

# **Lessons from the Great American Real Estate Boom and Bust of the 1920s\***

## **ABSTRACT**

Similar in magnitude to the recent real estate boom and bust, the first nationwide twentieth century “bubble” appeared in the early 1920s and burst in 1926. While fundamentals, including a post-war construction catch-up, low interest rates and a “Greenspan put,” played a role in its inception, the boom developed its own momentum, particularly in hot regional markets, notably Florida. Financial innovation and lax supervision contributed to the upswing. Alternative monetary policies would have dampened but not eliminated the boom. Its collapse caused foreclosures to rise and weakened some firms’ balance sheets. Yet, unlike the events of 2008, the drop in real estate prices did not induce a collapse of the banking system. The crucial elements absent in the 1920s were federal policies that increased homeownership and risk-taking in the banking sector, suggesting that these were crucial to the eruption the recent and worst financial crisis since the Great Depression.

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Although apparently dwarfed by the magnitude of the recent events, real estate booms and busts were not unknown in the past. Huge swings in real estate prices and construction occurred at long intervals. The important question today is thus not why was there a boom but why its consequences were so severe for the financial sector. The 1920s, the 1980s, and the first years of the twenty-first century constitute the three great real estate events of the last one hundred years. Focusing on the 1920s is useful because it occurred well before any of the major New Deal and late twentieth century interventions by the federal government in the housing and banking, permitting us to see how a similar boom and its fallout in a less regulated environment.

Frustrating analysis of current events are the many potential factors given for driving the boom. A short list of the major contenders would include: (1) the Federal Reserve's excessively easy monetary policy, (2) the "Greenspan put," (3) the failure of bank supervision (4) moral hazard from "Too Big to Fail" and deposit insurance, (5) deregulation of banking (notably the end of the Glass-Steagall Act), (6) the failure of the rating agencies, (7) the excessive growth of Fannie Mae and Freddie Mac, (8) legislation promoting affordable housing, (9) international imbalances, notably high savings rates in China and East Asia, (10) unregulated derivatives markets, (11) poor corporate governance, (12) greedy/ predatory lenders and (13) greedy/ignorant borrowers.

While most analyses focus on one or two factors, one would be hard-pressed to design a method of measuring the relative role of each factor. However, the 1920s allows us to witness how a boom unfolded in the absence of many of these elements. The Federal Reserve may have contributed to the boom of the 1920s by easy monetary policy and suppression of panics, while federal and state bank supervisors may have failed to control risk-taking by banks. But, there was no federal deposit insurance, no federal housing agencies or legislation to aggressively promote homeowners, no growth of new unregulated derivatives markets, and the United States was a net international lender rather than a borrower. Essentially, the boom of the 1920s occurred in climate of minimal government intervention.

In this paper, I examine the key characteristics of the early 1920s real estate bubble, comparing it to the 1928-1929 stock market bubble and real estate booms of the 1980s and 2000s. The boom of the twenties displayed many familiar characteristics, including surging housing starts, financial innovation, with strong regional elements; while the crash produced rapidly rising foreclosures. Part of the surge in construction arose from a catch-up from the World War I slump when funding was diverted to finance the federal deficit. Two potential monetary factors may have contributed: first, there was a "Greenspan put" by the Fed that decreased money market volatility and the likelihood of a panic; and secondly, there were alleged excessively low interest rates that provided additional fuel to the boom. However, alternative monetary policies, as defined by Taylor rules, would not have been enough to halt the boom. Whatever impetus came from these factors and a weakening of supervision, banks were sufficiently capitalized that a drop in the urban real estate constituted little threat to their solvency. Thus, the storm passed without bringing down the financial system.

## Why Was the 1920s Real Estate Bubble Forgotten?

Few economists have taken note of this early real estate bubble, perhaps because it was followed soon by and obscured by the Great Depression.<sup>1</sup> However, the extreme character of the boom in Florida caught Galbraith's eye (1954). He saw the rise and fall of Florida real estate as a classic speculative bubble: "The Florida boom was the first indication of the mood of the twenties and the conviction that God intended the American middle class to be rich." (p. 6). Conceding that there were elements of substance, Galbraith saw it as based on the self-delusion that the Florida swamps would be wonderful residential real estate. In spite of the fact that he saw the Florida land boom as a harbinger of the stock market bubble, Galbraith failed to recognize that it was a nationwide event. How well the real estate boom of the 1920s was forgotten by economists is revealed in Shiller's first edition of *Irrational Exuberance* (2000), where it is not even mentioned. Only in his 2007 presidential address to the Eastern Economic Association did Shiller shift his focus from equity to real estate markets. Yet, Florida rates only a brief mention and he describes the collapse as the result of a change in investor psychology prompted largely by the "surprise" increase in the supply of properties.

The more general collapse of residential investment and housing prices was, however, recognized by contemporaries. For example, Simpson (1933) found that there was an excessive expansion of residential construction in the 1920s, abetted by an unholy alliance of real estate promoters, banks, and local politicians. In Cook County outside of Chicago, he claimed that there were 151,000 improved lots and 335,000 vacant lots in the bust year of 1928, estimating it would take until 1960 to sell these properties based on future his projection of future population growth. He considered Chicago to be important example of the bubble, although Florida was the most conspicuous. Yet, beyond bewailing current conditions, Simpson provided few statistics and confounded the problems of the real estate bust with the Great Depression.

Early post-World War II research was focused on the recovery from the depression. Morton (1956) and Grebling, Blank and Winick (1954) and others did not isolate the collapse of the 1920s from the Great Depression and treated it as one blur. Their implicit belief was that the New Deal reforms of banking and mortgage finance resolved most of real estate's problems in the 1930s----thus the boom and bust of 1920s did not require special attention as a separate issue.

The only modern study of the Great Depression where there is a suggestion that collapse of construction was important is Temin's 1976 book. Temin found that aggregate investment began to autonomously decline before 1929 and that the driving factor was the fall in construction after 1926, although he did not tie this to the demise of the residential housing boom. Two histories (Vickers, 1994; Frazer and Guthrie, 1996) provide details on the Florida boom but treat it as an isolated phenomenon. In the most recent national study, Field (1992) saw the general building boom of the 1920s as

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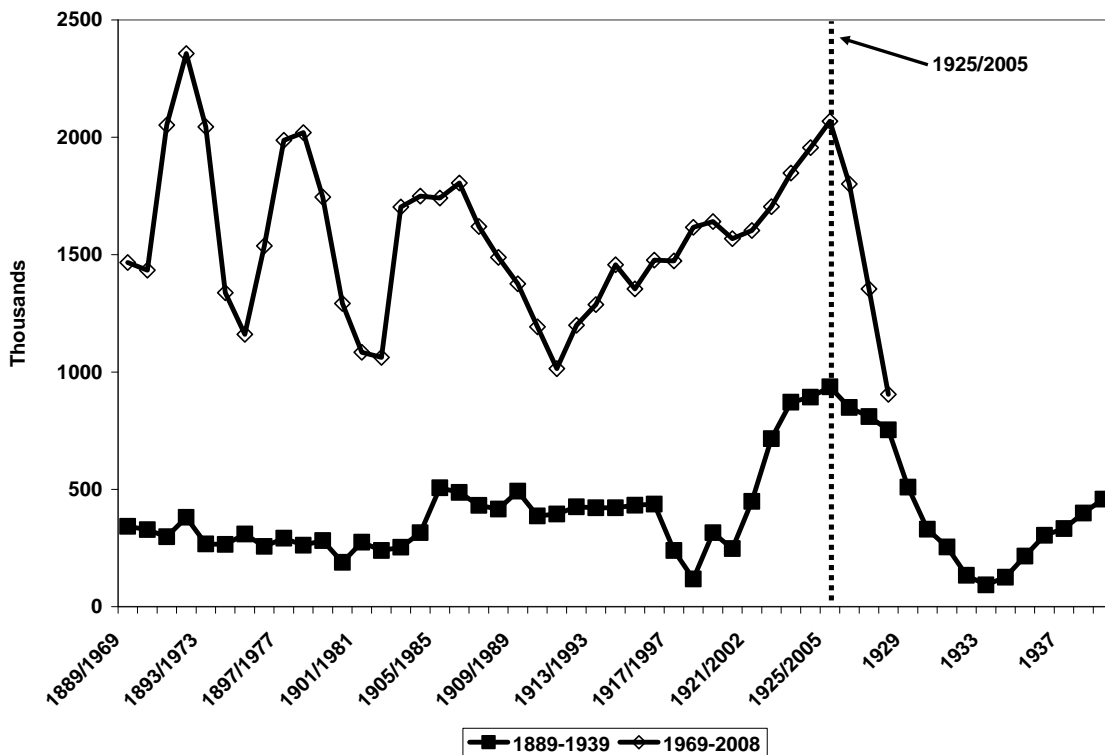
<sup>1</sup> In popular culture, the Florida land boom is remembered in the Marx Brothers' 1925 musical "The Cocoanuts," which became the 1929 movie. This features an auction of land of questionable value, with Groucho Marx as the auctioneer: "You can have any kind of a home you want to; you can even get stucco. Oh, how you can get stuck-oh!"

creating major problems for the economy. He identified a residential boom peaking in 1925, “a smaller orgy of apartment building” cresting in 1927, and a corporate building upswing continuing through 1929. Yet, his emphasis was not on a bubble with excessive aggregate investment but on the consequences of unplanned and unregulated development that later blocked the recovery of existing sub-divisions because it raised the transaction costs associated with titles and tax liens. Given this general amnesia, the first task of this paper is to lay out the dimensions and magnitude of the national residential real estate boom that swept the country in the mid-1920s.

### Measuring the Residential Housing Boom of the 1920s

Like the current boom and bust, the housing bubble that peaked in the mid-1920s was focused on residential housing. In a decade of otherwise almost steady growth, the behavior residential construction stands out among other macroeconomic aggregates, peaking in 1925 and collapsing well in advance of the Great Depression. Figure 1 plots residential housing starts for boom of the 1920s and the contemporary period.

**Figure 1**  
**Residential Housing Starts**  
**1889-1939 versus 1969-2008**

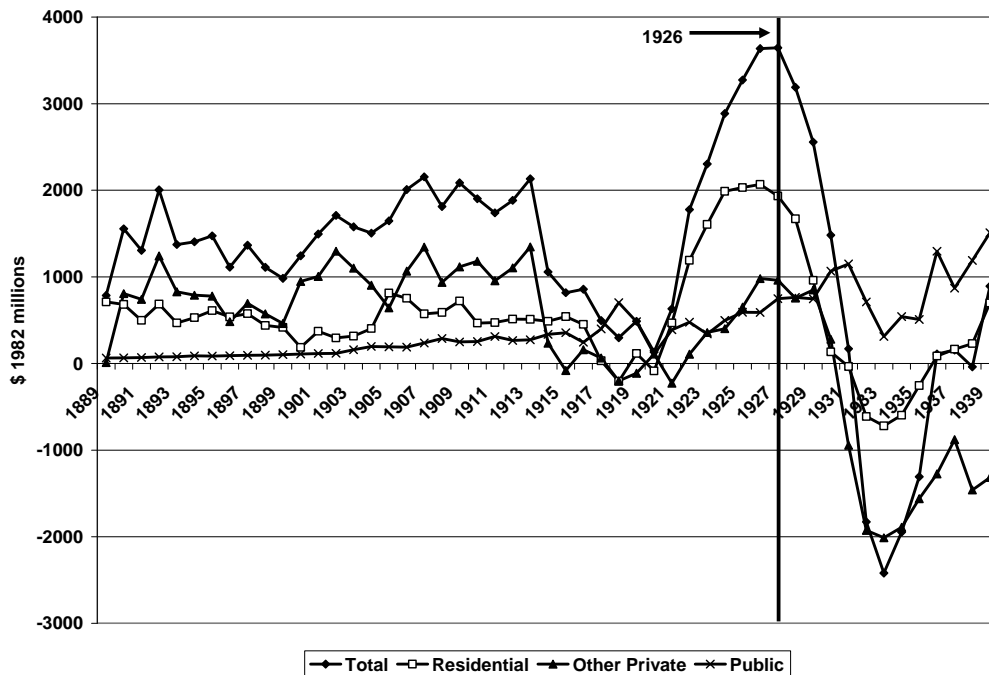


Sources: Historical Statistics, Table Dc510. Privately owned, permanent nonfarm housing units started and authorized by permit and Economic Report of the President (2008), Table B-56, new private housing units started, supplemented by U.S. Census Bureau, New Residential Construction, Table Q1, <http://www.census.gov/const/www/newresconstindex.html>

The early series begins in 1889, the first year for when there is national data; it attains a peak in 1925 that was not surpassed until 1949. The contemporary series is noticeably more volatile, particularly in the 1970s and 1980s, when swings in inflation and interest rates buffeted the housing markets. In contrast, price stability of the gold standard period kept mortgage rates in Manhattan between five and six percent for the whole era, except for World War I.<sup>2</sup> As the population of the country was considerably smaller ninety years ago, the level of housing starts was lower, but the run up during the booms is of the same magnitude. If 1920 and 2000 are considered baseline years, the boom of the twenties added 2.6 million units while the boom of the first decade of the twenty-first century added 1.3 million units, with starts 690,000 and 500,000 higher in the final years relative to the initial years.

Not all construction flourished during the boom of the 1920s, and residential housing dominated other types of construction expenditures. Whereas business construction, “other private construction,” in Figure 2, had been the largest component of construction in the pre-World War I era, residential construction surged ahead, more than doubling in importance. Business construction returned to prewar levels in the twenties, but the value of residential construction greatly exceeded its -1914 levels.

