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THE MASSACHUSETTS INSTITUTE FOR A NEW COMMONWEALTH
Publisher of *CommonWealth* magazine
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MassINC is a non-partisan, evidence-based organization. We reject rigid ideologies that are out of touch with the times and we deplore the too-common practice of partisanship for its own sake. We follow the facts wherever they lead us. The complex challenges of a new century require a new approach that transcends the traditional political boundaries.

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All of MassINC’s research and *CommonWealth* articles are available free-of-charge through our website, www.massinc.org.

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December 2003

Dear Friend:

MassINC is proud to present *Mass.Migration*, a report produced in partnership with the UMass Donahue Institute and made possible by the generous support of MassHousing.

MassINC has been interested in who is leaving Massachusetts and what it means that they are since we published *The Road Ahead* in 1998. After a detailed analysis of IRS migration data and Census 2000, we believe we are in a position to answer these questions definitively. The answers may surprise you.

Over the last twelve years, Massachusetts lost, on net, 213,000 residents to other states. It is important to keep in mind that this loss took place in the context of a decade of extraordinary economic expansion. This tells us that a strong job market alone is not enough to attract and keep workers.

Still, the story is not a simple one. Rather, two factors seem to be at work. Massachusetts is actually winning the competition for highly educated professionals with our key economic competitor states, but only narrowly. At the same time, we are losing our middle class to other New England states, and at an accelerating rate.

Our findings on the “brain exchange” deepen and extend a discussion already underway in our civic and political community. We should take pride in the Bay State’s ability to draw talent from around the country. But we will need to maintain and expand our narrow edge in attracting—and especially retaining—this talent if our knowledge economy is to grow and thrive.

At the same time, the fact that so many middle-class families have fled—and are continuing to flee—to neighboring states is worrisome. Middle-class families are the bedrocks of community life. The ones who are leaving are Massachusetts born and educated and have deep ties here. We let these vital contributors to our communities and our economy slip away at the Commonwealth’s peril.


In presenting these findings, we owe a debt of gratitude to our partners: Bob Nakosteen of UMass Amherst, Mike Goodman of UMass Donahue Institute, and their colleagues, who conducted the research. We would also like to thank the many reviewers whose critical insights have strengthened the final report. Lastly, we owe special thanks to Dana Ansel, MassINC’s Research Director, for shepherding this project to such a successful conclusion. Finally, we would like to thank our sponsors at MassHousing, who have been generous and enthusiastic partners, encouraging the authors to go where the data led them.

We hope you find *Mass.Migration* an informative and timely resource. We welcome your feedback and invite you to become more involved in MassINC.

Sincerely,



Ian Bowles
Executive Director



Gloria Cordes Larson
Co-Chair



Peter Meade
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EXECUTIVE SUMMARY

Examining the flow of people moving into and out of Massachusetts over the last decade reveals a state in transition. Our analysis of the Census 2000 data shows that native-born middle-class families are migrating in increasing numbers to other New England states, while smaller numbers of highly educated, highly mobile professionals are arriving in Massachusetts. But, with many choices about where to work and live, there is no guarantee that these workers will make the Bay State their permanent home.

In this respect, Massachusetts is no different from other states with knowledge economies. It is increasingly dependent upon a supply of skilled workers whose ties to the state are tenuous, especially during tough economic times. What makes the situation more acute for Massachusetts is the state's slow labor force growth and aging population. Massachusetts can ill afford to lose these new migrant workers whose jobs epitomize the present and future Bay State economy.

This research analyzes recent migration patterns in Massachusetts. It examines both the magnitude of migration over the last twelve years and the characteristics of migrants. We also analyze where the people leaving the Bay State are going, and where our new arrivals are com-

ing from. While the new arrivals are striking in their similar demographic and economic characteristics, the profiles of those moving out vary according to their destinations. We identify two different types of out-migrants: the New England migrant, primarily middle-class families; and the Economic Competitor migrant, young, highly educated managers and professionals. In addition, several Southern and Western states appear as new destinations for Massachusetts workers, uncovering additional competition for this colder, more expensive climate.

In looking toward solutions, it is important to keep in mind that these changes took place in the context of an extraordinary economic expansion, illustrating that a strong job market alone is not enough to attract and keep workers. Policy-makers and business leaders must grapple with a new reality: Worker mobility is now a long-term characteristic of the state's economy. As more and more regions across the country seek to develop knowledge-based economies, Massachusetts faces fierce competition in the contest for skilled workers. But, there are encouraging signs: Our research shows that Massachusetts is narrowly winning the fight to attract young, highly educated talent from its economic competitors—offering the state a foundation on which to build a new strategy.

KEY FACTS:

- In every single year over the last 12 years, Mass. lost more people than it attracted (excluding international immigrants). Mass. has suffered a net loss of 213,191 domestic out-migrants.
- Mass. is exporting a substantial number of residents to the rest of New England (CT, ME, NH, RI, VT). The rate of loss over the last 5 years has accelerated, despite a strong economy for much of that period. Over the last 12 years, on net, Mass. lost 79,031 people to other NE states.
- The vast majority of people who migrate to another New England state (80%) do not continue to work in Massachusetts.
- Native-born, middle-class families are migrating in increasing numbers to other New England States, most notably to New Hampshire.
- Mass. is narrowly winning its fight to attract young highly educated talent from its economic competitor states (CA, CO, CT, MN, NC, NJ, NY), gaining 14,428 people over the last 12 years.
- Mass. attracts a very specific type of person. No matter where they are coming from, they tend to be young, unmarried, highly educated professionals and managers who work in the knowledge economy.
- Those leaving for our economic competitor states share similar traits with in-migrants but in even higher percentages.
- There is also a substantial loss of people to Florida, Georgia, and Arizona. These states are top destinations for young, educated people across the country.
- The availability of high-quality jobs does not guarantee that there will be enough skilled workers to fill them. Even at our economy's peak, Massachusetts, on net, was not able to attract workers to our state.

Background

Over the last twelve years, Massachusetts has been losing in the competition for people. Between 1990 and 2002, not counting international immigrants, about 1.23 million people moved *into* Massachusetts from other states and about 1.44 million moved *from* Massachusetts to other states. That meant a net loss to Massachusetts of more than 213,000 domestic out-migrants.¹ This is quite a significant figure. It roughly approximates the total employment in the financial services sector in 2001 and is more than seven times the state's total employment in the biotech industry. The fact that our labor force grew at all was a result of international immigrants who have contributed substantially to our economy.

The patterns of domestic migration to and from Massachusetts vary loosely with the Massachusetts business cycle. Just as a hot economy will attract workers, a struggling economy will spur people to seek better job opportunities elsewhere. If we consider the net-migration year-by-year over the last twelve years, however, we find that in every single year, Massachusetts lost more people than it attracted—including those years of extraordinary economic expansion. During the boom economy of the late 1990s, our unemployment rate was at a historic low, while an estimated one in twelve jobs at technology-intensive firms remained vacant.² Even at our economy's

KEY DEFINITIONS:

IN-MIGRANT — a person who moved into Massachusetts from any of the forty-nine states, the District of Columbia, or a U.S. territory.

OUT-MIGRANT — a person who moved from Massachusetts to any of the forty-nine states, the District of Columbia, or a U.S. territory.

ECONOMIC COMPETITOR OUT-MIGRANT — a person who moved from Massachusetts to any of the seven economic competitor states (CA, CO, CT, MN, NC, NJ, NY).

