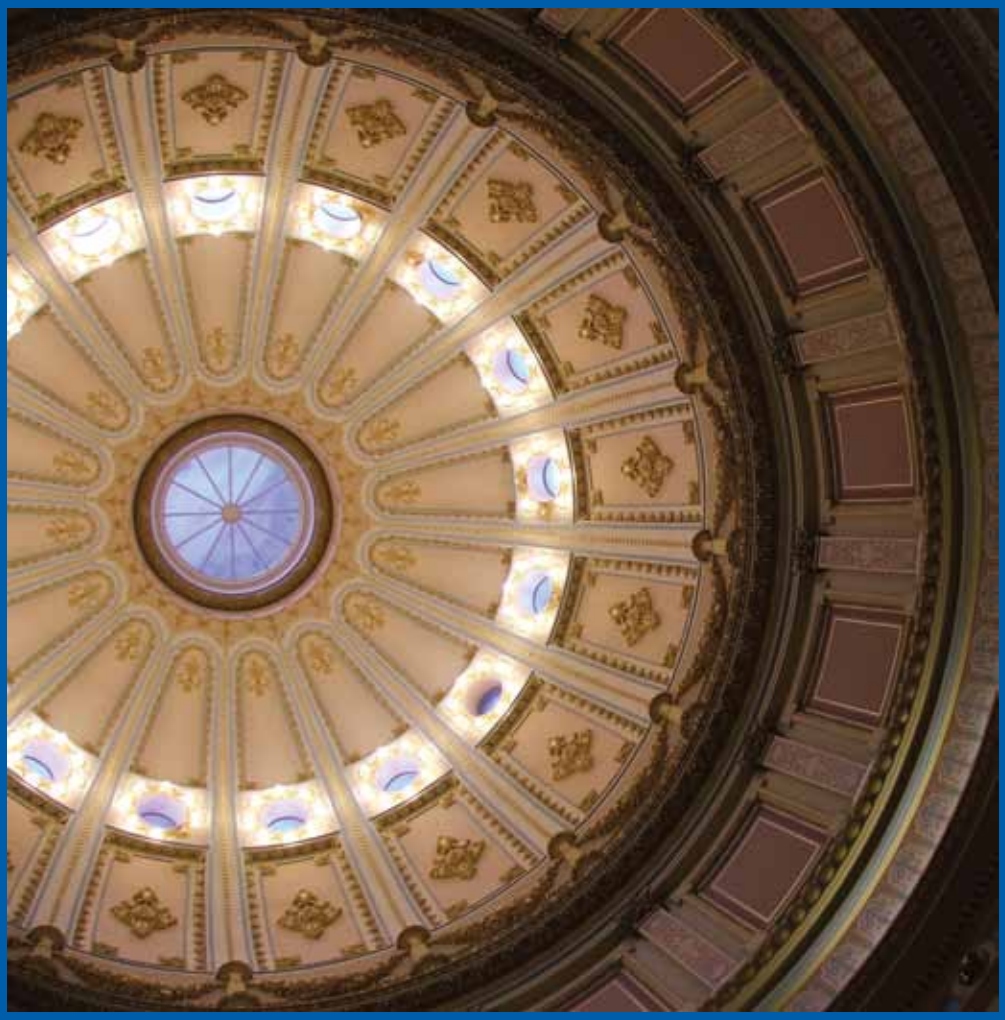
New England Public Policy Center
Discussion Paper 10-1
June 2010

Discussion Paper



The Housing Bust and Housing Affordability in New England:

An Update of Housing Affordability Measures

by Robert Clifford

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Acknowledgments

This paper could not have been completed without the assistance of many individuals. In particular, I would like to offer thanks to the following individuals: Yael Shavit, Michael O'Mara, and Libby Mishkin for diligently fact-checking the work, Sandra Hackman for editorial services, Darcy Saas and Mary Pierotti for help throughout the production process, Yolanda Kodrzycki for reviewing multiple drafts of this paper and providing invaluable suggestions and support along the way, and Alicia Sasser for her supervision and mentorship throughout every stage of the paper. All remaining errors are my own.

The Housing Bust and Housing Affordability in New England: An Update of Housing Affordability Measures

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In 2007 the New England Public Policy Center released "The Lack of Affordable Housing in New England: How Big a Problem? Why Is It Growing? What Are We Doing About It?"[1] Analyzing affordability measures from 1995 to 2005, Alicia Sasser, Bo Zhao, and Darcy Rollins Saas found that the lack of affordable, owner-occupied housing was a problem for both middle-income and low-income households in New England—particularly in southern New England states. The authors also found that households headed by young professionals could afford to purchase median-priced homes in the region, but not as easily as in the 1990s, and not as easily as in most rival metropolitan areas. New England's rental housing, in contrast, was expensive relative to that in the rest of the nation, but incomes were high enough that rentals were still affordable to most New Englanders.

After the report appeared, real housing prices peaked and then fell 10.7 percent in New England and 7.4 percent nationally from 2006 to 2008, while real household incomes remained relatively unchanged (see Figure 1).[2] The combination of falling house prices and flat incomes has led some observers to suggest that housing has become more affordable.[3] However, many households in both New England and the United States entered the recession facing cost burdens related to housing, so few may be able to take advantage of declining house prices. With that dichotomy in mind, this report draws on housing market data to examine the extent to which declining housing prices have translated into improvements in housing affordability.

This analysis reveals that as New England's housing prices have declined, affordability for people looking to buy has been returning to pre-housing crisis levels of the early 2000s. However, declining prices nationwide continue to make owner-occupied housing in most New England states less affordable than in the nation.

At the same time, the share of households—both owners and renters—in New England and the United States facing housing cost burdens has continued to rise. This has been particularly true for low- and middle-income homeowners in the region, who are much more likely to be cost-burdened than their national counterparts. New England has maintained its advantage in rental affordability relative to the nation, in contrast, and renters in the region are far less likely than their national counterparts to face cost burdens.

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[1] Alicia Sasser, Bo Zhao, and Darcy Rollins Saas, "The Lack of Affordable Housing in New England: How Big a Problem? Why Is It Growing? What Are We Doing About It?" Federal Reserve Bank of Boston, Working Paper 06-1, January 2007.
[2] See Figure A1 for information on changes in real housing prices in New England states.
[3] See Floyd Norris, "Housing Market's Upside: Affordability," *New York Times*, March 6, 2009.

Measures of Housing Affordability

Documenting the changes in housing prices over the past several years is relatively straightforward. However, measuring changes in housing affordability is more complex. To measure housing affordability for both renters and homeowners in New England and the nation, I assembled data for two distinct indicators:

• Housing income adequacy ratio: the ratio of median annual household income to the minimum annual income needed to afford the median-priced rental or owner-occupied unit.

• Housing burden: the ratio of the reported costs of owning or renting a housing unit to reported household income.

The first measure indicates whether the median household's income is sufficient to allow that household to afford the "typical" house or apartment in its geographic area. That is, it reflects the potential of the median household to obtain housing given current market conditions. The second measure indicates what households actually spend as a percentage of their income, reflecting choices households have already made to rent or own.

I account for the ability of households, not individuals, to bear the costs of housing because household members usually pool their incomes to take advantage of economies of scale when consuming housing services. My indicators therefore measure the ability of households to bear housing costs based on income from all members and all sources (such as wages, pensions, and income transfer payments).

In the case of owner-occupied housing, price is not a completely accurate indicator of the cost of owning a home. Homeowners' monthly payments are also determined by factors such as financing (including mortgage interest rates and loan-to-value ratios), real estate taxes, and premiums for homeowner's insurance. These costs are not always positively correlated with house prices. For example, falling interest rates can partially offset rapidly rising house prices.

I therefore measure homeowners' housing costs (on a pretax basis) as the principal and interest on the primary mortgage, plus monthly real estate taxes and insurance premiums for fire, hazard, and flood.[4] For renters, because the price of many units includes the cost of utilities, housing expenditures consist of "gross rent": that is, contract rent plus utilities.[5] I multiply these monthly expenses by 12 to obtain annual housing costs.

Following the methodology in the Sasser, Zhao, and Saas study, I also make two important refinements not found in other studies of housing affordability. First, I limit my sample to households whose head is 25 years of age or older and not enrolled in school. That

[4] I exclude principal and interest on second mortgages because households often use them to make discretionary renovations, or to fund other expenses such as a child's tuition. In 2008, homeowners with a second mortgage accounted for 32 percent of all homeowners with a mortgage in New England. In the nation, that share was 27 percent.

[5] See Tables A6 and A7 for monthly median expenditures for renters versus homeowners.

adjustment is important because individuals who are younger and investing in their education are likely to have limited participation in the labor market. As a result, their housing costs are likely to comprise an unusually large share of their incomes until they get a job after graduating, when the return on their investment in education yields a higher income. I exclude those households from my analysis because including them would overstate the share of households with long-term affordability problems.

Second, because my analysis focuses primarily on how market conditions are affecting the affordability of housing, I also exclude from the sample owner households without a mortgage.[6] As of 2008, most such homeowners were elderly (the median age of the household heads in New England was 67 years) and retired (more than 29 percent of these households had no members in the labor force). Many of these households purchased their homes when conditions in the housing market were very different from those of the past decade.[7]

Rising Affordability: The Housing Income Adequacy Ratio

Examining the ratio of median annual household income to the minimum annual income needed to afford the median-priced housing unit (whether a rental or owner-occupied) allows me to capture the market conditions facing buyers. As such, this measure reflects the market conditions confronting households looking to move to the region, or to shift from renting to buying.

Ideally, I would like to compare the full distribution of housing prices to that of incomes. However, because of limited data, I am restricted to using the median housing price. In doing so, my measure implies that households earning the median annual income should be able to afford the median-priced housing unit. While this assumption is somewhat arbitrary, it does allow me to compare affordability across geographic areas and among demographic groups. The measure also captures any disparity between household incomes and housing prices. However, this measure of relative affordability does not account for variation in the quality of housing stock (such as its age, number of rooms, and square footage) across regions.

I base my calculation of the annual income households need to afford housing in a geographic area on assumptions about the "affordable" percentage of income spent on rental and owner-occupied units. For rental units, the affordable share of income is 30 percent—the standard threshold used to define housing burden.[8] For owner-occupied housing, the affordable share of income is 28 percent: the industry standard used to determine whether potential buyers have enough income to qualify for a conventional 30-

[6] As of 2008, the share of homeowners without a mortgage was 28 percent for New England versus 32 percent for the nation.
[7] For more detailed explanations of restrictions on the sample and caveats on the indicators, see Sasser, Zhao, and Saas 2007, pp. 8–11.
[8] Joint Center for Housing Studies, "The State of the Nation's Housing," Cambridge, MA: Harvard University, 2009.

year, fixed-rate mortgage with an 80 percent loan-to-value ratio (that is, with a 20 percent down-payment).

The housing income adequacy measure—the ratio of median annual household income to the annual income needed to afford the median-priced home—indicates whether housing in a geographic area is affordable. A ratio of 1.0 is the affordability threshold: ratios at or above that threshold indicate that the median-income household can afford the median-priced house in a geographic area.

I compare the income adequacy ratio for three demographic groups. The first—which I call "all households"—includes households headed by an individual who is aged 25 or older and not currently attending school. The second group—which I call "potential first-time homebuyers"—is restricted to renter households whose head is aged 25–39 and not in school. I assume that potential first-time homebuyers aspire to purchase a starter house equivalent to 85 percent of the median house price in their geographic area, with more lenient mortgage terms than a conventional loan.[9]

The third group, "young professionals," includes households headed by a college graduate aged 25–39. Given the mobility of young professionals and the strong demand for their labor skills, the affordability of housing for this group could potentially indicate whether the cost of housing affects New England's economic competitiveness.

Affordability measures will vary among these groups as they experience disparate income levels (see Figure 2).[10] The median New England household income for all three of these groups is greater than that of their national counterparts. However, these groups' incomes have trended along fairly similar paths over the past few years with negligible changes to real income experienced in New England and the United States. Therefore we will expect housing price levels and trends to be driving the changes we see in our affordability measures.

[9] In its biennial survey of homebuyers, the National Association of Realtors defines starter homes as costing 85 percent of the median price in any given market. My measure assumes that first-time homebuyers secure a 30-year, fixed-rate loan from the Federal Housing Administration with a loan-to-value ratio of 95 percent and a qualifying income ratio of 29 percent. I also assume that first-time homebuyers pay monthly mortgage insurance premiums of 0.5 percent of the outstanding loan balance. See Table A4.

[10] See Table A5 for a comparison of the New England states, New England region, and national median annual household incomes for the three groups in 2008.

Box 1: How to interpret the income adequacy ratio

Scenario 1. Assume that median annual household income in State A is $40,000, while that in State B it is $50,000. If the annual income needed to afford the median-priced home in both State A and State B is $45,000, then their income adequacy ratios are about 0.89 and 1.11, respectively. That means the costs of owning the median-priced home in State A are 11 percent above an affordable level for households earning the median income. In State B, in contrast, the median household earns 11 percent more income than it needs to afford the median-priced house.[11]

The implication is that State B's median-income household has enough income to afford a more expensive home, or has discretionary income left over after the household takes out a mortgage to purchase the median-priced home. The median-income household in State A, in contrast, qualifies for a mortgage to purchase only a less expensive home, or must divert income from other uses to make a larger down-payment on the median-priced home. Under this scenario, the absolute affordability of housing is the same in States A and B, but housing is *relatively* more affordable in State B than in State A.

Scenario 2. Assume that median annual household income in State A is $40,000, while in State B it is $50,000. If the annual income needed to afford the median-priced home is $35,000 in State A and $40,000 in State B, then the income adequacy ratios are about 1.14 and 1.25, respectively. The median-income household in State A therefore earns 14 percent more than it needs to afford the median-priced home, while the median-income household in State B earns 25 percent more than it needs to afford the median-priced home. As a result, even though State A's median-priced home is *absolutely* more affordable than State B's, housing is *relatively* more affordable in State B than in State A.

[11] When the income adequacy ratio lies above the affordability threshold, calculating the percentage by which the median annual household income exceeds the annual household income needed to afford the median-priced home is easy. It is the income adequacy ratio minus 1.0—the affordability threshold. However, calculating how much that median household's income would need to rise to reach the affordability threshold is not as straightforward. For example, in scenario 1, State A's median-income household would need to raise its income by 12.5 percent to afford the area's median-priced home ($40,000 * 12.5% = $5,000). To figure the percentage increase based on the ratio, we would need to subtract the income adequacy ratio from 1.0 and divide by the income adequacy ratio ([1-0.89] / 0.89 = 12.5%). Therefore, when the income adequacy ratio falls below the affordability threshold, I refer to the percent decrease in the cost of owning the median-priced home needed in order to make it affordable for the median-income household.

Results: Affordability improves as house prices fall

As predicted, declining housing prices mean that housing affordability has improved considerably since 2006 for those looking to buy, in both New England and the nation (see Figure 3). The income adequacy ratio bottomed out in the region (except in Vermont) and the nation that year, as house prices peaked and median annual household income remained relatively flat. From 2006 to 2008, falling house prices and flat income growth improved affordability by 10–20 percent for the median household in New England. The 2008 income adequacy ratios approach those last seen in the early 2000s, before the housing bubble.