**Figure 2**  
**Net Real Construction Expenditures, 1889-1939**



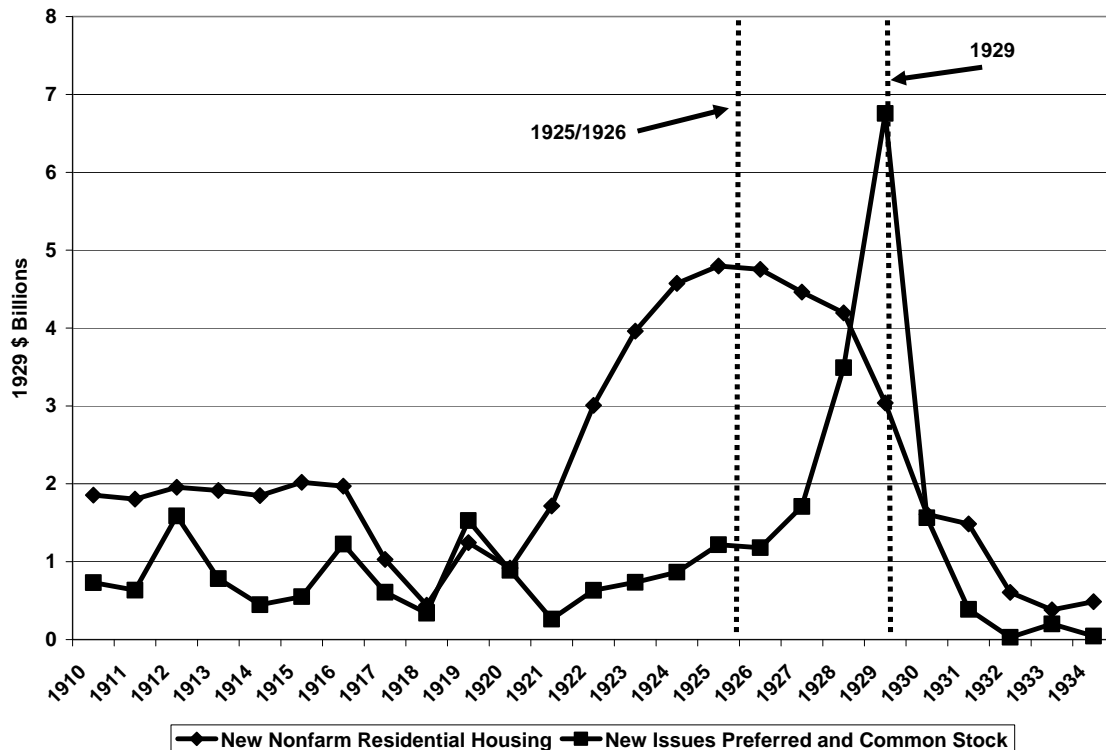
Source: Historical Statistics. Table Dc87-90. Net Construction Expenditures deflated by the wholesale price index (Cc66).

The subsequent stock market boom of 1928-1929 offers another useful comparison for measuring the magnitude of this surge or bubble in residential housing.

<sup>2</sup> Grebler, Blank and Winick (1956), Table O-1.

Figure 3 depicts the value of new residential construction and the value of new stock issues, revealing the double real estate-stock bubble of the 1920s, another parallel to the end-of-century double dot.com/real estate boom, but with the order reversed. Housing market run-ups are typically slower and smoother than in equity markets, but both experienced rapid upswings and quick declines. The peak in housing was reached in 1925-1926 when there was almost \$5 billion in new residential construction in each year, equaling the \$10 billion absorbed by new securities issues in 1928-1929. By the time that new stock issues approached \$7 billion in 1929, housing construction had fallen to \$3 billion.

**Figure 3**  
**Real New Housing and New Stocks Issues, 1910-1934**

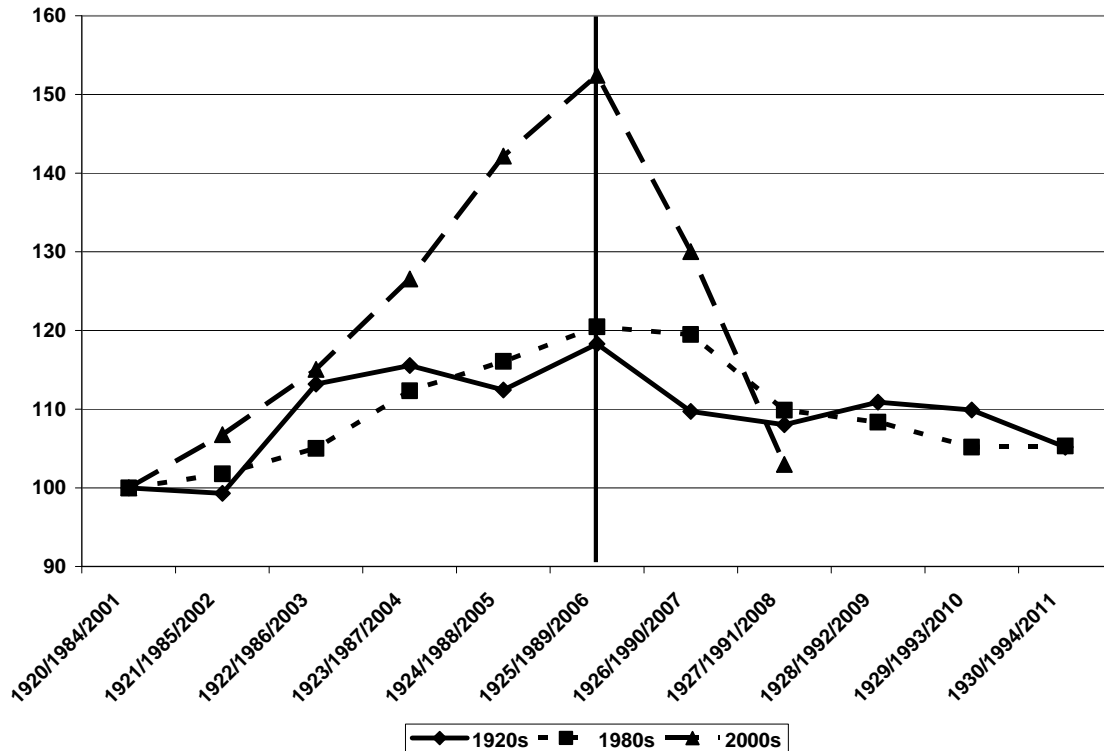


Source: Historical Statistics. New issues of common and preferred stocks, Table Cj837. New Residential Construction, Table Dc261 for 1915-1939 and Grebler, Blank and Winick (1956) Table B-5 for 1891-1914

The thorniest problem in measuring the real estate boom of the 1920s is the absence of an adequate housing price index. As is well known, even contemporary housing price indices vary considerably depending on their construction. Figures 4 and 5 report two different indices, which point to upper and lower limits on the size of the bubble. Figure 4 examines three booms using the real home price index provided by Shiller (2005 and <http://www.econ.yale.edu/~shiller/>). Setting 1920, 1984, and 2001 (five years before the price peaks) as the base years for three separate indices, the relative magnitude of each boom can be appreciated. In the current cycle, prices jumped 50 percent in five years to reach their peak in 2006. By this index, the 1920s does not appear to be as big as the current boom, but it was certainly as large as the boom in the 1980s

with national housing prices rising 20 percent before declining over 10 percent. While modest by comparison to today, the eighties was disastrous for real estate in the Northeast, Texas and California, contributing to the demise of many banks.

**Figure 4**  
**Indices of Real Estate Prices**



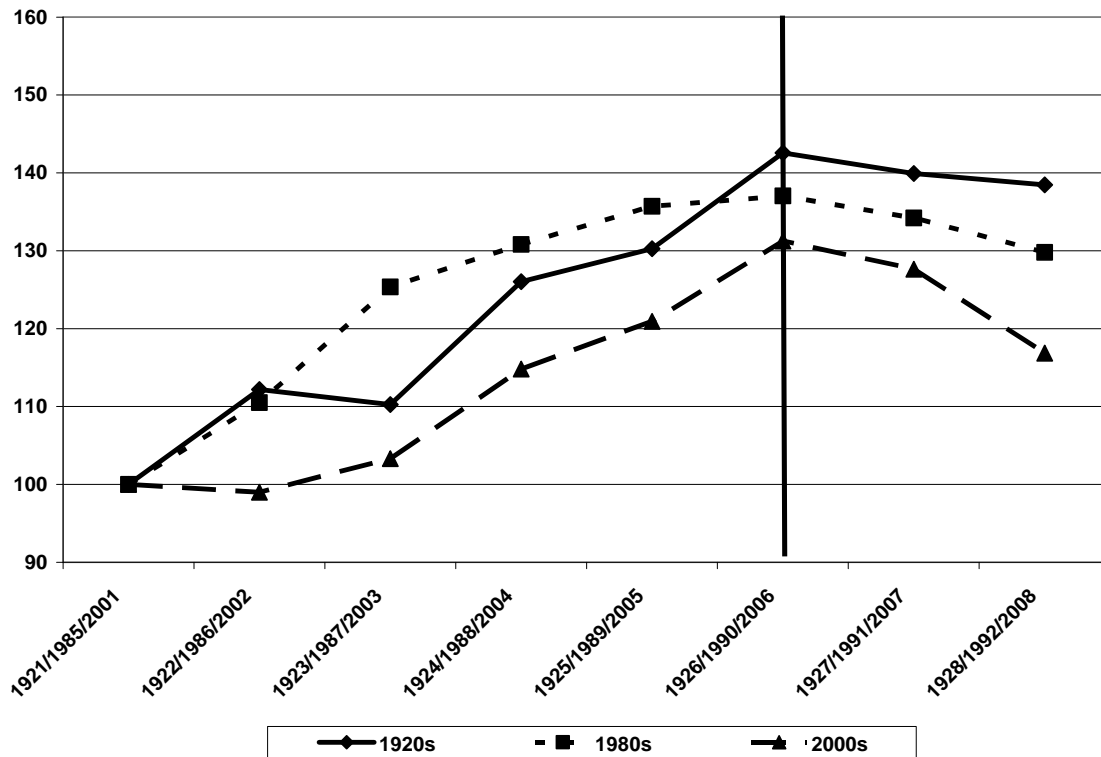
Source: Robert Shiller, webpage, <http://www.econ.yale.edu/~shiller/>.

Unfortunately, the index presented by Shiller appears to have a strong downward bias for the 1920s. Grafted on to the Case-Shiller index, these data for earlier years are very different. The source of this pre-depression national index is Grebler, Blank and Winick (1956). This series is based on a 1934 survey of owners in 22 cities who were asked what the current value of their home was and what it cost in the year of acquisition. There were two problems that the authors were not able to address. First, the year-to-year volatility increases dramatically for the early years of the index, a feature that does not match the smooth movement of contemporary indices. This phenomenon may be attributable to the relatively small number of observations in each year for houses that were purchased 20, 30, or 40 years before 1934. Secondly, if foreclosures or abandonment of property were more common for owners who had bought late in the boom at high prices, the peak of the boom would be underestimated. The size of this potential downward bias is difficult to estimate in the absence of sufficient additional national or regional data.

Florida, which is generally agreed to have experienced the biggest boom and crash in the twenties, has no housing prices index. One of the better extent series is the median asking price of single family homes in Washington D.C., which was not

considered part of the boom regions. (Historical Statistics, Table Dc 828). Real prices of these homes rose 38 percent from 1920 to the peak, dropping by nearly 10 percent before 1929.<sup>3</sup> A rise of this magnitude alone would place the twenties as the second greatest real estate boom of the last one hundred years. A superior hedonic real estate price index for Manhattan was recently developed by Nicholas and Scherbina (2009) for 1920-1939. For this critical market, prices rose 70 percent between the fourth quarter of 1922 when the postwar recession ended and the second quarter of 1926, the acknowledged peak, before tumbling. This evidence on regional real estate prices reveals that the boom was not confined to Florida, and that the Case-Shiller index grossly underestimates its magnitude. The two regional indices suggest that the 1920s boom in prices may well have been similar the rise in the early twenty-first century.

**Figure 5**  
**Indices of the Real Value of a Newly Constructed House**



Note: All housing values are converted into real values using the consumer price index. The value of a newly constructed house is equal to the value of new housing units divided by the number of new housing starts.

Sources: Historical Statistics (2000), Series Dc257 value of new housing units and Series Dc520 number of new housing units started Economic Report of the President (2009) Table B-55, value of new residential housing units and Table B-56, new housing units started

<sup>3</sup> The only other indexes are three-year moving averages for Cleveland and Seattle, while these would tend to reduce the peaks, the Cleveland index still climbed 30 percent and the Seattle index 16 percent. (Grebler, Blank and Winick, 1956, Table C-2).



Figure 5 shows an index for the value of newly constructed homes that is comparable across all three booms. The real value of a newly constructed house is obtained by dividing the real value of all new housing units by the number of new housing starts. By this measure, the three booms enjoyed rises of 43 percent, 37 percent, and 31 percent during the five years before the peaks in 1926, 1990, and 2006. The most recent boom here is smaller than the boom measured by the Case-Shiller index because it focuses on new construction. It is lower because there was a greater rise in price of existing homes in established urban areas where urban amenities and constraints on development contributed to the boom (Glaeser, Gyourko, and Saks, 2005). These three measures of the 1920s boom with a national minimum of 20 percent, a maximum of 43 percent and an increase of 70 percent in Manhattan demonstrate that the housing boom of this earlier era was very similar in magnitude to the recent one.

### **Was the Boom the Result of a Post-World War I Catch-Up?**

The underlying economic conditions for the housing booms of the 1920s and the 2000s also appear to have been quite similar. Unemployment was low and growth was exceptional. Likewise there had been a reduction in inflation. The great moderation in inflation after World War I, when the Federal Reserve took an activist role, attempting to lean against the prevailing macroeconomic winds, suggests that its role in the housing market requires close inspection. Just as critics today have blamed the Fed for firing up the boom, the Fed of the twenties may have contributed to the earlier jump in real estate prices if it had an excessively easy monetary policy or increased risk taking by reducing the fear of a panic. Yet, before turning to the role of the Fed, there are other fundamentals that need to be accounted for. Most importantly, the boom took place after a short but very serious decline in construction during World War I. Thus, the upswing might be attributable to a simple recovery of residential construction.

The enormous financing needs of World War I crowded out non-essential investment and consumption as resources were transferred to the government. Repressed demand helped to fuel the postwar boom in goods and inventories, but demand for housing was also constrained. To examine the possibility that the upsurge in home construction in the mid-1920s was only a catch-up, I provide some simple forecasts of what would have happened if World War I had not occurred. After first differencing to ensure the stationarity of the variables, I regressed housing starts and then the real value of construction on real GDP, population, and the Manhattan mortgage rate for the years 1889-1914.<sup>4</sup> The exercise is similar to Taylor's (2009) counterfactual analysis for the recent period.