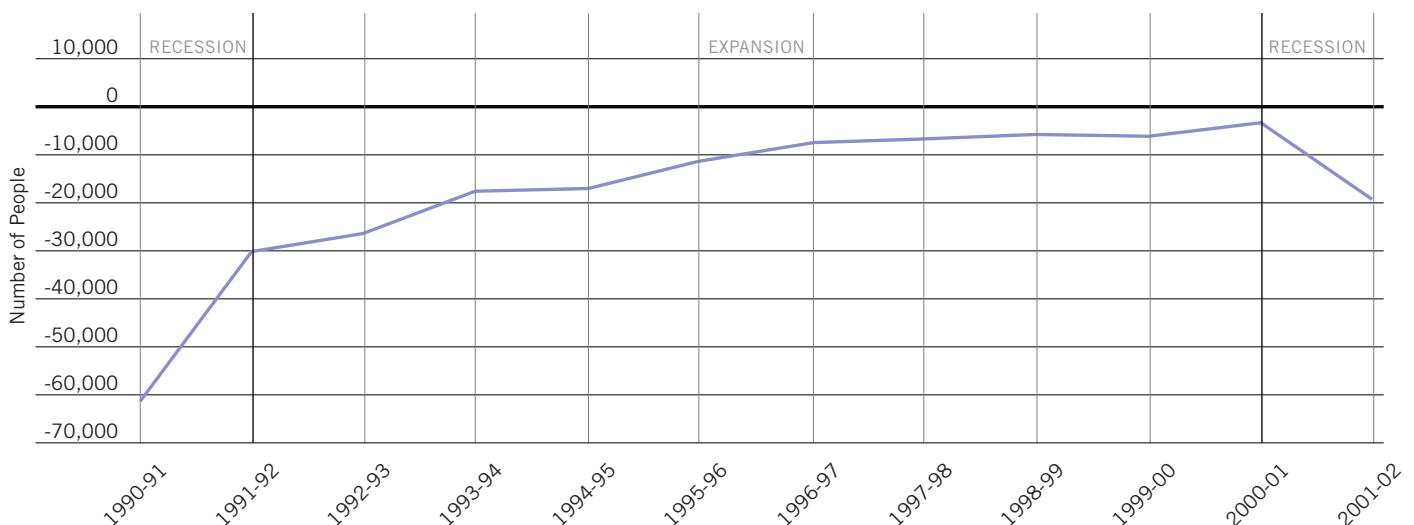
NEW ENGLAND OUT-MIGRANT — a person who moved from Massachusetts to another New England state (CT, ME, NH, RI, VT).

NET MIGRATION — the difference between immigration and out-migration. Positive net migration indicates that more people moved to Massachusetts from a particular state than moved from Massachusetts to that same state. Negative net migration indicates that more people moved from Massachusetts to a particular state than moved from that state to Massachusetts.

NON-MIGRANT — a person who, according to the 2000 Census, lived in Massachusetts in both 1995 and in 2000.

Figure ES1

Net Domestic Migration in Massachusetts, 1990-2002



Source: Author's calculations of IRS data

peak, Massachusetts was not able, on net, to attract people to our state.

The General Profile of a Migrant

One of the principal findings of this study is that the new migrant population is not like everybody else. Migrants tend to be young, well-educated managers and professionals who work in the knowledge economy.³ There are a handful of other characteristics that help to predict whether or not a person is a likely mover, such as family or other emotional ties to a region; marital status and children, especially school-age children; and the migration history of the individual. A person who has moved before is more likely to move again. Thus, the same characteristics that bring migrants into our state also increase the likelihood that they will leave at some point. The key challenge, then, is for policy-makers to make it as easy as possible for migrants to lay down roots in our state, which will help deter subsequent moves. By helping families establish roots in Massachusetts, policy-

makers will enhance the state's overall economic competitiveness.

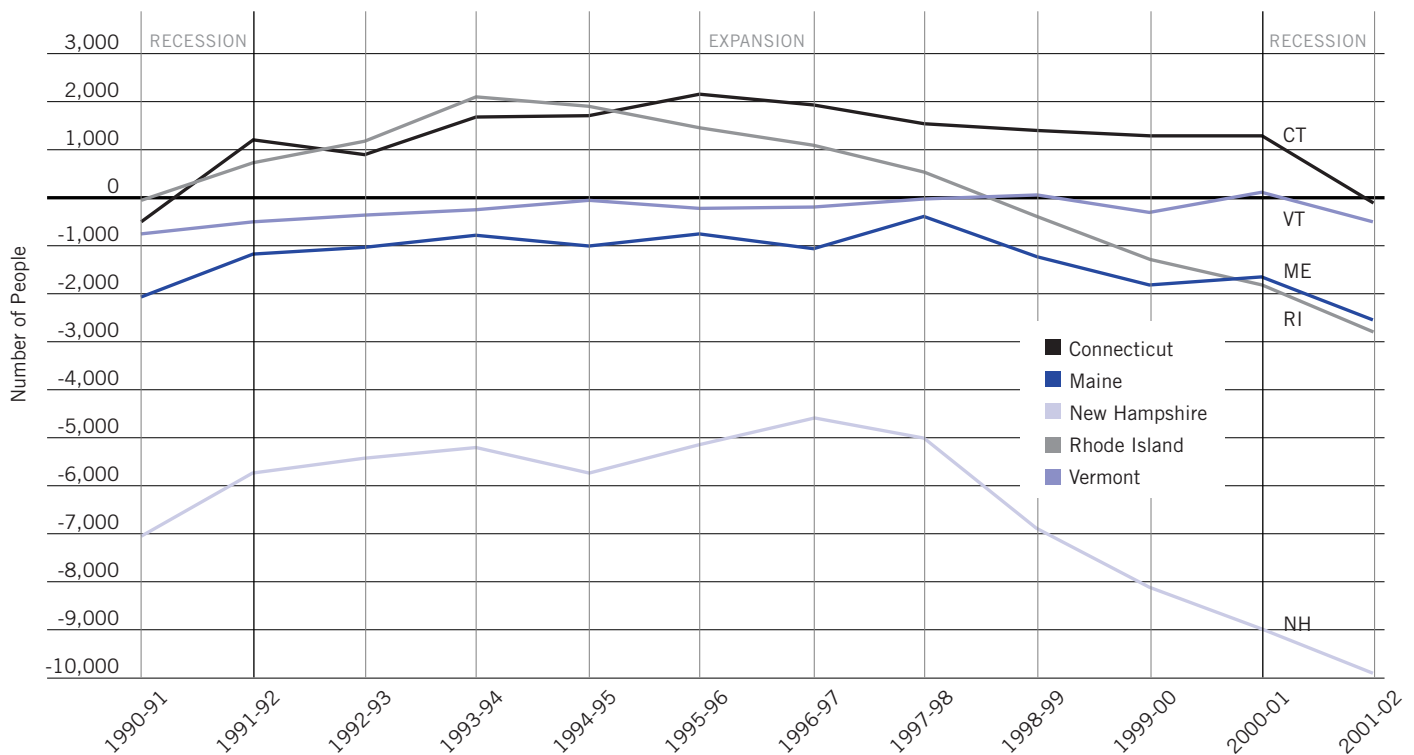
When we examine the characteristics of in-migrants, they are remarkably similar.⁴ Massachusetts attracts a very specific type of person. No matter where they are coming from, they tend to be young, unmarried, highly educated professionals and managers who work in knowledge sectors of the economy. The story with the out-migrants is not so simple. While there are general similarities among the out-migrants, there are also important differences based on their destinations. Out-migrants going to our economic competitor states are an extreme version of the typical out-migrant, while out-migrants going to the other New England states are much more likely to be native-born Massachusetts families with children.

The New England Out-Migrant: Middle-Class Flight

Migration to and from the other New England states accounts for about one-quarter of all migration. In this

Figure ES2

Net Migration Between Massachusetts and Other New England States, 1990-2002



Source: Author's calculations of IRS data

exchange, Massachusetts is clearly on the losing side, exporting more residents than it is attracting. More troubling, though, is that the rate of loss has been accelerating over the last five years. Contrary to popular belief, the vast majority of the people who migrate to another New England state (80%) do not continue to work in Massachusetts. Over the last 12 years, Massachusetts, on net, lost 79,031 people to the other New England states.

The majority of that loss is to New Hampshire, to which 78,201 former Massachusetts residents, on net, fled between 1990 and 2002. The fact that Massachusetts is losing people to New Hampshire is not new, although the size of the loss has been increasing over the last five years. What is new, however, is the shift in the patterns of exchange with Connecticut and Rhode Island. In the early years of the 1990s, Massachusetts was a big net-gainer from these two neighbors. Recently, the gain from Connecticut has been steadily decreasing in size, and in 2001-02 Massachusetts actually lost forty-seven people to the Nutmeg State. The change in the exchange with Rhode Island is even more dramatic. Instead of gaining people, Massachusetts lost 6,323 people to Rhode Island over the last four years. Perhaps even more telling is that these downward trends actually started when the Massachusetts economy was strong—times when we should have had few problems attracting people to the Bay State. If the current trends continue, Massachusetts can expect to lose even more residents to its New England neighbors over the coming years.

