The New Deal, the GI Bill, and the Post-War Housing*

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Abstract

After the collapse of housing markets during the Great Depression, the government played a large role shaping the future of the housing finance, housing policy in the New Deal, as well as the development of the GI Bill for war veterans that had significant importance for mortgage finance and education. Soon after, the housing markets witness the largest boom in recent history. The objective in the paper is to quantify the contribution of government intervention in housing markets in the expansion in U.S. home ownership using an equilibrium model of tenure choice. In the model home buyers have access to a menu of mortgage choices to finance the acquisition of the house. The government also provides special programs, consistent with the provisions of the GI Bill and the tax code. The parameterized model is consistent with key aggregate and distributional features in the U.S. in 1940. The model is capable of accounting for 95 percent of the boom in homeownership. The model suggests that government policies had a non-trivial effect in the housing boom. All these policies has positive effects in the demand for housing by reducing the relative cost. For example, introduction of the mortgage deduction can account for 13 percent of the increase in ownership. The asymmetric treatment of owner-occupied housing also had significant effects in housing demand. The model suggests that 35 percent of ownership in that period can be accounted for this factor. Again, the results are in-line with Rosen and Rosen (1980) that predict 25 percent decline. The general equilibrium effects are important. Ignoring the income and price effects should reduce the incentives to own a home even more. When these adjustments are not available, the model predicts a 45 percent decline (from 63 to 53 percent) in ownership.

Keywords: Housing finance, first-time buyers, life-cycle
J.E.L.:E2, E6

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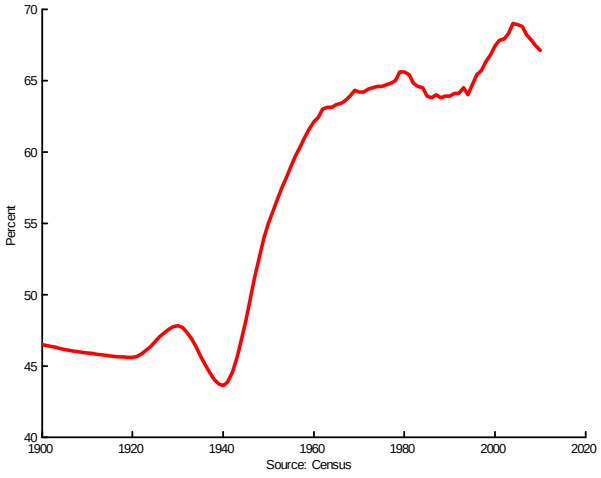
1 Introduction

From a historical perspective, the recent expansion ownership is small compared to the one starting in 1940. Prior to the Great Depression there was little federal involvement housing except for land grants and the regulation of commercial banks. As a result of the foreclosure problem that coincident with the 1929 collapse, the role of government in residential housing changed.[1] The government played a large role shaping the future of the housing finance and housing policy through the New Deal and the GI Bill.

- **Housing finance and the mortgage industry (New Deal):** Before the Great Depression a large fraction of mortgages were short term (5-7 years), balloons (non-amortizing), and with large downpayment requirements (50-60 percent). Through New Deal policies, the intervention of the government changed those terms in favor of the standard fixed-rate mortgage (FRM) with longer maturities (20-30 years) and higher loan-to-value ratio (80 percent and above). A government agency was established to create a secondary market providing liquidity and expand credit buying primarily FHA insured loans.
- **Housing policy (Tax provisions and the GI Bill):** The government also changed the treatment of owner-occupied housing in the federal income tax system. This policy changes the effective price of owner-occupied housing services because of the deductibility of local property taxes, mortgage interest payments, and by the omission of imputed rents from adjusted gross income. The GI Bill did provide higher education to returning veterans and also offer zero downpayment loans programs via the Veteran Administration (VA).

These interventions coincided with the most significant expansion in home ownership in the recent history. Between 1940 and 1960, the fraction of households that own the home they occupy increased from 44 to 62 percent, with significant contribution from younger homeowners.

Figure 1: Home Ownership Rate: United States (1900-2010)



It is important to determine the contribution of government intervention in the expansion in the home ownership rate. There is an extensive empirical literature that argues the success of these different government programs. Yearn (1976) argues the explanation is in the increase in

[1] For example, the Home Owners Loan Act Bank 1933 and the 1934 National Housing Act were designed to stabilize the financial system. The National Housing Act established the Federal Housing Administration (FHA) with the objective of regulating the terms of mortgages.

the availability of mortgage funds from Federal Housing Administration (FHA) and the Veterans Administration (VA) and the easy monetary policy of the Federal Reserve System. Housing provisions in the tax code have also contributed to increase ownership. Rosen and Rosen (1980) estimate that between 1949 and 1974 about one-fourth of the increase in home ownership was a result of benefits towards housing embedded in the personal income tax code. Hendershott and Shilling (1982) support this claim by finding that the decline in the cost of owning a home relative to the cost of renting during the period 1955 to 1979 was due to income tax provisions. Historians have credited the GI bill with playing a vital role in opening the doors of higher education to millions and helping set the stage for the decades of widely shared prosperity that followed WWII. Almost 70 percent of men who turned 21 between 1940 and 1955 were guaranteed an essentially free college education under one of the two GI Bills.[2] Fetters (2010) has estimated that VA's policy of making zero downpayment mortgage loans available to veterans returning from World War II and the Korean War after 1946 accounts for a ten percent increase in home ownership. The aforementioned research has attempted to measure the importance of a factor in a regression based framework that holds other potential factors constant. Therefore the extrapolation of the findings to the whole economy could be challenging because most of these factors interact with each other.

This paper quantifies the contribution of government intervention in housing markets in the expansion in U.S. home ownership using a dynamic general equilibrium model.[3] In particular, the government role in housing finance and the subsidies toward housing in the federal income tax code. The model allows economic agents to make optimal decisions in an environment that reflects the economic and institutional environment of the relevant time period.[4] The approach permits the different factors to dynamically interact and provides a laboratory to study the changes in government regulation on individual incentives and relative prices. An additional advantage is that it allows to conduct a series of counter factual experiments.

The model is an modification of the life-cycle mortgage choice framework developed in Chambers, Garriga, and Schlagenhauf (2009). The model includes ex-ante different types that differ in their education status and income risk. These households purchase consumption of goods and housing services, and investment in capital and/or housing. The purchase of housing services is intertwined with tenure and duration decisions. Housing is a lumpy investment that requires a down payment, long-term mortgage financing, and receives preferential tax treatment. Depending on the military status, home buyers have access to different menu of mortgage loans. These loans are provides by a centralized financial sector that receives deposits from households and also loans capital to private firms. The model uses a homeowners-based rental market, hence the house price to rental price ratio is an endogenous variable. The production sector uses a neoclassical technology with capital and labor to produces consumption/investment goods and residential investment. The government implements a housing policy through various programs and collects revenue with a progressive income tax system. The baseline model is parameterized to match the key features of the U.S. economy during the 1935-1940, and then used to determine the contribution of various government interventions in the New Deal policies and the GI Bill in the expansion in the home ownership rate.

[2] For example, 70% is based on self-reported military service during WWII or the Korean War amoung males in the 1970 census.

[3] This paper follows the tradition of Amaral and MacGee (2002), Cole and Ohanian (2000,2004), Hayashi and Prescott (2002), Ohanian (2009), and Perri and Quadrini (2002), who employed quantitative techniques in the study of historical events.

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The model suggest a relevant role for housing finance. The introduction of the 30 year FRM with the increase can account for 10 percent of the change in ownership. The model suggests that the length of the mortgage contract sponsored by FHA has significant effect in ownership. If instead of sponsoring the 30 year FRM the loan have had a 20 year maturity the model predicts a 25 percent decline in ownership. However, increasing the maturity beyond 30 years only seems to have very marginal effects in ownership. These do not seem to go beyond 2 percent when the loan maturity is increased from 30 to 40 years. Why the FRM was not that effective when available in the 1940's? Given the low income growth over the life-cyle and the high home prices, household could not afford to take advantage of the leverage features available in a fixed rate mortgage.

The model suggests that the mortgage deduction can account for 13 percent of the increase in ownership. These results are in-line with Rosen and Rosen (1980) that predict a decline from 64 to 60 percent. However, Rosen and Rosen's use a partial equilibrium analysis to obtain the size of the decline. implies a 6 percent change. The similarity in magnitudes illustrates the importance of considering general equilibrium effects.[5] The small movements in relative prices could suggest that a partial equilibrium analysis is appropriate. This conjecture is explored by resolving the model at baseline prices and ignoring the tax adjustment associated with the revenue-neutral assumption. The elimination of the deduction already reduced the incentive to own homes, if in addition, the government does not rebate back the savings from eliminating the deduction, the implied ownership rate falls from 63 percent to 54 percent. However, when the government rebated the resources back to the homeowners and most prices remain at the baseline level, then the increase in ownership is more in-line with Rosen and Rosen (1980).

The model suggests that the lack of taxation of housing services has an important impact on ownership. The model suggests that 35 percent of ownership in that period can be accounted for this factor. Again, the results are in-line with Rosen and Rosen (1980) that predict 25 percent decline. The general equilibrium effects are important. Ignoring the income and price effects should reduce the incentives to own a home even more. When these adjustments are not available, the model predicts a 45 percent decline (from 63 to 53 percent) in ownership.

This paper is organized into five sections. The first section presents a brief economic history from 1930 to 1960 as well as some data for this period. The next section develops our model economy. In order conduct our historical decomposition analysis the model has to calibrated and estimated to 1935. This is discussed in the third section. Additionally, the third section discusses data used for calibrating the model to 1960 in order to conduct our decomposition analysis. The fourth section conducts and discusses the results of the decomposition analysis. The final section concludes.

2 Government Programs and Housing Markets

In the late 1930s and early 1940s, the economy was recovering from the Great Depression. Not surprising, the economic environment substantially changed in the years to follow. This section describes the policy changes between 1930 and 1960.

[5] In this model all homeowners deduct mortgage interest payments. In the U.S. tax code only a fraction of the homeowners itemize. If we allow households to choose the standard deduction, the impact of the removal of this provision would be somewhat smaller, but they would be clearly bounded below by the partial equilibrium findings.

