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The Lack of Affordable Housing in New England: How Big a Problem? Why Is It Growing? What Are We Doing About It?

Alicia Sasser, Bo Zhao, and Darcy Rollins Saas
(with an overview by Robert Tannenwald)

Updated January 10, 2007

Abstract

Although housing costs in greater Boston and elsewhere around the region have leveled off, affordable housing is still high on the public policy agenda in every New England state. A growing chorus of employers and policymakers are warning that the region's high cost of housing is now undermining its ability to attract and retain workers and businesses. This paper presents a thorough, region-wide analysis of the housing affordability problem in New England. We construct three affordability indicators to examine differences in the cost of housing across socioeconomic, demographic, and occupational groups, for every New England state and for the region's principal metropolitan areas.

We find that owner-occupied housing is often not affordable, particularly in southern New England, and the problem is getting worse over time. In contrast, New England's rental housing is expensive relative to the rest of the nation, but incomes are high enough that rentals are still affordable to most New Englanders. However, the lack of affordable owner-occupied housing is a problem for both middle-income and very low-income households. Households headed by young professionals can afford to purchase median homes in New England, but not as easily as they used to, and not as easily as in most rival metropolitan areas. At the same time, the very low-income are being squeezed by falling household incomes coupled with rapidly appreciating prices for houses at the lower end of the price distribution. Finally, fewer rental and owner-occupied units are actually available to the very low-income than in the past because households with higher incomes are moving down the housing distribution in order to secure shelter.

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We also draw on the existing literature to analyze what might have caused the region's affordability problem to worsen over the last decade. While many factors may have contributed in small ways, easier access to mortgage credit and strict regulations on building are likely to be the two most important reasons behind the increase.

Finally, we summarize the strategies New England governments have adopted to address the problem. These policies attempt either to increase the ability of households to rent or purchase a home or to increase the supply of affordable units. Supply-side strategies are likely to be particularly critical in improving housing affordability given the sluggish growth in the region's housing stock over the past decade.

Keywords: housing policy, New England, affordable housing, house prices
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The Lack of Affordable Housing in New England: How Big a Problem? Why Is It Growing? What Are We Doing About It?

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Updated January 10, 2007

Executive overview

By Robert Tannenwald

For several decades, policymakers at all levels of government have tried to expand access to affordable housing. Policies designed to this end have generally targeted low-income households, those least able to secure adequate shelter. However, in recent years competitiveness as well as compassion has catapulted affordable housing to the top of the public policy agenda in every New England state—even as housing prices have leveled off. A growing chorus of policymakers and employers is warning that expensive housing may be undermining the region's ability to attract and retain workers, especially those with skills in high demand. More and more households, spanning a wide swath of the income distribution, find that they can get more "bang for their buck" outside New England, particularly the region's major metropolitan areas. As a result, the cost of housing may be driving away households and repelling potential migrants, slowing growth in the region's workforce. Thus, concern about affordable housing has intensified with housing policy focused not only on the least fortunate members of their community but also on the region's ability to compete economically with other parts of the country.

This report provides, to our knowledge, the most thorough *region-wide* analysis of this problem ever undertaken. The authors analyze differences in housing affordability among specific socioeconomic, demographic, and occupational groups, for every New England state and for the region's principal metropolitan areas. These detailed breakdowns provide unique insights into the incidence and severity of New England's housing problems and their implications for the region's competitiveness. The report also synthesizes what we know (and do not know) about why housing in many parts of New England is so unaffordable and why it has become increasingly so. Finally, the report discusses the larger public policy initiatives undertaken by state and local governments within the region that attempt to ameliorate the problem.

A. Changes in New England's housing market over the past decade

The authors provide a comprehensive overview of changes in the region's housing market over the past decade, discussing both the rapid increase in prices and rents as well as sluggish growth in housing supply. Notable findings include:

- **Owner-occupied housing has become increasingly expensive in New England.** The gap in owner-occupied house prices between New England and most other parts of the country has grown substantially over the past decade. Between 1995 and 2005, real house prices increased by 85 percent in New England versus 56 percent nationwide. House price appreciation was even greater in some of the region's larger metropolitan areas within the region, with prices almost doubling in the Boston area during this period.

- **As a result, house prices are relatively high throughout most of New England compared to the rest of the U.S.** As of 2005, the median price of a single-family house exceeded the nation's in eight of the region's nine largest metropolitan areas. Among these, both the Bridgeport-Stamford-Norwalk CT and Boston-Cambridge-Quincy MA metro areas ranked among the 13 priciest metro areas in the nation. Even in the region's less expensive metro areas, house prices were often higher than those in rival metro areas such as Phoenix AZ and Raleigh NC.
- **In contrast to owner-occupied housing, the gap in rents is not as great, nor has it grown as fast, as the gap in owner-occupied house prices.** As a result, the median gross monthly rent in New England, at $831, was only 14 percent higher than the national median of $728. Moreover, in the greater Boston area, the growth in rents slowed in 2002, was constant between 2003 and 2004, and actually declined in 2005.
- **Over the past decade, most of New England has been characterized by sluggish growth in its housing stock.** Every state in the region except New Hampshire ranked among the bottom 10 states in the rate of growth in housing starts between 2000 and 2005. Housing production has been especially slow in the region's largest metropolitan areas.

B. The lack of affordable housing in New England: How big is the problem?

The authors use several indicators to compare the affordability of housing inside and outside of New England and how it has changed over time. These indicators take into account rent levels and house prices as well as the financing, taxes, and insurance costs

associated with purchasing a home. Moreover, their measures take into consideration the role of household income in determining affordability. If households facing high housing costs also enjoy high incomes, housing burdens may not be out of line. With these concerns in mind, the authors have assembled data for three distinct indicators to measure various aspects of affordability in New England for both the rental and homeowner markets:

- **Housing burden ratio:** the ratio of the costs of owning or renting a home to household income. Typically, households spending more than 30 percent of their income on housing are considered to be moderately cost-burdened while those spending more than 50 percent are considered to be severely cost-burdened.
- **Housing income adequacy ratio**: the ratio of median household income to the minimum income needed by a household to afford the median-priced rental or owner-occupied unit. Places where the housing income adequacy ratio was 1.0 or higher indicate that households earn incomes that are equal to or greater than the income needed to secure housing and so are considered to be affordable.
- **Housing availability ratio**: the ratio of the number of affordable units available to the number of households within a given income range. The number of units available is the number of housing units that are both affordable to these households and not occupied by households in a higher income range. Places where the housing availability ratio was 1.0 or higher indicate that the number of units was equal to or greater than the number of households and as such are considered to have an adequate supply of affordable housing.

The authors compare these indicators across a variety of socioeconomic and demographic groups, examining both the current level of each indicator as well as the trend

over the past decade for various parts of the region. Within each group and geographic area, they compare indicators for both homeowners and renters. The authors find:

- **Although housing burdens are high for many low-income households, rental housing in New England is relatively affordable compared to other parts of the U.S.** All three of the affordability indicators used in this study show that while rental housing in New England is expensive, incomes in the region are high enough to compensate. When household income is taken into consideration, rental housing in every New England state is as affordable as, or even more affordable than, rental housing in the nation as a whole.
- **Yet owner-occupied housing is not affordable in some parts of the region, especially in southern New England.** Access to affordable owner-occupied housing is a relatively severe problem in several (though not all) New England states and metropolitan areas. Owner-occupied units appear to be especially unaffordable in southern New England—Connecticut, Massachusetts, and Rhode Island—where the gap between median household income and the income needed to purchase the median priced house was considerably larger than that for the U.S. as a whole. In particular, housing burdens were significantly higher in Massachusetts and Rhode Island versus nationwide with the number of available units in these states being in short supply.
- **The lack of affordable owner-occupied housing is getting worse.** Most indicators show access to affordable owner-occupied units falling faster in every New England state than in the nation as a whole in recent years. This is true for almost all

socioeconomic and demographic groups, whether categorized by age, education, or select service occupations (e.g. teaching, nursing, police work).

- **Owner-occupied housing is not affordable for middle-income as well as low-income households in many parts of New England.** The lack of affordable owner-occupied housing is not limited to low-income households. In 2005, 29 percent of middle income homeowners in Massachusetts and 32 percent in Rhode Island bore moderate or severe housing burdens as compared to 21 percent of homeowners nationwide.
- **Owner-occupied housing is often more affordable in competitor metro areas.** The authors find that even after taking into account the relatively high household incomes in southern New England, owner-occupied homes in some of the region's southern metro areas were much less affordable than those in competitor metro areas. In 2005, the median household earned only 65 to 80 percent of the income needed to purchase the median-priced house in Boston-Quincy MA; Bridgeport-Stamford-Norwalk CT, Providence RI, and Cambridge-Newton-Framingham MA. But in rival metro areas—places like Phoenix AZ and Raleigh NC—the median household earned just enough or even in excess of the income needed to purchase the median-priced house. Smaller metro areas in New England, however, compared more favorably, with median households earning at least enough to afford the median home in Hartford CT; Springfield MA; Worcester MA; Manchester-Nashua NH; and Burlington VT.
- **Young professionals can afford the median home in New England, but not as easily as they used to, and not as easily as in other regions.** As of 2000,

households headed by young professionals—college graduates in the first-time homebuyer age bracket (25 to 39 years old)—were able to afford the median-priced house in every New England metro area. However, for young professionals, the gap between median household income and the income needed to purchase the median-priced house was greater in many of the region's metro areas compared to rival metro areas such as Chicago IL, Philadelphia PA, Phoenix AZ, and Raleigh NC. Moreover, between 1995 and 2000, affordability decreased sharply for young professional households in each of the New England metro areas. These households, often looking to purchase their first home, are more mobile than other groups, making them especially sensitive to the burden of housing in general and of owner-occupied housing in particular. Given that college graduates possess valuable skills that are in high demand, rising house prices may make it difficult for employers within the region to recruit these workers if these workers can buy more house for their money elsewhere. Moreover, firms may also choose to relocate if compensation is being driven by higher housing costs rather than greater worker productivity.

- **The very low-income are being squeezed by falling household incomes coupled with rapidly appreciating prices for houses at the lower end of the price distribution.** Over the past five years, very low-income households at the bottom of the income distribution have experienced a double-whammy when it comes to housing affordability. According to detailed house price data for Connecticut, the least expensive houses have appreciated more rapidly than those higher up in the housing distribution. At the same time, the median household income for this group has actually fallen in real terms. As a result, a significantly higher share of very low-

income homeowners spend more than 30 percent of their household incomes on housing in New England than elsewhere; indeed, on average very low-income homeowners in New England spend 67 percent of their income on housing.

- **Very low-income households are being crowded out of affordable rental units as higher income households move down the housing price distribution to obtain shelter.** As of 2005, there was roughly one affordable apartment for every two households in this group. Excluding those apartments occupied by higher-income households, there was only one affordable apartment that was *available* for every *three* households in this group.

C. Why has housing become so unaffordable in parts of New England?

Why has owner-occupied housing become so unaffordable in parts of New England, and why has this affordability gap widened in recent years? The authors search for answers to these questions by analyzing previously conducted research and its implications for housing prices and affordability in New England. They explore several possible explanations on both the demand side and the supply side of the markets.

On the demand side, the authors discuss five factors that may have fueled housing demand within the region, thereby exacerbating affordability problems: 1) rising incomes, 2) increasing income inequality, 3) changes in the age distribution of households, 4) easier access to mortgage credit, and 5) high and rising expectations regarding future price appreciation. The first three factors listed above are rather slow-moving and therefore

unlikely to have caused such a rapid increase in housing demand over such a relatively short period of time.

However, the two remaining factors—easier access to mortgage credit and accelerating expectations of house price appreciation—have the potential to affect rapid change in housing markets and may have stimulated demand beyond equilibrium levels. Although the latter can change quickly, survey evidence indicates that New Englanders were no more likely than homebuyers in other regions to engage in speculation. However, easier access to mortgage credit—in particular falling real interest rates, the growth of adjustable rate mortgages, and the use of non-traditional loans—appear to have played an important role in increasing the demand for housing. These changes in financing reduced income constraints for borrowers, making housing appear more affordable and possibly luring more buyers into the market. The resulting surge in demand may have spurred houses prices beyond equilibrium ("normal") levels.

On the supply side, the authors discuss three factors that may have limited the supply of housing: 1) rising costs of physical construction, 2) increasing land prices, and 3) greater regulatory barriers to new construction. While scarce land and high construction costs may be partially responsible, the single most important factor appears to be the region's strict land-use regulations. Recent research indicates that such regulations can raise prices from 17 to 50 percent, depending on the type of restriction and geographic area studied. While land-use regulations have been in place for many decades, it appears that some regulations—particularly sub-division regulations—have become a greater impediment to builders over time. Moreover, it may be the case that land-use regulations

may have become more binding over the past decade as easier access to mortgage credit has fueled demand beyond "normal" levels.

D. Affordable housing in New England: What are we doing about it?

Governments at all levels are engaged in a wide variety of efforts throughout New England to promote access to affordable housing. While these policy initiatives address different segments of the population, they all take one of two approaches: 1) increasing the ability of households to rent or purchase a home or 2) increasing the supply of affordable units.

The former consist of demand-side strategies that seek to increase the purchasing power of low- and moderate-income households by providing subsidies to renters or reducing wealth and income constraints for buyers. The latter consist of supply-side strategies that seek to maintain or increase the supply of affordable housing by increasing investment in new construction and rehabilitation, removing regulatory and procedural barriers for developers, or preserving the affordability of existing units.

Recent research and experience suggest that supply-side strategies are likely to be critical to increasing the supply of housing given the sluggish growth in the region's housing stock over the past decade. In particular, the most innovative policy solutions have occurred in southern New England where state governments have either constrained the ability of local governments to restrict land use in ways that curtail the production of affordable units or reduced the incentives to engage in such constraint. Furthermore because many communities have concerns that increasing their stock of affordable housing will result in

higher municipal costs, particularly for education, Massachusetts passed a new law this year to provide funding for any net education costs associated with affordable units developed within a smart growth district. However it remains to be seen whether local communities will find this to be a sufficient incentive to create enough affordable units to alleviate the upward pressure on prices.

Should state governments restrict municipal regulatory discretion? The answer is not clear-cut. The reluctance of many communities to allow the production of affordable housing within their borders is understandable. Moreover, local control is one of New England's distinguishing traits. More so than communities in other regions, New England's cities and towns have the power to shape their own environment with minimal interference from higher levels of government. However, this aversion to hosting affordable housing may be near-sighted. As each community vigorously defends its right to shape its own character, the region's collective interest in attracting and retaining workers suffers. And, as housing prices remain high, low-income households, already squeezed, have increasing difficulty finding affordable shelter.

New Englanders face unavoidably difficult tradeoffs as they confront the troublesome issue of affordable housing. The lack of affordable housing has the potential to affect not only individual households in the region, but also the region's economy itself. A successful solution will require coordination across cities and towns, metropolitan areas, and even states to create policies that will have a measurable effect on prices throughout the region. We hope that those who read this report will understand the issue better and will have better empirical tools at their disposal.

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Introduction

In recent years competitiveness as well as compassion has catapulted affordable housing to the top of the public policy agenda in every New England state—even as house prices have leveled off. A growing chorus of policymakers and employers is warning that expensive housing may be undermining the region's ability to attract and retain workers, especially those with skills in high demand. More and more households, spanning a wide swath of the income distribution, find that they can get more "bang for their buck" outside New England, particularly the region's major metropolitan areas. As a result, the cost of housing may be driving away households and repelling potential migrants, slowing growth in the region's workforce. Thus, concern about affordable housing has intensified with housing policy focused not only on the least fortunate members of their community but also on the region's ability to compete economically with other parts of the country.

This report provides, to our knowledge, the most thorough *region-wide* analysis of this problem ever undertaken. The authors analyze differences in housing affordability among specific socioeconomic, demographic, and occupational groups, for every New England state and for the region's principal metropolitan areas. These detailed breakdowns provide

unique insights into the incidence and severity of New England's housing problems and their implications for the region's competitiveness. The report also synthesizes what we know (and do not know) about why housing in many parts of New England is so unaffordable and why it has become increasingly so. Finally, the report discusses the larger public policy initiatives undertaken by state and local governments within the region that attempt to ameliorate the problem.

A. Changes in New England's housing market over the past decade

Ten years ago, the gap between house prices in New England and the rest of the nation was not as great as it is today. Between 1995 and 2005, real house prices increased by 85 percent in New England versus an increase of 56 percent nationwide (see Figure A.1). Over this period, the annualized growth rate in house prices for the region was 6.3 percent per year, about 1.4 times as fast as the national rate of 4.6 percent per year. Yet the rate of house price appreciation varied considerably over this period as the gap in house prices between New England and the rest of the U.S. began to widen in 1997 and accelerated sharply after 2001—with Massachusetts, New Hampshire, and Rhode Island leading the pack. Since then, the housing market in New England has slowed somewhat with real house prices gaining only 7.5 percent in New England in 2005, compared to an increase of 9.2 percent nationwide.

Many of the region's metropolitan areas also experienced rapid growth in house prices over the past decade.[1] Table A.1 shows that between 1995 and 2005, house prices almost doubled in the Boston-Quincy metro division, with an annualized growth rate of 7.7 percent.[2] In addition, the Rockingham County-Strafford County NH, Cambridge-Newton-Framingham MA, Manchester-Nashua NH, Providence-New Bedford-Fall River-Warwick RI-MA, Worcester MA, and Portland-South Portland-Biddeford ME areas all experienced annualized house price appreciation of 6 to 7 percent per year. Yet some cities, particularly those outside greater Boston, experienced appreciation rates that were more similar to the U.S. average. For instance, annualized growth rates in the Springfield MA, Burlington-

[1] Because of data limitations, we do not have a measure of changes in house prices in rural areas. But it seems likely that the price increase in rural areas is no greater than that experienced in large metropolitan areas.
[2] The Boston-Quincy metro division includes Norfolk County, Plymouth County, and Suffolk County.

South Burlington VT, and Hartford-West Hartford-East Hartford CT metro areas were at or below 4.6 percent per year, even slower than the nationwide average. Nonetheless, most of the New England metro areas listed here have experienced faster price increases than competitor metro areas outside the region, with San Francisco and New York being the notable exceptions.

Because of this rapid escalation in costs, prices for owner-occupied homes were significantly higher as of 2005 in many parts of New England compared to the rest of the country. Table A. 2 shows that the median price of an existing single-family home exceeded the national median in eight of the nine largest MSAs in the region. Among these, both the Bridgeport-Stamford-Norwalk and Boston-Cambridge-Quincy metro areas, which together are home to almost 40 percent of the region's residents, ranked among the top 13 of 156 areas surveyed by the National Association of Realtors.[3] However, high prices for owner-occupied houses are not prevalent in every part of the region; for instance, the median price in Springfield, MA was slightly below the national median. But even in the less expensive areas, prices were often greater than those in more affordable rival metro areas such as Philadelphia PA, Raleigh NC, and Phoenix AZ. Perhaps more than anything else, the growing divergence between house prices in New England and these competitor areas has stirred fears that New England's expensive housing may have become a serious competitive liability.

In contrast to owner-occupied housing, the prices of New England's rental housing units have not accelerated as quickly over the past decade. As shown in Figure A.2,

[3] The Boston-Cambridge-Quincy MA-NH metropolitan statistical area (MSA) includes four metro divisions: Boston-Quincy MA, Cambridge-Newton-Framingham MA, Essex County MA, and Rockingham County-Strafford County NH.

between 1995 and 2005 Boston-Brockton-Nashua, the only New England area surveyed by the Bureau of Labor Statistics in compiling its rent statistics, saw an annualized increase of 2.3 percent per year in inflation-adjusted terms.[4] While almost 2.5 times as fast as the national rate, it was much slower than the rate of increase in the region's real price of owner-occupied houses. Since 2002, rent appreciation in Boston-Brockton-Nashua has slowed down significantly; real rent remained constant in 2003 and 2004, and actually declined in 2005.

As a result, in 2005 the median gross monthly rent in New England, at $831, was only 14 percent higher than the national median of $728 (see Table A.3). Although Connecticut, Massachusetts, and New Hampshire were among the top 10 for median rent, rents in those states were only roughly 20 percent greater than the national median. Vermont and Maine had the least expensive rental housing in the region, with median rents that were 6 percent and 14 percent lower, respectively, than the national average. As with house prices, rents also varied considerably across metropolitan areas within New England. In 2005, median rents ranged from $667 per month in Springfield to $1,021 in the Boston-Cambridge-Quincy metro area and $1,067 in Fairfield County, CT. Yet, rents were still higher in many of the region's metro areas relative to competitor metro areas. For example, the median rent in Raleigh-Durham-Chapel Hill NC MSA was just $716, which is less than the median rent found in many metro areas within the region.

In spite of skyrocketing house prices in many parts of New England, the region's housing stock has grown slowly in recent years. As shown in Table A.4, the number of housing units in the region (including both rental and owner-occupied properties) grew by

[4] The calculation is based on CPI-rent of primary residence, which controls for the quality of rental housing.

only 3.2 percent between 2000 and 2005—less than half the national growth rate of 7.4 percent. With the exception of New Hampshire, all New England states ranked among the bottom 10 states. In particular, the rate of growth in housing in Rhode Island was the slowest among the 50 states, at just 1.8 percent.

Data on housing permits tell a similar, although improving, story. Although the regional rate of house permitting is lower than the national average, it has picked up in recent years. After falling by 7 percent between 1998 and 2001, total housing permits soared by 32 percent between 2001 and 2005. As a result, the total number of permits in 2005 was 53 percent higher than its 1995 level. In addition, Figure A.3 shows that the mix of permits between multifamily and single family units changed dramatically over the last decade. Multi-family permits grew by a whopping 315 percent between 1995 and 2005, but single family permits grew by only 22 percent. As a result, the share of multi-family housing units permitted jumped from 10 percent to 29 percent, suggesting that the supply of single family homes is especially tight.

Despite this recent growth, New England issued permits for only 413 housing units per 100,000 persons in 2005, slightly more than half the national average (Figure A.4). Housing permits were at their highest levels in Maine and New Hampshire with approximately 600 building permits per 100,000 residents. Vermont issued 468 permits per 100,000 residents, while the other three New England states–Massachusetts, Connecticut, and Rhode Island–had much lower levels of permit activity. In Rhode Island, only 264 permits per 100,000 residents were issued, which is just one-third of the national average. With lower rates of permitting and slower growth in its housing stock, it is not surprising that New England's owner-occupied residential vacancy rates fell relative to the U.S. over

the past decade. Between 1995 and 2005, the vacancy rates in New England and the nation diverged with the national rate increasing slightly but decreasing in all New England states except Maine (see Table A.5). In particular, vacancy rates in Vermont fell by 1.4 percentage points. Among the three large metropolitan areas listed, vacancy rates increased only in Boston MA-NH, by 0.3 percentage points. They remained constant in Hartford CT and fell by 1 percentage point in Providence-Fall River-Warwick RI.[5] By 2005, the national homeowner vacancy rate was 1.9 percent, not far below what is considered to be the "normal" rate in the real estate industry.[6] In contrast, the 2005 vacancy rates of the six New England states ranged from 0.5 percent in Vermont to 1.6 percent in Rhode Island. Boston's vacancy rate was 1.2 percent, more than double its 2004 value of 0.5 percent.

[5] According to the 2002 Greater Boston Housing Report Card, vacancy rates for residential rental properties were higher than those for homeowner vacancy rates throughout the region. As of 2005, the region-wide vacancy rate for rental properties was 6.2 percent—close to the "normal" rate of 6 percent.
[6] The normal vacancy rate of 2 percent is discussed on page 13 of the 2002 Greater Boston Housing Report Card.

B. The lack of affordable housing in New England: How big is the problem?

As the previous section described, on the whole, New England's housing is expensive and prices have risen rapidly over the past decade. But measuring whether housing has become unaffordable, and how housing costs affect different parts of the region and different groups, is not a simple question. For example, house prices grew more rapidly than per capita income between 1995 and 2005. However, this comparison is likely to overstate the affordability problem for a number of reasons, some of which we will be able to address in constructing our affordability measures and others which should be noted as caveats to our analysis. Below we discuss these refinements in our approach to measuring housing affordability and the development of three distinct indicators we used to examine various aspects of affordability in New England. This discussion is followed by the results of our analysis for both the rental and homeowner markets.

Measuring housing affordability

First, when evaluating affordability, one must take into account the ability of *households*, not individuals, to bear the costs of housing. Households generally pool their incomes in order to take advantage of economies of scale when consuming goods such as housing. Thus, our indicators measure ability to bear housing costs based on household income from all members and all sources (e.g. wages, pensions, transfer payments, etc.).[7]

Second, in the case of owner-occupied housing, price is not a completely accurate indicator of the cost of owning a home. Monthly payments made by homeowners are also

[7] Note that household formation may actually be driven by high housing costs if it causes people to form households in order to share housing expenses.

determined by other factors such as financing (e.g. mortgage interest rates and loan-to-value ratios), real estate taxes, and homeowners' insurance premiums. These costs are not always positively correlated with housing prices. For example, falling interest rates can partially offset rapidly rising house prices. Thus, our indicators measure housing costs for homeowners (on a pre-tax basis) as the principal and interest on the primary mortgage, monthly real estate taxes, and monthly insurance premiums for fire, hazard, and flood.[8] For renters, because many units include the costs of utilities, housing expenditures consist of "gross rent" equal to contract rent plus utilities.[9]

In addition to making the usual adjustments to incomes and costs, we also made two important refinements not found in existing studies. First, we limited our sample to households whose head is 25 years of age or older and not enrolled in school. This adjustment is important because individuals who are younger or investing in their education may temporarily have low incomes, yet still consume a relatively constant level of housing. As a result, housing costs are likely to comprise an unusually large share of their incomes.[10] Including these individuals in the analysis would overstate the share of households with long-term affordability problems.[11]

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[8] Principal and interest on second mortgages were excluded since households often choose to take out a second mortgages to make renovations to their house that are discretionary or to fund other expenses such as a child's college tuition. In 2005, homeowners with a second mortgage accounted for 29 percent of all homeowners with a mortgage in New England; for the U.S., their share was 25 percent.

[9] See appendix tables 1 and 2 for monthly median expenditures for renters versus homeowners.

[10] For example, median household income in New England for all households in 2004 was $53,400 compared to $55,000 for households where the head was age 25+ and not enrolled in school – a difference of $1,600. The majority of this difference came from restricting the sample to older households. Imposing the age and education restriction together reduces the share of households that are cost burdened by 2 percentage points for "very low-income" households and 1 percentage point for "middle-income" households.

[11] Limiting the sample in this manner still does not fully capture permanent rather than transitory incomes since households may be able to draw on personal savings or wealth to supplement their earnings. However, the personal wealth data needed to fully estimate permanent household income are not available on a timely or geographically disaggregated basis.

Second, since this report is primarily focused on how current market conditions are impacting the affordability of housing, we also excluded from our sample owner households without a mortgage.[12] As of 2005, most of these homeowners were elderly (median age of household head was 68 years in New England) and retired (50 percent had no household members in the labor force). As such, many of these households purchased their houses at a point in time when conditions in the housing market were very different than those of the past decade. Thus we chose to exclude these households from our analysis, particularly in light of the concern that high housing costs are affecting the ability of the region to attract and retain a skilled workforce.[13]

Finally, we acknowledge two important caveats to our set of indicators. First, we make no attempt to control for housing quality or local amenities such as good public schools, low crime rates and proximity to employment. Not controlling for changes in quality or neighborhood amenities may overestimate the true increase in house prices and potentially overstate the housing affordability problem. However, taking into account changes in quality or neighborhood amenities may understate the affordability problem if lower-income households would prefer to buy lower-quality homes or live in lower-amenity neighborhoods but are unable to find them due to an inadequate supply. Ideally, one would like to produce a range of estimates for each indicator with these considerations in mind. However, the available data on housing quality and neighborhood amenities is not at a sufficiently disaggregated level to allow for this type of detailed analysis.

[12] As of 2005, the share of homeowners without a mortgage was 30 percent for New England versus 33 percent for the U.S..

[13] Note that the majority of these households are in the very low-income category so that excluding them significantly reduces the share of households that are cost burdened by about 40 percentage points. For middle-income households, this restriction has a much smaller impact—excluding homeowners without a mortgage reduces the share of households that are cost burdened by only 6 percentage points.

Second, because our measures compare housing costs to the incomes of current residents, we are measuring housing affordability for those households that have already chosen to live in the area. To some extent, these households are finding ways to afford housing in the region since they are living here. Yet there is a group of households that are potentially even worse off—potential migrants to New England who would like to live in here but who cannot afford housing and so have chosen to live somewhere else. Not capturing these individuals in our measures has the potential to understate the housing affordability problem. However, identifying such individuals would require a sophisticated model of migration as well as detailed data on the various factors that influence people's migration choices. Such an analysis is beyond this report but is a topic for future research.

With these concerns in mind, we have assembled data for three distinct indicators that are designed to measure various aspects of affordability in New England for both the rental and homeowner markets:

- **Housing burden ratio:** the ratio of the costs of owning or renting a home to household income.
- **Housing income adequacy ratio**: the ratio of median household income to the minimum income needed to afford the median-priced rental or owner-occupied unit.
- **Housing availability ratio**: the ratio of the number of affordable units available to the number of households within a given income range.

By measuring different aspects of the ability of households to secure housing, we hope to present a comprehensive picture of housing affordability for the region. The first

measure indicates what households actually spend as a percentage of income, while the second measures whether their income is sufficient to afford the "typical" house or apartment in their range, and the third measures whether the supply of affordable units in their range is sufficient relative to the number of households seeking to rent or buy them.

Housing affordability in New England over the past decade

Using the three indicators described above, we examine housing affordability in New England. We examine both the current level of each indicator and the trend over the past decade (1995 to 2005). In doing so, we compare these indicators across a wide variety of socioeconomic and demographic groups. For each group, we compare indicators among states within New England, between the region and the nation as a whole, and across selected metropolitan areas. Within each group and geographic area, we compare indicators for both homeowners and renters since these households are typically concentrated in different parts of the income distribution (see Table B.1). For example, 56 percent of very low-income households in the first quintile, (those that had incomes in the bottom 20 percent of the income distribution), were renters.[14] In contrast, 74 percent of middle-income households in the third quintile (those with incomes in the middle 20 percent of the income distribution) were homeowners.

Such a varied, disaggregated analysis of affordability indicators is especially valuable to policymakers concerned about both the access of low-income households to affordable housing and the degree to which expensive housing is a competitive liability for New

[14] Note that of the 41 percent of very-low-income households that were homeowners, two-thirds had no mortgage loans since they tended to be older (median age of 68 years) and were likely to be retired (nearly half had no household members in the labor force).

England. For example, comparisons of affordability indicators for middle-income households, highly educated households, and young households provide additional insight into competitive issues than comparisons of more highly aggregated data. These households are more mobile than the population as a whole and are also more likely to have members possessing scarce labor skills highly valued by employers. We discuss our results for each of the three indicators in turn below.

Housing burden ratio

The first way we attempt to quantify affordability is simply calculating the percentage of income that New England households spend on housing. This measure is often referred to as a household's housing burden. Many studies of housing affordability use this type of threshold, typically defining a household as having a moderate housing burden if it spends more than 30 percent of its income on housing, and as having a severe housing burden if it spends more than 50 percent on housing (Joint Center for Housing Studies 2004). We follow this convention when categorizing households. Households experiencing *any* housing burden (moderate or severe) are those spending more than 30 percent of their incomes on housing while those spending more than 50 percent are considered severely cost burdened.

By this measure, our results show that affordability is primarily a concern for very low-income households. But even middle-income households are spending a large share of their incomes on housing, particularly in southern New England. Our evidence also shows that young and highly educated homeowners, as well as those working in service occupations,

are experiencing difficulty in finding affordable housing in some parts of the region, especially Massachusetts and Rhode Island.

Housing burdens by income quintile. Among households with very low incomes (which we define as those in the bottom 20 percent of the income distribution for the specific geographic area), housing burdens are widespread. In 2005, over three-quarters of very low-income households in the nation and the region alike were cost burdened, paying more than 30 percent of their household incomes toward housing (Table B.2, column 1).[15] In all New England states except Maine, housing costs appear to be particularly challenging for these households; over half of the households in the bottom income quintile reported severe housing burdens (column 6). Vermont has the region's highest share of households experiencing severe housing burdens—58 percent. However, it should be noted that for the region as a whole and for all New England states except Vermont, housing burdens for very low-income households were slightly below that for the U.S. as a whole.

High housing burdens are not limited to households at the bottom of the income distribution. As of 2005, roughly one out of every five middle-income households (in the middle 20 percent of the income distribution) spent more than 30 percent of their household incomes toward housing. However, all New England states had a lower fraction of severely cost burdened households relative to the nation (column 8).

Furthermore, more and more households are crossing the threshold of spending more than 30 percent of their incomes on housing. The percentage of households experiencing any housing burden (moderate or severe) has risen over the past few years, both nationwide

[15] Note that very low-income households are those in the bottom fifth of the income distribution and roughly correspond to the group of households with incomes at or below 80 percent or area median income as defined by the Department of Housing and Urban Development (HUD).

and in New England, with burdens in Massachusetts, New Hampshire, and Rhode Island accelerating particularly rapidly (see Figure B.1). Moreover, statistical tests show that a significantly greater share of households experienced any housing burden in New England versus nationwide for this group (see Table B.2, column 3). However, all New England states had a lower fraction of severely cost burdened households relative to the nation (column 8), although this difference is not statistically significant for Massachusetts and New Hampshire.[16]

However, housing affordability varies considerably within income categories depending on whether households are renters or owners. For example, the majority of the region's very low-income households are renters while nearly three-quarters of middle-income households are owners (Table B.1). Consequently, measuring housing burdens only in the aggregate could mask high burdens for different groups of households within income categories. In addition, since homeownership appears to be a goal for many American households, the relative incidence of high housing burdens among owners may be a more revealing indicator of affordability than the incidence of high housing burdens among households generally.

Within income groups, housing burdens are more common for homeowners than for renters throughout New England, but not necessarily across the nation. For middle-income households, the share of households spending more than 30 percent of their income on housing was 10.1 percentage points higher for owners versus renters in New England

[16] It has been argued that households at higher income levels, such as middle income households, can "afford" to spend more than 30 percent of their income on housing without finding it burdensome. However, the 30 percent and 50 percent income thresholds still provide a useful metric by which to compare the relative affordability of housing across different geographic areas for a given income group.

compared to a gap of only 3.1 percentage points nationwide (Table B.3, column 3 versus 4). For very low-income households, the gap between owners and renters bearing any housing burden (moderate or severe) was 10.6 percentage points; but elsewhere in the country the reverse was true—a higher share of renters than owners reported experiencing any housing burden (Table B.4, column 3 versus 4). Similar patterns hold for middle-income and very low-income households with severe housing burdens. Note that for both income groups housing burdens for renters were lower than that nationwide while for owners the reverse was true.

Since 2000, the percentage of middle-income homeowners who are experiencing housing burdens has risen in every New England state except Connecticut. For example, in Rhode Island, 17 percent of middle-income households reported experiencing any housing burden (moderate or severe) in 2000; 32 percent did so in 2005 (Figure B.3). Because roughly three-quarters of this group owns a home, such rapid increases in housing burdens among middle-income homeowners are striking. With homeownership rates rising faster than the U.S. in some New England states, the recent increase in housing burdens for homeowners may reflect an increasing number of households becoming homeowners over this period—particularly if households on the margin of buying versus renting are stretching financially to get into the housing market.[17]

Housing burdens by age, education, and service occupation. Our evidence also shows that young and highly educated households, as well as those working in service

[17] See U.S. Bureau of the Census http://www.census.gov/hhes/www/housing/hvs/hvs.html for rates of homeownership by state.

occupations, are experiencing high housing burdens in some parts of the region, especially Massachusetts and Rhode Island.

Since younger households typically looking to purchase their first home are more mobile than older groups, they may be especially sensitive to the burden of housing in general and of owner-occupied housing in particular. As of 2005, nearly one-quarter of young (age 25 to 34 years) homeowners in Massachusetts and Rhode Island were paying more than 30 percent of their household incomes towards housing, versus 19 percent nationwide (see Table B.5). However, this was not uniformly true across the region; young homeowners in Maine, and Vermont experienced lower housing burdens than their equivalents nationwide.

Like younger homeowners, highly educated owners also are more likely to face housing burdens in New England than in the nation as a whole, a trend that has persisted over the past decade (see Figure B.5). But the difference between the region and the nation is not that great. Households headed by a college graduate that own a house in high-cost southern New England are only a few percentage points more likely to experience any housing burden, or even a severe housing burden, than their counterparts nationwide (see Table B.6, columns 7 and 8). Not surprisingly, homeowner burdens are in fact far worse for households headed by a high school graduate (columns 3 and 4). Among renters, whether high school or college graduates, affordability problems in New England were more or less similar to those in the nation (columns 1, 2, 5 and 6).

