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The Impact of Federal Housing Programs During the Great Depression

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The modern housing sector is critically important to sustained economic success. Current estimates suggest that housing related consumption is responsible for approximately 14 percent of GDP. In fact, during the current business cycle as business investment has been crumbling, the real estate sector has remained robust and the consumption of consumer durables has helped keep the economy from sinking into deep recession. One of the most remarkable features of the modern American housing market is the ease with which potential homeowners are able to secure credit and existing homeowners are able to refinance their mortgages at better rates. While international credit markets may swoon, as they did in 1998, or as U.S. equity markets gyrate, American consumers are able to secure an abundance of reasonably priced mortgage credit. With the myriad of finance options available to homebuyers today, the homeownership rate is approaching an unprecedented 70 percent of households.

There are two key features of the modern housing finance system that make mortgages on U.S. residential properties extremely liquid: the insurance the mortgage investor receives against default risk and the deep secondary market in bundled-mortgage securities. In today's conforming mortgage market the government sponsored enterprises (GSEs) Fannie Mae and Freddie Mac dominate as the providers of these services.[1] The companies reduce the credit risk associated with individual mortgage default by pooling a group of loans into a single security and then they further insure the investors in these securities against default risk.[2] While the investor still bears interest rate risk, the credit risk is borne by the GSE, for which it charges an insurance premium.[3] Congress's intent when chartering the companies to perform their current roles in 1968, which was reformed in 1989, was to provide mortgage lenders a means of replenishing their capital in order to make mortgage capital widely available across the country.[4]

Critics of the modern GSEs argue that the companies have outlived their originally intended purpose because private mortgage markets, and the debt securitization industry more generally, have

become quite sophisticated. Critics also decry the huge implicit subsidies that the GSEs receive as a result of investors' beliefs that the federal government would bail out the companies in the event of financial distress.[5] The GSEs and their supporters, on the other hand, attribute the widespread level of homeownership in the U.S. to the uniquely American institution of housing finance that attracts capital from around the world.

What is often forgotten in today's discussion of the significance of the GSEs is that the modern U.S. housing finance institutions evolved directly from the New Deal's National Housing Act of 1934. Title I of the Act provided for federal government insurance of unsecured loans that were designed to facilitate home remodeling.[6] This part of the Act was designed to be temporary with the hope that the spending from the loans would jump-start the crippled housing and construction industries. The significant innovation of the Act was Title II, which charged the Federal Housing Administration with insuring mortgages for building new homes or purchasing/refinancing existing homes. By insuring mortgages the FHA sought to give incentives to banks and other mortgage lenders to make more loans that would stimulate the recovery of the building industry (FHA Annual Report 1935, 1-2). In the process of creating this new insurance scheme, the FHA fundamentally changed the nature of home financing by allowing lower down payments and by making relatively long-term loan amortizations the standard for mortgage lending. It is important to emphasize that the FHA sought to insure credit-worthy mortgages and rejected a significant number of applications (FHA Annual Report 1938, 13-15). FHA loans tended to help families well in the upper half of the income distribution. The largest number of loans in the late 1930s went to families with incomes in the $2,000 to $2,500 range, while average annual earnings for full-time employees in nearly every sector of the economy were below $1,500 (FHA 1938, 13; HSUS 1975, 166-7). The FHA allowed relatively high-income borrowers to pay a smaller down payment and to extend the length of the mortgage repayment, thus lowering their monthly payments. Also, by assuming some of the default risk of the mortgage, the FHA lowered the interest rates that borrowers would have otherwise paid.

The HOLC's role was quite different from the FHA's because the former was a direct lender, whereas the FHA only acted as an insurer of private institutions. While the FHA was designed to provide assurances to lenders in an attempt to stimulate liquidity in the mortgage industry, the HOLC goal was to stave off massive defaults across the country. The HOLC refinanced mortgages that were already in default or in serious distress. The HOLC refinanced nearly one million loans, totaling $3.1 billion, with the great bulk of that lending occurring in 1934 and 1935 (Harriss 1951, 1). In addition, the act establishing the HOLC also provided enabling legislation for the chartering of federal savings and loan associations and expanded the lending activities of the Federal Home Loan Banks (FHA 1959, 2).

Given the current public debate over the role of the modern GSE, it seems reasonable to look to the time when these programs were first introduced to gain insights into their effects on the housing market. While we intend to make no judgments about the current mortgage finance system in the U.S., the goal of this paper is to investigate the effectiveness of the New Deal's spending and housing programs on local economic activity during the 1930s. The measures of economic performance we focus on are changes in housing and rental values and homeownership rates as reported in the Censuses of 1930 and 1940. Macroeconomic analyses of the New Deal era concentrating on national aggregate data over a handful of years have been unable to exploit several remarkable features of the New Deal programs. Federal involvement varied widely from state to state and across counties within states. There was significant geographic variation in the degree to which economic activity returned its to pre-Depression levels by the end of the New Deal experiment. Moreover, the various New Deal programs were designed to accomplish different objectives, so it is important to disentangle the various types of New Deal activity when assessing the programs' effects. Such a study is possible because of a recently-uncovered data set that describes over 30 federal New Deal spending, loan, and mortgage insurance programs in each U.S. county from 1933 to 1939.

In the process of estimating the impact of the New Deal on local economic activity, we deal with two econometric issues. First, New Deal spending can not be treated as exogenous. New Deal spending was distributed in response to a combination of political and economic factors, including the performance

of the local economy.[7] If this potential endogeneity is ignored, the estimates of the impact of New Deal

spending will be biased. Second, in focusing on local economic activity we need to recognize that there

may be geographic spillover effects in the sense that local real estate markets were integrated. In

addition, economic shocks to one county may have spilled over into its neighbors, therefore our

econometric models account for this spatial autocorrelation.

I.   Changes in Housing Characteristics, 1930 to 1940

One of the leading casualties of the Great Depression was the housing sector, which recovered

slowly during the 1930s. In general, measures of the value of housing, rents, and home ownership rates

suggest that by 1940, the housing sector had not recovered to its 1930 levels. This general statement

disguises substantial variability in the situations that developed across the country. We use this variation

in changes in the housing sector and the geographic variation in the distribution of New Deal funds to

measure the impact of New Deal programs on the housing sector.

Table 1 shows the median value of nonfarm owner-occupied housing, the median rents on

nonfarm properties, and home ownership rates by state from the 1940 Housing Census. In 1940 the

median nonfarm housing value was 48.6 percent below 1930's median value. Over the same period the

CPI, which includes measures for rental value, had fallen by 17.4 percent, while food prices had fallen 27

percent. So even after adjusting for the deflation of the period, housing values had not recovered to the

levels at the beginning of the Depression. In contrast, average personal income and average retail sales in

the majority of states had re-achieved their 1929 values (in real terms) by 1939. Nonfarm housing values

were hit hardest in the Dust Bowl states of South Dakota, Oklahoma, and Texas, in the major industrial

centers of New York, Massachusetts, Michigan, Illinois, and New Jersey, and the southern states of

Louisiana, Arkansas and Mississippi. The areas that fared best were Delaware, South Carolina, Virginia,

Nevada, and Florida.

The situation for median monthly nonfarm rents was not nearly so dire. In nominal terms median

rents for the entire United States in 1940 were only 24 percent below the 1930 level. In more than half

the states monthly rents fell by less than food prices fell. Rents fell most in the Dust Bowl states and in some midwestern states and fell least in New England, the southwestern states of Nevada and New Mexico, and some eastern states near the Mason-Dixon line.

For the United States as whole, the decline in housing values did not lead to a rise in homeownership. Ten years of Depression caused the homeownership rate to fall from 47.8 percent in 1930 to 43.6 percent in 1940. Homeownership rates, as shown in Table 1, fell the most in several Dust Bowl and Northeastern states. There were bright spots, however, as homeownership rates rose in several western and southern states.

II.   The New Deal

The Roosevelt administration responded to the depressed housing sector with New Deal programs in the form of FHA insurance, direct government lending under the HOLC, and the construction of public housing. In response to other aspects of the Depression, the New Deal also distributed federal money for the purposes of building public works, providing relief and agricultural support, and granting repayable loans to local governments. Each of these programs also might have influenced the housing markets through their direct impacts on income and local economic activity.

In 1940 the U.S. Office of Government Reports (OGR) compiled a detailed statistical description of the federal government's expenditures in over 3,000 counties for the period March 3, 1933, through July 30, 1939. Previous research has made use of the state-level reports from the OGR to explain the distribution of New Deal spending, but the county-level data have been left unexplored. The federal government distributed $16.5 billion in nonrepayable grants over the six-year period, provided $10.4 billion in repayable loans, and the Federal Housing Administration insured $2.7 billion in mortgage loans (see Table 2). The grants and loans accounted for 61 percent of all federal expenditures during this time span. This federal spending was unprecedented in terms of the amounts spent during peacetime. For example, the New Deal increased the federal government's expenditures as a share of GDP from about 4 to 8 percent. Furthermore, the federal government began spending large amounts of money where it had

spent very little before, setting the stage for a long-term structural shift in the financial responsibilities of the national, state, and local governments.[8] As a share of government expenditures at all levels, the New Deal raised the proportion of federal spending from 30 percent in 1932 to 46 percent by 1940 (Wallis 1984, 141-2).