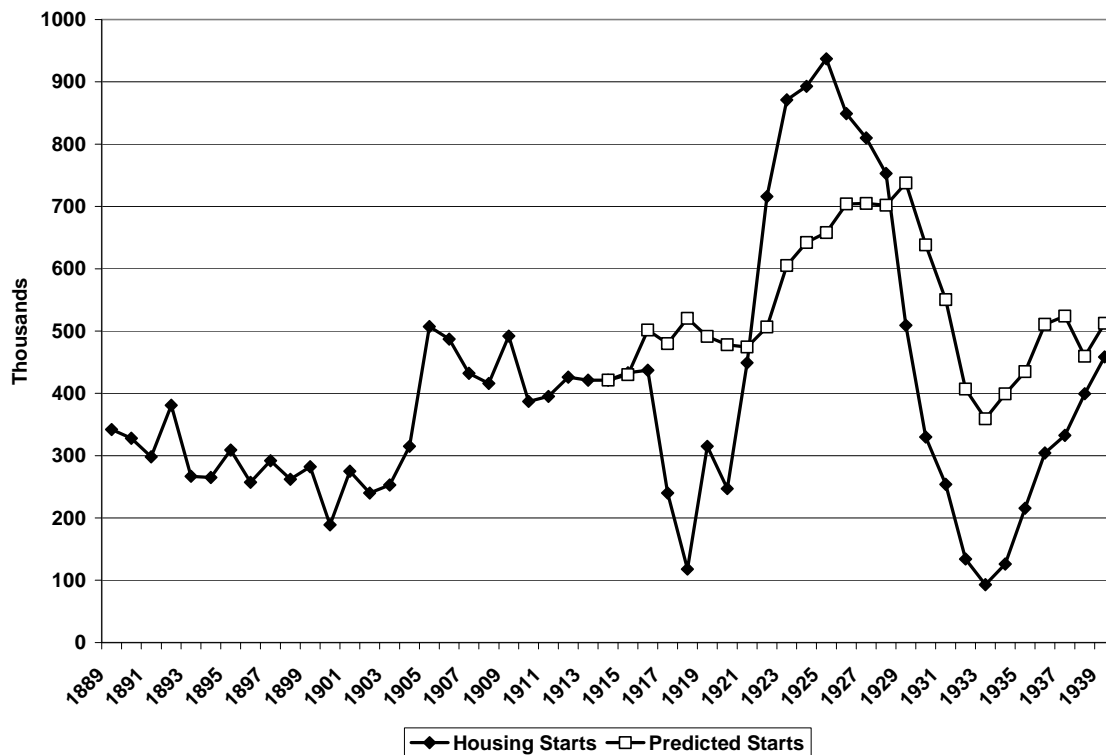
The actual and predicted out-of-sample values are plotted in Figures 6 and 7. The results diminish substantially the appearance of a bubble in the aggregate data. Housing starts and the value of new construction would have followed slow paced growth without the war and increased later as real incomes grew faster, until halted by the Great Depression. While predicted housing starts and the value of construction are below their actual levels in the 1920s, the predicted wartime levels are higher. If we consider the deficit in housing starts during the war, defined as 1917-1920, there were 1,049,000

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<sup>4</sup> The series from [Historical Statistics](#) are Dc510, Dc522 and Grebler, et. al. Table O-1.

starts that never materialized. In contrast there were 1,306,000 starts in excess of the predicted during the early twenties. The difference, 256,000, might be considered as a measure of the “bubble.” While this may seem small, it is two-thirds of the annual average starts for 1900-1917. If we examine the value of new construction, there was a shortfall of \$4.9 billion during the years 1917-1920 and “excess” construction of \$7.3 billion during the boom years of the 1920s. Given that the average real value of construction was \$1.8 billion for 1900-1917, a difference of \$2.9 billion suggests that there was more to the boom than a simple postwar recovery.<sup>5</sup>

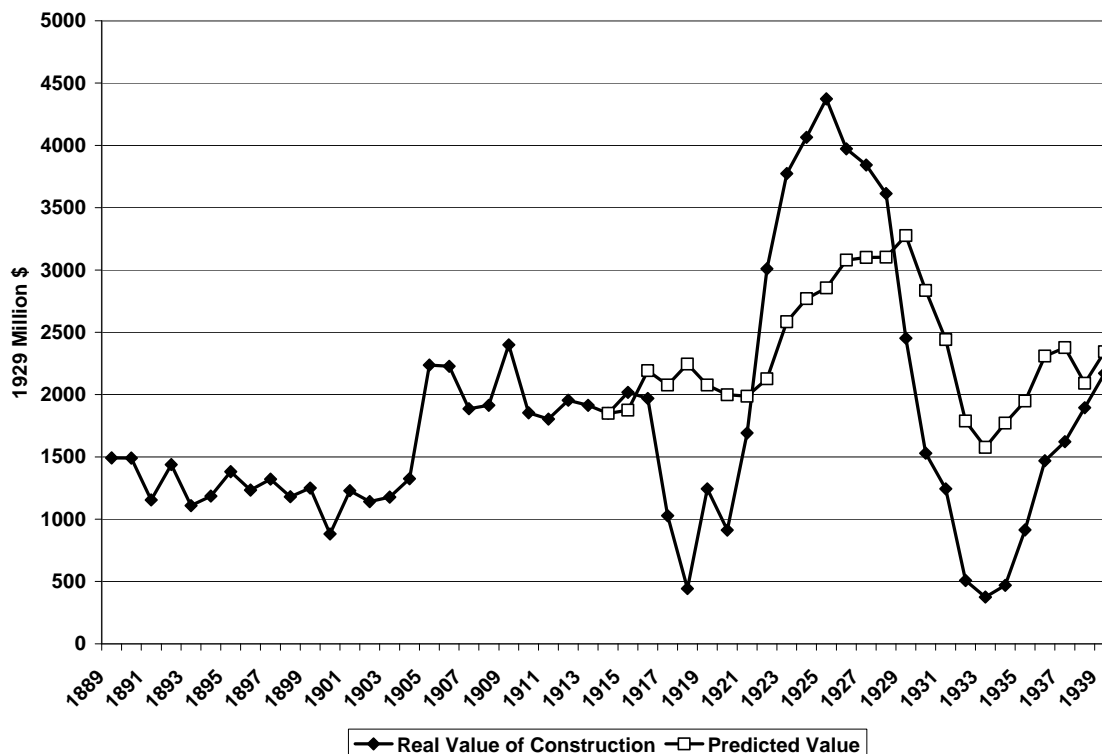
**Figure 6**  
**Actual and Forecast Residential Housing Starts**  
**1889-1939**



Source: [Historical Statistics](#) Table Dc510 and the text.

<sup>5</sup> Some observers argued that the spread of the automobile that furthered suburban expansion may have been a new fundamental. To approximate the effects of the automobile and suburbanization in the 1920s, I added a variable, the miles of streets and roads under control of the states, to the regressions ([Historical Statistics](#) Table Df184). However, this series only begins in 1904. Given the paucity of observations before 1914, it was not possible to obtain meaningful estimates for out-of-sample forecasts, so the estimated coefficients for a full sample of 1904-1939 were used. The coefficient on the variable for roads for the regressions with housing starts and the value of construction was insignificant. There may also some reason to that suburbanization was responsible for the housing boom. In the absence of the automobile, there could just as easily have been a greater housing boom in the central cities substituting for suburban growth and overcoming the wartime housing deficit.

**Figure 7**  
**Actual and Predicted Value of Real New Residential Construction**  
**1889-1939**



Source: [Historical Statistics](#) Table Dc522 and the text.

### Was the Federal Reserve Responsible for the Boom?

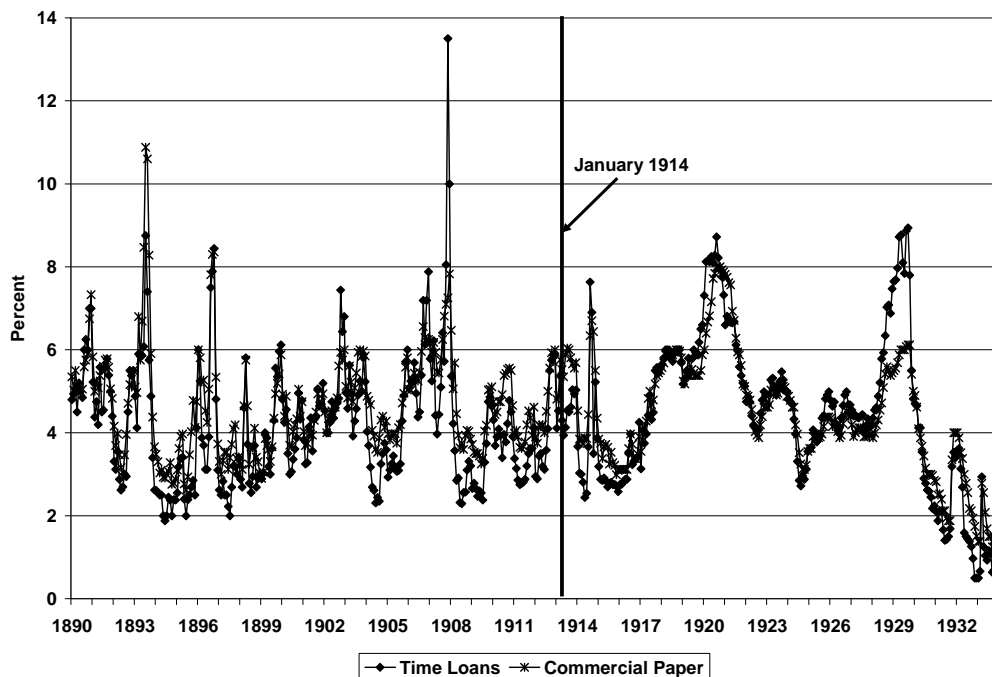
Could the Federal Reserve have been responsible for this residual surge in construction? There are two channels through which the Fed could have driven activity higher: (1) a promise by the central bank to prevent a financial crisis, and (2) keeping interest rates abnormally low.

The promise that the central bank will prevent a financial crisis is often called the “Greenspan put.” This phrase was coined after the 1998 collapse of Long-Term Capital Management when it was believed that the then chairman of the Federal Reserve Board, Alan Greenspan would lower interest rates whenever necessary to preserve stability capital markets forgoing price stability. Because this appeared to guarantee an “orderly” exit of sellers, he was criticized because the moral hazard of such a policy would encourage excessive risk taking, thereby contributing to a boom. In addition to observers on the street, some academics (see Miller, Weller and Zhang, 2002) argue that this policy was at least partially responsible for the subsequent dot.com boom.

A version of this “Greenspan put” may have emerged in the 1920s because the establishment of the Federal Reserve System substantially reduced the threat of crises and panics by sharply changing the stochastic behavior of interest rates. As is well known, the Fed was founded in response to the Panic of 1907 and charged in the Federal Reserve Act

of 1913 to “furnish an elastic currency.” The Fed considered it a central obligation to eliminate the seasonal strain in financial markets, as the first Annual Report (1914, p. 17) emphasized “its duty is not to await emergencies but by anticipation, to do what it can to prevent them.” Miron (1986) documented that the Federal Reserve promptly carried out policies that reduced the seasonality of interest rates. Because panics occurred in periods when seasonal increases in loan demand and decreases in deposit demand strained the financial system, accommodating credit to seasonal shocks reduced the potential of a crisis. Comparing 1890-1908 and 1919-1928, Miron found the standard deviation of the seasonal for call loans fell from 130 to 46 basis points, with the amplitude dropping from 600 to 230 basis points.

**Figure 8**  
**Nominal Short-Term Interest Rates, 1890-1933**



Source: NBER, Macro History Database, [www.nber.org](http://www.nber.org). The Time Loan rate is the interest on 90 day brokers (stock exchange) loans in New York City (Series m13003) and the Commercial Paper rate (Series m13002) is the interest on prime double name 60 to 90 day commercial paper until 1923 and 4 to 6 month paper thereafter.

The remarkable change in interest rate movements is seen in Figure 8 for both commercial paper and brokers’ term loans.<sup>6</sup> The reduction of seasonality in interest rates lowered the stress on the financial system, leading Miron to conclude that it had eliminated banking panics during the period 1915-1929. Most striking, was the absence

<sup>6</sup>During World War I, the Fed ceded control of the level of interest rates to the Treasury, which wanted to ensure that it could float bonds at low nominal rates. Nevertheless, the Fed first began to dampen seasonal in 1915 by rediscounting bills backed by agricultural commodities at preferential rates, continuing this program until 1918. Gaining control over its discount rate in 1919, the Fed acted more directly. A measure of the Fed’s intervention was its credit outstanding. Over the period 1922-1928, Miron (1986) calculated that there was an increase in the level of reserve credit outstanding over the seasonal cycle of 32% or approximately \$400 million per year at a time when the total New York City banks’ loans was \$6 billion.

of a panic during the severe recession of 1920-1921. Both the timing in the decline of seasonality and the role of the Fed have been challenged, but Miron's basic results have been upheld.<sup>7</sup> By reducing the volatility of the financial markets, the Fed may have induced additional risk-taking, contributing to the real estate boom of the mid-twenties.

In addition to a "Greenspan put," today's Fed has been attacked for lax monetary policy. John Taylor (2009) has been one of its leading critics. Instead of adhering to policies that match a Taylor rule, as it had in the prior twenty years, he has argued that beginning in 2001 the Fed kept the Federal funds rate far below what a Taylor rule would require. The result was that there "was no greater or more persistent deviation of actual Fed policy since the turbulent days of the 1970s," fueling the housing boom. To measure whether monetary policy was easy or tight, I apply similar Taylor rules to the Federal Reserve in the 1920s.<sup>8</sup>

The Taylor rule is linear in the interest rate and the logarithms of the price level and real output. Using the inflation rate and the deviation of real output from a stochastic trend, renders the two variables stationary. The result was a linear equation:

$$(1) \quad r = (r^* + \pi) + h(\pi - \pi^*) + gy$$

where  $r$  is the short-term policy interest rate,  $r^*$  is the equilibrium rate of interest,  $\pi$  is the inflation rate and  $\pi^*$  is the target inflation rate, and  $y$  is the percentage deviation of real output from trend. The policy response coefficients to inflation and the output gap are  $(1+h)$  and  $g$ , with the intercept term being  $r^* - h\pi^*$ . If  $h$  is greater than zero, then the policy rate will rise, not decline, in response to an increase in inflation.