In recent years, some housing advocates have expressed concern about the affordability of owner-occupied housing for households with at least one member in a service occupation, such as teaching, nursing, or police work. Many consider these

occupations to be critically important. However, because people engaged in them tend to be employed in the public or nonprofit sectors, their incomes may not be sufficient to enable them to live nearby the communities they serve. As of 2005, New England homeowners working in one of these occupations had higher housing burdens than their counterparts nationwide and were most likely to encounter affordability problems in Massachusetts, Vermont, and Rhode Island (see Table B.7, columns 3 and 4). However, burdens are higher for renters versus homeowners for this group (columns 1 and 2). This may reflect the fact that households containing a teacher, nurse, or police officer that own a home are those that also contain household members who are better compensated, such that their combined household incomes make it possible for them to purchase a house. In contrast, households relying primarily on the income of service workers are more likely to be renters than owners.

Housing income adequacy ratio

While the percentage of household income spent on housing is a useful indicator of housing affordability, it has two limitations. First, it cannot differentiate owners who bought their houses recently from owners who bought some time ago, when housing was much less expensive. The experience of recent buyers more accurately reflects that faced by potential in-migrants and by renters aspiring to own a home. Second, housing costs as a percentage of household income also reflects choices made by households due to differences in preferences. For example, some households may prefer to spend more than 30 percent on housing to live in higher quality housing or better school districts. If so, one should not necessarily characterize their relatively high cost-to-income ratios as

burdensome. Alternatively, other households facing involuntary expenses such as medical costs may find that spending, say, even 20 percent of their income on housing is burdensome.

To get at these issues, we compare the distribution of household income to the distribution of incomes needed to afford various prices of houses or rentals. This allows us to examine whether, say, the median household can afford a median house. Implicit in this approach is the assumption that households earning the median income should be able to or would want to rent the median-priced apartment or purchase the median-priced house. This is a reasonable, albeit arbitrary, assumption, and it provides a common measuring stick by which we can compare affordability across geographic areas and demographic groups. In addition, this measure gives us some sense of the magnitude of the disparity between household incomes and the prices that households face in the market.

We calculate the annual income needed to afford housing based on the prices of rental and owner-occupied units in each geographic area. For rental units, we assume that households spend no more than 30 percent of their annual income to rent the median apartment. We chose 30 percent because it is the standard threshold used to distinguish affordable from unaffordable burdens. For owner-occupied units, we assume that households spend no more than 28 percent of their annual income to pay the mortgage on the median-priced house (equal to principal and interest payments, real estate taxes, and homeowners' insurance premiums). We chose 28 percent because it is the lending industry standard used to determine whether potential buyers have enough income to qualify for the

mortgage. We assume a conventional 30-year fixed rate mortgage with an 80 percent loan-to-value ratio (e.g. 20 percent down payment). [18]

The ratio of median household income to median housing cost (as defined above), which we call the housing income adequacy ratio, indicates whether housing is affordable for that income range. Housing income adequacy ratios of 1.0 or higher indicate that housing is affordable in a given geographic area. For example, a housing income adequacy ratio of 1.20 indicates that the median household earns 20 percent more income than it needs to afford the median-priced house (or rental unit); similarly, a ratio of 0.75 indicates that the median household earns 25 percent less than it would need to afford the median house (or rental unit). Note that this ratio can also be calculated for other percentiles, not just the median.

We compare housing income adequacy ratios across various geographic areas and demographic groups, including a subset of households most likely to be potential first-time homebuyers—young households (aged 25-39) who currently do not own a home. We assume that these households aspire to purchase a starter house equal to 85 percent of the median house price within their geographic area,[19] and that they receive mortgages on more lenient terms than a conventional loan.[20] We also calculate housing income adequacy ratios for young professionals—households headed by college graduates who are between the ages of 25 and 39. Since young professionals are relatively mobile and possess critical labor skills

[18] See appendix tables 3 and 4 for more details on sources of data and how the rental and homeowner affordability measures were constructed

[19] Based on their biennial survey of homebuyers, the National Association of Realtors defines starter homes as costing 85 percent of the median price in any given market.

[20] We assume first-time homebuyers secure a 30-year fixed-rate FHA loan with a loan-to-value ratio of 95 percent and a qualifying income ratio of 29 percent. We also assume first-time homebuyers pay monthly personal mortgage insurance premiums of 0.5 percent of the outstanding balance of the loan. See appendix table 5 for the details regarding these calculations.

that are in high demand, the affordability of housing for this group is a potentially useful indicator of whether the cost of housing may impact the region's economic competitiveness.

Housing income adequacy by income quintile. As in the case of housing burdens, our analysis of housing income adequacy ratios shows that for New England's middle-income households, the rental market is more affordable than the homeowner market. Table B.8 shows that in 2005, the household with the median income in each state earned between 1.5 and 2 times the income needed to rent the median-priced apartment (column 1). Moreover, the housing income adequacy ratio for rental housing in every New England state was roughly comparable to the national ratio. Even potential first-time homebuyers in the middle 20 percent of the income distribution found the rental market in every New England state to be affordable, both absolutely and relative to the rest of the country (column 3).

However, median-income households in every New England state were not able to qualify for a traditional 30-year fixed rate mortgage (with 20 percent down) to purchase the median-priced house in their state (Table B.8 column 2).[21] (Nor were such households able to qualify nationwide, for that matter.) In fact, potential first-time homebuyers at the middle income level in Connecticut, Massachusetts, and Rhode Island would have had to more than double their incomes in order to be able to afford the median-priced starter house in their states (Table B.8 column 4). Since 1999, housing income adequacy ratios for middle-income households have declined throughout New England and in the nation as a whole (Figure B.6), indicating that the gap between household income and the income

[21] In fact, in some New England states (Massachusetts and Rhode Island) higher income households in the fourth quintile were just able to afford the median priced house.

needed to purchase the median-priced house has been growing over time. Declines have been especially steep in Maine and Rhode Island.[22]

For very low-income households, we again find that although renter households in New England fared better than those in the U.S., homeownership remains out of reach for many of these households. Table B.9 shows that the bottom quintile of households in each New England state except Connecticut and New Hampshire earned incomes that were sufficient to rent apartments at the 10th percentile of the rental distribution (column 1). By contrast, their counterparts elsewhere in the nation were not able to afford to rent even these low-cost apartments. Since 2000, rental affordability for very low-income households has shown no significant upward or downward trend in any of the six New England states (Figure B.7).

However, based on detailed house price data available only for Connecticut, we find that owner-occupied units are much less affordable than rental units for very low-income households. In Connecticut, these households would have to triple their incomes in order to purchase the least expensive houses at the 10th percentile of house prices (Table B.9, column 2). Potential first-time homebuyers would have to quintuple their incomes in order to buy into the lower end of the market for starter houses in that state (column 4).

Moreover, over the past five years very low-income households have apparently experienced a double whammy when it comes to housing affordability. Using the same house price data for Connecticut, Table B.10 shows that the least expensive houses have appreciated more rapidly than the median house price, while the incomes of very low-

[22] Note that for potential first-time homebuyers in this group, affordability actually improved for a brief period during 2001-2003 as interest rates fell.

income households in this state have actually fallen in real terms. As a result, housing affordability decreased sharply for this group, with very low-income households earning about half the income needed to purchase a house at the tenth percentile in 1999, but less than one-third of the income needed to purchase such a house in 2005 (column 4). By contrast, incomes grew for households in the middle 20 percent of the income distribution while house prices in the middle 20 percent of the housing distribution appreciated more slowly (columns 5 and 7). Yet the pace of house price appreciation far outstripped that of real income growth, such that housing affordability decreased even for this group—consistent with our previous results.

However, looking at housing income adequacy ratios by state masks considerable variation in affordability across metropolitan areas. Table B.11 reveals that there were some areas within each New England state where owner-occupied housing was affordable to middle-income households in 2005. For example, within Connecticut, middle income households were able to afford the median-priced house in Hartford, but not in the New Haven or the Bridgeport-Stamford-Norwalk areas (column 1). In Massachusetts, middle income households could afford to purchase a house in MSAs in the central and western parts of the state (Springfield and, to a lesser degree, Worcester), but not in the greater Boston area. In New Hampshire the Manchester-Nashua area was more affordable than the southern counties that border Massachusetts. However, potential "first-time homebuyers" could not afford to purchase the median-priced "starter" house in any of these MSAs

(column 2). Figure B.8 shows that affordability has declined since 1999 in each of the New England metro areas.[23]

Finally, from the perspective of economic competitiveness, few metro areas within New England were as affordable as the region's competitor cities in the south and west. These are cities with similar advantages in terms of an educated workforce, large knowledge-based and high-tech industries, and established financial sectors. The most affordable competitor areas were Phoenix, AZ and Raleigh, NC; only three New England metro areas (Hartford, CT , Springfield, MA, and Manchester-Nashua, NH) were equally as affordable in 2004. Relative to the whole group of competitor cities, Boston compared favorably only to the New York and San Francisco areas.

Housing income adequacy by age, education, and service occupation. For these groups, our analysis of housing income adequacy ratios yields results similar, but not identical, to our housing burden analysis. Note that because affordability was not a problem for these groups in rental markets, we focus our analysis only on their opportunities for homeownership.

The housing income adequacy ratio measure shows that both younger households and households headed by a college graduate found New England less affordable than the U.S. (see Table B.12). Breakdowns by age show that in every New England state in 2004, households headed by 25-34 year olds were less likely to be able to qualify for a loan to purchase the median-priced house than households in their prime earning years (age 35-44 and 45-54). For the youngest group, houses in three of the six New England states—

[23] Note that housing income adequacy ratios in all MSAs are higher than the housing income adequacy ratio of the state in which they are located, suggesting that housing affordability may be an especially serious problem in rural areas.

Connecticut, Massachusetts, and Rhode Island—were considerably less affordable than elsewhere in the nation.[24]

Households headed by a college graduate were just able to afford the median-priced house (see Table B.13). However, the housing income adequacy ratio in Connecticut, Massachusetts, and Rhode Island was considerably below the nationwide ratio. Moreover, the homeowner market has become less affordable for college graduates since 1999, and the rate of decline was notably larger in two New England states (Maine and Rhode Island) than in the U.S. as a whole (Figure B.9).

In addition, because households headed by young college graduates are so mobile and so highly valued in many New England labor markets, we performed a separate analysis of housing affordability faced by these households, broken down by metro area. To achieve this geographic level of disaggregation, it was necessary to use U.S. Census data for 1990 and 2000. Our results, reported in Table B.14, show that young professional households could afford to purchase the median-priced house in each New England metro area in the year 2000 (column 3). However, this group found many of the competitor metro areas to be more affordable—particularly Phoenix AZ, Philadelphia PA, Chicago IL, and Raleigh NC. Moreover, affordability decreased sharply for these households in each of the New England metro areas between 1999 and 2000 (Figure B.10). Note that one should exercise caution in extrapolating these results to 2005 as affordability for college-educated households fell precipitously in states such as Maine and Rhode Island between 1999 and 2005.

[24] The difference between the housing burden ratio and the housing income adequacy ratio for young homeowners most likely reflects selection into homeownership. Young potential homebuyers are still in the process of forming households and more likely to be income constrained such that they delay purchasing a home until their household incomes are in the upper part of the income distribution.

Finally, households in which one member is in a service occupation were able to purchase the median-priced house in every New England state as of 2005 (Table B.15). However, housing income adequacy ratios in Connecticut, Massachusetts, New Hampshire, and Rhode Island were considerably lower than in the nation as a whole.[25] In Massachusetts in particular, households containing at least one service member could just barely afford the median-priced house whereas these households earned incomes that were nearly 1.4 times that needed to purchase the median-priced house nationwide. Furthermore, affordability ratios for owner-occupied homes have been declining for households with members in service occupations since 1999 (Figure B.11).

Housing availability ratio

What share of total existing housing units are affordable to very low-income or middle-income households? Are there a sufficient number of affordable housing units relative to the number of households that need them? Neither the housing burden nor the housing income adequacy ratios address these important questions. For example, even if very low-income households within a given geographic area are able to afford the least expensive apartments, the supply of units in that price range might still be insufficient to meet their demand. If so, the area still has an affordability problem.

In this section, we construct two measures to examine whether there is a mismatch between supply and demand for both very low-income and middle-income households:

[25] Note that the percentage of service occupation households reporting moderate and severe housing burdens in New Hampshire was relatively low for 2005. The difference between the housing burden ratio and the housing income adequacy ratio for these households most likely reflects selection into homeownership. Households containing a teacher, nurse, or police officer are less likely to purchase a home unless they also possess other household earners such that their household incomes are in the upper part of the income distribution.

- Ratio of the *number* of housing units that are affordable in an area to the *number* of households within a given income range
- Ratio of the number of affordable housing units that are *available* to the number of households within a given income range—excluding from the numerator affordable units that are occupied by higher-income households.

For both measures, a ratio of 1.0 or higher indicates that there is a potentially sufficient supply of affordable units for households in a given income group. The first measure indicates whether there is a potentially sufficient supply of housing units affordable given the number of households in each income group. The second measure indicates whether the potential supply of affordable units is actually available, taking into account of the fact that a unit affordable to a middle-income household might be occupied by a higher-income household—a situation that is particularly likely to happen when supply is constrained. Thus, the first measure represents the maximum availability based only on the price of the unit while the second represents the minimum availability based on both the price of the unit as well as the characteristics of the unit's current occupants.

Housing availability by income quintile. As of 2005, the number of affordable houses nationwide and in most New England states was roughly twice as large as the number of middle-income households (see Table B.16, column 1). Yet, more than half of these affordable units were occupied by higher-income households (column 2).[26] This suggests that there may be a significant amount of crowding out from households in the

[26] These ratios are based on owner-reported house values, not market prices. As such, they will be biased to the extent that owners over- or under-estimate the values of their homes. The literature is mixed on which direction the bias goes in with earlier studies showing a propensity for owners to overestimate the value of their homes and later studies showing the opposite.

upper part of the income distribution.[27] Note also that this measure includes all houses below a particular price threshold, right down to the least expensive house. As such, the indicator may include many units that, although affordable, would be considered by middle income households as undesirable by virtue of its inferior quality.[28]

In particular, our availability measures for Massachusetts and Rhode Island were considerably lower than those for the U.S., suggesting that the supply of owner-occupied units affordable to middle income households in these two states is relatively tight. Moreover, the ratio of the number of units available to the number of households fell below 1.0 (Table B.16, column2), indicating that the supply of owner-occupied housing in these states was not sufficient, in part because these units higher-income households were moving down the house price distribution to occupy these units. Moreover, the share of affordable stock has been consistently decreasing since 2003 in Massachusetts and New Hampshire (see Figure B.12).

Yet, not all middle-income households in New England own, or want to own, their own home. As shown in Table B.1, over one-quarter of them were renters in 2005. If we include the affordable rental units that are available to this group, the combined supply of rental and owner units is more than sufficient with availability ratios within the region ranging from 2.25 to 2.57, close to the national ratio (Table B.16, column 3). However, this assumes that New England's middle-income households are willing to either rent or own as well as live in even the least expensive units.

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[27] Note that it is likely that some portion of the high-income households occupying these units saw their incomes rise during subsequent years after they purchased their homes.

[28] Indeed, if we also exclude the only houses affordable to very low-income households, (on the assumption that middle income households, although able to afford these units, would not want them), then the supply ratio falls below 1.0 in each of the six New England states.

Given evidence that high-income households are occupying housing units affordable to households further down the income spectrum, it is no surprise that the supply of affordable housing available to very low-income households in New England is woefully inadequate. As of 2005, there was roughly one affordable apartment for every two such households (Table B.17, column 1). Excluding those apartments occupied by higher-income households, there was approximately one affordable apartment that was available for every three very low-income households (column 2). Note that excluding apartments occupied by students makes the situation even worse. Adding in affordable rental units improved the picture, but only slightly (column 3). No wonder that the majority of low-income households bear moderate or severe housing burdens. For them, there are simply not enough affordable units to go around. Moreover, the apartments in this income range are those at the very bottom of the housing distribution and may be of inferior quality.

C. Why has housing become so unaffordable in parts of New England?

Why has owner-occupied housing become so unaffordable in parts of New England, especially relative to that in other parts of the country? Why has this affordability gap widened in recent years? Policymakers need answers to these questions if they are going to craft policies that address the region's housing problems effectively.

Rising house prices are a function of both increased demand for housing as well as limits on the supply of housing required to meet that demand. In the basic economic framework, when demand exceeds supply, a shortage will occur, causing house prices to rise. In a free market, rising prices will prompt producers to supply more housing until demand and supply equilibrate and prices stabilize. This section reviews two types of potential causes: those that have strengthened the demand for owner-occupied housing and those that have limited the growth in supply. Where possible, we present data from New England to shed some light on the degree to which each of these factors has contributed to the recent increase in house prices within the region.

Factors strengthening the demand for housing

It is possible that high and surging demand for housing may have led to the rapid increase in house prices over the past decade, thereby exacerbating affordability problems within New England. Factors that may have fueled demand within the region include 1) rising income levels, 2) increasing income inequality, 3) changing demographic trends, 4) enhanced access to mortgage credit, and 5) high and rising expectations of house price appreciation. Note that although some factors—such as rising income levels and enhanced access to mortgage credit—are likely to have boosted the ability of New Englanders to

afford housing, they may have also stimulated housing demand beyond usual levels and thereby driven up housing prices—ultimately resulting in a net reduction in housing affordability.

Rising income levels

Other things equal, the demand for housing increases with income. Consequently, the high and relatively rapid rise in housing prices throughout the region may be partly attributable to the region's high and relatively rapid rise in income levels (Rosen 2005). Table C.1 shows that over the past decade all New England states, with the exception of Maine, have experienced faster real income growth than the nation as a whole (Duca 2004). As of 2005, median household income in every New England state with the exception of Maine was above that of the U.S. Most notably, median household income was considerably higher than the national median in Connecticut, Massachusetts, and New Hampshire—places where house prices have appreciated rapidly within the region.

Thus it is possible that high and rising incomes may have enhanced the ability of New Englanders to afford high and rising housing prices, possibly fueling demand. However, given that the annualized rate of positive income growth was on the order of 1 to 2 percent over the last decade, it is unlikely that these trends are the primary explanation for the relatively rapid rise in house prices and subsequent deterioration in affordability in some parts of the region.

Increasing income inequality

High and rising income inequality may also have exacerbated New England's housing affordability problems. High-income households, by virtue of their

disproportionately large purchasing power, may have bid up prices in the owner-occupied housing market, leaving lower-income households no choice but to meet market prices or rent in the short run. In the long run, developers may also have a greater incentive to build more expensive houses to meet the demand of high-income households rather than building more affordable units, particularly if supply is restricted by local land-use regulations. Either effect could raise house prices.

There is some evidence that rising income inequality may have contributed to the rapid increase in house prices in New England over the last decade. A recent study of "superstar" cities, such as Boston and New York, finds that metro areas where the share of high-income population has increased have also experienced relatively rapid house price appreciation and slower growth in the supply of new housing units (Gyourko, Mayer, and Sinai 2004). In addition, a recent analysis of changes in family income inequality by the Economic Policy Institute and the Center on Budget and Policy Priorities[29], found that between 1990–92 and 2001–03 five of the six New England states experienced significant increases in inequality, possibly accelerating growth in home prices in those states (see Table C.2). Moreover, in four of these states, the rise in inequality over this period was greater than that for the U.S. as a whole.[30] However, it should be noted that although the change in inequality was greater in New England than elsewhere, as of 2001–03 the level of

[29] Bernstein, McNichol, and Lyons, 2006.

[30] Corroborating these findings, Lynch (2003) found that during the late 1990s, income inequality increased in both the U.S. and New England, with New England experiencing an even larger increase than the nation as a whole.

inequality for each of the New England states was either equal to or less than that nationwide. [31]

Changing demographic trends

Over the past decade, New England has undergone a number of demographic changes, some of which might have affected the demand for housing. In particular, while New England's total population has been growing relatively slowly (see Figure C.1), the share of 30 to 60 year-olds has been expanding relatively quickly over the past decade. This is particularly true in Connecticut, Massachusetts, New Hampshire, and Rhode Island, where 30 to 60 year-olds have been gaining population share more rapidly than in the nation (see Table C.3). As of 2005, the share of population attributable to this group was higher in all six New England states than in the nation as a whole.

Research shows that the growth in house prices is positively correlated with the share of the total population accounted for by people in the 30- to 60-year old age bracket (Case and Mayer 1996). However, it should be noted that while this trend is significantly different for New England relative to elsewhere in the country, the rate of increase in the share of 30 to 60 year-olds is much slower than the rate of increase in housing prices. Thus, it is unlikely that changes in the share of 30- to 60-year olds would be the major driving force behind the rapid appreciation in house prices over the past decade.

Enhanced access to mortgage credit

A relaxation of one or more of the three major constraints that potential homeowners face when seeking a mortgage—income, wealth, and credit quality—along with falling

[31] See Tables 2 and 2A in Bernstein et al. (2006).

interest rates, could also have accelerated the rise in home prices. Although the major impact of lower interest rates is to reduce the financing cost for homebuyers (that is, reducing the user cost of owner-occupied housing), falling interest rates can also relax income constraints by reducing monthly mortgage payments. Other mortgage innovations, such as first-time homebuyer programs that reduce down payment requirements, may loosen wealth constraints. Finally, the greater willingness of lenders to issue sub-prime loans could ease credit-quality constraints faced by borrowers with less-than-perfect credit histories. Any of these factors are likely to have enhanced access to mortgage credit in recent years, possibly fueling demand within the region and putting upward pressure on prices.

Falling interest rates. Research shows that low and declining mortgage interest rates have played a major role in stimulating housing demand throughout the nation (Feldman 2001, Rosen 2005, and Greenspan 2005). As shown in Figure C.2, the interest rate on the 30-year fixed mortgage dropped by more than one quarter over the past decade, from 7.9 percent in 1995 to 5.8 percent in 2004, resulting in its lowest level in more than three decades. In 2005, it rose to 6.2 percent, which is still 22 percent lower than its value from a decade ago. Over the same period, the interest rate on the 1-year adjustable-rate mortgage (ARM) fell even more sharply, from 6.1 percent in 1995 to below 4 percent in 2004; in 2005, it rose slightly to 4.4 percent.

Although the drop in interest rates was no greater in New England than the rest of the country, it still could have fueled increasing demand in the region relative to elsewhere—particularly in the larger metro areas (such as Greater Boston) where the long-term rate of home appreciation is high. In these areas, the tendency of residential values to

grow rapidly is a strong, persistent inducement to buy a home. Consequently, any change in the overall incentive to purchase a house is more likely to result from, and be especially sensitive to, variation in factors other than expected long-term capital gains, such as interest rates (Himmelberg, Mayer, and Sinai 2005).

Income constraints. An income constraint is binding if mortgage applicants cannot meet the qualifying debt-to-income ratio, which usually requires that the monthly mortgage payment not exceed 28 percent of monthly household income. Di and Liu (2005) show that income constraints are an important barrier to homeownership, especially for low-income first-time homebuyers.

Over the past decade falling interest rates have made it easier for mortgage applicants to meet the debt-to-income requirement, controlling for income and the size of the loan. The increasing use of ARMs has further relaxed income constraints since the initial interest rate on an ARM is generally much lower than that on a 30-year fixed rate mortgage, thereby lowering early monthly mortgage payments. Research shows that the use of ARMs appears to stimulate housing demand, with borrowers demanding more expensive houses if the loan is financed with an ARM versus a fixed-rate mortgage (Brueckner and Follain 1989).

As shown in Figure C.3, the share of ARMs has been trending upward for both the nation and New England since 1998. A larger increase in the share of such mortgages occurred in Massachusetts, Rhode Island, and New Hampshire—states that have posted some of the highest rates of appreciation in the region. Yet it is not clear whether the use of ARMs has spurred housing demand within New England or whether these mortgages have gained in popularity in response to the rapid increase in prices within the region.

Other innovations in the mortgage market also might have helped to further ease the burden of income constraints. For example, the use of nontraditional loans such as interest-only loans and payment-option loans may have significantly reduced borrowers' monthly mortgage payment amounts—at least initially.[32] These products might have enabled some people to purchase homes that they otherwise might not have been able to afford and thereby added to housing demand (Greenspan 2005).[33] The popularity of nontraditional loans has surged in the past two years, the only period for which data are available. For example, interest-only loans accounted for about 20 percent of mortgages issued in Massachusetts in the first half of 2005 (Associated Press Newswires 2006). According to the July 2005 Senior Loan Officer Opinion Survey on Bank Lending Practices conducted by the Federal Reserve Board, more than half of domestic banks reported a substantial or moderate increase in their nontraditional residential mortgage originations over the 2004-2005 period.[34] Given the disproportionate share of ARMs and nontraditional loans in New England, it seems plausible that these factors loosened income constraints and played a role in stimulating housing demand across the region.

Wealth constraints. A wealth constraint is considered binding when a potential homebuyer does not have enough money for a down payment. Barakova, Bostic, Calem, and Wachter (2003) and Di and Liu (2005) find that wealth remains the most important borrowing constraint, although its importance fell in the 1990s due to increasing use of

[32] Interest-only loans allow borrowers to make no payments on the principal during the first several years. Payment-option loans allow borrowers to choose a monthly interest payment above a certain minimum amount, without requiring them to make any payment on the principal during the first several years.
[33] However, one may argue that lenders are willing to offer these new products because housing prices have been rising; if borrowers default on their nontraditional loans, it would not be difficult for borrowers to sell the house and pay off the loan or take out another loan from a less scrupulous lender.
[34] We do not have information on nontraditional loans in other years because the July 2005 Survey marks the first time the Federal Reserve Board asked banks about their practices on these mortgage products.

financing-aid programs by lenders and the public sector. Di and Liu (2005) also show that the magnitude of the wealth constraint is more significant at the lower end of the wealth distribution, where first-time homebuyers are more likely to concentrate.

Changing wealth constraints can be examined by looking at changes in loan-to-price (LTP) ratios. If households were making smaller initial down payments in recent years, then LTP ratios would be rising over time.[35] As shown in Figure C.4, however, the average LTP *decreased* over time for both New England and the nation from 1997 to 2003.[36] Moreover, the decline in LTP ratios in all the New England states except Vermont was steeper than that nationwide over this period. Thus, the majority of homebuyers in New England were increasing their down payment percentages more rapidly than homebuyers in other regions.

Another way to examine the development of wealth constraints is to look at the share of loans with high loan-to-value (LTV) ratios—those where the loan is greater than 80 or 90 percent of the value of the house.[37] Both the mortgage industry and the public sector have developed programs to help low-income, first-time homebuyers by lowering the standard 20-percent down payment (thereby raising the LTV above 80 percent). These programs may have had a significant impact on loosening wealth constraints, thereby fueling housing demand. If this were the case, we would expect that the share of high-LTV loans would be increasing over time. However, as shown in Figure C.5, the share of loans nationwide with

[35] This is because the down payment as a percentage of the purchase price equals one minus the LTP: [down payment / purchase price] = 1 – [loan / purchase price].
[36] Note that this does not include mortgages issued to refinance existing loans.
[37] The ratio of loan to value is nearly equal to the ratio of loan to price, on average.

high LTV ratios fell over the past decade.[38] As of 2005, all of the New England states except Maine and Vermont had a smaller share of high-LTV loans compared to the nation as a whole (see Table C.4).[39] Those New England states with more rapid house price appreciation—Massachusetts, New Hampshire, and Rhode Island—had a lower share of high-LTV loans compared to other states within the region, most likely because existing homeowners in those states could draw on greater equity for subsequent house purchases.

The decreases in the average LTP ratio and the share of loans with high LTV ratios go against what the popular press has suggested about the impact of reduced wealth constraints on borrowing. Are there other factors that might have caused a decline in the average LTP ratio and share of high LTV loans? Himmelberg et al. (2005) argue that because existing homeowners could sell their homes and realize capital gains accumulated during the recent housing boom, they were able to make larger down payments on subsequent home purchases. Regardless of the reason why, the evidence does not seem to suggest that housing demand in New England increased because of reduced wealth constraints.

Credit-quality constraints. Lastly, easier access to mortgage credit may have stimulated housing demand by relaxing credit-quality constraints. Some potential homebuyers have difficulty obtaining mortgages because of their poor credit ratings. Barakova et al. (2003) show that the credit-quality constraint has a significant negative impact on access to homeownership and that this constraint became more binding over time

[38] Note these data are for all homebuyers combined. It may be the case that the share of high-LTV loans increased for first-time homebuyers over this period, thanks to the financing aid from lenders and the public sector. Unfortunately we do not have data on LTV values for first-time homebuyers to test the hypothesis.
[39] Data on the share of high-LTV loans by state do not exist prior to 2004, so we cannot determine whether New England experienced a larger or smaller decrease over the past decade.

due to an increase in the number of households with impaired credit quality during the 1990s. If borrowers have limited or impaired credit histories, lenders could offer them sub-prime loans, usually loans with high interest rates and a short-term ARM structure (Angell 2004). Table C.5 shows that between 2003 and 2004, the share of mortgages accounted for by subprime loans increased more sharply in southern New England relative to the nation as a whole. The increase in Rhode Island was particularly sharp, such that one-quarter of home purchase originations were sub-prime loans by 2004. Thus it appears that relaxed credit-quality constraints may have contributed to increasing demand for housing in southern New England, particularly Rhode Island, although the share of sub-prime loans in the rest of the region is relatively small.

High and rising expectations of house price appreciation

High expectations of a rapid increase in house prices, especially those faster than the long-term trend, also may have boosted housing demand in New England. A 2002 survey of new homebuyers by Case and Shiller found that most homebuyers in Boston expected housing prices to continue rising over the next several years, on the order of about 15 percent per year (see Table C.6). In addition, some signs of "herd behavior" emerged among the Boston homebuyers—about one-third were afraid of being priced out of the market and reported being influenced by market excitement. Yet similarly high expectations were also prevalent in Milwaukee—a metro area that was identified by the survey as not experiencing a housing boom.

High and rising expectations are important because housing is different from other goods in that it not only serves as shelter, also is often the largest investment held in most

household portfolios. After the 2000 stock market crash, a significant number of investors might have moved some of their capital from stocks to real estate, hoping to earn a better return and inadvertently fueling demand in the housing market—particularly in places where house prices were expected to rise. Table C.6 shows that approximately 90 percent of homebuyers in the Boston area thought of their home purchases as an investment—either as a major consideration or in part.

Mortgage data collected through the Home Mortgage Disclosure Act also suggest that home purchases for investment purposes or as second homes may have grown over the period we examine. Figure C.6 shows that the share of non-owner-occupied home purchase mortgage originations has increased for all six New England states from 1995 to 2004. Yet there is considerable variation in the share non-owner-occupied home purchases across the region with both Maine and Vermont having both a higher level of and a higher increase relative to the nation. However, it does not necessarily mean that these two states have a larger share of investors; rather it is more likely that people are buying second homes in Maine and Vermont for recreation and vacation.[40]

Thus, speculative home buying in New England may not be as prevalent as the popular press has suggested (Jackson 2005 and DePasqual 2005). One possible explanation is that returns to speculation in homes are significantly reduced by transaction costs, including commissions, taxes, points, and other fees (Greenspan 2005). Another reason could be that not many people can afford to be speculators given the already high price of

[40] According to the 2005 American Community Survey, the share of vacant housing units for seasonal, recreational, or occasional use in Maine and Vermont is 14.8 and 14.6 percent, respectively, much higher than the nationwide share of 3.1 percent.

housing in the area.[41] Finally, speculative activity may be more difficult to pursue in certain areas if the supply of housing is limited.

Factors limiting the supply of housing

Slow growth in the supply of housing may also be responsible for exacerbating affordability problems within New England—either directly by limiting the number of affordable units or indirectly by raising prices. Indeed, we have seen that areas in the region where prices have risen more rapidly (Massachusetts and Rhode Island) have produced less (rather than more) new housing compared to places where price increases have been more modest. Factors that may have limited the supply of housing within the region include 1) rising costs of physical construction, 2) increasing land prices, and 3) greater regulatory barriers to new construction.

Rising costs of physical construction

House prices should be roughly equal to construction costs plus land prices plus the costs associated with regulatory barriers (Glaeser, Gyourko, and Saks 2005). Thus, the ratio of construction costs to house prices (CC/P) represents the contribution of construction costs to the overall house price. Figure C.7 shows that since 1997, the ratio of median construction costs to median house prices for new single family homes has declined fairly steadily in both the U.S. and the Northeast as house prices continued to rise.

Moreover, one would expect that when house prices are high relative to construction costs, suppliers would have an incentive to build more housing, thereby increasing the stock

[41] Yet speculation may be more prevalent in the condominium market where prices and transaction costs are lower.

of housing in the following years. This was certainly the case in 1970—in metropolitan areas where house prices were high relative to construction costs, the pace of new construction accelerated in the following decade (1970-1980). However, this basic relationship was reversed in the 1990s. Places where house prices were high relative to construction costs in 1990 saw a *decrease* in new construction in the following decade (1990-2000)—even controlling for changes in population density and median family income over time (Glaeser, Gyourko, and Saks 2005).

However, rising construction costs could still explain rising house prices if structural size and quality were increasing rapidly. Table C.7 shows that new one-family houses built for sale in 2005 were larger, had more bedrooms and bathrooms, and were more likely to feature vinyl siding, a two-car garage, and central air conditioning than new houses built a decade ago. Moreover, with the exception of the number of bedrooms, the percentage of new houses built with these characteristics grew more rapidly in the northeast over the past decade compared to the rest of the U.S.

However, some basic calculations suggest that improvements in the quality of housing account for approximately two-fifths of the average increase in new house prices. Figure C.8 shows that, in the Northeast, the price of a new "constant-quality" house with 1996 characteristics increased by 2.4 percent per year from 1995 to 2005 while the average sales price of a new house increased by 3.9 percent per year—so that quality accounts for roughly 40 percent of the increase in real house prices.[42] This estimate is similar to the findings of other empirical studies (Quigley and Raphael 2004; Glaeser, Gyourko, and Saks 2005).

[42] Constant-quality prices are not available at a more disaggregated level than the four Census regions.

Thus, although construction costs are higher in New England relative to elsewhere in the country, house prices rose faster than construction costs—even taking into consideration changes in quality. Moreover, the rapid rise in house prices did not lead to significant increases in supply, suggesting that other factors must be at play.

Increasing land prices

Studies have shown that land prices are driven by both natural restrictions (for example bodies of water, mountains), as well as man-made restrictions (regulations). For example, using data for 26 U.S. cities from 1975 to 1990, Guidry, Shilling, and Sirmans (1999) find that natural restrictions and land-use regulations increase the market value of a ¼-acre lot zoned for single-family homes by 30 percent and 37 percent, respectively, controlling for population, per capita income, and economic growth. Clearly both the natural restrictions and regulatory constraints on land use increase the price of housing in a given area, but to what degree has each of these factors played a role in the rapid increase in house prices over the last decade?

Although four of the six New England states have a lower percentage of available land compared to the U.S. (see Table C.8), a recent study suggests that the impact of natural land restrictions on house prices since 1990 is likely to be small relative to land-use regulations. Using data from the American Housing Survey for 1999, Glaeser and Gyourko (2003) analyze the share of house prices not related to physical construction costs and conclude that, for an average lot, only 10 percent of the value of the land comes from intrinsically high land prices (that is, scarcity of land due to natural restrictions).

However, it should be noted that their approach does not take into account differences in local attributes within metro areas (such as school quality, crime rates, or distance from key employment nodes) when estimating the "market" value of a given lot. Thus, people might be buying larger lots in those parts of the metropolitan area with lower costs. Not controlling for this factor may yield "market" land price estimates that are biased downward.

Greater regulatory barriers to new construction

A number of studies have shown that greater government regulation can lead to higher housing prices by constraining the supply of housing—either by increasing the costs of construction or by restricting the number of units that can be built. These regulations typically fall into one of two categories: building codes and land-use regulations. Each is discussed in turn below.

Building codes. Since the early 1990s, a number of states have cited building codes as a governmental constraint on affordable housing (Commonwealth of Massachusetts 2002). Building codes comprise a set of codes regulating various aspects of construction, such as the physical structure, plumbing, mechanical, electrical, energy use, and special restrictions regarding handicap access, lead paint, etc. Most states have adopted model codes developed by regional associations or the International Code Council (I-Codes) and have delegated enforcement to local governments. However, many states also incorporate their own exceptions or amendments, apply the model code to only certain categories of properties, or allow local jurisdictions to adopt stricter standards.

