction between housing peak and economic cycle peak during the past ninety-four years in the United States was the 43.9 percent collapse between Q1 2006 and Q4 2007.

6. For a comparison of the somewhat typical 1973 to 1975 recessions and the 1980 and 1981 to 1982 recessions with the atypical 2007 to 2009 recession see Gjerstad and Smith (2012). Buchanan, Gjerstad, and Smith (2012) compares the 1980 and 1981 to 1982 recessions with the 2007 to 2009 recession.

7. Figure 3.2 in section 3.3 shows that mortgage lending collapsed well before the money supply declined, and before the first large failures of financial firms occurred in November and December 1930, or the serious decline in the money supply began in early 1931.

in 1930 was much sharper relative to the declines in household income and wealth than it was during the other two interwar recessions in 1920 to 1921 and 1937 to 1938.[8] Friedman and Schwartz argue that a series of monetary policy failures—starting with the failure to provide liquidity during the first banking crisis in November and December 1930—turned a normal cyclical downturn into an inexorable economic collapse. Temin's observation that the decline in consumption in 1930 was unusually large is consistent with the hypothesis that household balance sheets were stressed before the monetary collapse in 1931. Particularly unusual, in comparison with other downturns in the last century, was the decrease in nondurable consumption. (See figure 3.1.) This decline, suggesting unusual household belt tightening, preceded the monetary collapse described by Friedman and Schwartz, which leaves open the possibility that both consumption decline and an inadequate monetary response are consistent with the broad course of events. White (1984) has argued that the first banking crisis was indistinguishable from the banking troubles that had plagued rural areas throughout the 1920s. White notes that "Friedman and Schwartz argue that the surge of failures was prompted by a loss of confidence in the banking system, while Temin believes that the failures and depression grew out of a downturn in the real sector" (119) and concludes that "depictions of events by Temin and by Friedman and Schwartz are not really in conflict. The weakening of assets and the lack of easy credit put the squeeze on all banks, and many weak ones were doomed" (137).

Although we cannot unambiguously identify the cause of the collapse in consumption, the buildup of household debt almost surely played a significant role. The period prior to the Depression contrasts sharply with the period leading up to the 1920 to 1921 recession. Before the 1920 to 1921 recession, the price level—including housing prices—rose sharply. The Consumer Price Index (CPI) and nominal GDP doubled from December 1915 to June 1920. Consequently, even as households took out new mortgage loans, real household mortgage debt fell over 20 percent between 1915 and 1920. During the deep 1920 to 1921 recession and again in the shallow 1923 to 1934 recession, while fixed investments and inventories fell, real household expenditures on nondurable goods and services, on durable goods, and on new residential structures all increased. As we show in our discussion of the Depression, all major components of households' expenditures declined sharply early in the Great Depression. Even though there

8. Note that declines in total wealth alone do not measure the impact on households of a decline in home values against fixed mortgage debt. During the Great Recession, mean household wealth fell 14.7 percent between 2007 and 2010, but median household wealth fell 38.8 percent. (These figures are calculated from the 2007 and 2010 Survey of Consumer Finance from the Federal Reserve.) For many households, home equity is a major store of wealth, and a collapse of housing prices can affect the wealth of a large fraction of households to an even greater extent than it decreases national wealth.

were sharp monetary contractions in both the 1920 to 1921 recession and in the Great Depression, the persistence of the monetary contraction in the Depression was most likely catalyzed by the stressed balance sheet conditions among households.

3.2 Changes in Output by Sector

During the 1920s residential and commercial construction, manufacturing, and consumer durable goods production all expanded rapidly, but mortgage and consumer credit were the factors that expanded most sharply. The expansion had two distinct phases—a strong expansion from 1921 to 1925 supported by a rapid expansion of residential construction and consumer durable goods expenditures followed by a moderate expansion from 1925 to 1929 that continued in spite of declines in residential construction that began in 1927. These two phases indicate the important role that residential construction played over the entire decade from 1921 to 1930, so it is worthwhile to decompose the growth and decline in the economy during that period into its major components. We examine changes in GNP and four of its major components: consumption of nondurable goods and services (C), investment in new residential structures (H), expenditures on durable goods (D), and fixed investment less investment in new residential structures (I).[9]

Table 3.1 shows annual growth rates of GNP and several of its primary components between 1921 and 1933. Looking at the growth rates of these components from 1925 to 1929, nothing looks surprising moving down the table from GNP to the sum of residential fixed investment and nonresidential fixed investment ($H + I$). Toward the end of the expansion, $H + I$ flattened out for a long period, from 1925 to 1929. But nonresidential fixed investment grew by 5.3 percent per year during those four years. It was residential construction that was collapsing. Given its size relative to the economy, that should not be a serious problem. But it plays an outsized role in the household balance sheet because it became increasingly leveraged during the decade, and the price collapse during the Depression seriously reduced household wealth and solvency.

Changes in output by sector in the Great Depression are uncharacteristic of recessions primarily in their magnitudes, but also by the fact that there

9. For brevity we refer to personal consumption of services and nondurable goods as "consumption" (C), households' durable goods expenditures as "durables" (D), expenditure on new single-family and multifamily housing units as "housing" (H), and nonresidential fixed investment as "investment" (I). Expenditure on new single-family and multifamily housing units is from Grebler, Blank, and Winnick (1956, table B-3); consumption and durable goods expenditures are from Swanson and Williamson (1972, table A1); investment is from Swanson and Williamson (1972, table A2, Column 3), minus expenditure on new housing units from Grebler, Blank, and Winnick (1956, table B-3); and GNP is from Swanson and Williamson (1972, table 1). All series are converted from nominal to real figures by dividing by GNP deflators from Balke and Gordon (1989, table 10); the Balke-Gordon GNP deflators are HSUS series Ca215.

Table 3.1 Annual growth rates of GNP and components, 1921–1933

	1921–1925 (%)	1925–1929 (%)	1929–1933 (%)
GNP	6.1	3.7	–7.8
C	3.4	4.7	–4.6
D	12.9	2.7	–15.6
D + H	17.7	–1.7	–19.8
H + I	17.6	0.6	–27.6
H	29.4	–10.9	–40.1

was a large decrease in consumer spending on nondurable goods and services. With the single exception of the 2001 recession, consumer durables, residential construction, and investment all declined in every postwar recession, but their percentage declines have never matched the declines during the Depression.[10] During the Great Depression, durable goods expenditures declined 49.2 percent, investment declined 68.6 percent, and housing declined 92.5 percent. In the average of eleven postwar recessions from 1948 to 2007, the corresponding declines were 11.4 percent (durables), 11.8 percent (investment), and 32.5 percent (housing).[11]

In the Depression, real GNP declined 27.7 percent and every major component of output declined: even nondurable consumption fell by 17.3 percent—a figure dramatically larger than the decline in consumption of nondurable goods and services in any downturn since the depression.[12] Figure 3.1 shows the movement of GNP and several of its major components between 1922 and 1937. Each data point in a series measures the difference between the value of the series in that year and its value at the peak of the economic cycle in 1929. For example, residential construction was 30.3 percent higher in 1923 than it was in 1929; it was 46.4 percent lower in 1930 than it was in 1929. In figure 3.1 housing peaked in 1925 at a level 58.7 percent higher than its 1929 level. Other major components of GNP—and GNP itself—all continued to rise until 1929. Every major component of GNP fell in 1930, but none fell as much as housing. By 1933, housing was only 12.5 percent of its 1929 level and a paltry 7.5 percent of its peak level in 1925.

10. In the 2001 recession, nonresidential fixed investment was the only sector that declined. *This* has only happened once before in the past ninety-four years, in the 1923 to 1924 recession, when a downturn in consumption was averted by large infusions of mortgage credit, just as in 2001. See figure 3.2 in section 3.3 for a depiction of the highly unusual growth of net mortgage credit in 1923 and 1924.

11. These figures on the average size of sectorial changes in postwar recessions are drawn from table 1 in Gjerstad and Smith (2012).

12. Real expenditures on nondurable goods and services have fallen in only three postwar recessions (1980, 1981–1982 and 2007–2009), and the only year-over-year decline in households' consumption of nondurable goods and services between 1934 and 2012 was the 1.4 percent decline in 2009.

