

May 22, 2006

Sustaining the Mass Economy: Housing Costs, Population Dynamics, and Employment

Barry Bluestone
Northeastern University

Recommended Citation

Bluestone, Barry, "Sustaining the Mass Economy: Housing Costs, Population Dynamics, and Employment" (2006). *Dukakis Center Publications*. Paper 10. <http://hdl.handle.net/2047/d20003660>

This work is available open access, hosted by Northeastern University.

Sustaining the Mass Economy: Housing Costs, Population Dynamics, and Employment*

Barry Bluestone

Russell B. and Andr e B. Stearns Trustee Professor of Political Economy
Director, Center for Urban and Regional Policy
Northeastern University

Prepared for the

The Federal Reserve Bank of Boston's New England Public Policy Center
and
The Rappaport Institute for Greater Boston

Conference
on

***Housing and the Economy in Greater Boston:
Trends, Impacts and Potential Responses***

Boston Federal Reserve Bank

May 22, 2006

* I am indebted to Angela Caldwell and Mark Melnik for their research assistance on this project. This project was funded under a grant from the Massachusetts Association of Realtors. The research findings and any opinions expressed in this report are, however, solely those of the author. They do not necessarily represent the views or positions taken by this association.

Sustaining the Mass Economy: Housing Costs, Population Dynamics, and Employment[†]

Barry Bluestone
Russell B. and Andr e B. Stearns Trustee Professor of Political Economy
Director, Center for Urban and Regional Policy
Northeastern University

In the preface to a comprehensive study of the Greater Boston housing market published in September 2000 after five uninterrupted years of annual double-digit housing price appreciation, Bernard Cardinal Law of the Boston Catholic Archdiocese called expanding the supply of affordable housing a “moral imperative.”¹ The president of the Greater Boston Chamber of Commerce, Paul Guzzi, chimed in that for the continued prosperity of the region, bringing housing prices within reach of workers and their families was an absolute “economic necessity” if the state was to attract investment and jobs. With both the church and corporate interests singing from the same hymnal, doing something about the explosive increase in home prices and rents seemed downright ordained. Nonetheless, during the succeeding five years, housing prices throughout Massachusetts went through the roof.

While the moral issue no doubt deserves greater attention, the economic issue is increasingly in the news. To many observers, it seems obvious that the extraordinary

[†] I am indebted to Angela Caldwell and Mark Melnick for their research assistance on this project. This project was funded under a grant from the Massachusetts Association of Realtors. The research findings and any opinions expressed in this report are, however, solely those of the author. They do not necessarily represent the views or positions taken by this association.

high cost of living in the Commonwealth is now responsible for young people leaving the state and for the region's lackluster job growth. A recent *Boston Globe* poll of 524 randomly selected former Massachusetts residents -- who moved out of the state in 2005 - - suggests employment opportunity followed by housing costs were the top reasons for out-migration.² In a separate set of questions, 50 percent of those surveyed named the cost of housing as a "major factor" in their decision to leave the state, while a better job was cited as a "major factor" by 39 percent. A third of those polled mentioned high taxes (16%), the cost of living (10%), and the cost of housing (6%) as what they missed least about the Commonwealth.

This survey (as well as others) notwithstanding, it is possible that the recent dearth of new jobs in the state has to do with factors other than housing prices and the overall cost of living, and that the loss of population is due to older residents retiring to sunnier climes and younger residents leaving because of a lack of jobs unrelated to the high cost of living in the state. In this case, we might fret over the size of our mortgages or our rent checks, but not have to worry that these are putting economic development and continued prosperity at risk. Indeed, the high cost of living may be an indication of just how good things have become in the state. After all, places like filmmaker Michael Moore's Flint, Michigan have all the affordable housing you might want. Still, few businesses and people are moving there.

This paper tries to address this issue by statistically testing for a link between housing costs on the one hand and internal net migration and employment growth on the other. In doing this, we look at over 300 metropolitan areas across the United States so that we can investigate whether there is a general relationship between housing cost,

demographic growth, and employment across the U.S. or whether the apparent relationship in Massachusetts is idiosyncratic and perhaps illusory.

To provide a preview of coming attractions and the bottom line, so to speak, this report concludes that whether or not the church was correct on the ethics, the Chamber of Commerce appears, on the facts, to be right on the money. The high cost of living in the Commonwealth is indeed a major culpable factor in recent demographic and employment trends.

We initiate our inquiry by taking a quick look at employment and population trends in the Commonwealth going back to the early 1990s.

Job Growth and Population Dynamics

Soon after the 1991-1992 recession ended some fifteen years ago, the Massachusetts economy began to expand rapidly. The number of jobs in the state (seasonally adjusted) increased by nearly 583,000 between April 1992 and February 2001, an increase of just under 21 percent.³ This healthy rate of employment growth nearly matched the 22.2 percent set by the U.S. as a whole. Indeed, industry was hiring so many workers in the state that even with net internal migration into the Commonwealth and the entry of a large contingent of foreign immigrant workers, labor supply had trouble keeping up with employment demand. In the last quarter of 2000, the unemployment rate bottomed out at just 2.7 percent, as close to full employment as one could possibly imagine.

The Massachusetts economy was so strong in 2000 that it began to add jobs at a faster rate than the national economy and continued to do so until mid-2001. But as **Figure 1** indicates, once the 2000-2001 national recession reached the state, it hit with a

vengeance. Employment plunged at a rate faster than the nation as a whole and continued to drop through the middle of 2004, months after the rest of the country was once again experiencing job growth. In less than three years, the state lost nearly 206,000 jobs. As of March of this year, the Commonwealth still experienced a jobs deficit of 164,000 relative to its February 2001 peak. (See **Figure 2** and **Figure 3** for a comparison of the employment trends in the U.S. and Massachusetts.) This provides just one indication of how the Massachusetts economy, once so very strong, now faces a real challenge.⁴

As it turns out, not only is job growth in the state anemic, but the state's population is now declining. Massachusetts is the only state in the nation to lose population in both 2004 and 2005 -- after growing rapidly between 1980 and 2000. (See **Figure 4**). Between July 1, 2003 and July 1, 2005, the U.S. Bureau of the Census estimates that the total population of the Commonwealth declined by nearly 19,000. Thus, while Massachusetts gained some new residents, *on net* the state lost population, and *on net* none of the 5.6 million new residents of the United over these two years settled in the Commonwealth. This recent trend in the state's population stands in sharp contrast to the 1980s when Massachusetts' population rose by nearly 28,000 a year and in the 1990s when another 33,300 were added to the number of state residents annually.⁵

What is driving the decline in population is the net "internal" out-migration of the Commonwealth's domestic population to other states. Each year births exceed deaths and each year we enjoy a net influx of foreign immigrants. But since 2000, the number of domestic residents leaving the state has increased every year as shown in **Figure 5**. Altogether, between July 1, 2000 and July 1, 2005, 233,000 more domestic residents left

the state than the number of people who came to live here from other states.⁶ The number of net “internal” out-migrants swamped the number of net foreign immigrants by 79,000 over this five year period. Those leaving Massachusetts are going to states like Florida, New Hampshire, California, Arizona, North Carolina, and Washington, as **Map 1** indicates. What may add to the net loss in population over the next few years is a decline in foreign immigration, a trend that began soon after 9/11. In 2004-2005, net foreign immigration into the Commonwealth was more than 20 percent lower than in 2001-2002.