The New Deal programs we consider include the FHA insurance on Title I and Title II loans, HOLC loans, and PWA grants for public housing projects prior to 1937 and U.S. Housing Authority loans after 1937 for the same purposes. Put simply, government intervention in the mortgage market during the 1930s structurally changed the nature of writing mortgages in the United States. Mortgagees historically were required to place large down payments on their propertie s – up to 50 percent of the property value – and could only obtain financing for relatively short periods of time – perhaps five years – after which time the mortgage had to be refinanced. Under the FHA and HOLC mortgage contracts, smaller downpayments were required and the length of the mortgage amortization was extended up to twenty years. Further, with the government insuring lenders against default risk, interest rates should have fallen as well. Table 3 presents index numbers showing the dramatic changes in the costs and terms of loans during the 1930s. From the early 1920s mortgage interest rates had fallen about 15 percent by the latter part of the 1930s, the average length of the mortgages had increased about 55 percent, and the loan-to-value ratio had increased 16 percent. Moreover, the structural changes that the FHA and HOLC instituted permeated the financial market because of the magnitude of the programs. We use the distribution of FHA and HOLC loans across counties as a measure of the extent to which these innovations were spreading around the country. By 1940 the FHA was insuring 10.3 percent of all mortgages and 30.6 percent of all new construction in the U.S (Grebler, et. al. 1956, 243). Similarly, during the 1930s the HOLC had refinanced 10 percent of all nonfarm, owner-occupied dwellings or 20 percent of all mortgaged properties.

Changing the amortization structure of a home mortgage, allowing a lower down payment, and lowering the interest rate all served to make it easier and less costly for borrowers to acquire loans for fixing and buying homes. We would expect all of these developments to have had a positive effect on

real estate values as housing demand was stimulated. Or, from an accounting perspective, reducing the discount rate on an asset would have led to an increase in its value. The indirect effects of the FHA-insured and HOLC loans may have been large to the extent that a substantial proportion of the unemployed during the 1930s were building tradesmen and the increased liquidity of the mortgage market presumably stimulated the housing construction and remodeling industries. Thus, even though the FHA and the HOLC were targeted at homeowners, greater diffusion of the FHA and HOLC programs into an area could have stimulated the demand among workers for rental housing, as well.

The impact of the FHA and the HOLC on home ownership rates might have been limited, however, to the extent that both programs sought to focus on more credit-worthy borrowers. In the annual reports, the FHA claimed that they were careful to insure only loans that they believed were likely to be repaid. As a consequence, most FHA-insured loans went to people in the upper portion of the income distribution, and the foreclosure rate on FHA-insured loans between 1935 and 1939 was only 0.4 percent (FHA, 1938, 13-15; 1940, 39). The HOLC also sought to limit losses on their loans by rejecting substantial numbers of applicants and explicitly focusing on lending to better credit risks. But given the mission of the HOLC, the agency was less successful at forestalling foreclosures than the FHA because the HOLC was designed to refinance loans in 1933 through 1935 that were already in trouble. By 1940 the HOLC foreclosed on 16.7 percent of their loans (Harris, 1951, 197). Given the HOLC's focus on troubled loans, we would expect the program to have had more of a positive effect on home ownership than the FHA.

The housing programs were only part of the distribution of New Deal funds. The bulk of New Deal grant spending was devoted to relief programs such as the Works Progress Administration (WPA), the Federal Emergency Relief Administration (FERA), the Civil Works Administration (CWA), and Social Security Administration's Aid to the Blind, Aid to Dependent Children, and Old-Age Assistance programs. The immediate goal of the projects was to provide relief to the unemployed and low-income people. These programs provided employment for millions of unemployed workers, sometimes in make-

work jobs, but also in projects that built sidewalks, post offices, schools, local roads, and other additions to the local infrastructure.

Public works spending included expenditures by the Public Works Administration, Public Building Administration, and the Public Roads Administration. These programs were administered differently as they focused less on providing immediate work relief in response to greater unemployment, but more on building long-term and large-scale projects like dams, roads, schools, sanitation facilities, and other forms of civil infrastructure (Clarke 1996, 62-68; Schlesinger 1958, 263-96). The large scale of the PWA projects meant that the projects had the potential to influence economic activity outside the county where the money was spent.

Both the relief and public works programs potentially affected housing values by providing income to the unemployed and more indirectly by building infrastructure that could stimulate the productivity of local economies.[9] We might anticipate a relatively strong effect of public works development on housing values as roads, dams, sewers, waterworks, schools, etc. would have enhanced the asset value of local property, especially if the federal government were paying the bill. Yet the local effect of relief spending on housing values was potentially lessened by the displacement of private employment. John Wallis and Daniel Benjamin (1981, 1989) estimate that for each work relief job created about half a job in the private sector was lost. Further, the impact of the public works spending on housing values would have been lessened to the extent that state and local governments allowed the federal government to finance the building of projects that might have been undertaken even without the federal government's financial support. Numerous studies measuring the "flypaper effect," however, have shown that such federal expenditures can indeed increase overall government spending.[10] From a demand-side perspective we would expect that the programs would have bolstered homeownership rates, all else equal. However, given the temporary nature of the major public works projects and the employment uncertainty associated with relief work, it is not clear how much increase we should actually expect to observe in homeownership rates over the entire 1930s decade. Since we are measuring the

change in homeownership over the 1930s (specifically, 1930 to 1940), our estimates will uncover the structural influences that the New Deal policies had on local real estate markets.

The impact of spending under the Agricultural Adjustment Act is more complex. The AAA spending reported by the OGR was designed to reduce acreage under production. The farmers who received payments were likely to have ended up with higher incomes, but the reduction in land under production was likely to reduce the demand for farm labor, thus lowering the incomes of sharecroppers and farm laborers. This demand reduction may have been exacerbated further by increased adoption of tractors in areas with higher AAA payments (Alston 1981). Finally, the literature on the New Deal has often suggested that share tenants and croppers did not receive their expected shares of the AAA payments (Whatley 1983; Biles 1994, 39-43; Saloutos 1974). Thus, the ultimate impact of the AAA on homeownership in the county depends on these countervailing effects of a rise in income for landowners and a potential fall in income for croppers and farm workers. If the AAA contributed to a decline in income for farm workers, homeownership rates might well have fallen, particularly since landowners were already likely to own their own homes. The effect of the AAA on our nonfarm measures of housing values and monthly rents is uncertain since the farm program was likely to have only indirect effects on the nonfarm housing.

The federal government sponsored a series of loans programs during the 1930s that lent money to banks, railroads, businesses, distressed farmers, agricultural credit institutions, and state and local governments for public works and some relief programs.[11] The full impact of the loans on economic activity is difficult to predict. The loans potentially had a limited effect on the real estate market because the majority of loans to state and local governments and businesses were short-term and were repaid by the end of the 1930s (Olson 1988). Even in the case of longer-term loans, the borrower may have anticipated repayment and thus increased the collection of taxes or set aside resources to repay the loans. On the other hand, the loans may have had a positive impact on income and economic activity by providing immediate opportunities for the recipients to undertake projects that may have been stalled because of short-term liquidity problems. The actual financial benefit that borrowers received from the

federal government is also difficult to determine. It may have come in the form of an interest rate subsidy or in some cases the loans may have been made with the implicit understanding that they would be forgiven or that repayment could be delayed. Unfortunately, the data collected by the OGR only records the aggregate amount of loans provided in each county and not the terms of the loans, which could help to predict the loans' impact on the local economies.

In general, we expect that the New Deal housing programs and the New Deal grant programs stimulated the demand for owner-occupied homes and rentals to varying degrees. The impact of these programs would have been influenced by crowding out and flypaper effects on private and state and local government spending. In many cases a program that stimulated the local economy was likely to also lead to increases in both the median value of owner-occupied housing and the median rents in the area. It should be noted, however, that the New Deal programs might also have had less obvious compositional effects on the distribution of owner-occupied housing values and rents because the programs targeted different segments of the population. Many housing studies show that higher income persons are more likely to be homeowners and that the values of their homes are positively related to their income. Similarly, among renters, renters with higher income are likely to rent properties at the higher end of the rent distribution. Now consider a New Deal program, like relief spending that targeted households in the lower segment of the income distribution. As relief spending increased incomes, some recipients may have been able to purchase a home or avoid losing their existing homes. Given that these households had lower incomes, they were likely to purchase or already own homes with values below the median housing value. The impact of this change might therefore lead to a reduction in the observed median value of homes. On the other hand, because the relief recipients were more likely to be distributed more evenly across the distribution of rental values, an increase in relief spending could have contributed to an increase demand for rental housing that raised median rents.

There was substantial variation in the extent of per capita New Deal activity (see Table 4) that we can use to examine the impact of the various New Deal programs on housing values. Spending on work relief was over $100 per person in the largest urban states in the Northeast, Midwest, and in many

western states. Relief expenditures were below $50 per person in many southern states. Per capita public works expenditures were highest in Nevada, Arizona, and Wyoming, and lowest again in the South. Meanwhile, AAA expenditures, as expected, were highest in agricultural regions, particularly the West North Central region and the Mountain West. The South received substantially higher AAA amounts per capita than did the Northeast, but much less than the West or the West North Central. Non-housing loans were highest in a number of midwestern states, especially the Dakotas, and in a number of western states, including California, Wyoming, and Nevada. Casual observation of the distribution of FHA-insured and HOLC mortgages shows that they were widely distributed across the country. The value of mortgages insured by the FHA ranged from $83 per person in California to a low of $5.40 in North Dakota. The HOLC had the most per capita activity in Nevada, Michigan, and Ohio, while the West North Central and South seem to have gotten the least attention. Finally, public housing grants and loans were concentrated in the states with major urban centers and many states received nothing.

