

Baystate Population Change 1990 to 2000, Natural Increase or Net Migration?

by Stefan Rayer, Ph.D., Demographic Statistician

The results from Census 2000 showed that the population of Massachusetts increased by 332,680 persons or 5.5% between 1990 and 2000. The population of an area can grow by two demographic processes—natural increase (i.e. an excess of births over deaths) and/or net in-migration. While reliable data on births and deaths are readily available, much less is known about the migration component of population change. One can, however, estimate migration by the so-called residual method, which is calculated as follows:

$$\text{Net Migration 1990-2000} = \text{Population 2000} - \text{Population 1990} - \text{Natural Increase 1990-2000}.$$

From April 1, 1990 to March 30, 2000 Massachusetts recorded 838,084 births and 547,300 deaths, which amounts to a natural increase of 290,784 persons. According to the above formula, the remainder of the population change, 41,896 persons, was net in-migration. Thus, 87.4% of the population growth of the Commonwealth between 1990 and 2000 was due to natural increase and only 12.6% to migration. This statewide scenario, however, masks some important regional differences.

Figure 1 shows overall population change from 1990 to 2000 and the respective contributions of natural increase (or decrease) and net migration by county. The figure demonstrates that virtually the entire population growth for Cape Cod (Barnstable), Martha's Vineyard (Dukes) and Nantucket was due to net in-migration. Natural increase only played a minor role on the Islands while the Cape in fact recorded an excess of deaths over births between

1990 and 2000. The only other county that experienced natural decrease over this time period was Berkshire County. Similar to the Cape and the Islands, most of the population change for Berkshire County was driven by net migration, albeit by net out-migration.

In contrast, in the remaining six counties of Eastern Massachusetts (Bristol, Essex, Middlesex, Norfolk, Plymouth, and Suffolk) and in Worcester County most of the population growth between 1990 and 2000 was due to natural increase rather than net migration. Both Middlesex County and Suffolk County experienced net out-migration over the period, but because of a much larger excess of births over deaths the population of both counties increased over the period. In the other 5 counties both net

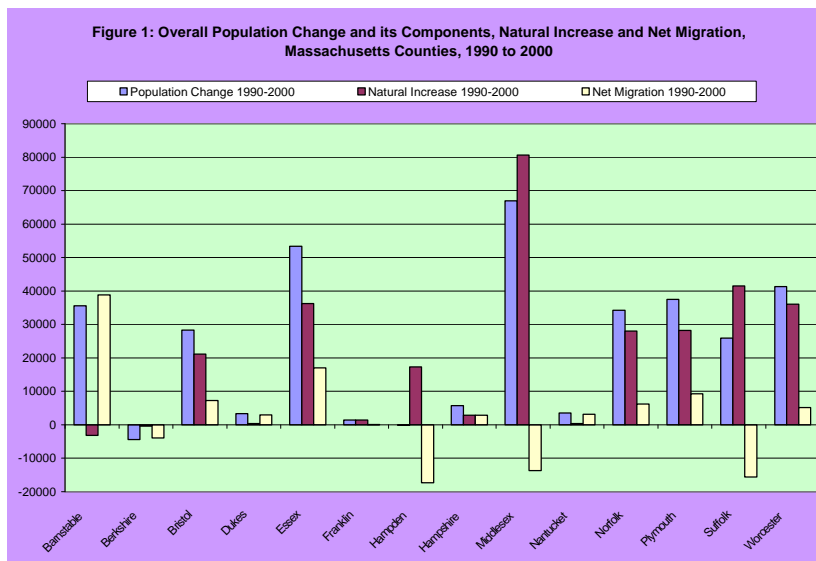
in-migration and natural increase contributed to overall population growth, but except for Essex County the migration component was of only minor importance.

The three counties of the Connecticut River Valley form an amorphous group with population dynamics different from the rest of Massachusetts. The

The

population of Hampshire County grew by 3.9% from 1990 to 2000, with natural increase and net in-migration contributing in roughly equal proportions to the population gain. Franklin County's growth of 2.1% was almost entirely due to natural increase. Finally, while the population of Hampden County remained essentially unchanged from 1990 to 2000, the county would have grown by about 17,000 persons were it not for a net out-migration of about an equal number of persons over the ten year period.