Still, owner-occupied housing continues to be less affordable in most New England states than in the nation as a whole. In 2008, median household income was high enough for that household to afford the median-priced home in only two New England states—Maine and New Hampshire. In the rest of the region, median household income fell below the affordability threshold for the median-priced home by amounts ranging from 6 percent in Connecticut to 18 percent in Massachusetts. Median household income for the nation, in contrast, slightly exceeded the amount that household needed to afford the median-priced house (Table 1, column 1).

Potential first-time homebuyers in New England continue to face daunting market conditions, as the median household in this group in each state is unable to afford the median-priced starter home in that state. In fact, the costs of owning the median-priced home are 20–40 percent above an affordable level for median-income, potential first-time buyers in New England states (Table 1, column 3). The gap between incomes and housing costs is particularly large in southern New England states. However, such a gap is not unique to the region. Nationally, the annual costs of owning the median-priced starter home would have to decline by 25 percent to reach the affordability threshold for the median-income potential first-time homebuyer.

Young professional households in New England can afford the median-priced house in the region, yet (with the exception of Maine) they can get more "bang for their buck" in other parts of the nation. These households, headed by individuals with a college degree, earn incomes 28–45 percent above the annual income needed to purchase the median-priced house in New England states. However, even though they have more annual income than their national counterparts, the region's young professionals also face higher housing costs. They therefore have less discretionary income remaining after they buy their state's median-priced home (Table 1, column 5). In Maine, the housing income adequacy ratio for young professional households is nearly the same as their national counterparts at 1.58.

Affordability varies across the region's metropolitan areas

Figure 4 and Table 2 show gains in affordability across New England's metropolitan areas since 2006. In fact, only one New England metropolitan area fell substantially below the affordability threshold for all households in 2008: Bridgeport-Stamford-Norwalk, CT (Table 2, column 1).

Metropolitan areas in the Greater Boston area (Boston-Quincy, MA and Cambridge-Newton Framingham, MA) and Rhode Island (Providence-New Bedford-Fall River, RI-MA) saw especially large rebounds in affordability, returning to roughly the levels of 2000–2001 (See Figure 4). In the metropolitan areas in northern New England, the ratios of median annual household income to the annual income required to purchase the median-priced house have all risen to just above the affordability threshold—as in 2004 and 2005, just before house prices peaked. These trends reflect both the degree to which house prices rose before 2006 and the declines in those prices since the peak. Prices around Greater Boston and Providence, RI appreciated the fastest in the early 2000s, and then saw the steepest declines. In the metro areas of northern New England, house prices rose more slowly, and also declined more slowly.[12]

Within New England states, housing affordability varies considerably across locations. For example, in Connecticut, the median household income in Hartford is almost 20 percent higher than the income needed to afford the median-priced home (see Table 2, column 1). However, just to the southwest, the costs of owning the median-priced home in the Bridgeport-Stamford-Norwalk area would need to fall by 15 percent to be affordable for the area's median-income household.

Greater Boston has seen greater gains in affordability since 2006 than notable competitor metropolitan areas.[13] For example, Boston has gained on low-cost areas like Seattle and Raleigh-Cary, NC, and has continued to pull away from high-cost areas such as New York and San Francisco (Figure 5).

Boston's gains in affordability since 2006 are partly due to timing. In the Boston area, real house prices peaked in 2005, and then fell 15.3 percent through 2008.[14] Yet prices continued to rise (or at least stagnate) in competitor cities such as Chicago, New York, Seattle, and Philadelphia, and steep declines did not begin to appear until 2007 and 2008. By the end of 2008, real house prices had declined by 8.1 percent in Chicago, 8.5 percent in

[12] See Figure A2 for details on trends in housing prices in New England's metropolitan areas.
[13] I define competitor metropolitan areas as those with similar advantages, including an educated workforce, large knowledge-based and high-tech industries, and established financial sectors.
[14] See Figure A3 for details on trends in housing prices in competitor metropolitan areas.

New York, and 6.4 percent in Seattle. Now that house prices appear to be stabilizing in Boston but are continuing to fall in most competitor cities, Boston's gains in relative affordability may dissipate.

Turning to the findings by subgroup, potential first-time homebuyers could afford to buy a home in only one metropolitan area in New England: Worcester, MA (Table 2, Column 2). The region's metropolitan areas are more affordable for young professional households because of their higher incomes—even compared with many competitor cities (Table 2, column 3). Greater Boston tied with Raleigh-Cary, NC, for second in affordability for young professionals among eight cities analyzed in 2008 (see Figure 6). Boston surpassed Washington, DC, in housing affordability for this demographic group, and became nearly as affordable as Chicago, IL.

New England's rental housing remains affordable

Although shifting house prices have led to major changes in the affordability of owner-occupied housing since the release of the Sasser, Zhao, and Saas study, the consequences for rental housing have been relatively minor. Since 2006, real median gross rents (contract rent plus utilities) have declined by 1.5 percent in New England, while growing a slight 0.3 percent nationally (Figure 7). As a result, rental housing continues to be more affordable in most New England states relative to the nation (Figure 8).

What's more, rental affordability has been fairly stable since 2006 in most New England states (except Vermont), as household income and rental prices have remained fairly level.[15] The median annual household income of each state in the region was 1.5 to 1.7 times the level that household needed to rent the median-priced apartment in 2008 (see Table 1, column 2). Connecticut, Maine, New Hampshire, and Rhode Island have notably higher rental affordability than the nation as a whole.

I should note that my measures capture only state-level rental affordability. Studies that examine rental affordability in metropolitan areas find that New England's largest metropolitan area is relatively unaffordable. For example, the 2009 Greater Boston Housing Report Card showed declining rental affordability in the greater Boston area, owing to rising rents and stagnant incomes.[16] The authors also found that Boston had the second-highest

[15] In Vermont, the real median annual income of households with a head aged 25 or older and not currently enrolled in school declined 6.5 percent from 2006 to 2008. The other five New England states reported modest growth in median annual household incomes of 0.5 to 5.0 percent.

[16] Barry Bluestone, Chase Billingham, and Jessica Herrmann, "The Greater Boston Housing Report Card 2009: Positioning Boston in a Post-Crisis World," Boston, MA: Center for Urban and Regional Policy, Northeastern University, October 2009.

monthly gross rent—behind only San Francisco—for four-person families among 20 major metropolitan areas in 2007.[17]

Rising Burdens: The Housing Burden Ratio

As noted, housing burden is based on the percentage of income that households spend on housing. In contrast to the income adequacy ratio—which captures recent conditions in the housing market for those looking to buy or rent—the housing burden measure captures the economic conditions of those already owning or renting a unit.

Housing affordability studies typically categorize housing burdens as either moderate or severe. A household that spends more than 30 percent of its income on housing is seen as having a moderate burden, while a household that spends more than 50 percent of its income on housing is said to have a severe burden.[18] I follow that convention.

Results: Burdens increase as the economy enters recession

The share of cost-burdened households has risen steadily since 2000, in both New England and the nation (Figure 9). From 2000 to 2008, the percentage of households experiencing any burden in New England and the nation rose from less than 24 percent to more than 31 percent. Since 2006, the share of burdened households in New England has increased more slowly than in the nation as a whole. The result is that the region's share of burdened households is just 0.3 percentage points higher than the nation's share.

Comparing housing burdens by income quintiles reveals significant variations.[19] Not surprisingly, very-low-income households in New England—those in the lowest-income quintile—are far more likely to be burdened than households with higher incomes. As of 2008, nearly 80 percent of very-low-income households in New England spent 30 percent or more of their income on housing (Table 3, column 1). In contrast, only 23.6 percent of the region's middle-income households were moderately burdened (column 3).

Inequality is even starker if we look at the percentage of households that are severely burdened. More than half of very-low-income households spent more than 50 percent of

[17] The report card measure is based on the median rent for four-person families in 2007, compiled by the Economic Policy Institute. That measure allows the authors to compare similar rental units across the 20 major metropolitan areas covered by the Case-Shiller Home Price Index.
[18] Joint Center for Housing Studies, "The State of the Nation's Housing," Cambridge, MA: Harvard University, 2009.
[19] I construct quintiles by ordering household incomes in a given geographic area and then dividing them into five equal groups.

their income on housing, compared with less than 4 percent of middle-income households (Table 3, column 6 versus column 8). Southern New England states had the highest shares of severely burdened very-low-income households. Northern states had significantly lower shares of such households than in the nation as a whole (column 6).

Challenges facing owners versus renters

Examining households in aggregate masks the different challenges faced by owner and renter households. Both owners and renters have faced rising housing burdens since 2000. However, the share of renters experiencing housing burdens is more than 20 percentage points higher than the share of owners facing such burdens—in both New England and the nation (see Figure 10).[20] Still, the shares of cost-burdened renters in New England and the nation have been nearly identical over the past few years, while the share of cost-burdened homeowners has remained slightly higher in the region than in the nation.

Owners and renters also face varying housing burdens within income quintiles.[21] In New England, homeowners in every quintile are more likely to be cost-burdened than renters (Table 4). Nationally, renters in the bottom two quintiles are more likely to be burdened than homeowners.

As of 2008, a higher share of homeowners in the lowest three quintiles was cost-burdened in New England than in the nation. However, homeowners in the region's highest two quintiles were *less* burdened than their national counterparts (Table 4, columns 1 through 5). Meanwhile a lower share of renters in all quintiles in the region were cost-burdened than renters in the nation (Table 4, columns 6 through 10).

Over time, the share of middle-income homeowners facing cost burdens has been higher than the share of middle-income renters facing cost burdens, in both New England and the nation (Figure 11). However, the gap between the share of cost-burdened middle-income owners and renters is larger in New England than the nation. For example, in 2008, the share of cost-burdened middle-income homeowners in New England was 15.1 percentage points higher than the share of cost-burdened renters—three times the gap for the nation

[20] This is not surprising, as roughly 30 percent of households in New England and the nation are renters, of which a majority is in the lower 60 percent of the income distribution. And as the distribution of housing burdens by income quintiles shows, the lower the income quintile, the higher the share of burdened households.

[21] In 2008, 55 percent of very-low-income households in New England were renters. More than 75 percent of middle-income households were homeowners, in contrast, while more than 90 percent of households in the highest-income quintile were owners.

(Table 5, column 3 versus column 4).[22] The gap is particularly large in Massachusetts (18.7 percentage points) and Rhode Island (24.0 percentage point), where the shares of cost-burdened homeowners exceed that of the regional average.

This disparity is due largely to the fact that middle-income homeowners in New England have continued to face higher housing costs relative to incomes than renters in the region and homeowners elsewhere (Table 6). From 2000 to 2005, growth in the cost of both houses and rental units outpaced income growth among middle-income households in both New England and the nation. That meant the share of middle-income owner and renter households that were cost-burdened rose steadily (Table 6, columns 4 and 9).

However, from 2005 to 2008 housing costs and incomes grew at similar rates among New England's homeowners, while incomes grew faster than rental costs among renters—widening the gap between the shares of cost-burdened owners and renters (Table 6, column 5). Nationally, the share of cost-burdened owners and renters continued to rise, as annual income growth was slower than the growth of housing costs for both groups (Table 6, column 10).

The disparity between owners and renters in New England is even larger among severely burdened, very-low-income households. Nationally, the shares of very-low-income owners and renters facing severe cost burdens have been fairly similar (Figure 12). However, in New England, the share of such homeowners paying more than 50 percent of their income in housing costs has far exceeded the share of renters facing such a severe burden (Table 7, column 5 versus column 6). In fact, almost two-thirds of very-low-income homeowners in New England spent more than 50 percent of their income on housing in 2008. Very-low-income homeowners face particular challenges in southern New England, where the share of severely burdened homeowners ranges from 67 in Connecticut to 80 percent in Rhode Island.[23]

As with middle-income households, the gap between very-low-income cost-burdened owners and renters is largely due to the high costs of owning a home in New England relative to income. From 2000 to 2005 both house and rental unit costs grew faster than incomes of very-low-income households in both the region and nation (Table 8, columns 4 and 9). This trend continued from 2005 to 2008, resulting in a sustained high share of burdened very-low-income owner and renters (Table 8, columns 5 and 10).

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[22] Compared with their counterparts nationwide, the share of New England's middle-income homeowners with a cost-burden is 4.3 percentage points higher, while the share of cost-burdened renters is 5.4 percentage points lower (see Table 5, column 3 and 4).

[23] For a more in-depth analysis of the affordability challenges confronting owners and renters in Rhode Island, see "Special Report: Foreclosures in Rhode Island," *HousingWorksRI*, Winter 2010.

Conclusion

Declining housing prices in the past few years have mixed implications for housing affordability in both New England and the United States. The income adequacy ratio—the ratio of median annual household income to the annual household income needed to afford the median-priced house—suggests that housing affordability in the region recently returned to the levels of the early 2000s. However, concurrent declines in housing prices nationwide have meant that New England states still lag the nation in housing affordability.

As of 2008, nearly every major metropolitan area in the region had reached the affordability threshold—and made considerable gains versus competitor metropolitan areas. However, whether these trends will continue is unclear, given that house prices in metropolitan areas in New England began declining a year or two earlier than those in competitor areas. As house prices continue to fall in these competitor cities, they may match or surpass New England's metro areas in housing affordability.[24]

At the same time, the share of households facing cost-burdens—owners and renters alike—has continued to rise in both New England and the nation. Nationally, the share of cost-burdened households has been fairly evenly distributed among owners and renters. In New England, the high cost of homeownership relative to incomes made owning a home burdensome for large shares of the region's households even before the economic downturn.

As both incomes and housing costs in the region have continued to grow at similar rates between 2005 and 2008, homeownership in New England continues to be burdensome. In fact, the share of cost-burdened homeowners—especially low- and middle-income homeowners—has continued to rise, while the share of cost-burdened renters has remained fairly stable. This has also resulted in a persistently higher share of cost-burdened homeowners in New England than nationally.

New England's rental affordability continues to be a bright spot in the region's housing market. Owing to fairly stable median gross rents and household incomes, New England states have maintained their rental affordability relative to national markets. Renters in each New England state are far less likely than their national counterparts to face high cost burdens.

[24] In 2009, most competitor metropolitan areas continued to see larger declines in house prices than the Boston metropolitan area.

Looking ahead: Affordability is still an issue

Extensive efforts by federal, state, and local governments, combined with favorable national monetary policy, have helped make housing more affordable in recent months.[25] Homebuyer tax credits and low interest rates have eased the cost of purchasing a home for potential buyers, reducing the inventory of unsold homes. Loan modification and refinancing programs, such as the Homeowner Affordability and Stability Plan, have helped current homeowners fend off foreclosure by lowering monthly payments and mortgage interest rates.[26]

These temporary stimulus measures notwithstanding, policymakers need to be aware of longer-term challenges related to housing costs. The affordability measures explored here point to lingering sources of concern pertaining to the high cost of homeownership in New England. In four of the six New England states (all but Maine and New Hampshire), recent drops in home prices have not been large enough to make the median-priced home affordable for the median-income household. Or—to present the same results from a different angle—the weak economy has prevented middle-income households from augmenting their incomes enough to allow them to afford the median-housed home in their state. The difference in affordability between New England and the nation is especially acute in Massachusetts.[27]

The other troubling finding is that the share of cost-burdened lower- and middle-income homeowners in New England noticeably exceeded the share of such homeowners nationally from 2006 and 2008. Although this analysis did not explore the precise reasons for this finding, it is reasonable to conclude that New England's relatively high house prices have forced households of moderate means to stretch their resources to buy a home, or to maintain homeownership. The situation is particularly severe for such homeowners in Massachusetts and Rhode Island. The implication is that lower- and middle-income homeowners in New England are more vulnerable in the face of shocks to their income or rising housing costs than their counterparts nationwide.