III.   An Empirical Model of the Impact of the New Deal

To capture the impact of the various New Deal programs on the real estate market, we estimate the following reduced-form equation for median house values in county i in year t

$$P_{it} = \boldsymbol{b}\,ND_{it} + \boldsymbol{d}\,Z_{it} + \boldsymbol{g}\,g_i(P_{jt}, j \neq i) + \boldsymbol{e}_{it} \qquad (1),$$

where P_{it} is the natural log of the median house value in county i and year t. ND_{it} is a series of New Deal variables representing expenditures on relief grants, public works grants, AAA grants, non-housing loans, the value of FHA-insured and HOLC loans, and the other public housing programs. The control variables in the Z_{it} vector are included to reflect the economic and socioeconomic factors that may have influenced income or other aspects of the real estate sector. The variables include the percentage of the population living in urban and rural non-farm areas. The percent black and percent foreign-born capture the influence of racial differences that may have affected the income distribution in a county. The percent illiterate captures differences in education, skill levels, and thus incomes across educational classes. We should note that we do not include income directly in the model because such data do not exist for the

county level. The function $g_i(P_{jt}, j \neq i)$ is a linear function assigning weights to the value of real estate in nearby counties j ($j \neq i$). Specifically, the spatial functions for county i are weighted averages of the housing values in neighboring counties j. These functions are called spatial lags and the system is considered to be spatially autoregressive. Finally, the stochastic error term, $\boldsymbol{e}_{it}$, captures random and unmeasured shocks. We also estimate equations of the same form with median rents as the dependent variable and again with percentage homeowners as the dependent variable.

There are a variety of unmeasured factors that may have influenced real estate values that did not change over time within each county, but varied across counties. These might include fundamental differences in the cost of living, local taxes, or different patterns of homeownership versus renting. To control for this unmeasured heterogeneity across counties we develop the difference equation[12]

$$dP_{it} = \boldsymbol{b}\,dND_{it} + \boldsymbol{d}\,dZ_{it} + \boldsymbol{g}g_i(dP_{jt}, j \neq i) + \boldsymbol{q}\,D_i + d\boldsymbol{e}_{it} \tag{2}.$$

In this equation we have also included a vector of state dummy variables, D, to capture changes in state policies during the 1930s that were common to all counties in that state but may have varied across states. These changes might have included changes in the cost-of-living, state tax policies, or state policies relating to relief and public works spending.

The Census Bureau collected information on nonfarm housing values and rental rates for each county in 1930 and 1940. In our estimation we use the median values reported by the Census. The OGR reported aggregate New Deal information by program by county for the period March 1933 to June 30, 1939 (February 2, 1932, was the starting point for the RFC Loans). Focusing on the difference between 1930 and 1940 allows us to look at the extent to which the New Deal promoted a recovery in the real estate market. Because there was no New Deal spending in 1930, we use the average annual New Deal spending reported by the OGR for the period March 3, 1933, through June 30, 1939, as our test of the New Deal's effectiveness. Thus the basic equation becomes:

$$P_{i40} - P_{i30} = \boldsymbol{b}\,ND_i^{avg} + \boldsymbol{d}\,(Z_{i40} - Z_{i30}) + \boldsymbol{g}g_i(P_{j40} - P_{j30}, j \neq i) + \boldsymbol{q}\,D_i + (\boldsymbol{e}_{i39} - \boldsymbol{e}_{i29}) \tag{3}.$$

The **b** coefficients in the log-difference equation can be read as the percentage increase in median housing or rental values over the decade that was associated with an additional dollar of New Deal spending on the various programs per person per year.

III.1   Instruments for the New Deal Variables

Estimating the impact of New Deal spending on changes in economic activity is complicated by potential simultaneity bias. Harry Hopkins and other New Deal administrators argued that they responded to continuing slumps in economic activity, which would imply a negative relationship between the change in the housing sector and New Deal spending. On the other hand, state and local governments often proposed projects and in some cases were required to provide matching spending. Therefore, counties with less of a decline in housing values may have had more resources at their disposal for attracting federal matching grants which, in turn, would lead to a positive relationship between housing values and New Deal spending.

To eliminate the simultaneity bias we use an instrumental variables approach. Our goal is to find variables to use as instruments that were not directly affected by the level of New Deal spending from 1933 to 1939 and that were not directly affected by retail sales in 1929 or 1939. The literature on the geographic distribution of state funds (summarized in Wallis 1998 and Couch and Shughart 1998) suggests a series of instruments. The instruments include structural economic variables describing the 1930 economy, such as the percent urban, percent rural nonfarm, percent illiterate, and ethnic percentages in the population, which are unlikely to be determined by retail sales per capita. Another series of variables are used to measure the strength of the farm lobby, the importance of large farms, and the extent of farm distress as of 1929. The variables include average farm size, the value of farm output per capita in 1929, the percentage of acres with crop failures in 1929, and the percentage of acres within the county devoted to farming. We include a series of variables describing the political clout of the electorate, fundamental political factors that might have influenced the distribution of funds, and the congressional committee seats held by the representatives from the counties. These variables include the inverse of

population, the mean percentage voting for the Democratic presidential candidate from 1896 to 1932, the standard deviation of the percent voting for the Democratic presidential candidate from 1896 through 1932, the difference between the percentage voting for Roosevelt in 1932 and the mean Democratic vote from 1896 through 1932, the percentage of the adult population voting in 1932, the county's share of the presidential electoral votes per capita, and dummy variables reflecting whether the county's representatives sat on a relevant committee in the House of Representatives. The committees include Agriculture, Appropriations, Banking and Currency, Flood Control, Irrigation, Labor, Public Buildings, Public Lands, Rivers and Harbors, Roads, and Ways and Means. The economic structure and the political variables have been found to be important determinants of the distribution of New Deal funds.[13]

III.2   Estimation Technique with Geographic Spillover Effects

Our model includes two levels of geographic spillovers. The first, as shown above, is that we allow neighbors' real estate markets to directly affect the county of interest's real estate values. Second, to the extent that markets in neighboring counties were integrated, unmeasured shocks that struck one county were likely to influence nearby counties as well. Therefore, we control for these unmeasured spatial correlations in our model of the error structure.

To deal with the spillover effects and simultaneity issues we use an empirical framework that combines both instrumental variables techniques and spatial econometrics.[14] After a series of papers that developed solutions to specific problems associated with estimating spatial models in the presence of simultaneity problems, Kelejian and Prucha (1998) developed a general solution to the simultaneity problem, and we use their estimators in what follows.

The spatial lag function (g_i) is typically based on some geographic proximity measure such as contiguity or physical distance. For example, a strong real estate market in neighboring counties j and k may have had an effect on property values in county i, but the spillover effect may have been stronger for neighboring county j than for county k if county j was closer to county i than county k. Moreover, if county i were in New York and county k in California, spending in county k might not have had any

effect on county i at all (especially since real estate markets are relatively localized given the immobility of the capital). For computational parsimony and to reduce the number of spatial parameters we need to estimate, we allow the spatial functions to be the same in the deterministic and random components of the model.

A typical spatial lag structure is given by:

$$g_i(X_j, j \neq i) = \sum_j^n a_{ij} X_j \, , \, i = 1, \ldots, n \text{ where } \sum_j^n a_{ij} = 1 \text{ and } a_{ii} = 0.$$

This measure produces a weighted average of the values of X_j in neighboring counties. The requirement that $a_{ii} = 0$ ensures that the county of interest i is not spatially correlated with itself, and the requirement that the a_{ij} sum to one is a normalization so that relative (and not absolute) relationships between counties matter. There are an infinite number of parameterizations one could use to specify the function g, though two commonly used parameterizations in the spatial analysis literature are geographic contiguity and geographic distance. In the analysis below we use a distance-based weighting scheme that includes more neighboring counties to allow for spillovers beyond just contiguous neighbors, but also accounts for the localized nature of real estate markets. It is probably unrealistic to suspect that property values in county i in New York would be affected by events in county j in California with some positive weight. The implication for the spatial modeling is that we need to select a maximum mileage cut-off value (a distance above which neighboring counties received a weight of 0) that is large enough to include more than just contiguous neighbors, but small enough to reflect the localized nature of housing. To this end, we use a cut-off of 100 miles and the following weighting parameterization:

$$a_{ij} = \frac{1}{d_{ij}} \left[\sum_j \frac{1}{d_{ij}} \right]^{-1} \text{ for } d_{ij} < 100 \text{ miles; } a_{ij} = 0 \text{ otherwise,}$$

where d_{ij} is the physical distance between the county seats of counties i and j. At a cut-off of 100 radial miles the median number of neighbors is 44 (versus 6 under a contiguity scheme), the maximum is 102 neighbors, and the minimum 1 neighbor.

In our modeling we include a spatial lag for the real estate values in the deterministic portion of the equation, but there are also likely to be spatial lags in the disturbance term:

$$e_i = \rho f_i(e_j \, j \neq i) + u_i, \, i = 1, \ldots, n,$$

where u_i is a zero-mean disturbance with variance σ^2.[15] The ρ is a scalar autoregressive parameter and the equation implies that economic shocks in county i are functions of the economic shocks in neighboring counties $j \neq i$. Again for computational parsimony, we assume that spatial relationships are equivalent throughout the system, so that $f_i = g_i$. Therefore, the spatial lag in the error term is also based on the inverse of physical distances between county seats with mileage cut-offs of 100.

Stacking observations over i, the system derived from equation (3) can be written more compactly as:

$$dP = b \, ND + gW \, dP + d \, Z + q \, D + e,$$

$$\varepsilon = \rho W\varepsilon + u;$$

where W is an $(n \times n)$ spatial weighting matrix, consisting of typical element

$$w_{ij} = a_{ij} \Big/ \sum_j a_{ij} \, , \, i, j = 1, \ldots, n.$$

Under suitable conditions outlined in Kelejian and Prucha (1999) and satisfied here, a generalized two stage least squares (G2SLS) procedure produces consistent estimates of the model's parameters.