2.1 New Deal, FHA, and the Regulation of Housing Finance

In 1900, mortgage lenders consisted of mutual savings banks, life insurance companies, savings and loan associations and commercial banks. Mutual savings banks were the dominate lender, while commercial banks played a small role. After 1900 the importance of mutual saving banks declined while life insurance companies and savings and loans associations substantially increased their market shares. Commercial banks did not become a dominant lenders until after World War II. The real that commercial banks were a relatively unimportance source of mortgage funds is a result if the National banking Act. This Act made real estate loans inconsistent with sound banking practise. Hence, any commercial bank mortgage loans were restricted to State chartered banks. In 1913, the Federal Reserve Act liberalized restrictions that limited participation in the mortgage market on national banks. As a result, the importance of commercial banks in this market steadily increased.

Perhaps a more important change occurred in the structure of the mortgage contract. Loan-to-value ratios, length of contract, and contract structure as related to amortization were changing. A common belief is that mortgage interest loans were non-amoritizing in the period 1920 to 1940. In other words, the mortgage contract can be characterized as a short term balloon type contract with high down payment. Grebler, Blank, and Winnick (1956) examine data from life insurance companies, commercial banks, and savings and loans and find that partially amortizing loans did exist in the period 1920-1950. Between 1920 and 1940, approximately fifty percent of mortgage loans issued by commercial banks were unamortized contracts. For life insurance companies, approximately 20 percent in the period 1920-1934 were non-amoritizing while the percent of non-amoritizing loans for saving and loans associations did not exceed 7 percent of this same period. However, over the period 1940-1946, Saulnier (1950) reports that 95 percent of mortgage loans issued by saving and loan associations were fully amortizing. Over approximately the same period, Behrens (1952) claims 73 percent of loans issued by commercial banks were fully amortized and Edward (1950) finds 99.7 if saving and loan association contracts were fully amortized.

However, the belief that mortgage contracts in the early years were of short duration and with low loan-to-value ratio is accurate. In Table 2, mortgage durations are presented for loans originated by saving and loan associations, commercial banks, and saving and loan associations. As can be seen, for the period 1920 to 1930, the average duration was between 6 and 11 years. After 1934, the length of mortgages increased and started to approach 20 year mortgages. This was especially true for mortgages offered by life insurance companies. Loan-to-value ratios also changed over this period. For the 1920-34 subsample, loan-to-value rations were around 50. After 1934, loan-to-value ratios began to increase, and by 1947 this ratio started to approached 80 percent.

Table 1: Properties of Mortgage Contracts between 1920 and 1950 (Yearly Average)

	Mortgage Duration			Loan-to-Value Ratio		
Period	Life Insurance Companies	Commercial Bank	S & L Associations	Life Insurance Companies	Commercial Bank	S & L Associations
1920-24	6.4	2.8	11.1	47	50	58
1925-29	6.4	3.2	11.2	51	52	59
1930-34	7.4	2.9	11.1	51	52	60
1935-39	16.4	11.4	11.4	63	63	62
1940-44	21.1	13.1	13.1	78	69	69
1945-47	19.5	12.3	14.8	73	75	75

Source: Data for life insurance companies is from R. J. Sailnier, Urban Mortgage Lending by Life Insurance Companies, National Bureau of Economic Research, 1950, for commercial banks is from C. F. Behrens, Commercial Bank Activities in Urban Mortgage Financing, National Bureau of Economic Research, 1952, and saving and loan association is from J. E. Morton, Urban Mortgage Lending: Comparative Markets and Experience, Princeton University Press, 1956.

An obvious question is why did mortgage contracts start to change after 1934? Prior to 1930, there was little federal involvement in housing except for land grants as exemplified by the 1862 Homestead Act. The Great Depression changed government's role in residential housing. As a result of the foreclosure problem that coincided with the 1929 collapse, Congress responded initially with Home Loan Bank Act of 1932. This Act brought thrift institutions under the Federal regulation umbrella. The Home Owners Loan Act Bank (1933) and the 1934 National Housing Act were passed. These Acts were designed to stabilize the financial system. The National Housing Act established the Federal Housing Administration(FHA) which introduced a government guarantee in hopes of spurring construction.[6] The FHA home mortgage was initially a 20-year, fully amortizing loan with a maximum loan-to-value ratio of 80 percent. Carliner (1989) argues that the introduction of this loan contract influenced the behavior of existing lenders, thus partially explaining the data trends presented in Table 2. The contract took time to be implemented as state laws limiting loan-to-value ratios had to be modified. The FHA also added restricted design, construction and underwriting standards. These government programs, that were part of "New Deal" legislation, are thought to have increased homeowner participation.

A second government policy that could impact home ownership, especially after 1950, was federal guarantees for individual mortgage loans. Because of the treatment of veterans after World War I, Congress passed the Servicemen's Readjustment Act of 1944, or the "GI Bill."[7] This program was a benefit to veterans. Initially no downpayments were required on the theory that soldiers were not paid enough to accumulate savings and did not have an opportunity to establish a credit rating. Here are the relevant aspects of this program. Under the original VA loan guarantee program, the maximum amount of guarantee was limited to 50% of the loan, and not to exceed $2000. Loan durations were limited to 20 years, with a maximum interest rate of 4%. These ceilings were eliminated when market interest rates greatly exceeded this ceiling. The

[6] Marriner Eccles (1951), who was a central figure in the development of the FHA made it clear the the main intent of the program was "pump-priming" and not reform of the mortgage market.

[7] A "veteran" mean an individual served at least 90 days on active duty and was discharged or released under conditions other than dishonorable. Service time was much higher some an individual who was in the military, but not on active duty. For World War II active duty was between September,1940 to July 1947. The Korean conflict was the period June, 1950 to January 1955.

VA also set the price of the home. Because of rising house prices in 1945 the maximum amount of the guarantee to lenders was increased to $4,000 for home loans. The maximum maturity for real estate loans was extended to 25 years for residential homes. In 1950, the maximum amount of guarantee was increased to 60% of the amount of the loan with a cap of $7,500. The maximum length of a loan was lengthened to 20 years.

Were these programs quantitatively significant? In Table 3, the value of FHA and VA mortgage are reported as well as the relative importance of these mortgages in the total home mortgage market. While these government mortgage programs took a while to have an impact, by 1940, FHA and VA mortgages accounted for 13.5 percent of mortgages, and by 1945 these mortgages accounted for nearly a quarter of mortgages. In 1950 the home mortgage share of FHA and VA mortgages was 41.9 percent. The increased role of these government programs is due to the growth of VA mortgage contracts. Between 1949 and 1953, VA mortgage loans averaged 24.0 percent of the market. Clearly, these statistics suggest the VA mortgage program may have had a significant effect on home ownership and seem to support Fetters(2010) claim that the VA program lead to a 10 percent increase in the home ownership rate.

Table 3: The Role of Government Mortgage Debt for Home Mortgages: 1935 to 1953 (in millions)

	FHA	VA	Combined	Total Home Mortg.	FHA and VA Home Mortg. (% total)
1936	$12		12		
1936	203		203	15,615	1.3
1937	594		594	15,673	3.8
1938	967		967	15,852	6.1
1939	1755		1755	16,402	10.7
1940	2349		2349	17,400	13.5
1941	3030		3030	18,364	16.5
1942	3742		3742	18,254	20.5
1943	4060		4060	17,807	22.8
1944	4190		4190	17,983	23.3
1945	4078	$500	4578	18,534	24.7
1946	3692	2,600	6292	23,048	27.3
1947	3781	5,800	9581	28,179	34.0
1948	5269	7,200	12469	33,251	37.5
1949	6906	8,100	15006	37,515	40.0
1950	8563	10,300	18863	45,019	41.9
1951	9677	13,200	22877	51,875	44.1
1952	10770	14,600	25370	58,188	43.6
1953	11990	16,100	28090		

Source: Grebler, Blank, and Winnick (1956), p243.

The important changes in the mortgage market could have implications for mortgage interest rates. Unfortunately, mortgage interest rate are more difficult to find for this period. Grebler, Blank, and Winnick (1956, Table O-1, p. 496) report a mortgage rate series for Manhattan between 1900 and 1953 as well as a bond yield. As can be seen in Figure 3, the mortgage interest rate was 5.11 percent in 1900, while the bond yield was 3.25.

Figure 2: Bond and Mortgage Rates: 1900-1953

Between 1900 and 1930, both interest rates had an increasing trends (see Figure 2). After 1930 mortgage interest rates declined from 5.95 percent down to around 4.9 percent. This partially reflected an easy money policy clearly seen in the large decline in bond yields over this period. Some economic historians have used this information to argue that an easy money policy played a large role in the increase in home ownership., but it could also be due to the elimination of regional lending and a more homogeneous credit market.

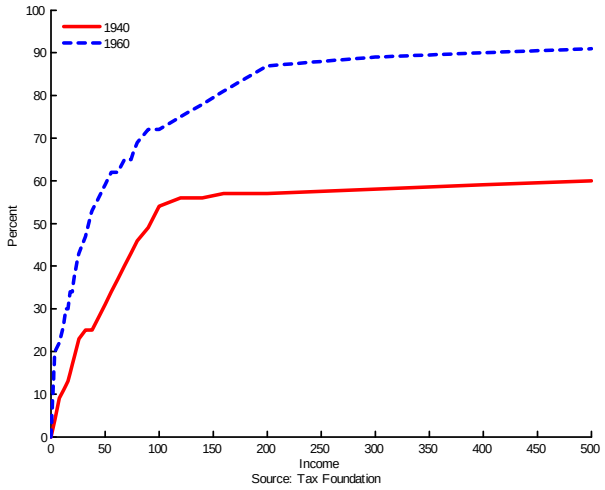
2.2 Tax Treatment of Owner-Occupied Housing

During this period the U.S. government used the tax code to promote owner-occupied. The most prominent provisions were (i) the deductibility from taxable income of mortgage interest payments and property taxes, (ii) the exclusion of the imputed rental value of owner-occupied housing from taxable income, and (iii) the special treatment of capital gains upon the sale of the house.