As a result, different states and different communities within a state may impose different building code requirements, which may also differ from federally established codes. In New England, only Connecticut and Rhode Island have mandatory statewide codes that do not allow any local amendments. Massachusetts and New Hampshire allow jurisdictions to amend their state codes (although Massachusetts requires state approval). Maine does not require localities to adopt the state code, and Vermont's statewide building code applies only to government buildings (Listokin and Hattis 2005).

While building codes confer positive benefits in terms of quality, safety, and accessibility, they also create additional costs by imposing substantive and administrative impediments to the construction of new housing. Examples of substantive impediments include requiring improvements of questionable value, restricting the use of cost-saving materials and technologies, and thwarting large-scale and efficient production.[43] Examples of administrative impediments include conflicts among different departments, inadequately trained inspectors, delays in permitting, and excessive fees. In addition, administrative challenges can also create uncertainty in the building process, which decreases the potential return on the investment for the builder (Listokin and Hattis 2005).

Although relevant empirical studies are somewhat dated, they typically show that building codes increase housing costs by 5 percent or less (Muth and Wetzler 1976, Seidel 1978, Noam 1983). In addition, these studies find that building codes have a smaller impact on housing costs than land-use regulations such as zoning and subdivision requirements (Listokin and Hattis 2005). However, most studies have focused only on the substantive

[43] An example of requiring questionable improvements is the "25-50 percent" rule which mandates that if financial investment in a building exceeds a certain threshold then the entire building would have to meet the standards for new construction, not just the area being improved.

restrictions imposed by building codes and have, except for an occasional anecdote, largely ignored the administrative costs that they entail (Euchner 2003).

Land-use regulations. Land-use regulations can reduce the supply of housing either by restricting the number of units that can be built within a municipality or by increasing the costs of construction. Those restricting the number of units include growth controls such as exclusionary zoning and limits on the number of residential building permits issued. Those raising construction costs do so either directly (through state impact fees, required specifications for historical preservation, or subdivision regulations that specify street and sidewalk design) or indirectly through delays in the permitting and review processes through which developers and officials negotiate over the size, density, infrastructure, and form of the proposed project. Land-use regulations, particularly those governing subdivisions, have become a greater impediment to builders over time (Ben-Joseph 2003).

Industry observers and researchers have noted that areas where house prices have risen most rapidly also appear to have greater restrictions on land use—again areas in and around coastal cities (Euchner 2003). Looking at a combined index of housing regulation by MSA, Figure C.9 shows that land-use regulations were positively correlated with changes in housing prices and negatively correlated with changes in housing stock between 1980 and 2000. Moreover, the four MSAs in New England included in the figure (Boston, Hartford, New Haven, and Providence) were in the upper two-thirds of the regulatory distribution, with Boston ranking near the top at 16th among a total of 58 metro areas.[44]

[44] Cities such a New York NY(1st), San Francisco CA(2nd), Newark NJ (11th), and Washington D.C. (15th) ranked higher.

Individual types of land-use regulations, such as permit restrictions, growth controls, historical preservation, and state regulations, have also been positively correlated with the growth in house prices over the past two decades (see Figures C.10 and C.11). However, only regulations associated with permit restrictions and historic preservation have been negatively correlated with growth in the residential housing stock. The four New England MSAs ranked in the upper half of all MSAs studied in terms of the stringency of permit restrictions. They ranked in the upper third in terms of the restrictiveness of their historic preservation measures.

Analysts using more sophisticated econometric techniques in order to quantify the impact of land-use controls have also found that they significantly raise housing prices (Fischel 1990, Nelson et al. 2004). A review of the literature (see Table C.9) reveals that relatively stringent land-use regulations can increase house prices by 17 percent to 50 percent, depending on the type of regulation and the geographical area studied. Typically, studies of regulations within MSAs tend to show that characteristics zoning (such as minimum lot size and set-back requirements) has a larger impact than land-use zoning (such as growth controls). Studies across MSAs tend to show larger effects for both types of regulations (Ihlanfeldt 2004).

However, few of these studies controlled for local amenities, such as better schools or lack of congestion, that might be correlated with greater regulation. As a result, the relationships found in these studies between the severity of regulation and house prices may be spurious. A more recent study by Saks (2004) addresses this deficiency by examining the effect of regulation on housing market dynamics arising from labor demand shocks within metropolitan areas over time, thereby controlling for local fixed effects. The

estimates show that a 1 percent increase in demand leads to a 0.25 percent increase in house prices for areas with an average level of housing supply regulation. However, the effect of the same demand shock on house prices is twice as large in an area with a housing supply regulation index that is one standard deviation higher than the average. Note that while these results clearly indicate that greater regulation increases the price of housing, they are based on an index of regulation that represents a combination of regulatory measures, so the magnitude of the impact is likely to be smaller for any one type of regulation.

To some extent, one should not be surprised that regulations raise house prices—in some sense that is what they are designed to do. The real issue is how much they raise prices compared with the benefits that they confer. For example, negative externalities associated with increasing the supply of housing, such as congestion, environmental costs, infrastructure costs, fiscal effects for local public services, and changes in neighborhood composition, may raise the social cost of housing above the private cost. If such externalities are large and can be correctly measured by the regulating authority, and if the specific policy instrument used is sufficiently precise, then regulation can correct for these negative externalities (Malpezzi 1996).

Whether building codes and land use regulations generate net economic benefits or costs (and for whom) is a difficult issue to resolve empirically. However, whatever benefits these regulations may create, three pieces of empirical evidence suggest that their increasing severity may be restricting supply. The first piece of evidence consists of studies analyzing whether the effects of local regulations in one jurisdiction spill over to neighboring communities. Both Pollakowski and Wachter (1990) and Cho and Linneman (1993) find evidence that land-use restrictions in areas adjacent to an MSA contribute to

higher prices within that MSA. It is unlikely that regulations in the adjacent areas made the MSA more desirable by creating local amenities. The more plausible explanation is that supply restrictions in the adjacent areas induced potential homebuyers to cross over into the MSA itself in search of available housing.

The second piece of evidence consists of several recent studies showing that more restrictive regulations slow growth in new construction (Thorson 1997, Levine 1999, Pendall 2000). The most compelling of these is a study by Mayer and Somerville (2000), which shows that the costs imposed by local land-use regulations reduce both the current level and future growth of new construction within an MSA. For example, an MSA with more extensive delays in approval and a higher number of growth management actions has approximately 45 percent fewer housing starts than less heavily regulated MSAs. In addition, the two authors estimate that for an exogenous 1-percent increase in house prices, the increase in new construction will be 20 percent lower in metropolitan areas with greater delays in regulatory approval. Saks (2004) finds a similar impact, where for a 1-percent increase in demand, the corresponding increase in the housing stock in a more heavily regulated area is 17 percent smaller than in an area with an average degree of regulation.

Finally, the third piece of evidence comes from Somerville and Mayer (2003), which shows that restrictive housing regulations reduce the affordable stock by causing low-quality units to "filter-up" within the housing distribution. The authors speculate that restrictions on the supply of new units serve to increase the demand for high-quality units, thereby giving landlords more incentive to maintain, repair, and renovate lower quality units so that they "filter up" within the housing distribution. As lower-quality units filter up, the supply of affordable units decreases. Using data spanning a decade, the authors estimate the

probability that an affordable rental unit will (a) remain affordable, (b) filter up and become unaffordable, (c) convert to owner-occupied, or (d) be demolished. Controlling for general market effects, unit characteristics, neighborhood quality, and the level of government regulation, they find that greater use of growth controls and impact fees directly increases the probability that a unit will filter up and out of the affordable stock.

Conclusion

Given the extraordinarily rapid increase in house prices within the region over the last decade, it is likely that some combination of demand and supply factors is responsible. On the demand side, the first three factors listed above (rising incomes, increasing income inequality, and the changing age structure of the population) are rather slow-moving and are unlikely to have caused such a rapid change in housing demand over such a relatively short period of time. However, the two remaining factors—easier access to mortgage credit and accelerating expectations of house price appreciation—have the potential to affect rapid change in housing markets and may have stimulated demand beyond equilibrium levels. Of these two, there appears to be some evidence that easier access to mortgage credit—in particular falling real interest rates, the growth of adjustable rate mortgages, and the use of non-traditional loans—may have significantly reduced financing costs and relaxed income constraints for borrowers within New England, thus spurring housing demand.

Parallel arguments can be made on the supply side. Although constructions costs are higher in the Northeast relative to elsewhere in the country, changes in the cost and quality of construction occur too slowly to account for the change in house prices over the past

decade. In contrast, a number of recent studies have shown that the high price of housing over the past few decades is largely related to government regulation, particularly that governing land-use, which has constrained the supply of housing.

Although one could argue that land-use regulations have been in place for many decades, it appears that some regulations—particularly sub-division regulations—have become a greater impediment to builders over time (Ben-Joseph 2003). Moreover, it may be the case that land-use regulations have become more binding over the past decade as easier access to mortgage credit has fueled demand beyond "normal" levels.

D. Affordable housing in New England: What are we doing about it?

Over the past several decades, policymakers at both the state and local level have tried to expand access to affordable housing for low and moderate income households. These policy initiatives address different segments of the population—from the chronically homeless to community service providers unable to afford housing near their job to middle-income households unable to purchase a home in an increasing number of communities within the region. By necessity, affordable housing policies also apply to different geographies: across a state, within municipalities, and even at specific places of employment.

Yet regardless of the demographic target or geographic level of application, affordable housing programs can be classified depending on whether they aim to augment the ability of households to rent or purchase a home or to increase the supply of affordable units. The former consist of demand-side strategies that seek to increase the purchasing power of low and moderate income households by providing subsidies to renters or reducing wealth and income constraints for buyers. The latter consist of supply-side strategies that seek to increase the supply of affordable housing by increasing public funding of and private investment in new construction and rehabilitation of existing units or by removing regulatory and procedural barriers for developers. Recent research and experience suggest that supply-side strategies, in particular, are critical to increasing the supply of housing.

The following section of the report presents an overview of the key strategies that New England state and municipal governments—and, to some extent, for-profit and non-profit organizations—are employing to boost the purchasing power of low- and moderate-

income households while increasing the supply of both market-rate and more affordable units. For both demand- and supply-side strategies, we further categorize programs based on the target group (e.g. renters versus homeowners, public versus private lenders). For each program, we describe the mechanism used to achieve the program's goals (e.g. subsidies, looser financing constraints, regulatory changes) as well as the manner by which the program is funded (e.g. general revenues, borrowing, private contributions).

Demand-side strategies

The public sector plays a significant role in subsidizing the ability of low- and moderate-income households to rent or purchase a home. These demand-side strategies seek to address one of two barriers faced by households; inadequate monthly income to make monthly rent or mortgage payments or a lack of wealth to cover down payment and closing costs.

Providing subsidies for renters

Subsidies are the primary public sector tool used to bridge the gap between market rent and incomes for households in the rental market. The largest source of rental subsidies has been the federal government's Section 8 voucher program, which was created in the 1970s. Although the Section 8 program is federally funded, vouchers are distributed by a network of state, regional, and local housing agencies. Rental vouchers are either tenant-based (providing subsidies to a household or individual) or project-based (providing subsidies to a specific development). The New England Housing Network, a coalition of housing and community development organizations, estimates that vouchers currently

support approximately 138,000 families in the region in securing subsidized, private housing (New England Housing Network Federal Budget Priorities for Fiscal Year 2007).

Proponents consider vouchers a cost-effective means to assist households with rent burden, and they draw attention to the vouchers' ability to stabilize welfare families (Turner 2005). However, the Section 8 voucher program has been criticized as wasteful and inefficient, making it vulnerable to budget cuts and stimulating attempts to reform the program (GAO 2001). In recent years, the federal government has proposed several changes to the program, including linking state and local funding for vouchers to performance standards and converting the program to a block grant. At the same time, federal funding for existing vouchers has declined, forcing state and local housing authorities to make tough decisions about program administration and eligibility.

Some states also administer their own rental voucher program to augment Section 8. For example, Connecticut's Rental Assistance Program provides portable housing vouchers—meaning they are connected to a household and not a specific development - for families earning less than half of the median family income in their area of the state. Similarly, the Massachusetts Rental Voucher Program (MRVP) provides both tenant- and project-based vouchers to households with incomes less than twice the federal poverty threshold.[45] Like the Section 8 program, state-funded voucher programs have been subject to program changes and budget cuts over the last decade. For example, in the early 1990s, MRVP subsidized roughly 15,000 households and almost 6,000 units in Massachusetts. As of January 2005, the program supported only one-tenth (1,544) as many tenant-based

[45] Massachusetts also has a smaller Alternative Housing Voucher Program (AHVP) that was created to provide tenant-based rental assistance to people under age 60 with disabilities who want to relocate from a public housing development into a private unit.

vouchers and only half (3,171) as many project-based vouchers in the state (Citizens' Housing and Planning Association 2005a).

Providing subsidies and financing for homeowners

Demand-side policies to increase homeownership focus on assisting with monthly mortgage payments and reducing the wealth needed for a down payment. State housing finance authorities help reduce monthly mortgage payments by providing low-interest mortgage financing to first-time homebuyers and low- and moderate-income families. These low interest loans are primarily financed by issuing bonds. For example, the New Hampshire Housing Finance Authority's single-family mortgage program has a *2-Under Option* that is available to borrowers making less than or equal to 60 percent of the statewide median income. Under this program, a subsidy reduces the mortgage interest rate by two percentage points for the first three years and one percentage point for the following two years. The subsidy amount must be repaid if the property is sold within the first ten years, but it is forgiven after ten years of continuous ownership. Similarly, the Maine State Housing Authority (MSHA) also provides low-interest mortgages to low- and moderate-income residents purchasing their first homes, generally at one to two points below conventional rates. According to MSHA, the program helped over 1,000 low- and moderate-income Maine families become homeowners in 2004.

In addition to providing low-interest loans, some state housing finance authorities also assist with down payment and closing costs for eligible buyers. For example, first-time homebuyers and/or low-income homeowners in Maine receive assistance from the MSHA's Maine Assist program in the form of down payment, closing costs, and prepaid escrow

expenses. In Rhode Island, the Housing and Mortgage Finance Corporation provides grants in amounts of up to 3 percent of the mortgage loan for first-time homebuyers. Repayment of the grant is gradually forgiven in equal annual installments over the first seven years of ownership. If the home is sold within seven years, the outstanding balance must be repaid by the homeowner.

Other state and nonprofit organizations are able to provide considerably more assistance to help bridge the gap between the market price of a home and available resources. For example, the Vermont Housing and Conservation Board has a Homeland Program that provides eligible households with purchase grants of up to $40,000 to subsidize the cost of single-family homes. The Board offers the program in collaboration with local nonprofits and community land trusts (CLTs). Buyers accepting the grants sign an agreement with a participating nonprofit organization or CLT such that they will share any appreciation in the value of their home with future buyers. The Board reports that their Homeland program has supported approximately 450 homeowners over the last 15 years.

Community land trusts (CLTs) promote the broad goal of making housing more affordable by limiting price appreciation. All six New England states have CLTs. The Burlington Community Land Trust in Vermont was the largest in the country, maintaining 370 single-family homes and condominiums and 270 rental apartment leases; in October 2006, it merged with Lake Champlain Housing Development Corporation and now maintains over 2,000 homes. CLTs typically acquire and hold land with long-term, renewable, and often inheritable land-leases signed by property owners. CLTs limit price appreciation by selling or leasing only the residential or commercial buildings which are on the land, so that any appreciation in the value of the land is not reflected in the cost of

housing. In addition, most CLTs have in place "limited equity" policies and formulas that restrict the resale price of the house in order to maintain its long-term affordability. Some CLTs also act as developers of special-needs housing or group homes, rental housing, and even commercial space for lower-income entrepreneurs. Yet despite the popularity of CLTs, there has been limited analysis of the effectiveness of the programs or identification of the elements that make a community land trust successful (Greenstein and Sungu-Eryilmaz 2005).

Increasingly, government, non-profit, and private employers across the nation are helping their employees buy homes through employer-assisted housing (EAH) programs. These programs vary in scope and administration but generally provide benefits, such as down-payment grants; forgivable, deferred, or repayable loans; or home-buyer education. While innovative EAH programs are popular in other areas of the country, few employers in New England offer formal programs, and there are only a handful of existing and pending policy initiatives. For example, Citizens Bank of Rhode Island is one of the largest employers offering an EAH in the region, providing forgivable loans and homebuyer education. In Maine, York Hospital offers a $10,000 forgivable loan that employees can use towards the purchase of a new home in the area in an effort to help retain nursing staff (Afshar 2006). In Connecticut, a state program matches dollar-for-dollar, up to $100,000, employers' contributions to a revolving loan fund from which employees can borrow to meet their housing needs. Despite some initial success after its implementation in 1993, program managers report difficulty allocating all of the available credit due to a number of factors, including a surfeit of tax credit programs in the state and strict rules for monitoring

and compliance. In Massachusetts and Vermont, legislators are currently considering policies that would support EAH programs.

Supply-side strategies

Supply-side strategies focus on building new homes and improving the existing housing stock for low- and moderate-income individuals. Increasing the amount of public funding available for new housing production or preservation is an obvious supply-side strategy. Another is to stimulate private investment in affordable housing development by providing financial incentives to developers. Similarly, incentives may encourage local governments to develop more affordable housing and remove barriers to affordable housing development. In most cases, successful development of affordable housing stock occurs when a combination of these strategies are employed.

Increasing public funding

Affordable housing trust funds have become a primary mechanism to dedicate state and local public resources to increasing the supply of affordable housing. Housing trusts are generally established by legislation, ordinance, or resolution and receive dedicated public revenues from a range of sources, including real estate transfer taxes, development fees, linkage fees, exactions, and tax-exempt bonds. The funds typically provide financial resources to address the housing needs of low- and very low-income households, though some address the needs of moderate-income households or distinct groups, such as the homeless or disabled. Trust funds can be managed at the regional, state, local, or county level and are often administered by a public or non-profit entity. According to the Center

for Community Change's Housing Trust Fund Project, there were 38 state housing trust funds and more than 350 city and county housing trust funds in operation.

Affordable housing trust funds were initially developed in the 1980s to fill the gap left by the large reduction in federal funding for housing. Critics note that available trust fund resources are significantly less than were previously available from these federal sources. A 1993 evaluation of housing trusts funds found that they had secured relatively small levels of revenue relative to demand, were unable to address the needs of the lowest-income households, and generally did not include provisions to preserve long-term affordability of the units they supported (Connerly 1993). Further, the evaluation found that revenues for housing trust funds in New England (specifically in Maine) were eroded during the recession of the early 1990s, signaling that these funds are susceptible to looting during budget crunches. While housing trust funds have increased public funding for housing, they are still dependent on other state and federal subsidy sources to be effective, given that the level of subsidy that they can typically provide per development is insufficient.

State and local policies may also allow locally collected revenues to be levied for, or directed towards, providing more affordable housing. For example, Montpelier, Vermont, recently created a municipal housing trust fund that will use revenues from a one-cent surcharge on the municipal property tax to support homeownership in the capital. Similarly, the Massachusetts Community Preservation Act (CPA) allows cities and towns to adopt a 3 percent property tax surcharge to pay for one of four activities: affordable housing, land conservation, historic preservation, and recreation. The state matches the amount raised by local communities, and towns are required to use a minimum of 10 percent of total funds

levied by the tax surcharge for each of these objectives. According to records maintained by the Community Preservation Coalition, as of August 2006, a total of 871 units of affordable housing had either been produced or were under development using CPA funds.

Maine allows local governments to establish special districts from which property tax revenues may be directed to the development of more housing within the community. Municipalities are able to establish tax increment financing (TIF) districts and keep the new revenues raised from property within the district in reserve for affordable housing production. Up to 2 percent of tax revenues collected within an established TIF district can be dedicated to affordable housing production or used for capital expenses related to the new homes, including school and infrastructure costs. At the time of this report, only the city of South Portland had used the Affordable Housing TIF, developing approximately 300 units of affordable housing in a former youth center (Umphrey 2004).

Stimulating private investment

In addition to increasing public funds, state and federal policies can establish market incentives to stimulate new affordable housing production. State housing finance authorities administer one of the most significant of these incentives: the federal Low Income Housing Tax Credit (LIHTC). Created by the Tax Reform Act of 1986, the LIHTC program grants budget authority to states to issue tax credits for the acquisition, rehabilitation, or new construction of rental housing targeted to lower-income households. States receive allocations of the tax credits on a per-capita basis; these credits can be sold to outside investors to raise equity for affordable housing projects. According to the U.S. Department of Housing and Urban Development (HUD), tax credits helped finance over 600

developments in the region (almost 40,000 units). Widely used in New England, tax credits cover a significant portion of development costs. The New Hampshire Housing Finance Authority estimates that on average, tax credit equity covers 35 percent of total project costs in New Hampshire, making it the predominant funding source of almost all affordable rental production in the state. Likewise, the Vermont Housing Finance Authority claims that tax credits "have produced most of Vermont's recently-developed affordable rental housing."

Nationally, the supply of available tax credits is lower than demand. According to a survey of tax credit allocating agencies conducted by *Affordable Housing Finance* magazine, states reported an average of $3 of tax credit requests for every $1 of tax credit available to them in 2003 (Kimura 2003). To increase the availability of tax credits, several New England states have developed supplementary, state-funded housing tax credits. For example, Massachusetts' Low Income Tax Credit program was created in 1999 specifically because demand for federal credits far exceeded the amount allocated to the state. Massachusetts state tax credits are awarded in place of part of the federal credit the project would otherwise receive, expanding the total federal credit allocation available (Citizens' Housing and Planning Association 2005a). Vermont also funds state housing tax credits, providing $150,000 annually to qualified developments.

Removing regulatory and procedural barriers

Policies intending to increase the supply of affordable units and homes are ineffective if communities are opposed to allowing new development or feature regulatory barriers that make new development difficult or infeasible. In this section of the report, we

investigate policies in New England that address significant local political and regulatory barriers to affordable housing development.

There are several legitimate reasons for concern about new housing development. While research suggests that a household is both a contributor and a recipient of public resources over a span of time, municipalities are often concerned about increased municipal costs from families with children moving into new affordable developments. Communities struggling to balance increased service obligations and a desire to keep property taxes low may be reluctant to allow new housing that does not contribute a significant amount of property tax revenue and that may require additional public education and infrastructure expenditures. Recent research in Massachusetts suggests that new households can increase municipal costs for some communities (Center for Urban and Regional Policy, 2005). In addition to concerns about increased municipal costs, some municipalities express concern that affordable housing developments will erode their community character or be established in areas that contribute to sprawl. Others suggest that these objections are politically savvy expressions of prejudices about affordable housing (low-income) residents.

Municipal efforts to reduce barriers. Local concerns about the costs and impact of new housing may manifest in land-use regulations. Municipalities can limit affordable housing development by giving preference to age-restricted housing and small units marketed to single professionals rather than starter homes for new families. Communities also may zone a preponderance of large lots for single-family homes that are not affordable for low- or moderate-income families. There is evidence that stricter local land use regulations can significantly constrain the supply of affordable housing in metro areas (Glaeser, Gyourko, and Saks 2004).

Many municipalities in the region have taken steps to remove regulatory and procedural barriers to new development. For instance, Boston expedites the design and application review process for affordable housing. New Haven (CT) has an ordinance that reduces the amount of time necessary to acquire land, demolish existing structures, and dispose of the property for the purposes of housing development. Manchester (NH), Providence (RI), and Lewiston (ME) have updated municipal ordinances to allow accessory dwelling units (also known as in-law apartments), a policy that has been identified as a simple and quick way to increase the supply of affordable units within a community. Other municipalities are taking a more comprehensive approach, updating entire zoning districts to encourage housing development. For instance, Laconia (NH) recently created a Downtown Riverfront Overlay District to allow for the redevelopment of mill property into affordable housing and retail space (New Hampshire Housing Finance Authority, 2004).

Local communities are also using regulation and zoning to mandate more affordable housing development. Local inclusionary zoning policies require a certain percentage of units in any sizable development be designated as affordable for a certain, defined group. For example, Cambridge (MA) has a mandatory inclusionary zoning policy requiring that 15 percent of all units in any development of ten or more units (or 10,000 or more square feet) be affordable to households earning 65 percent of the local area median income. To attract developers, the policy offers a density bonus allowing more market-rate units than would have been permitted under regular zoning (National Housing Conference 2002). In Burlington (VT), between 15 and 25 percent of total units in all new market-rate developments of five or more homes must be affordable to families earning 65 percent of local area median income for rental units or 75 percent of area median income for sale units.

Mandatory inclusionary zoning policies like those in Burlington and Cambridge are lauded for their ability to promote development of affordable housing at little or no financial cost to governments and for their ability to promote income integration in a community. However, because projects succeed or fail based on a developer's ability to sell the market-rate units, the policy is not likely to produce a significant number of affordable units during economic recessions or in places where there is less demand for the higher market-rate units needed to subsidize the affordable units (Burchell and Galley 2000).

State efforts to reduce barriers. Despite these commendable local efforts, there are many communities around the region with significant local regulatory and procedural barriers. To address this issue and more equitably distribute the share of affordable units throughout the region, three states in New England—Massachusetts, Rhode Island, and Connecticut—have taken a top-down approach. The three southern New England states have adopted state inclusionary housing policies that require the development of affordable housing in communities not hosting a sufficient supply of affordable units.

Massachusetts' Chapter 40B applies to municipalities where less than 10 percent of the total housing stock is defined as affordable, defined by use of the state, federal, and quasi-governmental programs which contain established affordability thresholds and are approved under 40B. In these places, Chapter 40B encourages the development of additional affordable units in two ways. First, qualifying developments can secure a comprehensive permit from a local Zoning Board of Appeals (ZBA). This permit cuts development costs and improves project feasibility by providing one permit in lieu of the normal practice requiring builders to secure multiple permits from various local agencies. Second, in those cases in which the ZBA decides not to grant a comprehensive permit to a

qualified development, the local decision may be appealed to the state Housing Appeals Committee (HAC). The Committee reviews the case, weighing regional need for affordable housing against the development's potential impact on public health, safety, and welfare. Chapter 40B can be — and has been — used in communities where more than 10 percent of the housing stock is affordable.

For several decades, Chapter 40B has been the Commonwealth's primary affordable housing production policy, especially in suburban areas. The Citizens Housing and Planning Association reports that approximately 43,000 units in 736 developments have been created under 40B statewide since the early 1970s, which includes approximately 23,000 affordable homes reserved for households below 80% of median income. A recent study by Northeastern's Center for Urban and Regional Policy found that 40B developments accounted for 60 percent of all new affordable units in the state and 80 percent of those built outside the city of Boston (Heudorfer 2003). However, in part because of local resistance, 40B has not been able to increase the supply of affordable housing to meet the required 10 percent threshold in many communities in the Commonwealth. According to the state Department of Housing and Community Development, as of January 2006, affordable units accounted for 10 percent or more of the housing stock in only 47 of the state's 351 communities. It should be noted, however, that several Massachusetts communities are close to meeting the 10 percent threshold: in 2006, between 8 and 9 percent of the total housing stock was affordable in 36 communities. Further, the number of communities meeting or near the threshold has increased in recent years.

Rhode Island's state inclusionary housing policy, the Low and Moderate Income Housing Act, also applies to communities with less than 10 percent of total housing stock affordable. It, too, includes an appeals process for affordable developments that sought, but were denied, a comprehensive building permit. The act was not extensively used until 2002, when an amendment expanded the permit eligibility guidelines and led to a significant increase in the number of applications.[46] Subsequent concern about loss of local control over the development process resulted in the revision of the original act and passage of the comprehensive 2004 Rhode Island Housing Act. The 2004 Act requires that local affordable housing plans be prepared and adopted by cities and towns to satisfy the requirements of the Low and Moderate Income Housing Act. Communities with state-approved housing plans have increased authority over the permit and appeals process. In addition, the Act requires the state to develop a strategic plan for affordable housing development.

In Connecticut, the state's Housing Appeals Procedure does not allow for a comprehensive permit: Developers must still apply to all local boards for building approval. However, the Connecticut Housing Appeals Procedure does provide for appeal at the state level of any locally-denied permits through judicial review. In 1999 the statute was changed such that any project using the appeal procedure must make 30 percent (up from 25 percent) of units affordable to low- and moderate-income households. The statute was also expanded to give towns stronger review and enforcement tools and provide a moratorium on appeals to towns that made significant progress in providing new affordable housing.

[46] Permit use was increased when for-profit developers were allowed to use the permit for owner properties in addition to rental properties. Previously, only non-profit developers could use the permit in owner developments.

State inclusionary policies currently do little to allay local fears about net new costs of development, and they exacerbate local concerns about the character of new housing and community development plans. Recently, Massachusetts passed two complementary laws which seek to address these local concerns and provide financial incentives to develop more housing. The Smart Growth Zoning and Housing Production Law (Chapter 40R) was passed in 2004 to promote the dual objectives of increasing the supply of housing and encouraging smart growth. Under Chapter 40R the state provides financial incentives to communities that establish a state-approved smart growth zoning district (SGZD). Within the zone, towns are required to allow for denser residential development, and at least 20 percent of the housing developed within a SGZD must be affordable to households making 80 percent of the area median income. Communities are further encouraged to establish design guidelines for new development within the zone to promote overall community character. Upon state approval of an SGZD, municipalities receive a one-time incentive payment ranging from $10,000 to $600,000, depending on the number of total new housing units planned. An additional "density bonus payment" of $3,000 per housing unit is disbursed when a building permit is issued. Chapter 40R also gives communities with approved SGZDs priority for discretionary funds from other state agencies. (Boston Foundation et al. 2003).

Chapter 40R provides financial incentives for communities to plan and design development in a manner that limits environmental impact and fits with established community character. However, it does little to address local concerns about new municipal costs associated with additional families moving into the houses built under the new law. A 2005 study found that in the 238 Massachusetts cities and towns not receiving state aid for

education, each single-family home costing $550,000 or less built in a Chapter 40R SGZD would likely increase net education costs by $5,000 (Center for Urban and Regional Policy 2005). It should be noted that other research does not conclusively show that new housing automatically implies increased housing costs. Still, to address the potential impact on education costs, Massachusetts passed Chapter 40S, establishing a Smart Growth School Cost Reimbursement Fund to provide full reimbursement for any net new education costs resulting from housing units built under 40R. Only net new municipal costs attributed to eligible children, defined as children living in a SGZD and enrolled as of the prior year in a public elementary, middle, or high school, are covered under 40S. To date, Massachusetts is the only state in New England to address the issue of increased school costs by promising reimbursement in the event of potential impact. Analysts and practitioners have praised the Commonwealth's efforts to align local interests with state affordable housing development goals, but some remain skeptical that Chapters 40R and 40S will significantly reduce local regulatory and political barriers to new housing. As of early May 2006, the Department of Housing and Community Development reported that only two communities in the Commonwealth – Norwood and Chelsea – had received a letter of eligibility for their 40R districts while three other communities had applications under review with the department.

Preserving existing affordable stock

In addition to increasing the supply of affordable housing through increased funding and removing barriers to new development, New England states are working to preserve the supply of existing affordable units. Those at risk include units developed using federally-subsidized mortgages, rental subsidies, the Low-Income Housing Tax Credit, and

others programs with required long term use restrictions (rent and tenant income limits). Use restrictions typically expire between 20 and 40 years; recently many projects have reached the point where owners can end use restrictions by prepaying their subsidized mortgage or not renewing their rental assistance contract when it expires, an attractive option in a strong real estate market where owners may prefer to convert affordable housing units to market rate or non-housing use. According to the National Housing Trust, New England states have lost more than 16,800 project-based, HUD-assisted units (both Section 8 units and those with restricted rents due to mortgage subsidies) between 1995 and 2005. Other units in weaker real estate markets are also at risk due to physical deterioration, primarily as a result of deferred maintenance.

New England states are providing tax incentives, low interest financing and subsidies to support preservation of affordable units. Housing finance authorities provide low- or zero-interest loans for preservation and several states have subsidies directed specifically towards preservation projects. Massachusetts has several housing programs that are funded by state bond funds that are designed to specifically preserve affordable housing, including the Housing Stabilization Fund (HSF) and a Capital Improvement and Preservation Fund (CIPF), which was created with the specific purpose of preserving or improving existing privately owned, federal- or state-assisted affordable rental housing. A report by the Citizens Housing and Planning Association found that funds from these sources helped preserve 52 developments, or 7,200 units, since 1993. And, states are working to ensure that new affordable units are preserved. For example, the Vermont Housing Conservation Board's number-one funding priority is projects with established

mechanisms to assure perpetual affordability for lower-income households, including enforceable plans for stewardship of affordability.

Massachusetts provides, and Maine recently considered, tax incentives to encourage the preservation of affordable units into the future. Massachusetts Chapter 121A provides tax relief to developers of federally-assisted housing who agree to provide low- and moderate-income housing, typically for 40 years. Instead of paying property taxes, these developers pay a formula-based excise tax, which provides tax relief and greater predictability. In the state of Maine, legislation was considered in 2005 that would have allowed an owner of affordable multi-unit properties to forgo payment of capital gains and depreciation taxes if they sold the property to a new owner who agreed to keep the units as affordable for 30 years.

The public sector has developed a number of policies intended to support household demand for rental housing and homeownership. While state and local governments are assuming greater responsibility for housing programs and developing innovative strategies to support demand and stimulate increases in supply, the amount of state and local funding dedicated to affordable housing is still small relative to other public investments. Further, it is unclear what the relative importance of demand or supply-side policies is in terms of solving the current affordability problem. Researchers have argued the merits of both supply-side policies and demand-side policies in lowering rents and improving housing quality, both in the short and long run (Galster 1997, Apgar 1990).

Given the lack of clear evidence for one strategy over another, it may be the case that choosing the most effective policy depends primarily on local housing conditions. For instance, in places with adequate vacancies in the lower-end housing market, demand side

approaches subsidizing the ability of households to purchase adequate housing may be more appropriate. In contrast, locations without much vacancy, especially of lower priced units, may be better served by adopting a supply-side approach to housing policy (Listokin 1991). For the New England region, it remains to be seen whether these tools, even if employed simultaneously and optimally, can meet the demand for affordable housing in New England.

Conclusion

Although housing costs in greater Boston and elsewhere around the region have leveled off, affordable housing is still high on the public policy agenda in every New England state. In recent years, employers and policymakers alike have warned that the region's high cost of housing may undermine its ability to attract and retain workers and businesses.

This report provides, to our knowledge, the most thorough *region-wide* analysis of this problem ever undertaken. We analyze differences in housing affordability among specific socioeconomic, demographic, and occupational groups, for every New England state and for the region's principal metropolitan areas. These detailed breakdowns provide unique insights into the incidence and severity of New England's housing problems and their implications for the region's competitiveness. The report also synthesizes what we know (and do not know) about why housing in many parts of New England is so unaffordable and why it has become increasingly so.

We find, not surprisingly, that the gap between house prices in many parts of New England and those in other parts of the country has grown substantially over the past decade. Between 1995 and 2005, real house prices increased by 85 percent in New England versus an increase of 56 percent nationwide. In some of the larger metropolitan areas within the region, house price appreciation was even greater, with prices almost doubling in the greater Boston area during this period. Since then, the housing market in New England has slowed with real house prices gaining only 7.5 percent in New England in 2005, compared to a nationwide increase of 9.2 percent. Moreover, in contrast to owner-occupied housing,

the gap in rents is not as great, nor has it grown as fast, as the gap in house prices over the past decade.

However, given the rapid appreciation over the past decade, house prices are still relatively high throughout most of New England compared to the rest of the U.S. As of 2005, the median price of a single-family house exceeded the nation's in eight of the region's nine largest metropolitan areas. Among these, both the Bridgeport, Connecticut and Boston, Massachusetts metro areas ranked among the 13 priciest metro-areas in the nation. Even in the less expensive metro areas within New England, house prices were often higher than those in rival metro areas outside of the region such as Phoenix, Arizona and Raleigh, North Carolina.

Yet, in spite of skyrocketing house prices in many parts of New England, the region's housing stock has grown slowly in recent years. The number of housing units in the region (including both rental and owner-occupied properties) grew by only 3.2 percent between 2000 and 2005—less than half the national growth rate of 7.4 percent. Every state in the region except New Hampshire ranked among the bottom 10 states in the rate of growth in housing starts between 2000 and 2005. Housing production has been especially slow in the region's largest metropolitan areas.