IV.   Results

Tables 5 and 6 show the estimated coefficients from the log-difference equations for the nonfarm housing and nonfarm monthly rents values, respectively, using several estimation procedures.   On the right-hand side of the tables we show the OLS and 2SLS estimations without any spatial analysis. The left-hand side of the tables shows the results after correcting for spatial interactions in the error terms and also controlling for the direct interaction of housing values across counties. In the discussion of the results we will focus on the coefficients and t-statistics for the analysis with controls for housing values

and rental values in nearby counties, which are in the third and fourth columns of numbers in the tables, which we have placed in bold type. The Generalized Two-Stage Least Squares results suggest strong geographic integration of the housing markets. Changes in neighbors' median housing or rental values had a strong and statistically significant influence on the changes within the county of interest. For every percentage point change in the values of nonfarm owner-occupied homes in surrounding counties, the nonfarm housing values also rose by approximately one percent. The impact of changes in rents in nearby counties also had the same effect. However, it should be noted that the negative rho coefficient of –0.4768 in Table 5 suggests that unmeasured positive random shocks to changes in housing values in neighboring counties had a negative impact on the change in housing values in the county of interest.[16]

In Table 7 we show the results of OLS and 2SLS estimation of the change in home ownership rates between 1930 and 1940. Because we do not anticipate that home ownership rates would have the same types of spillover effects that housing values and monthly rents would have, we do not perform the spatial analysis on this equation. We will focus on the results of the 2SLS, which are in bold type in Table 7.

The New Deal housing programs had significant and diverse effects on the housing and rental markets. The value of FHA-insured home mortgages had a strong positive effect on both owner-occupied housing values and monthly rents. At the margin an increase of one dollar per capita per year in the value of FHA loans raised the average value of owner-occupied homes by nearly $16 and the average rent by 29 cents. However, the FHA insurance did not raise home ownership rates, as the coefficient in Table 7 is negative although not statistically significant. The rise in housing values from the FHA program was probably driven in part by the subsidy to home improvement and modernization, as the FHA met one of its stated goals of improving the value of the housing stock in the U.S. economy. In the mortgage market, the FHA programs tended to lower the interest rates on mortgages and improved the terms of the loans in ways that increased housing demand, but it appears that this was confined largely to upper income persons who could qualify for the loans anyway. As mentioned above, the FHA monitoring was very effective, as the default rate on the loans was extremely low (FHA 1940, p. 39). Thus it appears that the

FHA programs raised the demand for housing in the upper segment of the housing-value distribution, but did relatively little to open the door in the 1930s for lower income persons.

The increased housing activity at the upper end of the income distribution does appear to have stimulated other segments of the economy. In spatial analysis of changes in retail sales and of net migration across counties, we found that the FHA loans had a strong stimulus effect on local economic activity, as measured by changes in retail sales per capita and measures of in-migration (Fishback, Kantor, and Horrace, 2001a and b). This stimulation of local activity, when combined with the effect of modernization and home improvement loans, helps explain the positive impact the FHA had on median rents.

It is important to note that FHA loans were private loans and the primary role of the federal government was to insure the lender against default risk. The question naturally arises: How much credit should the FHA program receive for the resulting expansion in economic activity? Given that the FHA monitored the risk of the loans that they accepted for insurance very carefully, some percentage of the loans that were insured would likely have been made in the absence of the FHA program. The government's share of the credit might be as small as its cost of insuring the loans, which would have been in the range of 1 to 5 percent of the value of the loans. On the other hand, given the moribund state of the mortgage market in 1933, the FHA's reorganization of the standard mortgage terms and its insurance of billions of dollars worth of loans might have jump-started the mortgage industry by providing lenders the confidence to take on risks that otherwise would have stymied lending. Moreover, the FHA was very active in promoting its mortgage insurance and its efforts to boost modernization activities. For example, in his reports to Washington, DC, the Alabama State Director of the Federal Emergency Agencies John Petree consistently made comments similar to the ones below about the actions of the FHA in Alabama:

> This agency has been the most active of any in the state in their efforts to sell their
> agency to the people. They have had proclamations issued by mayors in all of the
> principal cities calling upon every residence and building owner to take advantage of

the act and repair and improve wherever possible. They have had modernization

exhibits in several of the cities with a staff of people explaining the agency and its

advantages. They have contacted practically every bank in the state urging their

cooperation. They have had committees make house to house canvasses urging that

improvements be made and modern appliances installed (Petree 1934, p. 5).

There is a sharp contrast between the HOLC's impact on housing values relative to the FHA's.

The HOLC had a small positive but statistically insignificant effect on the change in housing values,

while contributing to lowering rental rates in 1940. Whereas the FHA "cherry-picked" the default risks it

decided to take on, the HOLC was charged with refinancing loans that were already in trouble. The

program typically refinanced the loans at more favorable rates and amortized the loans for 15-year terms.

The goal was to aid the homeowner in avoiding default and, thus, a bank's foreclosure. Most of the

refinancing was done in 1933 and 1934. Although the HOLC sought to limit its loans to households with

better prospects for repayment among the group of applicants, the group of loans to choose from were

already problematic. Thus the overall default rate on HOLC loans was 16.7 percent by 1940, compared

with a default rate on FHA loans of 0.4 percent between 1935 and 1939.[17] The real potential gain from

the HOLC was to prop up the housing values in 1933 and 1934 by preventing distress sales of potentially

10 percent of the housing stock in the United States during the heart of the Depression in 1933 and 1934.

When the HOLC did foreclose, its goal was to avoid distress sales and thus continue to prop up the

housing values in the market. The HOLC was successful in the sense that 80 percent of the loans they

refinanced never foreclosed, and they managed to delay the foreclosure and resale of the remaining 20

percent until the late 1930s and early 1940s when the economy was stronger. To fully capture the

positive impact of the HOLC we would need information on housing values in 1933 through 1935.

However, to the extent that there is path dependence in the housing values, we should still be able to

detect the influence of the HOLC on housing values in 1940.

The coefficient of the HOLC loans per capita in Table 5 shows that an additional annual dollar

per capita in HOLC loans raised housing values in 1940 by about $3, although the effect is not

statistically significant. The positive effect of the HOLC loans was probably smaller than it was in 1933 through 1935 in part due to the resale of foreclosed properties in the late 1930s. The HOLC foreclosed on 170,000 properties between 1935 and the end of 1939. Of those properties the HOLC had resold 80,824 by December 1939 and 90,845 by March 1940. The agency then sold another 90,000 properties between March 1940 and March 1943 (Harris 1951). Even though the HOLC claimed it was trying to sell foreclosed properties for full market value, the increase in the supply of houses available for resale through the HOLC probably helped depress prices in the markets where this occurred.

We can see the negative impact of the HOLC foreclosures more clearly on the rental markets in 1940. After foreclosing, the HOLC sought to repair and improve the homes and then rented them while waiting for the proper time to resell the homes. Over 70,000 foreclosed homes in 1939 and over 66,000 homes in 1940 were rented out by the HOLC (Harris 1951, 191). If the values of foreclosed properties were distributed similarly to those acting as collateral on all HOLC loans, we might expect a negative effect of HOLC loans on rental values. The coefficient on the value of per capita HOLC loans in Table 6 suggests that an additional dollar of HOLC loans was associated with an 8 cent reduction in rents in 1940.

We were surprised to find that the HOLC had only a small positive and statistically insignificant effect on the change in home ownership rates. It is possible that since the key period in which the HOLC operated was the crisis in 1933 and 1934 we might be missing the full effect of the HOLC's ability to keep people in their homes. Another possibility is that the HOLC took the place of the private arrangements that lenders might have pursued to refinance the distressed loans in order to avoid a firesale of the foreclosed property. The HOLC did try to limit its lending to households that were likely to repay the loans. This group of borrowers was precisely the group with whom private lenders would have been likely to try to negotiate new terms for refinancing. Thus, the ultimate effect of the HOLC might have been to provide lower interest rates and better loan terms to persons who would have still been able to refinance their homes under less favorable terms through private lenders.

Public housing projects were targeted at providing higher quality rental housing for low-income persons. Given that they were designed to meet the needs of the lowest end of the income distribution,

the public housing programs may have added rental property at the lower end of the rental distribution, but not at the top part of the distribution. Thus, as public housing provided more lower-end rental properties, the median rents might well have fallen. The coefficient of grants per capita for PWA public housing in Table 6 is consistent with this notion. More spending per capita on PWA public housing was associated with lower rents. On the other hand, the public housing loans that were being introduced by the U.S. Housing Authority in the late 1930s had a small positive effect. The difference in effects may have been driven by the difference in the timing of the programs. The PWA public housing projects were generally completed by 1940 and thus the impact of the greater supply of rental properties at the low end was already in place. The projects from the USHA loans were still being built and thus may have been stimulating incomes for skilled construction workers in ways that would have increased the demand for rental housing.

Although we have focused on the housing programs, other New Deal programs also contributed to changes in housing values and rents in diverse ways. Complementing the FHA programs for upper income groups, it appears that the major relief programs like the WPA, FERA, and CWA contributed to helping more people in the lower tail of the income distribution reach their goal of homeownership. An additional per capita dollar per year in work relief spending increased home ownership rates by a statistically significant 0.13 percentage point. Meanwhile, the distribution of relief funds appears to have had a compositional effect on the demand for housing that led to statistically significant reductions in median housing values and statistically significant increases in median rents. The relief programs specifically provided funds and employment for the unemployed and lower income people. The members of this group were more likely to be purchasing or retaining housing in the bottom portion of the housing value distribution while they were more likely to be evenly distributed across the rental distribution. To the extent that the relief programs raised incomes or reduced income uncertainty for this group, the results in Table 5 suggest that the recipients increased the number of homes in the lower tier of the housing value distribution, which in turn would have reduced the median housing value. On the other hand, in the rental

markets the distribution of relief funds appear to have increased the demand for rental housing in the parts of the rental value distribution such that the median rental value increased.