If the decline in the Commonwealth’s population was mainly due to older residents leaving the state for retirement elsewhere, the impact on the labor market might be limited. But this is not the case. As shown in **Figure 6**, U.S. Census data indicate the largest loss in population is among 25 to 34 year olds, precisely those who would normally comprise the emerging labor force. There were nearly 44,000 fewer 25-34 year olds in the Commonwealth in 2004 as compared with 2001, representing a loss of nearly 5 percent of this age group. Over the same time period, the number of 25-34 year olds increased in the U.S. as a whole -- albeit by only 0.5 percent (See **Figure 7**).

A comparison with a competitor state like North Carolina suggests just how much Massachusetts is at a disadvantage when it comes to the age composition of the population. According to **Figure 8**, North Carolina’s 25-34 year old cohort *grew* by 2.3 percent between 2000 and 2004 as compared to the 4.8 percent *loss* in Massachusetts. Moreover, there is a strong indication that young families with children are staying in North Carolina or moving there while younger families with children appear to be leaving Massachusetts and few are replacing them. Note that Massachusetts had fewer

children and teenagers in 2004 than in 2000. Over the same time span, the fastest growing age cohorts in North Carolina (with the exception of those aged 55 and above) are children under age 5 and children aged 5 to 19.⁷ Unless the Tar Heel state has an enormous number of orphans, these statistics suggest a growing number of families with parents who are young workers. This presumably bodes well for economic growth in North Carolina while the opposite holds true in Massachusetts. Losing jobs and losing population is usually a sure sign that a region is in danger.

Why the Adverse Turnaround in Massachusetts' Fortunes?

There are at least two prime suspects one might consider if one were trying to explain why Massachusetts is suffering a job drought and a decline in population: (1) a regional industry composition that is particularly vulnerable to job loss, and (2) a cost of living/wage structure that discourages job creation and encourages residential out-migration.

Suspect No. 1

It is possible that the key industries that comprise the Massachusetts economic base are in decline, not only here but nationwide, as a result of global competition or because technological progress is leading to the need for fewer workers. A state heavily dependent on the domestic auto industry like Michigan, by way of example, is going to suffer economically and most likely demographically because its key industry leaders including General Motors and Ford are in trouble. The same might hold true for Massachusetts if its key industries happen to be ones that have been especially susceptible to job loss in the emerging high productivity, global economy.

Massachusetts' current economic base has been built on six key industries: high tech manufacturing, financial services, higher education, hospitals and medical care, construction, and computer services. It turns out that only one of these is suffering a major decline in employment *nationwide* -- the manufacture of computer and electronic products. The rest, according to **Figure 9**, are growing -- with four growing rapidly nationwide: construction, financial services, educational services, and health care. U.S. construction employment is up nearly 11 percent since 2000. The financial services industry took a brief dive following the stock market meltdown in 2001, but it has come back strongly with national employment up 8.1 percent. Education, nationwide, has added more than 20 percent to its employment base since 2000 and health services, 16 percent. With the exception of the sharp (26%) drop in U.S. computer and electronics manufacturing ("High Tech Manufacturing") and the sluggish growth in the national computer systems services industry (1.2%), Massachusetts should be experiencing rapid employment growth given its historical leadership in these fields.

Yet, as **Figure 10** demonstrates, the Massachusetts results are mixed. Between 2000 and 2006, construction employment in the Commonwealth actually grew a bit faster than in the U.S. as a whole (13.4% vs. 10.7%) -- no doubt in part due to the Big Dig -- and the precipitous slide in high tech manufacturing was no worse in Massachusetts than the nation (-25.2% vs. -26%). But in the other four key industries, employment growth was anemic when compared to the U.S. record. While the number of jobs in financial services increased by 8.1 percent nationwide, the number in Massachusetts declined by 1.2 percent. While computer services employment increased by 1.2 nationwide, it fell by a 17 percent in the Commonwealth. Education services increased, but at a rate only one-

fifth as fast as the national rate (3.6% vs. 20.0%). Health care employment grew at only three-fifths the national rate (9.6% vs. 15.9%). It is not surprising then that Massachusetts has not recovered from its early employment losses while the nation has. Clearly, one cannot blame the loss of jobs in Massachusetts on the inability of America as a whole to compete globally or on job-eroding technological change in these key sectors.

Suspect No. 2

The other leading suspect is the high cost of living in the Commonwealth based on its extraordinarily high housing costs (as well as the steep cost of health care, daycare, and taxes.) Much has been made of the fact that since 1995 the cost of owner-occupied homes and rental housing has skyrocketed. According to **Figure 11**, between 1995 and 2004, the median price of a single family home in Greater Boston rose by 144 percent to \$376,000.⁸ Apartment rents have also increased to the point where there are few metro areas where renting is more expensive. Using data from a recent *Forbes Magazine* study, a typical small (900 sq.ft.) Class A luxury apartment in Boston rents for \$1,825 per month, second only to New York and higher than luxury apartments in Honolulu; San Francisco; and Northern, New Jersey; not to mention Los Angeles, San Jose, and Washington, D.C.⁹ (See **Figure 12**). While home prices and rents have stabilized over the past two years, they remain among the very highest in the country.

Many have suggested, as the recent *Boston Globe* poll seems to show, that the high cost of living is chasing young Massachusetts residents out of state and reducing the prospect of out-of-state citizens moving in.¹⁰ Others have surmised that the high cost of living has discouraged firms from expanding their industrial operations in the state, has encouraged some former Massachusetts' firms to relocate outside the state, and has

dissuaded out-of-state firms from setting up operations here. Corporate leaders have been known to complain publicly that the high cost of living in Massachusetts, particularly in Greater Boston, makes it more difficult for them to recruit new workers and some have suggested they need to pay a wage premium to attract and retain workers to compensate for higher housing costs. The recent announcement that Fidelity Investments was relocating some of its operations to Rhode Island and others to North Carolina suggests that some firms are doing more than just complaining about the cost of doing business in the state.