(continued on other side)



(Baystate Population Change...from other side)

Below the county level, individual cities and towns also show unique patterns with respect to the contributions of natural increase and net migration vis-à-vis total population change. Figure 2 presents analogous data for the 15 largest cities and towns in the Commonwealth. All 15 cities and towns experienced natural increase during the 1990s. In fact, when all communities in Massachusetts were ranked by their population size, all 46 cities and towns with a population exceeding 30,000 in 1990 recorded natural increase. Yet while the population of each of the 15 largest cities and towns grew in size due to natural increase, only 3 of the 15 cities also experienced net in-migration (Cambridge, Quincy, and Lynn). And even here, the contribution of natural increase to population growth was much larger. In other words, without natural increase the majority of the largest cities and towns in Massachusetts would have lost population during the 1990s because of net out-migration.

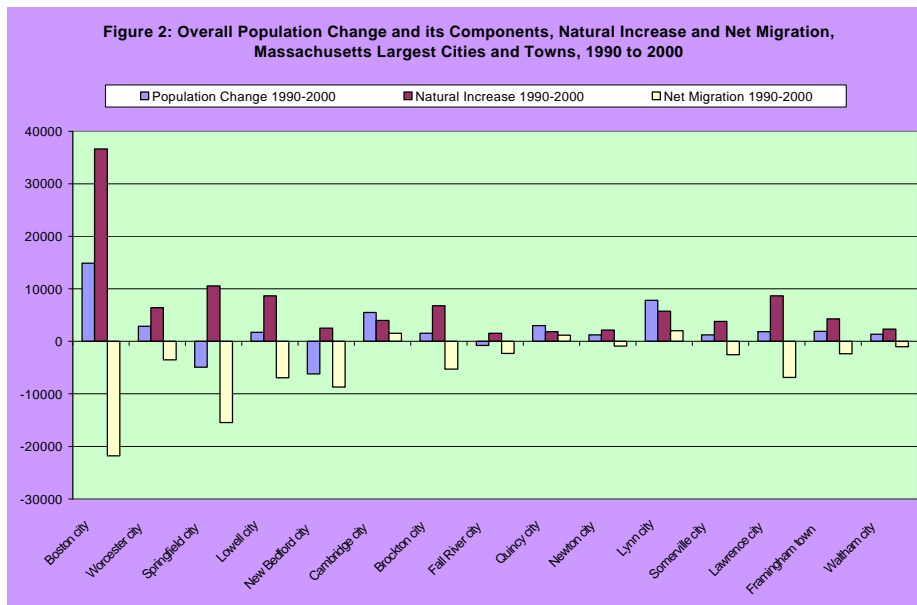
Because of the excess of births over deaths, however, only Springfield, New Bedford, and Fall River actually lost population from 1990 to 2000.

To summarize, most of the population growth in Massachusetts during the 1990s was the result of natural increase rather than net in-migration. This was especially the case for the fifteen largest cities and the seven counties that form the eastern half of the state excepting the Cape and the Islands. The latter showed a unique growth pattern driven almost entirely by net in-migration. On the other side of the

state, Berkshire County's declining population was the result of net out-migration, which got exacerbated by natural increase that turned negative in the mid-1990s. The three counties of the Connecticut River Valley showed slow growth (Franklin and Hampshire) or no growth (Hampden) between 1990 and 2000, and no clear patterns otherwise.

Two final points are worth mentioning. First, natural increase or decrease is a dynamic process that can change over time. While Massachusetts recorded a population gain due to natural increase of almost 300,000 persons over the decade, the annual excess of births over deaths declined from almost 40,000 in 1990 to about 26,000 in 1995 and then stabilized around 25,000 in the latter half of the 1990s.

While all counties showed natural increase in 1990, Barnstable County turned to natural decrease in 1992, Berkshire County in 1994, and Hampshire County in 2000. Second, while net migration



for the state overall was positive during the 1990s, one should note that domestic and international migration have differential impacts on population change in the Commonwealth. The migration data presented in this article did not distinguish between these two migration streams, and it is very difficult to obtain accurate numbers for them. However, estimates produced by the Census Bureau show a persistent annual net gain from international migration during the 1990s and a simultaneous annual net loss domestically. Both the changing dynamics of natural increase and a further decomposition of net migration into its international and domestic components deserve further study.