A large body of empirical and quantitative research evaluates the tax treatment of housing. This literature indicates that the elimination of the prominent provisions would have significant effects for tenure and housing consumption. These provisions introduce a wedge into the decision to invest in housing relative to real capital, as well as the tenure decision. Laidler (1969), Aaron (1972), and Rosen and Rosen (1980) estimate that eliminating these tax provisions would have sizeable effects on the homeownership rate. Berkovec and Fullerton (1992) use a static disaggregated general equilibrium model to examine the same question and estimate the decline of owner-occupied housing consumption would range between 3 to 6 percent. Gervais (2002) uses a dynamic life-cycle economy and finds positive sizeable effects on ownership.

The Tax Foundation has constructed marginal tax rates by income level for 1935 and 1960. In Figure 3, the marginal taxes for each year is presented. As can be seen, marginal tax rate were substantially lower in 1935.

Figure 3: Marginal Tax Rates in 1935 and 1960



Source: Tax Foundation (http://www.taxfoundation.org)

In fact, the highest marginal tax rate in 1935 was 63 percent for tax households earning $2 million or more. In 1960, the top marginal rate was 91 percent for households over $200,000. Figure 3 shows evidence that fiscal policy code have fostered an increase in the home ownership rate. On the margin, the increased tax rates give home ownership a greater preference in the tax code give the deductibility of mortgage interest.

2.3 The GI Bill and the Veteran Administration

Historians have credited the GI bill with playing a vital role in opening the doors of higher education to millions and helping set the stage for the decades of widely shared prosperity that followed WWII. To provide some gross numbers, almost 70 percent of men who turned 21 between 1940 and 1955 were guarenteed an essentially free college education under one of the two GI Bills. In 1960 some 18 percent of the total stock of college-educated males in the US could claim that their college education was financed by the GI bill subsidy.

The empirical evidence suggests that for men born beween 1921 and 1933, the GI Bill increased total years of post secondary attainment by 15 to 20 percent. The main benefit was received for individuals in the upper half of the distribution of socioeconomic status. This period coincide with big trend in college emtollment. Goldin and Katz (1999) argue that college enrollments doubled between the fall of 1945 and the fall off 1946, and by 1947 enrollment was 70% higher that the prewar level. While one could use this data to argue that this was due to the GI Bill, but the large number of returning males should have lead to an enrollment increase.

"FDR never got the chance to remake America, but the GI Bill did. A nation of renters would become a nation of homeowners. College would be transformed from an elite bastion to

a middle class entitlement" Next table summarizes the benefits provided by the GI Bill.

Table: GI Benefits under Public Law 346 and 550

				% of Veterans	
Year	**Readjust**	**Educ**	**H. Loans**	**Educ**	**H. Loan**
1946	$1,000.9	$350.6	$5.3	17.9	3.3
1947	1,447.9	2,122.3	75.5	30.7	6.8
1948	667.3	2,498.9	64.4	37.8	8.9
1949	509.6	2,703.9	40.4	43.3	10.6
1950	138.2	2,595.7	58.7	47.5	13.9
1951	8.4	1,943.3	90.1	50.7	16.7
1952		1,325.4	226.6		
1953	24.4	667.8	158.6	50.6	20.7
1954	74.3	544.1	162.3		
1955	106.7	664.5	153.5	50.8	26.7

In addition to the GI BIll, the VA home loan program has made mortgage credit available to many veterans whose loans otherwise would not have been made. In this connection, although VA borrowers have been directly favored by the more liberal terms on those loans, it is also likely that these terms have induced a competitive liberalization of the terms on conventional mortgages, whose recipients have benefited as well. As a result, the impact of the VA home loan programs on the economy and on the mortgage market vastly exceeds the actual volume of VA home loans.

The home loan guaranty program was originally conceived in 1944 as a part of an attack on the harsh aftermath associated with wars. The overall objectives of this attack were to diminish to the greatest possible extent the economic and sociological problems of post war readjustments of millions of men and women then serving in the Armed Forces. Credit was viewed as one of the cornerstones of a program to aid the veteran in his/her effort to readjust to civilian life. In the opinion of the supporters of the original legislation, the Government should provide the means whereby the veteran could obtain favorable credit which would permit him/her to shelter his/her family or begin a business or farming venture. This concept arose because of the feeling that veterans, in view of their service in the Armed Forces had missed an opportunity to establish a credit rating which could be the basis of borrowing to acquire a home or to establish a business. The establishment of the loan guaranty program was an attempt to place the veteran on a par with his/her nonveteran counterpart.

The loan guaranty program also provided an investment outlet for large amounts of savings which existed in the economy at the end of World War II. During the years of the war, normal investment outlets were restricted because of the shift from the production of civilian goods to war production. By imposition of price and production controls on many items, the normal flow of consumer durable goods had been reduced. Thus, individual savings reached record proportions, and large amounts of money became available for investment purposes. Expectations at the time that there would be a normal postwar depression shortly after termination of the war made it seem important that planning be done to stimulate the redirection of accumulated liquid capital into normal peacetime avenues.

Type of Program	Total Number	Total Percent
Total, all programs	7,800,000	
College and University	2,200,000	28.2
Schools below college level	3,500,000	44.9
On-the-job training	1,400,000	17.9
On-farm-training	700,000	9.0

What are the percentage of veterans who received benefits?. Between 1951 and 1955, 51% had retraining benefits. In 1951 approximately 15% took addvantage of home loan guarentee program. By 1955 the fraction increased to 27%.Few took advantage of both programs at the same time for economic reasons. Veterans of WWII who had enetered retraining program as of June 30, 1955

3 Model

The model is based on the overlapping generations economy with housing and long-term mortgages developed in Chambers, Garriga, and Schlagenhauf (2009). The economy consists of households, a final goods producing sector, a rental property sector, a mortgage lending sector and a government that engages in a number of activities.

3.1 Households

Age Structure. The economy is populated by life-cycle households that are *ex-ante* heterogeneous. Let j denote the age of an individual and let J represent the maximum number of periods an individual can live. At every period, an individual faces mortality risk and uninsurable labor earning uncertainty. The survival probability, conditional on being alive at age j, is denoted by $\psi_{j+1} \in [0,1]$, with $\psi_1 = 1$, and $\psi_{J+1} = 0$. Earnings uncertainty implies that the individual is subject to income shocks that cannot be insured via private contracts. As usual in this class of models annuity markets for mortality risk are absent. The lack of these insurance markets creates a demand for precautionary savings to minimize fluctuations in consumption goods, c, and in the consumption of housing services, d, over the life-cycle.

Preferences. Individual preferences rank goods (consumption and housing) according to a momentary utility function $u(c,d)$. This function satisfies the usual properties of differentiability and Inada conditions.

Asset Structure. Individuals have access to a portfolio of two assets to mitigate income and mortality risk. A financial asset denoted by a' with a net return r and a housing durable good denoted by h' with a market price p where the prime is used to denote future variables. This assumption simplifies the problem because households do not need to anticipate changes in house prices. A housing investment of size h' can be thought of as the number of square feet in the house. A house of size h' yields s services.[8] If a household does not invest in housing, $h = 0$, the household is a renter and must purchase housing services from a rental market. The rental price of a unit of housing services is R.

Mortgage Contracts. Housing investment is financed through long-term mortgage contracts. These contracts have a general recursive representation. Consider the expenditure associated

[8] For the sake of simplicity, we assume a linear relationship between house and services generated. In other words, $s = h'$.

with purchase of a house of size h (i.e. square feet) with a unit price p (per square feet). In general, a mortgage loan requires a downpayment equal to χ percent of the value of the house. The amount χph represents the amount of equity in the house at the time of purchase, and $D_0 = (1-\chi)ph$ represents the initial amount of the loan. In a particular period, n, the borrower faces a payment amount m_n (i.e., monthly or yearly payment) that depends on the size of the original loan D_0, the length of the mortgage, N, and the mortgage interest rate, r^m. This payment can be subdivided into an amortization, (or principal) component, A_n, which is determined by the amortization schedule, and an interest component I_n, which depends on the payment schedule. That is,

$$m_n = A_n + I_n, \qquad \forall n. \tag{1}$$

where the interest payments are calculated by $I_n = r^m D_n$.[9] An expression that determines how the remaining debt, D_n, changes over time can be written as

$$D_{n+1} = D_n - A_n, \qquad \forall n. \tag{2}$$

This formula shows that the level of outstanding debt at the start of period n is reduced by the amount of any principal payment. A principal payment increases the level of equity in the home. If the amount of equity in a home at the start of period n is defined as H_n, a payment of principal equal to A_n increases equity in the house available in the next period to H_{n+1}. Formally,

$$H_{n+1} = H_n + A_n, \qquad \forall n, \tag{3}$$

where $H_0 = \chi ph$ denotes the home equity in the initial period.

Prior to the Great Depression the typical mortgage contract was characterized by no amortization and a balloon payment at termination. A balloon loan is a very simple contract in which the entire principal borrowed is paid in full in last period, N. The amortization schedule for this contract can be written as:

$$A_n = \begin{cases} 0 & \forall n < N \\ (1-\chi)ph & n = N \end{cases}.$$

This means that the mortgage payment in all periods, except the last period, is equal to the interest rate payment, $I_n = r^m D_0$. Hence, the mortgage payment for this contract can be specified as:

$$m_n = \begin{cases} I_n & \forall n < N \\ (1+r^m)D_0 & n = N \end{cases},$$

where $D_0 = (1-\chi)ph$. The evolution of the outstanding level of debt can be written as

$$D_{n+1} = \begin{cases} D_n, & \forall n < N \\ 0, & n = N. \end{cases}.$$

With an interest-only loan and no changes in house prices, the homeowner never accrues additional equity beyond the initial downpayment until the final mortgage payment is made. Hence, $A_n = 0$ and $m_n = I_n = r^m D_0$ for all n. In essence, the homeowner effectively rents the property from the lender and the mortgage (interest) payments are the effective rental cost. As a result, the monthly mortgage payment is minimized because no periodic payments toward equity are made. A homeowner is fully leveraged with the bank with this type of contract. If

[9] The calculation of the mortgage payment depends on the characteristics of the contract, but for all contracts the present value of the payments must be equal to the total amount borrowed, $D_0 \equiv \chi ph = \sum_n^N m_n/(1+r)^n$.

the homeowner itemizes tax deductions, a large interest deduction is an attractive by-product of this contract.