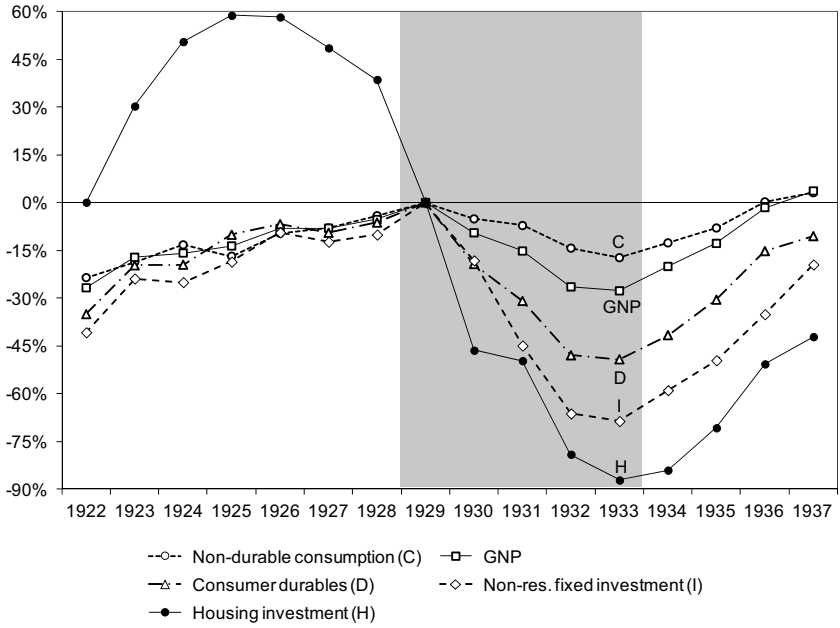

Fig. 3.1 Percentage changes to GNP and its major components relative to 1929 levels

3.3 Residential Mortgage Debt Boom and Increasing Leverage

Grebler, Blank, and Winnick (1956, table L-6) report residential mortgage debt outstanding from 1896 to 1952. Mortgage debt increased fairly steadily from 1896 to 1922. The rapid decline in foreign lending after World War I combined with the pent-up demand for housing led to a surge in residential mortgage finance starting in 1919. From 1919 to 1929, nominal residential mortgage debt rose from $7,998 million to $29,440 million, an increase of 268 percent. Mortgage debt outstanding grew rapidly from 1923 to 1928 and then slowed in 1929 and 1930. From 1931 to 1937, total mortgage lending outstanding fell in every year. Figure 3.2 shows the net growth of mortgage funds outstanding from 1905 to 1939.

The nominal declines in mortgage debt outstanding between 1931 and 1937 were remarkable in view of the historical record of mortgage lending in the United States. Residential mortgage debt increased every year from 1897 to 1952 except the period from 1931 to 1937 and during the war years 1942 to 1944. Combining the Grebler, Blank, and Winnick annual data from 1896 to 1952 with the Federal Reserve Flow of Funds quarterly data from 1952 on, mortgage loans outstanding increased in every reporting period from 1945 until Q1 2008. It then declined for twenty-one consecutive quarters, from Q2 2008 through Q2 2013 before rising in Q3 2013.

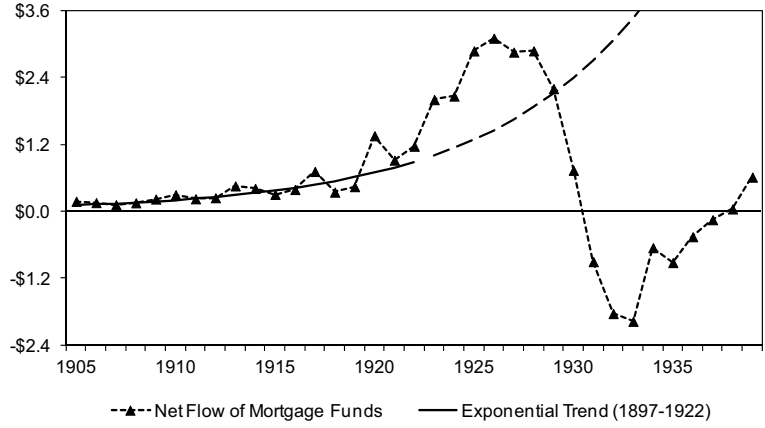

Fig. 3.2 Net flow of mortgage funds, 1905–1939 (in billions of dollars)

Residential mortgage credit growth over this period was much higher than during any other period over the past 110 years. Nominal mortgage debt increased at an average annual rate of 13.9 percent between the end of 1919 and the end of 1929. During the same period the consumer price index fell 11.4 percent, so the net effect was a rapid growth of household mortgage debt. This rapid buildup of mortgage debt enabled increased residential construction.

Mortgage bonds financed large construction projects to a greater extent than at any previous time, with results that ultimately proved very costly to investors. Losses on Chicago residential apartment building bonds began before 1929. More than 10 percent of apartment building bonds were in default by the end of 1929 and 35 percent of them were in default at the end of 1930. Almost every indicator in the residential real estate market turned down before the stock market bubble began in 1928. Sales, prices, the net flow of mortgage funds, and residential construction all peaked in 1925 or 1926, but the net flow of mortgage funds continued at an elevated level in 1927 and 1928 while house prices, housing sales, and new residential construction were all falling. From this we can conclude that household leverage—the fraction of home sales paid for with mortgages—was rising in 1927 and 1928.

In 1934 the Department of Commerce conducted a Financial Survey of Urban Housing in fifty-two cities. The survey included a broad range of questions about household and housing finance. Wickens (1937) tabulated the results of these surveys in up to eighty tables per city for twenty-two of the fifty-two cities in the original survey. Table 29, which was tabulated for each of the twenty-two cities, provides the total number of respondents who acquired their home in each year from 1901 to 1933, and the amount

of the original purchase price that was financed by a mortgage, grouped into percentage ranges. The three highest ranges were 70 percent to 84 percent, 85 percent to 99 percent and 100 percent. There is widespread belief that mortgages were limited to 50 percent of the purchase price in the 1920s—for example, see chapter 1 in this volume—yet the results of the survey indicate very high levels of mortgage leverage.

Aggregated across the 27,795 respondents who originally purchased their homes between 1920 and 1929, 23.4 percent of all home buyers (whether they had a mortgage or purchased entirely with equity) had mortgages at the time of purchase that were 85 percent of the purchase price or higher. The time trend was also consistent with increasing leverage: the percentage of new purchases made with 85 percent borrowed money or more increased every year from 1920 (when it was 16.3 percent) until 1926 (when it reached 26.4 percent).

If we set the threshold lower, 42.7 percent of homeowner occupants in the survey had borrowed 70 percent or more of their purchase price. The survey also reports the number of homeowners who did not take out a mortgage when they purchased their homes. If we consider only those homeowners who took out a mortgage at the time of purchase, 55.8 percent of those borrowed 70 percent or more of their purchase price. Most measures of the nominal decline in housing prices are close to 30 percent for the period from 1930 to 1933, so by this measure about half of mortgaged properties could have been at risk of being "underwater" (that is, with a mortgage greater than the value of the home).

Research on the housing market in Franklin County, Ohio, complements the evidence we have reported from aggregate data and from the Financial Survey of Urban Housing. The Bureau of Business Research (1943), a study conducted at Ohio State University, examined deed and mortgage recordings from 1917 through 1937. The study reports tax assessment values of properties with new mortgages by year and type of structure. We use these data to determine the loan-to-value ratio for years from 1921 to 1930, which we report in table 3.2.[13]

As with the data from the Financial Survey of Urban Housing, the deed and mortgage survey data show a gradual increase in loan-to-value ratios, and the average mortgage debt is well above the 50 percent commonly believed to be the norm in the 1920s. Table 3.2 shows that, averaged across all mortgages recorded in 1928 in Franklin County, Ohio, debt amounted to

13. The data on number of residential mortgages are from table 21 in Bureau of Business Research (1943). Data on the ratio of mortgage to assessed value and average assessed value are calculated from data in table 24 for appraised value of mortgaged residential structures and from table 27 on the amount of residential mortgages. We have restricted attention from 1921 to 1930 because the same data source also includes assessed values on properties acquired under sheriff's deeds and on the sale prices for those properties, and those prices and assessed values are close. For 1921 through 1930, the average ratio of sales price to assessed value was 1.018. These ratios are calculated from data in table 87 and table 96.