Table ES1

Characteristics of Working-Age New England Out-Migrants Compared to Other Out-Migrants (numbers in percent unless otherwise noted)

CHARACTERISTIC	NEW ENGLAND OUT-MIGRANTS	ALL OTHER OUT-MIGRANTS
Bachelor's Degree or Higher	38.2	53.6
Professional/Managerial Occupation	41.2	47.9
Knowledge Sector	43.3	48.6
Median Age (years)	33	31
Married	52.6	44.5
Children in Household	31.9	26.5
Born in Massachusetts	52.8	35.8

Source: U.S. Census Bureau, 2000 Census 1% Public Use Microdata Sample

When looking at the profile of the New England out-migrants, a disturbing pattern emerges: It appears that native-born, middle-class families are fleeing the Bay State. Over half of New England out-migrants were born in Massachusetts (53%), compared with only 36 percent of all other migrants; they are more likely to be married with children; and while they are well-educated, they are, on average, less so than migrants to other states (38% with a bachelor's degree vs. 54%). Furthermore, compared with other migrants, they are less likely to be managers or professionals, and they are less likely to work in the knowledge economy.

What is driving these families across the border? A recent MassINC survey offers some insights. One-quarter of Massachusetts residents polled said they would move out of the state if they had the opportunity, with 49 percent rating the state's quality of life as either "fair" or "poor". Personal finances and the high cost of living were dominant concerns for these people. In fact, the number one reason for wanting to move was "to go somewhere with a lower cost of living or lower taxes."⁵

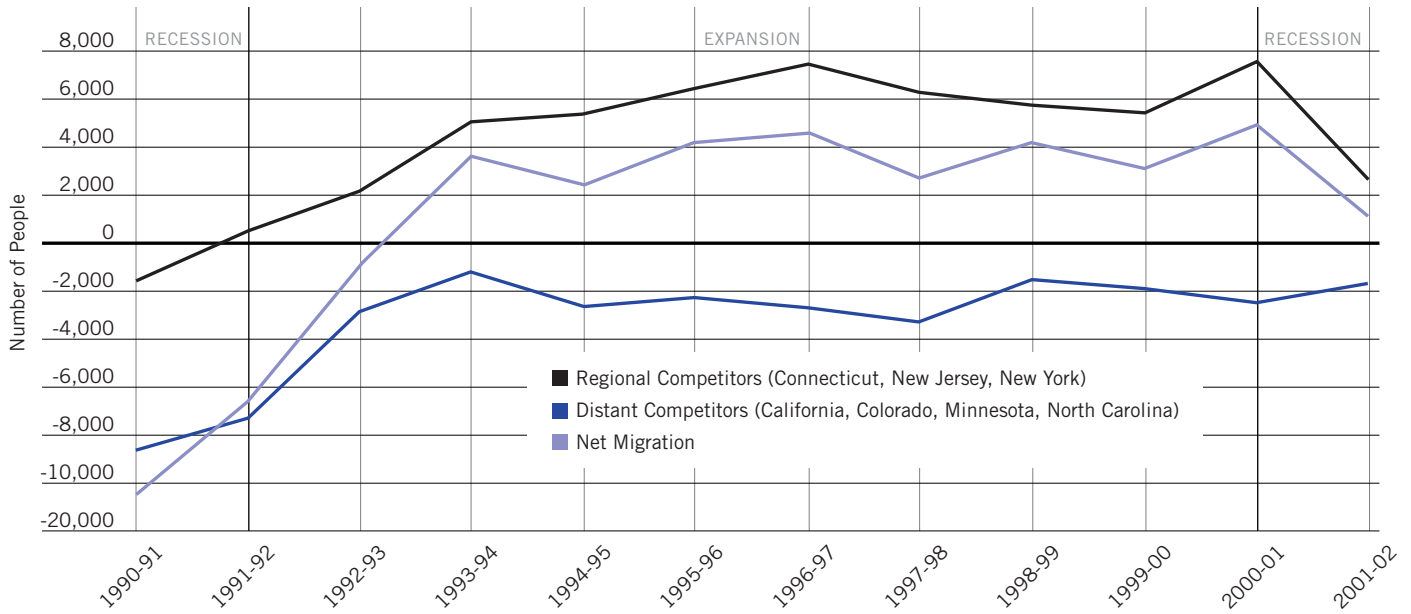
The Economic Competitor Out-Migrant: Winning the Brain Exchange

The other significant migration exchange for Massachusetts is with a group of states with high-tech, knowledge-intensive economies. Massachusetts competes with these economic competitors for skilled workers. To understand how well Massachusetts does in this competition, we measure the migrations flows to and from seven economic competitor states: California, Colorado, Connecticut, Minnesota, New Jersey, New York, and North Carolina.⁶ From 1990 through 2002, there was considerable exchange of individuals between Massachusetts and these other high-tech states. Approximately 28 percent of all the people entering Massachusetts came from one of these seven states, while 23 percent of all the people leaving Massachusetts moved to one of these high-tech states.

The good news is that Massachusetts has been narrowly winning in the brain exchange contest. Even with the past two years of shaky economic conditions, Massachusetts has been net-positive compared with our economic competitors. Overall, Massachusetts gained 14,428 people from our economic competitors since 1990. While this gain is not huge, the fact that we are net-positive clearly

Figure ES3

Net Migration Between Massachusetts and its Economic Competitors, 1990-2002



Source: Author's calculations of IRS data

shows that Massachusetts is an attractive destination for these highly skilled workers. The Bay State’s positive track record offers the state a solid foundation to build upon in the ongoing competition for these highly skilled workers.

A closer look reveals considerable variation in these migration patterns. While Massachusetts has been gaining people from our regional competitors (CT, NY, NJ), we have also been losing people to our long-distance competitors (CA, CO, MN, NC). We gained 53,339 people from our regional competitor states during the last twelve years but lost a total of 38,911 people to our long-distance competitors. California, the most populous state, dominates the migration flows among these four states; 23,978 more people fled the Bay State for California than made the reverse move. The bottom line is that we are losing more people to our competitor states outside the Northeast than we are attracting. Furthermore, the trend has changed recently with Connecticut, showing that patterns of exchange with our economic competitors can and do change—a warning sign for policy-makers and business leaders. With more and more states entering this competition, the Bay State cannot be complacent in its efforts to attract and retain these workers.⁷

Beyond just raw numbers, the contrast between the

profile of these migrants and other migrants is striking. Three out of five Economic Competitor out-migrants (61%) have at least a baccalaureate degree. The extraordinarily high level of education of these migrants is much higher than that for all other migrants, where only 43 percent have a baccalaureate degree or higher.

In addition, 54 percent of Economic Competitor migrants are managers or professionals, and 56 percent work in the knowledge economy. This compares with 42 percent and 43 percent, respectively, for all other migrants.

Table ES2

Characteristics of Working-Age Economic Competitor Out-Migrants Compared to Other Out-Migrants (numbers in percent unless otherwise noted)

CHARACTERISTIC	ECONOMIC COMPETITOR OUT-MIGRANTS	ALL OTHER OUT-MIGRANTS
Bachelor's Degree or Higher	61.2	43.0
Professional/Managerial Occupation	54.2	41.7
Knowledge Sector	55.5	42.8
Median Age (years)	30	33
Married	41.9	49.3
Children in Household	24.2	30.0
Born in Massachusetts	33.2	44.7

Source: U.S. Census, 2000 Census 1% Public Use Microdata Sample

Thus, the “brain exchange” with other high-technology states not only represents a significant portion of the migration flows for Massachusetts, it also demonstrates that the Economic Competitor migrants are very specialized, highly educated workers concentrated in jobs that epitomize the future of the Massachusetts economy.

Places to Watch: Florida, Arizona, and Georgia

Understanding the dynamics of the New England and Economic Competitor migration flows helps to explain much but not all of the Massachusetts migration patterns. In particular, three states do not neatly fit in these categories but still represent a significant amount of migration flow from Massachusetts: Florida, Arizona, and Georgia. Florida actually tops the list of all the states in terms of a net-loss of residents. Over the last twelve years, Massachusetts lost 99,082 more residents to Florida than it gained. Of these residents, about 42,000 (42%) are 55 years and older, which means that the majority of out-migrants to Florida are not retirees or pre-retirees. Rather, the majority are younger than 55 years old. In addition to Florida, Massachusetts has lost a significant number of people to Arizona and Georgia, roughly losing 11,000 residents, on net, to each of those states between 1990 and 2002.