In contrast to the impact of the relief programs, it appears that the AAA payments to farmers to restrict production served to harm the homeownership prospects of farm workers and share croppers and tenants.   The AAA payments may have benefited landowners who were likely to have owned their own homes. But by reducing the acreage under cultivation and by stimulating a shift toward mechanization, the AAA program may have led to reductions in the demand for labor that led to lower incomes for farm workers and share tenants and croppers (Alston 1981). In our study of changes in retail sales during the 1930s, we find evidence consistent with this demand-reduction argument as higher AAA payments were associated with lower retail sales on a per capita basis (Fishback, Horrace, and Kantor 2001b). The results in Table 7 also appear consistent with this finding as increases in AAA payments were associated with a statistically significant reduction in home ownership rates.[18]

We had anticipated that New Deal spending on public works would have increased the demand for all types of housing as the value of federally funded projects such as roads, irrigation projects, and dams would have been incorporated into the capitalized value of housing. Further, demand for housing would have been stimulated further by increases in economic activity and employment associated with these projects. However the results in Tables 5 through 7 suggest that the public works projects had small and statistically insignificant effects on median housing values, median rents, and on homeownership rates.

Finally, we found that the nonhousing loan programs also had small and statistically insignificant impacts on both the median housing values and the median rents.   However, the nonhousing loan programs did have a positive and statistically significant impact on homeownership rates.

V.   Conclusions

The New Deal programs that were designed to stimulate the construction and home remodeling industries profoundly and permanently changed the housing finance institutions in the United States.

Instead of short-term loans with steep capital requirements, the FHA and HOLC institutionalized the long-term amortizing mortgage that required only a 20 percent downpayment. Equally important, the FHA insured lenders against the risk that the borrower would default. The FHA and the HOLC programs were first introduced in the mid-1930s and we were able to examine the impact of the diffusion of the programs using the geographic distribution of the funds from these and other New Deal programs.

There is ample evidence that the FHA insurance program helped stimulate the economy during the 1930s. In earlier studies (2001a, 2001b) we found that the FHA program helped stimulate the retail sector and was associated with net migration into counties where the FHA was relatively more active. The analysis here shows that the FHA was on the way to achieving one of their stated goals of improving the quality of the housing stock in the United States. The FHA mortgage insurance was positively related to both median owner-occupied housing values and median monthly rents. However, it appears that people who were relatively well-off benefited most from the FHA because the agency monitored borrowers' abilities to repay carefully and only insured a mortgage if the default risk was low. The careful monitoring appears to have led to our finding that the FHA had a small and statistically insignificant effect on homeownership rates during the 1930s.

The emergency relief programs during the 1930s complemented the FHA by helping families at the lower end of the income distribution. Homeownership rates were stimulated by the relief programs, as were median monthly rents. Given that the relief programs were targeted at lower income persons and the unemployed, they also appear to have stimulated the number of houses in the lower end of the housing value distribution, as relief spending was associated with lower median housing values. The success of the relief programs in boosting homeownership rates was partially offset in rural areas by AAA spending. There is substantial evidence in the historical literature that the AAA funds went largely to landowners and scholars have suspected that the AAA might have led to a reduction in the demand for labor that might have contributed to lower incomes for farm workers and tenants. Our findings here and in studies of retail sales are consistent with this hypothesis. More per capita AAA spending in a county was associated with lower homeownership rates and also lower retail sales per capita.

More work needs to be done to understand the impact of the HOLC. Given that we have information only on the end points of the decade of the 1930s and the HOLC lending was most intense from 1933 to 1935, our analysis shows only the long-term effects of the HOLC. We find that the HOLC had small positive but statistically insignificant effects on median owner-occupied housing values and also on homeownership rates. Further, we find that the HOLC was associated with lower median monthly rents on rental property. The negative relationship may have been a result of increases in the supply of rental housing that resulted when the HOLC was forced to foreclose on bad loans and hold them as rental property until the homes could be resold at reasonable market values in 1939 and 1940. We are in the process of developing panel data sets on building permits and New Deal programs at the state level that might allow us to better examine the impact of the HOLC and the FHA in the mid 1930s.

There is little doubt that the FHA and the HOLC helped revolutionize the mortgage lending industry by institutionalizing the terms that we see on most home mortgages today. Our analysis suggests that when they were first introduced they helped stimulate the housing industry during a time of crisis. However, most of the benefits of the programs may have gone to persons with more incomes and better credit, as both the HOLC and the FHA actively monitored the quality of the loans they were either making or insuring. The relief programs did more to stimulate home ownership at the lower levels of the income distribution during the 1930s. Our sense is that the FHA was more successful at stimulating home ownership in later decades after the program was more firmly established.

DATA APPENDIX

The information on the median value of nonfarm owner-occupied housing and the median monthly rent of rented nonfarm properties for each county comes from the Census of Families in 1930 and the Census of Housing in 1940 (see U.S. Bureau of the Census, 1933 and 1943). Homeownership rates were calculated for 1930 as the number of families where a family member owns the home at least in part as a percentage of families both owning and renting. In 1940 the homeownership rate is the number of owner-occupied dwellings as a percentage of the number of owner-occupied dwellings and the number of tenant-occupied dwellings. Although the precise definitions in the 1930 and 1940 census vary, the U.S. Bureau of Census (1943, 1) claims that "Historical comparisons of many of the subjects covered in the housing census may be made on the basis of statistics presented in the publications of earlier censuses. The number of 'occupied dwelling units' in 1940 is roughly comparable with the number of 'private families' or 'homes shown in the 1930 census report on Families." We thank Michael Haines for computerizing and generously sending us the information for 1930. In addition, we thank Michael for giving us updated files for county level data that have been rechecked and corrected from the original files on "Historical, Demographic, Economic, and Social Data: The United States, 1790-1970," ICPSR tape number 0003 . Missing values for the median housing value and rents reduced the sample to 2922 observations in those regressions. We had information on homeownership for 3067 observations.

The 1929 and 1939 retail sales information is New Deal spending information is from the Office of Government Reports, 1940. The percent black, percent urban, percent nonfarm, and percent foreign-born for 1930 and 1940, and percent illiterate for 1930 are from the 1930 and 1940 files in from ICPSR tape number 0003 (corrected by Michael Haines). Retail sales information from 1933 and 1935 is from U.S. Department of Commerce, Bureau of Foreign and Domestic Commerce, 1936 and 1939. For 1930 we used the illiteracy rate for people aged 10 and above. We then estimated illiteracy rates for 1940 for people aged 25 and over. We used 1947 information from the U.S. Bureau of the Census (1948, 7) to find the number of people over 24 years old with no schooling and those with 1 to 4 years of schooling. The illiteracy rate in 1947 for persons with no schooling was 78.2 percent for male and 80.72 percent for females. The illiteracy rate for 1-4 years of schooling was 22.5 percent for males and 16.68 percent for females. We assumed those with more than 5 years of schooling were all literate. U.S. Bureau of the Census, "Illiteracy in the United States, October 1947," Current Population Reports: Population Characteristics, September 22, 1948. Series P-20 no. 20.

The key instruments for the New Deal endogenous variables are the presidential voting variables: the mean democratic share of the presidential vote from 1896 to 1932, the percent voting for Roosevelt in 1932 minus the mean democratic share from 1896 to 1932, the standard deviation of the democratic share of the presidential vote from 1896 to 1932, electoral votes per capita, and the percent of adults voting in 1932. These variables were all calculated using information from ICPSR's "United States Historical Election Returns, 1824-1968" (tape number 0001). The variables measuring representation on House committees between 1933 and 1938 are from U.S. Congress, Official Congressional Directory, for the 73rd Congress 1st session through 76th Congress. We then matched the congressional information with the counties.

Other instruments for the New Deal variables include state dummies, the inverse of the population in 1930, average farm size in 1929, value of crops per person in 1929, percent of land on farms in 1929, percentage of acreage with crop failures in 1929, and the percentages unemployed, urban, black, foreign-born, illiterate, income tax returns in 1929 per person, and rural nonfarm in 1930. All but the tax return information was found in the ICPSR tape 0003 as corrected by Michael Haines or from the Office of Government Reports (1940). The tax return information was collected from U.S. Department of Commerce, Bureau of Foreign and Domestic Commerce, 1932.

All monetary variables in our analyses were translated into 1967 dollars using the Consumer Price Index (CPI) (U.S Bureau of Census 1975, series E-135, 211-12). For the New Deal funds we used the average annual CPI over the period 1933 to 1939. After the substantial deflation from a peak CPI of .513 in 1929 to a trough of .388 in 1933, the CPI then bounced around between .4 and .43 between 1934

and 1939 (see also Romer 1999). There is a problem with using the CPI to deflate the housing value and rents because the CPI has a housing component. Since this is a cross-sectional analysis and the CPI used for 1930 and 1940 is the same for all counties, this should not affect the results. However, we are currently searching for an alternative deflator.

The overall data set consists of 3,068 counties and county/city combinations in the United States. The New Deal program information was reported for some combined counties. For example, the New Deal information was reported for all of New York City. Thus, in New York state, Bronx, King, New York, Queens, and Richmond counties were combined into New York City. Similar situations developed in other states. In Missouri the city of St. Louis and St. Louis County were combined. In Virginia we combined the following districts that were reported separately in the Census: Albemarle County and Charlottesville city; Allegheny County and Clifton Forge city; Augusta County and Staunton city; Campbell County and Lynchburg city; Dinwiddie County and Petersburg city; Elizabeth City County and Hampton city; Frederick County and Winchester city; Henrico County and Richmond city; Henry County and Martinsville city; James City County and Williamsburg city; Montgomery County and Radford city; Nansemond County and Suffolk city; Norfolk County with Norfolk city, South Norfolk city, and Portsmouth city; Pittsylvania County and Danville city; Prince George County and Hopewell city; Roanoke County and Roanoke city; Rockbridge County and Buena Vista city; Rockingham County and Harrisonburg city; Spotsylvania County and Fredericksburg city; Warwick County and Newport News city; Washington County and Bristol city; Arlington County and Alexandria city. A small number of counties were dropped from the sample because of missing values in the variables above.