[25] See Table 7.1 in the "Greater Boston Housing Report Card 2009" for recent federal and state policies that aim to stabilize housing.
[26] The Homeowner Affordability and Stability Plan, also known as the Making Home Affordable Program, allows eligible homeowners to modify their mortgages to make payments more affordable.
[27] For a more detailed analysis of housing affordability in Massachusetts, see Lindsay Koshgrain, "Is Housing in Massachusetts More Affordable? (Only for the Lucky Few)," *MassBenchmarks* 12(2) (2010): 13–18.

Table 1
Ratio of Annual Household Income to Income Needed to Afford Median-Priced Housing, 2008: Owners versus Renters
New England States and United States

	All Households (aged 25+ and not in school)		Potential First-Time Buyers (aged 25–39, not in school, currently rent)		Young Professionals (aged 25–39, not in school, with a BA or higher)	
	[1] Median house price	[2] Median gross rent	[3] Median house price	[4] Median gross rent	[5] Median house price	[6] Median gross rent
Connecticut	0.94	1.63	0.64	1.10	1.39	2.41
Maine	1.07	1.63	0.79	1.19	1.59	2.41
Massachusetts	0.82	1.49	0.62	1.14	1.38	2.52
New Hampshire	1.07	1.74	0.79	1.27	1.45	2.37
Rhode Island	0.92	1.57	0.62	1.06	1.29	2.21
Vermont	0.91	1.49	0.72	1.16	1.28	2.10
United States	1.01	1.49	0.75	1.11	1.58	2.33

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

Median annual household incomes are three-year moving averages calculated from the 2006–2008 U.S. Census Bureau's Current Population Survey, adjusted to real 2008 dollars.

Monthly expenditures for renters equal median gross rent, as reported in the 2008 U.S. Census Bureau's American Community Survey. Annual income needed = gross income per month * 12 / 0.30.

Monthly expenditures for homeowners are based on the median price for a single-family home (See the Appendix for details on sources of data on median prices in each state). Total monthly payment equals principal and interest on 80% of the purchase price at prevailing interest rates for a 30-year conventional mortgage, real estate taxes, and homeowner's insurance premiums. Annual income needed = total monthly payments * 12 / qualifying income, which is assumed to be the industry standard of 28%. See the Appendix for further details.

For Potential First-Time Homebuyers, monthly expenditures are based on 85% of the median price of a single-family home. Total monthly payment = principal and interest on 95% of the purchase price at prevailing interest rates for a 30-year loan from the Federal Housing Administration (FHA), real estate taxes, homeowner's insurance premiums, and personal mortgage insurance of 0.5% of the outstanding loan balance. Annual income needed = total monthly payments * 12 / qualifying income, which is assumed to be the FHA requirement of 29%. See the Appendix for further details.

Table 2
Ratio of Annual Household Income to Income Needed to Afford the Median-Priced House, 2008: New England and Competitor Metropolitan Areas

	[1] All Households	[2] Potential First-Time Buyers	[3] Young Professionals
Connecticut			
Bridgeport–Stamford–Norwalk, CT	0.85	0.52	1.24
Hartford–West Hartford–East Hartford, CT	1.19	0.81	1.60
New Haven–Milford, CT	1.10	0.73	1.47
Maine			
Portland–South Portland–Biddeford, ME	1.02	0.77	1.25
Massachusetts			
Boston–Quincy, MA	0.99	0.77	1.37
Cambridge–Newton–Framingham, MA	1.00	0.80	1.26
Springfield, MA	1.17	0.75	1.49
Worcester, MA	1.39	1.02	1.98
New Hampshire			
Manchester–Nashua, NH	1.14	0.84	1.46
Rockingham County–Strafford County, NH	1.12	0.84	1.46
Rhode Island			
Providence–New Bedford–Fall River, RI-MA	1.10	0.75	1.55
Vermont			
Burlington–South Burlington, VT	1.09	0.79	1.25
Competitor Cities			
Washington–Arlington–Alexandria, DC-VA-MD-WV	1.13	0.76	1.30
Raleigh–Cary, NC	1.11	0.76	1.37
Chicago–Naperville–Joliet, IL	1.06	0.73	1.39
Seattle–Bellevue–Everett, WA	0.79	0.56	0.93
Philadelphia, PA	0.74	0.53	1.08
San Francisco–San Mateo–Redwood City, CA	0.53	0.49	0.71
New York–White Plains–Wayne, NY-NJ	0.47	0.42	0.74

Notes:

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

Median annual household incomes for the three groups are estimated from the 1990 and 2000 Censuses. I interpolate them between census years by applying the compound annual growth rate in median household income between the 2000 Census and 2005 U.S. Census Bureau's American Community Survey, and thereafter by applying year-over-year growth in median household income between the 2005 and 2006, 2006 and 2007, and 2007 and 2008 U.S. Census Bureau's American Community Surveys.

Monthly expenditures for homeowners are based on the median price of a single-family home, as reported by the National Association of Home Builders. Total monthly payment equals to principal and interest on 80% of the purchase price at prevailing interest rates for a 30-year conventional mortgage, plus real estate taxes, and homeowner's insurance premiums. Annual income needed = total monthly payments * 12 / qualifying income—a ratio that is assumed to be the industry standard of 28%. See the 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 interest on 95% of the purchase price at prevailing interest rates for a 30-year FHA loan, real estate taxes, homeowner's insurance premiums, and personal mortgage insurance of 0.5% of the outstanding loan balance. Annual income needed = total monthly payments * 12 / qualifying income—a ratio that is assumed to be the FHA requirement of 29%. See the Appendix for further details.

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

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

Young Professional Households are those where the head is aged 25–39 and not in school, and has a bachelor's degree or higher.

Table 3
Percentage of All Households with a Moderate or Severe Housing Burden, by Income Quintile, 2008

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
	Moderate: households paying more than 30% of income for housing					Severe: 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	81.6%	51.4% ***	20.9%	10.1%	2.5% ***	54.6%	15.5%	2.3% ***	1.4%	0.4%
Maine	77.1% **	51.9%	18.8%	6.9% ***	2.6% **	49.1% **	11.5%	2.7% *	0.4% ***	0.0% ***
Massachusetts	77.4% ***	55.4% ***	25.1% ***	9.4% ***	2.3% ***	54.6%	17.5% ***	4.5%	1.0% ***	0.3%
New Hampshire	80.2%	45.9%	21.9%	9.4%	2.5% ***	46.8% ***	11.7%	2.7% **	0.9%	0.1%
Rhode Island	74.7% ***	58.9% ***	25.9% *	8.6% *	1.7% ***	53.0%	17.3% *	4.2%	0.4% ***	0.3%
Vermont	82.3%	50.5%	18.4%	6.0% ***	3.5%	45.6% ***	5.4%	1.0% ***	0.4% ***	1.1%
New England	78.7% ***	51.7% ***	23.6% ***	9.7% ***	2.5% ***	52.7% ***	15.2% **	3.7% ***	1.1% ***	0.3%
United States	82.7%	47.5%	22.1%	10.9%	4.4%	56.3%	13.9%	4.5%	1.6%	0.4%

Source: U.S. Census Bureau, American Community Survey, 2008.

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

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

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

Expenditures for owner housing consist of monthly mortgage payments (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.

*Indicates significance at the 10% level, ** at the 5% level, and *** at the 1% level relative to the U.S. average.

Table 4
Percentage of Households with Moderate or Severe Housing Burdens, by Income Quintile, 2008: Owners versus Renters

	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
	Homeowners paying more than 30% of income for housing					Renters paying more than 30% of income for housing				
	Household income quintile					Household income quintile				
	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th
Connecticut	86.8% ***	57.9% ***	25.1%	11.1%	2.6% ***	80.0% ***	45.1% **	10.6% ***	3.9% *	0.0% ***
Maine	82.1%	45.6%	19.8% *	7.6% ***	2.6% **	75.4% ***	57.9% *	16.0% ***	3.0%	2.2%
Massachusetts	89.7% ***	59.0% ***	31.4% ***	11.1% *	2.5% ***	74.5% ***	52.5% *	12.7% ***	2.6% ***	0.9%
New Hampshire	82.3%	52.2% **	27.0%	10.5%	2.7% ***	79.2% *	38.3% ***	9.3% ***	2.1% ***	0.0% ***
Rhode Island	94.5% ***	64.7% ***	34.9% ***	10.0%	1.8% ***	71.2% ***	55.1%	10.9% ***	3.2% *	0.0% ***
Vermont	83.4%	49.4%	20.5%	7.1% **	3.6%	81.8%	51.7%	13.4% *	0.0% ***	0.0% ***
New England	86.2% ***	54.2% ***	28.3% ***	11.3% **	2.6% ***	76.6% ***	49.4%	13.2% ***	2.8% ***	0.8% *
United States	80.0%	45.2%	24.0%	12.2%	4.8%	83.7%	49.6%	18.6%	6.4%	1.5%

Source: U.S. Census Bureau, American Community Survey, 2008.

Notes:

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

Household income is based on all sources of income for 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.

*Indicates significance at the 10% level, ** at the 5% level, and *** at the 1% level.

Table 5
Housing Burden for Middle-Income Households, 2008: Owners versus Renters

	Median percentage of income spent on housing		Moderate burden: households spending more than 30% of income on housing		Severe burden: households spending more than 50% of income on housing	
	[1] Owners	[2] Renters	[3] Owners	[4] Renters	[5] Owners	[6] Renters
Connecticut	23.3% ***	19.8% ***	25.1%	10.6% ***	3.2% ***	0.1% ***
Maine	21.0% *	21.2%	19.8% *	16.0%	3.5% **	0.6% *
Massachusetts	24.0% ***	20.1% ***	31.4% ***	12.7% ***	6.3%	0.9% **
New Hampshire	23.9% ***	19.7% **	27.0%	9.3% ***	3.7% **	0.4% ***
Rhode Island	25.5% ***	19.9%	34.9% ***	10.9% ***	5.9%	1.3%
Vermont	20.9%	19.8%	20.5%	13.4%	1.5% ***	0.0% ***
New England	23.1% ***	20.1% ***	28.3% ***	13.2% ***	5.0% ***	0.8% ***
United States	20.6%	21.4%	24.0%	18.6%	5.9%	1.8%

Source: U.S. Census Bureau, American Community Survey, 2008.

Notes:
Middle-income households are those that fall into the third quintile of the income distribution.

Sample includes households with a positive income where the household head is aged 25+ and not enrolled in school.

Household income is based on all sources of income for 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.

*Indicates significance at the 10% level, ** at the 5% level, and *** at the 1% level relative to the U.S. average.

Table 6
Median Annual Household Income and Median Annual Housing Costs for Middle-Income Households: Owners versus Renters
New England and United States

	New England					United States				
	[1] 2000	[2] 2005	[3] 2008	[4] Annualized Growth Rate 2000–2005	[5] Annualized Growth Rate 2005–2008	[6] 2000	[7] 2005	[8] 2008	[9] Annualized Growth Rate 2000–2005	[10] Annualized Growth Rate 2005–2008
Owners										
Income	50,450	57,200	65,000	2.5%	4.4%	44,830	49,000	54,600	1.8%	3.7%
PITI	10,100	13,200	14,950	5.5%	4.2%	8,000	9,600	11,219	3.7%	5.3%
Mortgage	7,550	9,451	10,900	4.6%	4.9%	6,240	7,351	8,551	3.3%	5.2%
Property taxes and insurance	2,450	3,350	3,710	6.5%	3.5%	1,450	1,949	2,249	6.1%	4.9%
Renters										
Income	49,000	55,000	62,000	2.3%	4.1%	43,000	47,000	52,100	1.8%	3.5%
Gross rent	8,830	11,520	12,560	5.5%	2.9%	8,120	9,960	11,280	4.2%	4.2%
Contract rent	7,560	10,080	10,800	5.9%	2.3%	6,960	8,400	9,600	3.8%	4.6%
Utilities	1,100	1,340	1,560	4.0%	5.2%	1,000	1,320	1,560	5.7%	5.7%

Notes:
Author's calculations from the 2000 Census IPUMS and the U.S. Census Bureau's American Community Surveys.

Sample includes households with positive income where the head is aged 25+ and not enrolled in school.

Middle-income households are those that fall into the third quintile of the income distribution.

PITI = monthly mortgage payment (principal and interest) + real estate taxes + homeowner's insurance premiums.

Gross rent = contract rent + utilities.

Incomes and costs are in nominal dollars for their respective years.

Table 7
Housing Burden for Very-Low-Income Households, 2008: Owners versus Renters

	Median percentage of income spent on housing		Moderate burden: households spending more than 30% of income on housing		Severe burden: households spending more than 50% of income on housing	
	[1] Owners	[2] Renters	[3] Owners	[4] Renters	[5] Owners	[6] Renters
Connecticut	70.8% ***	51.0%	86.8% ***	80.0% ***	67.3% ***	50.7% ***
Maine	56.6%	47.6% ***	82.1%	75.4% ***	56.1%	46.7% ***
Massachusetts	87.3% ***	49.8% ***	89.7% ***	74.5% ***	76.2% ***	49.5% ***
New Hampshire	64.3%	42.0% ***	82.3%	79.2% *	57.7%	41.8% ***
Rhode Island	89.0% ***	47.2% ***	94.5% ***	71.2% ***	79.8% ***	48.2% ***
Vermont	42.0% ***	49.1% **	83.4%	81.8%	43.2% **	46.7% *
New England	71.2% ***	48.9% ***	86.2% ***	76.6% ***	66.2% ***	48.8% ***
United States	57.5%	55.4%	80.0%	83.7%	56.7%	56.1%

Source: U.S. Census Bureau's, American Community Survey, 2008.

Notes:
Very-low-income households are those that fall into the first quintile of the income distribution.

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

Household income is based on all sources of income for 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.

*Indicates significance at the 10% level, ** at the 5% level, and *** at the 1% level relative to the U.S. average.

Table 8
Median Annual Household Income and Median Housing Costs for Very-Low-Income Households: Homeowners versus Renters
New England and United States

	New England					United States				
	[1]	[2]	[3]	[4] Annualized Growth Rate	[5] Annualized Growth Rate	[6]	[7]	[8]	[9] Annualized Growth Rate	[10] Annualized Growth Rate
	2000	2005	2008	2000–2005	2005–2008	2000	2005	2008	2000–2005	2005–2008
Owners										
Income	14,430	15,750	17,940	1.8%	4.4%	13,000	13,500	15,500	0.8%	4.7%
Cost	8,400	10,049	11,420	3.7%	4.4%	5,925	6,960	8,200	3.3%	5.6%
Mortgage	6,000	6,840	8,051	2.7%	5.6%	4,570	5,280	6,155	2.9%	5.2%
Property taxes and insurance	2,150	2,940	3,149	6.5%	2.3%	1,065	1,454	1,709	6.4%	5.5%
Renters										
Income	11,170	11,600	13,200	0.8%	4.4%	10,780	11,400	12,600	1.1%	3.4%
Gross rent	5,200	6,360	7,560	4.1%	5.9%	5,350	6,600	7,418	4.3%	4.0%
Contract rent	4,560	5,400	6,360	3.4%	5.6%	4,320	5,280	5,880	4.1%	3.7%
Utilities	420	600	720	7.4%	6.3%	700	960	1,200	6.5%	7.7%

Notes:
Author's calculations from the 2000 Census IPUMS and the U.S. Census Bureau's American Community Surveys.