While such evidence is sufficient to indict, it is not clear that there is enough to convict. After all, Massachusetts might be a high cost of living state, but it has an extraordinarily productive labor force. Its personal income, which reflects its skilled labor force and high productivity, is second in the nation. The Commonwealth boasts attractive recreational activities and cultural amenities. Generally, the region is tolerant of new immigrants and alternative lifestyles. One might ask, “Isn’t the combination of a high productivity workforce, rich recreational and cultural amenities, and a reasonably tolerant community sufficient to attract young workers and industry to the Commonwealth?” Massachusetts may be an expensive place to live, but don’t we harbor sufficient economic, social, and cultural assets to compensate for the high price we pay to remain here?

If so, the loss in population and sluggish job growth may be a temporary phenomenon and not particularly related to housing costs. To move from an indictment of high living costs as the main culprit undermining future economic development to conviction requires, at a minimum, a more robust test of the relationship between the cost

of living on the one hand and employment growth and net internal migration on the other. Does the link stand up to statistical investigation? Is Massachusetts unique or are other high cost of living regions suffering the same population and employment trends? The next section of this paper and those to follow are devoted to examining these questions.

The High Cost of Living in Massachusetts

It is no secret that living in Massachusetts is expensive and this is particularly true of Greater Boston. What we now know from a new analysis of living costs is that out of the 385 metropolitan areas in the United States (and 49 rural communities), Boston is the single most expensive place to live for young working families. This analysis is based on the Family Budget Calculator developed by the Economic Policy Institute (EPI), a Washington D.C. based research center.¹¹ The items included in the basic budget represent what a family requires to adequately meet its needs for housing; food; child care; transportation; health care; other necessities (e.g. clothing, personal care products); and federal, state, and local income, payroll, and sales taxes.¹² The family budget reflects variations in regional, state, or local prices (and is calculated for families of various sizes) and represents the cost of obtaining the same market basket of goods and services in different metro areas. Essentially, this establishes the cost of living in each community.

For the present study, we have used the EPI family budget for four person families containing two adults and two children, what older readers will recall as the typical “Ozzie and Harriet” household. Across the U.S., the family budget for such a family ranges from a low of \$31,080 in rural Nebraska to \$64,656 in Boston. While there may not be many Boston families who will pull up stakes to move to a small town in Nebraska, those who do can live -- at least in terms of housing, food, transportation, and

other necessities -- on less than half the income it takes to live in Boston. The median family budget across all 434 communities in the EPI study is \$39,984, only 62 percent of what it takes to pay for an equivalent standard of living in the Greater Boston region.

Figure 13 provides a comparison of family budgets across a number of metro areas.

A more reasonable comparison might be between metro Boston and the Raleigh-Durham-Chapel Hill metropolitan area in North Carolina, one of the destinations for Massachusetts migrants. **Figure 14** provides that comparison for each budget component and the total. The good news is that it apparently does not cost anymore to eat in Raleigh-Durham than in Boston -- at least if you never go out to a restaurant. The basic family budget does not include eating out. Transportation is actually a better deal in Boston, a function of the fewer miles commuting to work in Boston's metro area. But on all of the other items, the four-person family in Raleigh-Durham has the better deal by far. At \$779 a month for the typical rent in this North Carolina metro area, it pays only three-fifths (62%) as much as the Boston family (\$1,266). Child care expenses are only two-thirds (67%) as much, due in part to the higher wages Boston child care workers need to survive in the higher priced city. Health care costs only three-fifths (62%) as much, presumably in part due to the large proportion of medical care provided in Boston's expensive teaching hospitals and partly due to the necessary higher cost of health care workers. Other necessities, including hair cuts, cost less in North Carolina, as well. Finally, taxes are lower in Raleigh-Durham because one pays lower federal income taxes on the smaller income needed to maintain one's standard of living in that region and sales taxes are lower because one's taxable purchases are less costly.

In total, the North Carolina family needs to spend \$3,677 a month to enjoy the same material standard of living that costs a similar household \$5,388 in Boston. Thus, the Tar Heel family spends only two-thirds (68%) as much as the Beantown family. On an annual basis that works out to \$44,124 vs. \$64,656.

Lest one believe that this is merely a Greater Boston problem, **Table 1** reveals that other metro areas in Massachusetts -- many of them considered to be in “lower cost” older industrial areas -- are “high cost” by national standards. Surprisingly as it may be, Lawrence is more expensive than New York, Barnstable-Yarmouth is more expensive than San Francisco, and Worcester and Springfield are more costly places to live than San Jose and San Diego. The central cities in these Massachusetts MSAs may be a bit less costly, but they anchor wider metro areas where it is relatively expensive to live.

The large cost of living differential can explain why *both* firms *and* families would find it beneficial to move from Massachusetts to locations with living costs like those in North Carolina. When considering where to establish their operations, businesses consider the *nominal* wages (and the nominal value of benefits) they will have to pay their employees. Families, in contrast, consider the *real* (i.e. cost of living adjusted) incomes they will earn in various locations. Hence, a firm now operating in Greater Boston can pick up and move to Raleigh-Durham-Chapel Hill, taking all their present employees with them and both the company and their workers can end up materially better off. If the company had been paying an annual wage equal to the EPI 4-Person Family Budget in Boston, it could now offer its employees \$10,000 less and yet, at \$54,656 a year, their workers would have the equivalent of a 24 percent increase in their material standard of living once they arrived in Raleigh-Durham where the Boston

living standard costs the equivalent of only \$44,124. Despite this substantial rise in material living standards, the company saves more than 15 percent on its wage bill. Who can pass up such a win-win situation ... particularly when one ponders such a relocation in the middle of a typical Boston winter?

Indeed, it is noteworthy that, according to the *Boston Globe* poll, a majority of those who left Massachusetts in 2005 for other states were now making “less money” (28%) or “about the same” (23%) than they were when they left the state.¹³ Only 41 percent were “making more.” Yet 54 percent reported that their current standard of living was “higher” in their new state and only 9 percent responded it was “lower.”