Table 3.2 **Mortgage leverage in Franklin County, Ohio, 1921–1930**

Year	Number of mortgages	Mortgage to assessed value (%)	Average assessed value ($)	Index of assessed values
1921	8,599	61.6	3,998	0.76
1922	12,097	62.1	4,352	0.83
1923	14,303	62.1	4,906	0.94
1924	13,526	57.6	5,227	1.00
1925	16,896	64.2	4,885	0.93
1926	18,195	67.8	4,798	0.92
1927	15,735	68.8	4,890	0.94
1928	14,120	69.1	4,968	0.95
1929	9,997	65.4	4,936	0.94
1930	8,400	66.6	4,806	0.92

69.1 percent of assessed value.[14] Data on properties with junior liens in the Bureau of Business Research (1943) volume indicate that the loan-to-value ratio was far worse for homes with junior liens. Table 69 in that volume indicates the number of properties with junior liens, the assessed value of the properties, the principle amount of the junior lien, and the amount of the senior lien. For properties that had two or more liens, the principal of the junior liens gradually escalated from 21.4 percent of assessed property values in 1917 to a peak of 46.1 percent of assessed values in 1925. Between 1917 and 1924, the average amount of the sum of the two liens was 85.4 percent of the assessed property values. Between 1925 and 1930, the sum averaged 109.1 percent of the assessed property values.

The roles of debt-fueled construction and durable goods booms were mentioned in the early literature, but received limited attention in subsequent accounts of the Depression. Persons (1930) attributed the boom to excessive lending on real estate and consumer durables, and Fisher (1933) outlined a theory of the impact of deflation on debt, but during sixty postwar years of relatively stable domestic financial markets their concerns faded. Now that the pattern has been repeated several times over the past twenty years in developed countries such as Japan, Finland, and Sweden, and more recently in the United States, United Kingdom, Spain, and several other European countries, it is easier to appreciate a more universal role for the impact on the

14. Some mortgages issued in 1928 would have been refinanced from earlier purchases, and the assessed value may have been from a previous year. Even so, according to the price series in appendix C in Grebler, Blank, and Winnick (1956), the average price of homes was almost unchanged between 1920 and 1928. Table 3.2 also shows that average assessed values for mortgages recorded in Franklin County were very consistent between 1923 and 1929, with one brief blip in 1924. Consequently, the fact that not all assessed values were current probably would not have affected this measure of the loan-to-value ratio much. And the level of the loan-to-value ratio from mortgage recordings in Franklin County is also consistent with those reported in the Financial Survey of Urban Housing for twenty-two cities.

economic cycle of residential construction and durable goods booms that are based on unsustainable mortgage and consumer credit expansion. This new and neglected older evidence allows economic developments from 1920 into the 1930s to be reexamined with a fresh and more accurate perspective.

3.4 Housing Sales and House Price Declines, 1926–1933

The pattern of housing market decline during the late 1920s was similar to the pattern from 2006 to 2009. A broad measure of sales volume compiled by the Federal Housing Agency (FHA) peaked in 1925 and then fell in each year from 1926 until 1933. In a pattern that has been replicated in the recent downturn, home prices began to fall after the sales volume decline.

3.4.1 Housing Sales Decline

Fisher (1951, 157–62) describes a project devised by the Division of Research and Statistics at the Federal Housing Administration to make a complete survey of deed recordings in the District of Columbia and eight US counties.[15] Figure 3.3 shows a six-month moving average of the monthly aggregated deed recordings for these nine jurisdictions from 1922 through 1940.[16]

Aside from regular seasonal variation, the series declined sharply from its peak in July 1925 until it bottomed out in February 1934. Annual deed recordings fell 64.8 percent from their annual peak in 1925 to the annual trough in 1933. Although annual peaks varied from one location to another, in six of the nine locations, annual peaks took place in 1924 (Allegheny, PA), 1925 (San Francisco, CA; Cuyahoga, OH; and Salt Lake City, UT), and 1926 (Essex, NJ, and Washington, DC).

Several years before the FHA data were collected and evaluated Vanderblue (1927b) examined the number of real estate transfers and conveyances in Miami, Orlando, and Jacksonville, Florida.[17] Real estate transfers in all three cities exhibit a similar pattern of gradual but strong growth from 1919 that continued until it reached a feverish pitch in the last three months of

15. The survey methodology is described in Works Progress Administration (1938). A deed recording is the formal record of ownership transference, whether by sale, inheritance, foreclosure, or a voluntary conveyance of property to a lender.

16. The series began in 1895 in six of the nine jurisdictions and commenced by 1898 in the other three. The series extended through 1935 in all nine jurisdictions and through 1946 in four of them. The areas covered are the District of Columbia and eight US counties. The counties and their principal cities are San Francisco (San Francisco, California); Ada (Boise, Idaho); Washoe (Reno, Nevada); Essex (Newark, New Jersey); Burleigh (Bismarck, North Dakota); Cuyahoga (Cleveland, Ohio); Allegheny (Pittsburgh, Pennsylvania); and Salt Lake (Salt Lake City, Utah). The graph in figure 3 extends beyond 1935. Fisher estimates deed recordings for several counties. These are Ada and Burleigh (1936–1940), Allegheny (1937–1940), Washoe (1939–1940), and Salt Lake (1940). See Fisher (1951, tables A1 and A2).

17. Vanderblue (1927a) describes general economic conditions in Florida from the nineties through 1926.

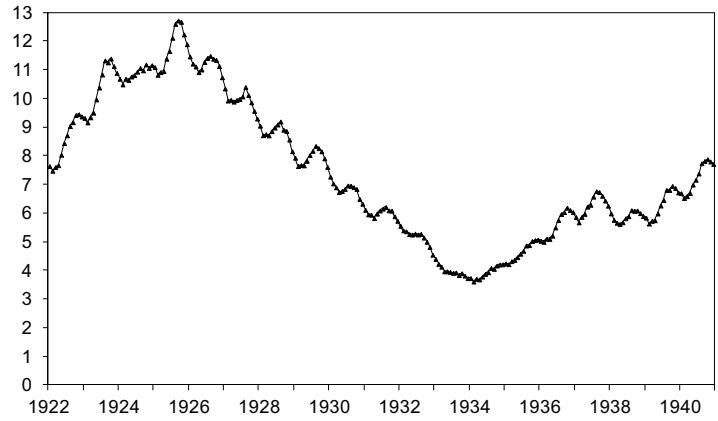

Fig. 3.3 Six-month moving average of deed recordings in eight counties and Washington, DC (in thousands)

1924 and the first nine months of 1925. The peak in Miami was reached in September 1925; real estate transfers had collapsed 75 percent by the time the September 1926 hurricane devastated Miami. The patterns of real estate transfers in Orlando and Jacksonville were similar: Jacksonville peaked in October 1925 and Orlando peaked in November 1925.

The Florida real estate boom was an amplified version of the more general boom throughout the country, much as the recent booms in Las Vegas, Phoenix, and Miami were amplified versions of similar booms around the country. Figure 3.4 shows that real estate transactions in Miami had increased by a factor of five in only fourteen months—from 5,000 transfers in July 1924 to 25,000 transfers in September 1925. Although the increase was remarkably rapid in Miami, its peak differed by only one month from the peak for the average of nine widely dispersed jurisdictions shown in figure 3.3.

3.4.2 House Price Movements, 1926–1933

House price data are fragmentary and obtained by a variety of methods from diverse geographical areas. Yet most show a similar temporal pattern and similar magnitudes. House prices peaked in 1926, fell moderately for at least two years, and then began a sharp decline before reaching a trough in 1933. Sales volume tracked price declines closely, as indicated by extensive data from the FHA.