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

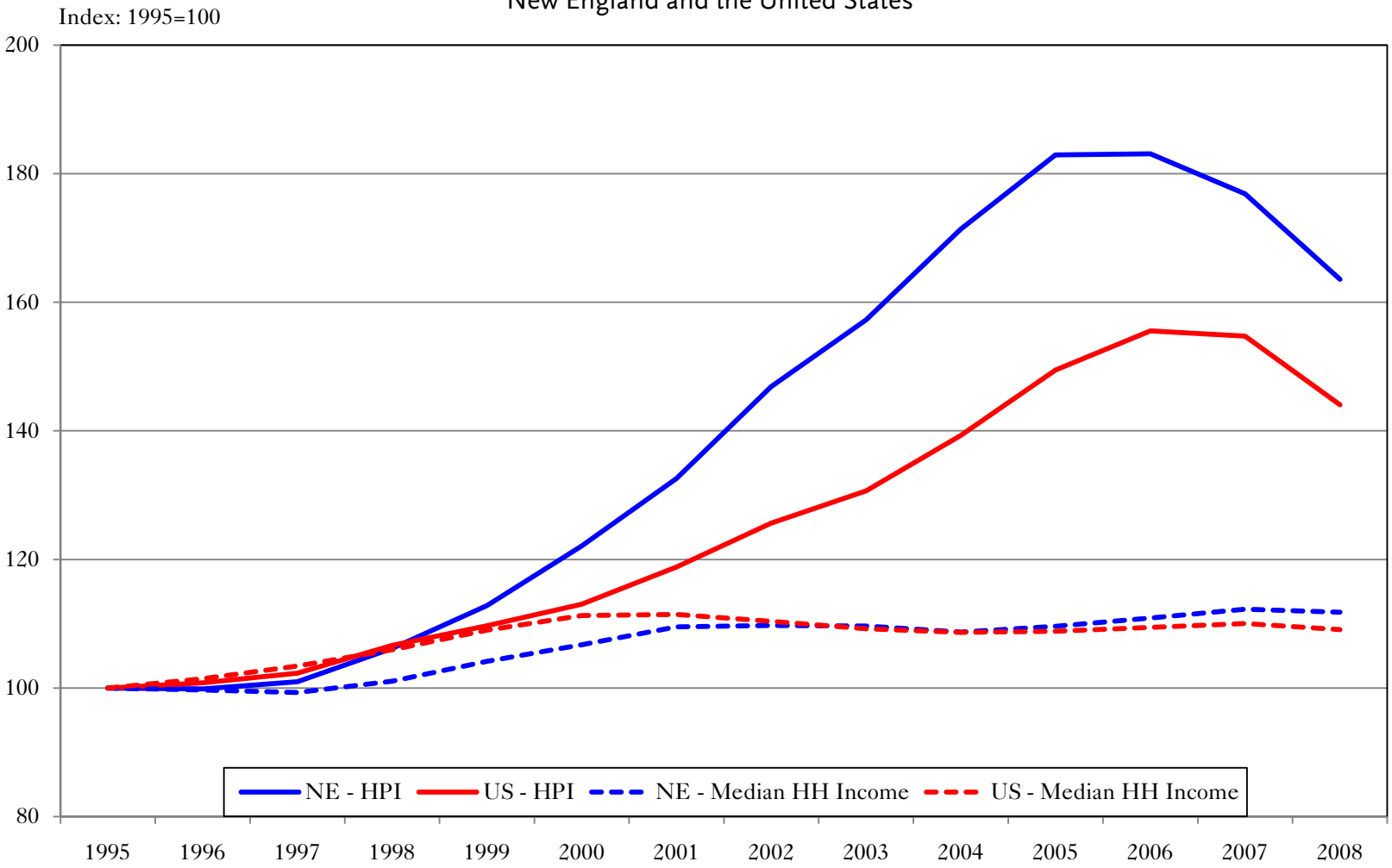
Very-low-income households are those that fall into the first quintile of the income distribution.

PITI = monthly mortgage payment (principal and interest) + real estate taxes + homeowner's insurance premiums.

Gross rent = contract rent + utilities.

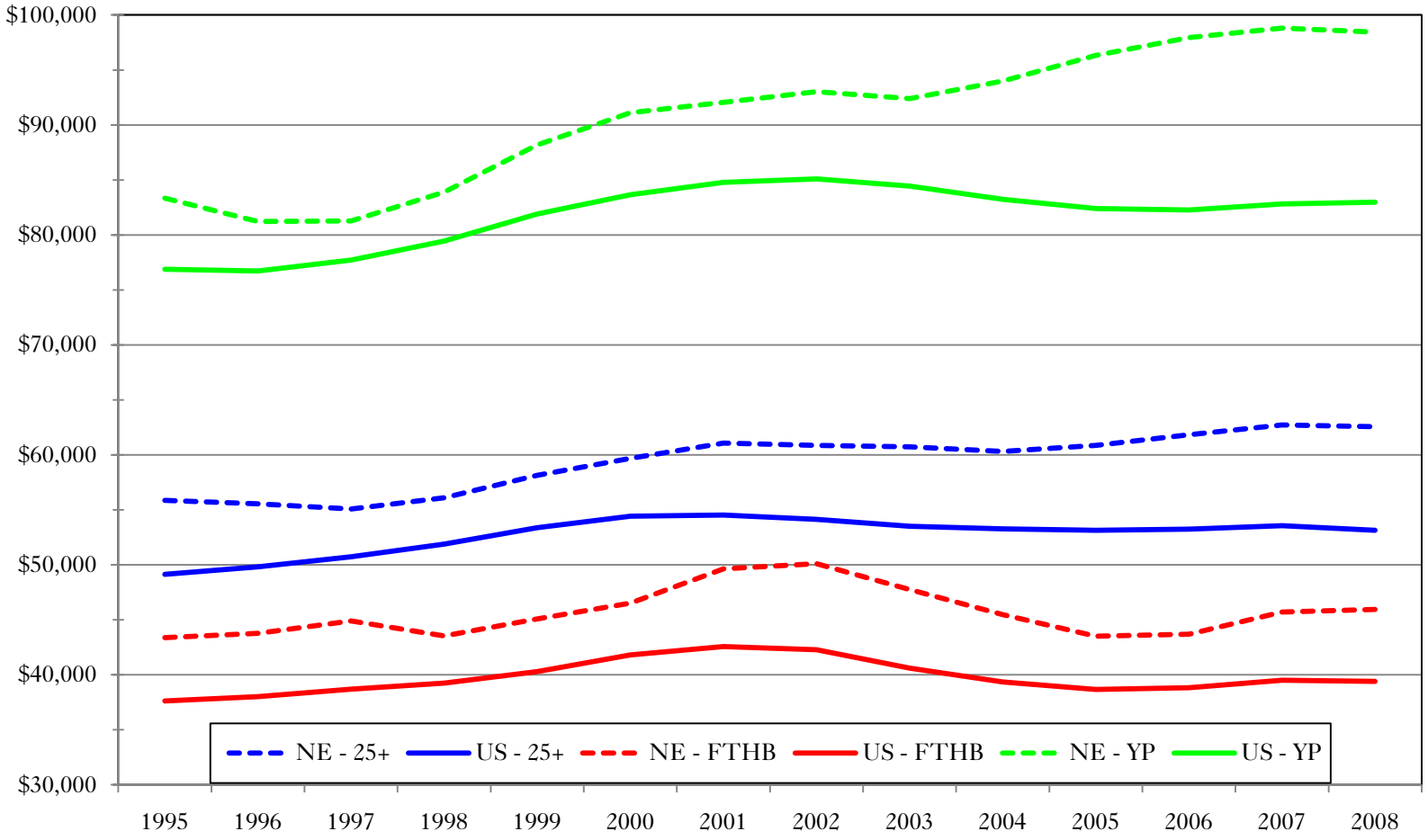
Incomes and costs are in nominal dollars for their respective years.

Figure 1
Real Housing Prices versus Real Household Incomes, 1995-2008:
New England and the United States



Source: Federal Housing Finance Agency and U.S. Census Bureau, Current Population Survey.
Note: HPI= Housing Price Index. HH = Household.

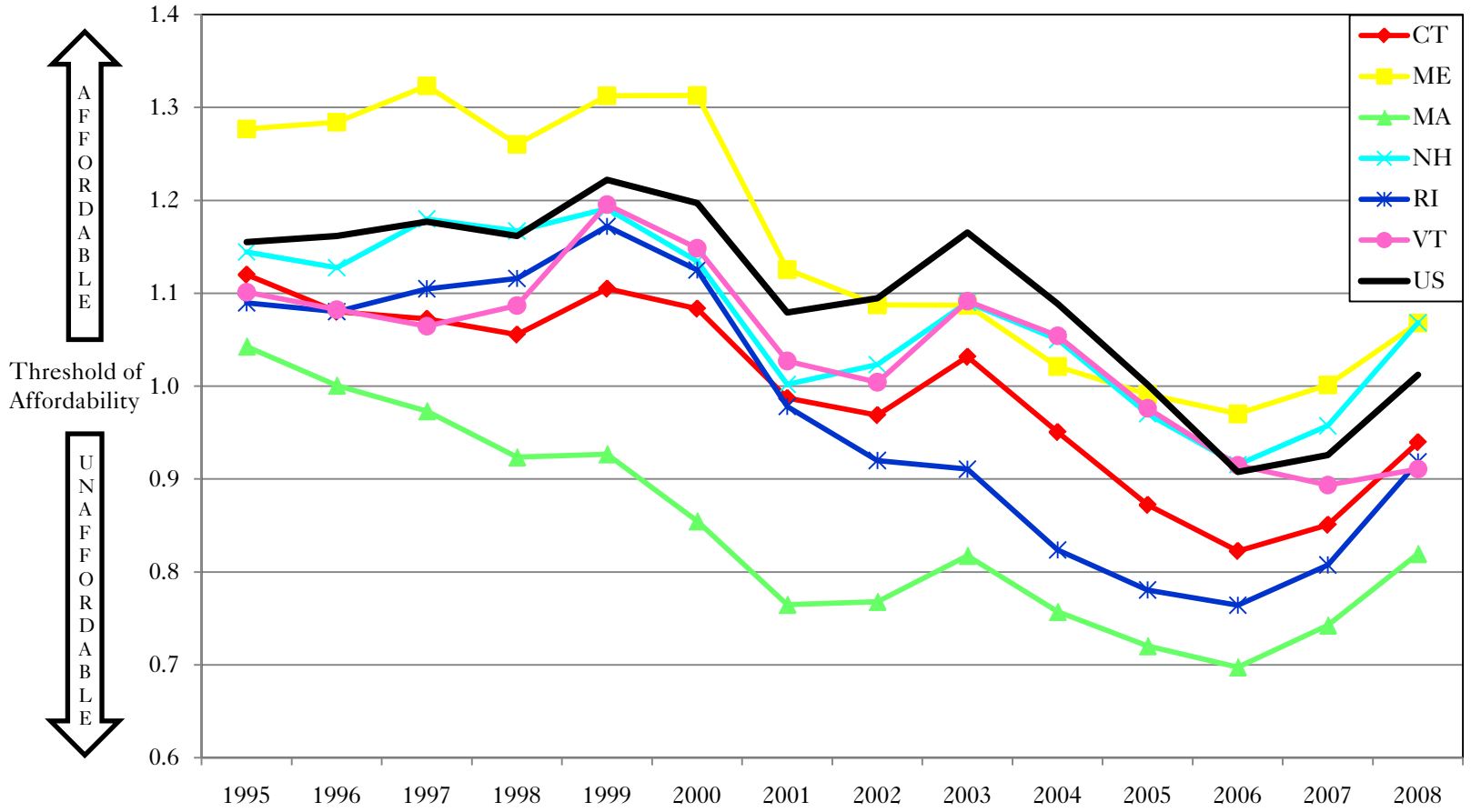
Figure 2
Real Median Household Incomes for Select Groups (in 2008 dollars):
New England and the United States



Source: U.S. Census Bureau, Current Population Survey.

Note: 25 + = All households. FTHB = Potential first-time homebuyers. YP = Young professionals.

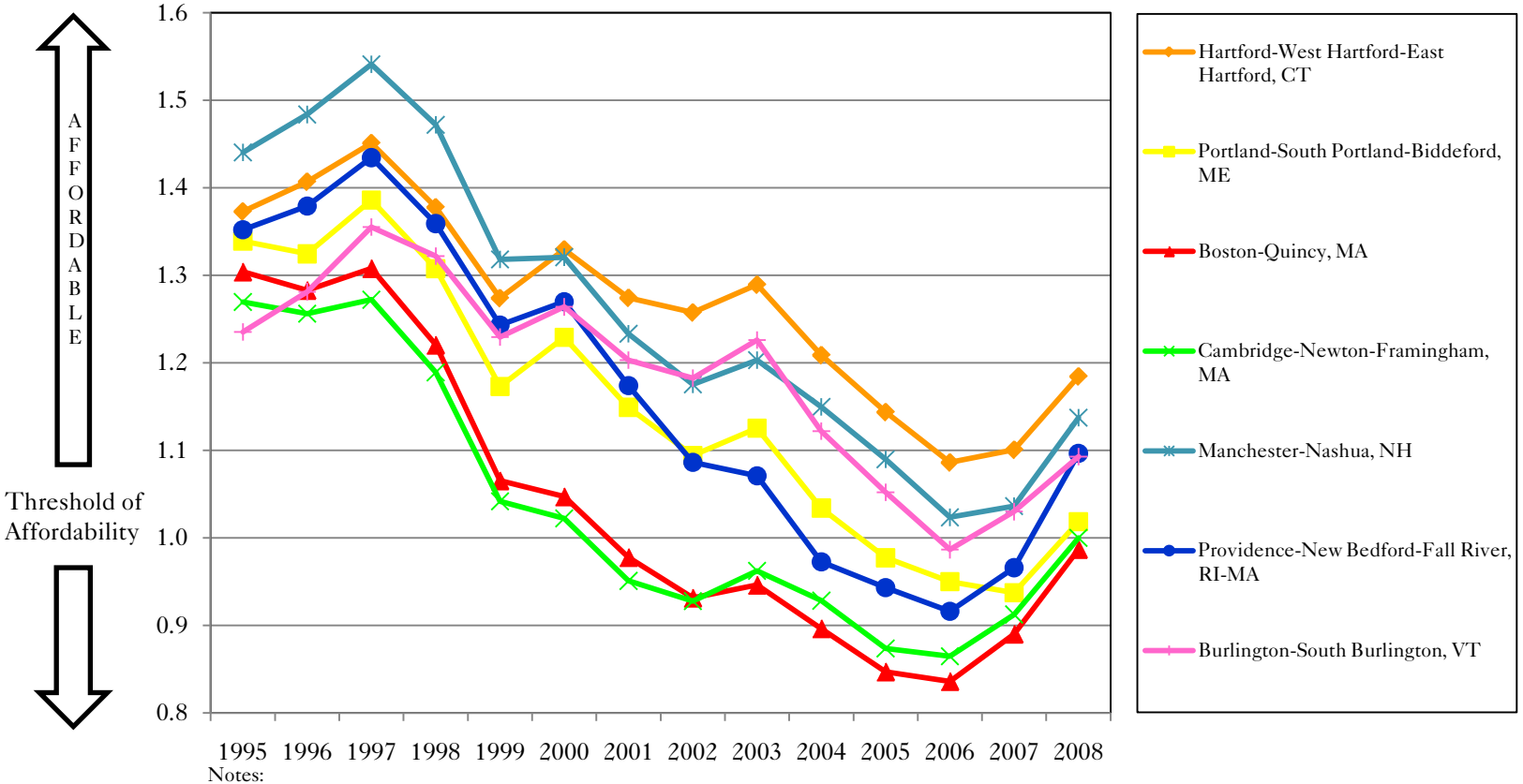
Figure 3
Ratio of Real Median Annual Household Income to Real Annual Income Needed to Purchase the Median-Priced House: All Households



Notes:
Median annual household incomes are three-year moving averages, as calculated from the Current Population Survey for households where the head is aged 25+ and is not enrolled in school, adjusted to 2008 dollars using the Consumer Price Index U.S. city average (CPI-U).