Based on the affordability indicators used in this study, we find that although access to affordable *rental* housing in every New England state is either comparable to or even better than that in the nation as a whole, access to affordable *owner occupied* housing is a relatively severe problem in some parts of the region. Owner-occupied units appear to be especially unaffordable in southern New England—Connecticut, Massachusetts, and Rhode Island—where the gap between median household income and the income needed to purchase the

median priced house was considerably larger than that for the U.S. as a whole. In particular, housing burdens were significantly higher in Massachusetts and Rhode Island versus nationwide with the number of available units in these states being in short supply. Moreover, the lack of affordable owner-occupied housing is not limited to low-income households. Most indicators show access to affordable housing in every New England state, especially owner-occupied units, falling faster than in the nation as a whole in recent years. This is true for almost all socioeconomic and demographic groups whether categorized by age, education, or select service occupations (e.g. teaching, nursing, police work).

We also find that, even after taking into account the relatively high income levels in southern New England, owner-occupied homes in some of the larger metro areas were much less affordable than those in competitor metro areas such as Chicago IL, Seattle WA, Phoenix AZ, Philadelphia PA, and Raleigh NC. However, smaller metro areas in New England such as Hartford CT, New Haven-Milford CT , Portland-South Portland-Biddeford ME, Springfield MA, Worcester MA, Manchester-Nashua NH, and Burlington VT compared favorably relative to rival metro areas.

Moreover, although households headed by young professionals—college graduates in the first-time homebuyer age bracket (25-39 years)—were able to afford the median-priced house in every New England MSA as of the year 2000, the gap between median household income and the income needed to purchase the median-priced house was greater in many New England MSAs compared to the most affordable rival metro areas. These households, often looking to purchase their first home, are more mobile than other groups, making them especially sensitive to the burden of housing in general and of owner-occupied housing in particular. Given that college graduates possess valuable skills that are in high demand,

rising house prices may make it difficult for employers within the region to recruit these workers if these workers can buy more house for their money elsewhere. Moreover, firms may also choose to relocate if compensation is being driven by higher housing costs rather than greater worker productivity.

Finally, it appears that over the past five years very low-income households at the bottom of the income distribution have experienced a double-whammy when it comes to housing affordability. According to detailed house price data for Connecticut, the least expensive houses have appreciated more rapidly than those higher up in the housing distribution. At the same time, the median household income for this group has actually fallen in real terms. As a result, very low-income homeowners spend a considerably larger percent of their income on housing in New England compared to the rest of the U.S. as a whole, with a significantly higher share of these households being moderately or severely cost burdened than nationwide. In addition, these households are also being crowded out of affordable rental units as higher income households move down the housing price distribution to obtain shelter.

Why has owner-occupied housing become so unaffordable in parts of New England, even for middle-income households, especially relative to that in other parts of the country? We analyzed previously conducted research and its implications for housing prices and affordability in New England to explore several possible explanations on both the demand side and the supply side of the markets. On the demand side, it appears unlikely that rising incomes, increasing income inequality, and the changing age structure of the population have caused such a rapid change in housing demand over such a relatively short period of time.

In contrast, the remaining two factors—easier access to mortgage credit and accelerating expectations of house price appreciation—have the potential to affect rapid change in housing markets and may have stimulated demand beyond equilibrium levels. In particular, easier access to mortgage credit—due to falling real interest rates, the growth of adjustable rate mortgages, and the use of non-traditional loans—appear to have played an important role in increasing the demand for housing. These changes in financing reduced income constraints for borrowers, making housing appear more affordable and possibly luring more buyers into the market. The resulting surge in demand may have spurred houses prices beyond equilibrium ("normal") levels.

On the supply side, while scarce land and high construction costs may be partially responsible, the single most important factor appears to be the region's strict land-use regulations. In surveying analyses of the impact of such regulations on housing prices, it appears that the stringency of such regulations can raise prices up to 50 percent, depending on the type of restriction and geographic area studied. Although one could argue that land-use regulations have been in place for many decades, it appears that some regulations—particularly sub-division regulations—have become a greater impediment to builders over time. Moreover, it may be the case that land-use regulations have become more binding over the past decade as easier access to mortgage credit has fueled demand beyond "normal" levels.

Governments at all levels are engaged in a wide variety of efforts throughout New England to promote access to affordable housing. Recent research and experience suggest that supply-side strategies are likely to be critical to increasing the supply of housing given the sluggish growth in the region's housing stock over the past decade. In particular, the

most innovative policy solutions have occurred in southern New England where state governments have either constrained the ability of local governments to restrict land use in ways that curtail the production of affordable units or reduced the incentives to engage in such constraint. Furthermore because many communities have concerns that increasing their stock of affordable housing will result in higher municipal costs, particularly for education, Massachusetts passed a new law this year to provide funding for any net education costs associated with affordable units developed within a smart growth district. However it remains to be seen whether local communities will find this to be a sufficient incentive to create enough affordable units to alleviate the upward pressure on prices.

Should state governments restrict municipal regulatory discretion? The answer is not clear-cut. The reluctance of many communities to allow the production of affordable housing within their borders is understandable. Many communities believe that hosting additional affordable housing units would impose a net fiscal burden on them. Moreover, local control is one of New England's distinguishing traits. More so than communities in other regions, New England's cities and towns have the power to shape their own environment with minimal interference from higher levels of government. However, this aversion to hosting affordable housing may be near-sighted. The lack of affordable housing has the potential to affect not only individual households in the region, but also the region's economy itself. A successful solution is likely to require coordination across cities and towns, metropolitan areas, and even states to create policies that will have a measurable effect on prices throughout the region.

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Table A.1
Annualized Growth Rates for Real Single-Family House Prices for Metropolitan Areas, 1995 to 2005

	Average annual growth rate
New England Metropolitan Areas	
Boston-Quincy MA	7.7%
Providence-New Bedford-Fall River-Warwick RI	6.9%
Rockingham County-Strafford County NH	6.9%
Manchester-Nashua NH	6.8%
Cambridge-Newton-Framingham MA	6.7%
Worcester MA-CT	6.5%
Portland-South Portland-Biddeford ME	6.0%
Bridgeport-Stamford-Norwalk CT	5.9%
New Haven-Milford CT	4.9%
Springfield MA	4.5%
Burlington-South Burlington VT	4.4%
Hartford-West Hartford-East Hartford CT	3.9%
Competitor Metropolitan Areas	
San Francisco-San Mateo-Redwood City CA	8.2%
New York-Wayne-White Plains NY	6.8%
Phoenix-Mesa-Scottdale AZ	6.5%
Seattle-Bellevue-Everett WA	5.1%
Philadelphia Metro Division PA	4.6%
Chicago-Naperville-Joliet IL	3.9%
Raleigh-Cary NC	1.3%
New England	6.3%
U.S.	4.6%

Source: Authors' calculations based on the house price index calculated by the Office of Federal Housing Enterprise Oversight (OFHEO).

Notes:
Adjusted for inflation using the Consumer Price Index, excluding shelter.
The Boston-Quincy metro division includes Norfolk County, Plymouth County, and Suffolk County.

Table A.2
Median Sales Price of Existing Single-Family Homes, 2005

	Median Price (Thousands)	National Rank (Out of 153 MSAs)
New England Metropolitan Areas		
Bridgeport-Stamford-Norwalk, CT	$482.4	8
Boston-Cambridge-Quincy, MA-NH**	$413.2	13
Providence-New Bedford-Fall River, RI-MA	$293.4	24
Worcester, MA	$290.7	25
New Haven-Milford, CT	$279.1	26
Norwich-New London, CT	$255.9	32
Hartford-West Hartford-East Hartford, CT	$253.3	33
Portland-South Portland-Biddeford, ME	$246.6	37
Springfield, MA	$201.8	52
Competitor Metropolitan Areas		
San Francisco-Oakland-Fremont, CA	$715.7	2
New York-Wayne-White Plains, NY-NJ	$495.2	7
Seattle-Tacoma-Bellevue, WA	$316.8	22
Chicago-Naperville-Joliet, IL	$264.2	29
Phoenix-Mesa-Scottsdale, AZ	$247.4	35
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	$215.3	45
Raleigh-Cary, NC	$194.9	56
U.S.	$219.0	NA

Source: National Association of Realtors.

Table A.3
Median Gross Rent, 2005

	Median Gross Rent ($Dollars)	National Rank (Out of 50 states)
New England	$831	
Massachusetts	$902	4
New Hampshire	$854	7
Connecticut	$839	9
Rhode Island	$775	15
Vermont	$683	23
Maine	$623	30
Fairfield County, CT	$1,067	NA
Boston-Cambridge-Quincy, MA-NH	$1,021	NA
Hillsborough County, NH	$930	NA
New Haven County, CT	$843	NA
Cumberland County, ME	$788	NA
Worcester County, MA	$786	NA
Hartford, CT	$781	NA
Providence-Fall River-Warwick, RI-MA	$758	NA
Springfield, MA	$667	NA
Competitor Metropolitan Areas		
San Francisco-Oakland-San Jose, CA, CS	$1,148	NA
Raleigh-Durham-Cary, NC CSA	$716	NA
U.S.	$728	NA

Source: U.S. Bureau of the Census, American Community Survey.

Notes:
Gross rent is is equal to contract rent plus the estimated average monthly cost of utilities.

Table A.4
Total Growth in Housing Units, 2000 to 2005

	Growth rate (percent)	National Rank (Out of 50 states)
New England	3.2%	NA
New Hampshire	6.6%	21
Maine	4.9%	40
Vermont	4.4%	42
Connecticut	2.7%	47
Massachusetts	2.5%	48
Rhode Island	1.8%	50
U.S.	7.4%	NA

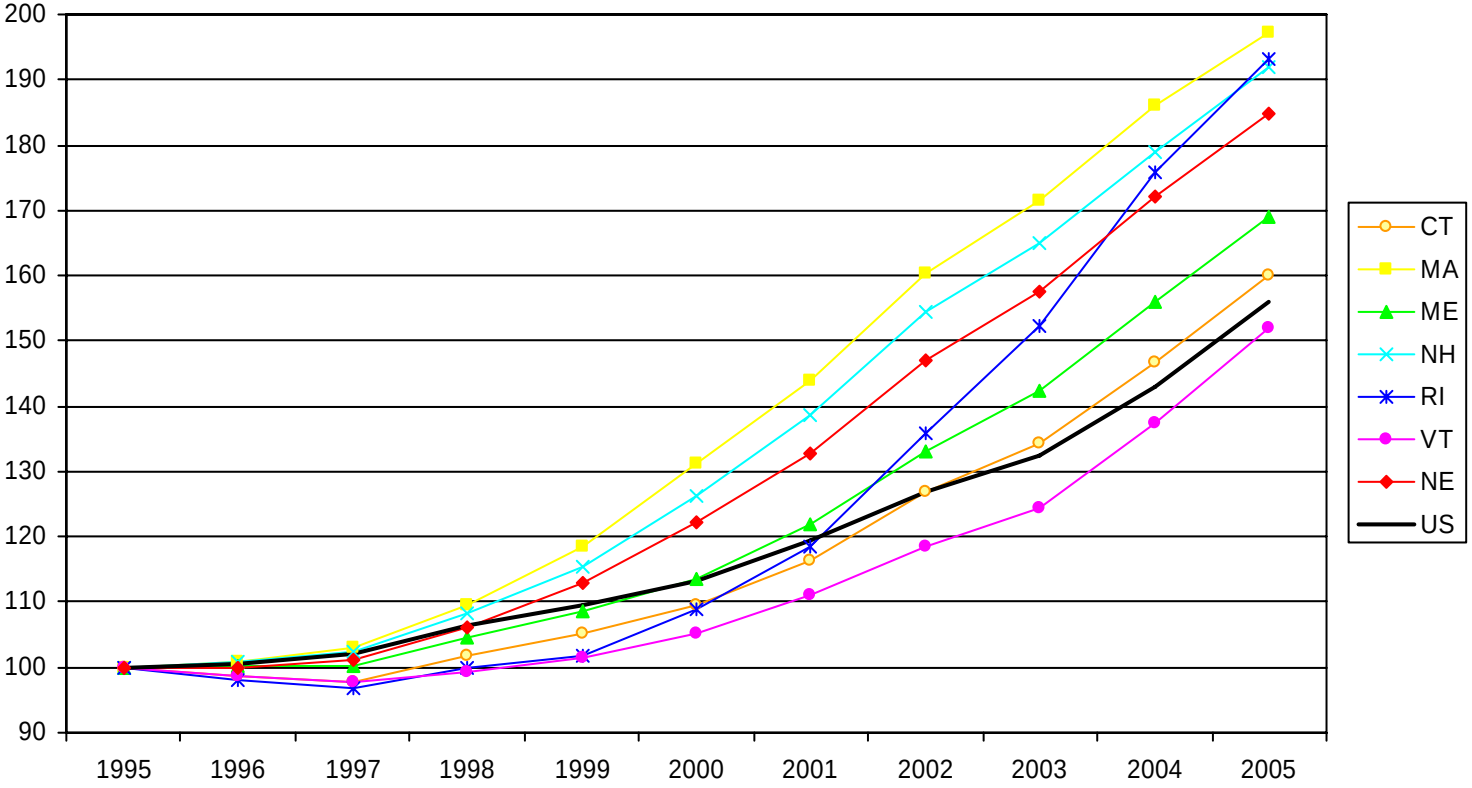
Source: U.S. Bureau of the Census, American Community Survey.

Table A.5
Change in Homeowner Vacancy Rates, 1995 to 2005

	1995	2005	Change
New England			
Connecticut	1.8%	1.3%	-0.5%
Maine	1.1%	1.4%	0.3%
Massachusetts	1.2%	1.1%	-0.1%
New Hampshire	1.1%	1.0%	-0.1%
Rhode Island	1.9%	1.6%	-0.3%
Vermont	1.9%	0.5%	-1.4%
Boston MA-NH	0.9%	1.2%	0.3%
Hartford CT	1.0%	1.0%	0.0%
Providence-Fall River-Warwick RI	2.4%	1.4%	-1.0%
U.S.	1.5%	1.9%	0.4%

Source: U.S. Bureau of the Census, American Community Survey.

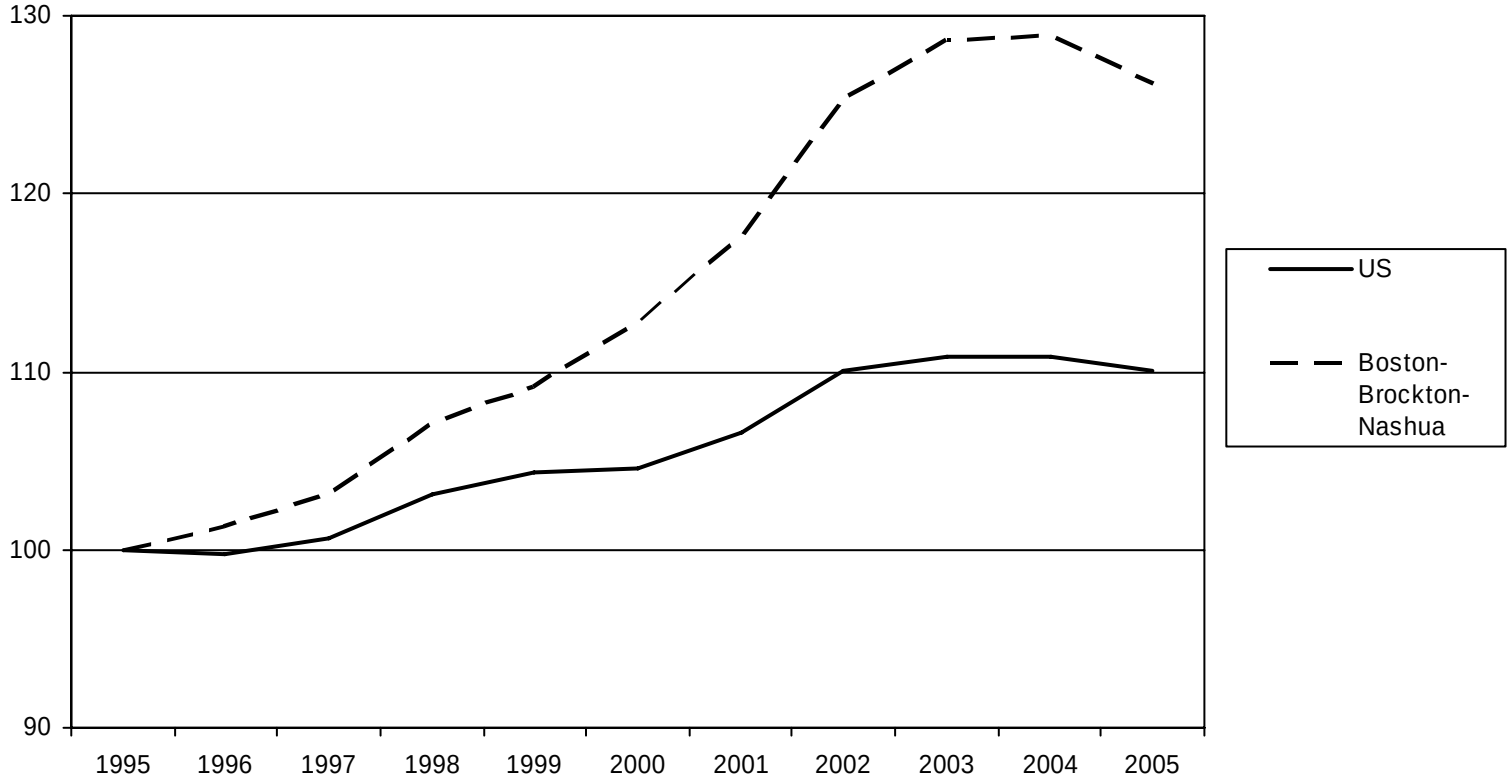
Figure A.1
Growth in Real Single-Family House Prices, 1995-2005



Source:
Authors' calculations based on the house price index calculated by the Office of Federal Housing Enterprise Oversight (OFHEO).

Notes:
Adjusted for inflation using the Consumer Price Index, excluding shelter.

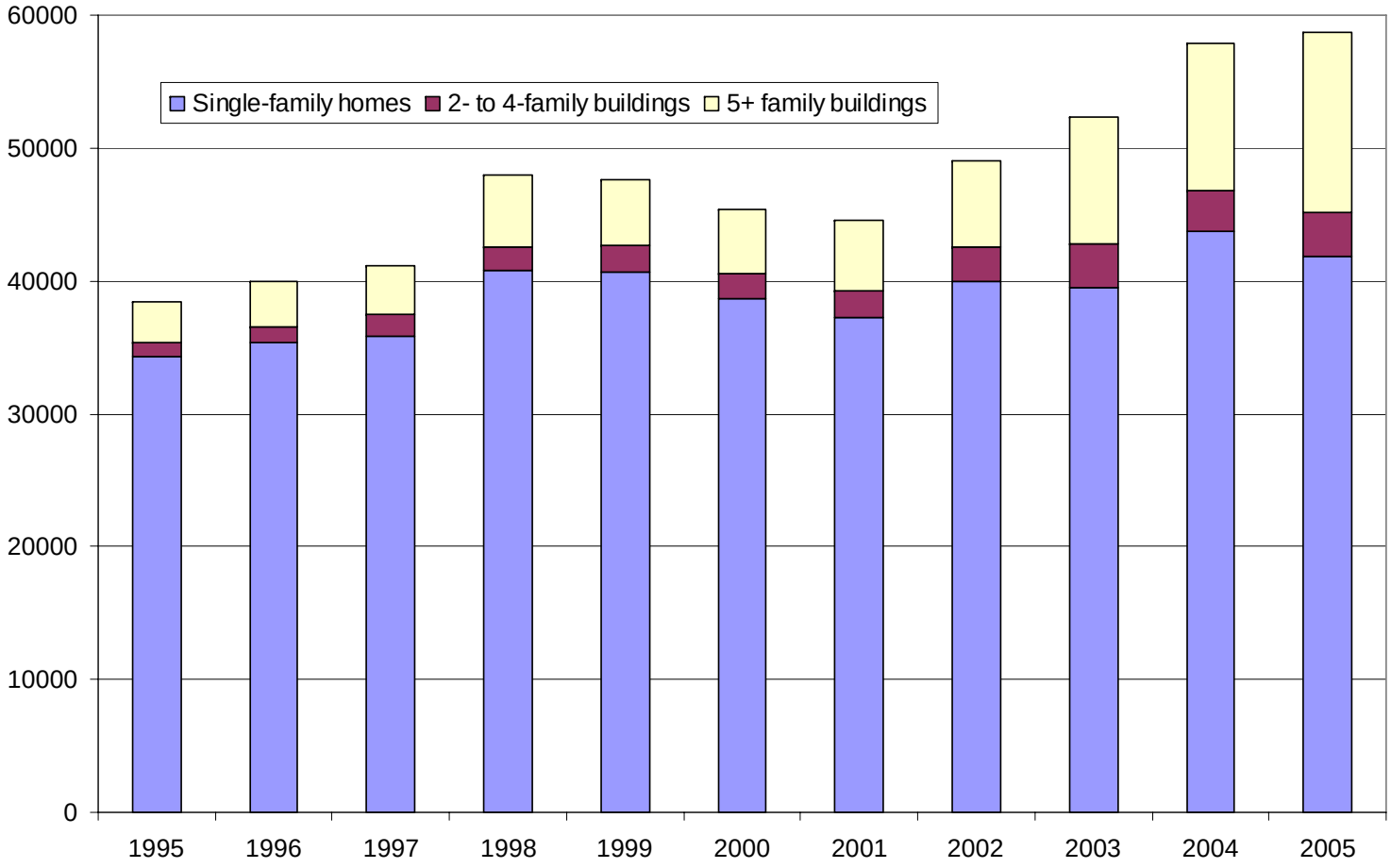
Figure A.2
Growth in Real Rent Index, 1995-2005



Source:
Authors' calculations based on the rent index calculated by the U.S. Bureau of Labor Statistics.

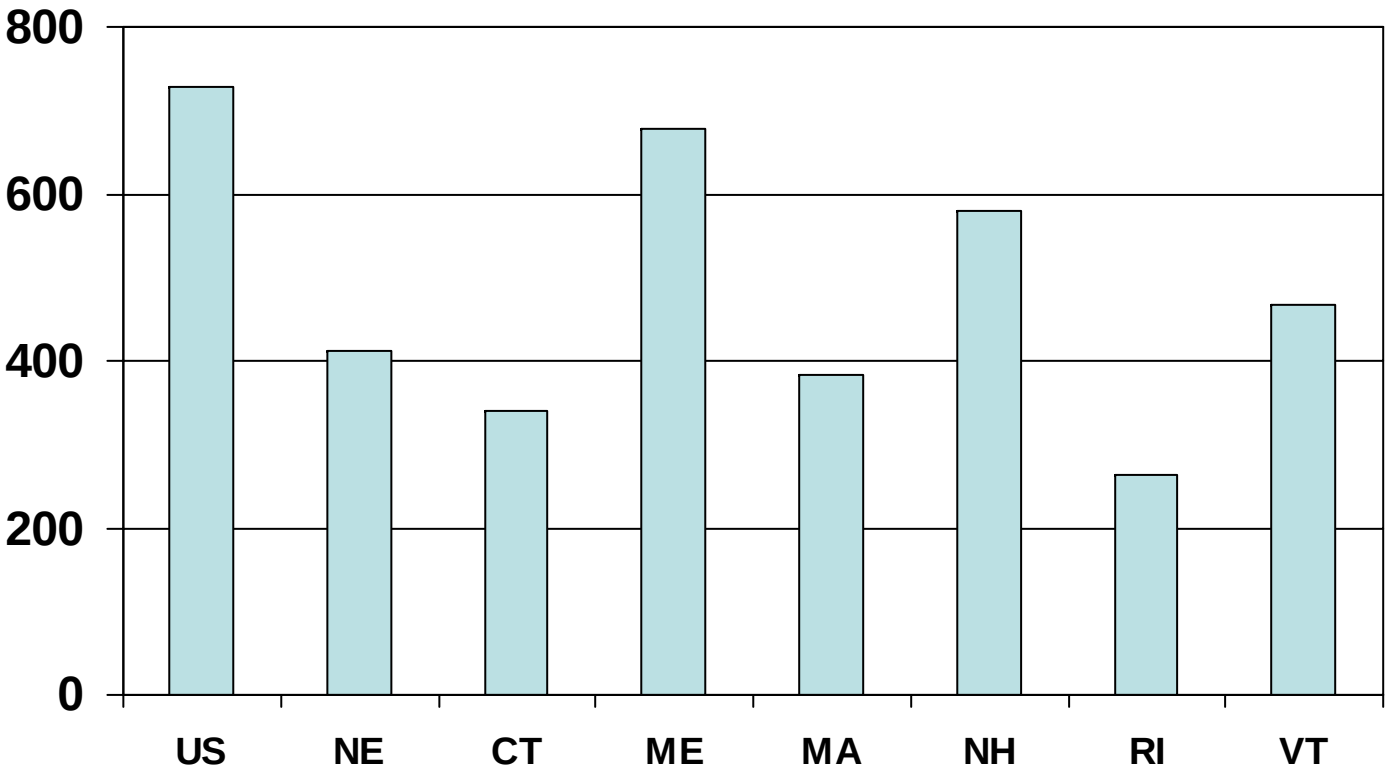
Notes:
Adjusted for inflation using the Consumer Price Index, excluding shelter.

Figure A.3
New Privately-Owned Housing Units Authorized by Building Permits for New England: 1995-2005



Source: U.S. Bureau of the Census.

Figure A.4
Building Permits Issued Per 100,000 Persons, 2005



Source: U.S. Bureau of the Census.

Table B.1
Distribution of Annual Household Income by Quintile, 2005

	1st Quintile Very Low Income	2nd Quintile Low Income	3rd Quintile Middle Income	4th Quintile High Income	5th Quintile Very High Income	All Households
Connecticut						
Median income	$14,400	$38,800	$62,400	$92,000	$160,700	$61,920
Income range	$1 - $26200	$26300 - $50000	$50001 - $75150	$75190 - $116000	$116034 - $1058000	$1 - $1058000
Number of households	236,074	247,566	223,390	236,685	234,421	1,185,859
Percent renters	52.4%	35.1%	21.5%	12.9%	6.5%	26.0%
Percent owners	43.4%	63.5%	76.7%	86.5%	93.1%	72.3%
Maine						
Median income	$11,000	$26,400	$43,100	$64,500	$106,000	$43,000
Income range	$4 - $18300	$18400 - $34050	$34100 - $53000	$53020 - $79000	$79050 - $399004	$4 - $399004
Number of households	92,014	91,956	92,872	91,532	91,401	462,444
Percent renters	48.8%	29.1%	20.2%	11.7%	6.8%	23.2%
Percent owners	48.2%	68.1%	78.7%	87.2%	92.2%	74.9%
Massachusetts						
Median income	$11,000	$35,000	$58,300	$89,250	$151,220	$58,150
Income range	$4 - $23300	$23310 - $46000	$46020 - $72240	$72290 - $110800	$110880 - $1049900	$4 - $1049900
Number of households	436,811	439,387	433,469	436,663	436,421	2,201,676
Percent renters	61.5%	39.4%	29.8%	16.9%	8.7%	31.5%
Percent owners	35.6%	59.3%	69.1%	82.4%	90.9%	67.3%
New Hampshire						
Median income	$15,200	$37,000	$56,000	$81,000	$138,400	$56,000
Income range	$500 - $27100	$27250 - $46800	$46860 - $68000	$68020 - $100000	$100100 - $509400	$500 - $509400
Number of households	87,071	87,168	86,795	88,270	85,553	437,983
Percent renters	42.7%	30.2%	20.2%	14.2%	3.7%	22.5%
Percent owners	54.5%	69.0%	78.3%	85.5%	95.0%	76.2%
Rhode Island						
Median income	$12,000	$30,000	$53,000	$79,000	$135,000	$53,000
Income range	$4 - $20800	$20880 - $40300	$40400 - $65000	$65100 - $99200	$99280 - $728000	$4 - $728000
Number of households	72,006	72,120	71,628	71,977	71,840	361,725
Percent renters	63.7%	43.8%	27.5%	16.3%	8.8%	32.3%
Percent owners	34.7%	54.8%	70.5%	83.2%	91.0%	66.6%
Vermont						
Median income	$12,000	$29,200	$46,000	$69,000	$128,700	$45,800
Income range	$200 - $20000	$20010 - $37100	$37200 - $56000	$56200 - $88730	$88900 - $669200	$200 - $669200
Number of households	43,451	43,084	43,774	42,769	43,188	216,732
Percent renters	50.6%	30.8%	22.2%	12.2%	5.3%	24.3%
Percent owners	47.0%	67.1%	75.5%	85.6%	93.7%	73.7%
New England						
Median income	$13,000	$34,300	$56,100	$85,000	$148,000	$56,000
Income range	$1 - $23500	$23501 - $45000	$45020 - $69600	$69620 - $106000	$106020 - $1058000	$1 - $1058000
Number of households	967,087	992,816	939,448	968,689	963,316	4,866,419
Percent renters	55.5%	36.5%	25.0%	15.8%	7.5%	28.3%
Percent owners	41.3%	62.1%	73.6%	83.5%	92.1%	70.3%
United States						
Median income	$12,000	$28,800	$47,400	$72,210	$128,600	$47,300
Income range	$1 - $20000	$20001 - $37500	$37501 - $58800	$58804 - $91700	$91704 - $1277770	$1 - $1277770
Number of households	19,461,399	19,325,769	19,373,065	19,362,337	19,376,050	97,773,714
Percent renters	47.6%	35.5%	27.0%	17.6%	9.4%	27.6%
Percent owners	48.4%	62.2%	71.6%	81.5%	90.1%	70.5%

Source: American Community Survey, 2005

Notes:
Sample includes households where the household head is age 25+ and not enrolled in school and the household has positive income.

Household income is based on all sources of income from all household members.

Income includes the sum of the amounts reported separately for wage or salary income; net self-employment income; interest, dividends, or net rental or royalty income or income from estates and trusts; Social Security or railroad retirement income; Supplemental Security Income (SSI); public assistance or welfare payments; retirement, survivor, or disability pensions; and all other income. Receipts from the following sources are not included as income: capital gains, money received from the sale of property (unless the recipient was engaged in the business of selling such property); the value of income ''in kind'' from food stamps, public housing subsidies, medical care, employer contributions for individuals, etc.; withdrawal of bank deposits; money borrowed; tax refunds; exchange of money between relatives living in the same household; gifts and lump-sum inheritances, insurance payments, and other types of lump-sum receipts.

Table B.2
Percentage of Owner/Renter Households with Moderate or Severe Housing Burdens, by Income Quintile, 2005

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
	Moderate Burden: Households Paying More than 30% of Income for Housing					Severe Burden: Households Paying More than 50% of Income for Housing				
	Household Income Quintile					Household Income Quintile				
	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th
Connecticut	80.3%	46.7%	16.6% ***	6.8% ***	1.9% ***	53.8%	11.1%	2.2% ***	1.6%	0.2%
Maine	69.9% ***	38.3% ***	17.1%	5.6% ***	2.5%	43.0% ***	5.6% ***	1.9% *	0.8%	0.0% ***
Massachusetts	75.3% ***	55.9% ***	25.1% ***	8.2%	2.1% ***	52.3% ***	17.3% ***	3.0%	0.5% ***	0.1% ***
New Hampshire	79.0%	44.3%	23.3% *	8.6%	1.2% ***	50.8%	9.1% *	2.9%	0.4% ***	0.0% ***
Rhode Island	71.4% ***	56.3% ***	24.2% **	6.5% **	1.2% ***	51.2%	13.8%	1.8% **	0.3% ***	0.0% ***
Vermont	82.4%	43.9%	13.2% **	5.5% **	0.7% ***	57.9%	6.0% ***	0.2% ***	1.5%	0.0% ***
New England	75.8% ***	50.1% ***	22.2% ***	7.7% ***	2.2% ***	51.8% ***	13.3% **	2.7% **	0.8% **	0.3%
United States	82.0%	46.1%	19.5%	8.8%	3.5%	55.5%	12.0%	3.3%	1.0%	0.3%

Source: American Community Survey, 2005

Notes:

Sample includes households where the household head is age 25+ and not enrolled in school and the household has positive income.

Household income is based on all sources of income and all household members.

Expenditures for rental housing consist of gross rent (contract rent plus utilities).

*Indicates statistically significant difference with the United States at the 10% level, ** at the 5% level, and *** at the 1% level.

Expenditures for owner housing consist of monthly mortgage payment (principal and interest), real estate taxes, and homeowner's insurance premiums for fire, hazard, and flood. Owners must have a mortgage payment and mortgage payments include only the primary mortgage.

Table B.3
Housing Burden for "Middle Income" Households, 2005

	Median Percentage of Income Spent on Housing		Moderate Burden: Percentage of Households Spending More than 30% of Income on Housing		Severe Burden: Percentage of Households Spending More than 50% of Income on Housing	
	[1] Renters	[2] Owners	[3] Renters	[4] Owners	[5] Renters	[6] Owners
Connecticut	19.2% ***	22.1% ***	7.2% ***	20.1%	0.4% ***	2.9% ***
Maine	20.4% ***	19.5% ***	16.2%	17.5%	0.0% ***	2.6%
Massachusetts	21.8%	24.2% ***	18.8%	28.7% ***	1.1%	4.1%
New Hampshire	21.7% *	23.3% ***	10.5% **	27.9% ***	0.0% ***	3.9%
Rhode Island	20.0%	26.0% ***	8.7% ***	32.2% ***	0.3% ***	2.6% *
Vermont	18.9%	19.6%	7.8% *	15.4%	0.0% ***	0.3% ***
New England	21.0% **	22.8% ***	15.3% *	25.4% ***	0.9% *	3.6% *
United States	21.3%	20.1%	17.5%	20.6%	1.6%	4.2%

Source: American Community Survey, 2005

Notes:
"Middle income" households are those that fall into the 3rd quintile of the income distribution.

Sample includes households where the household head is age 25+ and not enrolled in school and the household has positive income.

Household income is based on all sources of income and all household members.

Expenditures for rental housing consist of gross rent (contract rent plus utilities).

*Indicates statistically significant difference with the United States at the 10% level, ** at the 5% level, and *** at the 1% level.

Expenditures for owner housing consist of monthly mortgage payment (principal and interest), real estate taxes, and homeowner's insurance premiums for fire, hazard, and flood. Owners must have a mortgage payment and mortgage payments include only the primary mortgage.

Table B.4
Housing Burden for "Very Low Income" Households, 2005

	Median Percentage of Income Spent on Housing		Moderate Burden: Percentage of Households Spending More than 30% of Income on Housing		Severe Burden: Percentage of Households Spending More than 50% of Income on Housing	
	[1] Renters	[2] Owners	[3] Renters	[4] Owners	[5] Renters	[6] Owners
Connecticut	50.8% ***	67.0% ***	78.0% ***	88.3% ***	50.4% ***	65.8% ***
Maine	43.2% ***	43.5% **	69.6% ***	71.4% *	42.7% ***	44.1% **
Massachusetts	47.4% ***	77.3% ***	73.0% ***	86.7% ***	48.1% ***	73.1% ***
New Hampshire	49.6% ***	55.1%	77.7% *	82.2%	49.2% *	55.1%
Rhode Island	45.9% ***	69.5% ***	68.5% ***	87.4% **	47.8% ***	70.5% ***
Vermont	54.3%	70.6% **	83.2%	80.4%	54.1%	69.0% **
New England	48.4% ***	66.8% ***	73.7% ***	84.3% ***	48.5% ***	64.8% ***
United States	55.4%	54.9%	82.7%	80.2%	55.7%	54.9%

Source: American Community Survey, 2005

Notes:
"Very low-income" households are those that fall into the bottom (1st) quintile of the income distribution.

Sample includes households where the household head is age 25+ and not enrolled in school and the household has positive income.

Household income is based on all sources of income and all household members.

Expenditures for rental housing consist of gross rent (contract rent plus utilities).

*Indicates statistically significant difference with the United States at the 10% level, ** at the 5% level, and *** at the 1% level.