The High Cost of Housing in Massachusetts

While individuals and families should and often do consider the total cost of living when thinking about where to live, housing prices are really at the core of the matter. First of all, housing itself comprises approximately a fifth of average total monthly living costs in metro areas. For single individuals and families with less than two children, it is clearly the largest item in the budget, approaching an average of 32 percent.¹⁴

But the impact of housing costs on living costs is even greater for the cost of other items in the family budget are partly a result of the cost of housing. Workers who live in metro areas with high housing costs are likely to demand higher wages to cover their higher housing costs. If they do not explicitly demand better compensation, firms may nevertheless be forced to offer higher wages to attract workers to these costly locations. As a result, the cost of health services will tend to be somewhat higher along with the

cost of child care and other labor intensive labor intensive services because of high housing costs.

We found evidence for this relationship by correlating health and child care costs with housing costs for 304 metro areas throughout the United States. These 304, taken from the EPI Family Budget Calculator, have been selected as the basis for the data set we use for further analysis in this paper. They represent those MSAs for which we could match Census data on internal migration to the EPI data.

Using this combined data set, we ran simple ordinary least squares (OLS) regressions that revealed a modest positive relationship between monthly housing costs and monthly health costs and a somewhat stronger relationship between monthly housing costs and monthly daycare costs.¹⁵ Simulating with this simple regression equation suggests that a family in a metro area with an average monthly cost of housing equal to that in Greater Boston (\$1,266) will pay 12.1 percent more for child care than a family in an MSA with average monthly rent or mortgage of \$600. There is an 8.2 percent cost differential for health care. Thus, there is statistical evidence that housing costs do indeed affect a region's non-housing cost structure, presumably through elevated wage rates.

As high as housing costs are in Greater Boston, the metro areas in the Pacific region (Alaska, California, Hawaii, Oregon, and Washington) have slightly higher average monthly housing costs for 4-person families than do the six New England states. **Figure 15**, based on the EPI family budgets, confirms what is well known. The highest housing costs are on the Atlantic and Pacific coasts with lower costs as one proceeds into the interior of the nation.

It turns out that housing is particularly expensive in the top decile as **Figure 16** demonstrates. The average monthly housing cost of \$1,045 among these 31 metro areas is 36 percent higher than the 2nd decile average (and at \$1,266, Greater Boston's average housing cost is nearly 65 percent higher.) Housing costs in the remaining deciles vary by much less. The mean in the 2nd highest decile is only 43 percent higher than in the 10th (lowest cost) decile. Hence, the cost gap between the 1st and 2nd deciles is nearly as large as the gap between the 2nd and the 10th. Greater Boston -- and other Massachusetts metro areas -- therefore are in elite company when it comes to extraordinary living costs.

Not surprisingly, with housing costs so high in this top decile, they represent a higher proportion of total costs than in any other decile -- nearly 24 percent compared to 20 percent in the second decile and between 18 and 20 percent in the remaining deciles, as **Figure 17** demonstrates.

We might add at this point that while Greater Boston holds the EPI Family Budget record for highest cost of living area in the country, according to the EPI analysis, it does not have the highest housing cost for a family of four. That record goes to San Francisco at \$1,539 per month, nearly 22 percent higher than Boston. Because the other costs of living are not as high in the Golden Gate metro region, housing there represents over 32 percent of total costs. A young Bostonian family moving to the California Bay Area will have to pay more for housing, but its overall living costs will be \$7,000 lower because, according to EPI, child care expenses are 31 percent cheaper than in Greater Boston; federal and state taxes (on lower needed income) are 38 percent lower, and health care costs are 42 percent lower.

Indeed, following the EPI methodology, Boston does not rank as highest cost on any single item. It is 7th highest in housing, 7th highest in child care, 7th highest in health care costs, 6th highest in personal care expenses, and 2nd highest in taxes. Overall, however, being so high on so many components in the EPI Family Budget makes Boston numero uno in living costs.

Testing the Link between Housing Costs and Employment Growth

We now have much of the information we need to test whether housing costs have a statistically significant adverse impact on employment levels. Using data from the U.S. Bureau of Labor Statistics, we have calculated the percentage change in total non-farm employment in each of 245 metro areas for the period between 2000 and 2004 for which there is available information (out of the 304 in the overall analysis), and linked them to the EPI Family Budget housing cost data.

Before initiating the empirical analysis, we hypothesized that the relationship between employment growth and housing prices across metro areas, if it existed at all, would be non-linear. Those MSAs with the highest housing costs should have slower growth in employment than those with more modest home prices and rents. At the same time, those areas with the lowest housing costs might also experience slow growth or even job loss as the low prices and rents reflect a weak economy. In this case, the poor employment outlook induces out-migration causing housing supply to exceed housing demand, thus driving down housing prices.

Following this logic, we used a quadratic regression equation that relied on housing cost and housing cost squared from the 2005 EPI data as the independent variables and the percentage change in employment between 2000 and 2004 as the

dependent variable. The results as shown in **Regression Equation 1** indicate that while only about 6 percent of the total variance in employment growth can be accounted for by housing costs alone, both independent variables are highly significant with t-statistics in excess of 4.0. The signs on the independent variables are as expected with the linear term positive and the squared term negative.

Regression Equation 1

$$\begin{aligned} \% \Delta \text{Employment}_i &= -.1466 \\ &+.0000396 \text{ Housing Cost}_i \\ &\quad (4.07) \\ &-2.291\text{E-}007 \text{ Housing Cost Squared}_i \\ &\quad (4.04) \\ \text{Adj. } R^2 &= .056 \\ N &= 245 \text{ MSAs} \end{aligned}$$

A graph for this equation is found in **Figure 18**. One notes that despite the broad scatterplot indicating a great deal of variance in employment growth across metro areas, the regression line suggests that employment actually declines almost universally for the MSAs with the very highest priced housing (\$1,200 per month and above). There is also job loss in the lowest cost regions.

Something resembling these findings can be depicted by simply dividing the 245 MSAs into housing cost deciles and plotting the employment in each of them. This can be seen in **Figures 19**. Note that 2000-2004 employment growth in the top decile representing the 25 MSAs with the highest housing costs is less than 1 percent. Dropping back to the 9th housing cost decile more than triples the job growth rate while job growth

in the 8th decile is more than twice as strong. In the lower housing cost deciles, employment growth is close to zero or negative (with the anomalous exception of the very lowest cost decile.¹⁶) Generally, the decile chart follows the curve of the quadratic regression equation.