Taylor's original formulation (Taylor, 1993) had the federal funds rate adjusted in a fixed response to changes in inflation and the gap in real GDP, which fairly accurately described the then recent policy actions of the Federal Reserve. Even though there was no central bank or instrument like the federal funds rate, Taylor (1999) extended his model to earlier periods. For a period like late nineteenth America, which operated under a gold standard without a central bank, there still should have been a relationship between short-term interest rates and inflation. If a shock induced inflation in the U.S., the price-specie-flow mechanism would produce a balance-of-payments deficit with consequent losses of gold, a decline in the money stock and a rise in interest rates. Similarly, rising real output would increase the demand for funds and raise interest rates.

In a simple OLS estimate of his equation for the gold standard era, Taylor (1999) found low positive coefficients for inflation and the output gap.<sup>9</sup> If once the Fed was established, it played by the "rules of the game" and "leaned against the wind," the

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<sup>7</sup> See Clark (1986), Mankiw, Miron, Weil (1987), Barsky, Mankiw, Miron and Weil (1988), Fisher and Wohar (1990), Kool (1995), and Carporale and McKiernan (1998).

<sup>8</sup> More generally, Taylor (1999) viewed his work as focusing on the short-term interest rate side of monetary policy, rather than the money stock side. Instead of the quantity equation that had informed Friedman and Schwartz's (1963) analysis of American monetary history, Taylor formulated his monetary policy rule that was derived from the quantity equation.

<sup>9</sup> Taylor (1999) estimated equation 1 using ordinary least squares with the commercial paper rate for the years 1879-1914 with inflation measured as the average inflation rate over four quarters and. He did not correct for serial correlation, allowing for the possibility that monetary policy mistakes were serially correlated. He pointed out that serial correlation was high under the gold standard and hence the equations fit poorly and his t-statistics are not useful for hypothesis testing.

operation of the adjustment mechanism should have been reinforced and the response coefficients in the Taylor equation should be larger. Taylor did not follow his empirical investigation of the pre-Fed era with one for the 1920s. Instead, he lumped the twenties and the thirties together and dismissed the Fed's efforts to find an effective rule in the interwar period because of its disastrous performance during the Great Depression. In contrast, Orphanides (2003) offers a more positive Taylor rule assessment of the Fed's actions in the 1920s; but it is a narrative appraisal.

To characterize Fed policy in the 1920s and examine counterfactual policies, I have estimated a Taylor equation for the late nineteenth and early twentieth centuries. Table 1 reports the estimates for a Taylor equation on quarterly data for the last years of the classical gold standard 1890-1914 and for the interwar gold standard, 1922-1929. The war years and the postwar boom and bust of 1915-1921 are omitted because the Fed was not free to operate as an independent central bank but instead served the interests of the Treasury. For 1890-1914, the interest rate is the time rate for brokers' loans, rather than the commercial paper rate used by Taylor. The market for brokers' loans was larger than for commercial paper and more closely approximates the market for federal funds as banks often parked excess funds in this market. Using the commercial paper rate or the call rate on brokers' loans did not substantially alter the results. The GNP data were obtained from Balke and Gordon (1986), and the output gap as the percentage deviation of real output from the trend is extracted by a Hodrick-Prescott filter.<sup>10</sup> The inflation rate is derived from Balke and Gordon's GNP deflator.

**Table 1**  
**Taylor Equation Estimates**

|               |               | Constant           | Inflation          | Output Gap         | Lagged Dependent Variable | Lagged Excess Interest Seasonal | Adjusted R2 |
|---------------|---------------|--------------------|--------------------|--------------------|---------------------------|---------------------------------|-------------|
| Time Rate OLS | 1890.1-1914.4 | 2.657**<br>(0.416) | 0.084*<br>(0.037)  | 0.069+<br>(0.038)  | 0.360**<br>(0.094)        | ---                             | 0.231       |
| Time Rate IV  | 1890.1-1914.4 | 2.727**<br>(0.442) | 0.139<br>(0.107)   | 0.065+<br>(0.039)  | 0.331**<br>(0.109)        | ---                             | 0.214       |
| Time Rate OLS | 1922.1-1929.4 | 0.642<br>(0.576)   | 0.179**<br>(0.058) | 0.149**<br>(0.051) | 0.896**<br>(0.113)        | ---                             | 0.678       |
| Time Rate IV  | 1922.1-1929.4 | 0.695<br>(0.583)   | 0.147*<br>(0.070)  | 0.128*<br>(0.058)  | 0.881**<br>(0.114)        | ---                             | 0.675       |
| NYFDR OLS     | 1922.1-1929.4 | 0.708<br>(0.599)   | 0.054<br>(0.035)   | 0.031<br>(0.031)   | 0.838**<br>(0.146)        | ---                             | 0.548       |
| NYFDR IV      | 1922.1-1929.4 | 0.846<br>(0.644)   | 0.035<br>(0.046)   | 0.018<br>(0.038)   | 0.801**<br>(0.159)        | ---                             | 0.544       |
| NYFDR OLS     | 1922.1-1929.4 | .0130<br>(0.662)   | 0.049<br>(0.034)   | 0.015<br>(0.031)   | 0.981**<br>(0.162)        | -0.409+<br>(0.229)              | 0.581       |
| NYFDR IV      | 1922.1-1929.4 | 0.227<br>(0.685)   | 0.035<br>(0.042)   | 0.005<br>(0.036)   | 0.956**<br>(0.169)        | -0.416+<br>(0.230)              | 0.578       |

Note: instruments are second lags on inflation, the output gap and the time rate.

<sup>10</sup> The Hodrick-Prescott filter is used to estimate the trend from 1890.1 to 1930.2. Covering a longer period causes a sharp decline in the trend in 1929 because of the persistence of the Great Depression, creating a huge and unrealistic output gap for 1929.

The first two rows of Table 1 report the results for the Taylor equation under the classical gold standard, where the instrumental variables are the second lags on inflation, the output gap and the time rate. These regressions produce fairly consistent results, recalling that with the lagged dependent variable the estimated coefficients are  $(1 - \rho)\beta$ . Hence the constant is an interest rate of approximately four percent. Once adjusted for this factor, the coefficients on inflation and the output gap are in the vicinity of 0.10 to 0.20, and thus smaller than the coefficients for the last twenty years of the twentieth century when the coefficient on inflation is well over one and on the output gap, somewhat under one, implying the Fed was pursuing a stable policy. The results are similar to Taylor's (1999) and reflect the behavioral relationships in the absence of a central bank.

Taylor equations are first estimated for 1922-1929 using the time rate for brokers' loans. In contrast to Taylor's glum assessment, these results suggest that the Fed acted appropriately as Friedman and Schwartz (1963) have argued. The response coefficients for inflation and the output gap are positive and significant. Furthermore, they appear to be of an appropriate magnitude once they are adjusted for the presence of the lagged dependent variable. The coefficient on inflation has a value greater than one. Of course, the Fed did not operate directly in the brokers' loan market or the commercial paper market, instead its instrument was the discount rate, buttressed by open market purchases and sales. The next two equations apply the same model with the Federal Reserve Bank of New York's discount rate as the dependent variable. Unfortunately, the discount rate was changed infrequently, leading policy to look particularly feeble unless one views its impact through the brokers' loan market where it was apparently robust.

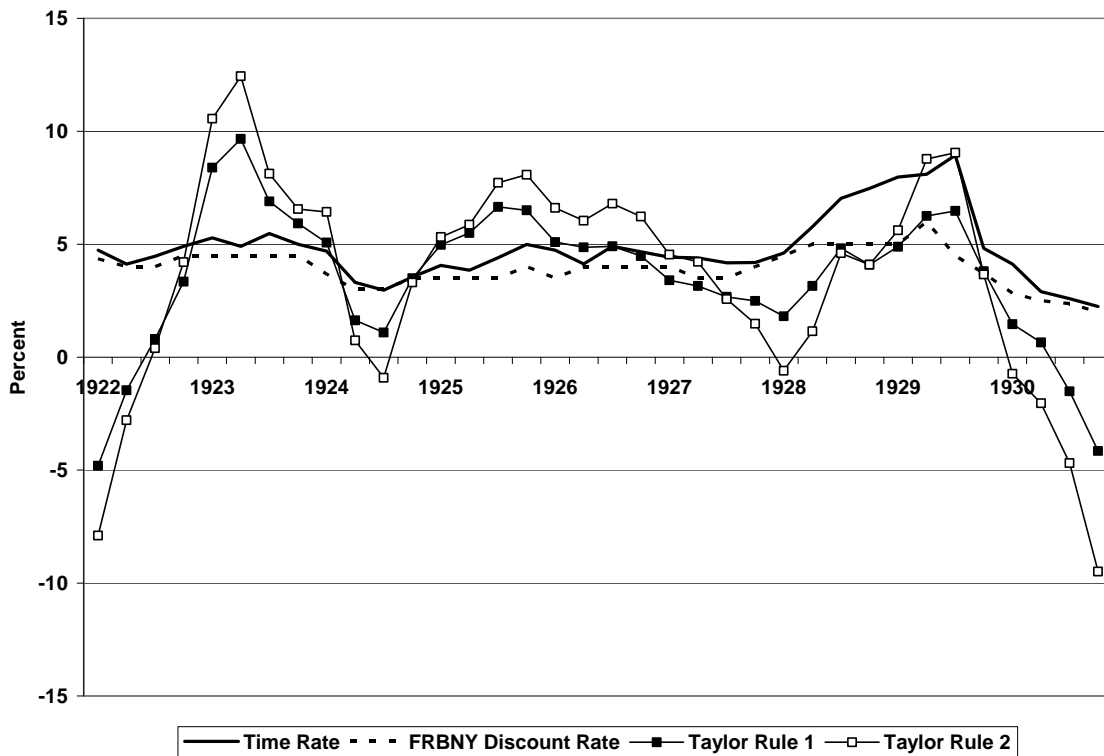
While Taylor equations capture the focus of contemporary policy, they do not include a measure of the seasonal problems that Miron showed were a vital component of Fed policy. To correct this omission, I include a variable for excess seasonality. Using the time rate, I constructed a centered moving average that deseasonalized the data. Taking the absolute value of the difference between the actual values and the deseasonalized values, I obtained a measure of the degree of seasonality (See Wilson and Keating, 2002). Although the Fed certainly would have responded more quickly if its efforts to reduce seasonality appeared weak, I include the lagged value of the difference between the time rate and the centered moving average as a measure of the response of the Fed to excess seasonality. In the last two regressions this variable has a negative and significant coefficient, suggesting that it is capturing an important feature of Fed policy even on a quarterly basis. If there was an excessive seasonal in the interest rate, the Fed intervened to reduce it.

By these simple measures, Fed policy in the 1920s thus appears to have been run in largely accordance with the "rules of the game" while lowering the risk of a panic. This "new regime," appearing in the twenties, should have increased investor confidence by reducing inflation risk and panic risk. These estimates show that Fed policy moved in the right directions but the question remains as to whether policy was too loose or too tight. To address the counterfactual question whether the Fed have should conducted policy differently in the 1920s, I apply some simple Taylor rules that have been invoked to judge recent Fed policy.

The first simple Taylor rule is Taylor's original rule with the policy response coefficients set equal to 0.50. The second rule sets the coefficient on the output response

at 1.0 (Taylor, 1999). When applied to the second half of the twentieth century, they show that the Fed funds rate was particularly low in the late 1960s, the 1970s, and possibly the late 1990s. In Figure 9, these two rules are applied to the 1920s, omitting World War I when the Fed purposely kept rates low. It is important to note that the Taylor rule is being applied here when there is no target rate of inflation  $\pi^*$ , as in equation one. The gold standard promised long-term price stability, at the expense of short-term price volatility. In this case, the implicit inflation rate target is zero. The Fed funds rate real rate is assumed in the Taylor rule to be 2.0 percent. However, this value cannot be used for the earlier periods because the real rate for the time rate on brokers' loans was higher because they had more risk. The nominal rate averaged 5 percent for 1922-1929 but was closer to 4 percent before the stock market bubble of 1928-1929 distorted it (Rappoport and White, 1994). Combined with an inflation rate target of zero, the value of the real rate of interest and the target inflation rate is 4 to 5 percent. A value of 4 percent is used to construct Figures 9, and a 5 percent value yielded similar results.