After the Great Depression, FHA sponsored a new mortgage contract characterized by a longer duration, lower downpayment requirements (i.e., higher loan-to-value ratios), and self-amortizing with a mortgage payment comprised of both interest and principal. This loan product is characterized by a constant mortgage payment over the term of the mortgage, $m \equiv m_1 = ... = m_N$. This value, m, must be consistent with the condition that the present value of mortgage payments repays the initial loan. That is,

$$D_0 \equiv \chi ph = \sum_n^N \frac{m}{(1+r)^n}.$$

If this equation is solved for m, we can write $m = \lambda D_0$, where $\lambda = r^m[1-(1+r^m)^{-N}]^{-1}$. Because the mortgage payment is constant each period, and $m = A_t + I_t$, the outstanding debt decreases over time $D_0 > ... > D_N$. This means the fixed payment contract front loads interest rate payments,

$$D_{n+1} = (1+r^m)D_n - m, \qquad \forall n,$$

and, thus, back-loads principal payments, $A_n = m - r^m D_n$. The equity in the house increases each period by the mortgage payment net of the interest payment component, $H_{n+1} = H_n + [m - r^m D_n]$ every period.

Household Income. Household income varies over the life-cycle and depends on whether the household is a worker or a retiree, the return from savings and transfer programs, and the income generated from the decision to rent property when a homeowner. Households supply their time endowment inelastically to the labor market and earn wage income, w, per effective unit of labor. Household's productivity depends on an age component, υ_j, and a transitory age-dependent idiosyncratic component ϵ_j drawn from a age-specific probability distribution $\Pi_j(\epsilon_j)$. For an individual younger than j^*, labor earnings are then $w\epsilon_j\upsilon_j$. Households of age j^* or older receive a social security transfer that is proportional to average labor income, and is defined as θ. Pretax labor earnings are defined as y_w, where

$$y_w(\epsilon, j) = \begin{cases} w\epsilon_j\upsilon_j, & \text{if } j < j^* \\ \theta, & \text{if } j \geq j^* \end{cases}.$$

A second source of income is available to households who invest in housing and decide to rent part of their investment. A household that does not to consumes all housing services, $h' > d$, can pay a fixed cost $\varpi > 0$ is paid, and receive rental income $y_R(h', d)$

$$y_R(h', d) = \begin{cases} R(h'-d) - \varpi, & \text{if } h' > d \\ 0, & \text{if } h' = d \end{cases}$$

Saving and transfers provide an additional sources of income. Households with positive savings receive $(1+r)a$. The transfers are derived from the households that die with positive wealth. The value of all these assets is uniformly distributed to the households that remain alive in an equal lump sum amount of tr. The (pre-tax) income of a household, y, is simply

$$y(h', a, \epsilon, d, j) = y_w(\epsilon, j) + y_R(h', d) + (1+r)a + tr$$

The various income sources generate a tax obligation of T, which depends on labor income, y_w , net interest earnings from savings, ra, rental income, y_R, less deductions that are available in the tax code, Ω. Examples of deductions could be the interest payment deduction on mortgage

loans or maintenance expenses associated with tenant-occupied housing. Total tax obligations are denoted as

$$T = T(y_w(\epsilon, j) + ra + y_R(h', d) - \Omega).$$

The Household Decision Problem. A single household budget constraint can not be easily written for this problem. The reason is that the households makes tenure decisions. In each period a renter could purchase a home, or a homeowner could change the size of their house or even become a renter. Hence, the household's budget constraint depends on the value of the current state variables. The relevant information at the start of the period is the type of agent(i.e. civil and veteran), i, the education level (no education, high school, and college), e, the level of asset holding, a, the housing investment, h, the mortgage choice, z, and the mortgage balance with the bank, n, and age, j. To simplify notation, let $x = (i, e, a, h, z, n, j)$ summarize the household's state vector. A household could face a number of budget constraints depending on the tenure decision. Individuals make decisions over consumption goods, c, housing services, d, and investment in assets, a', and housing, h'. Table 3 summarizes the five distinct decision problems that a household must solve.

Table 3: Basic Structure of the Model

Current renter: $h = 0$		Continues renting $h' = 0$
		Purchases a house $h' > 0$
Current owner: $h > 0$		Stays in house: $h' = h$
		Change size (Upsize or downsize): $h' \neq h$
		Sell and rent: $h' = 0$

The starting point is the problem of an individual that starts as a renter, and then consider the decision problem of an individual who starts as a homeowner.

- **Renters:** An individual who is currently renting, $(h = 0)$, has two options: continue renting, $(h' = 0)$, or purchase a house, $(h' > 0)$. This is a discrete choice in ownership that can easily be captured by the value function v (present and future utility) associated with these two options. Given the relevant information $x = (i, e, a, 0, 0, 0, j)$, the individual chooses the option with the higher value, which can be expressed as

$$v(x) = \max\{v^r, v^o\}.$$

The value associated with continued renting is determined by solving

$$v^r(x) = \max u(c, d) + \beta_{j+1} E_{e,i} v(x'), \tag{4}$$

$$s.t. \quad c + a' + Rd = y(x) - T.$$

The household is subject to nonnegativity constraints on c and d, as well as the restriction that $a' \geq 0$. These constraints are present in all possible cases and are not explicitly stated

in the other cases. [10] The evolution of the state vector summarizing future information is $x' = (i, e, a, 0, 0, 0, j+1)$.

The individual who purchases a house solves a different problem as choices must now be made over $h^{'} > 0$. This decision problem can be written as:

$$v^o(x) = \max u(c, d) + \beta_{j+1} E v(x'), \tag{5}$$

$$s.t. \quad c + a' + (\phi_b(x) + \chi(x))ph' + m(h', n; p) = y(x) - T,$$

The purchase of a home requires use of a long-term fixed-rate mortgage loan. The mortgage contract is a function that specifies the length of the contract, N, the down payment fraction, $\chi(x) \in [0, 1]$, and the payment schedule, m. The decision to buy a house of value ph' implies total borrowing must equal $D_N = (1 - \chi)ph'$. The payment structure depends on the mortgage available at any given time period. The purchase of a house only requires an expenditure of the downpayment and associated transaction costs, $\phi_b(x)$. The access to credit markets depends on the veteran status. The GI Bill provides zero downpayment loans and subsidized interest rates. The relevant continuation state is $x' = (i, e, a', h, z, N-1, j+1)$

- **Owners:** The decision problem for an individual who currently owns a house, $(h > 0)$, has a similar structure. However, a homeowner faces a different set of options: stay in the same house, $(h' = h)$, purchase a different house, $(h' \neq h)$, or sell the house and acquire housing services through the rental market, $(h' = 0)$. Given the relevant information $x = (i, e, a', h, z, n, j)$ the individual solves.

$$v(x) = \max\{v^s, v^c, v^r\},$$

Each of these three different values is calculated by solving three different decision problems. If the homeowner decides to stay in the current house the optimization problem can be written as:

$$v^s(x) = \max u(c, h') + \beta_{j+1} E v(x') \tag{6}$$

$$s.t. \quad c + a' + m(h, n; p) = y(x) - T.$$

This problem is very simple, because the homeowner must make decisions only on consumption and saving after making the mortgage payment. If the mortgage has been paid, $n = 0$ and $m(h, n; p) = 0$. Otherwise, the mortgage payment is positive. Next period's state is given by $x' = (i, e, a', h, z, n', j+1)$ where $n' = \max\{n - 1, 0\}$. The sale of the house generates revenue, $\Pi = (1 - \phi_s)p\xi h - D(h, n; p)$, that nets selling costs, ϕ_s, and any remaining principal on the mortgage loan, $D(p, h)$.[11] The consumer problem is

$$v^c(x) = \max u(c, h') + \beta_{j+1} E_{e,i} v(x')$$

$$s.t. \quad c + a' + (\phi_b(x) + \chi(x))ph' + m(h, n; p) = y(x) + \Pi - T.$$

This individual must sell the existing property to purchase a new one. The choices depend on the income received from selling the property, ph, net of transactions costs from selling,

[10] The change in the size of rental property (flow) is not subject to transaction costs; only the change in housing investment (stock) is subject to frictions.

[11] Because our analysis is conducted at the steady state, other than the differences in transaction costs and idiosyncratic capital gains, there are no differences in the purchase and selling price.

ϕ_s, and the remaining principal $D(n)$ owed to the lender. The relevant future information is given by $x' = (i, e, a', h, z', N-1, j+1)$

Finally, we solve the problem of a homeowner who sells the house $h > 0$ and becomes a renter $h' = 0$. [12] The optimization problem is very similar to the previous one. However, in this case the individual must sell the home and rent Rd. Formally,

$$v^r(x) = \max u(c, d) + \beta_{j+1} E v(x'), \tag{7}$$
$$s.t. \quad c + a' + Rd = y(x) + \Pi - T.,$$

the future state vector is $x' = (i, e, a', 0, 0, 0, j+1)$. Given the initial information summarized in x, the choice of whether to stay in the house, change the housing size, or sell the house and become a renter depends on the values of v^s, v^c,and v^r.

3.2 Mortgage Lending Sector

The financial intermediary is a zero-profit firm. This firm receives deposits from households, a', and uses these funds to make loans to firms and households. Firms acquire loans of capital to produce goods, and households use long-term mortgages to finance the housing investment. Financial intermediaries receive mortgage payments, principal payments from those individuals who sell their homes with an outstanding mortgage position, as well as the outstanding principal of individuals who unexpectedly die. The formulation of the market clearing condition derived from zero profit on the lender side is described in the Appendix.

3.3 Production of Final Goods

A representative firm produces a good in a competitive environment that can be used either for consumption, government, capital, or housing purposes. The production function has the property of constant returns to scale, $F(K, L) = K^\alpha L^{1-\alpha}$, where K and L denote the amount of capital and labor respectively, and the term α represents the labor share. The aggregate resource constraint is given by

$$C + C_H + I_K + I_H + G + \Upsilon = K^\alpha L^{1-\alpha}, \tag{8}$$

where C, I_K, I_H, G, and Υ represent aggregate consumption, capital investment, housing investment, government spending, and various transactions costs, respectively.[13]

3.4 Government Activities

In this economy, the government engages in a number of activities. First, retirement benefits are provided through a pay-as-you-go social security program. Social security contributions are used to finance a uniform transfer upon retirement that represents a fraction of average income. Second, exogenous government expenditure is financed by using a nonlinear income tax scheme. The financing of government expenditure and social security are conducted under different budgets. Finally, the government redistributes the wealth (housing and financial assets) of individuals who die unexpectedly. Both housing and financial assets are sold and any outstanding debt on housing is paid off. The remaining value of these assets, in conjunction with the profits from the corporate rental sector, are distributed to the surviving households as a lump-sum payment, tr.