Greater Boston is an outlier -- along with some other major MSAs -- even given its inclusion in the top decile as shown in **Figure 20**. With its monthly housing costs at \$1,266, it saw employment decline by 4.9 percent between 2000 and 2004. Other high cost housing areas also saw employment loss. San Francisco with the highest cost housing in the nation lost 10 percent of its employment base; San Jose 15.4 percent. Boulder-Longmont, Colorado with average an EPI housing cost of \$1,022 experienced a 10.7% loss of jobs. Job losses were also the rule in Stamford-Norwalk, Connecticut; New York, Oakland, and Los Angeles.

At the other end of the housing cost continuum, a good number of MSAs lost jobs as well. Decatur, Illinois led in this department losing 10.7 percent of its jobs, followed by Youngstown, Ohio (-7.7%), Flint, Michigan (-7.3%), Ft. Wayne, Indiana (-5.2%), and Binghamton, New York (-5.1%). Each of these old manufacturing cities has suffered significant “deindustrialization” over the past three decades leading to employment losses and out-migration of business and population. The result has been a housing market where supply has exceeded demand for a long period of time, forcing housing prices down.

To test for the impact of other factors on employment growth, we added to Regression Equation 1 variables to capture the effect of total costs besides housing, the structure of the industrial base of the MSA, and taxes. The results are found in **Table 2**.

Equation 1 is our initial regression. The second equation accounts for the impact of all other costs in the EPI Family Budget. The statistically significant negative coefficient on this variable combined with the fact that the coefficients and t-statistics on the two housing cost variables hardly change at all indicates that other costs have an independent effect on employment growth. This is further circumstantial evidence that high living costs force firms to pay higher wages and therefore acts to discourage job growth. Inserting the other cost variable into the equation almost doubles the amount of explained variance.

The third equation adds MFG1970 to the mix, the percentage share of total MSA employment in manufacturing back in 1970. Since the manufacturing sector of the U.S. economy has borne the brunt of job loss, controlling for this variable should help explain the loss in total employment. Even more importantly, it acts as a control variable in the equation to test for the real impact of the cost variables. If the addition of this factor to the equation reduces the coefficients on the family budget variables or substantially reduces their t-statistics, then it is possible that the relationship we found between housing costs and employment growth might be spurious. As it turns out, the coefficients on the two housing variables change only slightly and their t-statistics remain above 4.0. The other costs variable indeed becomes insignificant. The addition of the manufacturing variable with its expected highly significant negative coefficient increases the adjusted R-square to .386 -- indicating that we now can explain nearly two-fifths of the total variance in employment growth.

The last equation adds the EPI tax cost variable to the regression (and deletes the insignificant "Other Costs" variable.) This variable also turns out to be negative and

significant while hardly affecting the coefficients or t-statistics on the other variables. The adjusted R-square improves slightly to .396.

We can conclude from this analysis that after controlling for industrial structure, housing costs and taxes are both significant explanatory variables in explaining why some MSAs have seen growth in employment in the first half of this decade and others, like Greater Boston, have experienced loss. This conclusion appears from the regression equations to be quite robust.

Finally, we tested for the regional impact of housing costs on employment growth. The question posed here is whether higher cost MSAs *within* a Census region lose jobs to lower cost metro areas within the same region. Does the possible loss of jobs from Greater Boston to other MSAs in New England and the Middle Atlantic states -- for example, from Boston to Worcester; Providence, Rhode Island; or Nashua, New Hampshire -- have anything to do with housing costs? The answer is yes, but this phenomenon apparently only applies to MSAs in the Northeastern states and in the West. While the coefficients on the two housing terms had the hypothesized signs in the regressions for the Midwest and the South, their coefficients were not statistically significant. **Table 3** presents these results. Given our previous finding (Figure 15) that the New England, Mid-Atlantic, Mountain, and Pacific states had the highest housing costs in the nation may explain these regional impact disparities. While the general relationship between housing costs and employment growth holds nationally, it is particularly pronounced in the Top Decile metro areas. Massachusetts has many of them.

Testing the Link between Housing Costs and Internal Migration

It is clear from the previous section that high housing costs have a negative impact on employment levels, especially in metro areas with the very highest costs. The question is whether we can show statistically that high housing costs also affect internal migration. Following the methodology we used to test the change in employment, we begin by developing a quadratic regression equation for the impact of housing costs on the percentage change in internal migration for the 304 metro areas for which we have data. Similar to the case of employment, we hypothesize that MSAs with the highest costs will have net out-migration due to families seeking housing they can afford while the MSAs with the lowest cost housing might also experience net out-migration because the low housing prices are a proxy for a weak economy.

The regression equation fits the data with the expected signs even better than it does for employment. Nearly three times as much of the variance is explained by the equation and the t-statistics are above 7.0.

Regression Equation 2

$$\begin{aligned} \% \Delta \text{ Internal Migration}_i &= -.1541 \\ &+.000430 \text{ Housing Cost}_i \\ &\quad (7.03) \\ &-2.6580\text{E-}007 \text{ Housing Cost Squared}_i \\ &\quad (7.39) \\ \text{Adj. } R^2 &= .153 \\ N &= 304 \text{ MSAs} \end{aligned}$$

Figure 21 provides a graph of the regression results. With 59 more observations in the regression, we have a number of additional high housing price MSAs and nearly all

of them have experienced net out-migration. The curve is somewhat more bowed upward than that for employment growth, suggesting that housing costs have a greater impact on migration at the tails of the housing cost distribution. **Figure 22** indicates the big migration losers in addition to Boston are San Francisco, Stamford-Norwalk, San Jose, Oakland, and Nassau-Suffolk, New York. These are generally the same communities that lost jobs.

Once again, we have divided the MSAs into housing cost deciles as shown in **Figure 23**. The non-linear relationship we posited is clearly revealed when this exercise is undertaken. The top decile has an average migration rate of -2.25 percent; deciles 3 through 9 all have a positive in-migration rate with the highest being in Decile 8 (+3.05%), Decile 7 (+2.72%), and Decile 9 (+2.45%); and the two lowest cost deciles have average net *out*-migration rates like the top decile. This pattern is so strong and consistent that it suggests a highly robust relationship between housing costs and migration rates.

Additional regressions were run to test for the impact of other factors on internal migration. These factors include other family budget costs, the industrial structure of the MSA, and most importantly, the percentage change in employment. **Table 4** presents the results. Other costs besides housing have a small independent effect on migration, in accord with the *Boston Globe* survey results noted earlier. Adding this factor does not appreciably reduce the effect of housing costs, per se. Out-migration is also affected by the industrial structure of metro areas. Those MSAs that had large manufacturing sectors back in 1970 continue to experience less in-migration and more out-migration than other regions.