Fisher (1951, 55, table 7) reviews evidence from a sample of 3 percent of urban mortgage loans in New York, New Jersey, and Connecticut compiled by the Home Owners' Loan Corporation (HOLC). This survey compared

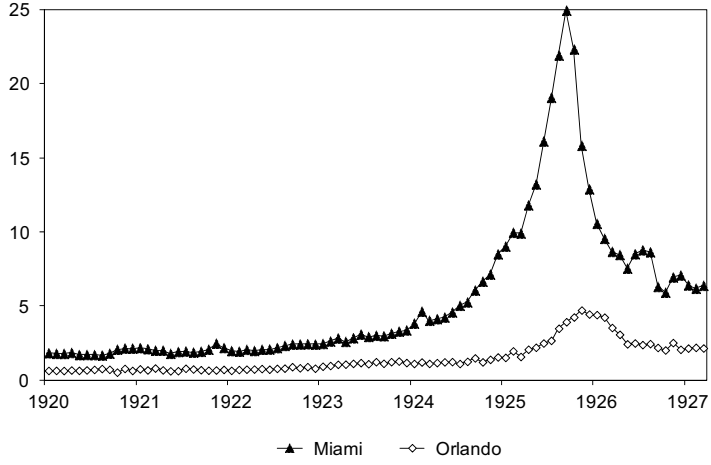

Fig. 3.4 Real estate transfers and conveyances in Miami and Orlando, Florida (seasonally adjusted, in thousands per month)

appraisal values for homeowners who were refinancing their homes in 1933 and 1934 to the purchase prices in 1925 to 1927. The median price decline between 1925 and 1933 to 1934 was 31.0 percent. For homes purchased in 1926 and 1927 the median decline to 1933 to 1934 was 26.9 percent.

The National Housing Agency used newspaper ads to compile asking prices for homes in Washington, DC, for the period from 1918 to 1948. Figure 3.5 shows a one-year moving average of these prices from 1920 through 1940.[18] The 1929 average asking price was 7.2 percent below the 1925 average asking price; by 1933 the average asking price was 26.3 percent below the 1925 average asking price. Figure 3.3 shows that, across nine jurisdictions, deed transfers fell substantially for three years before the significant decline in house prices and for four years before the stock market crash in 1929.

Grebler, Blank, and Winnick (1956, 345–49) summarize the results of a survey conducted in twenty-two cities by the Department of Commerce in 1934 and published in Wickens (1937). The survey was based on interviews of property owners who were asked (1) the current value of their property, (2) the year it was purchased, and (3) the original purchase price. The median price of single-family owner-occupied homes was determined from these survey data and this median price was used to develop an index of house prices for each year from 1890 to 1934. This series peaked in 1925. By 1929 it had fallen only 8.2 percent, but by 1933 it had fallen 30.5 percent.[19]

18. The Washington, DC monthly ask price series is provided in Fisher (1951, 53, table 6). Annual averages for the series are provided in HSUS series Dc828.

19. The survey is described in appendix C, pp. 345—348 in Grebler, Blank, and Winnick (1956). It is also available as HSUS series Dc826.

Fig. 3.5 One-year moving average of asking prices in Washington, DC (in thousands)

All three of these series show similar declines from annual peaks in 1925 to 1933. The Washington, DC, asking price series is the only monthly series, and it shows a peak in June 1926, almost a year after the sales series began to fall (although the sales series includes eight counties in addition to Washington, DC). The two series that include 1929 prices also display similar declines from the peak to 1929. Overall, given the widely different geographical coverage of these indices, and the variety of methodologies, the resulting measures of house price peaks, troughs, and percentage declines are surprisingly similar, and portray a situation in which large household home equity losses must have been widespread and severe. The price declines also demonstrate the potential for serious losses on residential mortgages.

Wickens (1941) uses census data for 1930 and data from the Financial Survey of Urban Housing for 1934 to estimate prices (table A 10) for fifty US cities. He estimates that the average value of a house fell 32.9 percent, from $6,619 in 1930 to $4,439 in 1934. He also uses 1930 census data to estimate the value of the housing stock for the entire country. The estimate of the total value of the housing stock in 1930 (from table A 2) is $122.58 billion, with owner-occupied homes valued at $64.68 billion and rented housing units valued at $57.90 billion. His table A 8 shows the value of owner-occupied housing in 1934 at $42.42 billion, and the value of rental housing as $36.75 billion. Rental unit value dropped 36.5 percent between 1930 and 1934 and owner-occupied unit value dropped 34.4 percent between 1930 and 1934. The total value of residential units fell 35.4 percent between 1930 and 1934 according to Wickens's estimates.

Table 3.3 **Cost of living and rent indices, 1921–1940**

Year	Cost of living index	Rent
1921	102.3	97.7
1922	97.4	95.9
1923	100.0	100.0
1924	101.3	106.3
1925	103.7	104.1
1926	104.3	101.3
1927	102.0	97.8
1928	100.6	93.7
1929	100.1	92.0
1930	96.7	89.5
1931	87.2	82.4
1932	77.9	72.4
1933	74.9	63.8
1934	79.4	64.8
1935	82.2	70.3
1936	84.1	77.9
1937	87.8	86.5
1938	85.7	87.0
1939	84.5	86.3
1940	87.0	86.9

Table 3.3 reproduces cost of living and rent indices for 1914 to 1941 from Colean (1944, table 41, 421). Rental price movements tracked house price movements over the course of the boom and decline, but the magnitude of the decline in rents was larger than the decline in any of the four price indices reported in this section.

Rent dropped 13.5 percent in nominal terms between 1924 and 1929; it dropped another 30.7 percent in nominal terms between 1929 and 1933. The cumulative nominal rent decline was 40.0 percent between 1924 and 1933. In real terms rent dropped 12.4 percent between 1924 and 1929 and it dropped 7.3 percent in real terms between 1929 and 1933. The cumulative real rent decline was 18.8 percent between 1924 and 1933.

Hoyt (1933, 377) finds a broadly similar pattern of rent price movements in Chicago between 1915 and 1933. His index increased from 100.0 in 1915 to 205.6 in 1925 with almost all of the increase coming between 1919 and 1924. From 1925 to 1929, the index fell 12.3 percent. It fell 39.7 percent between 1930 and 1933 to a level almost identical to its 1919 level.

It is worth noting that the nominal rent decline during the Depression period would have hurt a landlord who purchased a property with a mortgage before the property value and the rental income fell. At the same time, real rents fell much less during the Depression than real income, so that renters were also hurt between 1929 and 1933.

3.5 Mortgage Bond Defaults, Mortgage Delinquency and Foreclosure, and Unemployment

Mortgage bonds grew rapidly as a source of financing for apartment buildings and other commercial structures in the 1920s. After their spectacular rise, they had an even more precipitous collapse. In the last section, we saw that rent and residential real estate prices were falling before the general decline in 1930. It is also apparent from the data we review that rental prices fell earlier and further than purchase prices. Colean's rent index fell 11.6 percent and Hoyt's Chicago rent index fell 12.3 percent between 1925 and 1929. If these rental price strains were felt by the property owners that borrowed on mortgage bonds, then the early collapse of these bonds is understandable. The rapid accumulation of debt also had adverse consequences for households when the mortgage market collapsed from 1929 to 1931 and house prices collapsed along with it. In this section we examine the performance of mortgage bonds and the foreclosure record as indicators of the distress in the residential real estate market.

3.5.1 Mortgage Bond Defaults

The record of real estate bond issues provides a useful indication of real estate market trends. Bond issues increased rapidly, especially after 1921. The rapid growth of bond issues, their poor performance, and the pattern of early deterioration of residential mortgage bonds followed by later deterioration of commercial mortgages are all characteristics that are familiar from the recent real estate downturn. A number of studies of these developments were carried out during the depression.[20]

Data from the *Commercial and Financial Chronicle* analyzed by Johnson (1936a) show that by 1925 new real estate bond issues reached $695.8 million and accounted for 22.9 percent of corporate bond issues. As with many other series on real estate activity, the growth rate declined sharply after 1925. In 1928 real estate bonds were 1.7 percent below their peak in 1925, but then real estate bond issues began a precipitous fall. In 1929 real estate bond issues fell 51.2 percent to $333.9 million. Declines of 48.8 percent in 1930 and 32.8 percent in 1931 were followed by a virtual cessation of new issues in 1932 when newly issued bonds fell 96.8 percent. Johnson found that total real estate bond issues between 1919 and 1933 amounted to $4,114.9 million.[21] For the period from 1919 to 1931, Johnson found data on the performance of 1,090 bond issues that exceeded one million dollars, with

20. For an interesting history of real estate bonds, see Boysen (1931), who discusses the development of real estate bonds issued on Chicago apartment buildings starting in 1901.