[12] In the last period, all households must sell h, rent housing services and consume all their assets, a, as a bequest motive is not in the model. In the last period, $h' = a' = 0$.

[13] The definitions for aggregate housing investment and total transaction costs appear in the Appendix.

3.5 Stationary Equilibrium

In the model a stationary equilibrium includes optimal decisions that are function of the individual state variables, $x = (a, h, n, \epsilon, j)$, prices $\{r, w, R\}$, market clearing conditions, and a distribution over the state space $\Phi(x)$ that are constant over time. A formal definition of the recursive equilibrium is presented in an appendix which is available as supplementary material.

4 Parameterization and Baseline Results

In order to determine the critical factors that account for the large increase in the home ownership rate between 1940 and 1960 it is necessary to specify functional forms and parameter values. Some parameters can be directly specified using procedures established in the literature, but other parameters need to be estimated. The parametrization technique is based on moment estimation to replicate key properties of the U.S. economy. This period is chosen so as to minimize the potential structural effects on the housing market due to the National Housing Act. While this act was passed in 1934, the substantive effects of this legislation only began to impact housing markets late in the 1930's.

Population Structure: A period in the model corresponds to three years. An individual enters the labor force at age 20 (model period 1), and lives a maximum of 83 years (model period 23). Mandatory retirement occurs at age 65 (model period 16). Demographic parameters that need to be specified are the survival probabilities, $\{\psi_{j+1}\}$, as well as the relative size of each age cohort, μ_j. The survival probabilities are from the National Center for Health Statistics, *United States Life Tables* (1935,1940). Usually a population growth rate is specified and the corresponding steady state size if each cohort is generated. In this paper, the actual age cohorts are specified using data from the 1940 US Census. The normal convention is to calculate an equilibrium under an assumption of a demographic steady state. Because of the argument that the increase in the home ownership was due to demographic factors, it is important to have an accurate representation of the 1935-40 period.

Functional Forms: The expected value of the discounted sum of momentary utility functions is specified as:

$$E\sum_{j=1}^{J}\beta^{j-1}\psi_j\frac{\left[\gamma c^{-\rho}+(1-\gamma)(d-\overline{d})^{-\rho}\right]^{-\frac{1-\sigma}{\rho}}}{1-\sigma}$$

This means that parameter values for β, γ, σ_c, and σ_d are required. The parameter σ_d is normalized to 1 and the value of σ_c is set at 3 to match the growth rate of housing over the consumption over the life-cycle. The parameters γ, which measures the relative importance if consumption in the momentary utility function, and β are estimated. The first parameter estimated to the housing-to-consumption ratio 0.180. The individual discount rate is determined to match a wealth-to-output ratio of 2.54. The ratio for 1935, where the capital stock is defined as private fixed assets plus the stock of consumer durables less the stock of residential structures (to be consistent with the capital stock in the model). Output is gross domestic product plus an estimate of the service flow from consumer durables less the service flow from housing.

Goods outputs is assumed to be produced by a production function with a Cobb-Douglas form. The capital share parameter, α, is set at 0.24 which is based on NIPA data for 1935. Since the model does not consider aggregate shocks, total factor productivity in this production function is normalize to equal unity. The depreciation rate of the firm's capital capital stock, δ, is estimated to the ratio of fixed capital investment to GDP.

Income endowments: According to the model, two components of the household income process must be measured. One component is the age specific earnings component, υ_j. This component is generated using the average salary and wage income by age from Public Use Microdata Samples (PUMS) for 1940. Similarly, the data for 1960 is used to calculate the age-earnings component in that period. In Figure 2, we present the resulting age specific earnings component. The other earnings component is the stochastic component. Storesletten, Telmer, and Yaron (2004) find persistence. This finding is based on a sample of household data over many periods drawn from the Panel Survey on Income Dynamics (PSID). Obviously, this survey did not exist for the periods focused on in this paper. The micro evidence from PUMS is restricted to Census years 1940 and 1960 being only available every 10 years. The availability of data once every ten years does not allow us to estimate a serially correlated income process. This may not be a severe problem given the longer run focus of this study. The alternative is to consider the stochastic component to be an independent and identically distributed age dependent income shock, ϵ_j. This income process can be estimated using a Kernel density estimation for every age cohort, $\Pi_{jt}(\epsilon_j)$ for each time period. Since the model period is 3 years, the income process is estimated in the same time frame across cohorts. Although the approach does not capture the persistence of income shock, it captures the dispersion of labor income across age cohorts and reproduces the Gini coefficient for income in both time periods.

Government and the Income Tax Function: In 1940, the social security program was in its infancy. The payroll tax rate for a work was one percent of wage income. In addition, wage income for payroll tax purposes was capped at $3,000. The model considers a 30 percent replacement rate.

The income tax code in 1940 differentiated wage income from total net taxable income, which is equal to wage and interest income less interest payments such as mortgage interest payments. Each household receives an earned income credit. This credit is equal to 10 percent of wage income as long as net income is less that $3,000. If net income exceeds $3000, the credit is calculated as ten percent of the minimum of wage income or total taxable income. The tax credit is capped at $1,400. In addition to the earned income credit, a household received a personal exemption of $800. If these two credit are subtracted from total net taxable income, adjusted taxable income is determined. A tax schedule is used to determine part of the tax obligation. In Figure 4, the marginal tax rates are plotted for the 1940 tax code. The highest marginal tax rate is 0.79 which applicable to income level exceeding $500,000. In 1940, a income tax surcharge equal to an additional 10 percent of the income tax obligation. The documentation for the 1940 tax code is the Internal Revenue Service and the Tax Foundation. In order to ensure that the income tax function generates the proper amount of revenue for 1940, an adjustment factor must be added to the tax code. This parameter can be thought of adding an intercept to the tax function. If too much revenue is generated, this parameter, τ_0, can be reduced. This factor is estimated by targeting the personal income tax revenue to GDP ratio. In 1935, this ratio was 0.01.

Wealth endowments: Bequests appeared to be an important source of home ownership for young households in 1940. Table 4 presents IRS data on real estate bequests in both 1940 and

1960.[14]

Table 4: Real Estate Bequests in the U.S. (1940-1960)

Year	Returns	Gross Bequest Value	Mortages and Debts	Net Bequest Value
1940	16,156	2,649,492,000	229,866,000	2,419,626,000
1960	52,070	2,857,330,000	690,038,000	1,867,292,000

Source: Internal Revenue Service, Historical Data

Although the number of returns tripled between 1940 and 1960, the total gross value of real estate bequests grew by less that 10 percent. However, the amount of outstanding debts on bequested real estate more than tripled in the same 20 year period. As a result, the net value of real estate bequests actually dropped by 23 percent between 1940 and 1960. The apparent importance of real estate bequests in 1940 requires the introduction of an additional parameter W_0 to the model. This parameter represents the percentage of age one households who receive a bequest of a minimum size home. The percentage is adjusted so that the model generates a home ownership for young households that is similar to that found in the data. The value of transfers from accidental death is adjusted to equate to the amount of housing bequests to individuals.

Housing: In the baseline model, homeowners can only finance home purchases with short duration balloon type contracts. The balloon loan is restricted to 12 years (or 4 model periods), and a 50 percent downpayment is required. Formally, this means setting $N = 4$ and $\chi = 0.5$. The transaction costs from buying and selling property are $\phi_s = 0$ and $\phi_b = 0.06$. The minimum house size, $\underline{h}$, is estimated to be consistent with the set of specified targets. The value of minimum size house determines the second housing grid point. The values δ_o and δ_r are crucial for the supply of rental property. Data is not available for readily available that allows estimation of these parameters. The parameter values are taken from Chambers, Garriga, and Schlagenhauf (2009) where the annual depreciation rates for owner and tenant-occupied housing are $\delta_o = 0.0106$ and $\delta_r = 0.0135$ respectively.

The estimation of the set structural parameters $(\delta, \gamma, \beta, \underline{h}, \tau_0, W_0)$ is based on an exactly-identified Method of Moments approach along with the computation of market clearing (capital market, and rental market) under the restriction that government budgets balance. Table 5 reports the parameter values that generate aggregate statistics that are consistent with the U.S. economy. Parameters are estimated within one percent error for all the observed targets.

[14] The data in Table 5 are from U. S. Treasury Department, Bureau of Internal Revenue, Statistics on Income for 1940, Part 1. This data is compiles from individual income tax returns, taxable fiduciary income and defense tax returns, estate tax returns prepares under the direction of the Commissioner of Revenue by the statistics section, income tax unit. A similar document is used for 1960.

Table 5: Estimation of Model

Statistic	**Target**	**Model**
Ratio of wealth to gross domestic product (K/Y)	2.54	2.547
Ratio housing services to consumption of goods (Rs_c/c)	0.18	0.18
Ratio fixed capital investment to GDP $(\delta K/Y)$	0.112	0.112
home ownership Ratio	0.454	0.4564
Personal Income Tax Revenue to output $(T(ay)/Y)$	0.01	0.01
Balanced bequests	0.00	0.0003

Variable	**Parameter**	**Value**
Individual Discount Rate	β	0.918
Share of consumption goods in the utility function	γ	0.940
Depreciation rate of capital	δ	0.111
Minimum Housing Size	$\underline{h}$	4.173
Lump sum tax transfer	τ_0	0.001
Initial period bequested homes	W_0	0.253

The model can be evaluated from various perspectives. The objective is to measure the performance by looking at the home ownership rate statistics for the various years and age groups. As can be seen in Table 6, the home ownership rate was 48.1 percent in 1930. In 1940 home ownership rate was only 42.7. Since the baseline model attempts to focus on the home ownership rate prior to the impact of the National Housing Act. The average of the of the home ownership rate between 1930 and 1940 - 45.4 percent - is used as a target.