Expenditures for owner housing consist of monthly mortgage payment (principal and interest), real estate taxes, and homeowner's insurance premiums for fire, hazard, and flood. Owners must have a mortgage payment and mortgage payments include only the primary

Table B.5
Percentage of Owner Households with Moderate or Severe Housing Burdens, 2005
By Age of Household Head

	25 to 34				35 to 44				45 to 54			
	Renters		Owners		Renters		Owners		Renters		Owners	
	[1] Moderate Burden (>30%)	[2] Severe Burden (>50%)	[3] Moderate Burden (>30%)	[4] Severe Burden (>50%)	[5] Moderate Burden (>30%)	[6] Severe Burden (>50%)	[7] Moderate Burden (>30%)	[8] Severe Burden (>50%)	[9] Moderate Burden (>30%)	[10] Severe Burden (>50%)	[11] Moderate Burden (>30%)	[12] Severe Burden (>50%)
Connecticut	41.2%	18.4%	20.3%	5.8%	43.4%	22.1%	20.9%	8.1%	44.4%	21.4%	16.8%	5.7%
Maine	37.6%	12.2%	12.6%	3.1%	43.2%	19.3%	15.2%	4.0%	51.5%	27.5%	13.9%	4.7%
Massachusetts	41.3%	17.7%	23.8%	7.4%	47.1%	23.4%	21.8%	7.2%	45.1%	21.9%	18.6%	6.4%
New Hampshire	32.6%	14.9%	19.4%	4.2%	42.3%	21.2%	24.4%	6.5%	46.1%	21.9%	17.4%	5.4%
Rhode Island	35.1%	17.1%	23.6%	5.9%	48.6%	26.6%	22.6%	5.6%	45.3%	21.8%	16.5%	3.4%
Vermont	41.6%	21.7%	11.6%	3.5%	56.6%	32.6%	14.3%	5.6%	43.3%	20.3%	18.1%	4.8%
New England	39.9%	17.4%	21.0%	6.0%	46.0%	23.1%	21.0%	6.9%	45.4%	22.1%	17.4%	5.7%
United States	42.8%	19.8%	18.9%	5.8%	44.6%	21.7%	18.9%	6.4%	44.3%	22.2%	17.0%	6.2%

Source: American Community Survey, 2005

Notes:
Sample includes households where the household head is age 25+ and not enrolled in school, and household has positive income and a positive mortgage payment.

Household income is based on all sources of income and all household members.

Expenditures for owner housing consist of monthly mortgage payment (principal and interest), real estate taxes, and homeowner's insurance premiums for fire, hazard, and flood. Owners must have a mortgage payment and mortgage payments include only the primary mortgage.

Table B.6
Percentage of Households with Moderate or Severe Housing Burdens, 2005
By Education Level of Head of Household

	High school graduates				College graduates			
	Renters		Owners		Renters		Owners	
	[1] Moderate Burden (>30%)	[2] Severe Burden (>50%)	[3] Moderate Burden (>30%)	[4] Severe Burden (>50%)	[5] Moderate Burden (>30%)	[6] Severe Burden (>50%)	[7] Moderate Burden (>30%)	[8] Severe Burden (>50%)
Connecticut	48.7%	23.4%	23.5%	8.3%	31.0%	12.7%	17.8%	6.9%
Maine	44.1%	21.3%	15.4%	5.8%	35.7%	10.7%	13.3%	2.8%
Massachusetts	52.0%	26.1%	26.0%	9.7%	32.7%	14.1%	18.0%	6.6%
New Hampshire	45.2%	17.7%	25.0%	8.4%	23.3%	11.9%	15.6%	4.9%
Rhode Island	49.8%	25.7%	25.6%	6.9%	24.6%	9.6%	16.3%	3.9%
Vermont	43.4%	24.5%	19.2%	8.4%	34.5%	17.8%	18.3%	6.7%
New England	49.4%	24.3%	23.6%	8.5%	31.4%	13.3%	17.3%	6.1%
United States	49.5%	24.3%	22.0%	8.3%	30.8%	12.7%	15.6%	5.2%

Source: American Community Survey, 2005

Notes:
Sample includes households where the household head is age 25+ and not enrolled in school and the household has positive income.

Education level of household includes those who have exactly the specified level of education, and no more.

Household income is based on all sources of income and all household members.

Expenditures for rental housing consist of gross rent (contract rent plus utilities).

Expenditures for owner housing consist of monthly mortgage payment (principal and interest), real estate taxes, and homeowner's insurance premiums for fire, hazard, and flood. Owners must have a mortgage payment and mortgage payments include only the primary mortgage.

Table B.7
Percentage of "Service Occupation" Households with Moderate or Severe Housing Burdens, 2005

	Renters		Owners	
	[1]	[2]	[3]	[4]
	Moderate Burden (>30%)	Severe Burden (>50%)	Moderate Burden (>30%)	Severe Burden (>50%)
Connecticut	41.1%	21.7%	12.8%	4.1%
Maine	19.5%	5.6%	10.9%	3.0%
Massachusetts	38.9%	16.3%	15.5%	3.9%
New Hampshire	25.9%	11.9%	10.8%	1.1%
Rhode Island	37.5%	26.5%	14.8%	4.4%
Vermont	34.3%	7.3%	15.6%	3.2%
New England	36.7%	16.6%	14.0%	3.6%
United States	35.3%	15.5%	12.5%	3.5%

Source: American Community Survey, 2005

Notes:
"Service Occupation" households include at least one member that is a teacher, nurse, or police officer.

Sample includes households where the household head is age 25+ and not enrolled in school and the household has positive income.

Household income is based on all sources of income and all household members.

Expenditures for rental housing consist of gross rent (contract rent plus utilities).

Expenditures for owner housing consist of monthly mortgage payment (principal and interest), real estate taxes, and homeowner's insurance premiums for fire, hazard, and flood. Owners must have a mortgage payment and mortgage payments include only the primary mortgage.

Table B.8
Ratio of Annual Household Income to Income Needed to Afford Median-Priced Housing, 2005
"Middle Income" Households

	"All Households" Age 25+ and Not in School		"Potential First-Time Buyers" Age 25-39, Not in School, Currently Rents	
	[1] Median Gross Rent	[2] Median House Price	[3] Median Gross Rent	[4] Median House Price
Connecticut	1.75	0.69	1.17	0.46
Maine	1.79	0.88	1.30	0.64
Massachusetts	1.57	0.64	1.16	0.47
New Hampshire	1.75	0.81	1.23	0.57
Rhode Island	1.66	0.64	1.12	0.44
Vermont	1.83	0.92	1.33	0.68
United States	1.65	0.82	1.19	0.59

Notes:
Ratio = [Annual median household income] / [Annual income needed] for each housing type.

Annual median household incomes are three-year moving averages as calculated from the 2003-2005 Current Population Survey, adjusted to real $2005.

Monthly expenditures for renters equal to median gross rent as reported in the 2005 American Community Survey detailed tables. Annual income needed = gross rent per month * 12 / 0.30.

Monthly expenditures for homeowners based on the median price for a single family home as reported by the Federal Home Finance Board. Total monthly payment is equal to principal and interest on 80% of the purchase price at prevailing rates for a 30-year conventional mortgage laon, real estate taxes, and homeowners' insurance premiums. Annual income needed = total monthly payment * 12/ qualifying income ratio which is assumed to be the industry standard of 28%. See data appendix for further details.

For "first-time" homebuyers, monthly expenditures for homeowners are based on 85% of the median price for a single family home. Total monthly payment is equal to principal and interst on 95% of the purchase price at prevailing rates for a 30-year FHA loan, real estate taxes, homeowners' insurance premiums, and personal mortgage insurance of 0.5% of the outstanding balance of the loan. Annual income needed = total monthly payment * 12 / qualifying income ratio which is assumed to the FHA requirement of 29%. See data appendix for further details.

"Middle income" households are those that fall into the 3rd quintile of the income distribution.

Table B.9
Ratio of Annual Household Income to Annual Income Needed to Afford Housing at the 10th Percentile, 2005
"Very Low-Income Households"

	"All Households" Age 25+ and Not in School		"Potential First-Time Buyers" Age 25-39, Not in School, Currently Rents	
	[1] 10th Percentile Gross Rent	[2] 10th Percentile House Price	[3] 10th Percentile Gross Rent	[4] 10th Percentile House Price
Connecticut	0.89	0.28	0.63	0.20
Maine	1.25	NA	1.00	NA
Massachusetts	1.11	NA	1.04	NA
New Hampshire	0.95	NA	0.84	NA
Rhode Island	1.18	NA	0.92	NA
Vermont	1.01	NA	0.86	NA
United States	0.89	NA	0.73	NA

Notes:
Ratio = [Annual median household income] / [Annual income needed] for each housing type.

Annual median household incomes are three-year moving averages as calculated from the 2003-2005 Current Population Survey, adjusted to real $2005.

Median monthly expenditures for renters equal to the 10th percentile of gross rent as reported in the 2005 American Community Survey detailed tables. Annual income needed = gross rent per month * 12 / 0.30.

Monthly expenditures for homeowners based on the house prices at the 10th percentile as reported by the Center for Real Estate and Urban Economics Studies at the University of Connecticut. Total monthly payment is equal to principal and interest on 80% of the purchase price at prevailing rates for a 30-year conventional mortgage laon, real estate taxes, and homeowners' insurance premiums. Annual income needed = total monthly payment * 12/ qualifying income ratio which is assumed to be the industry standard of 28%. See data appendix for further details.

For "first-time" homebuyers, monthly expenditures for homeowners are based on 85% of the price for a single family home at the 10th percentile. Total monthly payment is equal to principal and interst on 95% of the purchase price at prevailing rates for a 30-year FHA loan, real estate taxes, homeowners' insurance premiums, and personal mortgage insurance of 0.5% of the outstanding balance of the loan. Annual income needed = total monthly payment * 12 / qualifying income ratio which is assumed to the FHA requirement of 29%. See data appendix for further details.

"Very low-income" households are those that fall into the bottom (1st) quintile of the income distribution.

Table B.10
Ratio of Annual Household Income to Annual Income Needed to Purchase a House at Select Percentiles of the Distribution, 1999-2005
Connecticut

	"Very Low-Income" Households					"Middle-Income" Households			
	[1]	[2]	[3]	[4]		[5]	[6]	[7]	[8]
	House Price	Annual Income Needed	Annual Household Income	Ratio of Household Income to Income Needed		House Price	Annual Income Needed	Annual Household Income	Ratio of Household Income to Income Needed
1999	$96,274	$30,840	$13,886	0.45		$220,718	$67,775	$57,944	0.85
2000	$99,648	$33,550	$14,979	0.45		$232,485	$75,191	$58,965	0.78
2001	$108,567	$33,988	$15,797	0.46		$235,778	$70,996	$60,339	0.85
2002	$122,016	$36,048	$15,450	0.43		$260,409	$74,078	$59,354	0.80
2003	$134,533	$37,082	$14,415	0.39		$266,466	$70,885	$60,156	0.85
2004	$147,230	$39,723	$12,973	0.33		$299,960	$78,131	$59,461	0.76
2005	$164,686	$44,560	$12,490	0.28		$326,458	$85,594	$58,951	0.69
Change 1999-2005	**71.1%**	**44.5%**	**-10.1%**	**-37.8%**		**47.9%**	**26.3%**	**1.7%**	**-19.4%**

Notes:

House price for the 10th percentile as reported by the Center for Real Estate and Urban Economics Studies at the University of Connecticut. House price for the 50th percentile as reported by the Federal Home Finance Board. Both were adjusted to $2005 using the CPI less shelter.

Annual income needed = total monthly payment * 12/ qualifying income ratio which is assumed to be the industry standard of 28%. Total monthly payment is equal to principal and interest on 80% of the purchase price at prevailing rates for a 30-year conventional mortgage laon, real estate taxes, and homeowners' insurance premiums. See data appendix for further details.

Annual median household incomes are three-year moving averages as calculated from the 2003-2005 Current Population Survey where the household head is age 25+ and not enrolled in school, adjusted to real $2005 using the CPI-U.

Ratio = Annual household income / Annual income needed.

"Very low-income" households are those that fall into the bottom (1st) quintile of the income distribution.

"Middle income" households are those that fall into the 3rd quintile of the income distribution.

Table B.11
Ratio of Annual Household Income to Income Needed to Afford the Median-Priced House, 2005
"Middle Income" Households

	[1] "All Households" Age 25+, not in school	[2] Potential "First-Time Homebuyers" Age 25-39, not in school, currently rents
Connecticut		
Bridgeport-Stamford-Norwalk, CT	0.73	0.49
Hartford-West Hartford-East Hartford, CT	1.08	0.77
New Haven-Milford, CT	0.84	0.60
Maine		
Portland-South Portland-Biddeford, ME	0.83	0.66
Massachusetts		
Boston-Quincy, MA	0.64	0.54
Cambridge-Newton-Framingham, MA	0.80	0.65
Springfield, MA	1.10	0.74
Worcester, MA	0.94	0.67
New Hampshire		
Manchester-Nashua, NH	0.95	0.72
Rockingham County-Strafford County, NH	0.80	0.62
Rhode Island		
Providence-New Bedford-Fall River, RI-MA	0.75	0.54
Vermont		
Burlington-South Burlington, VT	0.92	0.69
Competitor Cities		
Phoenix-Mesa-Scottsdale, AZ	0.95	0.68
Raleigh-Cary, NC	1.04	0.73
Philadelphia, PA	0.83	0.62
Seattle-Bellevue-Everett, WA	0.78	0.57
Chicago-Naperville-Joliet, IL	0.84	0.61
New York-White Plains-Wayne, NY-NJ	0.41	0.37
San Francisco-San Mateo-Redwood City, CA	0.37	0.35
United States	0.82	0.59

Notes:
Ratio = [Annual median household income] / [Annual income needed] for each group.

Median household incomes for the two groups are estimated using the 2000 Decennial Census and then applying the compound annual growth rate in median household income from the 2000-2005 American Community Survey.

Monthly expenditures for homeowners based on the median price for a single family home as reported by the National Association of Home Builders. Total monthly payment is equal to principal and interest on 80% of the purchase price at prevailing rates for a 30-year conventional mortgage laon, real estate taxes, and homeowners' insurance premiums. Annual income needed = total monthly payment * 12/ qualifying income ratio which is assumed to be the industry standard of 28%. See data appendix for further details.

For "first-time" homebuyers, monthly expenditures for homeowners are based on 85% of the median price for a single family home. Total monthly payment is equal to principal and interst on 95% of the purchase price at prevailing rates for a 30-year FHA loan, real estate taxes, homeowners' insurance premiums, and personal mortgage insurance of 0.5% of the outstanding balance of the loan. Annual income needed = total monthly payment * 12 / qualifying income ratio which is assumed to the FHA requirement of 29%. See data appendix for further details.

"Middle income" households are those that fall into the 3rd quintile of the income distribution.

Table B.12
Ratio of Annual Household Income to Annual Income Needed to Purchase the Median Priced House, 2005
By Age of Household Head

	[1] 25-34 Years	[2] 35-44 Years	[3] 45-54 Years	[4] 55-64 Years	[5] 65+ Years
Connecticut	0.66	0.86	0.95	0.71	0.33
Maine	0.92	1.16	1.23	0.90	0.46
Massachusetts	0.68	0.82	0.85	0.72	0.27
New Hampshire	0.82	0.99	1.04	0.89	0.35
Rhode Island	0.60	0.79	0.86	0.78	0.32
Vermont	0.90	1.08	1.20	1.02	0.48
United States	0.81	1.00	1.08	0.90	0.44

Notes:
Ratio = [Annual median household income] / [Annual income needed] for each group.

Annual median household incomes are three-year moving averages as calculated from the 2003-2005 Current Population Survey, adjusted to real $2005.

Monthly expenditures for homeowners based on the median price for a single family home as reported by the Federal Home Finance Board. Total monthly payment is equal to principal and interest on 80% of the purchase price at prevailing rates for a 30-year conventional mortgage laon, real estate taxes, and homeowners' insurance premiums. Annual income needed = total monthly payment * 12/ qualifying income ratio which is assumed to be the industry standard of 28%. See data appendix for further details.

For "first-time" homebuyers, monthly expenditures for homeowners are based on 85% of the median price for a single family home. Total monthly payment is equal to principal and interst on 95% of the purchase price at prevailing rates for a 30-year FHA loan, real estate taxes, homeowners' insurance premiums, and personal mortgage insurance of 0.5% of the outstanding balance of the loan. Annual income needed = total monthly payment * 12 / qualifying income ratio which is assumed to the FHA requirement of 29%. See data appendix for further details.

Table B.13
Ratio of Annual Household Income to Annual Income Needed to Purchase the Median Priced House, 2005
By Education Level of Household Head

	[1] High School Graduates	[2] College Graduates
Connecticut	0.51	1.02
Maine	0.78	1.26
Massachusetts	0.45	0.98
New Hampshire	0.62	1.19
Rhode Island	0.54	0.93
Vermont	0.82	1.19
United States	0.67	1.24

Notes:
Ratio = [Annual median household income] / [Annual income needed] for each group.

Annual median household incomes are three-year moving averages as calculated from the 2003-2005 Current Population Survey, adjusted to real $2005.

Monthly expenditures for homeowners based on the median price for a single family home as reported by the Federal Home Finance Board. Total monthly payment is equal to principal and interest on 80% of the purchase price at prevailing rates for a 30-year conventional mortgage laon, real estate taxes, and homeowners' insurance premiums. Annual income needed = total monthly payment * 12/ qualifying income ratio which is assumed to be the industry standard of 28%. See data appendix for further details.

For "first-time" homebuyers, monthly expenditures for homeowners are based on 85% of the median price for a single family home. Total monthly payment is equal to principal and interst on 95% of the purchase price at prevailing rates for a 30-year FHA loan, real estate taxes, homeowners' insurance premiums, and personal mortgage insurance of 0.5% of the outstanding balance of the loan. Annual income needed = total monthly payment * 12 / qualifying income ratio which is assumed to the FHA requirement of 29%. See data appendix for further details.

Table B.14
Ratio of Annual Household Income to Income Needed to Afford the Median-Priced House, 2000
"Young Professional" Households

	[1] All Households	[2] Potential First-Time Homebuyers	[3] Young Professional Households
Connecticut			
Bridgeport-Stamford-Norwalk, CT	0.90	0.62	1.36
Hartford-West Hartford-East Hartford, CT	1.16	0.83	1.64
New Haven-Milford, CT	1.10	0.79	1.53
Maine			
Portland-South Portland-Biddeford, ME	1.04	0.84	1.33
Massachusetts			
Boston-Quincy, MA	0.78	0.67	1.15
Cambridge-Newton-Framingham, MA	0.89	0.73	1.16
Springfield, MA	1.26	0.86	1.66
Worcester, MA	1.06	0.77	1.53
New Hampshire			
Manchester-Nashua, NH	1.10	0.84	1.46
Rockingham County-Strafford County, NH	0.99	0.77	1.30
Rhode Island			
Providence-New Bedford-Fall River, RI-MA	0.94	0.68	1.37
Vermont			
Burlington-South Burlington, VT	1.06	0.80	1.26
Competitor Cities			
Philadelphia, PA	1.08	0.81	1.64
Phoenix-Mesa-Scottdale, AZ	1.25	0.90	1.71
Chicago-Naperville-Joliet, IL	1.11	0.80	1.51
Raleigh-Cary, NC	1.05	0.74	1.34
Seattle-Bellevue-Everett, WA	0.92	0.68	1.12
New York-White Plains-Wayne, NY-NJ	0.61	0.56	1.00
San Francisco-San Mateo-Redwood City, CA	0.52	0.50	0.73

Notes:

Monthly expenditures for homeowners based on the median price for a single family home as reported by the National Association of Home Builders. Total monthly payment is equal to principal and interest on 80% of the purchase price at prevailing rates for a 30-year conventional mortgage laon, real estate taxes, and homeowners' insurance premiums. Annual income needed = total monthly payment * 12/ qualifying income ratio which is assumed to be the industry standard of 28%. See data appendix for further details.

Median household incomes calculated from the 2000 Decennial Census.

Ratio = [Annual median household income] / [Annual income needed] for each group.

"All Households" are those where the head is age 25+, and not in school.

"Potential First-Time Homebuyers" are households where the head is age 25-39, not in school, and currently rents.

"Young Professional" households are those where the head is age 25-39 years, not in school, and has a Bachelor's degree or higher.

Table B.15
Ratio of Annual Household Income to Annual Income Needed to Purchase the Median Priced House, 2005
By Service Occupation

	Ratio of Median Household Income to Income Needed			
	[1]	[2]	[3]	[4]
	Teachers	Nurses	Police	All
Connecticut	1.11	1.29	1.07	1.16
Maine	1.51	1.74	1.33	1.54
Massachusetts	1.02	1.12	1.23	1.05
New Hampshire	1.17	1.12	1.08	1.15
Rhode Island	1.16	1.25	1.30	1.21
Vermont	1.40	1.54	1.51	1.43
United States	1.36	1.45	1.32	1.38

Notes:
Ratio = [Annual median household income] / [Annual income needed] for each group.

Annual median household incomes are three-year moving averages as calculated from the 2003-2005 Current Population Survey, adjusted to real $2005.

Monthly expenditures for homeowners based on the median price for a single family home as reported by the Federal Home Finance Board. Total monthly payment is equal to principal and interest on 80% of the purchase price at prevailing rates for a 30-year conventional mortgage laon, real estate taxes, and homeowners' insurance premiums. Annual income needed = total monthly payment * 12/ qualifying income ratio which is assumed to be the industry standard of 28%. See data appendix for further details.

For "first-time" homebuyers, monthly expenditures for homeowners are based on 85% of the median price for a single family home. Total monthly payment is equal to principal and interst on 95% of the purchase price at prevailing rates for a 30-year FHA loan, real estate taxes, homeowners' insurance premiums, and personal mortgage insurance of 0.5% of the outstanding balance of the loan. Annual income needed = total monthly payment * 12 / qualifying income ratio which is assumed to the FHA requirement of 29%. See data appendix for further details.

Table B.16
Supply of Affordable Owner-Occupied Housing for "Middle-Income" Households, 2005

	[1] Ratio: Number of Affordable Houses/ Number of households	[2] Ratio: Number of Affordable Houses Available/ Number of households	[3] Adding in affordable rental units that are available
Connecticut	2.08	1.08	2.52
Maine	2.10	1.01	2.25
Massachusetts	1.71	0.87	2.45
New Hampshire	2.07	1.08	2.28
Rhode Island	1.82	0.85	2.57
Vermont	2.02	1.13	2.40
New England	1.92	0.98	2.47
United States	1.86	0.98	2.39

Source:
American Community Survey, 2005

Notes:
Affordable is defined as being able to qualify for a mortgage to purchase the homes assuming a qualifying income ratio of 28%.

Number of affordable units defined as the sum of all units that are affordable to "middle-income" households.

Number of affordable units available defined as the sum of all units that are affordable to "middle-income" households excluding those units occupied by higher-income households.

Number of "middle-income" households defined as households in the middle (3rd) quintile of the income distribution.

Table B.17
Supply of Affordable Rental Housing for "Very Low-Income" Households, 2005

	[1] Ratio: Number of Affordable Rental Units/ Number of households	[2] Ratio: Number of Rental Units Available/ Number of households	[3] Adding in affordable houses that are available
Connecticut	0.44	0.33	0.36
Maine	0.43	0.33	0.40
Massachusetts	0.50	0.40	0.43
New Hampshire	0.40	0.25	0.30
Rhode Island	0.48	0.37	0.39
Vermont	0.36	0.27	0.32
New England	0.46	0.35	0.40
United States	0.40	0.27	0.35

Source:
American Community Survey, 2005

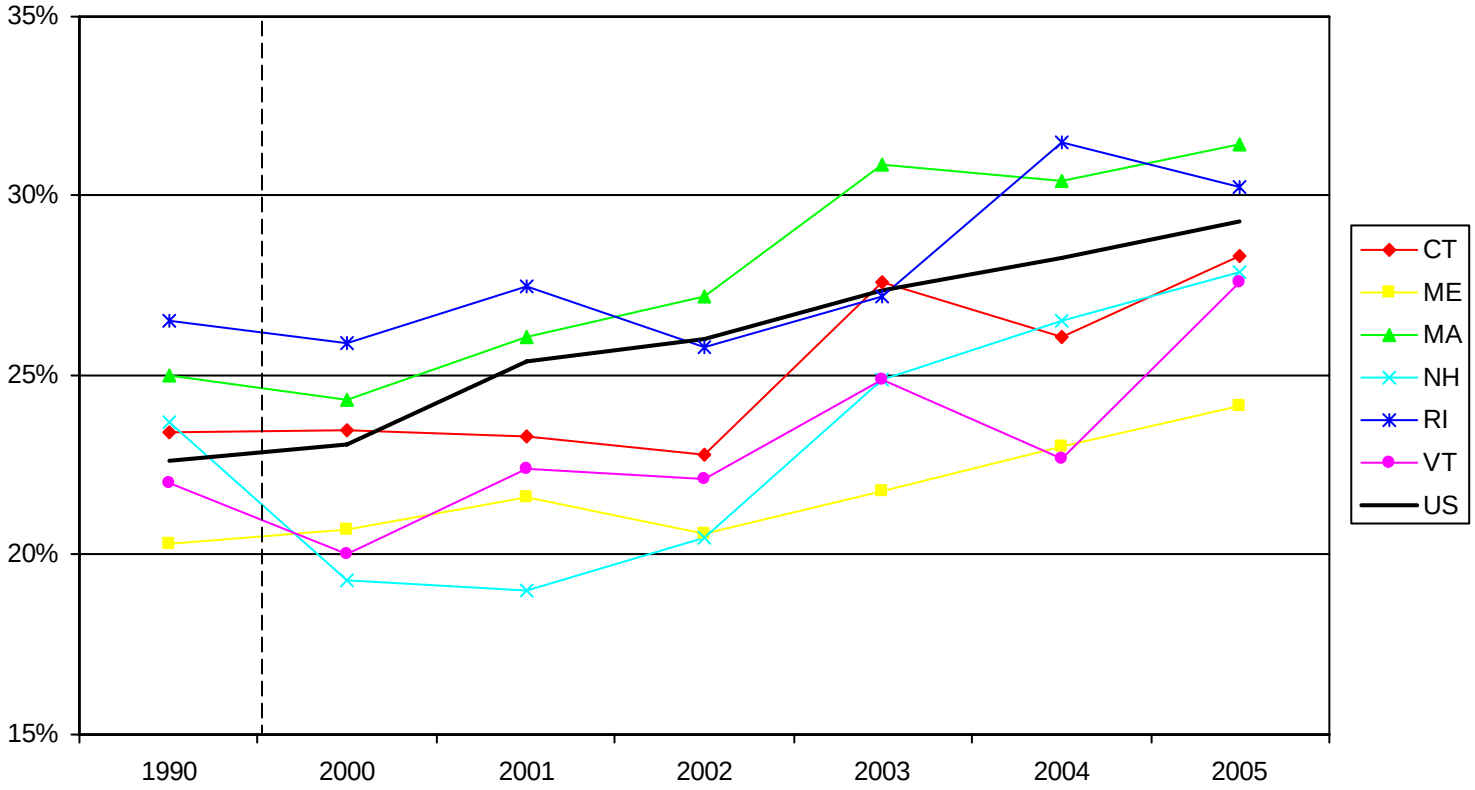
Notes:
Affordable is defined as having an annual income greater than annual rental costs / 0.30.

Number of affordable units defined as the sum of all units that are affordable to "very low-income" households.

Number of affordable units available defined as the sum of all units that are affordable to "very low-income" households excluding those units occupied by higher-income households.

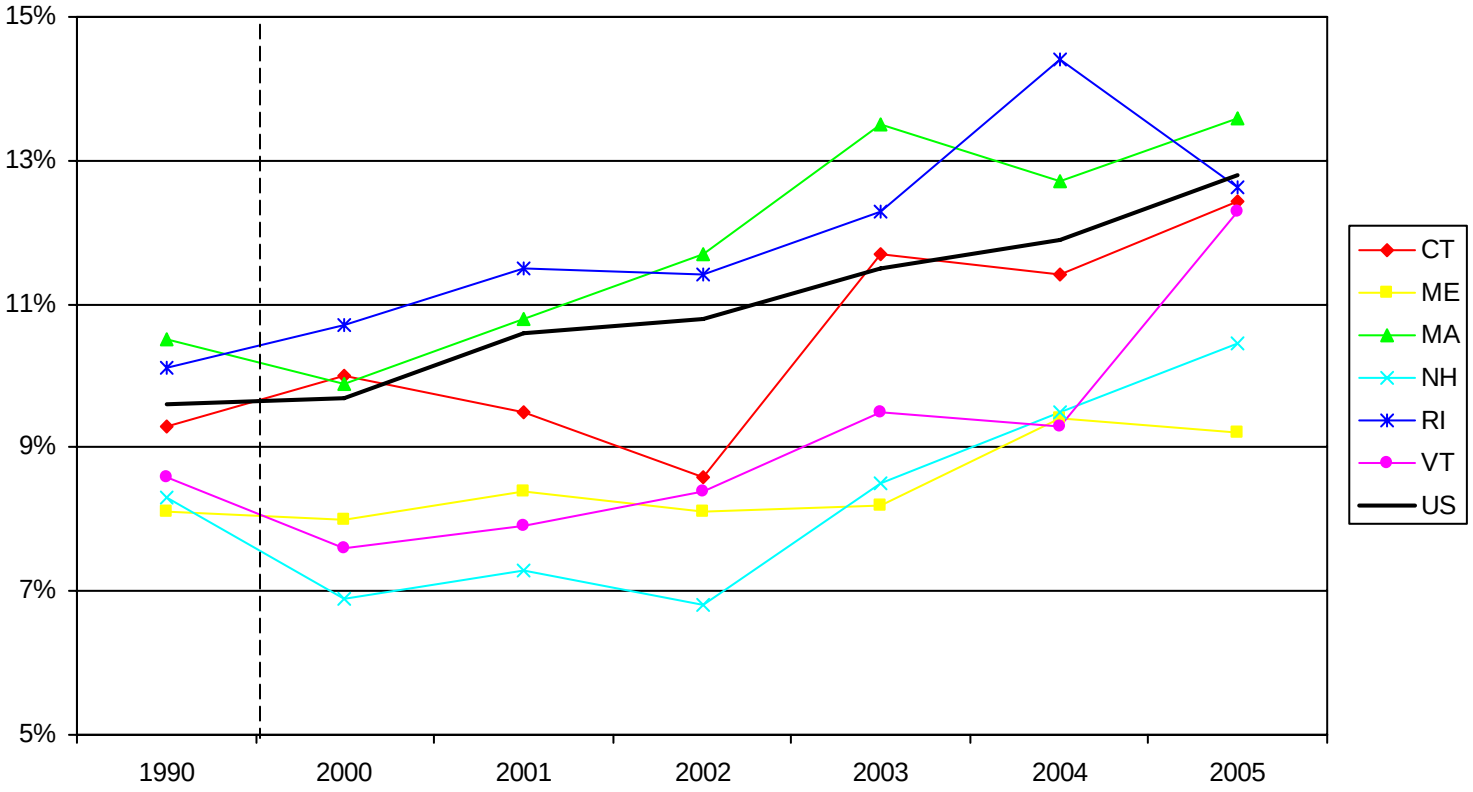
Number of "very low-income" households defined as households in the lowest (1st) quintile of the income distribution.

Figure B.1
Percentage of Households Experiencing Any Housing Burden (Moderate or Severe)
All Households



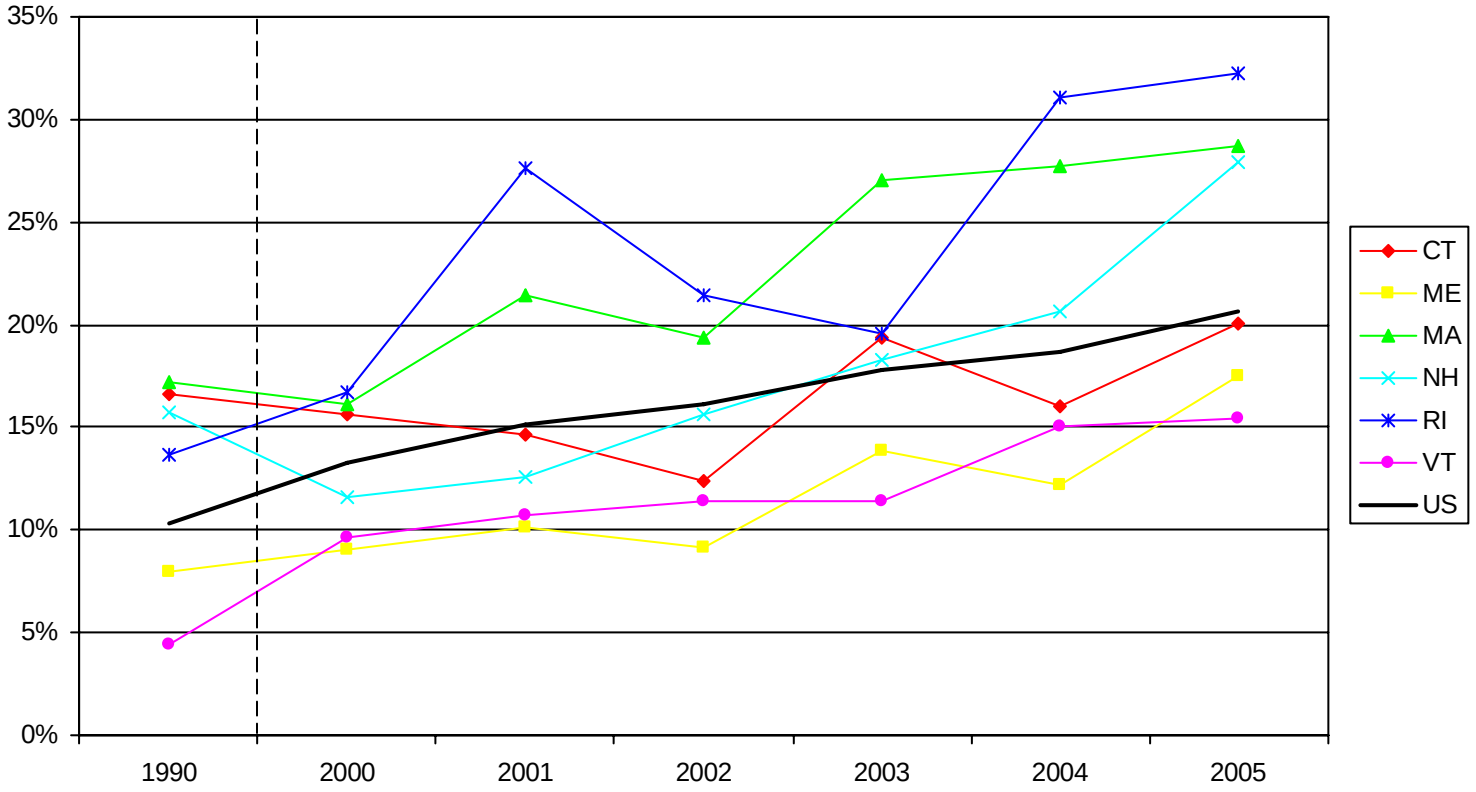
Notes:
Author's calculations from the Census IPUMS (1990 and 2000) and the American Community Survey.
Sample includes households with positive incomes where the head is age 25+ and not enrolled in school.
Moderate housing burden is defined as spending more than 30% of income on housing.

Figure B.2
Percentage of Households Experiencing Severe Housing Burdens
All Households



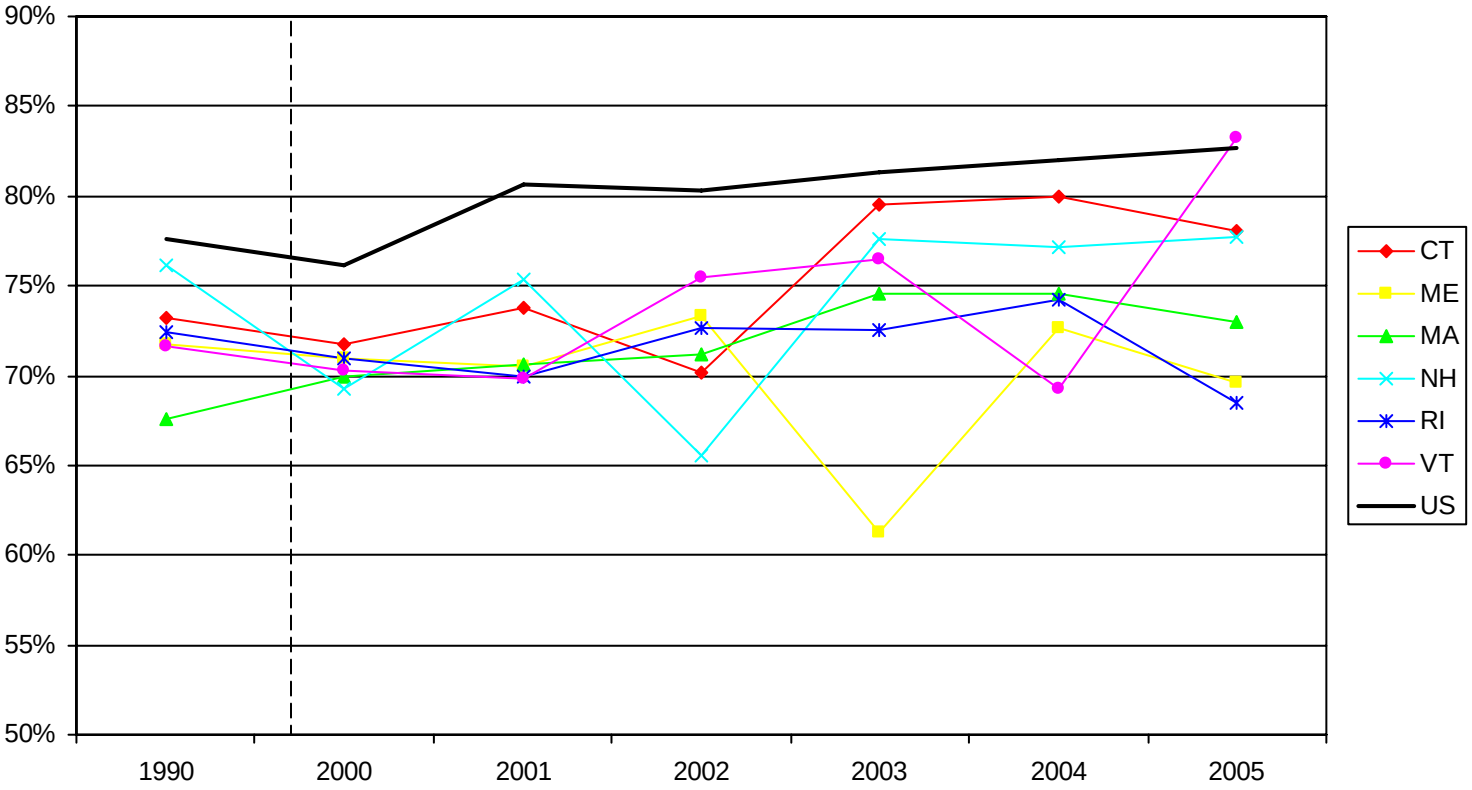
Notes:
Author's calculations from the Census IPUMS (1990 and 2000) and the American Community Survey.
Sample includes households with positive incomes where the head is age 25+ and not enrolled in school.
Moderate housing burden is defined as spending more than 50% of income on housing.