21. Goldsmith (1955) estimates that the total of outstanding real estate bond issues reached $6,500 million in 1931. The large difference between their figures is most likely attributable to the fact that Goldsmith provides an estimate, whereas Johnson counts them from contemporary records. Goldsmith's estimate is provided in Grebler, Blank, and Winnick (1956, table L-2).

Table 3.4 Defaults on Chicago real estate bonds, 1925–1934

Year	Number of defaults	Amount (thousands) ($)	Cumulative defaults ($)	Percent defaulted (%)
1925–1928	7	8,275	8,275	1.66
1929	22	29,320	37,595	7.55
1930	50	64,095	101,690	20.42
1931	104	162,116	263,806	52.97
1932	67	146,725	410,531	82.54
1933	20	38,003	448,534	90.17
1934	5	22,706	471,241	94.74

a total issuance of $2,684 million. He evaluated bond performance by year of issue and classified them into one of three categories: called, matured, and outstanding. Bonds outstanding in 1936 were further separated into those that were current and meeting all obligations and those that were not meeting obligations, or defaulted.

According to Johnson (1936b), New York accounted for 36.3 percent of the bonds issued; 25.9 percent were issued on Chicago real estate. Koester (1939a, 1939b) evaluates the performance of 285 Chicago real estate bonds issued between 1919 and 1930. The market grew rapidly from the first issue for $1 million in 1919, doubling approximately every year until 1925, when the growth slowed and eventually peaked at $109,305,000 in 1928. Koester examined 338 mortgage bonds compiled by Moody's that amounted to $546,983,500. Detailed information was available on 302 of these bonds with a total issue amount of $536,478,500.[22] Of these 302 issues, 285 issues totaling $497,391,000 had a corporate structure with bonds and equity. Koester restricted her analysis to this pool with a homogeneous legal organization. Some moderate losses on these bonds appeared between 1925 and 1928. By the end of 1930, more than one-fifth of the bonds were in default, in advance of the banking and monetary crises of 1931. (See table 3.4.)

Apartment and apartment hotels defaulted earlier than hotel and office buildings. Office bonds had the best record, yet even their record was terrible: 87.7 percent of the office building bonds were in default by the end of 1934. The cascade of defaults on these bonds, from apartments to commercial real estate, is consistent with other aspects of the transmission of the downturn from households to businesses. Koester (1939b) examined prices for these Chicago real estate bonds and found that the basic price patterns conformed to the pattern of defaults through much of the downturn. Prices of bonds on apartment hotels fell earliest and furthest; apartment and hotel bonds fell

22. All of the excluded issues were under $475,000. Public price and performance data on these bonds were incomplete, probably because the bonds were closely held.

almost as much. Commercial property bonds and office building bonds fell least, but even so, the declines were dramatic. When apartment hotel bonds reached their minimum price in July 1933, they traded at 8.2 cents on the dollar. Apartment bonds reached their minimum of 11.36 cents on the dollar in January 1934. Office bonds fared the best of the five categories, but even they traded at only 13.0 cents on the dollar at their minimum in January 1934. Recovery of bond prices was limited even by the end of the price series Koester evaluated in January 1939. Between July 1933 and January 1939, the highest average price for any of the categories was 31.93 cents on the dollar for commercial buildings in January 1937. The high level of defaults and the low prices indicate extensive losses on the Chicago real estate bonds.

Johnson (1936b) analyzed the performance of bonds issued between 1919 and 1931 in nine cities, including Chicago. His sample of Chicago bonds differed only slightly from the sample analyzed by Koester. He found that in 1936 the recoverable value of Chicago real estate bonds was 39.0 cents on the dollar.

3.5.2 Mortgage Delinquency and Foreclosures

As in the recent debacle, mortgage delinquency was a significant factor in the depression. Wickens (1941, table D 44, 284) reports that in a survey of over 30,000 homeowners in fifty-two cities, 41.9 percent of respondents were behind in their mortgage payments on January 1, 1934. The distress was not confined to low-valued homes. The rate of delinquency among homeowners with homes valued over $15,000 was, at 41.8 percent, almost identical to the average for the full sample. The frequency of delinquency among owners of rental properties was, at 45.7 percent, even higher. The situation in some cities was dire. In Cleveland, 61.9 percent of homeowners and 66.0 percent of the owners of rental housing were delinquent. These delinquent payments must surely have generated problems with banks' incomes and their liquidity position.

Wickens (1941, table D 9, 215) also reports the percentage of mortgaged properties for owner-occupied homes (56.2 percent) and rental property owners (39.8 percent), and the average dollar amount of past due payments to lenders for delinquent homeowners ($467) and for delinquent rental property owners ($582). (Figures on delinquent payments are in table D 45 on p. 287.) Together with the number of owned and rented homes, this is enough information to estimate the total delinquent payments.[23] The results are that homeowners had about $1.16 billion of delinquent payments and rental property owners had an additional $1.31 billion in delinquent payments. These delinquent payments amounted to 10.7 percent of the $23.08 billion

23. Table 965, p. 886, in the 1943 edition of the *Statistical Abstract of the United States* includes the number of owner-occupied homes (10,549,972) and the number of rental homes (12,367,100) in the United States in 1930.

in nonfarm residential mortgage debt (excluding mortgage bond debt) outstanding at the end of 1933. Comparison with the current situation provides some perspective on this number. Combined with the amount of residential mortgage debt from the Federal Reserve Flow of Funds, Lender Processing Services provides enough information to develop a reasonable estimate of delinquent mortgage payments. Delinquent residential mortgage payments appear to have peaked at $85.24 billion in the third quarter of 2012. This figure amounts to only 0.9 percent of the $9,442.12 billion in mortgage debt outstanding at that time.[24] This comparison should make clear that mortgage delinquency could have been an important factor in the financial distress during the Great Depression, since its magnitude was probably an order of magnitude greater (as a percentage of outstanding mortgage debt) than it was in the recent crisis.

Unfortunately, there is no national foreclosure data until 1926. Foreclosures increased steadily from this first year through 1933 and thereafter began to decrease.[25] Foreclosures began to rise sharply before the period of rapidly falling house prices and rapidly increasing unemployment began in 1930.

For comparison, the number of foreclosures during the recent crisis peaked at 1.1 million in 2010, which would correspond to about 20.6 foreclosures per thousand mortgaged residential properties. In 2012 the rate was approximately 14.4 per thousand mortgaged residential properties. In an April 2013 *National Foreclosure Report* from CoreLogic, they estimated that 4.4 million foreclosures have been completed since September 2008. That is about 8.1 percent of the mortgaged properties at the time of the financial crisis. The rates shown in table 3.5 for the Great Depression would imply that there were about the same percentage of home foreclosures between 1929 and 1936 as there have been between 2008 and 2012. Standard & Poor's estimates that the recoverable value on the average foreclosure is about 55 percent of the loan principal. By the end of 1933, accumulated foreclosures from 1929 had reached about 5.1 percent of the properties with mortgages

24. From the amount of residential mortgage debt provided in the Federal Reserve Flow of Funds and the number of mortgaged properties in the LPS *Mortgage Monitor*, it is possible to determine for each quarterly reporting period the average mortgage. In the third quarter of 2012, the average home mortgage principal balance was $188,598. If we assume that the typical delinquent mortgage was a fully amortized thrity-year loan with a 6 percent interest rate, then one missed monthly payment amounted to almost exactly $600 per $100,000 principal balance. The LPS reports the number of residential mortgages thirty days past due and the number sixty days past due in its *Mortgage Monitor*. For mortgages ninety or more days past due, they report both the number of them and the average number of days past due. They also report the number of mortgaged residential properties in the foreclosure process and the average number of days that they are delinquent. From these pieces of information it is possible to estimate the number of delinquent monthly payments. For example, multiplying the number of mortgages thirty days past due by the average principal balance per mortgage and the average monthly payment on that balance yields the estimate of delinquent payments for that category of delinquency.