The last equation in this table is perhaps the most important. We inserted the percentage change in employment as a control variable in order to test whether out-migration was principally the result of job losses rather than housing prices. The coefficient on PCTEMPCH is positive as expected -- the greater the job growth, the greater the in-migration -- but the coefficient is by no means statistically significant. The coefficients on the two housing terms remain highly significant with little change in their values. This strongly suggests that housing costs, and not simply employment opportunity, is affecting migration patterns.

That out-migration is influenced by the total cost of living was also tested using regression analysis. In the place of housing costs, we inserted total costs and total costs squared. While the variables were both statistically significant, the t-statistics were much lower than those for the housing variables and the adjusted R-square was less than a third of that in the equivalent housing-based regression. This suggests that while overall costs -- including health care, child care, and taxes -- have something to do with migration patterns, housing costs have by far the greatest influence.

Finally, we looked at intraregional migration patterns for the four major Census regions. As **Table 5** demonstrates, housing costs influence migration patterns in the Northeast, the South, and the West, but apparently not in the Midwest where housing costs are generally lower. The results for the Northeast are fully consistent with the survey findings that New Hampshire and Rhode Island are the chief destinations for out-migrants from Massachusetts.

Moreover, once again the impact of housing costs on migration is independent of the impact of employment growth. To show this definitively, we used the Northeast

regression to simulate the impact of differences in employment growth rates and housing prices on net internal migration. The results are shown in **Table 6**. Note that as employment growth changes from +5 percent to - 4.85 percent (the Greater Boston record from 2000-2004), the net migration rate goes from 2.27 percent to -1.54 percent (assuming average housing costs of \$600 per month. With housing costs at \$1,266 per month (the Greater Boston figure from the EPI Family Budgets), net migration falls from -0.77 percent to -4.58 percent -- very close to the actual Greater Boston migration record (-5.2%). Obviously, migration responds to employment opportunity.

But reading across the table suggests how at the same employment growth rate, migration rates vary depending on housing costs. For example, if employment growth was +2.5 percent, there is net *in*-migration of 1.30 percent when housing costs average \$600 per month. At \$1,266 per month, there is net *out*-migration of 1.74 percent. Note that according to this simulation, even if there is very healthy job growth (+5.0%), reasonably strong net *in*-migration (+2.27%) turns into net *out*-migration (-0.77%) as monthly housing costs roughly double. This is a powerful housing cost effect.

We have therefore found statistical results confirming that both employment and migration are influenced by housing costs and that this phenomenon is independent of other forces responsible for job trends and population dynamics. Higher housing cost metro areas are places where fewer jobs are being created and from where working individuals and their families are leaving. This is particularly true of the MSAs in the highest cost decile where Boston and other Massachusetts metro areas find themselves. Simply put, we now have strong statistical evidence that the dramatic rise in housing

prices and rents since the 1990s is now taking its toll on jobs and the size of the working population in the Commonwealth.

The Relationship between Housing Vacancies on Home Prices

These findings lead us to the final question posed in this paper. Clearly, if we are to support employment growth and reduce out-migration, particularly of young workers, we need to find ways to increase the supply of housing so as to reduce the rate of price and rent appreciation. But why should the roughly two-thirds of the households in Massachusetts who are homeowners support such measures? After all, they have benefited from the enormous appreciation in their homes over the past decade. Why would they want to see housing prices slow down or perhaps decline a little?

There are two traditional answers to this question. One that we mentioned at the beginning of this report is that we all have a moral responsibility to assure that everyone in Massachusetts has housing they can afford. The other is that homeowners have an interest in seeing that their children have the opportunity to live in the communities where they were raised.

While both arguments have been used to support new housing programs in the state, such as the newly passed Chapter 40R and 40S, it turns out that we can actually appeal to homeowners' self-interest in this matter. Slowing the appreciation in housing values after such a long-term run-up in prices may inoculate homeowners from seeing the values of their homes decline sharply. This conclusion is based on understanding the relationship between housing vacancy rates and home prices.

In labor economics, there is a well-known relationship between the rate of unemployment and inflation. This relationship is captured in the notion of the Phillip's

Curve, first discovered by the British economist A.W. Phillips in the late 1950s.¹⁷

Phillips observed that there was a non-linear inverse relationship between the rate of increase in money wage rates and the unemployment rate in England over the period 1861-1957. He found that, in general, wage inflation increased at an ever faster rate the further unemployment fell below 2.5 percent. Above that rate, money wage rates would decline, but only modestly. (In the 1980s and 1990s, those who believed the Phillips Curve still held suggested the non-inflationary rate of unemployment was closer to 6 percent.) Richard Lipsey, writing in 1960, suggested that this empirical relationship could be explained by noting that the level of wage inflation was a function of the degree of excess demand in the labor market. When there was a lot of “excess demand,” wages were bid up. When unemployment was high, indicating an absence of excess demand, wages stabilized or fell somewhat.

We can apply this same logic to the housing market, using housing vacancy rates as a measure of “excess demand” for homes. We would expect that when vacancy rates are in the normal range -- about 1.5 to 2 percent -- housing price appreciation will not be much greater than general inflation. As vacancy rates rise above the normal range, prices will tend to stabilize and ultimately may decline. In the short run, housing prices will not decline very much as sellers will either hold out for the price they had hoped to get or perhaps take their homes off the market altogether. As vacancy rates fall below the normal rate, housing prices will tend to rise and rise, like the Phillips Curve, at a faster and faster rate the more the vacancy rate falls below normal. The home market becomes a sellers’ market much like the game of musical chairs with people running ever faster to

find an empty chair and bidding prices up in the process. Ultimately, this leads to a housing price spiral not unlike the experience in Massachusetts between 1995 and 2004.

Using data on annual housing vacancy rates available for the 75 largest MSAs averaged over the period 2002 to 2004 and data on housing appreciation between 1995 and 2005, we developed an S-regression to see whether the Phillips' Curve holds for the housing market.¹⁸ The results are shown in **Figure 24**.¹⁹ The fitted curve provides just the kind of relationship expected. At vacancy rates *above* 1.5 percent, home prices rose on average by less than 100 percent (Index Value = 200). At vacancy rates below 1.5 percent, home prices appreciated at higher and higher rates depending on how low the vacancy rate declined below "normal." At an average vacancy rate of just 0.5 percent, Boston's price appreciation was 175 percent (Index Value=275.35).

We refitted the data using a cubic function to see what might happen at very high vacancy rates. **Figure 25** provides these results. Note that at vacancy rates above 3.5 percent, price appreciation falls off more rapidly. This suggests that if a local economy were to continue to hemorrhage jobs and people, it is possible that vacancy rates would rise to the point where home prices fell precipitously.