Figure B.3
Percentage of "Middle-Income" Households Experiencing Any Housing Burden (Moderate or Severe)
Homeowners



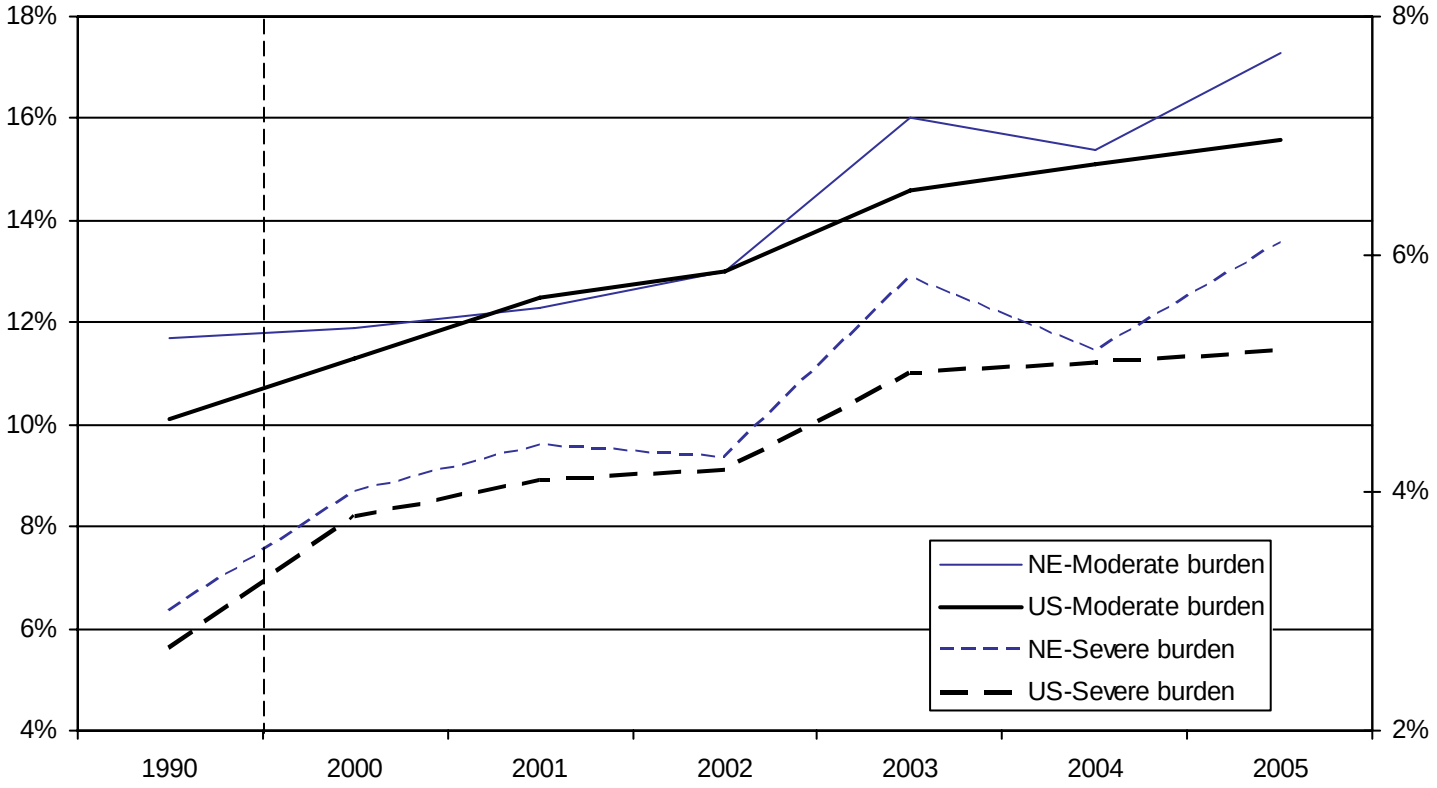
Notes:
Author's calculations from the Census IPUMS (1990 and 2000) and the American Community Survey.
Sample includes households with positive incomes where the head is age 25+ and not enrolled in school.
"Middle-income" households are those that fall into the 3rd quintile of the income distribution.
Moderate housing burden is defined as spending more than 30% of income on housing.

Figure B.4
Percentage of "Very Low-Income" Households Experiencing Any Housing Burden (Moderate or Severe)
Renters



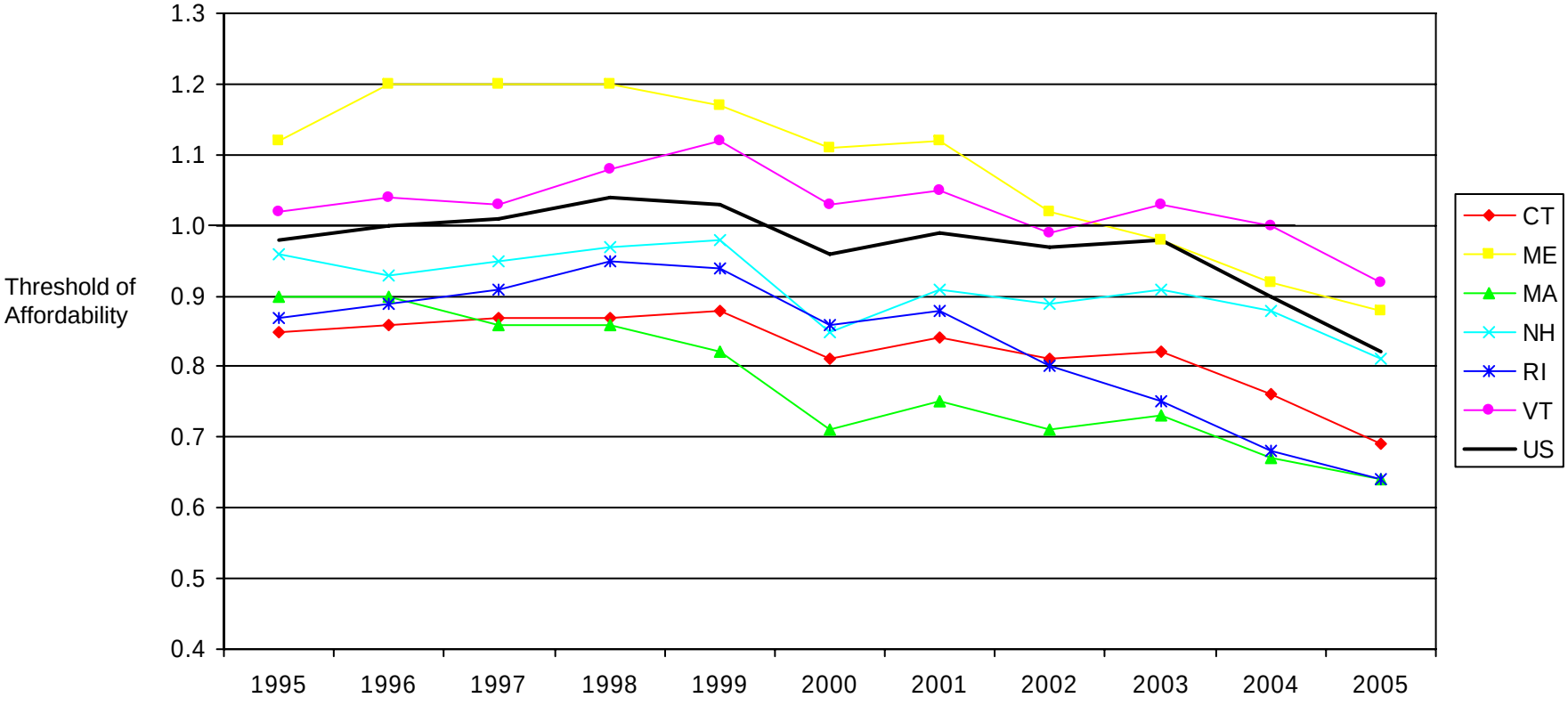
Notes:
Author's calculations from the Census IPUMS (1990 and 2000) and the American Community Survey.
Sample includes households with positive incomes where the head is age 25+ and not enrolled in school.
"Very Low-income" households are those that fall into the 1st quintile of the income distribution.
Moderate housing burden is defined as spending more than 30% of income on housing.

Figure B.5
Percentage of Owner Households Experiencing Moderate and Severe Housing Burdens
Household Head has College Degree



Notes:
Author's calculations from the Census IPUMS (1990 and 2000) and the American Community Survey.
Sample includes households with positive incomes where the head is age 25+ and not enrolled in school.
Moderate housing burden is defined as spending more than 30% of income on housing.

Figure B.6
Ratio of Real Annual Median Household Income to Real Annual Income Needed to Purchase the Median Priced House
All "Middle-Income" Households

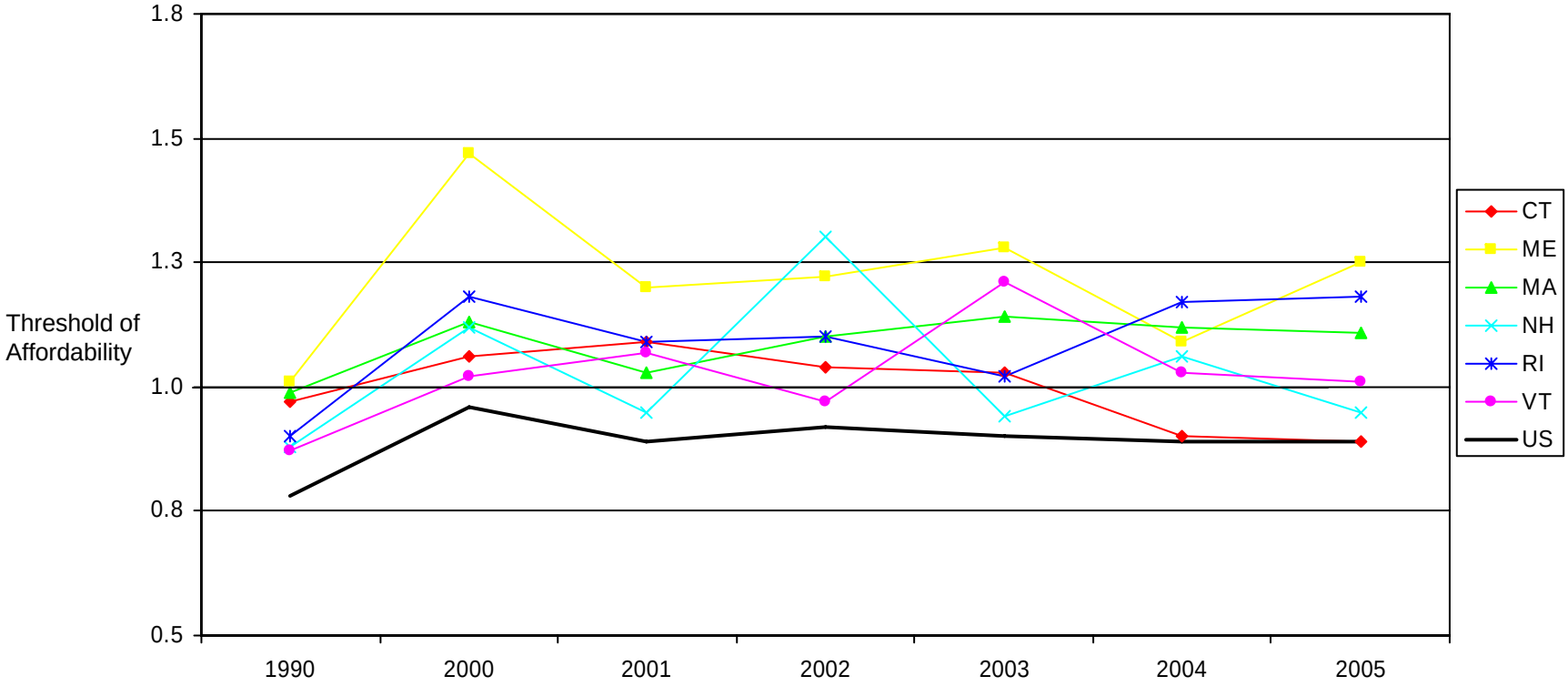


Notes:
Annual median household income are three-year moving averages as calculated from the Current Population Survey for households where the head is age 25+ and is not enrolled in school, adjusted to $2005 using the CPI-U.
Annual median income needed to purchase the median priced house are based on annual house prices as reported by the Federal Home Finance Bureau, adjusted by the OFHEO index and deflated by the CPI-U less shelter. See data appendix for details.
"Middle-income" households are those that fall into the 3rd quintile of the income distribution.

Figure B.7

Ratio of Real Annual Household Income to Real Annual Income Needed to Afford the Gross Rent at the 10th Percentile

"Very Low-Income" Households



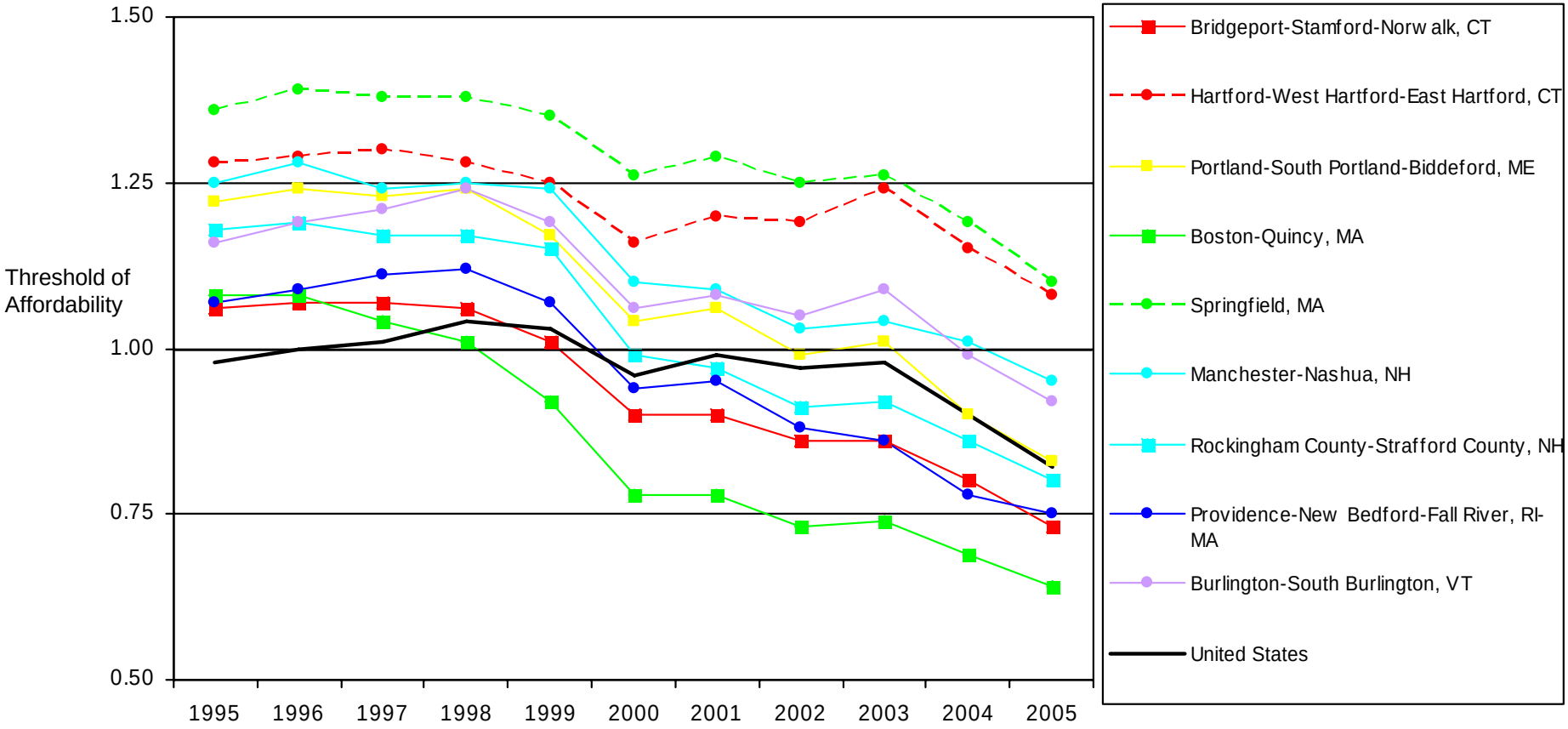
Notes:

Annual household income at the 10th percentile is for households where the head is age 25+ and not enrolled in school. Incomes at the 10th percentile are calculated from the Census for 1990 and 2000 and are represented by three-year moving averages from the Current Population Survey for 2001 through 2005. The 2001-2005 figures are adjusted to $2005 using the CPI-U. The 1990 and 2000 income figures are adjusted to $2004.

Annual median income needed to afford the 10th percentile of rent is based on monthly gross rent at the 10th percentile * 12 months / 0.30. Monthly gross rent is the sum of contract rent plus utilities at the 10th percentile is calculated from the Census for 1990 and 2000 and from the American Community Survey for 2001 through 2004 . All rents are adjusted to $2004 using the CPI for rent of primary residence.

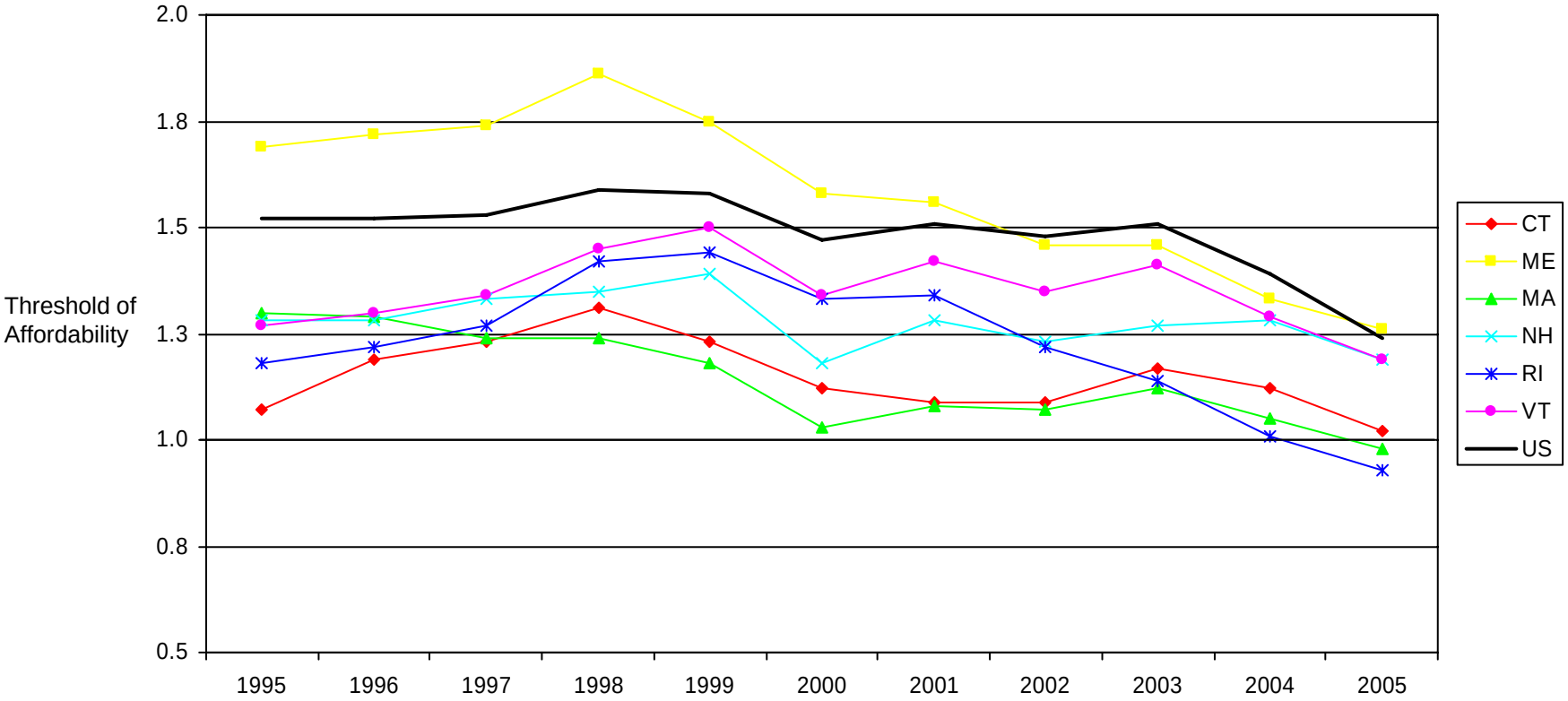
"Very low-income" households are those that fall into the 1st quintile of the income distribution.

Figure B.8
Ratio of Real Annual Median Household Income to Real Annual Income Needed to Afford the Median-Priced House
"Middle-Income" Households



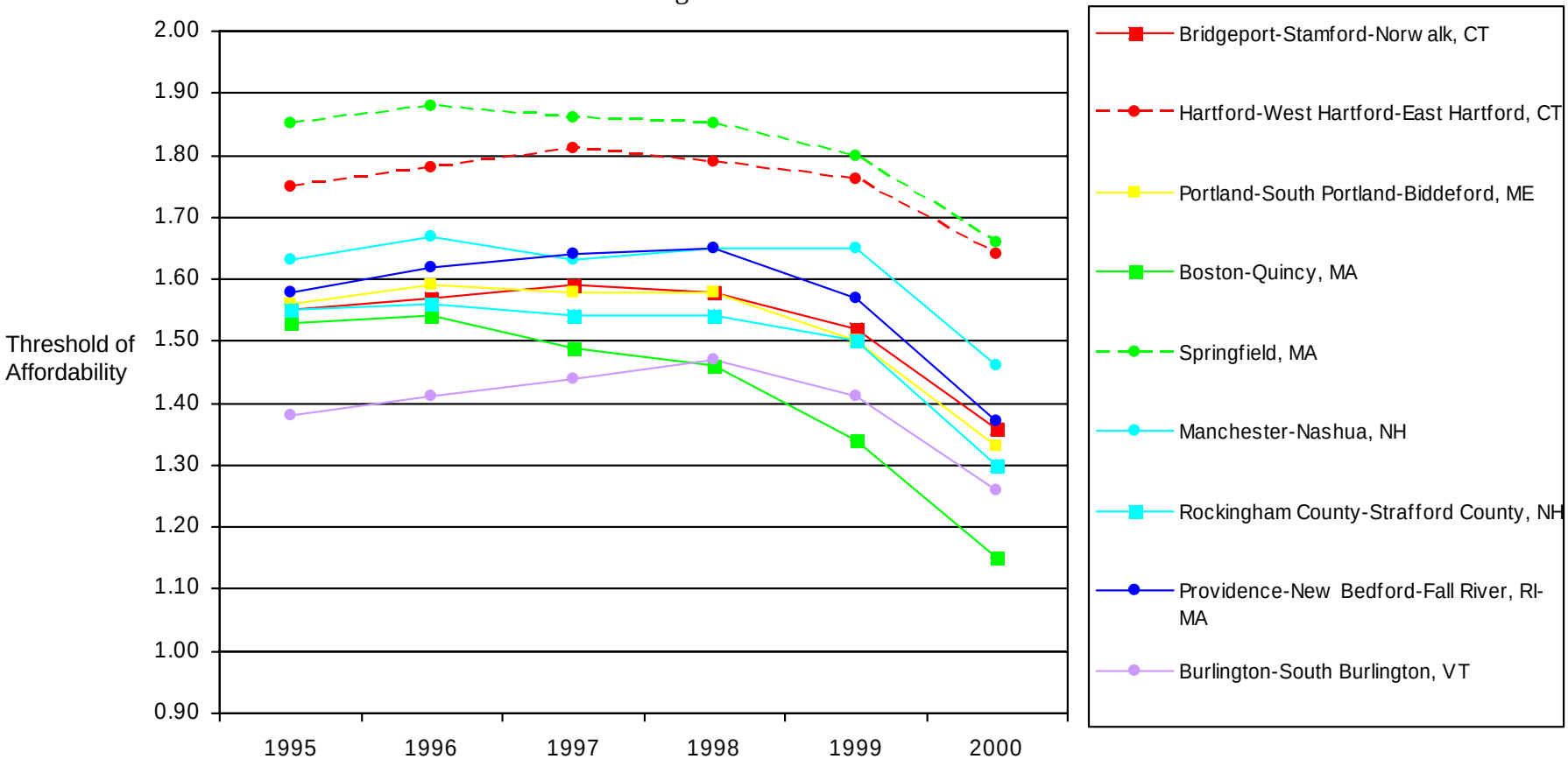
Notes:
Annual median household income are calculated from the 1990 and 2000 Census and interpolated between Census years for households where the head is age 25+ and is not enrolled in school, adjusted to $2005 using the CPI-U.
Annual median income needed to purchase the median priced house are based on quarterly and annual house prices as reported by the National Association of Home Builders as well as state housing agencies (Maine and Vermont), adjusted by the OFHEO index and deflated by the CPI-U less shelter. See data appendix for details.
"Middle-income" households are those that fall into the 3rd quintile of the income distribution.

Figure B.9
Ratio of Real Annual Median Household Income to Real Annual Income Needed to Purchase the Median Priced House
Household Head has College Degree



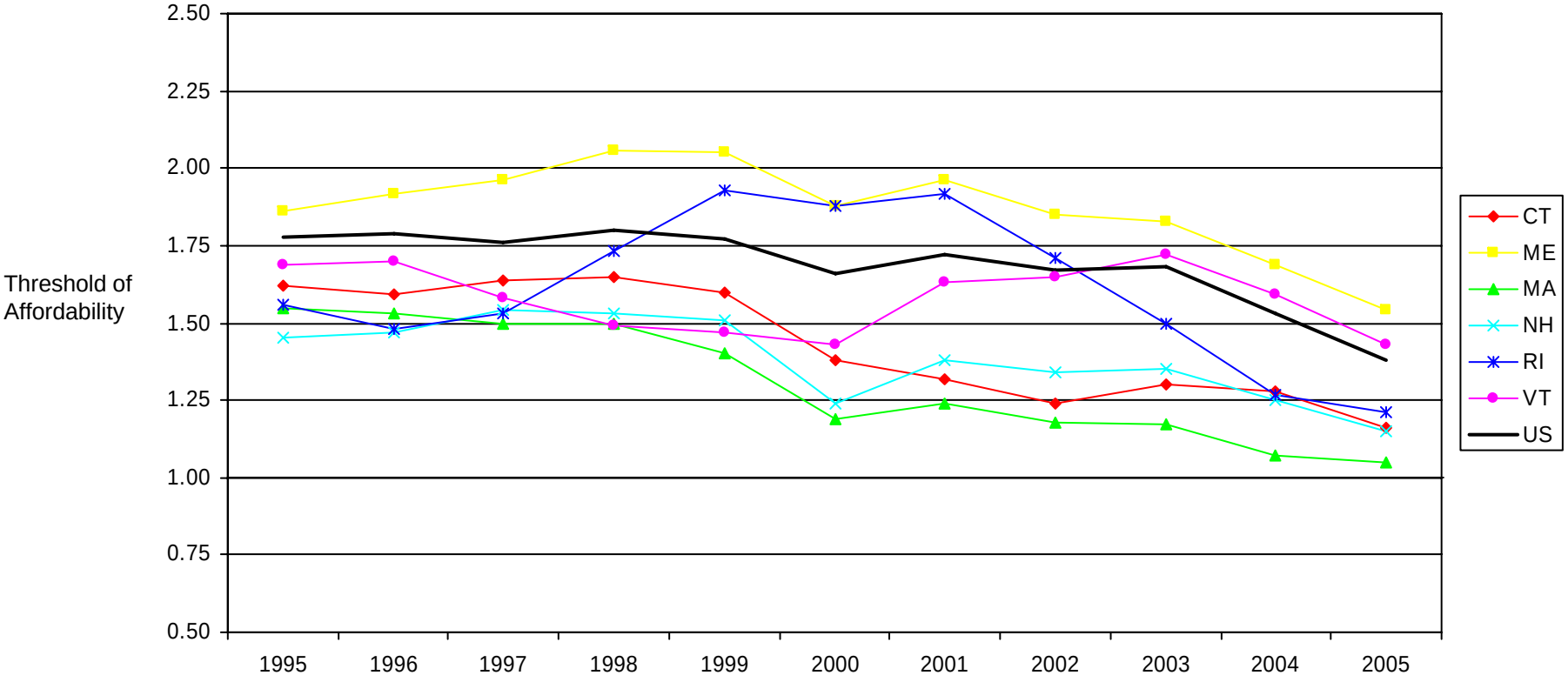
Notes:
Annual median household income are three-year moving averages as calculated from the Current Population Survey for households where the head is age 25+, not enrolled in school, and has a college degree, adjusted to $2005 using the CPI-U.
Annual median income needed to purchase the median priced house are based on annual house prices as reported by the Federal Home Finance Bureau, adjusted by the OFHEO index and deflated by the CPI-U less shelter. See data appendix for details.

Figure B.10
Ratio of Real Annual Median Household Income to Real Annual Income Needed to Purchase the Median Priced House
"Young Professional" Households



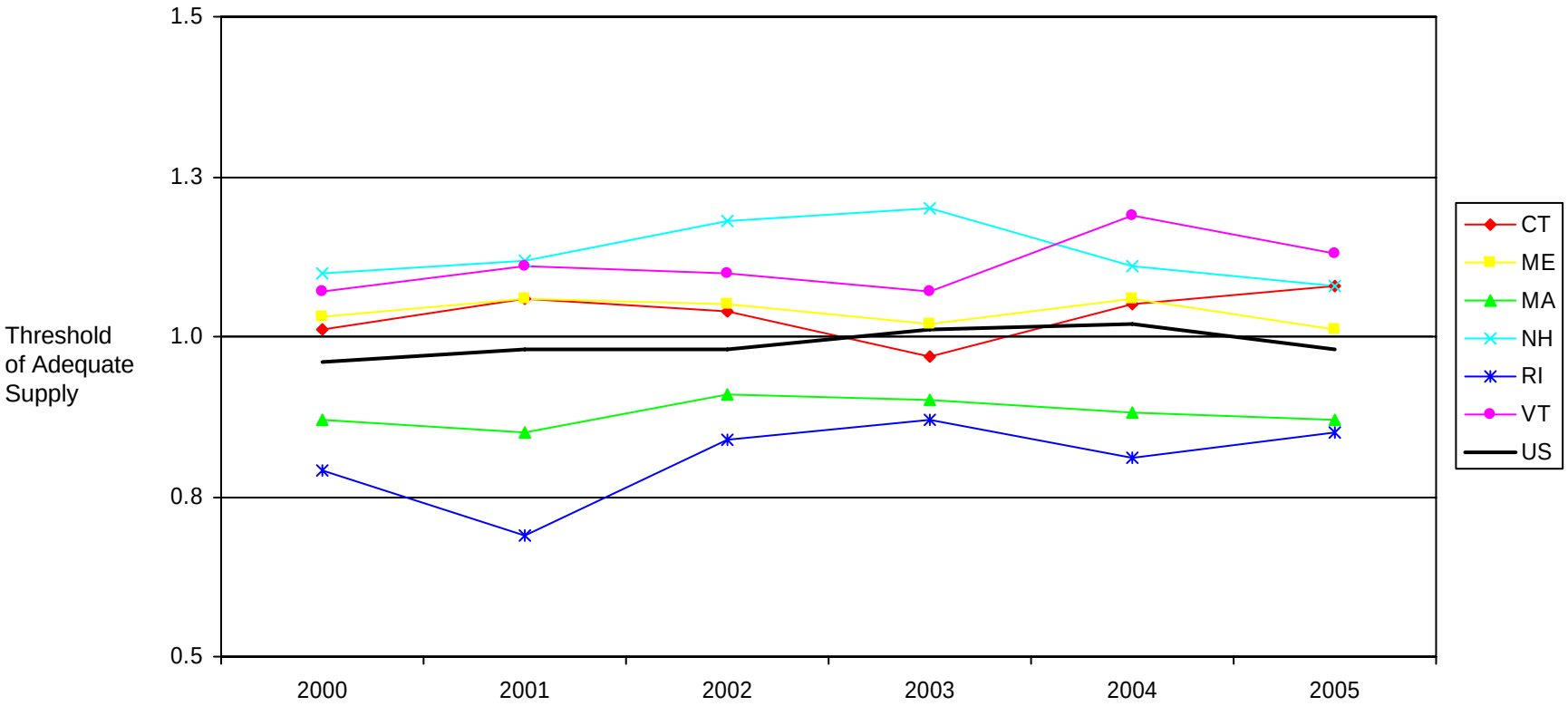
Notes:
Young professional households are those where the head is age 25-39, not enrolled in school, and has a BA or higher.
Annual median household income calculated from the 1990 and 2000 Census and interpolated between Census years, adjusted to $2005 using the CPI-U.
Annual median income needed to purchase the median priced house are based on annual house prices as reported by the Federal Home Finance Bureau, adjusted by the OFHEO index and deflated by the CPI-U less shelter. See data appendix for details.

Figure B.11
Ratio of Real Annual Median Household Income to Real Annual Income Needed to Purchase the Median Priced House
At Least One Household Member in a Service Occupation



Notes:
Annual median household income are three-year moving averages as calculated from the Current Population Survey for households where the head is age 25+, not enrolled in school, and has a college degree, adjusted to $2005 using the CPI-U.
Annual median income needed to purchase the median priced house are based on annual house prices as reported by the Federal Home Finance Bureau, adjusted by the OFHEO index and deflated by the CPI-U less shelter. See data appendix for details.
Service occupations include teachers, nurses, and police.

Figure B.12
Ratio of Number of Affordable Units Available to Number of Middle-Income Households



Source:
2000 Census and American Community Survey (2001-2005).

Notes:
Annual owner costs are estimated assuming the cost of purchasing a home at the time of the survey based on the reported value of the home.
Affordable is defined as being able to qualify for a mortgage to purchase the homes assuming a qualifying income ratio of 28%.
Number of affordable units available defined as the sum of all units that are affordable to "middle-income" households excluding those units occupied by higher-income households.
Number of "middle-income" households defined as households in the middle (3rd) quintile of the income distribution.

Table C.1
Change in Real Median Household Income from 1995 to 2005

	1995	2005	Average annual growth rate
Connecticut	$51,191	$56,835	1.1
Maine	$43,069	$43,923	0.2
Massachusetts	$49,068	$56,017	1.3
New Hampshire	$49,827	$56,984	1.4
Rhode Island	$44,978	$49,484	1.0
Vermont	$43,025	$50,704	1.7
United States	$43,346	$46,326	0.7

Source: Current Population Survey

Notes:
Real income ($2005) calculated using the CPI-U.