**Figure 9**  
**Taylor Rules and the Rate of Interest**  
**1922-1930**



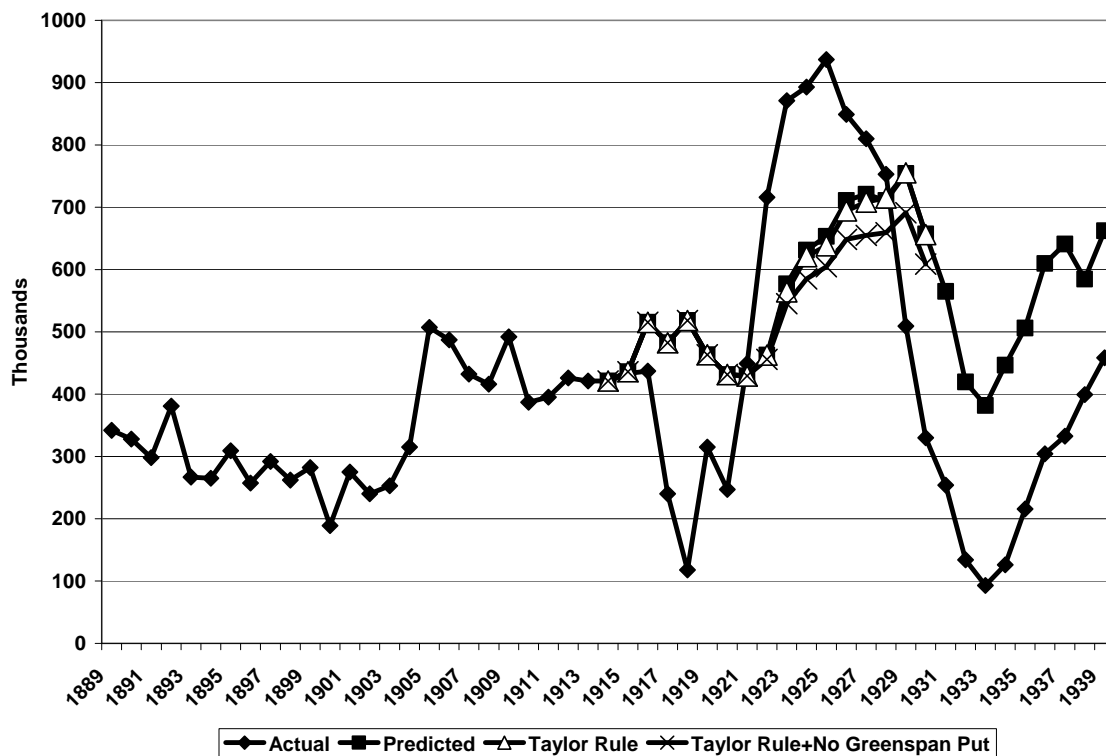
The Taylor rules have a greater amplitude than the time rate or discount rate, suggesting that that Fed policy, while appropriate, was not sufficiently vigorous. The rule, of course is not a precise formulation of policy as it would sometimes dictate negative rates of interest.<sup>11</sup> Could the Fed have pursued even stronger policies in the

<sup>11</sup> Taylor (1999, p. 338, footnote 13) recognized this problem for analyzing alternative policy in the 1960s.



1920s? What is the importance of the gap between the actual interest rates and the counterfactual Taylor rates? Taylor (1999) found that policy was first too loose in the early 1960s when the gap between the Federal Funds rate and Taylor Rule 1 was at 2 to 3 percent for three and a half years. Then, in late 1960s to the late 1970s, it rose to 4 to 6 percent creating the “Great Inflation. His counterfactual for 2001-2006 pointed to a policy gap as great as 3 percent. Taylor rules in Figure 9 suggest that policy should have been eased more quickly during the severe contraction of 1920-1921. It was too easy in the following boom and too tight in the short recession that followed. For the housing market, it appears that policy then eased considerably beginning in 1925 and remained loose through 1926 with the gap between the market rate and the counterfactual, peaking at 2% for Taylor Rule 1 and staying above 2% for Taylor Rule 2 from 1925.2 through 1926.3. These were the crucial years for the housing boom and suggest, at least by the measure of the early 1960s, that the magnitude of the error was substantial and may have contributed to igniting a housing boom.

**Figure 10**  
**The Effects of Alternative Monetary Policies**  
**On Housing Starts**



What impact could different monetary policies have had on the housing boom of the 1920s? Figure 9 shows the actual and predicted movements in housing starts depicted in Figure 5. The only difference is that the predicted housing starts use the time rate on brokers’ loans rather than a mortgage rate. The results differ very little but permit an

exercise in counterfactual monetary policy.<sup>12</sup> The first question is what would have happened to housing starts if monetary policy had followed Taylor Rule 1. The effect of the policy is measured as the difference between predicted housing starts and the Taylor rule. As is evident, the higher interest rates during the boom that the Taylor Rule would have required would have had little impact on housing starts.

The effects of abandoning the “Greenspan Put” are greater. This effect is measured by forecasting out-of-sample, using a regression that adds the excess seasonality variable. In the forecast, the excess seasonality of the pre-Fed era, averaging 0.74 is substituted for the actual values that averaged 0.25 in the 1920s. The results of this exercise show that if the Fed had allowed seasonal rates to fluctuate as they had before 1914 there would have been a reduction in starts. Over the period 1922-1926, this “put” combined with tighter Taylor Rule policy would have lowered housing starts by 196,000. The excess housing starts---the difference between the actual and predicted starts was 1,306,000 for these years, suggesting that a different policy would have had little effect. If on the other hand, one believes that the higher postwar housing were mostly a catch-up from the wartime deficit, then there were only excess housing starts of 256,000. A reduction of 196,000 starts would have virtually eliminated this “excess” suggesting that a different policy could have limited the extremes of the boom.

Of course, Federal Reserve policy in the 1920s was not focused on the housing markets. The alternative policy suggested above would have been a radical departure from the mandate given in the Federal Reserve Act, and no one suggested that it should abandon its established policy. Even if the Fed had wanted to include the housing market in its policy deliberations, there were no national indices, as there were for industrial production. The Federal Reserve was more focused on short-term rates, which it could more directly control and whose importance was validated by the Real Bills doctrine that emphasized the centrality of short-term finance. Longer-term interest rates that played a role in the housing market drew far less attention than brokers’ loan and related short-term rates that influenced the stock market boom. Centered in New York, the capital markets captured the concern of the Fed, but the housing market and many other markets still had strong regional elements, yielding a more complex and less easily interpreted picture.

### **Lending Standards and Risk-Taking**

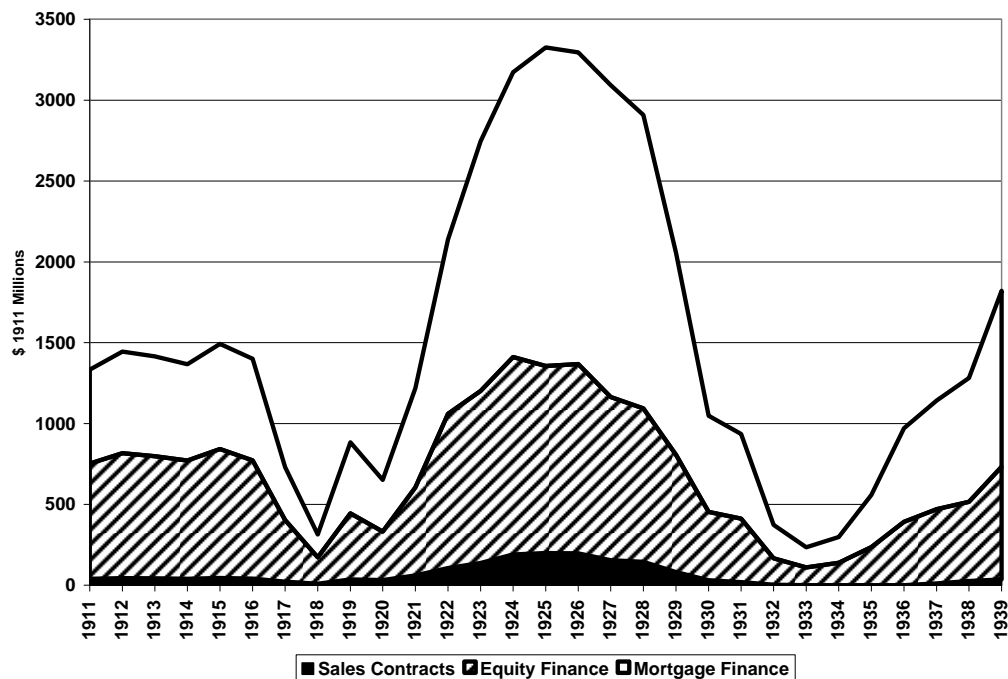
The rise in home prices and the pace of residential construction could have been driven by a reduction in lending standards that expanded credit. At the same time, such a change could have potentially increased the risk exposure of banks, pushing them closer to insolvency when the housing prices declined. Although the evidence for the twenties is fragmentary, there appears to have been only a modest drop in lending standards in spite of the expansion of mortgage market. These mild changes help to explain why financial intermediaries did not fail in the wake of the real estate crash, in contrast to today.

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<sup>12</sup> As already noted, mortgage rates during the 1920s were quite flat and apparently unresponsive to the fluctuations in short-rates. This phenomenon for the twenty-first century bubble was also noted by Taylor (2007) who attributed it to perceived changes in the responsiveness to inflation in short-rates. In the 1920s, long-run inflation would have been checked by the gold standard and thus have steadied longer rates.

The real estate boom of the 1920s saw an upswing in mortgage financing, fostered by the expansion of new entrants into the business. Mortgage funding which had accounted for less than 45 percent of residential construction finance before World War I rose to nearly 60 percent at the height of the boom. Depicted in Figure 11, this change shows the rise in the real funding of residential construction by source. Mortgages, which had constituted less than half of funding in the prewar ear, supplied over \$2 billion of the \$3.3 billion in financing for 1926.

**Figure 11**  
**Sources of Funding for Residential Construction, 1911-1939**

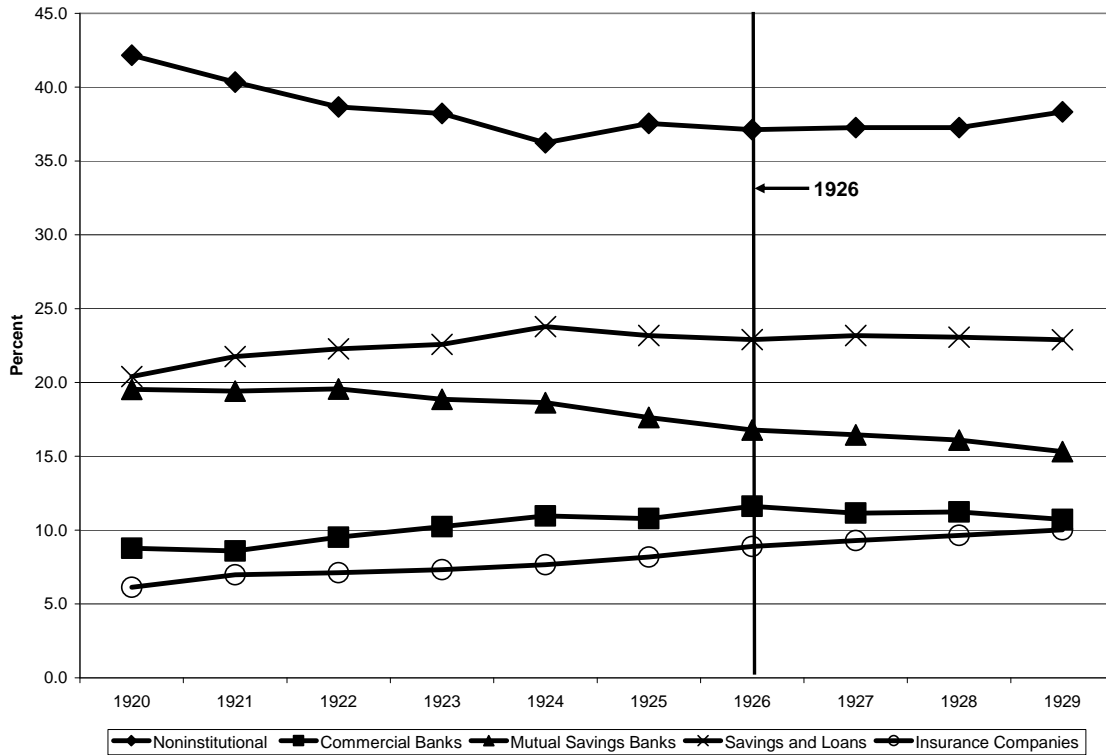


Source: Grebler, Blank and Winick (1956) Table M-1. The value are deflated by the consumer price index Historical Statistics Cc1.

One force behind the increase in mortgage finance was the shift in the sources of finance. Mortgage funding by source is shown in Figure 12. Non-institutional lending--friends, family and private local individuals--had been slowly declining since the turn of the century when it had accounted for over half the market. In the boom it fell further from 42.2 to 37.1 percent between 1920 and 1926. Mutual savings banks, which had been the largest source of institutional lending before the First World War, saw their share shrink from 19.5 to 17.6 percent over the same period. The more aggressive lenders gained ground in this short period, with commercial banks expanding from 8.8 to 10.8 percent, insurance companies from 6.2 to 8.1 percent and savings and loans associations from 20.4 to 23.2 percent. These three innovators expanded their total mortgages by 76, 79 and 62 percent in these six years.<sup>13</sup>

<sup>13</sup> Information on the sources of mortgage funding is found in [Historical Statistics](#) Dc903-928.

**Figure 12**  
**Shares of Mortgage Lending by Source**



Source: Historical Statistics. Tables Dc 903-928.

Unfortunately, there is little information on how the terms of mortgages changed in this period. Before reviewing this data, it is important to note that the long-term fixed interest amortized mortgage that became a standard in the early post-World War II era was uncommon before the Great Depression. Most mortgages were short-term, many had only partial or no amortization, with very low loan to value ratios; and balloon mortgages were not uncommon. Thus, the heterogeneous contemporary mortgage market resembles more its pre-depression ancestor than the market in the first three to four decades after World War II when there was a relatively high degree of standardization.