Table 6: Home Ownership by Age

	Data		**Model**
	1930	**1940**	**1940**
25-35	37.5	33.5	17.7
36-45	48.5	42.1	39.7
46-55	57.7	51.0	57.9
56-65	65.1	57.5	65.6
66-81	69.7	60.3	59.6
Total	48.1	42.7	43.5

Source: US. Census Bureau

Since the aggregate home ownership rate is an estimation target, it not surprising that the baseline model generates a number close to selected moment. The age specific home ownership rates can be used to evaluate the model. The model captures the hump-shaped behavior observed in the data. The lowest home ownership rate occurs in the youngest age cohort. The home ownership rate is increasing by age cohort. This pattern is apparent in 1930 and 1940. The difference is that home ownership rates are higher in 1930. The model does generate this pattern by age cohort, but does overstate the age specific home ownership rate starting with the age 46-55 cohort. Overall, the pattern between the data and the model is similar.

5 Quantitative Analysis

In this section, the model is used to quantify the contribution of the economic and non-economic forces behind this boom, with particular attention to the role of government intervention in housing markets. The parameter values are maintained at their respective baseline levels.

5.1 Policy Intervention in Housing Finance

The starting point tests the model ability to capture the total increase in home ownership between 1940 and 1960. That includes government related factors: housing financed sponsored policies such as the introduction of the FRM, a mortgage market innovation, mortgage interest rate deduction, a change in the federal income tax structure, and the reduction of transaction costs in mortgage rates. The additional factors considered are an increase in real income and change in the demographic structure

A starting point is to ask if all six of these changes occurred at the same time, what would the model predict home ownership would like in 1960? The 1940 survival and age cohort population shares are replaced with their 1960 counterparts. The distribution of i.i.d. idiosyncratic factor is adjusted to replicate the income distribution of 1960. In addition, real wage income per person in the labor force in 1960 was 2.25 times larger than the corresponding number for 1940. Since the age-specific productivity factors in 1940 is normalize to equal one, the 1960 values are rescaled upwards by the 2.25. The federal income tax code changed significantly by 1960. Using data from the Tax Foundation and the The US Treasury Department Internal Revenue Service publication No. 17, it is possible to construct a representative tax function. This tax function had to account for the fact that renters were not likely to itemize their deductions. A model assumption is that in 1960 all renters did not itemize deductions. As a result, these individuals used tax tables different from those households who itemize. In fact, non-itemizing households with income levels under $5,000 were able to use a tax table that differed from non-itemizers with income over $5,000. Individuals were allowed an individual deduction worth $600 that could be used to minimize the tax obligation. If a household itemized expenses due to the mortgage interest rate deduction, another tax table was to be used to calculate the income tax obligation where taxable income excluded the mortgage deduction and the individual exemption. The tax adjustment coefficient, τ_0, is set to be consistent with a federal income tax-GDP ratio of 7.73 percent. Income tax obligations were much higher in 1960, and marginal tax rates were higher. This fact was clearly displayed in Figure 4. The top marginal tax rate in 1960 was 91 percent for income over $2 million. The payroll tax increased to 1.5 percent of wage income up to a cap of $4,800.

By 1960, the dominant mortgage was a fixed payment amortizing contract. This contract increases the loan-to-value constraint to eighty percent, (i.e., $\psi = 0.20$) and lengthened the duration of the contract to 30 years, (i.e., $N = 10$). Hence, we replaced the balloon contract with a fixed payment amortizing contract. Another change that occurred between 1940 and 1960 was the size of the spread between the mortgage interest rate and risk free rate. In 1960, this spread was substantially from 2.53 to 1.63 percent.[15] Despite the income increase, house prices also increase according to Case-Shiller by 41.5. The model captures the increased cost of housing by adjusting the cost per unit of housing.

Table 7 presents the model's prediction on the effect on home ownership if the various factors

[15] The size of the spreads reflects the fact that a period in the model is three years.

are jointly introduced.

Table 7: Home ownership Rates 1960

	Data			Model		
	1940	**1960**	**Difference**	**1940**	**1960**	**Difference**
25-35	33.5	56.2	22.7	18.0	49.3	31.3
36-45	42.1	68.1	26.0	39.7	67.8	28.1
46-55	51.0	69.5	18.5	57.9	69.8	15.0
56-65	57.5	69.3	11.8	65.6	77.5	11.9
66-82	60.3	69.8	9.5	59.6	88.5	28.9
Total	42.7	62.5	18.9	43.5	65.2	21.7

The actual aggregate housing participation rate in 1960 was 62.5 percent. The model indicates that the introduction of the 1960 values of these key factors would result in an aggregate ownership rate of 68.5 percent. The model has a bias toward home ownership as housing is not a risky investment. The model generated age-cohort ownership rates have a more pronounced hump as compared to actual 1960 data. The age 25-36 participation rate is lower than actual data. The 56.2 percent rate for households in the 25-36 age cohort may reflect the benefits from the VA program. This program has not been considered in the model. The model has the unattractive feature of very high home ownership rates in the 46-55, 56-65 and 66-75 age cohorts which again is due to the lack of housing price risk.

Chambers, Garriga, Schlagenhauf (2009) found that mortgage market innovation was the key factor in explaining the increase in the home ownership rate between 1996 and 2005. The introduction of highly leverage loans with graduated mortgage payments were found to be important as these contracts attracted first-time buyers into the housing market. By 1960, fixed mortgage contracts had become more levered as the loan-to-value ratio increased and the duration of the mortgage contract lengthened. It seems that the mortgage contact innovation between 1935 and 1960 could be a key factor. To investigate this possibility, we replaced the 1935 balloon contract with a 1960 mortgage type contract. The home ownership rate change is presented in Table 8.

Table 8: Effects Mortgage Regulation

Mortgage Length	**Ownership Rate**
20	58.5
30	63.0
35	63.3
40	63.4

The introduction of the 30 year FRM with the increase can account for 10 percent of the change in ownership. The model suggests that the length of the mortgage contract sponsored by FHA has significant effect in ownership. If instead of sponsoring the 30 year FRM the loan have had a 20 year maturity the model predicts a 25 percent decline in ownership. However, increasing the maturity beyong 30 years only seems to have very marginal effects in ownership. These do not seem to go beyond 2 percent when the loan maturity is increased from 30 to 40 years. Why the FRM was not that effective when available in the 1940's? Given the low income growth over the lifeycle and the high home prices, household could not afford to take advantage of the leverage features available in a fixed rate mortgage.[16]

[16] We also experiment with the effect of lower the downpayment requirement to 5 percent. A move leveraged mortgage contract would result in a higher homeownership rate. However, the homeownership rate would only increase to 43.5 percent

5.2 Housing Policy: The Tax Treatment of Housing

This section reverses the previous question and explores the effects of eliminating existing asymmetries given the existing level of progressivity. The exercise shows how housing tenure and investment decisions in the model are affected by these distortions.

Understanding this decision requires more precision regarding the tax provisions toward owner- and tenant-occupied housing. Let κ_o and κ_r be the fraction of service income consumed by owner- and tenant-occupied housing, respectively, that is taxable. The terms ι_o and ι_r represent the fraction of maintenance expenses from owner- and tenant-occupied housing, respectively, that are deductible. As a result of these modifications, the definition of taxable income becomes

$$\widetilde{y} = \omega + ra + \kappa_r R(h' - d) + \kappa_o Rd - \iota_r \delta_r p(h' - d) - \iota_o \delta_0 pd - \Omega, \tag{9}$$

where Ω represents other deductions such as the interest deduction of mortgage payments.

The first-order condition for a homeowner who chooses to pay the fixed entry cost ($\varpi > 0$) to become a landlord is

$$\frac{U_d}{U_c} = R - p\Delta\delta + T'(\widetilde{y})[p(\iota_r\delta_r - \iota_o\delta_o) - R(\kappa_r - \kappa_o)], \tag{10}$$

where U_c and U_d represent the marginal utility with respect to consumption c, and housing services flows d, respectively. The first term labeled as the captures the net benefit of supplying an additional unit of rental property, while the second term captures taxation effects. The rental price of a unit of housing services, R, measures the benefit to a household of forgoing a unit of housing services. This benefit is reduced the greater the spread in the depreciation rate for rental and owner-occupied housing, $\Delta\delta = (\delta_r - \delta_o)$. In the absence of tax considerations, the effective cost of owner-occupied housing services is $R_o = R - p(\delta_r - \delta_o)$. The implicit moral hazard problem makes renting more expensive than owning. The nonlinear income tax code introduces an additional term. This effect arises from the asymmetric tax treatment on housing services and maintenance expenses. The benefit from supplying services to the rental market is reduced when the spread in the fraction of rental income relative to owner-occupied imputed income is large, and increases when the spread between in maintenance expenses on rental and owner-occupied housing increases.

In the current U.S. tax code, the income from the consumption of tenant-occupied housing services is taxable, whereas the income of owner-occupied serviced is not taxable. In contrast, rental maintenance expenses are deductible, but owner-occupied maintenance expenses are not deductible. These particular provisions in the tax code imply parameter values of $\kappa_o = \iota_o = 0$ and $\kappa_r = \iota_r = 1$. As a result, the first-order condition becomes[17]

$$\frac{U_d}{U_c} = R[1 - T'(\widetilde{y})] + p[T'(\widetilde{y})\delta_r - \triangle\delta]. \tag{11}$$

This condition illustrates the asymmetry in the tax treatment of homeowners and landlords. The first term on the right-hand side of equation (4) indicates that the failure to tax owner-occupied housing services reduces the cost of homeownership and thus introduces a bias toward ownership. To eliminate this asymmetry it is necessary to tax the housing services from owner and tenant housing at the same rate, $\kappa_o = \kappa_r$. The second term illustrates how the deductibility of maintenance expenses for tenant-occupied housing introduces a bias toward supplying housing services. Deductions, which appear in Ω, affect adjusted gross income, $\widetilde{y}$, and impact the decision to supply rental property via marginal tax rates, $T'(\widetilde{y})$. At the individual level, the progressivity

[17] The U.S. tax code allows for accelerated depreciation of rental property, suggesting that $\iota_r \geq 1$.

of the tax code amplifies or reduces the impact of the asymmetries. For example, under a less (more) progressive tax code, the taxation effects are very small (large) as landlords increase the supply of rental property. However, at the aggregate level some of these incentives might disappear due to general equilibrium effects.