While there is no immediate threat of this happening in Massachusetts in the current era, there is ample evidence that this has occurred in the past. Reviewing the housing price index for MSAs for the past twenty years reveals that home prices have fallen in some markets rather sharply and prices have not necessarily recovered very quickly. **Table 7** provides a few examples of this phenomenon. Reasonably mild downturns occurred in Gary, Indiana in the early 1980s and in Boston from 1988 to 1992. Prices fell between 10 and 12 percent and did not recover to their previous peaks for up

to nine years. Much more serious downturns occurred in Detroit, Hartford, Los Angeles, and Lafayette, Louisiana. Prices plummeted from 19 percent to more than 43 percent and did not return to their previous peak for as long as 15 years.

An overheated housing market was not necessarily responsible for any of these sharp home price corrections, but in the current Boston market where we now have strong statistical evidence that high housing prices are leading to both sluggish job growth and growing out-migration, it is just possible that left unchecked, these trends could continue to a point where vacancy rates began to rise sharply, touching off a major price “correction.”

Perhaps if we could build sufficient housing to moderate home prices and provide enough housing affordable to young working families, we could avoid such a “bubble” phenomenon. With more affordable housing, young workers would stay and businesses would be less discouraged about investing in the Commonwealth. As such, homeowners might have a self-interest in seeing their homes appreciate slowly or not at all in order to avoid the possibility of seeing them depreciate precipitously if current employment and population trends continue. If moral responsibility and concern about one’s children are not sufficient to get homeowners to permit more housing to be built in their own communities, perhaps the specter of seeing their nest eggs crack will do the trick.

Conclusions and Some Policy Implications

The primary purpose of this analysis was to test statistically whether the extremely high housing costs in Massachusetts are partly responsible for the loss of jobs in the Commonwealth and for the internal out-migration the state has suffered since 2000.

We used data from hundreds of metro areas across the country to see whether there is a general relationship between these factors.

The results provide strong evidence for our hypothesis and suggest that (1) high housing costs indeed play a substantial and significant role in employment growth and (2) that after controlling for the strength of the labor market, there is an independent and statistically robust effect of housing costs on migration patterns. Nationwide, the population is moving away from high cost of living cities and suburbs to those with lower housing costs -- and lower living costs in general -- and jobs are going with them. Given the demographic data for Massachusetts, this is especially worrisome for the population segment declining the fastest is comprised of young working families.

We also found some evidence suggesting that if the employment and migration trends were to deteriorate further, we could experience another sharp decline in housing prices -- as rising out-migration could lead to rising housing vacancy rates. While the evidence is not conclusive, it suggests that at vacancy rates above 4 percent, housing prices would begin to fall dramatically. While we do not forecast such a scenario for Massachusetts, we note this has indeed happened in a number of metro areas across the country over the past twenty-five years. The precipitating event in most cases has been the collapse of the industry base in these regions, but the evidence on housing price impacts suggests that an over-inflated housing market can lead to job losses and the combination could pose a serious challenge to both job opportunity and the asset value of people's homes.

Inoculating the Commonwealth against such a possible future by increasing the supply of housing to reduce price appreciation and by developing affordable housing for

young working families may be the best economic development strategy the state could undertake -- and in the process, perhaps paradoxically, maintain the housing values homeowners have come to expect.

Ultimately, however, “fixing” the housing problem is just one of the challenges facing the Commonwealth given its status as an exceptionally high cost of living state -- and Greater Boston’s #1 ranking in this category nationwide. Attention should be given to health care cost containment and to providing affordable child care for young families. More state aid to local communities could help reduce residential property taxes that have risen sharply in recent years.²⁰ These, in addition to housing, are the key cost items where Massachusetts ranks among the top ten in the U.S. and that survey research suggests are the chief reasons residents leave the state.

Finally, no matter how successful we may be at bringing costs under control, Massachusetts is going to remain a relatively high cost of living state. Thus an effort must be made to continually improve local public services so that young families will be willing stay here and pay a “Massachusetts premium” in order to take advantage of excellent public schools, crime-free neighborhoods, superb public transit, low traffic congestion, and a marvelous array of cultural amenities, recreational opportunities ... and, of course, the Red Sox. There is much to be done, but if we are serious about economic development, we should begin by not wasting any time in tackling our housing problem.

Endnotes

¹ Charles Euchner, Barry Bluestone, and Gretchen Weismann, "A New Paradigm for Housing in Greater Boston," Center for Urban and Regional Policy, Northeastern University, September 2000.

² Michael Levenson, "Most who left state don't plan to return: Jobs, housing inspired moves, survey finds," *Boston Sunday Globe*, May 14, 2006, p. A1. Other findings of this survey are quite telling. A majority of movers said they were either "very eager" (19%) or "somewhat eager" (32%) to leave Massachusetts. A clear majority are "very satisfied" with their new state with only 7% "not at all satisfied" or "not very satisfied." Before they moved, more than two out of five (42%) suggested they had up until then intended to stay in Massachusetts "for life." An equal percentage had "planned to move" with the remainder saying they had had no plans or "didn't know." New Hampshire was the top destination followed by Florida and Texas. Regionally, the Southeast was the most popular destination (19%), followed by 18% who now live in the Midwest or West. Those who moved to New Hampshire were more likely than other out-migrants to name housing costs as a "major factor" in their relocation. The *Boston Globe* poll was conducted by the UNH Survey Center between April 28 and May 4, 2006. The margin of error is +/- 4.4 percent.

³ These data are available from the U.S. Bureau of Labor Statistics at <http://data.bls.gov/PDQ/servlet/surveyoutputServlet>.

⁴ The official BLS employment data and Census population statistics used here, according to a recent analysis by the Spaulding and Slye real estate group, may underestimate recent employment growth and overestimate net out-migration. According to the Spaulding and Slye analysis, Census Bureau estimates are open to significant error. As one cited example, the Census Bureau's 1999 population estimate turned out to be 8 percent lower than the actual population count in 2000. It is possible, according to this source, that something akin to this undercount exists for the period between 2000 and 2005. Moreover, the BLS employment numbers have been revised upward in the past in Greater Boston once new information is available. In its March 2006 revision, according to Spaulding and Slye, the BLS found 8,700 "more" jobs in Boston's financial sector, technology-related information sector, and the education and health care services sector. Even if the Spaulding and Slye analysis is accurate, the impact on the findings in this report would only be in error if Boston was the *only* metro region in the study to suffer such an undercount. One suspects that across the hundreds of metro areas used in our analysis such errors very likely average out. See Ben Breslau, Vice President, Director of Research, Spaulding & Slye, "Is Boston doing better than you think?" Draft article to be submitted to the *The Boston Globe*., May 2006.