Although our analysis cannot pinpoint the reasons for the large out-migration to these specific states, all three of these states rank as top destinations for people across the country. Other analyses of Census data find that Orlando, Florida, and Atlanta, Georgia, were two of the top cities in attracting young single people who had a college diploma. Phoenix, Arizona, also appeared as a magnet for young adults.⁸ While policy-makers are unable to replicate the

warmer climates of these states, there may be other quality-of-life and affordability concerns that can be addressed.

Concluding Thoughts

The characteristics of migrants are different from those of the rest of the state’s population. Migrants are younger, better educated, and are more likely to work in the knowledge sectors of the economy than are the non-migrant population. These highly mobile individuals are attracted to areas of the country that can best utilize their education and skills. Thus, Massachusetts not only must compete with other high-technology regions of the country for jobs, it also must compete for qualified workers to fill those jobs.

Over the past twelve years, Massachusetts’ performance in this competition is a mixed story. Overall, during this period, Massachusetts has lost significantly more people than it has attracted—leaving the state with a deficit of 213,000 domestic migrants. (The state’s population and labor force grew slightly during this period because of international immigration.) That overall number, however, masks important differences among the different populations of out-migrants. In the case of the New England out-migrants, Massachusetts appears to be losing many native-born, middle-class families to the rest of the region. Over the last twelve years, Massachusetts has lost nearly 80,000 people to the other New England states. Moreover, the loss of these families has accelerated over the last five years. Significantly, the vast majority of the people who migrate to another New England state (80%)

Table ES3

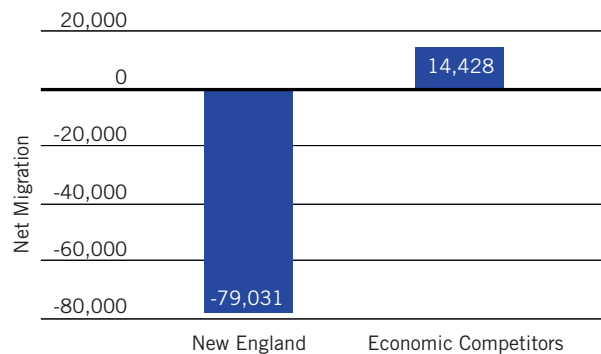
Top Net Migration Losses for Massachusetts, 1990-2002

RANK/STATE	NET MIGRATION, 1990-2002
1 Florida	-99,082
2 New Hampshire	-78,201
3 California	-23,978
4 Maine	-15,708
5 Georgia	-11,331
6 Arizona	-11,033
7 North Carolina	-8,983

Source: Author’s calculations of IRS data

Figure ES4

Net Migration with Other New England States and Economic Competitor States, 1990-2002



Source: Author’s Calculations of IRS data

Table ES4

Characteristics of Working-Age Out-Migrants to New England and Economic Competitor States and the Non-Migrant Population, (numbers in percent unless otherwise noted)

CHARACTERISTIC	ECONOMIC COMPETITOR OUT-MIGRANTS	NEW ENGLAND OUT-MIGRANTS	NON-MIGRANTS
Bachelor's Degree or Higher	61.2	38.2	32.4
Professional/Managerial Occupation	54.2	41.2	34.7
Knowledge Sector	55.5	43.3	41.5
Median Age (years)	30	33	41
Married	41.9	52.6	56.6
Children in Household	24.2	31.9	40.2
Born in Massachusetts	33.2	52.8	64.8
Total Net Migration, 1990-2002	+14,428	-79,031	

Source: U.S. Census Bureau, 2000 Census 1% Public Use Microdata Sample; Author's calculations of IRS data.

do not continue to work in Massachusetts.

The good news, however, is that during this same period Massachusetts has been narrowly winning the competition for the Economic Competitor migrants, gaining more than 14,000 of them since 1990. The results here are also mixed. Massachusetts has a much better track record with its regional competitors (CT, NJ, NY) than it does with its long-distance competitors (CA, CO, MN, NC), although the pattern of exchange has reversed course with Connecticut in recent years. Future patterns are thus uncertain.

Policy-makers and business leaders across the Commonwealth must recognize that the growth of the knowledge sector industries, the state's economic engine, will largely rest on the extent to which we can retain and expand the available pool of well-educated "knowledge

workers." But the challenge is more complex: Massachusetts must attract these highly educated, highly mobile young professionals while keeping a strong, stable middle class within its borders—in good and bad economic times. In addition to creating job opportunities, areas of common ground may be found in quality-of-life and affordability issues—including housing and education—major concerns for both populations. Finally, the Commonwealth must also focus its attention on improving the skills of current residents who already have strong ties to the state and, thus, are less likely to leave. Many lack adequate skills to compete in the knowledge economy. If they acquire those skills, then, they too will be able to share more broadly in the state's economic benefits, while helping to fuel a strong Massachusetts economy.

Endnotes

- 1 Migration flow data are estimated from IRS tax records. The Internal Revenue Service compiles tax return data in order to estimate annual state migration flows. A migration is recorded whenever the state of filing is different from one year to the next. By using the exemptions data (which approximate household size), we were able to estimate the number of individuals. While some of the migration measured by the IRS is related to retirement, using the 2000 Census data to estimate the magnitude of retirement migration, we find that approximately 95 percent of all people migrating into Massachusetts were between 18 and 64 years old, and about 91 percent of the out-migrants were of working age. Clearly, almost all of the migration is labor-force related. We also use the 2000 Census data in this report to analyze individual characteristics of in-migrants and out-migrants.
- 2 See Harrington, P. and Fogg, N. 1997. *Is There a Labor Shortage? A Review of the Evidence for Massachusetts and New England*, Center for Labor Market Studies, Northeastern University.
- 3 The knowledge sector includes the following industries, as defined by the North American Industry Classification system: Information Technology; Finance, Insurance, and Real Estate; Professional, Scientific, Administrative, and Management Services; and Education, Health, and Social Services.
- 4 Characteristics of migrants and non-migrants are derived from the 1% Public Use Microdata Sample (PUMS) of the 2000 Census of Population and Housing. These files contain records for a sample of households with information on the characteristics of each unit and each person in it, while preserving confidentiality (by removing identifiers). These microdata files permit users to analyze the demographic/socioeconomic characteristics of 1% of the respondents to the Census long-form questionnaire, administered to one in six housing units/households. Migrants and non-migrants are identified based on responses to the “five-year residence question.” The long form which is used to construct the Public Use Sample of the 2000 Census contained a question on the state of residence of the respondent in 1995. By comparing the state of residence in 1995 with the state of residence in 2000, migrants can be identified. Note that if an individual migrates more than once between 1995 and 2000, only one of the moves will be recorded. In addition, if a person leaves a state after 1995 and returns to the same state prior to the Census date in 2000, this migration will go unrecorded.
- 5 Princeton Survey Research Associates. 2003. *The Pursuit of Happiness: A Survey on the Quality of Life in Massachusetts*. MassINC.
- 6 For this analysis we use the Massachusetts Technology Collaborative’s six “Leading Technology States” and North Carolina, a state long seen as a competitor because of the presence of the Research Triangle.
- 7 Florida, Richard. 2002. *The Rise of the Creative Class and How It is Transforming Work, Leisure, Community, and Everyday Life*. New York: Basic Books.
- 8 U.S. Census Bureau. 2003. *Migration of the Young, Single, and College-Educated: 1995 to 2000*. Census 2000 Special Reports, November.

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Many people have an image of Massachusetts as a population magnet, attracting thousands of students with its universities and drawing other people to its technology economy and high quality of life. However, as this study demonstrates, the reality is far more complicated: With its own labor force growth stagnant, the Massachusetts economy is increasingly dependent upon a supply of skilled workers whose ties to the state are tenuous, especially during tough economic times. Massachusetts can ill afford to lose this pool of workers, many of them in occupations and industries that epitomize the present and future Massachusetts economy.

The Bay State's singular competitive advantage is the skill level of its workforce. But that advantage and growth in Massachusetts are in jeopardy if we simultaneously fail to properly train our own population in the 21st-century skills increasingly demanded by today's employers while depending upon in-migrants who have such skills—but who also have a tendency to move.

This research explores recent migration patterns in Massachusetts. It first examines the magnitude of migration over the last decade or so and then examines the socioeconomic and demographic characteristics of migrants both into and out of Massachusetts. These characteristics include a set of indicators that can be used to measure the importance of migrants to the Massachusetts economy. Finally, we analyze where the people who leave the Bay State are going, and from where our new arrivals come. In particular, we look at two significant migration exchanges: the flow of people to and from the other New England states and to and from our economic competitor states.