25. Foreclosure statistics are taken from the HSUS series Dc1255 and Dc1257.

Table 3.5 Foreclosures and foreclosure rates, 1926–1941

Year	Total foreclosures	Foreclosures per 1,000 mortgaged structures
1926	68,100	3.6
1927	91,000	4.8
1928	116,000	6.1
1929	134,900	7.1
1930	150,000	7.9
1931	193,800	10.2
1932	248,700	13.1
1933	252,400	13.3
1934	230,350	12.2
1935	228,713	12.1
1936	185,439	9.8
1937	151,366	8.0
1938	118,357	6.3
1939	100,410	5.3
1940	75,556	4.0
1941	58,559	3.4

in 1929. If lenders' losses were comparable to this, the recent estimates from Standard & Poor's losses would have been about $615 million or 2.7 percent of the residential mortgage principal outstanding at the end of 1933. Combined with losses from delinquency, the losses in the Depression would have been about 13.4 percent of mortgage loans; in the Great Recession, the figure would come to about 4.5 percent of mortgage loans. Although these are approximations, they certainly suggest that losses on mortgage lending must have been very severe and an important source of financial distress during the Depression. Moreover, foreclosure statistics underestimate both homeowner and lender distress, since many homeowners surrendered their homes before the foreclosure process was undertaken or completed. Fisher (1951, 48), citing Hoad (1942) notes that "during the eight-year period, 1931–38, 10.1 percent of all single-family homes in the [Toledo] area were foreclosed, and 9.6 percent were surrendered in lieu of foreclosure."

More disaggregated data reported in Bureau of Business Research (1943) for Franklin County, Ohio, can be used to determine which vintages of loans had the most serious foreclosure rates. Table 60 in that report shows that the percentage of mortgages resolved by foreclosure or court judgment by the end of 1937 increased monotonically from 0.5 percent in 1919 to 9.9 percent in 1928. If we assume that the hazard rate of foreclosure or court judgment was stationary for each vintage from 1917 to 1937, the percentage of loans that would go bad each year increased from 0.03 percent for those issued in 1919 to 1.09 percent for those issued in 1928. The rate then began to fall slowly to 0.66 percent by 1932. By 1934 it reached 0.04 percent per year.

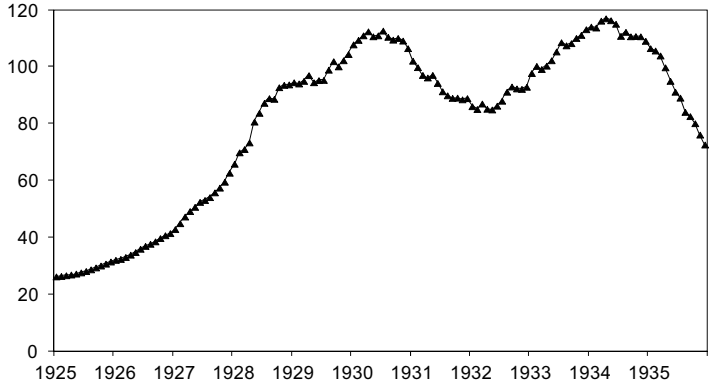

Fig. 3.6 One-year moving average of monthly foreclosures in Washington, DC

Additional evidence on the years prior to 1926 was provided by Badgley (1936), who published a monthly series on deed recordings and foreclosures from 1893 to 1936 for Washington, DC. Figure 3.6 shows a one-year moving average of Badgley's foreclosures series. It should be noted that foreclosures were increasing fastest during a period that was otherwise considered part of the economic boom, in 1927 and 1928.

In 1929 the unemployment rate was lower than in any other year in the twenties. Yet table 3.5 shows that the rate of foreclosures nearly doubled between 1926 and 1929. This result would be puzzling, but the experience of the recent housing bubble suggests a possible reason for rising foreclosures in a time of rising income and expanding employment. We have compiled much evidence that leverage was increasing as the real estate market was slowing down. Figure 3.2 shows that as late as 1928, the net increase in outstanding mortgages remained close to its peak level from 1926. Figure 3.3 shows that deed recordings in eight counties and Washington, DC, peaked in 1925 and had been falling rapidly for three years. The total number of deed recordings in 1928 was 31.4 percent below the level in 1925. Moreover, as figure 3.1 shows, new residential construction, which would absorb a large amount of new mortgage funds, was also falling by 1928. New residential construction had fallen 14.3 percent from 1925 to 1928. Yet through this developing downturn in residential construction and sales, the net flow of mortgage funds actually increased slightly between 1925 and 1928. From this it follows that the leverage was increasing as the Depression approached. It is possible or even likely that during the mid to late 1920s, underwriting standards were eroding and as house prices began to decline in 1927 and 1928, an increasing number of homeowners were unable to meet their obligations, even before the general downturn began.

3.6 Urban Bank Stress from Real Estate

Among the banks that experienced serious problems, we have some evidence that they were heavily exposed to residential real estate. According to Lucia (1985) and O'Brien (1992, 378), Bank of United States had 45 percent of its assets in real estate in 1930, compared to an average of 12 percent for other New York City banks. The final banking crisis from January to March 1933 originated in Detroit with the Guardian Union Group and Detroit Bankers Group. Union Guardian Trust had $30 million in real estate assets at the end of 1930, and it had 72 percent of its assets in real estate at the end of 1932 six weeks before it failed. According to Wigmore (1985, 437), "[w]ithin the Guardian Group as a whole approximately one-third of its total assets were in loans or investments related to real estate at the end of 1932." These figures are extremely high relative to other commercial banks. According to Grebler, Blank, and Winnick (1956, table N-10, 485), the average percentage of assets in residential mortgage loans for commercial banks in 1933 was 5.5 percent, and the average level of commercial bank lending on all real estate was only 8.7 percent.

The other main bank in the Guardian Group was the Guardian National Bank of Commerce. That bank's deposits of $198 million in December 1930 had fallen to $113.9 million when it was closed. Wigmore (1985, 438) also notes that "[t]he banks in the Detroit Bankers' Co. had over 40 percent of their assets in real estate loans or investments at the end of 1932, although their emphasis on individual home mortgages had produced a more sound portfolio." The largest bank in the Detroit Bankers' Group was the First National Bank of Detroit, which had deposits of $398.8 million when it closed.[26] In Senate hearings in late January 1934, Ferdinand Pecora quotes from the bank examiner's report of September 25, 1931, on the condition of the First National Bank of Detroit.[27]

> This report reflects a very unsatisfactory condition, showing classified loans and doubtful paper aggregating approximately the surplus and profit of the bank, without taking into consideration a large amount of slow assets. This condition has been brought about by two major causes, namely, the general business depression, and the shrinkage in the inflated value of real estate, and poor management.
>
> In the first instance Detroit has suffered along with other large cities from the depression, and more particularly because of the slowing down of the motor industry. The city has a large floating population, relying to a great extent on this one industry for its income. When this source of

26. For the final report on the condition of the First National Bank of Detroit, see table 36 in the *Eightieth Annual Report of the Comptroller of the Currency* (1942).

27. Stock Exchange Practices. Hearings before the Committee on Banking and Currency. Part 11, Detroit Bankers Company, January 24 to February 1, 1934. Washington, DC: US Government Printing Office, 1984.

> income is materially reduced, all other branches of business are to some extent affected.
>
> This condition has been reflected to a very marked degree in the value of real estate. Real estate values of 2 years ago have been cut in half, with little activity on this basis. Large buildings have not shown any market whatever. Foreclosures and receiverships are numerous.

From this quote it appears that the First National Bank of Detroit was also heavily invested in real estate, so the two largest banking conglomerates in Detroit, where the final banking panic of January to March, 1933 incubated, were both fragile institutions with large real estate portfolios.