⁵ These data are available from the U.S. Census Bureau at <http://www.census.gov/popest/estimates.php>.

⁶ These data are available from the U.S. Census Bureau at <http://www.census.gov/popest/states/tables/NST-EST2005-04.xls>. Also, see U.S. Census Bureau at http://www.census.gov/popest/national/files/NST_EST2005_ALLDATA.csv.

⁷ These data are available from the U.S. Census Bureau at <http://www.census.gov/popest/national/asrh/NC-EST2004/NC-EST2004-01.xls>.

⁸ See Bonnie Heudorfer and Barry Bluestone, *The Greater Boston Housing Report Card 2004* (Center for Urban and Regional Policy, September 2005), p. 33, Figure 4.3. The data are based on information available from The Warren Group Publications.

⁹ See www.forbes.com/2005/09/15/cx_sc_0916homeslide_1.

¹⁰ There is certainly circumstantial evidence available to indict this suspect even beyond the *Globe* survey. A 2003 survey of 1,001 Massachusetts residents conducted by the Massachusetts Institute for a New Commonwealth (MassINC) by Princeton Research Associates found that "one-quarter of the respondents

would move out of Massachusetts if given the opportunity.” More than half (54%) of all respondents feel that the availability of affordable housing is a policy area in need of major improvement while the leading reason given by those who would move out of Massachusetts is to find “somewhere with a lower cost of living or lower taxes.” MassINC, “The Pursuit of Happiness: A Survey of the Quality of Life in Massachusetts,” May 2003.

¹¹ Sylvania Allegretto, “Basic Family Budgets: Working Families’ Incomes Often Fail to Meet Living Expenses around the U.S.,” Briefing Paper, Economic Policy Institute, Washington, D.C., 2005 and Sylvia A. Allegretto and Yulia Fungard, “Family Budget Technical Documentation,” Economic Policy Institute, Washington, D.C., 2005. The family budget calculator is available on line at www.epinet.org.

¹² The components in the EPI family budgets are derived in the following way:

Housing. Housing costs are based on the Department of Housing and Urban Development's fair market rents (FMRs). FMRs represent 40th percentile rents (shelter rent plus utilities) for privately owned, decent, structurally safe, and sanitary rental housing of a modest (non-luxury) nature with suitable amenities. Rents for two-bedroom apartments were used for families with one or two children, and rents for three-bedroom apartments were used for families with three children (these assumptions were based on HUD guidelines).

Food. Food costs are based on the "low-cost plan" taken from the Department of Agriculture's report, "Official USDA Food Plans: Cost of Food at Home at Four Levels." The USDA food plans represent the amount families need to spend to achieve nutritionally adequate diets.

Transportation. Transportation expenses are based on the costs of owning and operating a car for work and other necessary trips. The National Travel Household Survey is used to derive costs that are based on average miles driven per month by size of the metropolitan statistical or rural area multiplied by the cost-per-mile.

Child care. Child care expenses are based on center-based child care or family child care centers for four and eight year olds, as reported by the Children's Defense Fund.

Health care. Health care expenses are based on an amount that recognizes that not all families receive employer-provided health care. A weighted average of the employee share of the premium for employer-sponsored health insurance and non-group premium costs from an online insurance quote is used, plus the cost of out-of-pocket medical expenses.

Other necessities. The cost of other necessities includes the cost of clothing, personal care expenses, household supplies, reading materials, school supplies, and other miscellaneous items of necessity from the Consumer Expenditure Survey.

Taxes. Citizens for Tax Justice (CTJ) computed the taxes for tax year 2004. The six line items from above represent after-tax budgets. CTJ determined the amount of tax liability that each after-tax budget would incur. Therefore, the after-tax budget along with the additional tax burden represents the total pre-tax budget. Taxes included federal personal income taxes, federal Social Security and Medicare payroll taxes (direct worker payments only), and state income taxes. Local income or wage taxes were also included. Included in the calculation are federal tax credits for children and the earned-income tax credit.

¹³ Michael Levinson, “The Ex-Residents,” *Boston Sunday Globe*, May 14, 2006, pp. A18-A19.

¹⁴ According to the EPI Family Budget Calculator, a three-person family comprised of two adults and one child living in Boston would have \$1,266 in rent and \$810 in child care expenses. Assuming that a two-person family with no children would spend the same on rent, the cost of housing would eat up close to one-third (32%) of the total family budget.

¹⁵ The regressions for this simple relationship are as follows:

$$\text{Childcare Cost} = 758.05 + .1545 * \text{Housing Cost} \quad \text{Adj. } R^2 = .024 \quad N = 304 \text{ MSAs}$$

(2.93)

$$\text{Health Care Cost} = 352.10 + .0465 * \text{Housing Cost} \quad \text{Adj. } R^2 = .013 \quad N = 304 \text{ MSAs}$$

(2.23)

¹⁶ The metro areas in the lowest cost of living decile include places like Provo, Utah; Texarkana, Texas, Fort Smith, Arkansas; Biloxi, Mississippi; and Brownsville, Texas. It is possible that the higher employment growth in such MSAs is partially due to the influx of migrant labor.

¹⁷ For a brief introduction to the Phillips Curve, see David W. Pearce (ed.) *The MIT Dictionary of Modern Economics* (Cambridge, MA., M.I.T. Press, 1992, 4th Ed.), pp. 330-331.

¹⁸ The vacancy data for this analysis are available from the U.S. Census Bureau at www.census.gov/hhes/www/housing/hvs/annual04/anno4t6.html. The housing price index for 1995 to 2005 for each of the metro areas in this analysis is taken from the Office of Federal Housing Enterprise Oversight available at www.ofheo.gov/download.asp.

¹⁹ A.W. Phillips used time series data for his analysis. Here we resort to cross-section data to see if MSAs with lower vacancy rates have higher rates of housing price appreciation. Such a test is only indicative of a possible inverse relationship. Further analysis with cross-section time series data on housing prices and vacancy rates will be needed to provide a more robust assessment of the price/vacancy relationship.

²⁰ For information on the local aid issue, see Barry Bluestone, Alan Clayton-Matthews, and David Soule, "Revenue Sharing and the Future of the Massachusetts Economy," *Massachusetts Municipal Association* and the *Center for Urban and Regional Policy*, January 2006