Table C.2
Change in Ratio of Incomes of Top and Bottom Fifths of Families from 1990-92 to 2001-03

	Rank among 50 states and D.C.	Top-to-bottom ratio 1990-92	Top-to-bottom ratio 2001-03	Change in top-to-bottom ratio
Connecticut	2	5.2	6.9	1.7
Maine	10	5.4	6.5	1.1
Massachusetts	22	6.7	7.3	0.6
New Hampshire	NA	5.4	6.0	0.6
Rhode Island	14	5.9	6.8	0.9
Vermont	18	5.1	6.0	0.9
United States		6.7	7.3	0.6

Source: Bernstein, Jared, Elizabeth McNichol, and Karen Lyons. 2006. "Pulling Apart: A State-by-State Analysis of Income Trends." Center on Budget and Policy Priorities and the Economic Policy Institute, January 2006, Table 10.

Notes:
Based on analysis of data from the U.S. Census Bureau's Current Population Survey.

Change in top to bottom ratio may not match the calculated difference due to rounding.

Rankings are based on unrounded numbers.

*Indicates statistically significant from zero at the 95 percent level of confidence.

Table C.3
Change in Percentage of Population Aged 30 to 60 Years from 1995 to 2005

	1995	2005	Difference
Connecticut	41.9	45.1	3.2
Maine	43.9	43.8	-0.1
Massachusetts	42.1	43.8	1.7
New Hampshire	43.9	45.7	1.8
Rhode Island	40.8	43.1	2.3
Vermont	44.8	45.3	0.5
United States	41.1	41.5	0.4

Source: Authors' calculations from the Current Population Survey.

Table C.4
Percentage of Mortgage Originations with High Loan-to-Value (LTV) Ratios, 2005

	LTV Ratio > 80%	LTV Ratio > 90%
Connecticut	19	13
Maine	24	17
Massachusetts	21	13
New Hampshire	24	13
Rhode Island	20	14
Vermont	29	21
United States	23	15

Source: Federal Home Financing Board.

Table C.5
Percentage of Mortgages that are Subprime Loans, 2003 and 2004

	2003	2004	Change
Connecticut	10.2%	17.2%	7.0%
Maine	10.6%	10.7%	0.1%
Massachusetts	8.0%	15.8%	7.8%
New Hampshire	9.6%	12.6%	3.0%
Rhode Island	14.0%	25.3%	11.3%
Vermont	4.5%	8.0%	3.5%
United States	9.9%	14.8%	4.9%

Source: Mortgage Bankers Association

Notes:
Calculations are based on home purchase originations for single-family residential (1 to 4 units).

Table C.6
Survey Results of House Price Expectations and Investments Motives for New Homebuyers, 2002

	Boston	Milwaukee
Do you think that housing prices in the _____ area will increase or decrease over the next several years?		
Increase	83.1	95.2
Decrease	16.9	4.8
On average over the next 10 years, how much do you expect the value of your property to change each year?		
Mean	14.6	11.7
Standard Error	1.8	1.3
Housing prices are booming. Unless I buy now, I won't be able to afford a home later.		
Agree	37.1	36.4
Disagree	62.9	63.6
There has been a good deal of excitement surrounding recent housing price changes. I sometimes think that I may have been influenced by it.		
Yes	29.6	34.8
No	70.4	65.2
In deciding to buy your property, did you think of the purchase as an investment?		
It was a major consideration.	33.9	50.3
In part	56.2	42.2
Not at all	9.9	7.5
Why did you buy the home that you did?		
Strictly for investment purposes.	8.2	13.8

Source: Case, Karl and Robert Shiller. 2003. "Is There a Bubble in the Housing Market? An Analysis."

Table C.7
Characteristics of New One-Family Houses Completed: Built for Sale

	Median square footage		Percent with 2,400-2,999 square feet		Percent with 4 + bedrooms		Percent with 2.5 bathrooms		Percent with vinyl siding		Percent with 2 car garage		Percent with central air conditioning	
	Northeast	US	Northeast	US	Northeast	US	Northeast	US	Northeast	US	Northeast	US	Northeast	US
1995	2010	1870	15	15	34	34	51	35	60	27	56	69	73	83
1996	2065	1945	19	16	35	35	55	36	68	29	55	69	74	84
1997	2130	1945	19	16	35	39	57	36	71	33	64	70	77	84
1998	2115	1990	21	17	36	38	60	37	74	34	63	70	80	84
1999	2149	2012	22	17	37	34	57	36	80	36	63	70	82	86
2000	2280	2060	23	17	39	41	59	37	73	37	62	70	81	87
2001	2341	2102	22	19	40	41	61	38	81	37	63	69	85	87
2002	2301	2109	21	19	40	43	65	37	83	38	66	69	85	89
2003	2285	2136	22	19	40	38	59	37	84	37	64	68	88	89
2004	2359	2138	23	20	41	41	62	36	85	36	69	69	90	91
2005	2383	2239	22	19	39	42	54	36	87	33	62	68	89	91
Change 2005-1995	18.6%	19.7%	7	4	5	8	3	1	27	6	6	-1	16	8

Source: U.S. Bureau of the Census.
Note: "Built for Sale" houses are houses built with the intention of being sold with the sale of land included in the transaction.

Table C.8
Land Area as a Percentage of Total Area, 2000

	Total area (Sq. mi.)	Land area (Sq. mi.)	Land area as a % of
Connecticut	5543	4845	87.4%
Maine	35385	30862	87.2%
Massachusetts	10555	7840	74.3%
New Hampshire	9350	8968	95.9%
Rhode Island	1545	1045	67.6%
Vermont	9614	9250	96.2%
U.S.	3794083	3537439	93.2%

Sources: U.S. Bureau of the Census, Statistical Abstract of the U.S., 2004-2005.

Table C.9
Review of Studies Examining the Relationship Between Land-Use Regulations and Housing Prices or Housing Stock

Study	Geographical Area	Time Period Covered	Measure of Regulation	Principal Findings
Cho and Linneman (1993)	10 cities in Fairfax County, Virginia	1982-88	Two sets of indices measuring the restrictiveness of local land-use regulations with respect to land use, residential use and minimum lot size for (1) the home city and (2) relative to adjacent cities.	Regress an annual real price index on a set of indices measuring the restrictiveness of regulations within the home city as well as the restrictiveness of regulations relative to those of adjacent cities. The results for the home indices show that an increase in the land-use restrictiveness index reduces house prices, suggesting that more land zoned for residential use increases the supply of housing. An increase in the minimum lot size index has a positive effect on house prices, suggesting that larger lot requirements increase house prices. The results for the relative indices show that an increase in the land-use restrictiveness index has a positive effect on house prices, suggesting that more land zoned for residential use in the home city relative to the adjacent city increases house prices in the home city. The minimum lot size index has a negative effect on house prices, suggesting that cities with larger lot sizes relative to adjacent cities have lower house prices. They conclude that land-use regulations increase housing prices by reducing the supply of housing, although they cannot rule out that there are demand-side effects as well.
Glaeser and Gyourko (2003)	45 MSAs in the U.S.	1989	Wharton Land Use Control Survey: average length of time between an application for rezoning and the issuance of a building permit for a modest-size, single family subdivision of less than 50 units.	Regress house values on permit length, family income, population and growth. Find a strong positive relationship between house prices and the rezoning variable, even controlling for median family income and population growth. When the index from a permit issuance lag of three months to one of six months, an additional 11 percent of the housing stock becomes expensive (valued at or above 140 percent of construction costs).
Green (1999)	39 municipalities in Waukesha County, Wisconsin		Sub-division regulations that apply to projects within each city such as road standards and set-back requirements.	Regresses housing cost on sub-division regulations, housing supply, and other control variables. Finds that higher minimum required set-backs and higher minimum required street widths cause large declines in the share of homes that are affordable to lower-income households (price < $75,000).
Katz and Rosen (1987)	California		TO BE COMPLETED	Houses selling in growth-controlled communities were 17-36 percent more expensive than those selling in communities without growth

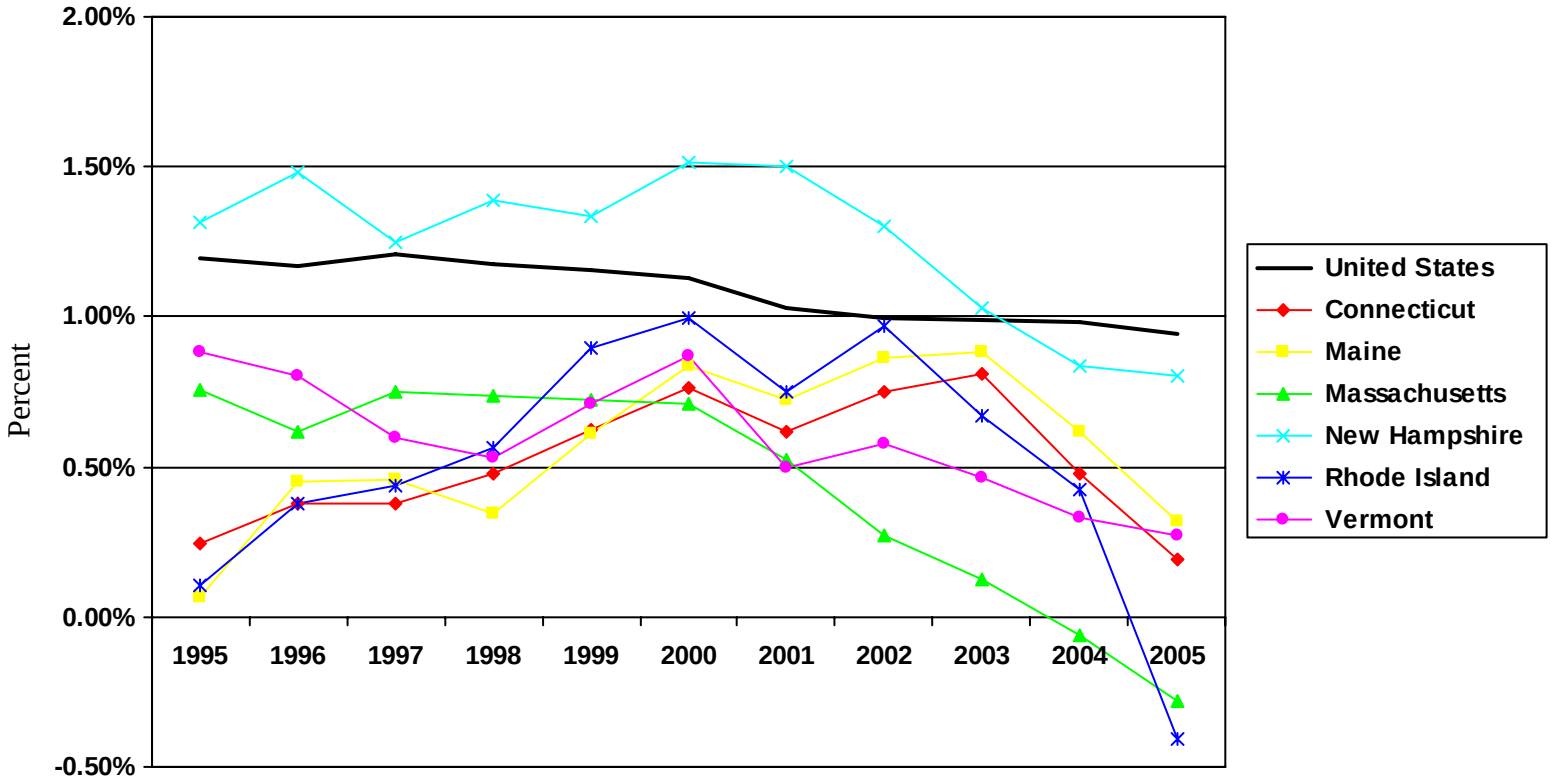
				controls, all else equal.
Landis (1992)	14 cities in California	1980-1989	TO BE COMPLETED	Compares seven growth-controlled cities with seven similar cities without growth controls. Finds no difference in the increase in the median home price between growth control and no-growth control cities. However, informal growth controls exist in both groups of cities that may have caused them to experience roughly equal restrictions on housing supply.
Levine (1999)	443 cities in California	1978-1988	Number of growth control measures enacted by the city	Relates changes in median rents and housing units to number of growth control measures. Finds that for each additional measure enacted, median rents increase by $5 and the net change in housing stock was reduced by 884 units. Concludes that this is due to the impact of growth control measures that are targeted against multi-family housing.
Malpezzi (1996)	60 MSAs in the U.S.	1990	(1) Aggregate index of local regulations constructed from seven variables collected by the Wharton Urban Decentralization Project. (2) Aggregate index of state regulations constructed from variables collected by the American Institute of Planners.	Estimates the impact of state and local land-use regulations on both median house values and contract rents, controlling for a set of demand and supply factors. Finds that a jurisdiction moving from the first to the third quartile of the regulation variables, would increase rents by 17 percent and house prices by 51 percent while reducing permits for new construction by 42 percent. Concludes that regulation raises rents and house values but cautions that more work needs to be done to explore the benefits of regulation.
Malpezzi and Green (1996)			TO BE COMPLETED	Find that moving from a relatively unregulated to a highly regulated metropolitan area increases bottom quartile rents by more than one-fifth and bottom-quartile house values by more than three-fifths. They conclude that the impact of regulation may be especially large for the low-quality housing market.
Mayer and Somerville (2000)	44 MSAs in the U.S.	1985-1996	Three measures of local land-use regulations based on surveys with local planners: the estimated number of months required for sub-division approval, the number of ways growth management techniques have been introduced[1], and whether development or impact fees are imposed.	Regress the log of single family permits issued per quarter within a metropolitan area on three measures of local land-use regulations , changes in house prices (current and lagged), the real prime rate, population, and a time trend. Find that an MSA with 4.5 months delay in approval where growth management actions have been introduced through two different approaches will experience about 45 percent less new construction than an MSA with a minimal 1.5 month delay and no growth management policies. Interacting the regulatory variables with the current and lagged price changes, they find that the estimated price elasticity is 20 percent lower in metropolitan areas with delays in regulatory approval that are greater than the median value of 4.5 months. They conclude that efforts to reduce construction through delay can be quite effective and in fact, more effective than the imposition of

[1] For example, citizen referendum, legislative action by municipalities, counties, and the state, and administrative action by public authorities.

				impact or development fees.
Pendall (2000)	1000 cities form the largest MSAs	1980-1990	Set of dummy variables registering whether each of the following was in effect: low-density-only zoning, building permit cap, long-term building moratorium, urban growth boundary, adequate public facilities ordinance.	Regress changes in housing stock (rental and owner) on regulation dummy variables and controls. Finds that only low-density-only zoning has statistically significant effect on reducing the amount of housing growth. Suggests that the other regulations are not binding on housing supply.
Pollakowski and Wachter (1990)	17 planning areas within Montgomery County, Maryland	1982-87	Construct a restrictiveness index by summing the percentages of land zoned for each type of residential use weighted by their assigned values for (1) the home city and (2) relative to adjacent cities.	Regress house price indices on two indices measuring the restrictiveness of regulations within the home city as well as the restrictiveness of regulations relative to those of adjacent cities, as well as a set of controls measuring supply and demand factors. Find that both the home index and relative index have a positive impact on prices. Conclude that more restrictive land-use regulations increase price and that at least part of this increase can be attributed to regulations inducing a reduction in housing supply.
Saks (2004)	58 MSAs in the U.S.	1980-2000	Construct a combined index of regulation including measures of permit restrictions, growth controls, historic preservation, and state regulations using data from the Wharton Urban Decentralization Project, the International City Management Association, the Fiscal Austerity and Urban Innovation Project, the Regional Council of Governments, the National Register of Historic Places, and the American Institute of Planners.	Estimate the impact of a demand shock on annual changes in the housing stock and housing prices using a fixed-effects approach where the same metropolitan areas are observed at different points in time, thereby controlling for local amenities that are constant over time (i.e. local climate). To control for other local amenities that can change over time (i.e. school quality), measure the demand shock using annual changes in labor demand based on the industrial composition of each metropolitan area which is less likely to be correlated with changes in amenities than changes in the housing stock. Finds that a one percent increase in demand leads to a 0.25 percent increase in house prices and a 0.35 percent increase in the housing stock in an area with an average level of housing supply regulation. The effect of the same demand shock in an area with a housing supply regulation index that is one standard deviation higher than the average results causes house prices to rise by twice as much and housing stock to grow by 17 percent less.
Segal and Srinivasen (1985)	51 MSAs in the U.S.	1975-78	Percentage of land removed from development by regulation and the Boeckh index of construction costs.	Estimate a simultaneous equation model of housing price inflation where housing supply was modeled as a function of the housing stock, an index of construction costs, and the percentage of land removed from development by regulation. Find that controlled cities have annual house price increases that are 2 percent higher than those in uncontrolled cities.
Somerville and Mayer (2003)	38 MSAs in the U.S.	1984-1994	Two measures from the Wharton Urban Decentralization Project: number of ways growth	Using a multinomial logit specification, estimate the probability that an affordable rental unit will (a) remain affordable, (b) filter up and become unaffordable, (c) convert to owner-occupied, or (d) be demolished,

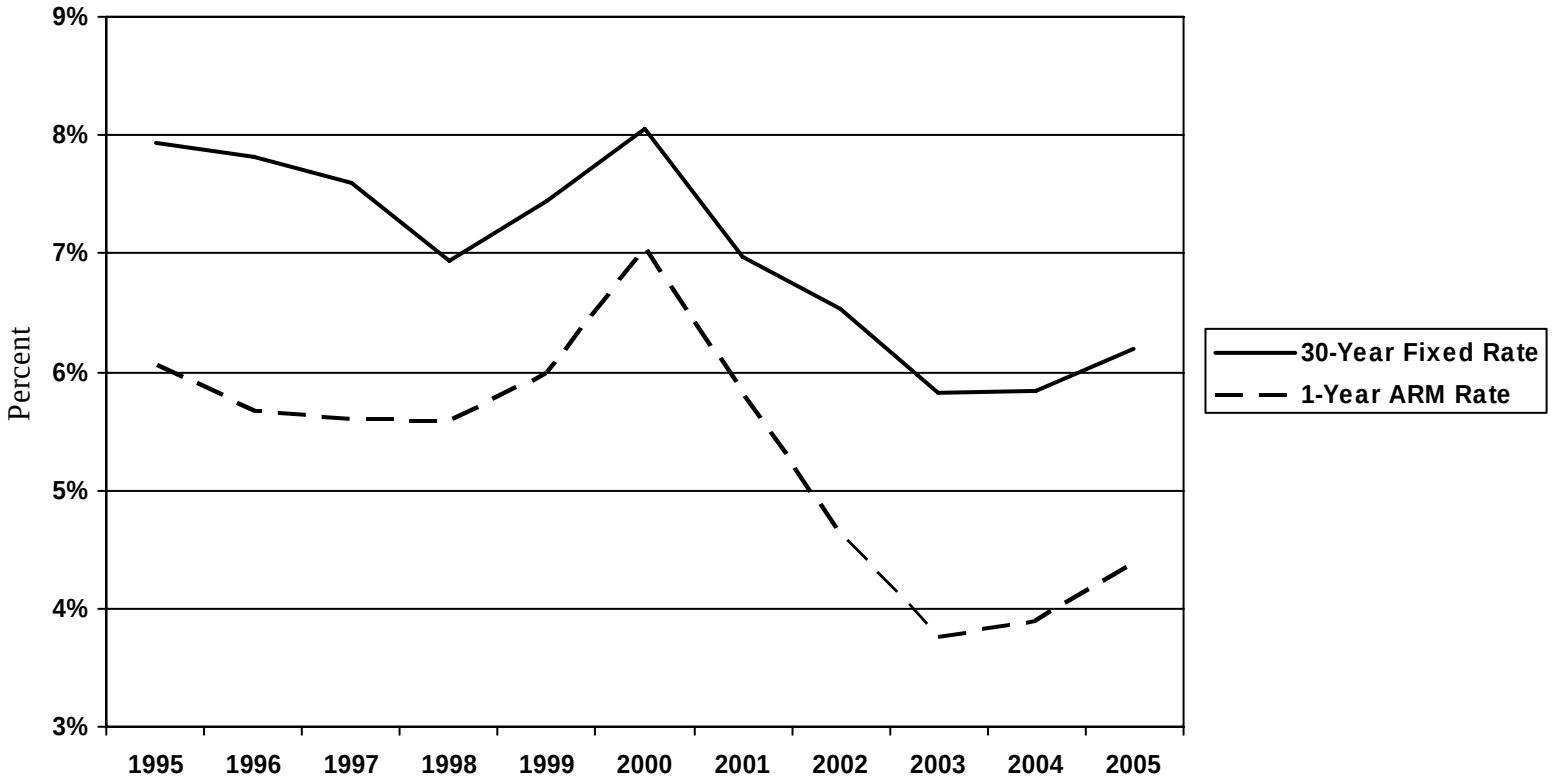
			management techniques have been introduced, and whether development or impact fees are imposed.	controlling for general market effects, unit characteristics, neighborhood quality and the level of government regulation. Find that a 10 percent decrease in the supply elasticity for new single-family permits from its mean level increases the probability that an affordable unit will filter up by about 1.2 percentage points. Examining the two explicit measures of government regulation also shows that greater regulation results in an increase in the probability that an affordable rental unit will filter up to become affordable. Conclude that policies targeted towards limiting new higher income owner-occupied suburban housing can have unintended negative consequences for lower income renters.
Thorson (1997)	12 jurisdictions in McHenry County, Illinois	1971-1994	Change in minimum lot size from 5 acres to 160 acres in 1979 to prevent farmland from being subdivided.	Regresses number of building permits issued for single family homes on a dummy variable reflecting the timing of the change in the regulation as well as variables controlling for supply and demand factors. Finds no significant effect for 1979-84 but that permits declines 94 percent per year between 1985 and 1994. Concludes that developers were able to circumvent the downsizing for the first 5 years by sub-dividing their land prior to the rezoning. Yet after the initial period, the number of residential lots fell sharply causing a severe decline in housing construction.

Figure C.1
Annual Growth Rate of Population, 1995-2005



Source: Authors' calculations from annual population data from the U.S. Bureau of the Census.

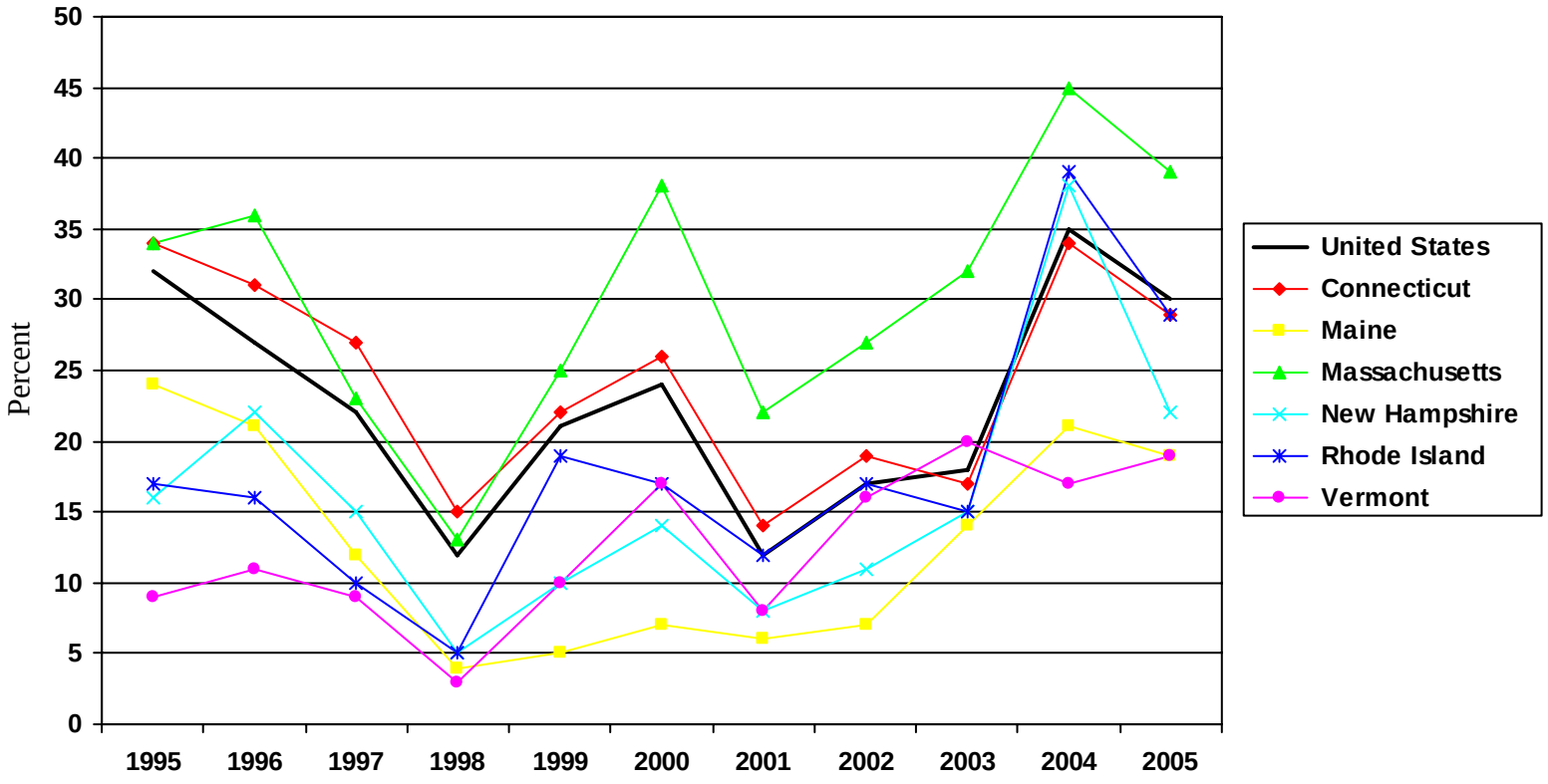
Figure C.2
Mortgage Interest Rates, 1995-2005



Source: Freddie Mac.

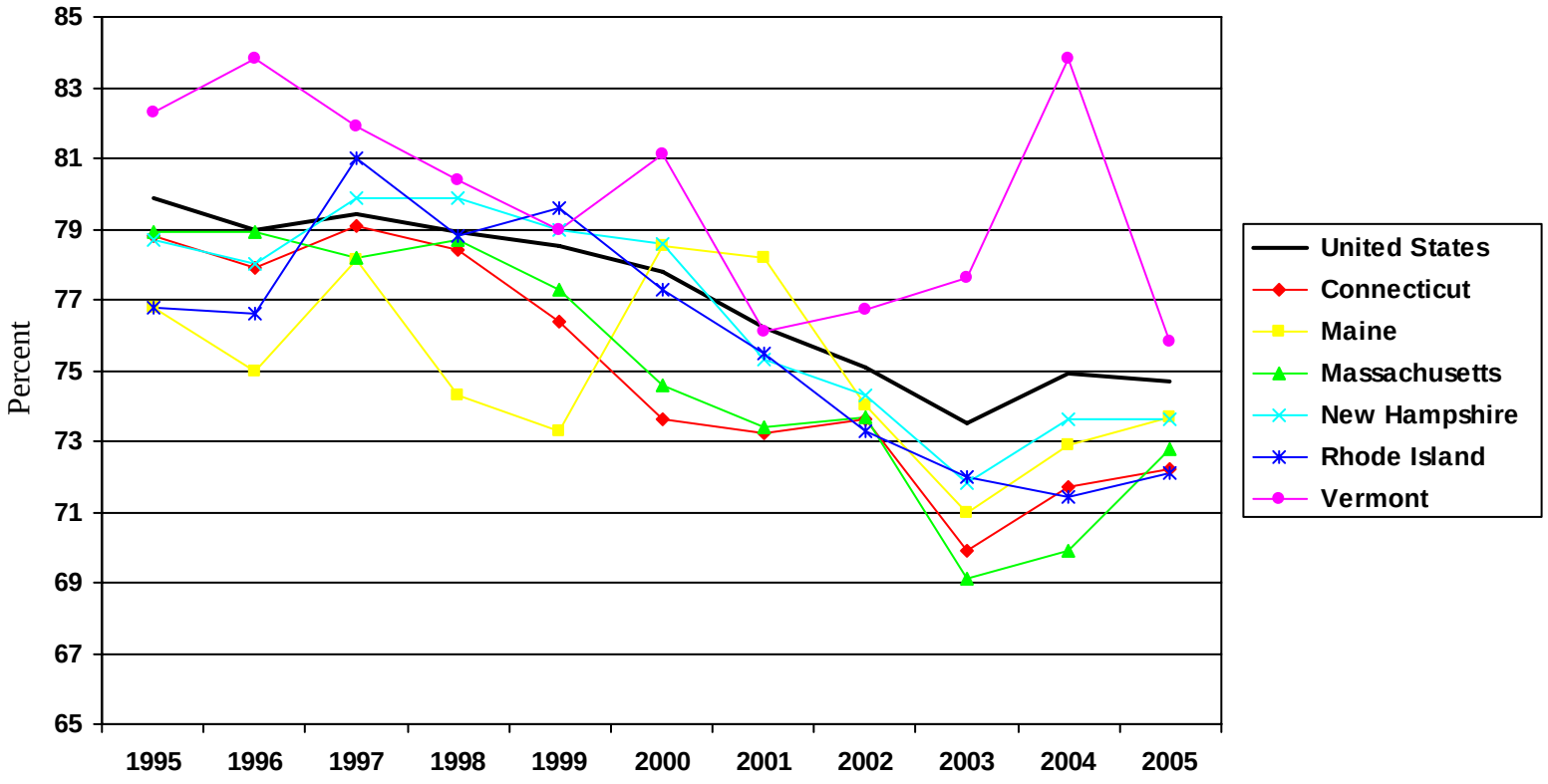
Note: ARM refers to adjustable rate mortgage.

Figure C.3
Share of Adjustable-Rate Mortgages, 1995-2005



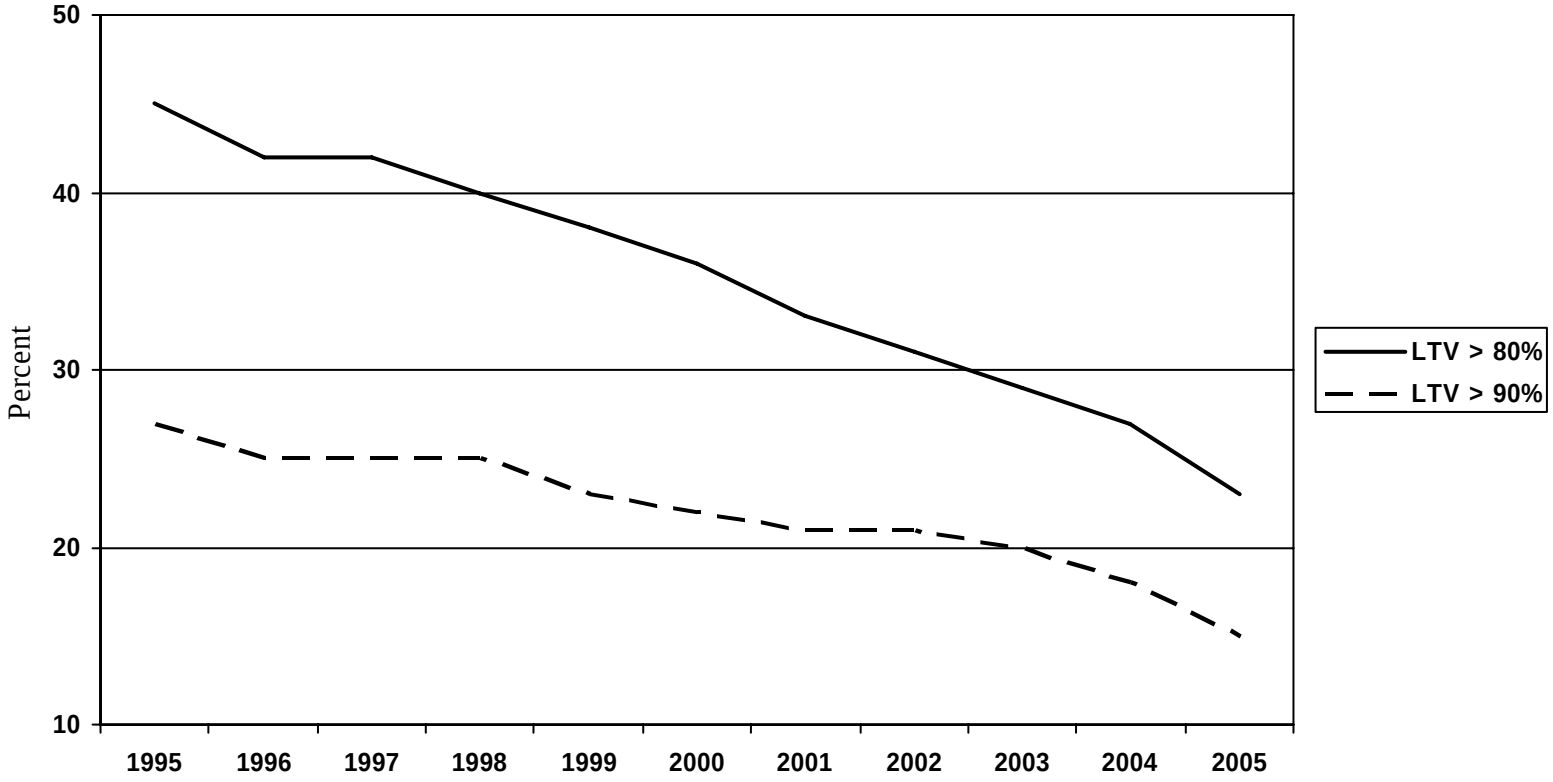
Source: Federal Housing Finance Board.
Note: These data are based on mortgage loans used to purchase single-family, non-farm homes. Loans used to refinance houses are excluded.

Figure C.4
Loan-to-Price Ratio for Mortgage Loans, 1995-2005



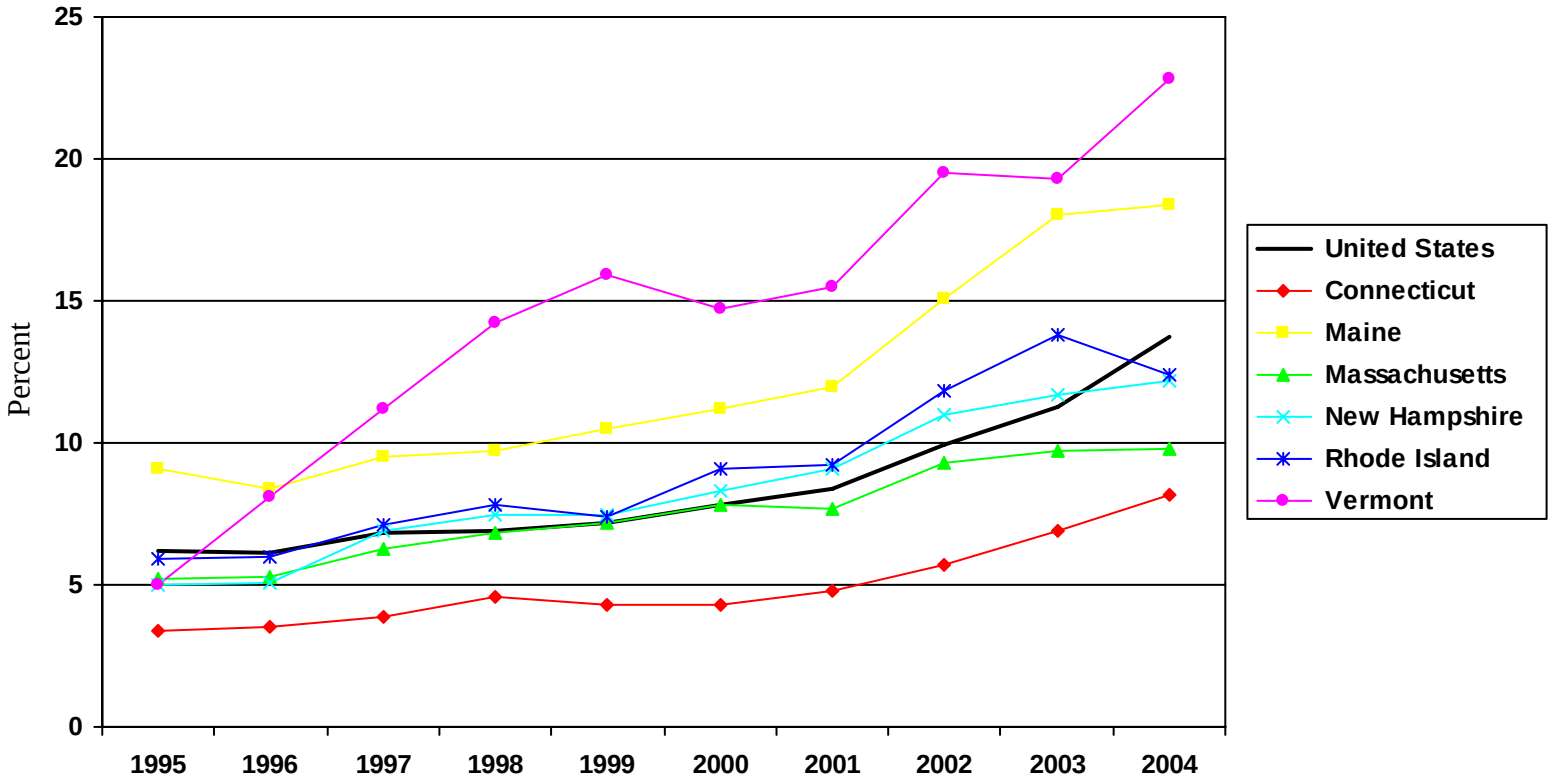
Source: Federal Housing Finance Board
Note: These data are based on mortgage loans used to purchase single-family, non-farm homes. Loans used to refinance houses are excluded.