Annual income needed to purchase the median-priced house is based on 2008 house prices, adjusted by the Federal Housing Finance Agency (FHFA) House Price Index (HPI) and deflated by the CPI-U less shelter. See the Appendix for details.

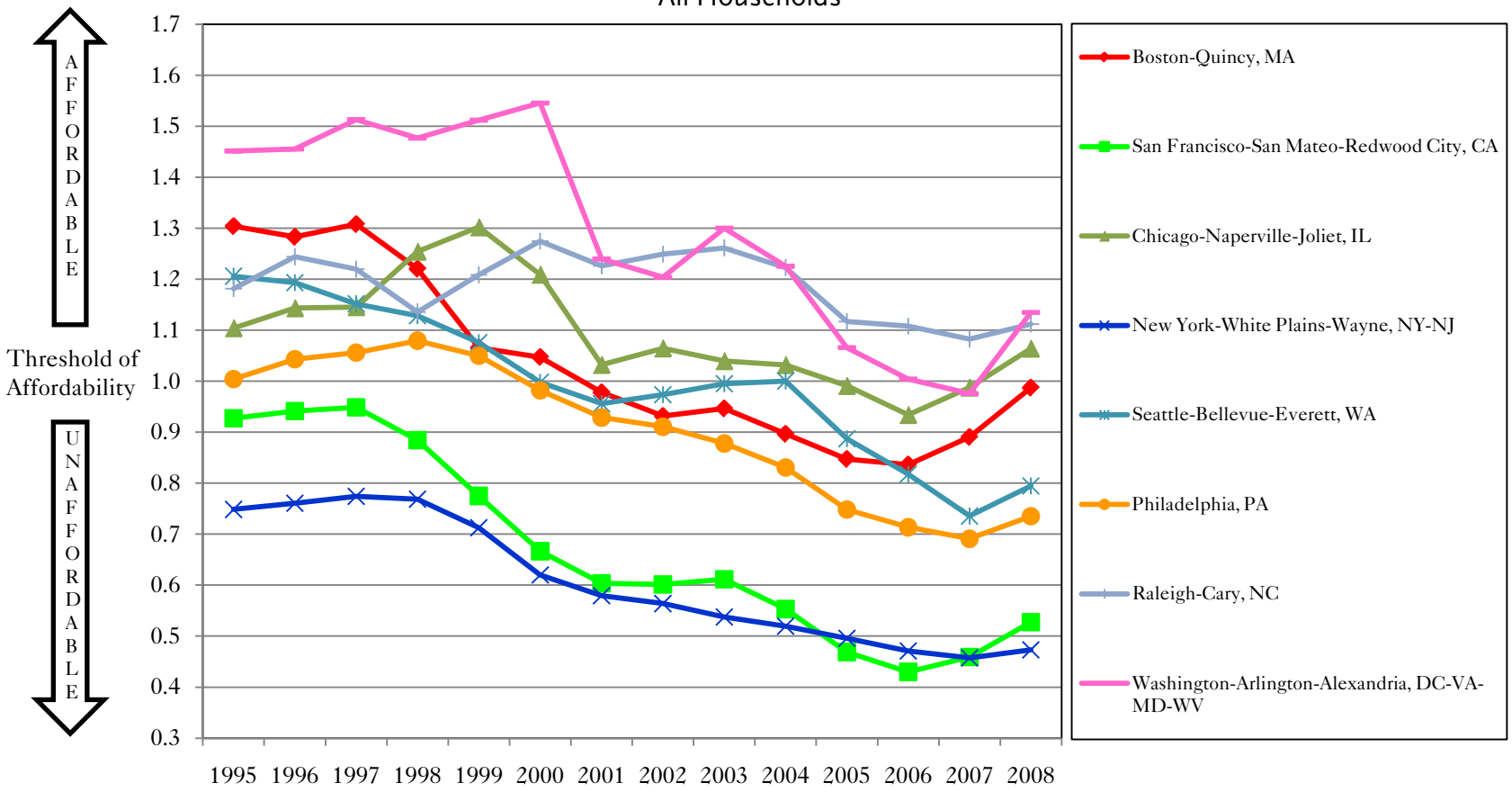
Figure 4
New England MSAs
Ratio of Real Median Annual Household Income to Real Annual Income Needed to Purchase the Median-Priced House:
All Households



Notes:
Median annual household incomes are estimated from the 1990 and 2000 Censuses for households where the head is aged 25+ and not enrolled in school and interpolated between Census years. I apply the compound annual growth rate in median household income between the 2000 Census and 2005 U.S. Census Bureau's American Community Survey. Thereafter I apply year-over-year growth in median household income between the 2005 and 2006, 2006 and 2007, and 2007 and 2008 U.S. Census Bureau's American Community Surveys, adjusted to 2008 dollars using the CPI-U.

Annual income needed to purchase the median-priced house is based on 2008 house prices, reported by the National Association of Home Builders, adjusted by the FHFA HPI and deflated by the CPI-U less shelter. See the Appendix for details.

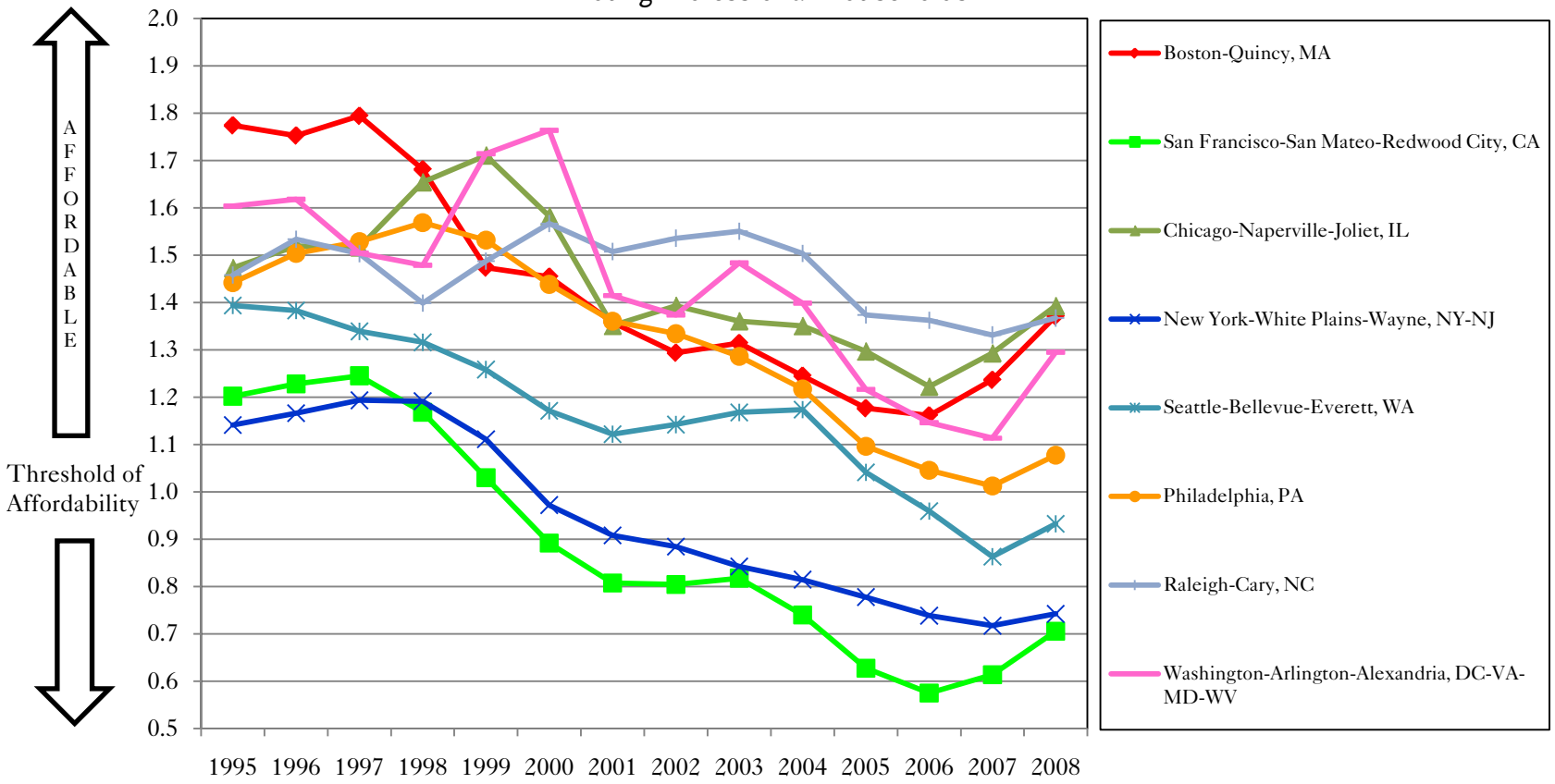
Figure 5
Boston versus Competitor MSAs
Ratio of Real Median Annual Household Income to Real Annual Income Needed to Purchase the Median-Priced House:
All Households



Notes:
Median annual household incomes are estimated from the 1990 and 2000 Censuses for households where the head is aged 25+ and not enrolled in school and interpolated between Census years. I apply the compound annual growth rate in median household income between the 2000 Census and 2005 U.S. Census Bureau's American Community Survey. Thereafter I apply year-over-year growth in median household income between the 2005 and 2006, 2006 and 2007, and 2007 and 2008 U.S. Census Bureau's American Community Surveys, adjusted to 2008 dollars using the CPI-U.

Annual income needed to purchase the median-priced house is based on 2008 house prices, reported by the National Association of Home Builders, adjusted by the FHFA HPI and deflated by the CPI-U less shelter. See the Appendix for details.

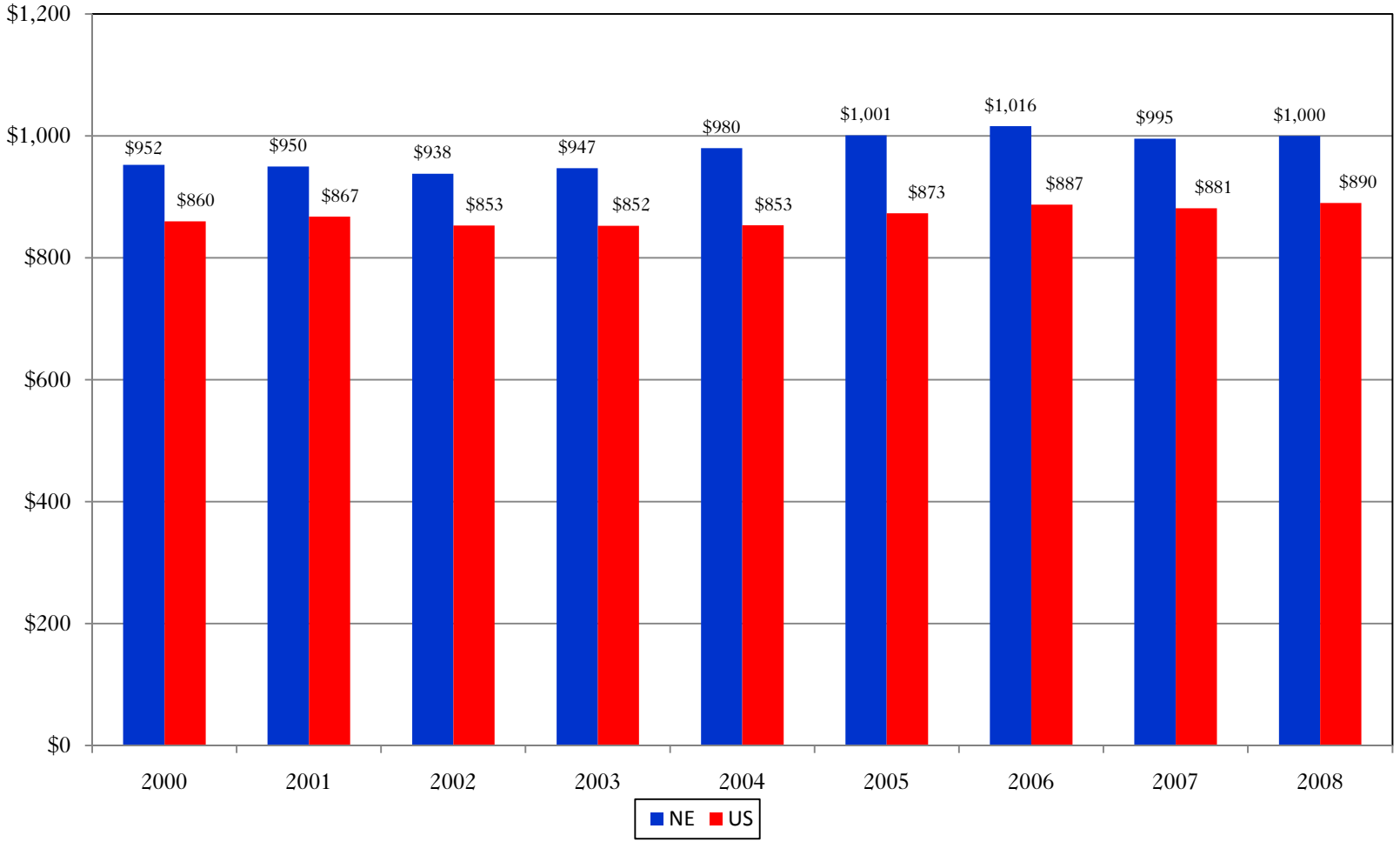
Figure 6
Boston versus Competitor MSAs
Ratio of Real Median Annual Household Income to Real Annual Income Needed to Purchase the Median-Priced House:
Young Professional Households



Notes:
Median annual household incomes are estimated from the 1990 and 2000 Censuses for households where the head is aged 25-39 and not enrolled in school, and has a bachlor's degree or higher and interpolated between Census years. I apply the compound annual growth rate in median household income between the 2000 Census and 2005 U.S. Census Bureau's American Community Survey. Thereafter I apply year-over-year growth in median household income between the 2005 and 2006, 2006 and 2007, and 2007 and 2008 U.S. Census Bureau's American Community Surveys, adjusted to 2008 dollars using the CPI-U.