MIGRATION IN MASSACHUSETTS: THE CONTEXT

During the last 20 years, the Massachusetts economy has changed dramatically, shifting away from manufacturing jobs toward service sector jobs and introducing into our economy the characteristic of worker mobility. The new Massachusetts economy, with its emphasis on technology-

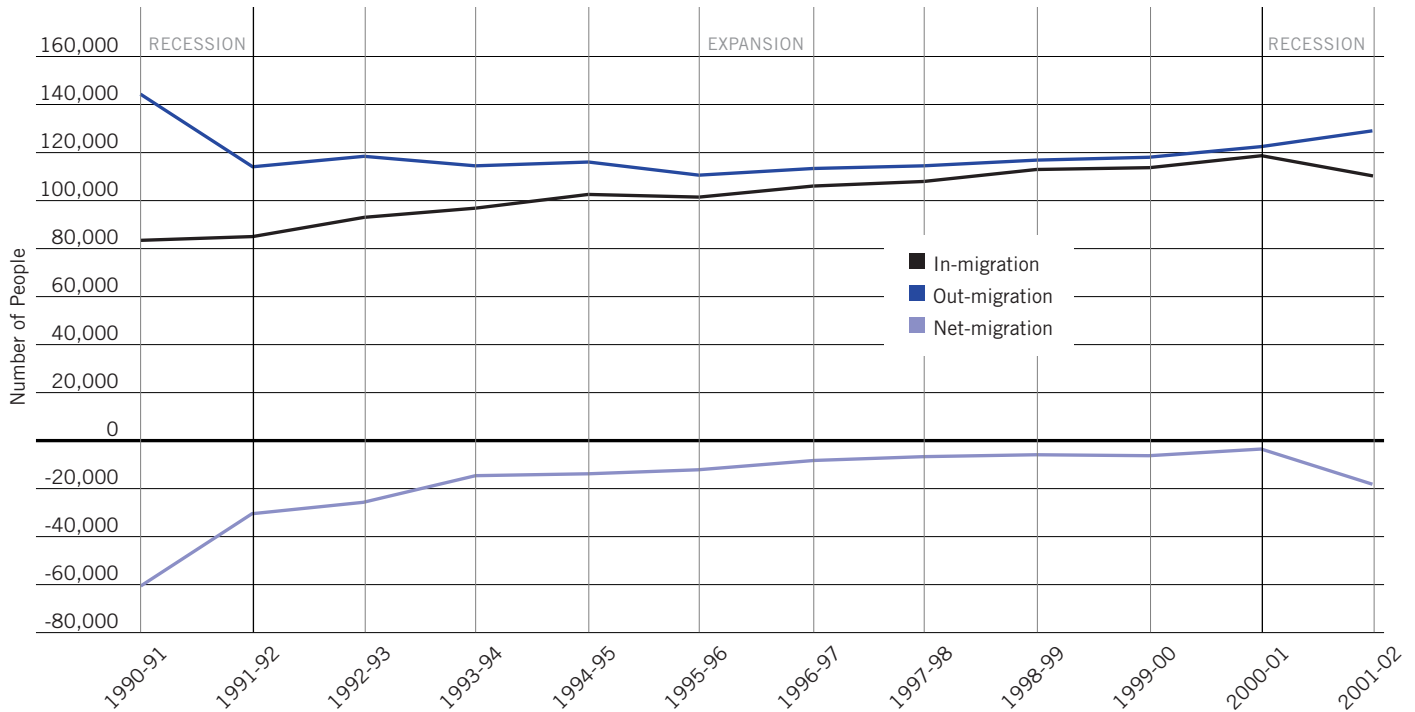
oriented and knowledge-intensive industries, requires (and attracts) highly educated workers. These workers by their very nature tend to have many choices about where to locate and, as a consequence, are highly mobile. Massachusetts is not the only state that depends upon a pool of highly mobile workers. Other states with similar economies that are heavily reliant on highly educated workers also face such worker mobility and compete with Massachusetts for this desirable segment of the labor force.

While other states contend with this issue, worker mobility is especially salient for the Massachusetts economy because of our state's slow labor force growth and aging population. The ability to sustain a healthy and growing economy over the long run fundamentally rests on a growing labor force that can expand economic activity. Massachusetts, however, has long faced the problem of a slowly growing labor force. Over the entire 1990s, our labor force grew by less than 2 percent, while the nation's labor force grew by nearly 14 percent. Indeed, during the 1990s, Massachusetts had the fourth lowest rate of labor force growth in the nation.¹ This is the disturbing prospect now facing policy-makers: Our labor force is barely growing; not enough Massachusetts workers have the skills and educational attainment required by the state's key industries; and many of the workers who do have such training are likely to leave the state, especially in difficult times.

Between 1990 and 2002, excluding international immigrants, about 1.23 million people moved *into* Massachusetts *from* other states and about 1.44 million moved *from* Massachusetts *to* other states.² That meant a net loss to Massachusetts of more than 213,000 domestic out-migrants.³ This is quite a significant figure. It equals about 82 percent of all labor force growth in Massachusetts during the same period. The fact that our labor force grew at all was a result of international immigrants who have contributed substantially to our economy.⁴ The focus of this research, however, is domestic migrants, who, as we shall see, play a critical role in sustaining key industries

Figure 1

In-Migration and Out-Migration in Massachusetts, 1990-2002



Source: Author's calculations of IRS data

in the Massachusetts economy. The number of domestic out-migrants roughly approximates the total employment in the financial services sector in 2001⁵ and is more than seven times the state's total employment in the biotech industry.⁶

The patterns of domestic migration to and from Massachusetts vary loosely with the Massachusetts business cycle on a year-by-year basis (Figure 1). Just as a hot economy will attract workers, a struggling economy will spur people to seek better job opportunities elsewhere. Consider the early 1990s, when the Massachusetts economy was deep in a recession. From 1990 to 1991, the “net migration” (in-migration minus out-migration) was -60,718; that's how many more people left the state than entered it during that year. Over the last twelve years, this was the single largest number of people lost in a given year. Because the economic conditions in Massachusetts in the late 1980s and early 1990s were significantly worse than in other parts of the country, potential migrants had better economic prospects elsewhere. As the Massachusetts economy began to recover, the magnitude of in-

migration rose steadily, from 83,291 in 1990 to 119,024 in 2001. But between 2001 and 2002—the first full year of the recession in Massachusetts—the number of in-migrants fell to 110,127.

In contrast, out-migration patterns were not nearly so linear and did not correspond as closely to the business cycle. From 1990-1991, at the height of the recession, 144,009 people left Massachusetts. The following year, the number of people who left the state dropped to 114,928. The number of out-migrants then fluctuated over the next several years. But since 1995-1996, despite the state's strong economy, domestic out-migration has been steadily increasing, reaching 129,946 by 2001-2002. Clearly, the business cycle alone cannot fully explain out-migration behavior in Massachusetts.

Looking at net-migration year-by-year over the last twelve years, we find that in every single year, Massachusetts lost more people than it attracted (Table 1). Given the extraordinary economic expansion during much of this time, our state's inability to attract more people than it lost is especially noteworthy. The year

2000-2001 was our best year in terms of losing the fewest people, on net, and in that year, we lost 3,818 people. During the other years of the economic boom, we lost anywhere from 5,768 to 7,183 people. Thus, even at our economy's peak, Massachusetts was not able, on net, to attract people to our state.

Table 1

Net Domestic Migration in Massachusetts, 1990-2002

YEAR	NET MIGRATION
1990-91	-60,718
1991-92	-30,013
1992-93	-26,630
1993-94	-17,766
1994-95	-17,538
1995-96	-11,343
1996-97	-7,183
1997-98	-6,519
1998-99	-5,768
1999-00	-6,076
2000-01	-3,818
2001-02	-19,819

Source: Author's calculations of IRS data.

That both in- and out-migration were rising during much of the expansion in the 1990s is consistent with other migration studies. Previous research finds that once a region starts receiving an increased flow of in-migrants, it eventually triggers an increased flow of out-migrants. As we will examine below, part of this phenomenon is due to the characteristics of migrants, which make them much more prone to move, and move on, than the population as a whole. The fact that both in-and out-migration can be high and even growing during a period of tremendous economic expansion, low unemployment, and reported labor shortages in certain science, technology, and engineering fields⁷ suggests that Massachusetts cannot rely on economic growth alone to solve its chronic labor force shortage through the attraction of in-migrants.