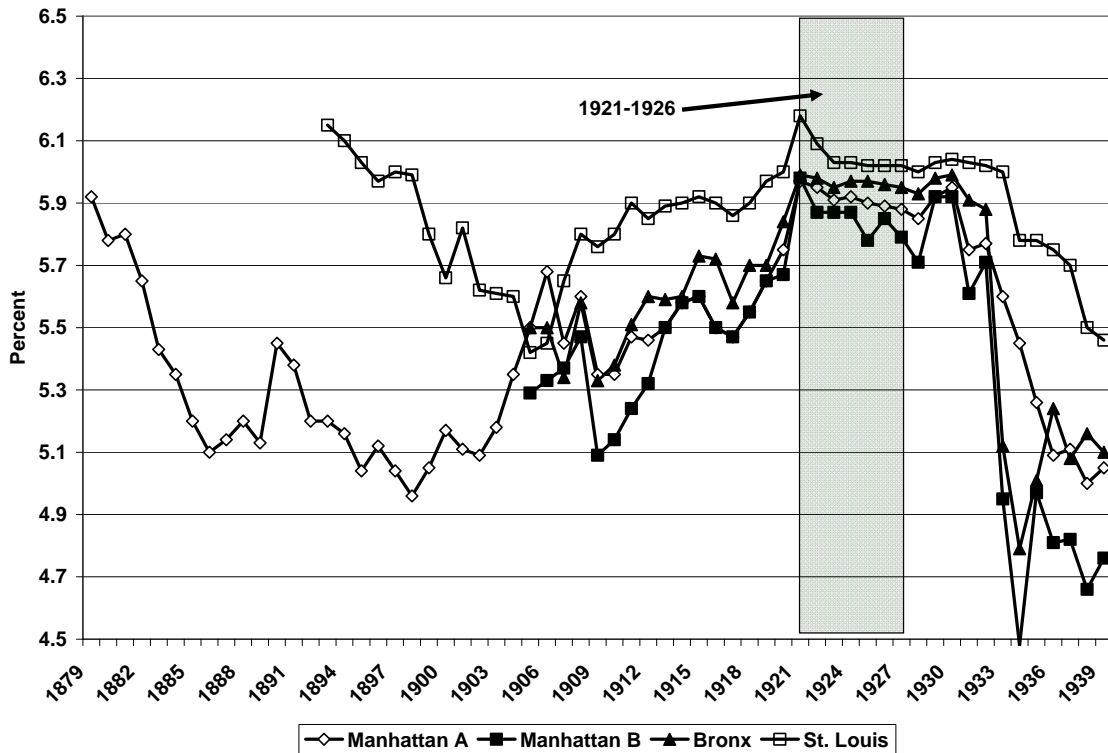
The only detailed source of data for mortgage contracts in the 1920s is Morton (1956), who drew upon samples of loan portfolios of several hundred financial institutions. Of course, these were institutions that had survived the ravages of the Great Depression and presumably had followed more conservative practices than those that disappeared. Yet, even taking into account this survivor bias, the changes in lending for the three fast-growing mortgage lenders appear to be far from reckless.

Commercial banks eased terms, letting their non-amortized loans increase from 41 to 51 percent in the loans sampled for 1920-1924 and 1925-1929, while the share of fully amortized loans dropped from 15 to 10 percent. The average contract length was approximately 3 years. Thus, the most common loans at commercial banks were non-amortized “balloon” mortgages of short duration. From the lenders’ point of view these were hardly risky loans as the loan to value ratios averaged just above 50 percent.

In contrast to commercial banks, amortized loans dominated the portfolios of savings and loans associations, constituting 95 percent of the mortgages sampled. The contract lengths were almost all under 15 years, with a mean contract length of 11 years. The S&Ls had loan-to-value ratios of approximately 60 percent. Even in the boom, grabbing market share, they appear to have remained quite conservative.

Insurance companies offered a more varied mix of loans than either S&Ls or commercial banks in the 1920s, giving 20 percent non-amortized loans in the first half of the decade and 24 percent in the second half. Less than 20 percent of these mortgages were fully amortized. Contract length for loans from insurance companies averaged 6 years but had greater variance than other institutions with 20 percent lasting 0 to 4 years, 51 percent 5 to 9 years, and 26 percent 10 to 14 years.

**Figure 13**  
**Mortgage Rates by City, 1879-1939**



Source: Grebler, Blank and Winick (1956) Table O-1

As most observers noted, interest rates for mortgages were relatively “sticky” moving very little over long periods of time, in comparison to other long term interest rates, such as bond yields. Grebling, Blank and Winick (1956) provide some data on interest rates by cities shown in Figure 13. The first series for Manhattan was taken from the Real Estate Analyst. The authors composed the second series from the Real Estate Record and Guide, where the interest rates were weighted by the dollar value of all reported loans for March, July and November. Similar data was available for the Bronx, which they considered to be almost entirely residential real estate and hence a better reflection of that market. Lastly, the authors compiled the St. Louis series from the Real

Estate Analyst and the St. Louis Daily Record, which they believed was primarily for one to four family home mortgages.<sup>14</sup> Three facts emerge from Figure 13. First, St. Louis rates are higher, perhaps reflecting high regional premiums. Secondly and most importantly, rates were relatively more volatile in the years before the founding of the Fed, a fact which is consistent with the behavior of short-term rates. The 1920s appear to be remarkably stable with very little movement in Manhattan, the Bronx or St. Louis. Third, the mild decline in rates shown in the national sample contract data reported by Morton (1956) is also present for the city level data. Overall, the impetus to a real estate boom in the 1920s from a reduction in the level of mortgage rates seems minor, given the very small declines and the lower rates that persisted before the founding of the Federal Reserve. However, if stability was a spur to the boom, as the econometric evidence suggests in the previous section, then the 1920s market had a new stimulus.

While it is difficult to draw a definitive conclusion from this admittedly patchy data, the changes in lending standards and mortgage rates in the 1920s seem quite modest. It is unlikely that the expansion of mortgage lending exposed financial intermediaries to significant risk because of the very conservative loan to value ratios of 40, 50, or even 60 percent. There was no potential for a financial crisis after 1926 because banks had loaded up their portfolios with higher risk loans.

But what about the overall risk to which financial institutions were exposed during the 1920s? Risk-taking by financial institutions in the boom of 2000-2006 was cloaked by use of off-balance sheet operations, but these were non-existent in the 1920s. Therefore, movements in the capital-to-asset ratios should capture much of financial institutions exposure to risk.

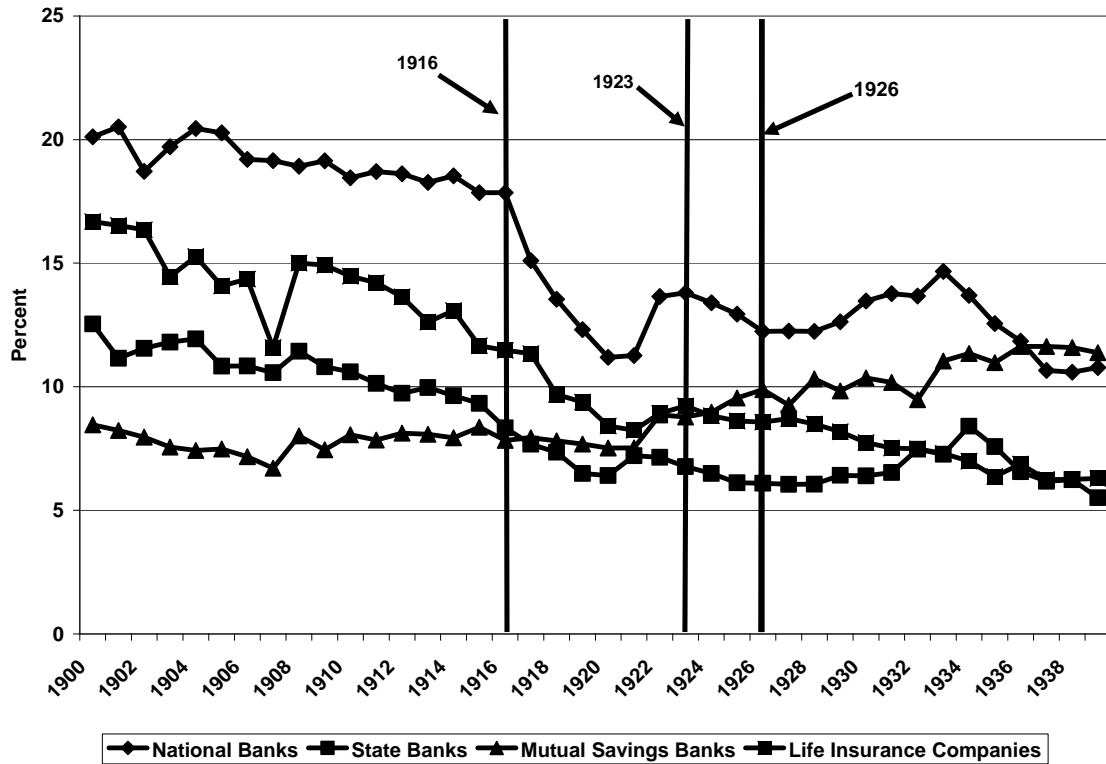
Figure 14 presents evidence for several institutions for 1900-1940. There were no federal or state capital-asset requirements in this era, thus the ratio should capture bankers' decisions. As for their relative importance as financial intermediaries, commercial banks were the dominant institution with 63 percent of the assets of all financial intermediaries in 1922. This share was almost evenly divided between national banks, which were typically larger and more diversified, and state banks that were often very small. Mutual savings banks had 9 percent and life insurance companies nearly 12 percent of all assets in 1922. Savings and loans had 4 percent of assets but unfortunately there is no data on their capital for this period (Goldsmith, 1958).

The figure shows the long decline in the capital-to-asset ratios that began in the nineteenth century. Yet, even in 1916, on the eve of America's entry into World War I, the ratio stood at 17.8 percent for national banks, 8.3 percent for state banks, 7.8 percent for mutual savings banks, and 11.5 percent for insurance companies. By contemporary standards this would be considered a very well-capitalized industry. Part of this high level reflected the need to reassure depositors, unprotected by deposit insurance, but it also was indicative of the fact that many banks were small and undiversified single office operations requiring higher levels of capitalization.

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<sup>14</sup> Grebling, Blank, and Winick (1956) also report a Chicago series from the graphs in Homer Hoyt's One Hundred Years of Land Values in Chicago. They regarded Hoyt's rates as crude approximations for the value of property in the central business district. The Chicago series is not reported here as its value seems dubious given that reported rates remained fixed for decades then experienced huge jumps.

**Figure 14**  
**Capital-Asset Ratios for Selected Financial Intermediaries**  
**1900-1940**



Source: [Historical Statistics](#).

World War I produced an abrupt departure from the gradual downward trend, with the ratio falling to 11 percent for national banks and 6 percent for state banks by 1920. The source of this decline is well known (Friedman and Schwartz, 1963). To fund the war, the federal government induced the banks to greatly expand their portfolios by buying bonds and providing loans secured by the purchase of bonds. Following the severe 1919-1921 recession, banks raised the ratio by holding asset growth in check and increasing capital. From 1923 to 1926, the capital-asset ratio resumed its decline with asset growth driving down the ratio. Suggestively, it halts at the end of the real estate boom in 1926, only to rise again when the banks were faced with the prospect of large losses in the depression. This very aggregate data hints that banks became more risky during the real estate boom, but leaves open the question whether the bust threatened their solvency.

The most detailed data available on the threat to solvency from a decline in the value of real estate loans is for national and state banks. While their capital decisions were not constrained by regulations, their portfolios choices were. The National Banking Act of 1864 had imposed severe limitations on mortgage loans for national banks. For banks outside the central reserve cities of New York, Chicago, and St. Louis, banks were allowed to grant loans up to five years' maturity on real estate provided that each loan was worth less than 50 percent of the appraised value of the land. Furthermore,

total real estate loans could not exceed 25 percent of bank's capital (White, 1983). In 1920, national banks held only 1.7 percent of their assets in real estate loans but by 1926, this had risen to 5.4 percent. Driving this change was an increase in total mortgage loans from \$371 million in 1922 to \$725 million in 1926. In this latter year, national banks had a total loan portfolio of \$13.3 billion and capital of \$3.1 billion so that real estate loans equaled 23 percent of capital, just below the legal limit of 25 percent. The low degree of leverage ensured that even a complete loss of these loans would not have been devastating. An impossible complete loss for the real estate loans of \$725 million would in aggregate have been easily absorbed by total capital. Actual losses were relatively modest. Net loan losses in 1926 were \$109 million and \$50 million in 1927, not significantly higher than the \$118 million average annual loss for 1921-1925. The burden of these losses was, of course, not equally distributed. National bank failures had risen because of the post-World War I agricultural problems, with annual suspensions climbing from 21 in 1921 to 123 in 1926, but they declined abruptly in 1927 and 1928 to 91 and then 51 (Banking and Monetary Statistics, 1943). If real estate losses from the bust had been severe, one would have expected an increase not a drop. Furthermore, most failures were in agricultural areas, unaffected by the real estate boom.

More difficulties might have been expected from state banks because state regulations on real estate were weaker. The only survey of state regulations that is proximate in time is Welldon (1909), a decade and a half earlier. But, since state regulations changed slowly and there was a tendency to weaken rather than to strengthen them (White, 1983), it should be a fairly accurate guide for the 1920s. Welldon found that only 12 states imposed any restrictions on commercial banks, and most rules tended to be weak. California and North Dakota limited real estate loans to first liens. Ohio and Texas restricted real estate loans to 50 percent of all assets, while South Carolina and Wisconsin set a limit of 50 percent of capital and deposits. The only strict states were Michigan, where real estate loans could not exceed 50 percent of capital, and New York, where rural banks could not have real estate loans in excess of 15 percent of assets and city banks in excess of 40 percent.

In general, real estate loans bulked much larger in the portfolios of state banks. They accounted for 14 percent of assets and 23 percent of all loans on the eve of the boom in 1922. Their real estate loans rose from \$3.3 billion in 1922 to in \$5.1 billion 1926, reaching 16 percent of assets and 27 percent of all loans. In the few states that regulated these loans, some state banks may have reached their legal limits, but most seem to have been well below them.

Overall, state banks do not seem to have taken on much more risk than national banks. The pattern of bank suspensions was no different from the national banks for these more numerous and smaller institutions (There were 21,214 state banks and 8,244 national banks in 1922). Suspensions rose from 409 banks in 1921 to a peak of 801 in 1926, which historians have attributed to the postwar collapse of agricultural prices. The real estate bust should have added to their woes, but instead suspensions fell to 545 in 1927 and 422 in 1928 (Banking and Monetary Statistics, 1943). Commercial banks were clearly not endangered by the collapse of the real estate bubble in spite of the expansion of mortgage lending. They remained prudent, managing the share of real estate loans in their portfolio and demanding substantial collateral.



Life insurance companies were among the more aggressive lenders in the 1920s. Mortgages as a share of assets rose from 36 percent in 1922 to 43 percent in 1926. Large losses here could certainly have driven these companies into insolvency as their capital to asset ratios were 8.2 percent in 1922 and 7.8 percent in 1926 (Carter, Historical Statistics, 2006, Tables Cj741-750). While there is less data on these institutions, there is no record of any major insurance company failures in the 1920s and they appear to have been quite profitable. Data is also limited for savings and loan associations. Mortgage loans constituted 90 percent of their assets in 1922 and 92 percent in 1926. Similarly, there is no record of any uptick in S&L failures; and unlike commercial banks, the number of savings and loan associations continued to grow through 1927 (Carter, Historical Statistics, 2006, Table Cj389-397).