We used maps from the 1930s to determine which counties were contiguous to each other; the largest number of contiguous neighbors for a single county was 14. When developing the inverse distance spatial weighting scheme, we used the ICPSR data set 8159 created by Sechrist. We found a number of errors in the latitudes and longitudes in ICPSR data set, which were corrected: Dutchess, NY latitude 41.45, Greene, PA longitude 80.12, Moultrie, IL latitude 39.35, Fulton IN latitude 41.07 longitude 86.15, Rock Nebraska longitude 99.32, Butte, SD latitude 44.38, Campbell, SD latitude 45.44, McCook SD latitude 43.39, Webster, GA latitude 32.04, Greene, NC latitude 35.28, longitude 77.45, Sampson NC latitude 35.0; Wake, NC latitude 35.45; Rains, TX latitude 32.52; Fulton, KY latitude 36.33; Custer, OK longitude 98.57; Carbon, MT longitude 109.2; Santa Fe, NM latitude 35.4; Mendocino, CA latitude 39.09, longitude 123.12; Multnomah, OR longitude 122.4.

FOOTNOTES

[1] A "conforming loan" is one that is not insured by either the Federal Housing Administration or the Veterans Administration. Such loans are insured/guaranteed by their respective agencies and then sold to Ginnie Mae where they are securitized and sold to investors. Jumbo mortgages are those that are larger than $275,000 and legally ineligible for purchase by Fannie Mae or Freddie Mac. These mortgages, however, follow the same channel as a conforming loan or a FHA/VA loan, just that it occurs in the private sector without any federal government intervention.

[2] The lender may retain or even sell the right to service the loan, such as collecting payments, holding an escrow account, paying property taxes, etc. The ultimate owner of the mortgage pays a fee to the entity that services the loan.

[3] What has become much more prominent over the past 15 years is that Fannie Mae and Freddie Mac have been purchasing the securities they have been creating and retaining them as part of their own investment portfolios. The GSEs have been achieving great financial success by issuing debt and then investing the money in their own mortgage securities. Because of the GSEs close ties to the federal government, investors think the companies' debt is unusually safe which enables them to borrow at near Treasury rates. Critics of the companies decry the implicit subsidy this arrangement inevitably generates.

[4] Prior to 1989 Fannie Mae and Freddie Mac were government agencies charged with purchasing loans from mortgage banks and savings and loans, respectively. In 1989 the agencies were "privatized" in the sense that the companies to issue stock and debt to raise their own capita. Moreover, the companies were permitted to purchase loans from any lender.

[5] The GSEs as private companies have two distinct functions: (1) buying mortgages, insuring the default risk, bundling the mortgages into securities, and then selling them to investors; and (2) purchasing the bundled securities to keep as investments in their "retained portfolios." The GSEs typically issue debt to make the purchases of their own mortgage securities. Critics of the GSEs typically focus their attention on this latter role since, they claim, the GSEs are able to borrow more cheaply than private investors because of their explicit and implicit government backing. Critics argue that because the GSEs are "too big to fail," they impose potential costs on taxpayers as the GSEs invest primarily in mortgage securities.

[6] Individual borrowers could borrow up to $2000 for home improvement loans. The banks making the loans were insured against losses for up to 20 percent of the value of such home improvement loans (Federal Housing Administration, First Annual Report).

[7] Empirical studies of the variation in per capita state-level New Deal spending include Wright (1974), Reading (1973), Wallis (1987, 1998), Anderson and Tollison (1991), and Couch and Shughart (1998). Fleck (1994) discussed county-level variation in the South.

[8] New Deal spending does not encompass all federal spending, so our analysis does not address the impact of all forms of federal spending. It should be noted, however, that much of the New Deal represented an entirely new role for the federal government. For example, agricultural spending, relief spending, many forms of lending to state and local governments, and insurance of mortgage loans broke new ground for the federal government. In addition, there were major increases in federal spending from the early 1930s on roads, public buildings, public works, and conservation. Federal intergovernmental and direct expenditures on education rose from 26 million in 1932 to 235 million in 1934, on highways from 217 to 599, on public welfare and employment security from 2 to 585, on housing and urban renewal from 0 in 1932 to 3 in 1934 to 71 in 1936. Federal expenditures on the primary tasks of the federal government prior to the 1930s generally did not display the same marked jumps. See Wallis 1985 and U.S. Bureau of Census 1975, pp. 1124-6.

[9] Recent empirical work investigating the impact of public infrastructure on economic growth gives mixed support to the hypothesis that more infrastructure spending leads to substantial increases in economic growth. See Aschauer 1989; Costa, Ellson, and Martin 1987; Duffy-Deno and Eberts 1991; Hulten and Schwab 1991; Garcia-Mila and McGuire 1992; Munnell 1992; Gramlich 1994.

[10] For a succinct overview of the flypaper literature see Hines and Thaler 1995.

[11] The largest program was the Reconstruction Finance Corporation (RFC), which was initiated under the Hoover Administration on February 2, 1932. The RFC made loans to operating banks, to closed banks to help pay depositors, to a variety of agricultural credit institutions, railroads, businesses, and rural electrification projects, and in 1932 to state and local governments to provide work relief. Approximately 40 percent of the RFC loans were made by June 1933. In addition to its grant programs, the PWA loaned money to state and local governments to aid in financing public works projects. In the agricultural arena the Farm Security Administration (FSA) offered a combination of grants and loans to low-income farm families who were unable to obtain credit from any other sources, while also offering loans to tenants to help them purchase farm land. The Farm Credit Administration (FCA) offered small loans in 1934 and 1935 to aid drought-stricken farm areas, made emergency crop and feed loans, and made new loans or refinanced indebtedness for farmers facing a specific set of risks (U.S. Farm Credit Administration 1935, 6, 7, 15, 16; 1936, 7). The Rural Electrification Administration (REA) provided loans to finance rural electrification. The Disaster Loan Corporation (DLC), organized in February 1937, provided loans to areas hit by disasters (Jones 1939, 1). The loan variable in our analysis excludes housing loans which are considered separately.

[12] The linearity of the spatial functions allows us to derive equation 2 from equation 1.

[13] See Reading 1973, Wright 1974, Wallis 1987, 1998 and 2001, Fleck 1994 and 2001, Anderson and Tollison 1991, and Couch and Shughart 1998 for discussions of the impact of the political and economic structure variables.

[14] Spatial analysis of economic models has been recently considered by Attfield, et. al. (2000), Case (1991), Conley (1999), Delong and Summers (1991), Dowd and LeSage (1997), Druska and Horrace (2000), Dubin (1988), Kelejian and Robinson (1993), Moulton (1990), Pinkse and Slade (1998), Quah (1992), Topa (1996) and Zheng and LeSage (1995). There is also a large body of literature devoted to spatial analysis in regional science, geography, physics, biology and medicine. See, for example, Anselin (1988), Bennett and Hordijk (1986) Cliff and Ord (1973, 1981) and Cressie (1993). Special cases related to simultaneity and endogeneity issues in systems of econometric equations have been considered by Anselin and Kelejian (1997), Kelejian and Robinson (1997) and Kelejian and Prucha (1999).

[15] e_i at this point refers to (e_{i39} - e_{i29}) from equation (3). For simplicity, we drop the subscript t to reflect the fact that we are estimating a difference equation and are not exploiting the panel or time-series nature of the data.

[16] The structural variables produce some interesting results. A number of results are consistent with expectations. Higher median rents are found in more urban and rural nonfarm areas and in areas with fewer blacks and fewer illiterates. Similarly, housing values were higher in areas with lower illiteracy rates. On the other hand, we were surprised to find that median nonfarm housing values were lower in urban and rural nonfarm areas than in rural areas and in areas with fewer blacks. These effects might have been reversed had we been able to include the value of farm homes.

[17] See Harris (1975, pp. 74 and 191) and FHA (1940, 39). The final default rate on HOLC loans after all loans were repaid or foreclosed in the early 1952 was 19.1 percent for the entire United States.

[18] The AAA had small and statistically insignificant effects on nonfarm housing values and monthly rents, which is what we expected since the AAA was primarily a farm program.