Figure C.5
Share of U.S. Mortgage Loans with High Loan-to-Value Ratios, 1995-2005



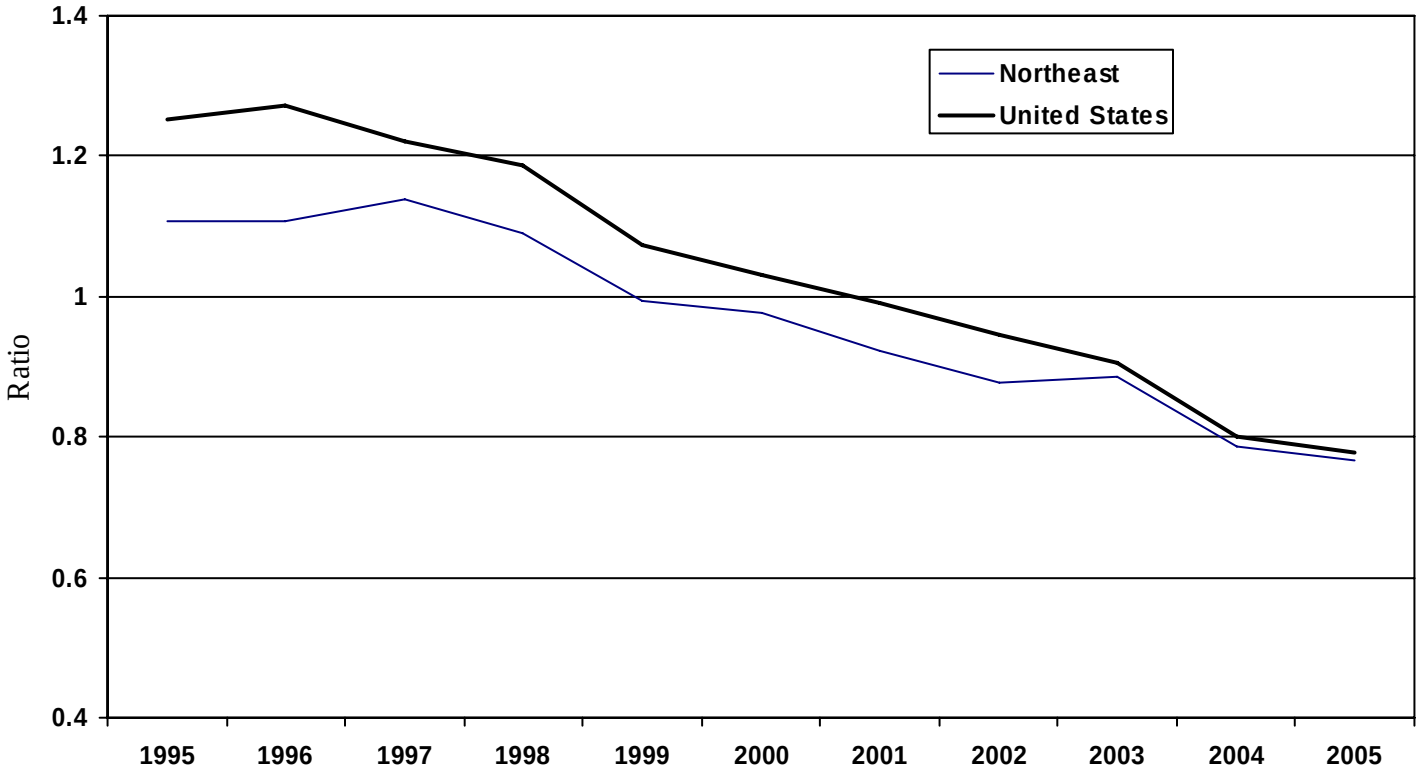
Source: Federal Housing Finance Board.
Note: These data are based on mortgage loans used to purchase single-family, non-farm homes. Loans used to refinance houses are excluded.

Figure C.6
Share of Mortgage Loans Classified as Non-Owner-Occupied, 1995-2004



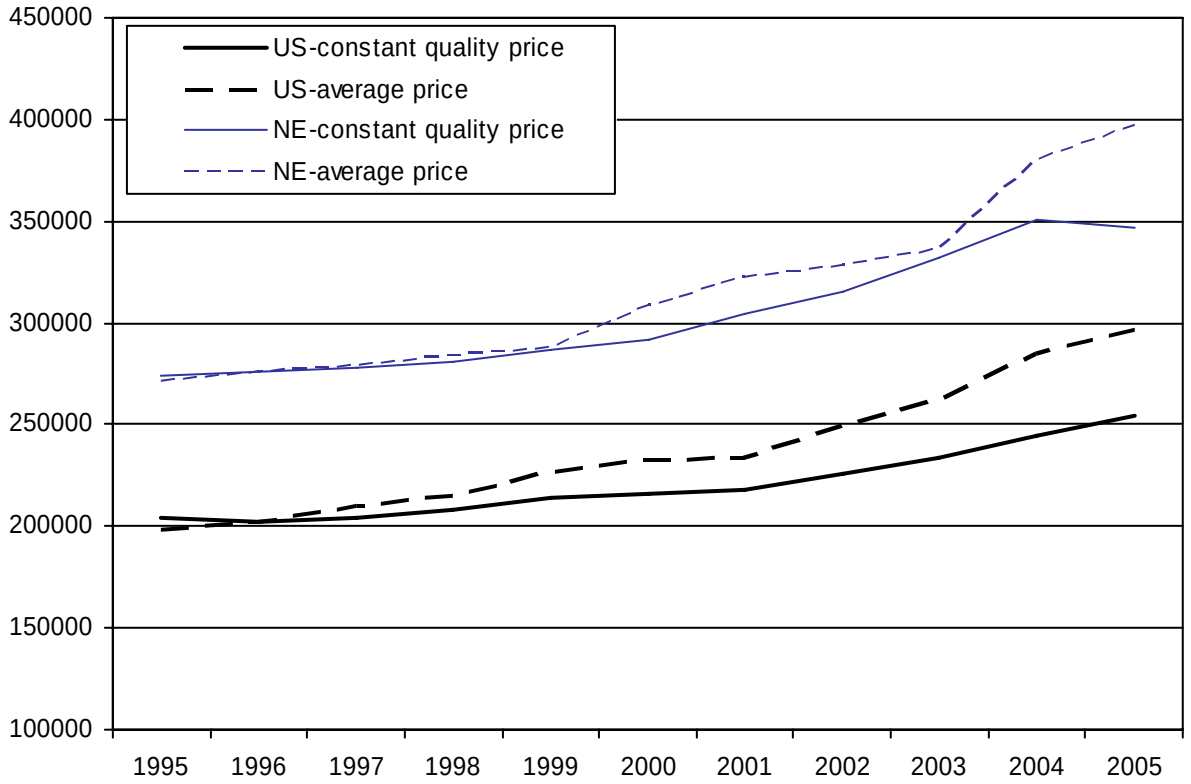
Source: Authors' calculations based on Home Mortgage Disclosure Act data.
Note: Calculations are based on home purchase originations for single- family residential (1 to 4 units) .

Figure C.7
Ratio of Median Construction Costs Per Unit to Median House Prices for New Single Family Homes



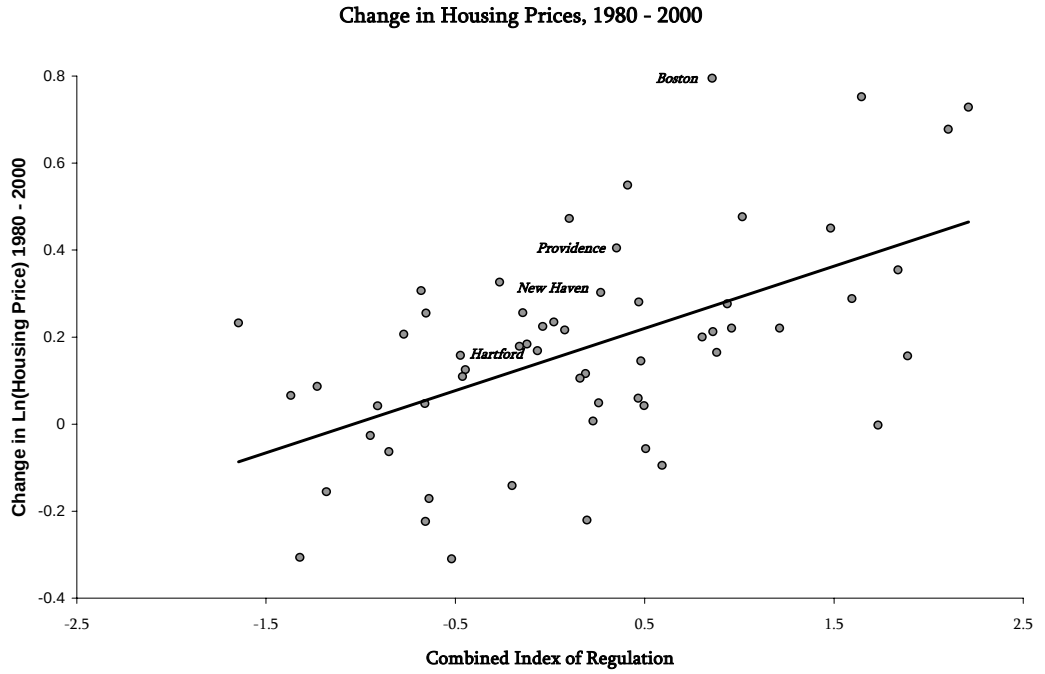
Source: U.S. Bureau of the Census.
Note: Per unit construction costs are calculated by multiplying the median square footage of new houses built for sale by the median construction price per square foot. ($2005)

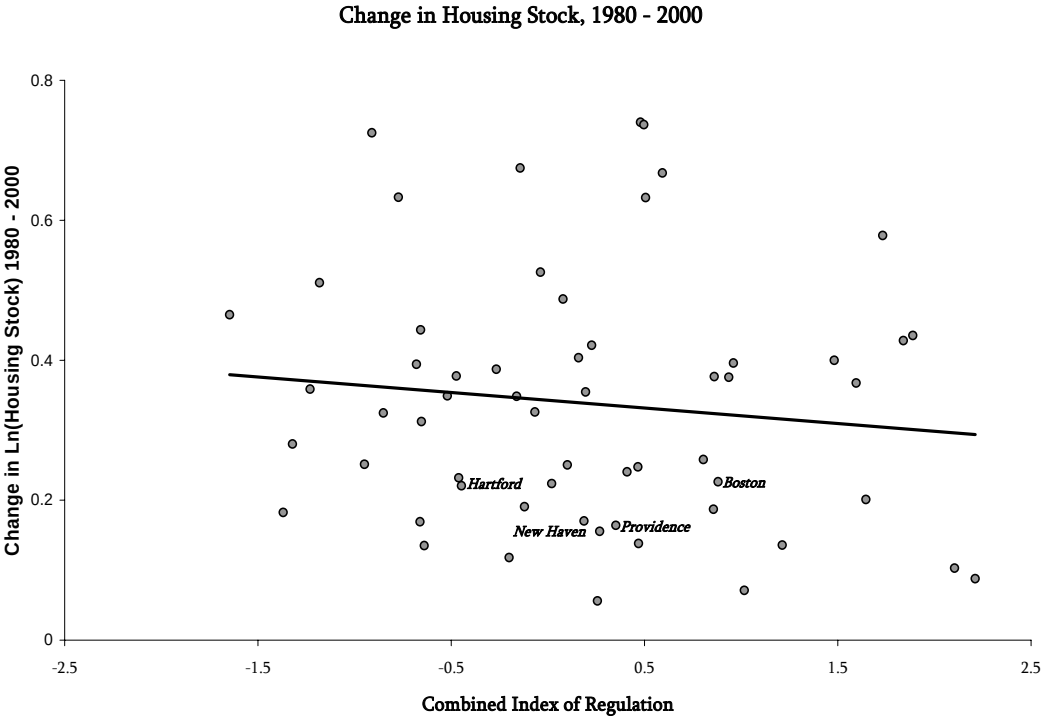
Figure C.8
Average Sales Price of One Family Houses Sold Versus "Constant Quality" House Sold
Northeast versus U.S. ($2005)



Source: U.S. Bureau of the Census.
Note: The "constant quality" house based on the characteristics (size, amenities, and location) for the average house in 1996. All figures adjusted to $2005 using the CPI-U less shelter.

FIGURE C.9
Combined Index of Housing Supply Regulations and
Growth in Housing Prices and Stock, 1980 - 2000

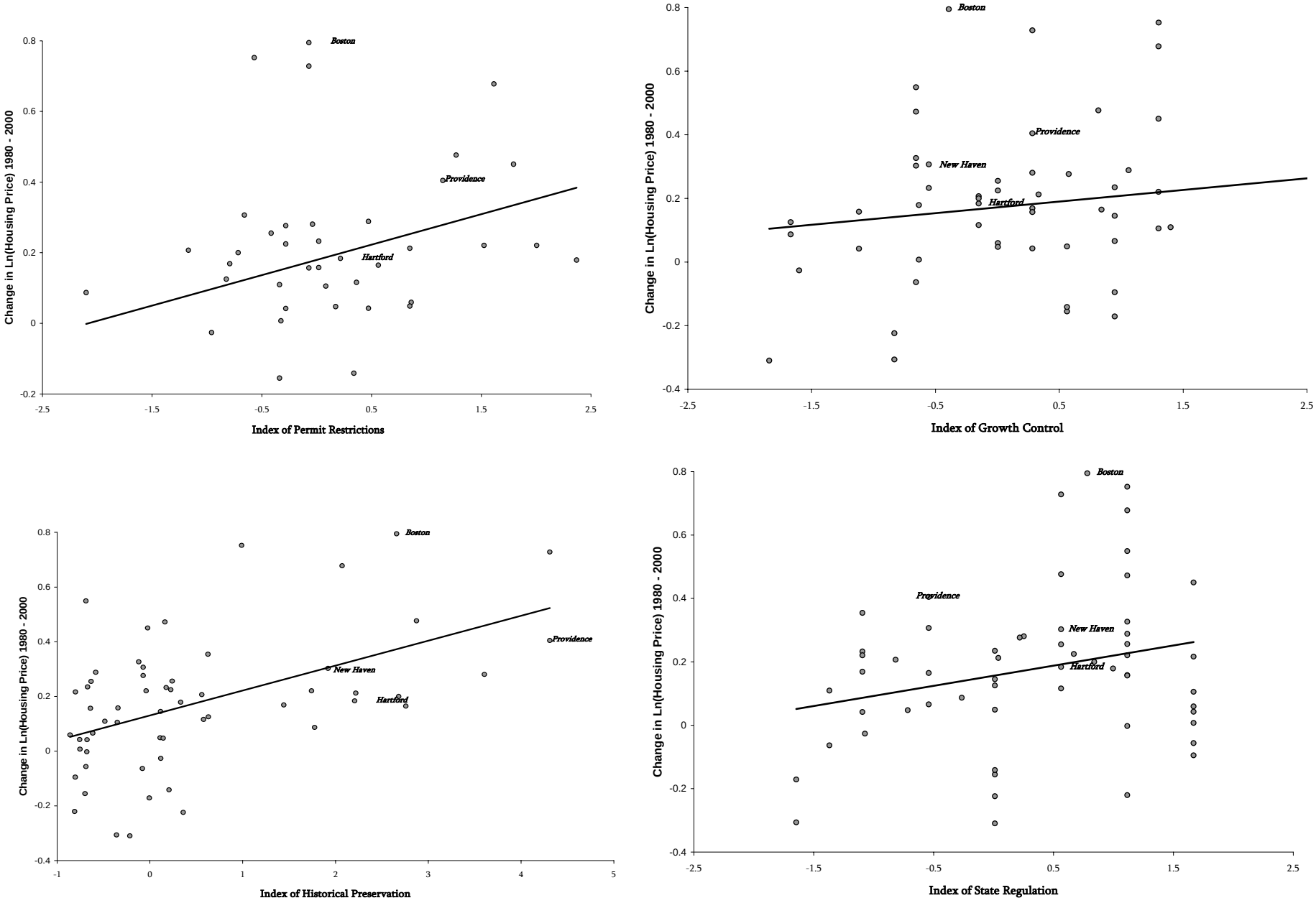




Source: Figure adapted from Saks (2004) with data provided by the author.

FIGURE C.10

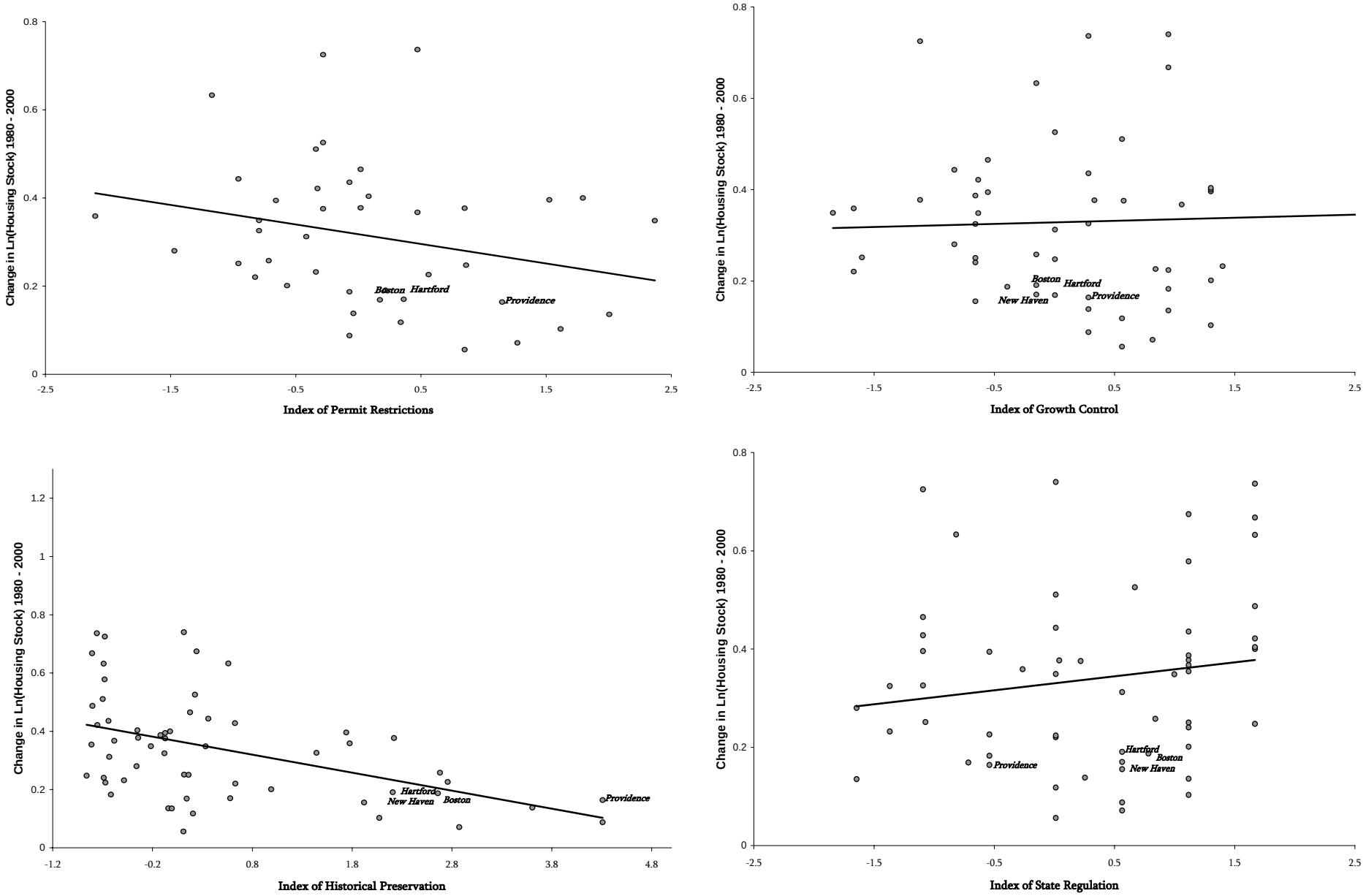
Housing Supply Regulations and Growth in Housing Price, 1980 - 2000



Source: Figure adapted from Saks (2004) with data provided by the author.

FIGURE C.11

Housing Supply Regulations and Growth in Housing Stock, 1980 - 2000



Source: Figure adapted from Saks (2004) with data provided by the author.

Data Appendix for Part B:
The Lack of Affordable Housing in New England:
How Big Is the Problem?

Housing Burden Ratio

The housing burden ratio is defined as the percentage of income that households spend on housing costs. Data on household incomes and housing costs come from either the Decennial Census (1990 and 2000) or the American Community (2001 through 2005).

Household income includes the sum of the amounts reported separately for wage or salary income; net self-employment income; interest, dividends, or net rental or royalty income or income from estates and trusts; Social Security or railroad retirement income; Supplemental Security Income (SSI); public assistance or welfare payments; retirement, survivor, or disability pensions; and all other income for all household members.

Housing costs for renters are equal to monthly gross rent which is defined as monthly contract rent plus utilities. Housing costs for owners are defined as the sum of the monthly principal and interest, real estate taxes, and homeowner's insurance premiums for fire, hazard, and flood. See Appendix tables 1 and 2 for median monthly expenditures for renters versus homeowners.

The sample is restricted to households where the head is age 25+ and not enrolled in school and the household has positive income. In addition, we require that households owning a home have a positive mortgage payment. We then divide the sample into quintiles based on their household incomes with the first quintile representing the poorest households earning incomes in the bottom 20 percent of the distribution.

We first calculate the percentage of income spent on housing for each household. Then within each income quintile we calculate the fraction of households experiencing any housing burden (spending more than 30 percent of their income on housing) and the fraction experiencing severe housing burdens (spending more than 50 percent of their incomes on housing). In addition, we also calculate housing burdens for renters versus owners within each income quintile.

Further refinements include calculating housing burdens by age groups (25 to 34 years, 35 to 44 years, and 45 to 54 years), education groups (high school versus college graduates), and for those in select service occupations (teaching, nursing, or police work). Households headed by a high school graduate are defined as having a high school diploma or a GED, but no further education. Households headed by a college graduate are defined as holding a Bachelor's degree, but no further education. Households containing a member in a service occupation are defined as

having at least one member in one of the following occupations: preschool and kindergarten teachers; elementary and middle school teachers; secondary school teachers; special education teachers; other teachers and instructors (but not postsecondary); registered nurses; licensed practical and vocational nurses; nursing, psychiatric, and home health aides; bailiffs, correctional officers, and jailers; detectives and criminal investigators; fish and game wardens and parking enforcement workers; and police officers, including transit police.

Housing Income Adequacy Ratio

The housing income adequacy ratio compares the distribution of household income to the distribution of incomes needed to afford various prices of houses or rentals. For example, we compare the annual income for middle-income households to the annual income needed to rent the median apartment or purchase the median priced house. We calculate the annual income needed to afford housing based on the prices of rental and owner-occupied units in each geographic area.

For rental units, we assume that households should spend no more than 30 percent of their annual income to rent the median apartment. We chose 30 percent because it is the standard threshold used to distinguish affordable from unaffordable burdens. Rental prices are based on monthly gross rent, which is equal to contract rent plus utilities. See Appendix table 3 for further details regarding these calculations. For example, the annual income needed to rent the median-priced apartment is calculated as:

Income Needed = [monthly median gross rent * 12] / 0.30

For owner-occupied units, we assume that households should spend no more than 28 percent of their annual income to pay costs on the median-priced house (equal to the principal and interest payments, real estate taxes, and homeowners' insurance premiums—together, PITI). We chose 28 percent because it is the lending industry standard used to determine whether potential buyers have enough income to qualify for a mortgage. We assume a conventional 30-year fixed rate mortgage with an 80 percent loan-to-value ratio (that is, a 20 percent down payment). See Appendix table 4 for further details regarding these calculations. For example, the annual income needed to purchase the median-priced house is calculated as:

Income Needed = [monthly PITI payment * 12] / 0.28

For first-time homebuyers, we modify the above assumptions. Specifically, we assume that these households aspire to purchase a starter house costing 85 percent of the median house price within their geographic area. This assumption is based on a biennial survey of homebuyers conducted by the National Association of Realtors that found that starter homes typically cost 85 percent of the median price in any given market. We further assume that first-time homebuyers receive mortgages on more lenient terms than a conventional loan: First-time homebuyers secure a 30-

year fixed-rate FHA loan with a loan-to-value ratio of 95 percent and a qualifying income ratio of 29 percent. However, these first-time homebuyers must pay monthly personal mortgage insurance premiums of 0.5 percent of the outstanding balance of the loan. See Appendix table 5 for further details regarding these calculations.

Data Sources:

Data Element	Source
Median house prices	From sales of both new and existing single-family homes based on the Federal Housing Finance Board's Monthly Interest Rate Survey (MIRS) of conventional mortgages http://www.fhfb.gov/mirs/mirs_downloads.htm. Data for Maine and Vermont are supplemented by state data due to the small sample sizes for these states in the MIRS survey. (Maine Real Estate Information System, Maine State Housing Authority http://www.mainehousing.org/ and Vermont Housing Finance Agency http://www.vhfa.org/. Using 2004 as a base, prices for earlier years are generated using the Office of Federal Housing Enterprise Oversight house price index http://www.ofheo.gov/HPI.asp . Adjusted for inflation using the CPI less shelter, U.S. Bureau of Labor Statistics http://www.bls.gov/cpi/.
Interest rates	Effective interest rate (taking into account the contract rate as well as initial fees and charges for points) on conventional single family mortgages as reported by that Federal Housing Finance Board's MIRS http://www.fhfb.gov/mirs/mirs_downloads.htm
Real estate taxes	Effective property tax rates per $1,000 of value for each state applied to price of home, with tax rate data from:
Connecticut	Connecticut Office of Policy & Management http://www.opm.state.ct.us
Maine	Maine Revenue Services, Property Tax Division http://www.state.me.us
Massachusetts	Massachusetts Department of Revenue, Division of Local Services http://www.dls.state.ma.us

New Hampshire	New Hampshire Department of Revenue Administration, Municipal Services Division http://www.nh.gov/revenue/property_tax/equalization
Rhode Island	Rhode Island Office of Municipal Affairs http://www.muni-info.state.ri.us
Vermont	Vermont Department of Taxes http://www.state.vt.us
Homeowner's insurance	Average annual dwelling, fire, and homeowners insurance premiums by state from the National Association of Insurance Commissioners http://www.naic.org/ Adjusted for inflation using the CPI for household insurance, U.S. Bureau of Labor Statistics http://www.bls.gov/cpi/ .

Data for household income comes from either the March Demographic Supplement of the Current Population Survey (CPS) or the Decennial Census. At the state level, household incomes for each quintile were calculated as three-year moving averages from the CPS for 1995 through 2005. The basic sample included households where the head is age 25+ years and not enrolled in school and the household has positive income. The first-time homebuyer sample included households where the head is age 25-39 years and not enrolled in school and the household has positive income and does not currently own a home.

At the metropolitan area level, household incomes for each quintile were calculated from the 1990 and 2000 Census for both the basic and first-time homebuyer samples. Household incomes for the intervening years were calculated by interpolating between Census years. Household incomes for 2001 through 2005 were estimated by applying the annual growth rate in those years for all households based on data from the American Community Survey web site. Note that this technique assumes that the growth in median income is similar to the growth in incomes at other parts of the distribution. Given that real incomes in the first quintile have been falling while those in the middle of the distribution have been rising, this procedure may yield household incomes for the first quintile that are biased upwards. However, the rate of growth in median household income was relatively slow over the 2000-2005 period—on the order of less than one percent per year—such that the bias is not likely to be that large. In any event, our affordability estimates for this group may be slightly optimistic.

Housing Availability Ratio

The housing availability ratio is defined in one of two ways:

- The ratio of the number of housing units that are affordable to a certain income group to the number of households within that income group.

- The ratio of the number of affordable housing units that are *available* to the number of households within a given income range—that is, we exclude from the numerator affordable units that are occupied by higher-income households.

Data on the number of housing units (both rental and owner) and the number of households come from either the Decennial Census (2000) or the American Community (2001 through 2005).

The sample is restricted to households where the household head is age 25+ and not enrolled in school and the household has positive income. In addition, we require that households owning a home have a positive mortgage payment. We then divide the sample into quintiles based on their household incomes with the first quintile representing the poorest households earning incomes in the bottom 20 percent of the distribution.

We calculate the number of affordable units for each income quintile by first determining the annual income needed to afford each unit as described above for the housing income adequacy ratio. For rental units, annual income needed for each unit is based on the monthly gross rent. For owner-occupied units, annual income needed is based on owner-reported house expenses (PITI), thus implicitly capturing changes in mortgage interest rates. Vacant units are not included in the analysis, as complete cost/price information is not available for them. Consequently, the housing availability ratios we present may be biased downward slightly.

The number of affordable units for a given income quintile is equal to the number of units whose monthly costs are below the affordability threshold of the maximum of a given income quintile. For example, the number of affordable units for middle-income households (third income quintile) is equal to the number of units with monthly costs at or below the affordability threshold of households at the 60th percentile of income. Note that it may be the case that middle-income households would find undesirable units affordable to lower income quintiles. However, in high-cost areas where demand exceeds supply, these households may consider units further down the price distribution out of necessity.

The number of affordable units *available* is calculated as the number of affordable units in each quintile less those occupied by households in higher income quintiles. This reflects the fact that a unit affordable to a middle-income household might be occupied by a higher-income household—a situation that is particularly likely to

happen when supply is constrained. Thus, the first measure represents the maximum availability based only on the price of the unit while the second represents the minimum availability based on both the price of the unit as well as the characteristics of the unit's current occupants.

Appendix Table 1
Monthly Median Expenditures for Renter Housing, 2005

	Contract rent	Utilities & fuels	Gross rent	Number of households
Connecticut	$700	$110	830	308,448
Maine	$500	$60	590	107,463
Massachusetts	$750	$80	870	692,660
New Hampshire	$730	$80	840	98,513
Rhode Island	$650	$80	750	116,715
Vermont	$550	$80	663	52,646
New England	$700	$80	805	1,376,445
United States	$600	$100	730	27,000,597

Source: American Community Survey, 2005

Notes:
Sample is households where the household head is age 25+ and not enrolled in school and the household reports positive contract rent.

Appendix Table 2
Monthly Median Expenditures for Owner-Occupied Housing, 2005

	Principal and interest on primary mortgage	Real estate taxes	Fire, hazard, flood insurance	PITI	Number of households
Connecticut	$963	$321	$58	$1,337	595,213
Maine	$600	$154	$40	$810	209,484
Massachusetts	$1,071	$246	$58	$1,400	1,043,180
New Hampshire	$838	$337	$45	$1,225	226,530
Rhode Island	$920	$254	$58	$1,246	166,922
Vermont	$636	$229	$45	$934	105,044
New England	$938	$254	$53	$1,300	2,346,373
United States	$750	$154	$53	$990	45,822,777

Source: American Community Survey, 2005

Notes:
Sample includes households where the household head is age 25+ and not enrolled in school and the household positive income and a positive mortgage payment.

Expenditures for owner housing consist of monthly mortgage payment (principal and interest), real estate taxes, and homeowner's insurance premiums for fire, hazard, and flood. Owners must have a mortgage payment and mortgage payments include only the primary mortgage.

Appendix Table 3
Minimum Annual Household Income to Income Needed to Afford the Median Gross Rent, 2005

	Median Gross Rent	Annual Income Needed
Connecticut	$840	$33,600
Maine	$605	$24,200
Massachusetts	$900	$36,000
New Hampshire	$860	$34,400
Rhode Island	$763	$30,533
Vermont	$680	$27,200
United States	$727	$29,067

Notes:
Median gross rent as reported in the 2005 American Community Survey detailed tables.

Annual income needed = median gross rent per month * 12 * 3.

Annual median household income for 2005 at various points in the income distribution are three-year moving averages as calculated from the 2003-2005 Current Population Survey where the household head is age 25+ and not enrolled in school, adjusted to real $2005.

Appendix Table 4
Minimum Annual Income Needed to Purchase the Median Priced House, 2005

	Median price	Interest rate	Monthly mortgage payment	Monthly real estate taxes	Monthly insurance premiums	Total monthly payment (PITI)	Annual income needed
Connecticut	$326,453	5.77%	$1,527	$405	$65	$1,997	$85,593
Maine	$188,648	6.00%	$905	$204	$42	$1,151	$49,339
Massachusetts	$374,103	5.66%	$1,729	$278	$60	$2,068	$88,615
New Hampshire	$283,563	5.80%	$1,331	$354	$48	$1,733	$74,263
Rhode Island	$302,467	5.74%	$1,411	$369	$60	$1,840	$78,857
Vermont	$196,058	5.86%	$926	$289	$49	$1,264	$54,191
United States	$239,842	5.90%	$1,138	$169	$62	$1,370	$58,694

Notes:

Median price	Median price of single-family homes for 2005 as reported by the Federal Housing Finance Board's Monthly Interest Rate Survey of conventional mortgages.
Interest rate	Effective interest rate for 2005 as reported by the Federal Housing Finance Board's Monthly Interest Rate Survey of conventional mortgages.
Monthly real estate taxes	Effective property tax rates per $1,000 of value for each state. See data appendix for details.
Monthly insurance premiums	Average annual dwelling fire and homeowners insurance premiums by state for 2002 as reported by the National Association of insurance Commissioners divided by 12, adjusted by the CPI for household insurance.
Financing	Financing is assumed to be a conventional mortgage loan available at current interest rates with a loan-to-value ratio of 80% and a term of 30 years.
Monthly mortgage payment	Median price * loan-to-value ratio * (interest rate/12) * ((1+interest rate/12)^360 / ((1+interest rate/12)^360 - 1))
Total monthly payment (PITI)	Monthly mortgage payment (principal and interest) + real estate taxes + homeowners insurance premiums.
Annual income needed	Total monthly payment * 12 / qualifying income ratio which is assumed to be 28%.

Appendix Table 5
Minimum Annual Income Needed to Purchase the Median Priced House, 2005
"First-Time" Homebuyers

	Median price	Interest rate	Monthly mortgage payment	Monthly real estate taxes	Monthly insurance premiums	Personal Mortgage Insurance	Total monthly payment (PITI)	Annual income needed
Connecticut	$277,485	5.77%	$1,542	$344	$55	$110	$2,051	$84,863
Maine	$160,351	6.00%	$913	$174	$36	$63	$1,186	$49,086
Massachusetts	$317,988	5.66%	$1,746	$237	$51	$126	$2,159	$89,339
New Hampshire	$241,028	5.80%	$1,344	$301	$41	$95	$1,780	$73,673
Rhode Island	$257,097	5.74%	$1,424	$314	$51	$102	$1,891	$78,230
Vermont	$166,649	5.86%	$935	$246	$42	$66	$1,288	$53,312
United States	$203,866	5.90%	$1,149	$144	$53	$81	$1,426	$59,014

Notes:

Median price	Median price as reported for all homebuyers in Table 12 multiplied by 85%.
Interest rate	Effective rate as reported for all homebuyers in Table 12.
Monthly real estate taxes	Effective property tax rates per $1,000 of value as reported in Table 12 for all homebuyers.
Monthly insurance premiums	Monthly insurance premiums as reported for all homebuyers in Table 12 multiplied by 85%.
Financing	Financing is assumed to be an FHA-insured mortgage with a 95% loan-to-value ratio and a 30 year term.
Personal mortgage insurance (PMI)	A mortgage insurance premium of 0.5% of the outstanding balance of the loan is required for FHA mortgages. The premium is spread evenly over 12 monthly payments.
Monthly mortgage payment	Median price * loan-to-value ratio * (interest rate/12) * ((1+interest rate/12)^360 / ((1+interest rate/12)^360 - 1))
Total monthly payment (PITI)	Monthly mortgage payment (principal and interest) + real estate taxes + homeowners insurance premiums + personal mortgage insurance.
Annual income needed	Total monthly payment * 12 / qualifying income ratio where the qualifying ratio is assumed to be 29% as required for FHA mortgages.