Mortgage loans were central to the mission of mutual savings banks and constituted 92 percent of their loans and 43 percent of their assets in 1922. These institutions lost market share and appear to have followed their traditional lending standards, even though their real estate lending jumped from \$2.7 to \$4.3 billion. At the peak of the boom in 1926, these loans represented 95 percent of loans and 52 percent of assets (Carter, Historical Statistics, 2006, Table Cj362-374). In spite of this apparently high level of exposure, only two mutual savings banks failed in the 1920s, one in 1922 and one in 1928 (Banking and Monetary Statistics, p. 292.).

Taking this fragmentary information together, it is hard not to reach the conclusion that financial institutions remained prudent lenders even as they expanded their loans to home buyers---whether they had strict limits on real estate like national banks or minimal regulations like state banks. They had adequate collateral and capital to meet substantial potential defaults. This picture stands in stark contrast to the experience of recent years when financial institutions became increasingly leveraged with more and more risky assets both on and off their balance sheets. Three factors may have induced contemporary institutions to take far more risk and transform a real estate collapse into a banking collapse: deposit insurance, bank supervision and housing policies. In the next section, I examine these incentives for risk-taking in the 1920s.

### **Incentives for Risk-Taking: Deposit Insurance, Bank Supervision and Housing Policies**

Compared to today, the federal government provided few incentives to for banks to take more risk in the 1920s. Tasked with preventing panics and serving as a lender of last resort, the Federal Reserve may have created some moral hazard for banks. As previously discussed, the Federal Reserve's policy of reducing seasonal interest rate volatility appears to have induced additional risk-taking in the expansion of real estate lending, although this accounts for a modest fraction of the boom.<sup>15</sup>

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<sup>15</sup> In addition to its efforts to reduce interest rate volatility, the Fed may have induced more risk taking by providing banks near the brink of failure with loans from the discount window, contravening the rule that a central bank should only lend to illiquid not insolvent banks. In 1925, the Federal Reserve estimated that 80 percent of the 259 national banks that had failed since 1920 were "habitual borrowers." These banks were provided with long-term credit. A survey in August 1925 found that 593 member banks had been borrowing for a year or more and 293 had been borrowing since 1920 ( Anna Schwartz , 1992).

Yet, compared to today when depositors are provided with high levels of explicit deposit guarantees and an implicit 100 percent insurance from the “Too Big to Fail,” doctrine, broad government protections that create risk-taking incentives were absent. There was no federal deposit insurance to induce morally hazardous behavior by banks. Several states had experimented with deposit insurance for state banks after the panic of 1907. Contemporary analysts and even many legislators understood the problems generated by deposit insurance and generally assessed these experiments as failures.<sup>16</sup> These historical experiments provide considerable evidence that deposit insurance may create dangerous moral hazard. Using individual bank data for Kansas in the twenties, where state deposit insurance was voluntary, Wheelock (1992a) found that the balance sheets of insured banks exhibited greater risk-taking and that insured banks were more likely to fail than non-insured banks. By the simplest test, the capital to asset ratio for insured banks averaged 11 percent compared to 14 percent for uninsured banks, pointing to the latter as less risky.<sup>17</sup> County level data revealed that deposit insurance did not prevent bank failures in counties suffering from the greatest agricultural distress in the 1920s (Wheelock, 1992b). More generally, state level banking data suggests that state deposit insurance induced rural banks to increase risk as their net worth declined reveal in the agricultural crisis of the decade (Alston, Grove, and Wheelock, 1994). At this point it should be recalled that deposit insurance was only adopted in seven states---all very rural states---and that most bank failures in the 1920s (79 percent) were in rural areas (Alston, Grove and Wheelock, 1994). The banks most deeply involved in the housing boom of the twenties were not insured and were located primarily in urban areas. While deposit insurance induced rural banks to expand and take risks, adding to their probability of failure; it was not present for the urban banks focused on residential lending, which presumably had no inducements to increase risk taking and had very few failures.

In this era, if a bank’s solvency was in question, the public ran on the bank and transferred deposits to other less risky banks or simply held more cash. Bank runs were regarded as an ordinary and necessary evil of the bank system that imposed market discipline on managers. The Federal Reserve’s unwillingness to aggressively respond to the early panics of the depression reflected in part the belief that depositors should suffer losses if banks failed.

Of course, whether depositors should have confidence in or run on their banks depends on the information available to them about the true condition of the banks. There is a great asymmetry of information between depositors and bank managers because bank balance sheets are opaque to depositors given that they do not have access to the details, which are usually claimed to be proprietary information and thus should not be disclosed. Because managers do not want many details publicly disclosed, the determination for depositors of a bank’s true condition has been delegated to bank examiners who can thoroughly examine an institution’s accounts.

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<sup>16</sup> Following the panic of 1907, seven states (North Dakota, South Dakota, Kansas, Nebraska, Oklahoma, Texas, and Mississippi) establish deposit guarantee funds. Although several produced extraordinary examples of unchecked morally hazardous behavior. For the debates on deposit insurance see Flood (1991) and Calomiris and White (1994). The state-operated deposit insurance systems are analyzed in White (1983), Calomiris (1990), and Wheelock (1992b).

<sup>17</sup> These ratios are calculated from Wheelock (1992b)’s Table 1.

In the contemporary real estate boom, there were claims that bank supervision failed either to detect the deterioration of banks' balance sheets and/or showed forbearance in disciplining excessively risky institutions. Similarly, in the 1920s, financial institutions may also have taken more risk and expanded their real estate lending if the examination and supervision policies of the Office of the Comptroller of the Currency, the Federal Reserve and the state bank regulators had weakened. Although there is scant secondary literature on the general quality of bank supervision in the 1920s, there are allegations that it failed in certain boom regions. These charges and the overall performance can be partly evaluated with data from the Office of the Comptroller of the Currency, which was responsible for supervision of national banks. Unfortunately, how states supervised state-chartered banks is largely unknown because of the absence of data on state bank supervisors, though state supervision is generally believed to have been much weaker than the OCC's oversight (Robertson, 1968).

Supervision of financial institutions can be evaluated by its three basic components---disclosure, examination and enforcement. First, disclosure aims at inducing banks to provide uniform information to the public that will allow depositors and other creditors to determine the safety of the bank. However, banks dislike disclosing information because they claim that it will reveal proprietary information. Thus, the second supervisory activity, examination permits government officials to perform a more detailed and confidential examination of the bank's condition, in addition to determining whether it is meeting regulatory requirements. Lastly, if a bank is deficient, the bank supervisors may impose some penalty to bring the bank back into compliance.

In the pre-deposit insurance era, disclosure was essential to keep the public informed, even if it was incomplete. Since 1869, Congress had required the Comptroller of the Currency to call for a minimum five reports of condition, or "call reports," with three dates of his choosing. The random choice of dates was aimed at preventing window-dressing of data and the relatively high frequency maintained the flow of information. Loss of charter was the only legal enforcement tool available to the OCC. Comptrollers repeatedly stressed that their job was to reinforce the operation of the market with by ensuring disclosure and promptly closing any insolvent institutions (Robertson, 1968).

The quality of disclosure was reduced with the advent of the Federal Reserve. The Federal Reserve Act of 1913 gave the Board of Governors the power to demand reports and examine member banks (Kirn, 1945), but initially the OCC carried out examination of state member banks in addition to national banks. When in 1915, Comptroller Williams asked for a sixth report and more detailed information, he provoked a flood of complaints (Kirn, 1945). As a consequence of this uproar and the inequality between the requirements imposed on national and state member banks, the 1917 Amendment to the Federal Reserve Act, ordered state member banks to make their reports of condition to their Federal Reserve Bank, setting the minimum number of call reports at three---not the five required of national banks. Furthermore, the power to set call dates was transferred to the Board. In 1916 surprise call reports were abandoned.

This regime shift was not complete until Williams left office in late 1921. But, once he had departed, disclosure began to weaken. In 1922, the number of reports fell back to five; then in 1923, it dropped to four and remained at that level for 1924 and

1925. There is no comment in the Annual Reports of the Comptroller of the Currency or the Federal Reserve Board or in the Federal Reserve Bulletin, but in the boom year of 1926, there were only three call reports---one for April 12, June 30, and December 3. In 1927, the Board called for four reports, a number it adhered to in subsequent years. What is missing for 1926 is the report that was traditionally called for in October, a shocking omission as this is the most fateful month of the year for financial crises. Why was it omitted? While the answer may lie somewhere in the archives of the Federal Reserve, there are two possible reasons. The Fed could have been under pressure from the national banks to reduce their reporting and put them on a par with state member banks. If so, this is an example of the “competition in laxity” between state and federal regulators that had led to a reduction of capital and reserve requirements in the late nineteenth and early twentieth centuries (White, 1983) and continues to bedevil contemporary American regulators. Alternatively, the Fed may have been alarmed by the condition of some banks, given that real estate values had begun to decline in the third quarter of 1926. The decision to skip the October call might have been made to give banks time to raise capital or make other adjustments.

The record of bank examination reveals no such obvious deterioration. All national banks had been examined twice yearly since 1898 (Kim, 1945). These examinations were intended to be unanticipated to provide the Comptroller with a true reading as to the condition of the banks and their compliance with regulations. It was well known that this surprise element had been undermined by the incentives from the compensation of examiners. Paid a fixed fee for each bank examined, officials minimized travel costs. The appearance of an examiner at one bank suggested an imminent visit at nearby banks. The new Federal Reserve regime improved examination by eliminating this deleterious incentive. Examiners were put on a salary and their expenses were paid. In addition they were provided with assistants to handle the minor details of examination. (Comptroller, Annual Report, 1919). Although the Comptroller was initially responsible for examining state member banks, the 1917 Amendment transferred this power to the Federal Reserve banks who organized their own examination departments.<sup>18</sup> The OCC reorganized its examiners in 1915 by Federal Reserve District and established a chief national bank examiner with responsibility for all examiners in the district (Kim, 1945).

The resources available to the Comptroller under this new regime are shown in Table 2. In the years after the post-World War I recession, the number of national banks slowly declined while their real size grew. To examine the roughly eight thousand banks, the OCC had only slightly more than two hundred examiners. The supervisory regime by nature thus had a relatively light hand and relied heavily on the discipline of the market as supported by the agency. Although the decline in revenues from 1922 to 1923 is unexplained it may reflect the final shift of state member examinations to the Federal Reserve. Otherwise, the revenues are roughly stable, reflecting their primary origin in the examination fees charged. There is a slight one year drop in revenue in 1925, and a small one year drop in the number of examiners in 1926. Yet these do not appear to be consequential. Would a one year increase from 37 to 39 banks per examiner weaken oversight? It seems unlikely. However, real assets per examiner were growing

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<sup>18</sup>State banks complained about bearing the cost of state examinations in addition to those of the Fed, though the Board could accept state examinations in lieu of additional federal ones (Kim, 1945, p. 164).

over time. Between 1923 and 1926, real assets per examiner had increased 20 percent, which must have added to the examiners workload, with no compensating increase in resources for the agency. If there was a problem, it was that the agency followed its traditions and could not readily respond, given its fee structure, to a rapid expansion of the system. There would appear to have been no active forbearance, but an unexpected stress on the ability of the OCC to carry out its obligations as the banking system rapidly expanded..

**Table 2**  
**Resources of the**  
**Comptroller of the Currency**

| <b>Year</b> | <b>OCC Examination Expenditures (Nominal \$)</b> | <b>OCC Examination Expenditures (1929 \$)</b> | <b>Number of OCC Examiners</b> | <b>Number of National Banks</b> | <b>National Bank Assets (\$ millions)</b> | <b>Real National Bank Assets (1929 \$ millions)</b> | <b>Banks per Examiner</b> | <b>Real Assets Per Examiner</b> |
|-------------|--|---|--------------------------------|---------------------------------|---|---|---------------------------|---------------------------------|
| 1922        | 3,839,805  | 3,885,246                                     | 216                            | 8,225                           | 20,633                                    | 20,877  | 38.1                      | 96.7                            |
| 1923        | 2,145,391  | 2,183,702                                     | 229                            | 8,184                           | 21,454                                    | 21,837  | 35.7                      | 95.4                            |
| 1924        | 2,168,731  | 2,143,659                                     | 217                            | 8,049                           | 22,525                                    | 22,265  | 37.1                      | 102.6                           |
| 1925        | 2,091,059  | 2,066,885                                     | 216                            | 8,054                           | 24,252                                    | 23,972  | 37.3                      | 111.0                           |
| 1926        | 2,295,122  | 2,192,547                                     | 201                            | 7,912                           | 25,202                                    | 24,076  | 39.4                      | 119.8                           |
| 1927        | 2,291,408  | 2,239,033                                     | 210                            | 7,765                           | 26,455                                    | 25,850  | 37.0                      | 123.1                           |
| 1928        | 2,308,250  | 2,281,565                                     | 206                            | 7,635                           | 28,265                                    | 27,938  | 37.1                      | 135.6                           |
| 1929        | 2,409,858  | 2,409,858                                     | 190                            | 7,408                           | 27,260                                    | 27,260  | 39.0                      | 143.5                           |

Source: Comptroller of the Currency Annual Reports 1922-1929

As Florida was one state that singled out during the boom and the bust for risky and reckless banking and a failure of bank supervision (Vickers, 1994; Frazer and Guthrie, 1995), Entry into Florida banking had been constrained by the refusal of the OCC to approve of any new national charters between 1907 and 1921. This changed when the bankers and developers Wesley D. Manley and James R. Anthony, Jr. persuaded Florida Senator Fletcher to intervene with the new Comptroller on their behalf. By merger and de novo charter, they proceeded to assemble a chain of 61 national and state banks by 1925. At the state level, Anthony developed close ties to Florida Comptroller Ernest Amos who offered charters, easy supervision and later control of receiverships in exchange for campaign funds and unsecured bank loans employed in real estate speculation. Insider lending was substantial and often exceeded legal limits. State examiners winked at these activities, while national bank examiners' objections were overruled by their superiors, and the public was kept in the dark.