Annual income needed to purchase the median-priced house are based on 2008 annual house prices, reported by the National Association of Home Builders, adjusted by the FHFA HPI and deflated by the CPI-U less shelter. See the Appendix for details.

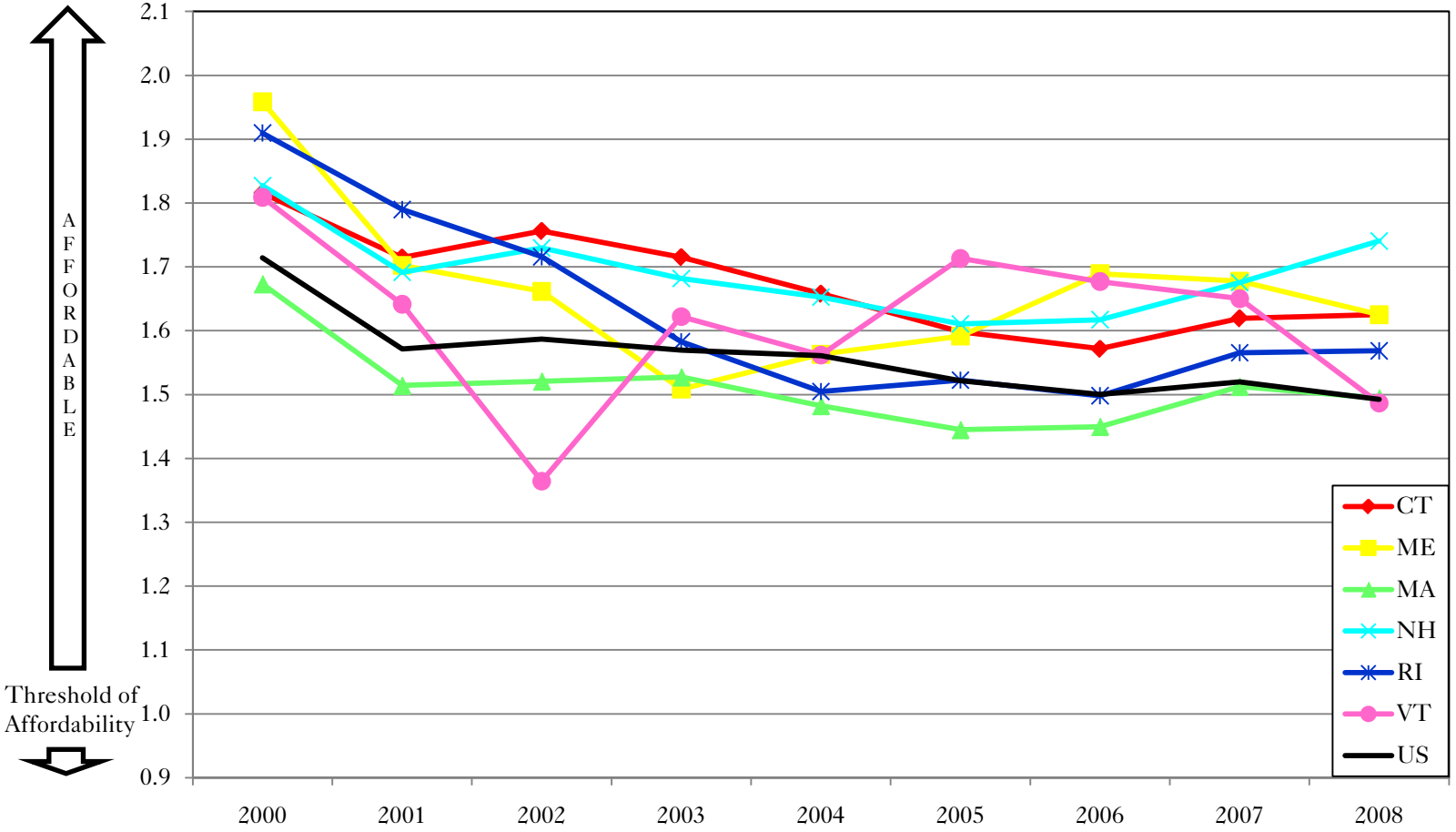
Figure 7
Real Median Gross Rents: New England and the United States, 2000-2008 (in 2008 dollars)



Source: U.S. Census Bureau, American Community Surveys.

Note: Rents are adjusted to 2008 dollars using the CPI for rent of primary residence.

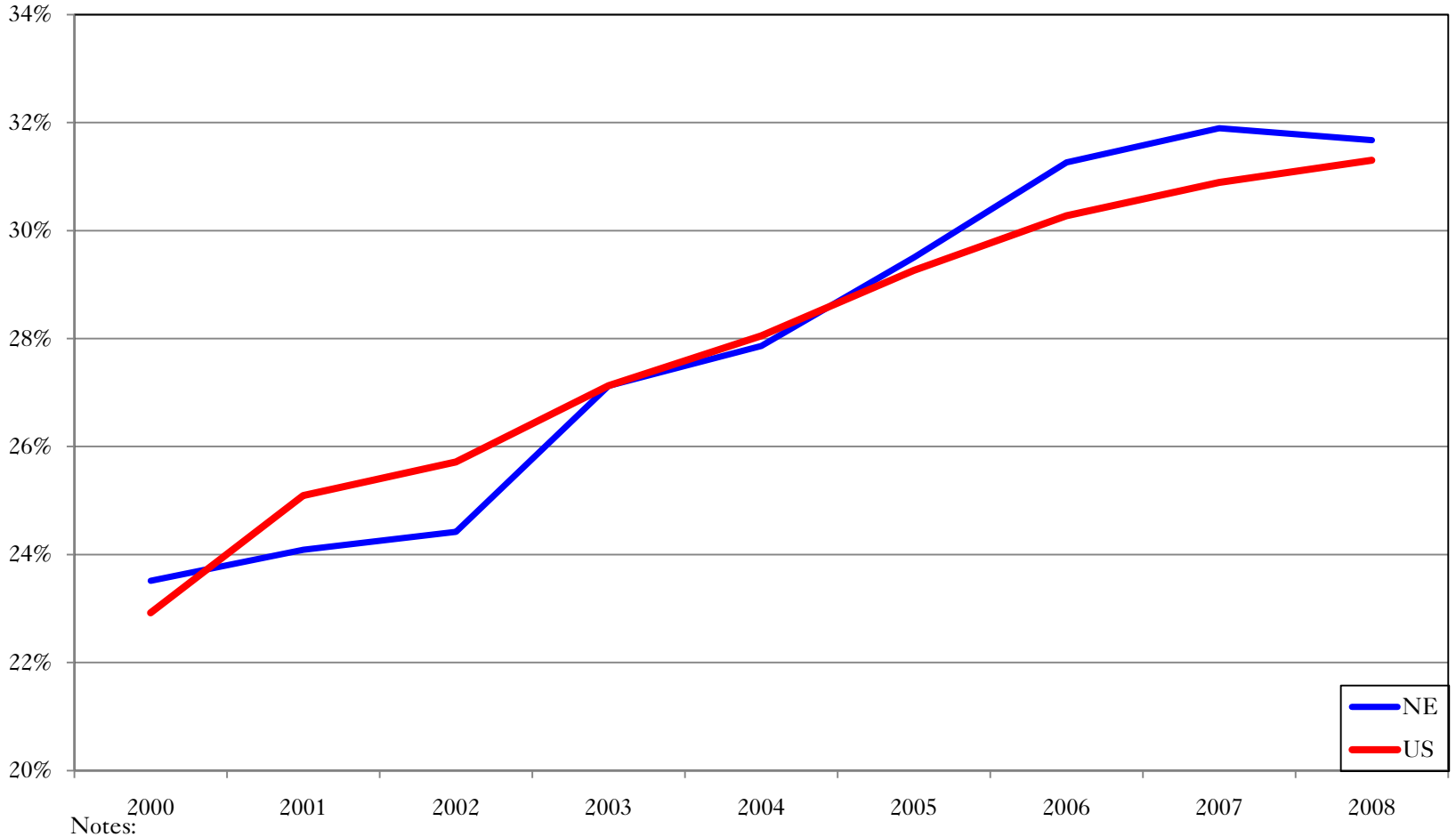
Figure 8
Ratio of Real Median Annual Household Income to Real Annual Income Needed to Afford the Median Gross Rent:
All Households



Notes:
Annual median household incomes are three-year moving averages, as calculated from the Current Population Survey for households where the head is aged 25+ and not enrolled in school, adjusted to 2008 dollars using the CPI-U.

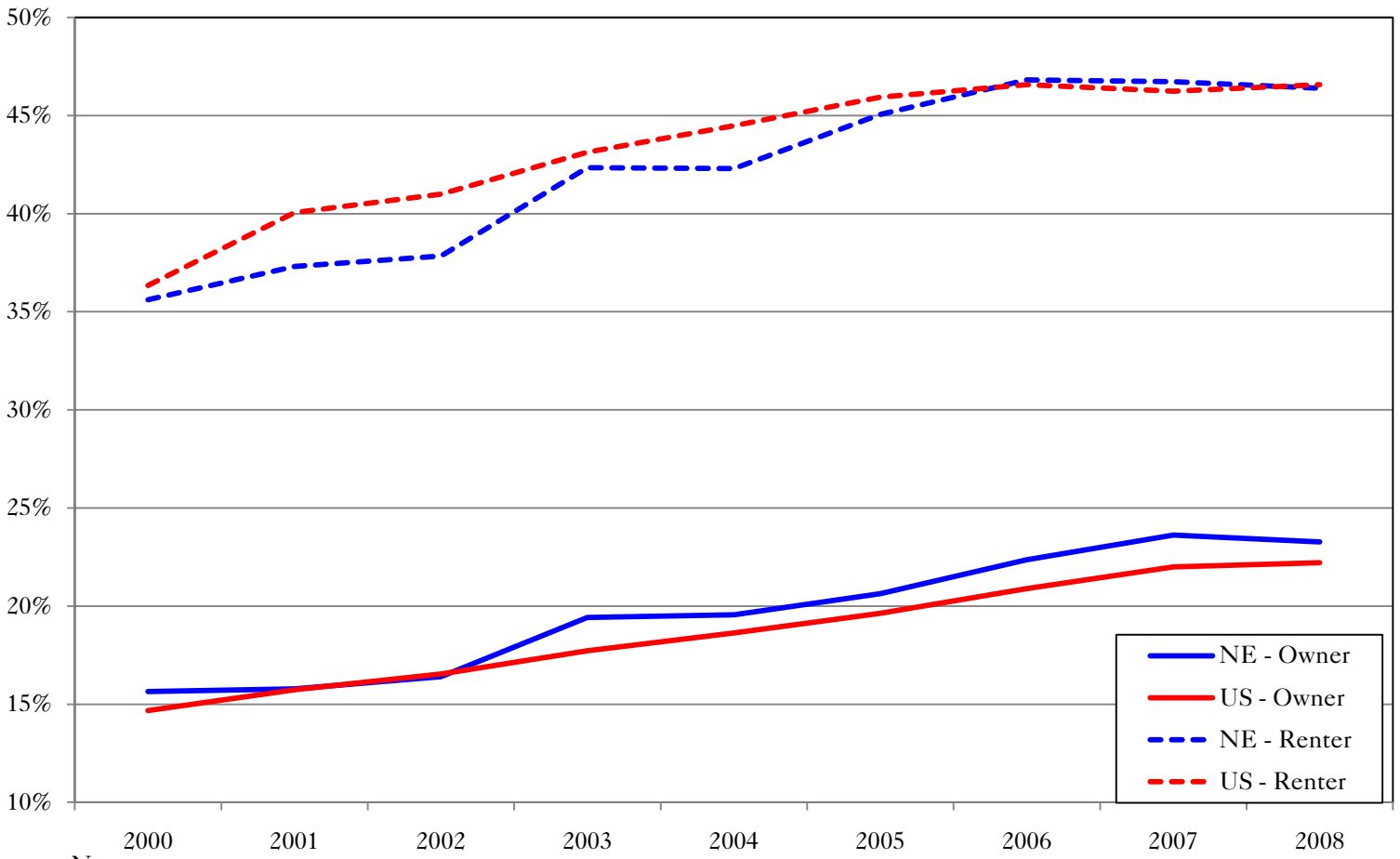
Annual income needed to afford the 50th percentile of rent is based on monthly gross rent at the 50th percentile * 12 months / 0.30. Monthly gross rent is the sum of contract rent plus utilities at the 50th percentile, as calculated from the 2000 Census and the U.S. Census Bureaus's American Community Survey 2001 through 2008. All rents are adjusted to 2008 dollars using the CPI for rent of primary residence.

Figure 9
Percentage of Households Experiencing Moderate or Severe Housing Burden:
All Households



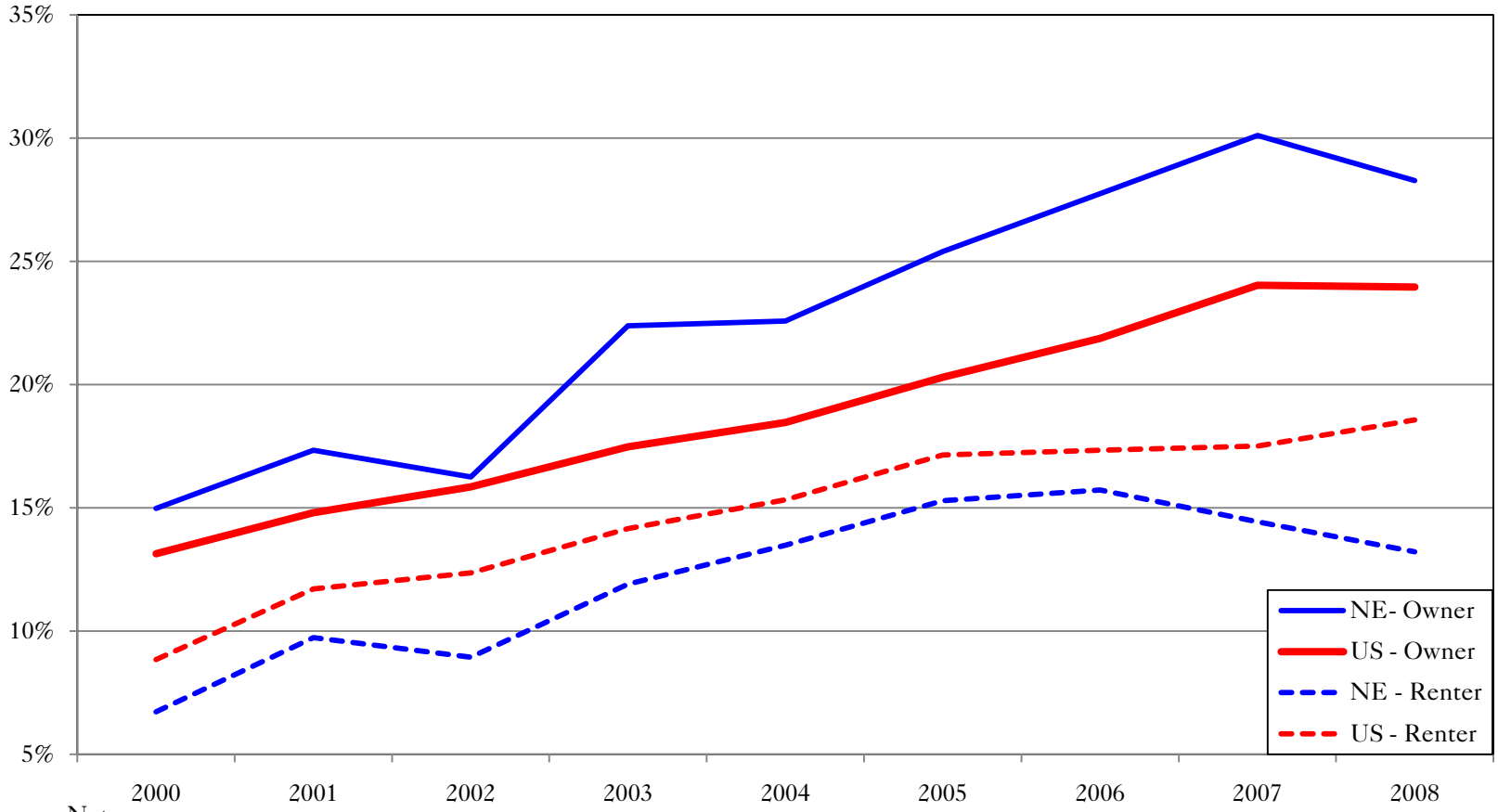
Notes:
Author's calculations from the 2000 Census IPUMS and the U.S. Census Bureau's American Community Surveys.
Sample includes households with positive incomes where the head is aged 25+ and not enrolled in school.
Moderate housing burden is defined as more than 30% of income spent on housing.
Severe housing burden is defined as more than 50% of income spent on housing.