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Table 1

Median Values of Nonfarm Owner-Occupied Housing, Median Monthly Rents paid by Tenants, and Homeownership Rates by State, 1930 and 1940

State	Value of Housing			Monthly Rent			Percent Homeowners		
	1930	1940	diff. in logs	1930	1940	diff. in logs	1930	1940	Diff.
Connecticut	7013	4615	-0.418	28.41	25.00	-0.128	44.5	40.5	-4.0
Maine	3233	2008	-0.476	19.35	17.41	-0.106	61.7	57.3	-4.4
Massachusetts	6249	3837	-0.488	29.70	24.69	-0.185	43.5	38.1	-5.4
New Hampshire	3533	2505	-0.344	18.83	17.53	-0.072	55.0	51.7	-3.3
Rhode Island	6153	3848	-0.469	24.49	20.17	-0.194	41.2	37.4	-3.8
Vermont	4031	2836	-0.352	18.46	16.25	-0.128	59.8	55.9	-3.9
Delaware	4878	4159	-0.159	25.58	22.58	-0.125	52.1	47.1	-5.0
New Jersey	7426	4528	-0.495	37.49	27.95	-0.294	48.4	39.4	-9.0
New York	7492	4389	-0.535	41.94	33.39	-0.228	37.1	30.3	-6.8
Pennsylvania	5206	3205	-0.485	26.91	21.30	-0.234	54.4	45.9	-8.5
Illinois	5867	3277	-0.582	36.69	26.58	-0.322	46.5	40.3	-6.2
Indiana	3654	2406	-0.418	22.47	17.38	-0.257	57.3	53.1	-4.2
Michigan	5067	2863	-0.571	37.90	26.64	-0.353	59.0	55.4	-3.6
Ohio	5201	3415	-0.421	29.08	21.59	-0.298	54.4	50.0	-4.4
Wisconsin	4781	3232	-0.392	28.79	23.89	-0.187	63.2	54.4	-8.8
Iowa	3657	2253	-0.484	22.00	16.94	-0.261	54.7	51.5	-3.2
Kansas	2768	1733	-0.468	19.03	13.69	-0.329	56.0	51.0	-5.0
Minnesota	4297	3024	-0.351	26.83	21.68	-0.213	58.9	55.2	-3.7
Missouri	4050	2392	-0.527	24.99	16.77	-0.399	49.9	44.3	-5.6
Nebraska	3717	2156	-0.545	22.61	15.92	-0.351	54.3	47.1	-7.2
North Dakota	2762	1626	-0.530	22.08	15.07	-0.382	58.6	49.8	-8.8
South Dakota	3180	1618	-0.676	20.68	13.84	-0.402	53.1	45.0	-8.1
Virginia	3392	2633	-0.253	14.77	13.27	-0.107	52.4	48.9	-3.5
Alabama	2710	1610	-0.521	9.86	7.26	-0.306	34.2	33.6	-0.6
Arkansas	2090	1100	-0.642	11.56	6.47	-0.580	40.1	39.7	-0.4
Florida	2892	2218	-0.265	14.56	12.92	-0.120	42.0	43.6	1.6
Georgia	2869	1957	-0.383	10.70	8.15	-0.272	30.6	30.8	0.2
Louisiana	2730	1414	-0.658	15.52	11.54	-0.296	35.0	36.9	1.9
Mississippi	2074	1189	-0.556	9.82	6.24	-0.453	32.5	33.3	0.8
North Carolina	2763	1802	-0.427	11.90	9.42	-0.234	44.5	42.5	-2.0
South Carolina	2710	2145	-0.234	7.89	6.48	-0.197	30.9	30.6	-0.3
Texas	2998	1693	-0.571	17.83	13.40	-0.286	41.7	42.8	1.1
Kentucky	3268	2074	-0.455	14.35	11.23	-0.245	51.3	48.0	-3.3
Maryland	4525	3031	-0.401	24.84	21.66	-0.137	55.2	47.4	-7.8
Oklahoma	2512	1293	-0.664	20.07	12.59	-0.466	41.3	42.8	1.5
Tennessee	2903	1826	-0.464	13.66	10.49	-0.264	46.2	44.1	-2.1
West Virginia	3620	2350	-0.432	13.13	12.08	-0.083	45.9	43.7	-2.2
Arizona	2363	1400	-0.523	19.17	14.57	-0.274	44.8	47.9	3.1
Colorado	3209	2091	-0.428	22.38	18.06	-0.214	50.7	46.3	-4.4
Idaho	2433	1600	-0.419	17.99	15.33	-0.160	57.0	57.9	0.9
Montana	2364	1651	-0.359	21.31	17.72	-0.184	54.5	52.0	-2.5
Nevada	2541	1987	-0.246	21.12	19.84	-0.063	47.1	46.1	-1.0
New Mexico	952	656	-0.372	13.46	12.99	-0.036	57.4	57.3	-0.1
Utah	3098	2320	-0.289	20.79	18.17	-0.135	60.9	61.1	0.2

Wyoming	3136	2174	-0.366	19.53	16.94	-0.142	48.3	48.6	0.3
California	5491	3527	-0.443	32.73	25.61	-0.245	46.1	43.4	-2.7
Oregon	3574	2343	-0.422	21.51	16.94	-0.239	59.1	55.4	-3.7
Washington	3316	2359	-0.341	23.60	17.47	-0.301	59.4	57.0	-2.4
UNITED STATES	4778	2938	-0.486	27.15	21.41	-0.238	47.8	43.6	-4.2

Source: U.S. Bureau of the Census, 1943, pp. 62, 104, 109.

Table 2

Federal Government's Distribution of New Deal Funds, March 1933 to June 1939

Programs	Total Federal Funds
Grant Programs	
Federal Works Agency:	
Public Works Administration, Non Federal Projects	1,367,347,520
Public Works Administration, Federal Projects	798,501,411
Public Roads Administration, Completed Projects	1,346,365,170
Public Building Administration, Federal Buildings	174,228,825
Work Projects Administration	5,908,626,227
Other Projects under works Program	313,759,435
Federal Security Agency, Social Security Board:	
Old Age Assistance	511,532,437
Aid to Dependent Children	47,318,977
Aid to the Blind	37,158,640
Department of Agriculture: Agricultural Adjustment Administration	
Conservation Programs, 1936	367,288,930
Conservation Programs, 1937	303,110,103
Farm Security Administration, Rural Rehabilitation	93,408,281
Completed Programs:	
Federal Emergency Relief Administration	2,654,860,349
Civil Works Administration	757,172,702
Agricultural Adjustment Administration, Rental & Benefit Payments	1,311,402,872
U.S. Housing Authority, Housing	127,206,671
Total Federal Expenditures Non-Repayable	16,119,288,550
Loan Programs	
Federal Loan Agency:	
Reconstruction Finance Corporation	$4,425,940,596
Disaster Loan Corporation	10,504,466
Federal Works Agency:	
Public Works Administration, Non Federal Projects	567,616,807
U.S. Housing Authority, Loan Contracts	449,854,991
Department of Agriculture:	
Farm Credit Administration, Land Bank Commission	965,597,730
Farm Credit Administration, Emergency Crop and Feed	219,884,875
Farm Security Administration, Rural Rehabilitation	310,324,936
Farm Security Administration, Farm Tenant Purchase	32,962,211
Rural Electrification Administration	226,247,292
Completed Programs:	
Farm Credit Administration, 1934-1935, Drought Relief	72,008,531

Home Owners' Loan Corporation, 1933-1936	3,077,258,287
Total Value of Loans Disbursed	10,358,200,722

Other Benefit Programs

Federal Housing Administration Mortgage Insurance:

Title I, Value of Modernization and Improvement Loans Insured	836,762,382
Title II, Value of Mortgages Accepted for Insurance	1,870,798,030

Others:

Farm Security Administration, Farm Debt Reduction	84,645,528
Public Roads Administration, Active Project Allotments	209,925,198

Source: See Data Appendix.

Table 3

Weighted Indexes of Terms of First Mortgages

	Interest rate	Contract length	Loan-to-value ratio
1920-1924	100.0	100.0	100.0
1925-1929	97.9	105.2	103.7
1930-1934	97.6	103.5	104.6
1935-1939	85.5	155.6	116.5
1940-1947	72.1	178.0	131.8

Notes: The indexes measure the terms of mortgages on 1- to 4-family houses made by commercial banks, savings and loan associations, and life insurance companies.

Source: Grebler, Blank, and Winnick (1956, 236).

Table 4

New Deal Funds by Purpose by State

STATE	Public Works Grants	Relief Grants	AAA Grants	Non-housing Loans	Value of Mortgages Insured	Home Owners' Loan Corporation Mortgages	PWA Grants for Public Housing	US Housing Authority Loan Contracts
NEW ENGLAND								
Connecticut	$31.3	$60.3	$2.1	$21.3	$20.1	$27.5	$0.5	$6.1
Maine	50.2	52.2	1.5	99.8	7.9	9.7	0.0	0.0
Massachusetts	24.6	105.8	0.5	21.8	11.6	25.7	2.0	9.0
New Hampshire	28.5	57.4	0.8	13.8	13.7	9.7	0.0	0.0
Rhode Island	42.8	62.1	0.1	14.1	20.2	35.9	0.0	0.0
Vermont	31.6	44.6	2.4	83.0	14.1	11.7	0.0	1.2
MID-ATLANTIC								
Delaware	54.1	57.0	5.6	12.6	27.6	21.4	0.0	0.0
New Jersey	32.3	92.7	0.5	62.5	39.6	43.4	1.1	7.0
New York	31.5	119.0	0.6	59.8	24.8	32.6	2.0	4.5
Pennsylvania	23.5	111.2	1.1	28.9	15.8	17.3	0.2	4.8
EAST NORTH CENTRAL								
Illinois	30.7	102.6	12.7	61.5	20.2	36.7	2.1	1.7
Indiana	28.2	87.6	18.7	38.1	23.0	34.9	1.3	1.0
Michigan	22.5	93.7	5.0	97.1	37.1	49.6	1.9	3.4
Ohio	24.5	115.7	7.5	76.4	25.3	46.0	2.9	5.6
Wisconsin	32.7	94.1	11.5	60.9	12.9	39.3	0.8	0.0
WEST NORTH CENTRAL								
Iowa	30.6	41.7	64.7	70.4	8.9	15.7	0.0	0.0
Kansas	35.4	65.4	81.8	52.3	14.0	17.9	0.0	0.0
Minnesota	35.1	94.4	27.8	50.7	16.0	18.7	1.4	0.0
Missouri	28.1	75.6	20.8	40.5	18.6	20.6	0.0	0.0
Nebraska	38.3	64.1	74.2	90.5	9.4	20.8	1.3	2.6