This closely intertwined and sometimes corrupt relationship between developers, bankers, and regulators produced excessive forbearance. The Florida State Controller's 1926 report concealed the deteriorating condition of the banks---notably the insolvent Palm Beach Bank and Trust Company. At the federal level, the national bank examiner found the Palm Beach National Bank to be insolvent in February 1926 but his superiors prevented its closure. At the same time the Federal Reserve Bank of Atlanta, whose Governor, M.B. Wellborn was an intimate of Manley and Anthony, made a loan to this bank equal to 87 percent of its capital. News that one of their development companies was insolvent triggered a run on its allied banks on June 21, 1926. The banks closure sparked a general run on the bank chains in both Florida and Georgia, with widespread failures. The regional interest rate shock to the South uncovered by Landon-Lane and Rockoff (2007) was no doubt a consequence of this disaster. Yet, the panic did not spread to all Florida or all regional banks, as depositors appear to have been sufficiently well-informed to distinguish between the solvent and insolvent institutions, in spite of efforts to keep them in the dark.

To take a closer look at Florida, Table 3 reports on national banks and the resources at the disposal of the Comptroller in Federal Reserve District 6 (Atlanta), which had responsibility for Florida. The staff of the region appears to have experienced some turnover but there were no major disruptions during the 1920s. The Chief District Examiner J. W. Pole was succeeded in 1923 by Ellis D. Robb who remained in charge through at least 1929.

**Table 3**  
**Resources of OCC's Atlanta Office and Florida**

| <b>Year</b> | <b>Examiners in Atlanta District</b> | <b>National Banks in Atlanta District</b> | <b>Real Assets of National Banks in Atlanta District (1929 \$ millions)</b> | <b>National Banks in Florida</b> | <b>Real Assets of National Banks in Florida ( 1929 \$ millions)</b> | <b>Banks per Examiner Atlanta District</b> | <b>Real Assets per Examiner (1929 \$ millions) Atlanta District</b> |
|-------------|--------------------------------------|---|---|----------------------------------|---|--|---|
| <b>1922</b> | 10                                   | 389                                       | 712   | 60                               | 88  | 38.9                                       | 71.2  |
| <b>1923</b> | 8                                    | 389                                       | 782   | 51                               | 98  | 48.6                                       | 97.7  |
| <b>1924</b> | 10                                   | 385                                       | 856   | 52                               | 127   | 38.5                                       | 85.6  |
| <b>1925</b> | 12                                   | 382                                       | 1071  | 56                               | 266   | 31.8                                       | 89.3  |
| <b>1926</b> | 10                                   | 378                                       | 1075  | 60                               | 196   | 37.8                                       | 107.5   |
| <b>1927</b> | 11                                   | 378                                       | 1108  | 59                               | 167   | 34.4                                       | 100.7   |
| <b>1928</b> | 9                                    | 378                                       | 1164  | 59                               | 157   | 42.0                                       | 129.4   |
| <b>1929</b> | 8                                    | 365                                       | 1174  | 50                               | 134   | 45.6                                       | 146.8   |

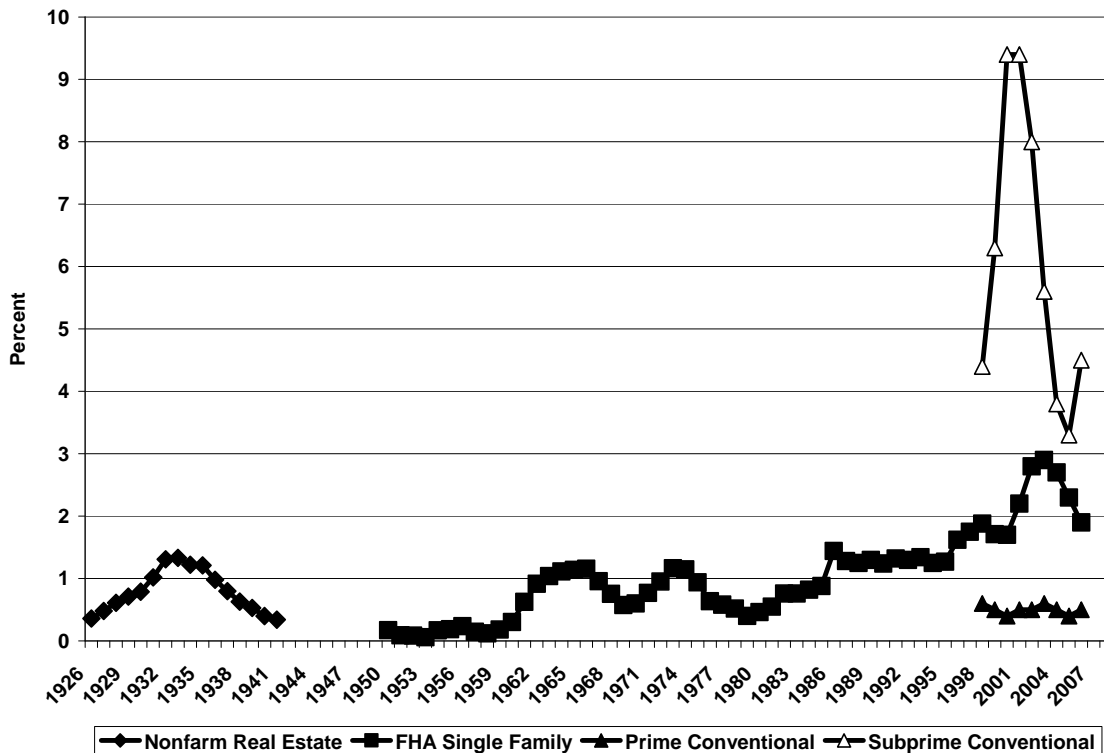
Source: Comptroller of the Currency Annual Reports 1922-1929

For the Atlanta District, the number of examiners during the boom years of 1925-1926 did not diminish and the banks per examiner and real assets per examiner were in line with national rates. Florida had one examiner stationed in the state, first in the north,

Jacksonville, who was later moved to Lakeland, perhaps reflecting the shift of population and activity southwards. The OCC faced the same problem in the Atlanta District and Florida as it did nationally. In the Atlanta District, the number of banks per examiner was stable or fell but the size of the institutions was increasing. In Florida, the number of banks fell from 60 in 1922 to 51 in 1923 only to return to 60 in 1926. While the one examiner may have coped with this change, the more than doubling in the value of assets must have represented a challenge.

Overall, the OCC, which most contemporary observers conceded was the best bank regulatory agency, did not respond to the real estate boom. It garnered no additional resources nor did it redirect its existing funds or manpower to increase supervision of rapidly expanding banking systems either national or in hot regional markets. It may even have mildly encouraged the boom by easy entry into banking and by weakening its oversight. More seriously, state supervisors, such as those in Florida (Vickers, 1994) may actually have been co-opted by land promoters and have allowed the creation of house-of-cards banking chains. But, these failures did not imperil the whole of the banking system, which remained sufficiently capitalized to withstand the fall in value of real estate.

**Figure 15**  
**Residential Foreclosures**  
**1926-2007**

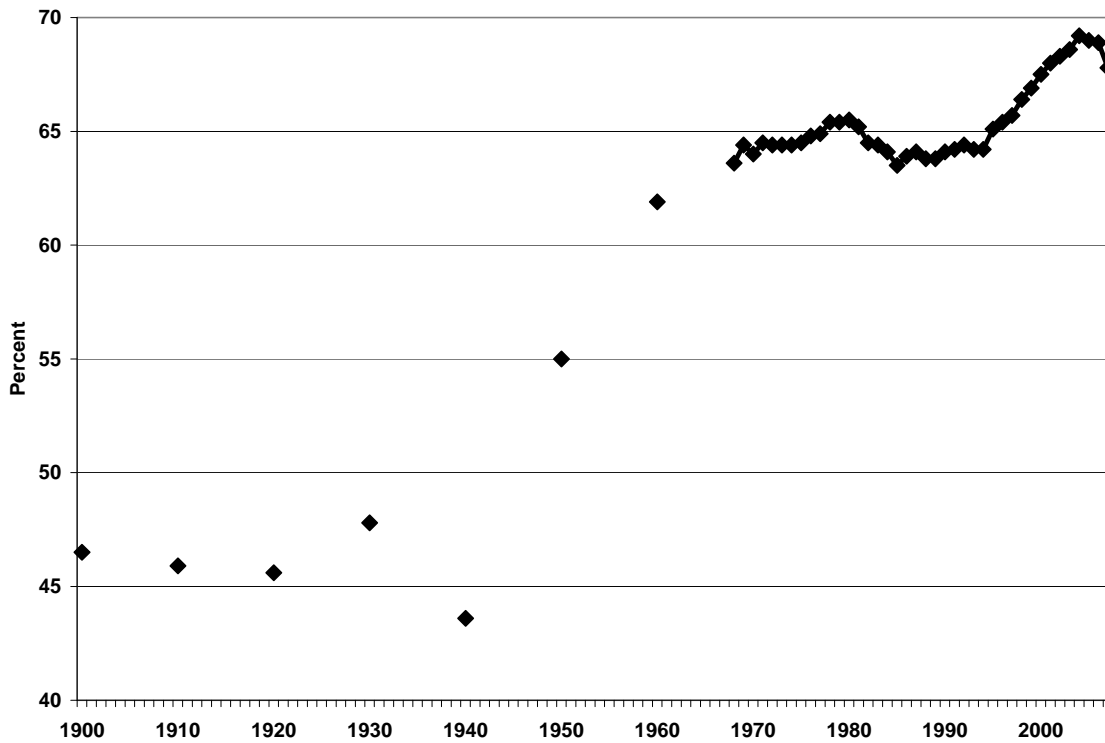


While there was no banking collapse, the effects of the post-1926 collapse of the housing market show up in the foreclosure data. Unfortunately, there are no national foreclosure statistics before 1926. Figure 15 shows the number of foreclosures per

thousand nonfarm residential mortgages for 1926 to 1941. After the real estate market began to decline in 1926, foreclosures steadily rose, increasing every year before the shock of the Great Depression, a clear signal of a distressed market. Foreclosures rose to a peak during the depression before declining. However, there was an extraordinary rescue of the mortgage market by the federal government during the depression, which included the creation of the Home Owners Loan Corporation in 1933; and the foreclosures during the depression years may be misleadingly low.

Comparison of foreclosures arising from the bust in the mid-1920s with the later twentieth real estate bubbles is not straightforward because so many mortgages have government insurance and the series are thus not directly comparable. Figure 15 displays the foreclosures for the booms that peaked in 1989 and 2006, as measured by the foreclosure rates for FHA mortgages, and prime and subprime conventional mortgages. The striking feature of this chart is that the rates for many post-war years are so much higher that the foreclosures rates from the crash of 1926 until government intervention in 1933. The relatively low levels of foreclosure for 1926-1932 reveal present further evidence of why the real estate bust did not endanger the banking system. However, it does raise the question why there was a late twentieth century secular increase in foreclosures even in prosperous and tranquil economic times.

**Figure 16**  
**Homeownership Rates**  
**1900-2008**



Source: Historical Statistics.



Why were mortgages less risky during the 1920s boom relative to the early 2000s? One reason is clearly that mortgages had much lower loan-to-value ratios and could sustain a drop of 10 or 20 percent in the value of the collateral. The other factor was the ability of households to make their mortgage payments. Compared to today, the mortgage market in the twenties provided funds to a very different pool of households. Figure 16 reports the homeownership rates. Unfortunately, until 1969 this data is only available every ten years from the Census. Nevertheless, the graph reveals a striking. At the beginning of the twentieth century, 47 percent of households owed their own homes. This proportion drifted down slightly in the next two decades then rose during the housing boom, only to drop significantly during the depression. Yet, these movements are dwarfed by the post-World War II rise, assisted by federal policies, such as the establishment of the FHA and Fannie Mae and Freddie Mac. By 1970, a plateau was reached with nearly 65 percent of the households owning their own homes. The second secular rise began in the 1990s when new federal efforts to make mortgages attractive to previously ineligible households took effect. While much of the postwar rise in homeownership may be attributable to higher incomes, federal policy has had a significant impact, acknowledged by both the programs' supporters and detractors. Unfortunately, the current crisis revealed that many individuals who had a marginal capacity to pay mortgage obtained them and a high propensity to default. The lower levels of homeownership in the 1920s suggest that the categories of high risk households that policy induced to obtain mortgages did not participate in the boom of the 1920s. This fact is born out by the considerable higher levels of foreclosures in the late twentieth century. Levels that even in prosperous times greatly exceeded foreclosure levels during the 1920s.

### **Some Lessons from the 1920s Boom and Bust**

In the search for explanations for the recent real estate market bubble, banking collapse and recession, it is important to remember that the demise of the housing market boom in the 1920s did not undermine the banking system and did not derail the economy between 1926 and 1929. At a glance this is surprising because the dimensions of the rise and fall of the housing market in the 1920s were similar to recent events. Furthermore, there also appears to have been some easing of monetary policy by the Federal Reserve, an equivalent "Greenspan put" reducing money market volatility and the likelihood of a panic and low interest rates, and unresponsive and perhaps facilitating bank supervision at the federal and the state levels. By themselves, they contributed to the boom, but it appears that they were not enough to undermine the banking system. What was absent in the 1920s and what, by comparison, seems to have been central to today's far greater disaster, were policies that induced banks to take increased risks. In the twenties, there was no federal intervention in mortgage markets. Far more households rented and bank's and financial institutions offered mortgages to those with far lower risk of default. Since the New Deal, the quest to expand home ownership has drawn higher risk families into the home buying market. The consequence of this policy is that foreclosure rates are higher than they were in the past reflecting the increased risk exposure for a given shock. In addition, deposit insurance and "Too Big to Fail" have induced banks to take more risk, if not on their balance sheets, then off balance sheet. Shocks to the banking system

thus generate greater losses. This historical comparison suggests that policies that reduce incentives for banks to take risks would do the most to safeguard the financial system and reduce the likelihood of a financial shock producing a severe recession.

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