MIGRATION: ABOUT THE PEOPLE AND THE PLACES

Migration can be seen as the outcome of the interaction between the "Characteristics of Places" and the "Characteristics of People."⁸ People tend to move into places that are thriving economically, while adverse economic conditions tend to push people out. In short, job growth attracts movers. But the other characteristics of

place can interact in an important way with the characteristics of people, leading to some counter-intuitive migration streams.

The academic literature reports a strong and consistent profile of someone most likely to migrate domestically.⁹ The most important factor is age. Younger workers are much more likely to change their state of residence. The probability that a worker will migrate within a year begins to increase dramatically at age 18 and remains high throughout the 20s and into the 30s, then declines slowly from the mid- 30s into the early 40s, and drops sharply thereafter. The probability of migration rises again as people reach their 60s and retire, often to other states. This pattern of the age-selectivity of migration is resilient across societies, cultures, countries, and time periods. It is one of the most striking findings in the study of migration behavior.

Another important factor in predicting an individual's migration behavior is the extent of that person's family ties in the region. Emotional ties to the region where one has family tend to deter an individual's willingness to relocate. Family ties can have an economic aspect as well. For example, a family network can provide child-care for free or at below-market rates. Having one's family close by also provides a source of location-specific capital for the individual that can be virtually impossible to duplicate elsewhere. And extended family networks, family friends, or even simple name recognition can open doors to economic and other opportunities.¹⁰ This social capital loses its value for individuals who relocate far from their original homes.

The family status of an individual can also affect migration behavior. Unmarried individuals are more likely to move, as are married people whose spouses do not have jobs. The presence of children in the household, especially those of school age (5 to 18 years of age) significantly reduces the likelihood of migration; once children enter school, parents are less likely to uproot the family.

Another factor is the migration history of the individual. People who have never moved before are less likely to move now or later, whereas those who have moved in the past are less likely to stay put. In essence, migration behavior begets more migration behavior. As a result, areas such as Massachusetts that are populated by migrants experience chronically high volumes of out-migration, regardless of

their economic conditions.

A number of other characteristics help identify likely migrants. Migrants tend to be more highly educated than non-migrants, and the impact of education often interacts with the related characteristic of occupation. More highly educated individuals, especially those in specialized occupations, seek jobs in more national (or even international) job markets, as opposed to local job markets. For example, a clerical worker may find it relatively easy to find a new job locally, but a biotechnology professional's effective job market is national or global. In short, these highly skilled people must look broadly because there are often limited job opportunities in a given geographic area, making them more mobile. At the same time, they are also likely to have a range of choices of geographic locations.

The characteristics of the place attract the type of person who is quite likely to move in good times, and even more likely to move in bad times, especially when a region's economic conditions worsen relative to other regions or the nation as a whole. Under these circumstances, out-migration flows enlarge, as people leave in pursuit of opportunities in more prosperous locations. Simultaneously, in-migration slows, as limited opportunities draw fewer people. This can result in a draining of a state's labor force. Because of the significant economic expansion during much of the 1990s, the Commonwealth attracted a substantial number of in-migrants. What remains is a pool of "hair-trigger" potential migrants, labor force members who by their previous behavior have self-identified as likely movers. If the current economic recovery goes slowly, and especially if our regional econ-

omy underperforms the national economy, the Commonwealth is at risk of losing many from this pool of previous in-migrants, plus others who are prone to move. Such an exodus could drain the state of a significant number of highly educated young workers. This could, in turn, further hamper the economy's ability to recover.

**A PROFILE OF MIGRANTS:
WHO MOVES IN AND WHO MOVES OUT**

In this study, we identify and examine the characteristics of those people who moved into Massachusetts at the height of the expansion, from 1995 to 2000—the in-migrants. In addition, we compare their characteristics with those who left the state during the same period—the out-migrants. Finally, we compare both groups with the non-migrants—those who lived in Massachusetts at both the beginning and the end of this time period. From this analysis, we build a profile of “movers” and “stayers.” Given our focus on the impact of out-migration on the state's labor force, in this section we restrict our analysis of the Census data to individuals between 18 and 64 years of age.¹¹

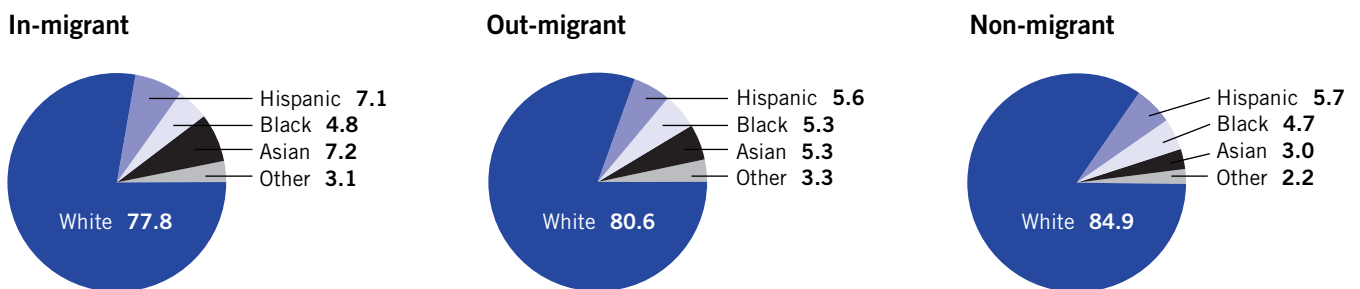
Demographics

Race and Ethnicity

In-migrants are changing the demographic composition of the state, albeit slowly (Figure 2). Non-migrants in Massachusetts are nearly 85 percent white, about 6 percent Hispanic, just under 5 percent black and 3 percent are Asian. For in-migrants from other states, only about 78 percent are white, just over 7 percent are Hispanic, just under 5 percent are Black, and just over 7 percent are

Figure 2

Racial/Ethnic Composition of the Massachusetts Working-Age Population, by Migration Status (percent)



Source: U.S. Census Bureau, 2000 Census 1% Public Use Microdata Sample

of Asian descent. While the magnitude of in-migration will not suddenly change the demographic composition of the state, the in-migrant population represents a demographic shift at the cutting edge of change in the state.

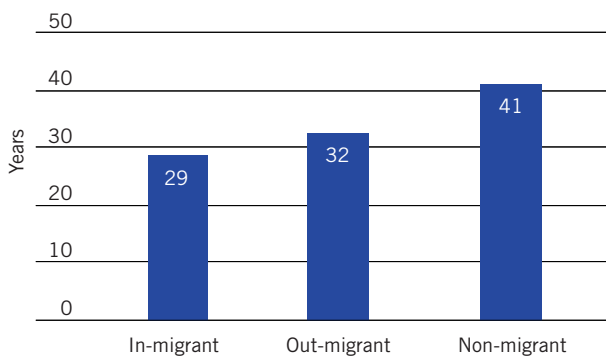
In-migrants are demographically different from non-migrants, but out-migrants more closely resemble the non-migrant population. Nearly 81 percent of out-migrants are white, compared to 85 percent of the non-migrant population. Over five percent of out-migrants are Hispanic; just over 5 percent are black, and just over five percent are of Asian descent.

Age

Both in- and out-migrants are considerably younger than the non-migrant population (Figure 3). The median age of in-migrants is 29, of out-migrants is 32, and of non-migrants is 41. In-migrants may be slightly younger than out-migrants because of the many college-aged students who enter the state to go to college or graduate school, while those leaving after graduation would tend to be older. Given the relationship between age and mobility, it is not surprising that two-thirds of in-migrants were between 18 and 34 years old, the most migration-prone age group. Among out-migrants, nearly three-fifths are between 18 through 34 years old, while only one-third of the non-migrant population falls into that category. Thus, the majority of the migrants (both in- and out-migrants) are between the ages of 18 and 34, which is not the case for non-migrants.