Dolbeare and Barnd (1931) compared the condition of ten banks that failed in the summer of 1929 with a group of eight banks that survived into 1931. The successful banks were chosen first from among the strongest Florida state banks. Eight of the failed banks were chosen because they were similar in size and located in the same cities as successful banks in the study, and two failed banks were chosen because they were similar in size to other successful banks in the study. Characteristics of the failed and successful banks are compared at call dates in June and December of each year from June 1922 to December 1928. Two comparisons stand out. The real estate loans of failed banks on average grew 288.1 percent between June 1924 and December 1925. The real estate loans of the successful banks grew by 40.0 percent on average between June 1924 and December 1925. The volume of real estate loans as a percentage of assets averaged 12.3 percent in the failed banks and 15.2 percent in the successful banks during the boom period. Although the failed banks had fewer real estate loans as a percentage of assets, the real estate loans of failed banks grew much faster during the bubble period than the real estate loans of successful banks. Failed banks also grew much faster during the boom. On average deposits in failed banks grew by 220.7 percent whereas deposits in successful banks grew only 90.6 percent. Total loans of failed banks also grew faster during the boom period, 166.0 percent versus 56.6 percent, but most other characteristics of the two groups were similar. Loans as a percentage of total assets averaged 57.4 percent in the failed banks versus 56.0 percent in the successful banks during the boom period. During the boom period, cash as a percentage of total assets averaged 29.4 percent in the failed banks versus 32.4 percent in the successful banks. Deposits as a percentage of total liabilities averaged 89.0 percent in the failed banks versus 90.1 percent in the successful banks during the boom period. These results leave open the possibility that it was growth of all lending that was a key factor in the failure of these banks, but it does contribute to the body of evidence that lending on real estate was risky when real estate values subsequently collapsed.

In chapter 2 of this volume, Field argues that banks' loans to brokers were probably a more serious source of losses than real estate loans. He notes the large volume of these loans and the fact that they constituted a very large

share of total lending by member banks. In spite of the large amount of loans for securities purchases, evidence from loans to brokers suggests that deleveraging in this sector was conducted quickly and with minimal losses. Loans to brokers on the New York Stock Exchange peaked in October 1929 at $8.55 billion. By the beginning of December 1929 the figure had fallen by 53 percent to only $4.02 billion.[28] Through the course of this rapid deleveraging only one brokerage, Mandeville, Brooks & Chaffee, failed. Its liabilities were estimated to be $4 million to $5 million.[29] It was seven months later when the next brokerage, Woody & Co., failed with liabilities estimated at $3 million.[30] This indicates the ease with which loans on securities could be closed out, and the safety of these loans, since the bonds and equities that secured the loans could be liquidated if margin calls went unmet.

In sharp contrast to loans on securities, mortgage lending is difficult to unwind, even as collateral collapses. (See Gjerstad and Smith 2009 for an analysis of this in the collapse of the US housing market from 2007 to 2009.) We have seen in section 3.4.2 how rapidly house prices fell during the Depression, and in section 3.5.2 we noted the escalation of foreclosures. Nevertheless, the reduction of mortgage debt was slow and prolonged, not because of a lack of distress from that category of lending. We have estimated that delinquent mortgage payments in January 1934 amounted to 10.7 percent of outstanding mortgage principal, and that losses on foreclosure may have amounted to another $615 million, or about 2.7 percent of outstanding principal at the end of 1933. Residential mortgage debt outstanding (excluding mortgage bond debt) peaked in 1931 at $27.65 billion. At the beginning of 1934, when losses on mortgage lending had reached approximately 13.4 percent of outstanding loans, mortgage loans outstanding had been reduced only $4.57 billion to $23.08 billion, a decline of 16.5 percent. The process of deleveraging in the real estate market was arduous, costly, and slow. Mortgage lending continued to fall for four more years until it reached a low of $21.92 billion in 1936 and 1937. This is remarkable in view of the fact that mortgage debt outstanding in the United States has fallen during only three periods during the past 115 years: 1932 to 1936, 1942 to 1944, and (at the time of this writing) from the second quarter of 2008 through the second quarter of 2013.

3.7 Summary: Channels of Contraction

There are five primary channels through which the construction and consumer credit booms accentuated the economic cycle. The first and most direct is reduced residential construction. The second channel was the

28. See *New York Stock Exchange Yearbook, 1929–1930*.
29. See "Brokerage Concern Put in Receivership," *New York Times*, Nov. 19, 1929, p. 2.
30. See "Brokerage Insolvent, Face Jury Inquiry," *New York Times*, June 20, 1930, p. 17.

damage to household balance sheets from the fall in home prices, and the negative impact from damage to household balance sheets on household demand for consumer durables and nondurables. The third channel was the reduction in firms' inventories, production, and fixed investment that resulted from the household consumption decline. The fourth channel was the feedback effect from declining production and investment to declining household income, which then circled back to affect each of the first three factors. The fifth factor was the damage to banks' balance sheets, which accentuated the troubles of both firms and households when loans could not be extended or rolled over due to the need for banks to deleverage.

3.7.1 Reduced Residential Construction

In the peak year of 1925, residential construction amounted to 5.3 percent of GDP. Between 1921 and 2010, residential construction as a percentage of GDP has exceeded 5 percent in four years. These were 1924, 1925, and 1926, and later in 1950 when the stock of housing was depleted from the low level of residential construction during World War II. Even during the recent boom, residential construction reached a maximum level of only 3.8 percent of GDP in 2005. The excess supply of structures constructed during the boom had to be absorbed before the construction industry could revive, so the decline in residential construction was the first and most direct channel by which the residential real estate downturn affected economic activity.

3.7.2 Damage to Household Balance Sheets

Housing market data show that real estate prices peaked in 1925 and 1926, and then began a slow decline that gathered momentum from 1929 to 1932. Many households borrowed when house prices were at or near their peak. Referring to figure 3.2, we see that in the years 1925 to 1928 the net flow of mortgage funds held steady at their flat four year peak of about $3 billion per year. As prices slid, household wealth fell while total debt burdens not only remained high but continued to increase even as new residential construction declined rapidly. For households with much of their total wealth consumed by their down payment, the house price decline wiped out their accumulated wealth, or worse. Short loan terms were a structural feature of the mortgage market, not only in commercial bank lending, but also in residential lending. These short contract terms probably created an additional source of contraction in mortgage lending and an additional source of downward pressure on housing prices when loans that came due were not rolled over.[31] In addition to their short term, many mortgages at that

31. Grebler, Blank, and Winnick (1956, table 67) list average lengths of mortgage contracts for life insurance companies, for commercial banks, and for savings and loan associations from 1920 through 1947. For the period from 1920 to 1934 the average contract length for commercial banks was only 3.0 years. The averages for life insurance companies and for savings and loan associations were longer at 6.8 and 11.2 years. But these figures are the average contract

time were either nonamortizing (i.e., interest-only as in the current crisis) or partially amortizing (i.e., balloon payments if not rolled over). For the period 1925 to 1929, about 14.3 percent of mortgages issued by life insurance companies were fully amortizing; in the same period, about 10.3 percent of mortgages issued by commercial banks were fully amortizing.[32] All these loans would have involved balloon payments at the end of their term. Savings and loan associations commonly issued fully amortizing loans: 94.9 percent of their loans between 1920 and 1929 were fully amortized. By 1935 to 1939 the share of fully amortized mortgages at commercial banks had risen to 69.0 percent.

The combination of short loan terms and the use of nonamortizing loans must have exacerbated the distress of both homeowners and lenders as the Depression developed. A large fraction of borrowers would have faced the necessity to refinance sometime between 1930 and 1935, when credit market conditions were stringent. When a borrower tried to refinance after prices had fallen, lenders either had to extend a new loan with a higher loan-to-value ratio, reduce the amount of the loan, or decline to renew it. As foreclosures were rising and prices were falling after 1926, this was an unattractive proposition for lenders, even before credit market conditions began to deteriorate significantly late in 1930. The need to refinance during a period of falling home prices must have led to distress sales when homeowners were unable to find new lenders upon expiration of their existing loans. Since many loans were not amortizing, lenders risked losses on a loan when the value of a home fell below the homeowner's equity. Lost equity and the prospect of a distress sale would naturally create uncertainty among households and lead to increased precautionary savings and reduced consumption. Estimates of personal savings in Swanson and Williamson (1972, table 3) reinforce this impression: the average level of personal savings between 1929 and 1931 was 97.5 percent higher than the average level for 1926 through 1928.

An increase in precautionary savings due to household balance sheet problems leads to declining household consumption, especially of durable goods. This in turn leads to reduced production levels and reduced employment. As reduced employment adds to household distress, it reinforces both the decline in durable goods consumption and the frequency of mortgage default and distress sales of housing. Reduced consumption from lost homeowner equity, its effect on production and employment, and the contribution of reduced employment to homeowners' mortgage distress is the second channel through which a downturn in the housing market affects economic activity.

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length when the loan was issued, so the average length remaining on the loan when the banking troubles began would have been significantly shorter and many borrowers would have been affected when banks tried to retain liquid assets by declining to roll over loans.