This condition for the supply of rental housing services embeds alternative specifications that have appeared in the literature. To derive the standard formalization of the rental markets, the progressivity of the tax code must be ignored (i.e., marginal tax rates are zero, $T'(\widetilde{y}) = 0$), and preferences between consumption and housing services must be homothetic. Let $\vartheta \equiv U_{d^*}/U_{c^*}$. In this case, the first-order condition is reduced to a user cost-type expression, $R^* = \vartheta + p\triangle\delta$. This expression represents an arbitrage condition that has must be satisfied for all individuals supplying property given the homotheticity assumption. In the absence of nonlinear taxation, all landlords have the same ratio, ϑ. This expression is similar to that in Gervais (2002), where the equilibrium rental price equals the gross return from rental investment, $R = r + p\delta_r$. In this specification, only housing and tax policies that reduce maintenance costs via subsidies have an impact on the equilibrium price. However, in the current formulation, the interaction between the nonlinear tax code and the decision of the household to supply rental services generates a positive-sloped rental supply for the noncorporate rental sector. This component of the aggregate supply breaks the link between the rental price and the equilibrium interest rate.

5.2.1 The home mortgage interest deduction

During this periods, one of the hallmarks of U.S. housing policy is the deductibility of mortgage interest payments for households that itemize. This deduction creates an incentive to both own and consume more homes generating an asymmetry between housing and financial investment. The view among many economists is that the removal of the interest deduction would reduce owner-occupied housing consumption and thus result in smaller home sizes. Homeownership would be lower because the incentives to own have been reduced. From a macro perspective, the elimination of the deduction should result in a tax reduction. The magnitude of the income effects implied from lower taxes can reverse the intuition implied from the partial equilibrium argument.

The baseline model assumes complete deductibility of mortgage interest payments. Formally, the deduction on taxable income is represented by the expression $\Omega = \varkappa I_n = \varkappa r^m D(h', n; p)$, where the term $\varkappa = 1$. The benefits from the mortgage interest deduction are enhanced when the tax rates became more progressive. We examine the role of the housing provisions by eliminating mortgage deduction in the 1960 tax structure. The quantitative implications of eliminating the deduction, $\varkappa = 0$ are summarized in Table.

Table : The Importance Mortgage Deduction

Experiment	**Ownership**
1) 60-30 (40 para)	63.0
2) SERV Tax:clearin+tax revenue same as 60-30	60.4
3) Prices fixed (except RNT) fix tax rev to 60-30	59.4
4)Fix prices (except RNT) ,tax revenue not fixed	53.7

The model suggests that the mortgage deduction can account for 13 percent of the increase in ownership. These results are inline with Rosen and Rosen (1980) that predict a decline from 64 to 60 percent. However, Rosen and Rosen's use a partial equilibrium analysis to obtain the size of the decline. implies a 6 percent change. The similarity in magnitudes illustrates the

importance of considering general equilibrium effects.[18] The small movements in relative prices could suggest that a partial equilibrium analysis is appropriate. This conjecture is explored by resolving the model at baseline prices and ignoring the tax adjustment associated with the revenue-neutral assumption. The elimination of the deduction already reduced the incentive to own homes, if in addition, the government does not rebate back the savings from eliminating the deduction, the implied ownership rate falls from 63 percent to 54 percent. However, when the government rebated the resources back to the homeowners and most prices remain at the baseline level, then the increase in ownership is more inline with Rosen and Rosen (1980).

5.2.2 Taxation of Owner-Occupied Housing Service Flows

Many economists argue that the primary distortion in the current tax code is the treatment of housing services. Previous studies suggest that the elimination of this asymmetry should lead to the consumption of smaller homes and lower homeownership. For example, Berkovic and Fullerton (1992) find that the taxation of housing services should reduce average housing consumption between 3 and 6 percent, whereas Gervais (2002) finds that taxing imputed rents of owner-occupied housing would increase the capital stock by more than 6 percent but decrease the housing stock by 8 percent.

Under the current tax code, income generated from rental property is subject to taxation, but the implicit income from owner-occupied housing is not taxed. As shown in Eq. (13), this policy introduces an asymmetry in the tax treatment of owners and landlords that favors the consumption of owner-occupied housing services and reduces the incentive to supply rental property. The landlord supply decision when housing services are taxed at different rates is determined by

$$\frac{U_d}{U_c} = [R - p\Delta\delta] + T'(\widetilde{y})p\delta_r - T'(\widetilde{y})R(\kappa_r - \kappa_o). \tag{12}$$

The current U.S. tax code sets $\kappa_o = 0$ and $\kappa_r = 1$. Equation (16) shows through the term $T'(\widetilde{y})R(\kappa_r - \kappa_o)$ that the failure to tax housing services reduces the effective cost of owner-occupied housing and introduces a bias toward this form of housing consumption. This asymmetry is eliminated when the fraction of imputed rental income from owner- and tenant-occupied housing are taxed at the same rate, $\kappa_r = \kappa_o$, but not necessarily zero. The analysis considers the case where the imputed rental income (measured as Rd) is fully taxed, $\kappa_o = \kappa_r = 1$. These results are presented in Table 7.

Table : The Importance Taxation Housing Services

Experiment	**Ownership**
1) 60-30 (40 para)	63.0
2) SERV Tax:clearin+tax revenue same as 60-30	56.1
3)Prices fixed (except RNT) fix tax rev to 60-30	54.8
4)Fix prices (except RNT) ,tax revenue not fixed	53.3

The model suggests that the lack of taxation of housing services has an important impact on ownership. The model suggests that 35 percent of ownerhip in that period can be accounted for this factor. Again, the results are inline with Rosen and Rosen (1980) that predict 25

[18] In this model all homeowners deduct mortgage interest payments. In the U.S. tax code only a fraction of the homeowners itemize. If we allow households to choose the standard deduction, the impact of the removal of this provision would be somewhat smaller, but they would be clearly bounded below by the partial equilibrium findings.

percent decline. The general equilibrium effects are important. Ignoring the income and price effects should reduce the incentives to own a home even more. When these adjustments are not available, the model predicts a 45 percent decline (from 63 to 53 percent) in ownership.

6 Conclusions

After the collapse of housing markets during the Great Depression, the government played a large role shaping the future of the housing finance, housing policy in the New Deal, as well as the development of the GI Bill for war veterans that had signficant importance for mortgage finance and education. Soon after, the housing markets witness the largest boom in recent history. The objective in the paper is to quantify the contribution of government intervention in housing markets in the expansion in U.S. home ownership using an equilibrium model of tenure choice. In the model home buyers have access to a menu of mortgage choices to finance the acquisition of the house. The government also provides special programs, consistent with the provisions of the GI Bill and the tax code. The parameterized model is consistent with key aggregate and distributional features in the U.S. in 1940. The model is capable of accounting for 95 percent of the boom in homeownership.

The model suggests that the mortgage deduction can account for 13 percent of the increase in ownership. These results are inline with Rosen and Rosen (1980) that predict a decline from 64 to 60 percent. However, Rosen and Rosen's use a partial equilibrium analysis to obtain the size of the decline. implies a 6 percent change. The similarity in magnitudes illustrates the importance of considering general equilibrium effects. The small movements in relative prices could suggest that a partial equilibrium analysis is appropriate. This conjecture is explored by resolving the model at baseline prices and ignoring the tax adjustment associated with the revenue-neutral assumption. The elimination of the deduction already reduced the incentive to own homes, if in addition, the government does not rebate back the savings from eliminating the deduction, the implied ownership rate falls from 63 percent to 54 percent. However, when the government rebated the resources back to the homeowners and most prices remain at the baseline level, then the increase in ownership is more inline with Rosen and Rosen (1980).

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8 Appendix

8.1 1900-30's: The emergence of Mortgage Finance

The influence of mortgage lending institutions on housing markets began at the start of the 20th century, and had some important developments until 1950's, primarily as a result of government intervention. During this period there has been an important process of creation of agencies, structures, programs, and regulations designed to make investment in the housing market secure and profitable for households, and especially financial intermediaries and lenders.

The growth in the mortgage financing for residential real estate was a result of the banks incentives to look for new profit opportunities. Prior to 1930's the large downpayment requirements, and the lack of long-term financing (mortgage contracts were only three to five years) had made housing ownership difficult even for middle class families.

8.2 1930's: Government Intervention after the Great Depression

The great depression had an important impact in the housing sector, and in particular in the mortgage market. The financial depression had a chain effect on homeowners that lost their sources of income, and landlords could not charge higher rents. Consequently, property owners could not keep up with their mortgage payments without drawing on their savings. However, the banks had liquidity problems, and homeowners could not withdraw their funds. Unable to meet the payments, owners had their properties foreclosed by the banks, and the banks were stuck with homes that they could not sell. In addition, the few funds available were withdraw to satisfy depositors eliminating the possibility of issuing new mortgage loans.

The government intervention in the 1930's had the objective to support the institutions that provide financial lenders in the housing market. Three main structures were the results of this intervention.

1. Federal Home Loan Bank Act and Federal Savings and Loan Insurance Corporation
2. Federal Housing Administration (FHA)
3. Secondary Mortgage Markets

8.2.1 Federal Home Loan Bank Act

The first one was the creation of a unified national mortgage market by centralizing, stabilizing, and insuring mortgage banking operations. The Federal Home Loan Bank Act was passed in 1932. The objective was to make the mortgage market more efficient, predictable, and profitable. An important aspect was to separate mortgage lenders from the liability to their depositors, with the objective to avoid the problems faced during the great depression. The system was organized in a system of twelve regional Home Loan Banks, and it also directs the Federal Savings and Loan Insurance Corporation. The membership is open to financial institutions, besides commercial banks, that engage in long-term financing. The system works with several regional banks to behave as reserve banks for the members by accepting deposits and making loans. That allow mortgage companies to engage in profitable investments by borrow cheaply.