Figure 3

Median Age of the Massachusetts Working-Age Population, by Migration Status



Source: U.S. Census Bureau, 2000 Census 1% Public Use Microdata Sample

Family Status

While over 56 percent of the non-migrant population is married, this number drops to under 40 percent for in-migrants (Table 2). Out-migrants, who are slightly older than in-migrants, occupy the middle ground with just under 47 percent married. A higher percentage of the non-migrant population (40 percent) has children in the household than either the in-migrants (slightly under 28 percent) or the out-migrants (just over 28 percent). This greater likelihood of parenthood for the non-migrants can be explained by the difference in ages between the migrant and non-migrant populations.

Table 2

Family Status of Massachusetts Working-Age Population, by Migration Status (numbers in percent)

	IN-MIGRANT	OUT-MIGRANT	NON-MIGRANT
Married	39.4	46.8	56.6
Children in the Household	27.6	28.1	40.2

Source: U.S. Census Bureau, 2000 Census 1% Public Use Microdata Sample

Place of Birth

People not born in their current state of residence or with few local family connections have weaker ties to the state. This is especially true in difficult economic times, when a family network can provide important economic and non-economic support. When no such network exists, moving becomes a much more appealing alternative. While nearly 65 percent of the non-migrant population was born in Massachusetts, just under 20 percent of in-migrants were born in Massachusetts (Table 3).¹² Because so few in-migrants were born in the Bay State, the potential for significant subsequent out-migration exists.

Table 3

Place of Birth of Massachusetts Working-Age Population, by Migration Status (numbers in percent)

	IN-MIGRANT	OUT-MIGRANT	NON-MIGRANT
Born in Massachusetts	19.7	40.8	64.8
Born outside of Massachusetts	80.3	59.2	35.2

Source: U.S. Census Bureau, 2000 Census 1% Public Use Microdata Sample

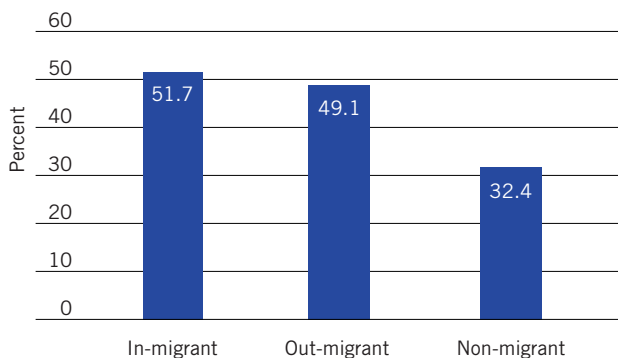
What is perhaps more interesting, however, is that more than 40 percent of out-migrants were born in Massachusetts.¹³ This figure is lower than for the non-migrant population (nearly 65 percent), but it is much higher than for in-migrants (just under 20 percent). The high percentage of out-migrants born within the state raises the possibility of a later “counter stream” of return migrants to the state from among this group. Quite often, when people who have migrated decide to move again, they choose to move back to the state in which they were born, which allows them access to the many advantages of having family nearby.

Educational Status

The educational attainment of both in-migrants and out-migrants is significantly higher than that of the non-migrant population. Nearly 52 percent of the in-migrants have at least a baccalaureate degree. At the same time, Massachusetts is also “exporting” a group of highly educated people. Nearly half (49%) of out-migrants have a baccalaureate degree or higher (Figure 4). The educational attainment of the in-migrants and out-migrants contrasts sharply with that of the non-migrants, only 32 percent of whom hold at least a baccalaureate degree. The education level of the non-migrants resembles that of the Massachusetts adult population over 25 years old. A much higher portion of both the in- and the out-migrants hold at least a college degree. The migrants play a critical role in helping to grow and attract the types of knowledge-intensive jobs that are the economic engine of our state.

Figure 4

Percent of Massachusetts Working-Age Population with a Bachelor's Degree or Higher, by Migration Status



Source: U.S. Census Bureau, 2000 Census 1% Public Use Microdata Sample

Massachusetts: A Higher Education Magnet

One of the Commonwealth’s leading industries, higher education, draws people from other states and countries not only to work in its colleges and universities but also to attend them. How much are the higher education institutions pulling people into the Bay State? Although precise data measuring the numbers of individuals who migrate domestically into the Commonwealth in order to attend college are not available, it is possible to make a reasonable estimate of the magnitude of college-related in-migration.

Not surprisingly, Massachusetts attracts significant numbers of in-migrants to its many world-class educational institutions. The U.S. Department of Education (DOE) estimated that almost 30,000 people migrated to Massachusetts in 2000 to become “first-time, first-year degree/certificate seeking students enrolled in Title IV institutions.”¹⁴ This means that roughly 41 percent of all first-year students in Massachusetts come from out of state. Of course, at the same time that students migrate into the state to attend college, some Massachusetts residents migrate out of the state to attend a higher education institution. During 2000, of the 57,000 Massachusetts residents that attended a Title IV institution, about 73 percent attended college in-state and 27 percent went out-of-state. With approximately 15,000 individuals leaving the state to attend college, Massachusetts had a net gain of slightly more than 14,000 students in 2000. These estimates, however, include both interstate and international in-migrants, which, strictly speaking, make the data incomparable to either the Census Public Use Microdata or the Internal Revenue Service data used in this study. Nonetheless, it is still useful to consider the student migration data to gain a general sense of the significance of undergraduate student migration to overall migration patterns in Massachusetts.¹⁵

Another way of gauging the contribution of the student population to migration flows is to estimate the student share of total in-migration into Massachusetts. Over the five years from 1995 to 2000, the Census Public Use Microdata Sample indicates that 370,046 individuals between the ages of 18 and 64 migrated into Massachusetts from other states. Using this information, it is possible to estimate an upper-bound estimate of domestic in-migration to the state for the purpose of attending col-

lege. To do so, we identified those in-migrant individuals who were 18 through 22 years of age and identified themselves as students in 2000.¹⁶ These individuals were of the traditional age for entering college at some point between 1995 and 2000, and since they were students in 2000, they may have migrated from another state to attend college. According to the US Census, 63,650 in-migrants met this description between 1995 and 2000, compared with the total of 370,046 interstate in-migrants tracked by the Census over the same period.¹⁷ Thus, the students represent about 17 percent of total estimated in-migration over the five-year period. This demonstrates that higher education is a powerful force in attracting college-age in-migrants, but it does not fully explain migration patterns in Massachusetts.¹⁸

Economic Status

Employment

The employment status of migrants and non-migrants is similar. Over 71 percent of in-migrants, just under 70 percent of out-migrants and 76 percent of the non-migrant population reported being employed (Table 4). In- and out-migrants report nearly identical unemployment rates, 4.9 percent and 4.8 percent respectively. (The Census question refers to employment status for the census week in April 2000.) These rates are considerably higher than the 3.3 percent reported by the non-migrant population. The difference in these figures may be the result of some migrants (or their spouses) arriving here without jobs, and subsequently launching a job search. About 23 percent of both in- and out-migrants were not in the labor force, compared to just over 20 percent for the non-migrant population.

Table 4

Employment Status of Massachusetts Working-Age Population, by Migration Status (numbers in percent)

	IN-MIGRANT	OUT-MIGRANT	NON-MIGRANT
Employed	71.2	69.7	76.2
Unemployed	4.9	4.8	3.3
Armed Forces	0.8	2.6	0.1
Not in the labor force	23.1	23.0	20.5

Source: U.S. Census Bureau, 2000 Census 1% Public Use Microdata Sample

Occupation and Industry

Along with educational attainment, a person's occupation is one of the best measures of the skill-level of the state's labor force and the quality of jobs. The contrast between the occupational profile of migrants and that of non-migrants is significant for understanding the importance of migration to the state's economy. This contrast is greatest for the occupational category representing what are arguably the best paying jobs in the economy: professional and managerial occupations. While just under 35 percent of the non-migrant population falls into this occupational category, nearly half (47%) of in-migrants and out-migrants (46%) report working in professional and managerial occupations (Table 5).

Table 5

Occupational Status and Industry of Employment of Massachusetts Working-Age Population, by Migration Status (numbers in percent)

	IN-MIGRANT	OUT-MIGRANT	NON-MIGRANT
Managerial & Professional Occupation	47.3	45.9	34.7
Knowledge Sector	51.9	47.1	41.5

Source: U.S. Census Bureau, 2000 Census 1% Public Use Microdata Sample

Understanding what industries migrants work in also offers insight into how the migration process "feeds" the Massachusetts economy—which, especially in the eastern part of the state, emphasizes information technology, financial services, technical and management consulting, and educational and health services. These industries roughly approximate what have been termed the Knowledge Sectors.¹⁹ Just over 41 percent of the non-migrant population works in this broadly defined sector, compared with just under 52 percent for the in-migrant population and 47 percent for the out-migrants.²⁰ In other words, the people moving into and out of our state disproportionately fill jobs in industries that represent the future of the Massachusetts economy.