Figure 10
Percentage of Households Experiencing Moderate or Severe Housing Burden:
Owners versus Renters



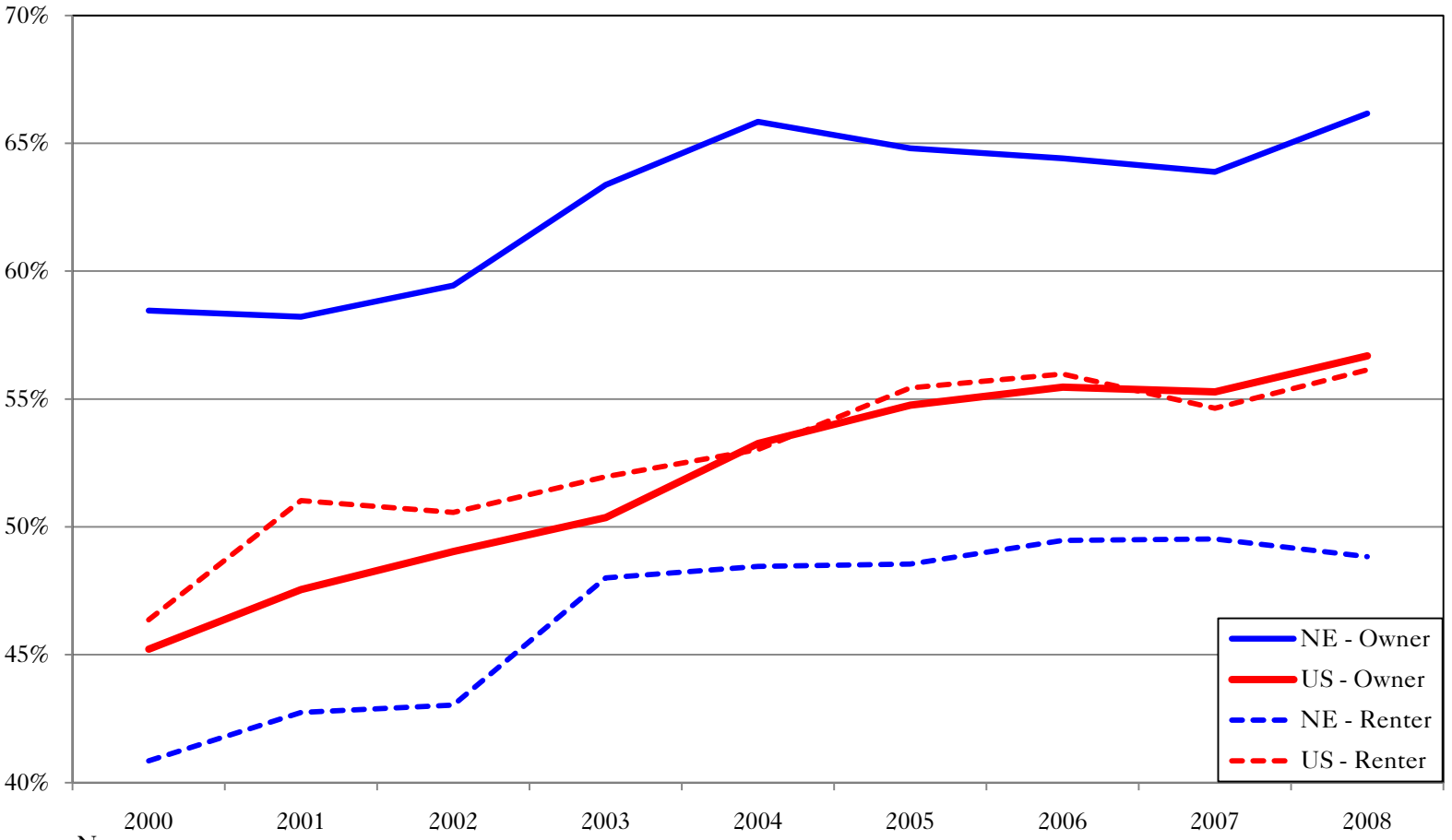
Notes:
Author's calculations from the 2000 Census IPUMS and the U.S. Census Bureau's American Community Surveys.
Sample includes households with positive incomes where the head is aged 25+ and not enrolled in school.
Moderate housing burden is defined as more than 30% of income spent on housing.
Severe housing burden is defined as more than 50% of income spent on housing.

Figure 11
Percentage of Middle-Income Households Experiencing Moderate or Severe Housing Burden:
Owners versus Renters



Notes:
Author's calculations from the 2000 Census IPUMS and the U.S. Census Bureau's American Community Surveys.
Sample includes households with positive incomes where the head is aged 25+ and not enrolled in school.
Middle-income households are those that fall into the third quintile of the income distribution.
Moderate housing burden is defined as more than 30% of income spent on housing.
Severe housing burden is defined as more than 50% of income spent on housing.

Figure 12
Percentage of Very-Low-Income Households Experiencing Severe Housing Burdens:
Owners versus Renters



Notes:
Author's calculations from the 2000 Census IPUMS and the U.S. Census Bureau's American Community Surveys.
Sample includes households with positive incomes where the head is aged 25+ and not enrolled in school.
Very-Low-Income households are those that fall into the first quintile of the income distribution.
Severe housing burden is defined as more than 50% of income spent on housing.

Appendix: Methodology of Measures of Housing Affordability

Housing income adequacy ratio

The housing income adequacy ratio compares actual household incomes to the incomes that households need to afford houses or rental units of various prices. For example, I compare the median annual income of households to the annual income needed to rent the median apartment or purchase the median-priced house. I 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, I assume that households should spend no more than 30 percent of their annual income to rent the median apartment. I chose 30 percent because it is the standard threshold used to distinguish affordable from unaffordable. Rental prices are based on monthly gross rent, which is equal to contract rent plus utilities (see Table A2). For example, the annual income needed to rent the median-priced apartment is calculated as:

Annual income needed = [monthly median gross rent * 12] / 0.30

For owner-occupied units, I assume that households should spend no more than 28 percent of their annual income to pay the costs of the median-priced house (those costs include principal and interest payments, real estate taxes, and homeowner's insurance premiums—together, PITI). I chose 28 percent because it is the industry standard used to determine whether potential buyers have enough income to qualify for a mortgage. I assume a conventional 30-year, fixed-rate mortgage with an 80 percent loan-to-value ratio (that is, a 20 percent down-payment) (see Table A3). For example, the annual income needed to purchase the median-priced house is calculated as:

Annual income needed = [monthly PITI payment * 12] / 0.28

For first-time homebuyers, I modify the above assumptions. Specifically, I assume that these households aspire to purchase a starter house costing 85 percent of the median house price in their geographic area. That assumption is based on a biennial survey of homebuyers conducted by the National Association of Realtors, which found that starter homes typically cost 85 percent of the median price in any given market.

I further assume that first-time homebuyers receive mortgages on more lenient terms than a conventional loan. That is, they secure a 30-year, fixed-rate loan from the Federal Housing Administration 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 mortgage insurance premiums of 0.5 percent of the outstanding balance of the loan (see Table A4).

Data for median annual household income comes from either the March Demographic Supplement of the U.S. Census Bureau's Current Population Survey (CPS) or the

Decennial Census. At the state level, I calculate median annual household incomes as three-year moving averages from the CPS for 1995 through 2008 (See Table A5 for median annual household incomes). The basic sample includes households with positive income where the head is aged 25+ and not enrolled in school. The sample of potential first-time homebuyers includes households with positive income where the head is aged 25–39 and not enrolled in school, and does not currently own a home. The young professionals sample includes households with positive income where the head is aged 25–39, has a bachelor's degree or higher, and is not enrolled in school.

At the metropolitan-area level, I calculate median annual household incomes from the 1990 and 2000 Censuses Integrated Public Use Microdata Series (IPUMS) for the all households, potential first-time homebuyers, and young professionals samples. I calculate median annual household incomes for the intervening years by interpolating between Census years. I estimate median annual household incomes for 2001 through 2008 by applying the annual growth rate of the median household income from the American Community Survey to the Census estimates.

Housing burden ratio

The housing burden ratio is the percentage of income that households spend on housing costs. Data on household incomes and housing costs come from either the U.S Census Bureau's 2000 Decennial Census or the American Community Surveys, 2001 through 2008.

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

Housing costs for renters equal 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 Tables A6 and A7 for median monthly expenditures for renters versus homeowners.) I restrict the sample to households with positive income where the head is aged 25+ and not enrolled in school. I require that households owning a home have a positive mortgage payment. I then divide the sample into quintiles based on household income, with the first quintile representing households earning incomes in the bottom 20 percent of the distribution.

I first calculate the average percentage of income that each quintile of households spends on housing. Then, within each quintile, I calculate the fraction of households with moderate housing burden (spending more than 30 percent of their income on housing), and the fraction with severe housing burden (spending more than 50 percent of their income on housing). I also calculate housing burden for renters versus owners in each income quintile.

Table A1. Sources of Data

Data Element	Source
Median house prices	From sales of existing single-family homes provided by each state's association of realtors or housing finance authority (except for Connecticut, where prices are from the Warren Group). Using 2008 as a base, we generate prices for earlier years using the Federal Housing Finance Agency (FHFA) House price Index (HPI): http://www.fhfa.gov/Default.aspx?Page=14 Adjusted for inflation using the Consumer Price Index (CPI), less shelter from the U.S. Bureau of Labor Statistics: http://www.bls.gov/cpi/
Connecticut	Warren Group: http://www.thewarrengroup.com/portal/Solutions/PressReleases/tabid/190/newsid751/2270/Default.aspx
Maine	Maine State Housing Authority: http://www.mainehousing.org/DATAHousingFacts.aspx
Massachusetts	Massachusetts Association of Realtors: http://www.marealtor.com/content/housing_data.htm
New Hampshire	New Hampshire Housing Finance Authority: http://www.nhhfa.org/demographic_housing.cfm
Rhode Island	Housing Works Rhode Island: http://housingworksri.org/matriarch/MultiPiecePage.asp_Q_PageID_E_47_A_PageName_E_about
Vermont	Vermont Housing Data: http://www.housingdata.org/profile/resultsMain.php
Interest rates	Effective interest rate (taking into account the contract rate, plus initial fees and charges for points) on conventional single-family mortgages, as reported in the FHFA Interest Rate Survey: http://www.fhfa.gov/Default.aspx?Page=250
Real estate taxes	Effective property tax rates per $1,000 of house value for each state, applied to the median house price in a geographic area, with tax rate data from:
Connecticut	Connecticut Office of Policy & Management: http://www.ct.gov/opm/site/default.asp
Maine	Maine Revenue Services, Property Tax Division: http://www.maine.gov/revenue/propertytax/homepage.html
Massachusetts	Massachusetts Department of Revenue, Division of Local Services: http://www.mass.gov/?pageID=dorhomepage&L=1&L0=Home&sid=Ador
New Hampshire	New Hampshire Department of Revenue Administration, Municipal Services Division: https://www.nh.gov/revenue/munc_prop/municipalservices.htm
Rhode Island	Rhode Island Department of Revenue, Division of Municipal Finance: http://www.muni-info.state.ri.us/
Vermont	Vermont Department of Taxes: http://www.state.vt.us/tax/index.shtml

Homeowner's insurance:	Average annual premiums for dwelling, fire, and homeowner's insurance 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/

Table A2
Minimum Annual Household Income Needed to Afford the Median Gross Rent, 2008

	Median gross rent	Annual income needed
Connecticut	$1,050	$42,000
Maine	$770	$30,800
Massachusetts	$1,064	$42,567
New Hampshire	$1,000	$40,000
Rhode Island	$920	$36,800
Vermont	$890	$35,600
United States	$890	$35,600

Source: U.S. Census Bureau's, American Community Survey, 2008.

Notes

Annual income needed = median gross rent per month * 12 / 0.30.

Median gross rent is calculated by taking the median of the sum of contract rent plus utilities and fuels.

Table A3
Minimum Annual Income Needed to Purchase the Median-Priced House, 2008

	Median price	Interest rate	Monthly mortgage payment	Monthly real estate taxes	Monthly insurance premiums	Total monthly payment (PITI)	Annual income needed
Connecticut	$268,000	6.09%	$1,298	$316	$81	$1,695	$72,645
Maine	$180,000	6.02%	$865	$176	$53	$1,094	$46,870
Massachusetts	$311,000	5.99%	$1,490	$236	$86	$1,811	$77,624
New Hampshire	$231,900	6.10%	$1,124	$335	$61	$1,521	$65,174
Rhode Island	$234,900	6.11%	$1,140	$241	$85	$1,466	$62,842
Vermont	$208,000	6.16%	$1,015	$279	$61	$1,356	$58,113
United States	$207,475	6.14%	$1,010	$140	$75	$1,225	$52,496

Notes:

Median price: Median price of single-family homes for 2008 as reported by the state's association of realtors or housing finance agency. See the text for details.

Interest rate: Effective interest rate for 2008, as reported in the FHFA's Monthly Interest Rate Survey of conventional mortgages, by state.

Monthly real estate taxes: Effective property tax rates per $1,000 of house value for each state. See text for details.

Monthly insurance premiums: Average annual premiums for dwelling, fire, and homeowner's insurance by state for 2006, as reported by the National Association of Insurance Commissioners, divided by 12 and adjusted by the CPI for household insurance.

Financing: Financing is assumed to be a conventional mortgage 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 + homeowner's insurance premiums.

Annual income needed: Total monthly payment * 12 / qualifying income —a ratio that is assumed to be 28%.