To attract funds Federal Savings and Loan Insurance Corporation promised savers into member banks that they could withdraw their money at anytime regardless of the bank performance (this is like a deposit insurance device that provides liquidity in the market). Consequently, the member bank where able to attract more funds for investment and reduce their obligations

with depositors. In 1933, the Home Owner's Loan Corporation (HOLC) was establish to help lending institutions with liquidity problems by purchasing the mortgages that were about to be foreclosed.

During roughly 20 years the total capital in savings and loans increased by a factor of 6. This growth was used to provide the needed funds for the housing market, and can partially explain the boom in the real estate market during this period.

8.2.2 Federal Housing Administration (FHA)

The second institution was the Federal Housing Administration (FHA) established by the National Housing Act of 1934. The objective of FHA is to insure mortgage lenders against the default risk on approved mortgage loans and increase the profitability of mortgage lenders. The important aspect is that the funds to provide mortgage insurance are not provided by taxes, nor the mortgage lenders, but the borrower. With this protection, lenders had incentives to expand the mortgage terms, and it made possible for many households to purchase their own home.

8.2.3 Secondary Mortgage Markets

One of the main problems with mortgage lending is that the investment is not very liquid. Under new investment opportunities, it is difficult for the mortgage lender to liquidate the holdings (say due to higher interest rates), and undertake new investment opportunities. In 1934, the National Housing Act also established a standardized secondary mortgage market , which in 1938 became the Federal National Mortgage Association (FNMA).

Prior to 1930, it already existed a secondary mortgage market where lenders could sell their assets to other investors. The main problem was that due to the great variation of mortgage characteristics and risk, the market was not very effective. The objective of FNMA was to provide uniformity and security. The initial endowment was used to buy insured mortgages from approved lending institutions. As a result, FNMA gave lenders the liquidity to make profits even after the mortgage had been sold by service the loan and receive a fee of 0.25% to 1% for doing so. It also created a large scale pool of insured mortgages, they created shares in this pool in a short term basis, making the market profitable for another group of investors.

After the great boom in real estate, the FNMA had become so profitable that there was a great pressure to privatize it. In 1968 the Housing Act completed the process and FNMA, today's known as Freddie Mae is entirely private.

8.3 1940's: Recovering from the Great Depression

In 1944 the FHA mortgage-insurance system together with the Veterans Administration (VA) had the priority help returning veterans to purchase housing. The program reduced the down-payment to ten percent, or in some cases no-downpayment, and it also provided long-term financing to twenty-five years. This program together with the guarantee program provided by the VA allowed veteran families to become homeowners.

In 1949 the Farmers Home Administration (FmHA), in the Department of Agriculture, was authorized to make direct loans to families for the purchase and rehabilitation of a farm home. Since its fully development the FmHa created 1,750 county offices that have had an important development of rural housing.

8.4 1950's: Housing Boom

During this period housing programs were reduced by the budget cuts imposed by the Korean War. Despite all these problems, there was an important boom in the housing market. The objective during this period was to perfect the existing programs, instead of creating new ones. There were some small program that authorized below market interest rate loans to nonprofit sponsors of rental units used by elderly and handicapped persons, that allowed to reduce the rental fee charged to the tenants. This was the first time that the administration developed program for those individuals or households with insufficient resources to purchase a private house, but too many resources to qualify for public housing.

9 The GI Bill

The GI Bill Legislation was passed in 1944. All individuals who served in the US armed forces during (Sept 1940-July 1947) were covered for a minimum of one year of training plus one additional month of activity duty, up to a maximum of 48 months.Out of 15.3 million WWII vets, some 7.8 million eventually drew on educational benefits (Pres. Commission,1956).

Using a contemporary survey of veterans, only 35 percent of those in training in Nov 1949 were enrolled at a University level, with the remaining enrolled in proprietory or vocational schools below the University level (Dept of Veterans Affairs, 1950). The Korean War Bill offered benefits to every veteran of the war determined by 1.5 times any active duty term.defined as June 1950 to Jan 31 1955. Benefits were limited to four academic years). Out of 5.3 million Korean veterans, about 2 million drew educational benefits under the bill within 5 years of passage. More than a million used the benefit for college. According to the 1978 Survey of Veterans, over 97 percent of veterans in both wars qualiified for at least 3 academic years of financial support,and over 80% qualified for 4 years of support. Stanley (2003) argues that the GI bill cut college costs by 60% for WWII and Korean veterans.

Selection to Military Service: There were two basic methods by which individuals entered military service during WWII: volunteering and induction. For World War II, volunteering was permitted on an unlimited basis through Dec 1942. Prior to Deember 1942, 1/3 of the army came from volunteers. From December 1942 through August 1945, volunteering was probited and a draft occurred.(The exception was for 17 year olds. Between Jan 43 and August 45, about 12% of new inductees were volunteers). After August 1945, volunteering was permitted. During the war there was a strong preference for individuals from 18 to 25 years of age. During the Korean War, volunteers were allowed. Draft liability was limited to those 18.5 and 25. Over 75 percent of the males born during the 1921 to 1926 period served in the War (P676) The GI Bill increased years of post-secondary education for men born between 1921 and 1933 by about 15 to 30 percent.

10 Veteran Administration

The Department of Veterans Affairs home loan programs serve a clientele which is diverse in many ways. The only common denominator of this clientele is service in the Armed Forces of the nation. Since the inception of these programs the objective has been to assist eligible veterans to become homeowners. Veterans are assisted by making it possible for them to compete in the market place for credit with persons who were not obliged to forego the pursuit of gainful occupations by reason of service in the Armed Forces of the nation. The VA programs are

intended to benefit men and women because of their service to the country, and they are not designed to serve as instruments of attaining general economic or social objectives.

This is a brief summary of the Veteran' Loan Benefits

1. The original act made no distinction in the amount of guaranty granted for homes, farms. The maximum amount was limited to 50% of the loan, but to to exceed 2,000. Loans were limited to 20 years with a maximum interest rate of 4%. Any loans over 5 years had to be amoritized. Loans had to be appriased.

2. The act was modified in 1945. Amount of guarantee was 60% loan, but not in excess of $7,500. Maturities were up to 30years The maximum interest rate was 4 and half, but could be lowered by administrative legislation. Loan insurance can be used as an alternative to the guarantee plan.

3. The VA wanted low downpayment and long term loans(p32-III). "Downpayemts ranged fro 5%to 45%, which were 5 to 10% less than down payment requirement of non veterans.

This is a brief summary of the program's history:

1. The orginal housing loan program was not effective. The maximum loan was for $2000. Because of the shortage of housing and materials for new construction, housing prices increased.Very few houses were available at $5,000. Public Law 346 said house values should be determined at values should be determined at reasonable normal values. This was interpreted as normal price that would have existed without the postwar inflation. Lastly incomes were too low to meet the payment on a 20-year amortized loan.

2. Public Law 268 in 1945 tried to address these problems. This plan changed the for on readjustment to a long term benefit for veterans as tis benefit was available at anytime within a ten years after the offical end of the war. The changes were: (1) $4000 maximum guarentee up to 50% for realestate loans, (2) maturity of 25 years for nonfarn realty, (3) the appraisal concelt was "reasonable value," and (4) loan insurance as an alternative to loan guaranty.

3. Between 1945 and 1946 demobilization occurred rapidly. Marraige rate were at an all time high and the demand for housing exceeded supply. Less than 20% of new loan at teh end of 1946 were for new dwellings.

4. The loan program was again changed in 1950. This tells use that the GI Bill is more than the one passed in 1944. (The Housing Act of 1950). The loan maximum guarantee was increases to 60% for a loan up to 7,5000. The loan maturity was extended to 30 years. Minimum housing standards were imposed.Prior to 1950, the lwas allowd the FHA-VA loan to be combined. This combined loan carried an effective interest cost of 4.8%, 4.5 interest plus one-half percent insurance on the 80-percent portion isured by the FHA and 4% on the cremaining 20 percent or less guaranteed by the VA. This loan, know as the 505 loan was popular with builders and lender because it could disposed on the secondary market. The increased guarantee was intended to go with a 4% mortgage rate.

5. Veterans of the Korean War had essentially the same benefits available for period of 10 years from the termination of hostilities-set at january 31, 1955. A major problem in reaching housing goals was the credit markets. The availabilitity of credit differed by regions. Credit controls from the federal government played a role. The FEd increased the

discount rate in 1955 after record-breaking demands for housing. over 1/2 of the increased debt from 1953 to 1955 was due to the increase in mortgage debt. During the first three years of the loan guarantee program there was no problem with funds Demand was low and ther was a large volume of savings due to veterans saving while on active duty.

Loan Programs-Veterans were not financially ready to use the loan program when they returned. Thus, the length of time to access the benefit was lengthed. Also, there was a shortage of material after the war. Lower income veterans did not use this program.

		Married			
		Own Home or Other			
	Total	**Total**	**VA Loan**	**No Va Loan**	**Rent**
Median Income					
Total	4355	4670	4994	4337	3818
Uner 25	2770	3730	4660	3300	2530
25-34	4268	4587	4973	4058	3839
35-44	4634	4866	5065	4655	4134
45 years or older	4388	4652	4865	4535	3810
Percent by housing status					
Total		57.9	28.2	29.7	42.1
Under 25		23.4	5.7	17.7	76.6
25-34		53.2	28.5	24.7	46.8
35-44		66.7	33.2	33.5	33.3
45 plus		68.7	20.7	48.0	31.3
Percent by age					
Total					
Under 25		2.2	1.1	3.2	9.8
25-34		45.8	50.4	41.5	55.3
35-44		40.6	41.5	39.8	27.8
45 plus		11.4	7.0	15.3	7.1

Source: Special Survey of Veterans, Bureau Census, October 1955

The VA loans account for 1/4 of the increase in new mortgage debt. Next table shows the total outstanding debt of VA loans

Year	**Total (in Bill)**	**Conventional**	**FHA**	**VA**	**Other**
1945	35.5	40	11%	0	48%
1946	41.8	40	9	6	45
1947	49.1	38	8	11	43
1948	56.2	37	9	13	41
1949	62.7	36	11	13	40
1950	72.8	36	12	14	38
1951	82.2	35	12	16	37
1952	91.2	36	12	16	36
1953	101.0	38	12	16	35
1954	113.5	39	11	17	33
1955	130.7	38	11	19	32

Source: Federal Reserve Bulletin