North Dakota	46.7	87.8	127.7	152.8	5.4	13.6	0.0	0.0
South Dakota	46.5	112.8	100.3	126.5	7.3	16.4	0.0	0.0
SOUTH								
Virginia	52.5	28.9	6.3	28.5	19.8	15.5	0.0	0.3
Alabama	22.2	46.6	19.5	30.3	8.4	14.0	1.3	3.5
Arkansas	22.2	56.1	31.1	54.3	7.5	10.1	0.0	0.0
Florida	31.4	76.7	4.1	35.1	40.0	21.0	1.3	10.1
Georgia	21.8	43.0	18.0	31.3	13.5	12.1	2.0	9.9
Louisiana	22.2	62.6	21.9	75.6	10.1	19.3	0.0	12.2
Mississippi	22.5	39.5	28.0	40.8	8.9	8.2	0.0	1.7
North Carolina	24.0	29.8	17.5	35.8	8.3	9.9	0.0	1.8
South Carolina	38.2	52.6	21.0	57.7	8.4	7.6	1.1	3.1
Texas	33.9	44.9	37.4	50.8	18.1	17.9	0.2	3.2
Kentucky	22.3	51.8	17.6	29.2	10.4	9.9	1.4	5.0
Maryland	41.6	56.6	4.2	84.9	27.6	27.9	0.0	13.8
Oklahoma	28.5	72.8	38.5	35.8	13.3	22.7	1.0	0.0
Tennessee	24.2	38.8	14.4	59.5	15.0	12.1	3.9	6.8
West Virginia	20.4	88.3	1.6	25.6	10.3	13.2	0.0	3.6
MOUNTAIN								
Arizona	145.5	103.7	10.6	47.5	36.4	36.2	0.0	0.0
Colorado	50.8	121.9	28.7	50.5	18.1	22.3	0.0	3.0
Idaho	59.2	85.8	46.8	78.5	23.1	19.0	0.0	0.0
Montana	86.0	129.0	72.8	96.0	13.7	14.2	0.0	3.9
Nevada	483.3	104.6	5.3	125.2	55.9	36.5	0.0	0.0
New Mexico	85.8	90.8	23.9	57.4	15.5	12.1	0.0	0.0
Utah	66.7	96.6	13.6	62.7	35.4	50.4	0.0	0.0
Wyoming	105.9	108.0	31.2	107.4	38.3	24.6	0.0	0.0
PACIFIC								
California	38.1	102.7	4.8	116.2	83.0	24.1	0.0	3.9
Oregon	47.2	75.1	16.0	43.5	23.7	19.5	0.0	0.0
Washington	53.5	103.6	16.5	45.2	36.7	25.0	0.0	0.0

Notes: Per capita New Deal spending in Each State is computed as total spending in the state from 1933 to 1939 divided by the population in 1930. AAA includes payments to farmers under the Agricultural Adjustment Act, including rental and benefit payments in 1934 and 1935 and Conservation payments in 1936 and 1937. Relief includes spending under the Federal Emergency Relief Administration, the Civil Works Administration, the Works Projects Administration, and the social security programs for old-age assistance, aid to the blind, and aid to dependent children. Public works includes expenditures under the Public Works Administration, the Public Buildings Administration, and the Public Roads Administration. The loans include the Reconstruction Finance Corporation (includes loans made after February 2, 1932), Farm Security Administration, Farm Credit Administration, Home Owners' Loan Corporation, Disaster Loan Corporation, U.S. Housing Authority, the Public Works Administration, and the Rural Electrification Administration.

Sources: See Data Appendix.

Table 5

Regression Results for Difference in Log Median Nonfarm Housing Value, 1930 to 1940

	100-mile Neighbor Weighting Scheme				No Spatial Weighting			
	Generalized 2SLS				2SLS		OLS	
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
Intercept	-0.1671	-1.8534	**0.0321**	**0.5016**	-0.2009	-2.2203	-0.2203	-2.9030
Change Between 1930 and 1940 in								
% Black	0.0056	1.9591	**0.0064**	**2.5140**	0.0038	1.0980	0.0044	1.5809
% Rural Nonfarm	-0.0073	-7.8735	**-0.0048**	**-5.9948**	-0.0086	-7.7470	-0.0075	-8.6380
% Foreign-born	-0.0025	-0.7877	**0.0003**	**0.1423**	-0.0044	-1.1276	-0.0049	-1.9171
% Urban	-0.0053	-4.9909	**-0.0034**	**-3.6619**	-0.0064	-4.5407	-0.0054	-5.5640
% Illiterate	-0.0069	-2.9777	**-0.0066**	**-3.2996**	-0.0043	-1.5899	-0.0117	-5.3528
New Deal Spending Per Capita on								
Public Works	-0.0003	-1.6172	**-0.0001**	**-1.0875**	0.0018	2.6916	-0.0001	-0.9083
Relief	-0.0047	-7.6032	**-0.0012**	**-3.0338**	-0.0075	-7.7314	-0.0023	-8.9220
AAA	0.0001	0.3598	**0.0002**	**1.0510**	-0.0002	-0.3896	0.0002	1.2697
Value of FHA-Insured Mortgages	0.0060	2.7421	**0.0031**	**1.7658**	0.0031	0.4842	0.0037	5.2557
PWA public housing projects	-0.0268	-1.0310	**-0.0089**	**-0.4242**	-0.0684	-0.9690	-0.0005	-0.0573
USHA loans for public housing	0.0040	0.8488	**0.0041**	**1.0962**	-0.0076	-0.4618	0.0025	1.6371
HOLC	0.0021	1.4087	**0.0006**	**0.5513**	0.0084	1.7271	0.0001	0.1602
Non-housing loans	-0.0006	-0.9115	**-0.0003**	**-0.7556**	-0.0003	-0.1923	-0.0005	-2.3181
Weighted Averages in Nearby Counties								
Change in Housing Value			**1.0549**	**22.658**				
State Dummies	incl.		**incl.**		Incl.		incl.	
Rho	0.4407		**-0.4768**					
Sigma	0.0443		**0.0394**		0.3241		0.1357	

Notes and Sources: See Data Appendix. There are 2,922 observations.

Table 6

Regression Results for Log Difference in Median Nonfarm Rents, 1930 to 1940

| | 100-mile Neighbor Weighting Scheme | | | | No Spatial Weighting | | | |
| | Generalized 2SLS | | | | 2SLS | | OLS | |
	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.	Coeff.	t-stat.
Intercept	0.0640	0.7785	**0.0031**	**0.0507**	0.0055	0.0504	0.1118	1.7308
Change Between 1930 and 1940 in								
% Black	-0.0122	-4.8666	**-0.0128**	**-5.4974**	-0.0083	-1.9972	-0.0144	-6.1171
% Rural Nonfarm	0.0009	1.0645	**0.0014**	**1.8621**	-0.0005	-0.3860	0.0012	1.6255
% Foreign-born	-0.0032	-1.1276	**-0.0023**	**-1.0894**	0.0037	0.7962	-0.0044	-1.9964
% Urban	0.0044	4.7407	**0.0050**	**5.9243**	0.0032	1.9031	0.0063	7.5979
% Illiterate	-0.0028	-1.3656	**-0.0037**	**-2.0151**	0.0001	0.0382	-0.0023	-1.2480
New Deal Spending Per Capita on								
Public Works	0.0005	2.6186	**0.0001**	**0.6351**	0.0032	4.0500	0.0004	4.7381
Relief	0.0002	0.3643	**0.0009**	**2.3985**	-0.0002	-0.1815	-0.0011	-4.7942
AAA	-0.0001	-0.5069	**0.0001**	**0.6397**	0.0010	1.5338	-0.0007	-6.0515
Value of FHA-Insured Mortgages	0.0162	8.3610	**0.0100**	**6.1632**	0.0218	2.8476	0.0039	6.6266
PWA public housing projects	-0.0535	-2.3244	**-0.0165**	**-0.8424**	-0.3236	-3.8290	-0.0031	-0.4545
USHA loans for public housing	0.0075	1.7989	**0.0027**	**0.7450**	0.0386	1.9616	0.0052	4.0700
HOLC	-0.0052	-3.9935	**-0.0027**	**-2.5811**	-0.0070	-1.2043	-0.0015	-2.6208
Non-housing loans	-0.0008	-1.3493	**-0.0002**	**-0.5149**	-0.0037	-1.9459	0.0000	0.0983
Weighted Averages in Nearby Counties								
Log change in Rental Value			**0.9618**	**17.882**				
State Dummies	incl.		**incl.**		Incl.		incl.	
Rho	0.5229		**-0.2606**					
Sigma	0.0337		**0.0320**		0.0854		0.0324	

Notes and Sources: See Data Appendix. There are 2,922 observations.

Table 7

Regression Results of Changes in Home Ownership Rates, 1930 to 1940

	2SLS		OLS	
	Coeff.	**t-stat**	**Coeff.**	**t-stat**
Intercept	**-5.018**	**-2.98**	-2.765	-2.14
Change Between 1930 and 1940 in				
% Black	**-0.453**	**-7.23**	-0.398	-8.77
% Rural Nonfarm	**-0.089**	**-4.87**	-0.103	-7.84
% Foreign-born	**0.135**	**2.04**	0.148	3.53
% Urban	**-0.085**	**-3.41**	-0.102	-6.63
% Illiterate	**-0.159**	**-3.38**	-0.042	-1.26
Annual New Deal Spending Per Capita on				
Public Works	**-0.001**	**-0.06**	0.001	0.76
Relief	**0.126**	**7.05**	0.017	3.82
AAA	**-0.024**	**-3.03**	-0.014	-7.03
Value of FHA-Insured Mortgages	**-0.112**	**-0.85**	0.027	2.26
PWA public housing projects	**1.668**	**1.23**	-0.058	-0.43
USHA loans for public housing	**-0.603**	**-2.00**	-0.066	-2.56
HOLC	**0.033**	**0.36**	-0.076	-6.78
Non-housing loans	**0.061**	**2.54**	-0.013	-3.90
Weighted Averages in Nearby Counties				
Change in Home Ownership				
State Dummies	Included		Included	
Rho				
Sigma	20.830		13.019	

Notes and Sources. See Data Appendix. There are 3067 observations.