Table A4
Minimum Annual Income Needed to Purchase the Median-Priced House, 2008
Potential 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	$227,800	6.09%	$1,311	$268	$69	$90	$1,738	$71,913
Maine	$153,000	6.02%	$873	$149	$45	$61	$1,128	$46,677
Massachusetts	$264,350	5.99%	$1,504	$200	$73	$105	$1,882	$77,860
New Hampshire	$197,115	6.10%	$1,135	$285	$52	$78	$1,550	$64,130
Rhode Island	$199,665	6.11%	$1,150	$205	$72	$79	$1,507	$62,360
Vermont	$176,800	6.16%	$1,025	$237	$52	$70	$1,384	$57,285
United States	$176,354	6.14%	$1,020	$119	$64	$70	$1,272	$52,633

Notes:

Median price:	Median price as reported for all homebuyers in Table A3, multiplied by 85%.
Interest rate:	Effective rate as reported for all homebuyers in Table A3.
Monthly real estate taxes:	Effective property tax rates per $1,000 of house value, as reported in Table A3 for all homebuyers.
Monthly insurance premiums:	Monthly insurance premiums as reported for all homebuyers in Table A3, 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:	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 + homeowner's 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.

Table A5
Median Annual Household Incomes, 2008

	All Households	Potential First-Time Homebuyers	Young Professionals
Connecticut	$68,256	$46,319	$101,122
Maine	$50,053	$36,748	$74,352
Massachusetts	$63,612	$48,443	$107,335
New Hampshire	$69,622	$50,963	$94,639
Rhode Island	$57,721	$38,878	$81,344
Vermont	$52,930	$41,172	$74,640
New England	$62,553	$45,942	$98,437
United States	$53,139	$39,398	$82,964

Source: U.S. Census Bureau's, Current Population Survey.

Notes:

Median annual household incomes are three-year moving averages, as calculated form the Current Population Survey, adjusted to 2008 dollars using the CPI-U.

All Households are those where the head is aged 25+, and not in school.
Potential First-Time Homebuyers are households where the head is aged 25–39 and not in school, and currently rents
Young Professional Households are those where the head is aged 25–39 and not in school, and has a bachelor's degree or higher.

Table A6
Monthly Median Expenditures for Rental Housing, 2008

	Contract rent	Utilities and fuels	Gross rent	Number of households
Connecticut	$800	$168	$1,000	482,077
Maine	$600	$80	$720	161,428
Massachusetts	$880	$120	$1,040	1,026,001
New Hampshire	$850	$100	$960	163,360
Rhode Island	$720	$110	$863	172,644
Vermont	$700	$120	$860	75,813
New England	$800	$120	$970	2,081,323
United States	$700	$130	$877	43,594,193

Source: U.S. Census Bureau's, American Community Survey, 2008.

Notes:
Sample includes households with a positive income where the head is aged 25+ and not enrolled in school.

Table A7
Monthly Median Expenditures for Owner-Occupied Housing, 2008

	Principal and interest on primary mortgage	Real estate taxes	Fire, hazard, flood insurance	PITI	Number of households
Connecticut	$1,146	$387	$67	$1,600	1,140,215
Maine	$700	$171	$42	$930	415,261
Massachusetts	$1,256	$287	$67	$1,642	2,020,710
New Hampshire	$1,025	$379	$50	$1,500	460,938
Rhode Island	$1,075	$296	$67	$1,442	306,204
Vermont	$750	$271	$50	$1,079	193,870
New England	$1,100	$304	$63	$1,500	4,537,198
United States	$904	$187	$58	$1,200	87,512,878

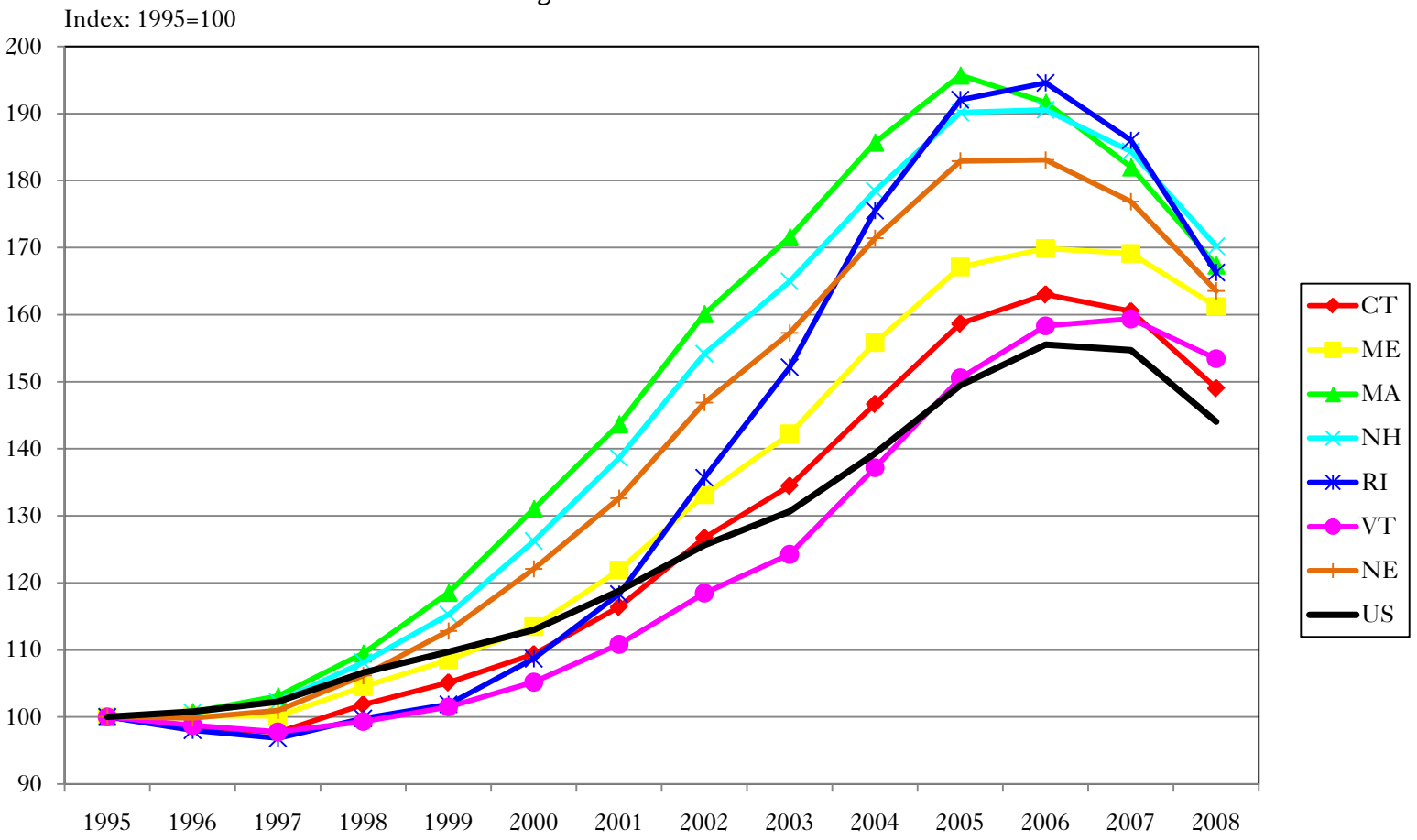
Source: U.S. Census Bureau's, American Community Survey, 2008.

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

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.

PITI = monthly mortgage payment (principal and interest) + real estate taxes + homeowner's insurance premiums.

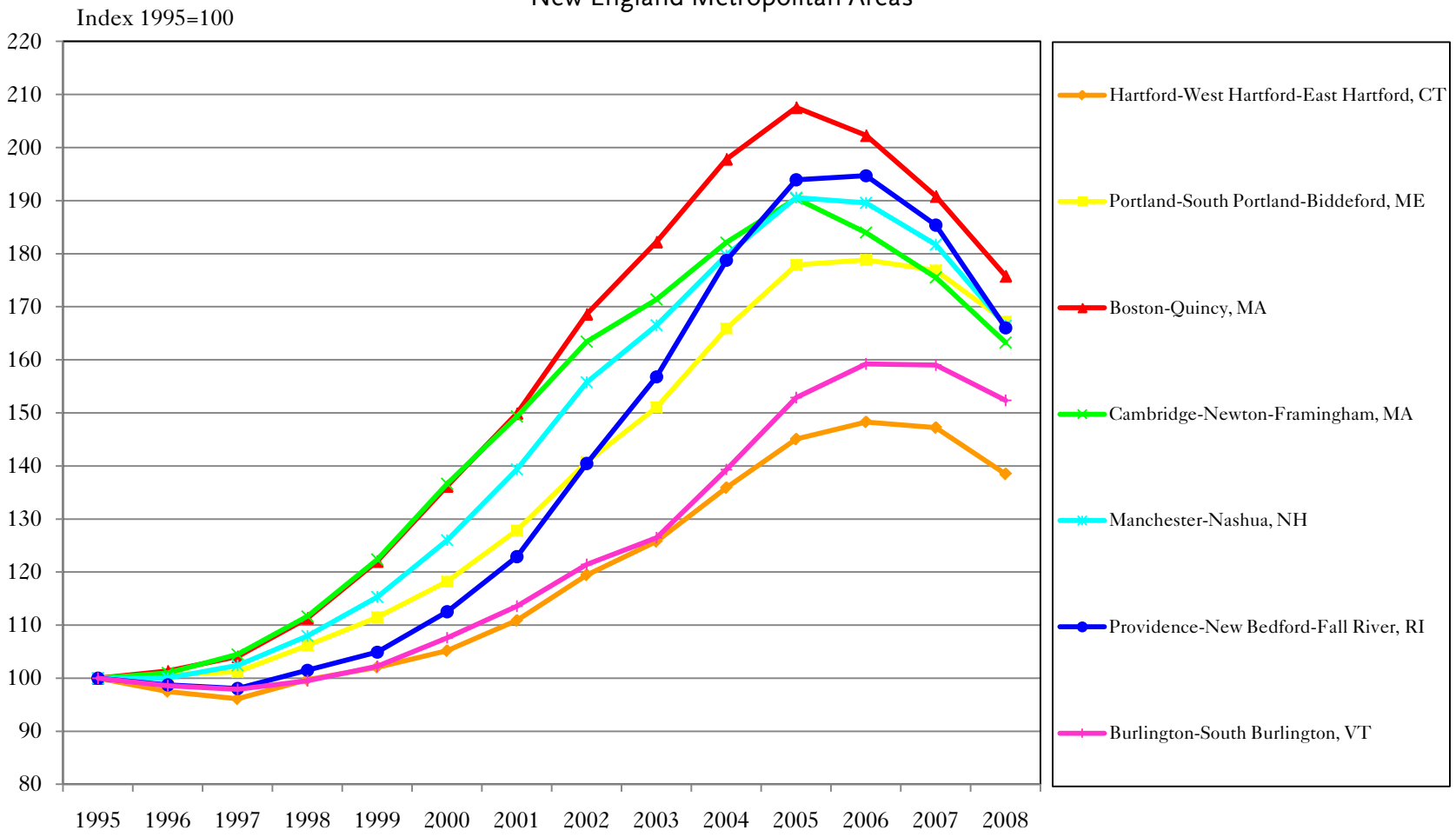
Figure A1
Growth in Real Single-Family House Prices, 1995-2008:
New England and the United States



Source:
Authors' calculations based on the FHFA HPI.

Notes:
Adjusted for inflation using the CPI less shelter.

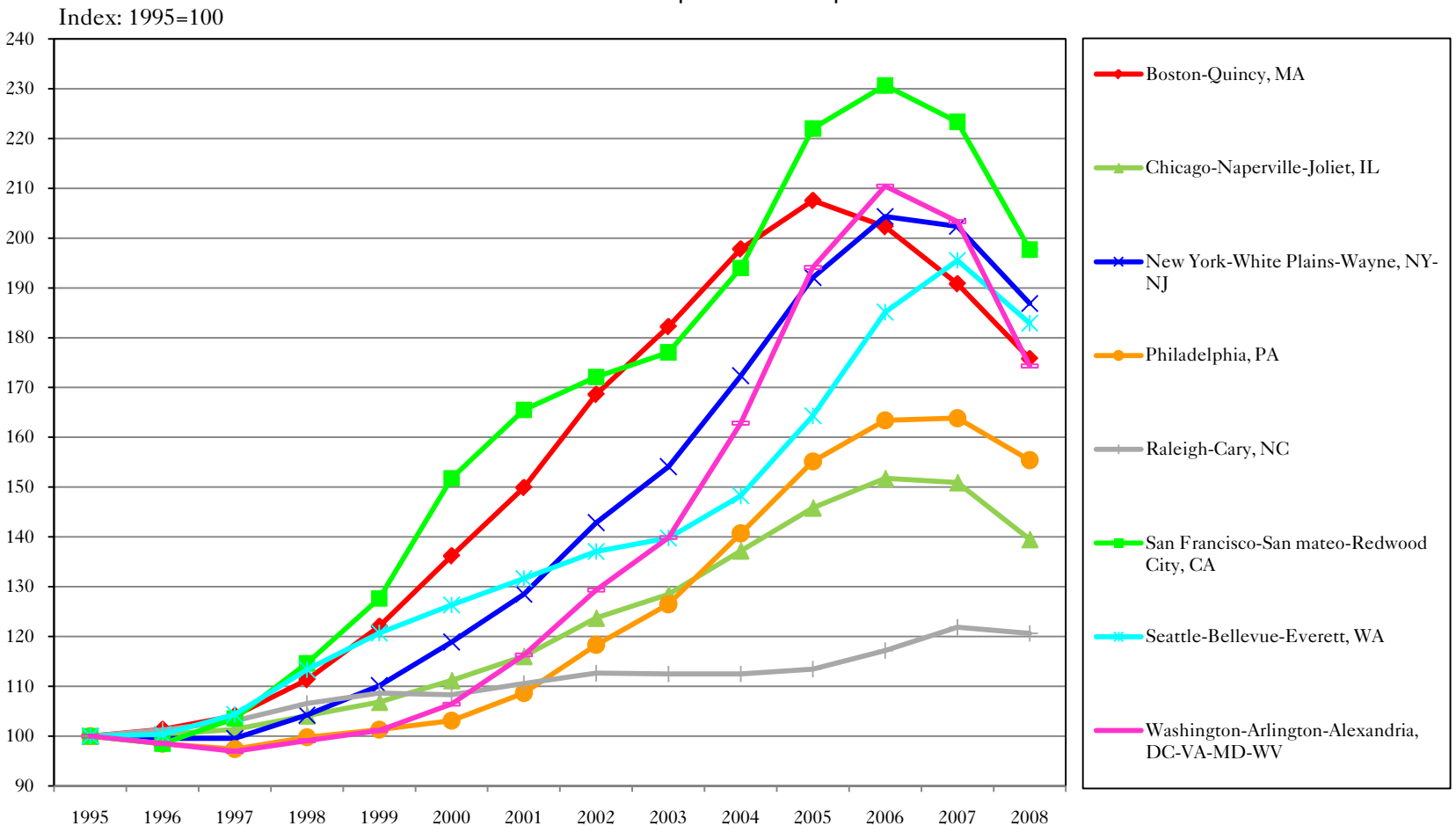
Figure A2
Growth in Real Single-Family House Prices, 1995-2008:
New England Metropolitan Areas



Source:
Authors' calculations based on the FHFA HPI.

Notes:
Adjusted for inflation using the CPI less shelter.

Figure A3
Growth in Real Single-Family House Prices, 1995-2008:
Boston versus Competitor Metropolitan Areas



Source:
Authors' calculations based on the FHFA HPI.

Notes:
Adjusted for inflation using the CPI less shelter.