32. Data on amortization are reported in Grebler, Blank, and Winnick (1956, table 66, p. 231).

3.7.3 Reduction of Firms' Inventories, Production, and Fixed Investments

As demand for consumers' durables collapsed, firms reduced inventories, but when demand failed to recover quickly, demand for producers' durables also began to fall. Investment decline impacts producers of raw materials and production equipment more than any other sector.[33] The decline in the demand for residential housing and for consumer durables leads to a desire by firms to reduce inventories, production, and employment. Reduced production then leads to a decline in demand for producer durables (plants, equipment, and structures). The large collapse in consumer durable goods demand that resulted from household balance sheet problems generated the third transmission channel into the real economy when producers' durable goods investment collapsed.

3.7.4 Feedback Effect on Households' Incomes

All of these effects have a pronounced impact on production, which feeds back to cause additional problems in the labor market. Labor market problems in turn circle back to cause further problems in the housing market and reduce consumer durable goods expenditures. Compensation to employees and proprietors' real incomes fell 11.3 percent from 1929 to 1930, whereas real GNP fell only 9.5 percent. At the same time the uncertainly associated with employees' compensation grew rapidly as unemployment rose from 2.89 percent in 1929 to 8.94 percent in 1930. In 1931 the plight of employees and proprietors grew considerably worse: their real income fell 16.6 percent, far in excess of the 6.3 percent decline in real GNP. In 1932, the gap between the decline in employee compensation and proprietors' incomes grew even larger: their real income fell 24.9 percent, while real GNP fell 13.3 percent. As their incomes fell in 1931 and 1932, employees faced increasing uncertainty as the unemployment rate increased to 22.89 percent. The brunt of the Depression fell on households, and their rapidly declining incomes led inevitably to a rapid collapse of demand for the products of industry.

3.7.5 Damage to Banks' Balance Sheets

The fifth transmission channel runs directly from households and investors to bank balance sheets. We estimated in section 3.5.2 that by January 1934, delinquent residential mortgage payments reached 10.7 percent of residential mortgage debt outstanding. Once housing equity losses among some households reach the critical threshold where their equity is exhausted and borrowers with inadequate collateral default on their payments, banks

33. Raw material and capital equipment output declined precipitously. Steel production (HSUS series Dd399) fell 75.5 percent between 1929 and 1932 and locomotive production (HSUS series Dd429) fell 96.4 percent from 1,770 in 1926 to 63 in 1933.

accumulate further losses. Distress among mortgage holders was not limited to owner occupants; it also included rental property owners and mortgage bond holders. In the 1920s, a large fraction of residential property was rented. Rental prices fell slightly more than property values, and the average loan term on rental properties was shorter than on loans to owner occupants. Real estate bonds issued in the 1920s on large apartment buildings, hotels, office buildings, and commercial properties accounted for an increasing share of real estate financing in the 1920s, and their performance was extremely poor. Transmission of losses into banks came from all sectors of the real estate market.

All classes of lenders deleveraged sharply during the course of the Depression. There are four reasons that banks reduce their private lending during a severe downturn. When bank capital declines as a result of losses, deleveraging is the simplest and most direct way for a bank to decrease its asset-to-equity ratio. When lending declines, the bank's assets are reduced but its equity is not directly affected. This improves its equity-to-asset ratio, even in the absence of direct capital investment. A second reason for a lending reduction is that when a loan is called or not rolled over, the funds obtained can be invested in liquid assets such as Treasury securities or excess reserves with the Federal Reserve Bank, which provide protection against illiquidity in the face of depositors' demands. A third reason for deleveraging is that borrowers are scrutinized much more carefully in a downturn, since loan collateral might decline in value and investments will produce an inadequate return during a downturn much more frequently than during a boom. A fourth—and very significant—reason that bank lending will decrease is outside of the control of the banks: many sound borrowers do not have solid investment opportunities, so borrower demand for loans declines. All four of these forms of bank deleveraging have been particularly characteristic of domestic developments during the Great Recession and the slow recovery from it. Bernanke (1983) focused on a related transmission channel from failed or suspended banks to borrowers. He argued that businesses that had established relationships with a failed bank faced reduced access to capital markets. While this is true, even solvent and surviving banks reduced their lending during the Depression.

In his discussion of the consumption decline of 1930, Temin (1976) argues that the consumption decline in 1930 was large relative to declines in wealth and income, especially when compared to consumption declines in the other two interwar recessions in 1920 and 1921 and 1937 and 1938. The unemployment rate shot up from 2.9 percent in 1929 to 8.9 percent in 1930. The foreclosure rate increased from 3.6 per thousand mortgaged nonfarm homes in 1926 to 7.1 per thousand in 1929 and 7.9 per thousand in 1930. Surely the fear of losing first a job and then a home could readily lead to a sharp decline in expenditures on housing and durable goods. As household expenditures

fell, production, investment, and employment fell too, and the cycle of collapse was underway.

The accumulating household balance sheet stress after 1926 did not have a visible impact on corporate profits or the value of corporate equities even as late as October 1929. The national income accounts for 1919 to 1941 in Swanson and Williamson (1972) indicate that the sum of dividends and undistributed corporate profits were higher in 1929 than in any other year between 1919 and 1940. But the capacity of households to buy the goods and services that industry produced was dependent on debt accumulation, and the capacity of households to absorb more debt was limited, hence the profits that industry had been earning would soon collapse and the value of the capital that industries had accumulated would be limited by the collapse of household demand.

During the Depression, the decline in expenditures on new residential units plus the decline in consumption accounted for 72.9 percent of the total decline in GDP.[34] This figure is striking, but it must understate the contribution of households to the contraction. Consumer durables sales fell 49.3 percent in real terms between 1929 and 1933. With such a dramatic decline in consumer durables sales, investment in plants and equipment collapsed almost completely. Nonresidential fixed investment declined 68.6 percent, which was a precipitous collapse especially in comparison with the average decline of 11.8 percent during postwar recessions and the maximum decline of 22.5 percent during the 2007 to 2009 recession.[35]

3.8 Conclusion

The evidence presented in this chapter on the Depression, combined with the evidence from Gjerstad and Smith (2012) and Buchanan, Gjerstad, and Smith (2012) on the Great Recession, indicates that our two most severe financial crises and our two most persistent economic downturns of the past century both followed large declines in the value of residential real estate prices. It is possible that some other factor caused the downturns in residential real estate prices, the financial crisis, and the prolonged recession, but we have also described a direct mechanism by which residential real estate losses are transmitted to the financial sector, and we have indicated why the losses to households suppress consumption, especially of durable goods, and how suppressed consumption reduces capacity investment by firms.

In the Depression, as in the Great Recession, the deterioration of the resi-

34. This figure is calculated from NIPA table1.1.6, comparing 1929 and 1933 figures for GDP and for residential investment and personal consumption expenditures.

35. For the figures on nonresidential fixed investment and on residential investment during the Depression see footnote 9. Declines in nonresidential fixed investment in postwar recessions are taken from table 1 in Gjerstad and Smith (2012).

dential real estate market preceded the peak of the economic cycle and the broader downturn by two to three years; in both cases the damage to household balance sheets originated in residential real estate losses, and much of the damage suffered by financial sector firms resulted from transmission of households' real estate losses to financial sector firms.

This begs the question, "Why are losses on residential real estate so pernicious?" There are at least four primary reasons. First, residential real estate is illiquid, especially in a downturn when sales begin to decline. Second, it is often highly leveraged, and in the Depression we saw that mortgage credit was growing while sales and construction of new homes were falling, so leverage was increasing toward the end of the boom as prices began to fall. A third reason is that residential real estate assets are a large portion of national wealth and a large fraction of the wealth of many households, so that a downturn in residential real estate values has a substantial impact on household balance sheets and on their consumption levels, especially of durable goods and new housing assets. Finally, housing assets are immobile, so that there is no geographical redistribution of overbuilding in one area to other areas. For many real assets, redistribution is almost immediate, as with ships, airplanes, or locomotives. Even overbuilding of production capability, such as factories, would lead to a revaluation of the assets, but they would often remain utilized for export. Residential real estate is unusual in having few alternative uses when it is overbuilt. For all of these reasons, policies related to development and financing of residential real estate should be carefully considered.

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