These differences between migrants and non-migrants highlight the potential for migration streams to either improve the quality of our labor force by drawing skilled people to the state or to threaten it by removing those young workers with the greatest levels of skill to other states.

DESTINATIONS AND ORIGINS

Where do people from Massachusetts go? And from which states do the newcomers in Massachusetts come?²¹ New Hampshire was the number one destination state of those leaving Massachusetts during the 1990s. On the top ten destination list, Florida ranked second and was followed by California, New York, and all other New England states with the exception of Vermont (Table 6). It turns out that the states that migrants from Massachusetts move to are the same states that new migrants to Massachusetts come from (Table 7). The top ten list of states of origin of in-migrants include: New York, New Hampshire,

Table 6

Top 10 Destinations of Out-Migrants from Massachusetts, 1990-2002

STATE	TOTAL OUT-MIGRANTS FROM MASSACHUSETTS
NEW HAMPSHIRE	183,509
FLORIDA	167,805
CALIFORNIA	98,630
NEW YORK*	89,289
CONNECTICUT*	77,777
RHODE ISLAND*	70,104
MAINE	39,502
NEW JERSEY*	29,367
TEXAS	28,395
VIRGINIA	25,851

*Massachusetts, on net, attracted more people from the indicated states than it lost over this time period.

Source: Author's calculations of IRS data.

Table 7

Top 10 Origins of In-Migrants to Massachusetts, 1990-2002

STATE	TOTAL IN-MIGRANTS TO MASSACHUSETTS
NEW YORK*	117,959
NEW HAMPSHIRE	105,308
CONNECTICUT*	92,774
CALIFORNIA	74,652
RHODE ISLAND*	72,999
FLORIDA	68,723
NEW JERSEY*	39,039
PENNSYLVANIA*	26,962
MAINE	23,794
TEXAS	21,164

*Massachusetts, on net, attracted more people from the indicated states than it lost over this time period.

Source: Author's calculations of IRS data.

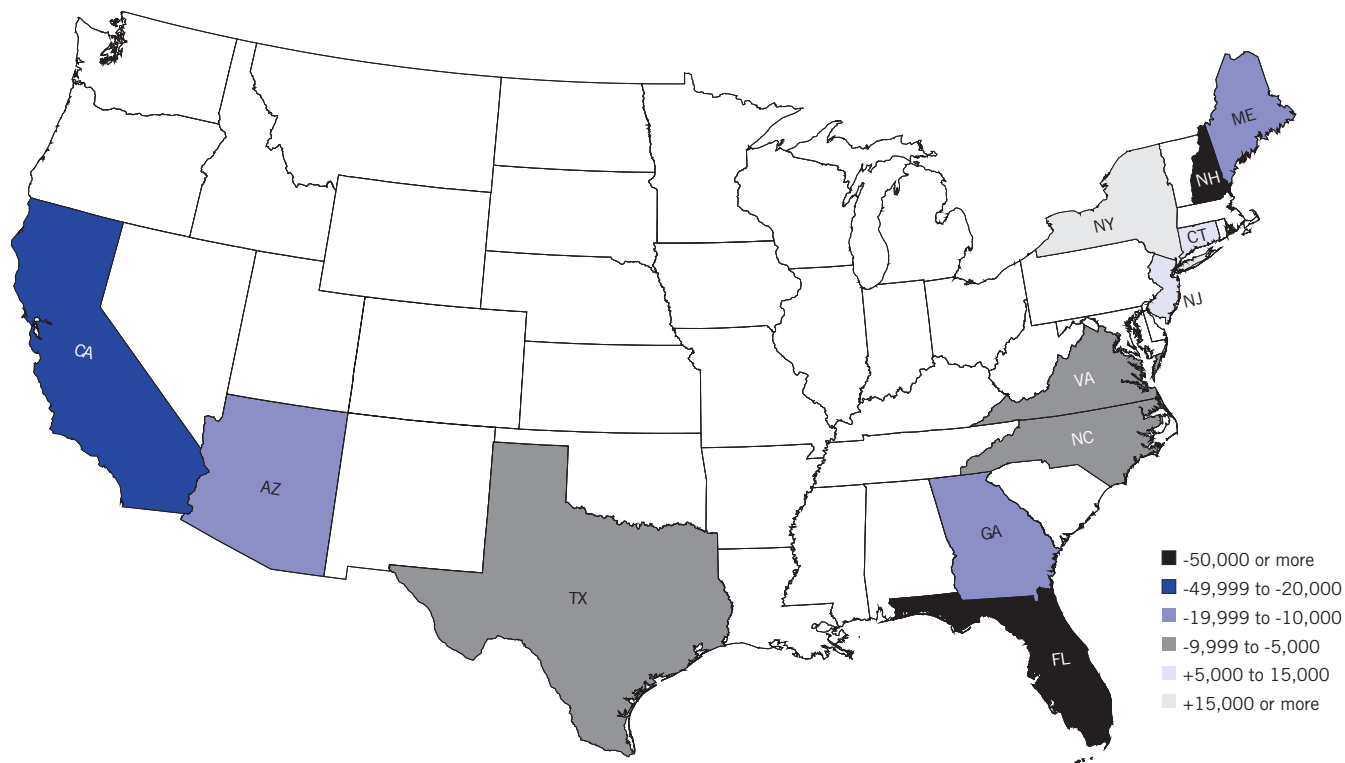
Connecticut, California, Rhode Island. The overlap of the states where in-migrants come from and where out-migrants go suggests that Massachusetts is engaged in a good deal of population exchange with a specific set of states.

Looking only at the origins and destinations of migrants, however, does not tell us the whole story; specifically it does not reveal the net total of exchange with an individual state. In some instances, in net total, Massachusetts gained more people than we lost, while in other instances we lost more people than we gained. If we rank the forty-nine states plus the District of Columbia in terms of net-migration, some interesting patterns emerge (Figure 5). First, it is clear that we are net-negative (31 states) with far more states than we are net-positive (17 states) (Table 8, see page 22).²² Florida tops the residential trade deficit list; on balance over the last twelve years, Massachusetts lost 99,082 residents to the Sunshine State. Florida, of course, is an unusual state because of the substantial retirement migration flow. Of all the out-migrants to Florida, about 42,000 (42%), are 55 years and older. While this is a significant number, it still means that 57,071 out-migrants to Florida, the majority, are neither retirees nor pre-retirees. Rather, they are younger than 55 years old. Florida is followed by New Hampshire, where Massachusetts suffered a net loss of 78,201 people. California ranks third on the list with a loss of 23,978 Bay Staters to the Golden state. Another New England state, Maine, ranks fourth, with Massachusetts losing 15,708 people.

After Maine come two unexpected states: Georgia and Arizona. The Commonwealth lost roughly 11,000 residents to each of these two states. Although our analysis cannot pinpoint the reasons for this large out-migration, the pattern is consistent with a larger national trend. Both of these states rank as top destinations for people across the country. Other analyses of Census data find that Atlanta, Georgia; Orlando, Florida; and Phoenix, Arizona, were three of the top cities in attracting young single people who had a college diploma.²³ Other states where the loss of people exceeded 5,000 people include: North Carolina, Texas, Virginia, and Colorado. The remaining states with whom our migration exchange was net-negative represent all regions of the country. Clearly, in the competition for people, state by state, Massachusetts

Figure 5

Net Migration Flows Between Massachusetts and Selected States, 1990-2002



Source: Author's calculations of IRS data

is typically on the losing side.

There are only a handful of states from which Massachusetts gains people in appreciable numbers. New York tops the list and is a leading “feeder state” for Massachusetts. Over the last twelve years, on balance, Massachusetts gained 28,670 people from the Empire State. The only other two states from which there was a sizeable influx of people during this same period are Connecticut (+14,997) and New Jersey (+9,672). While these gains help to offset the losses, they are too concentrated in far too few states to counter the overall loss of over 200,000 people. Moreover, as we shall see, the trend is changing with some of the states where we have traditionally been net-positive.

MIGRATION TO AND FROM THE NEW ENGLAND STATES

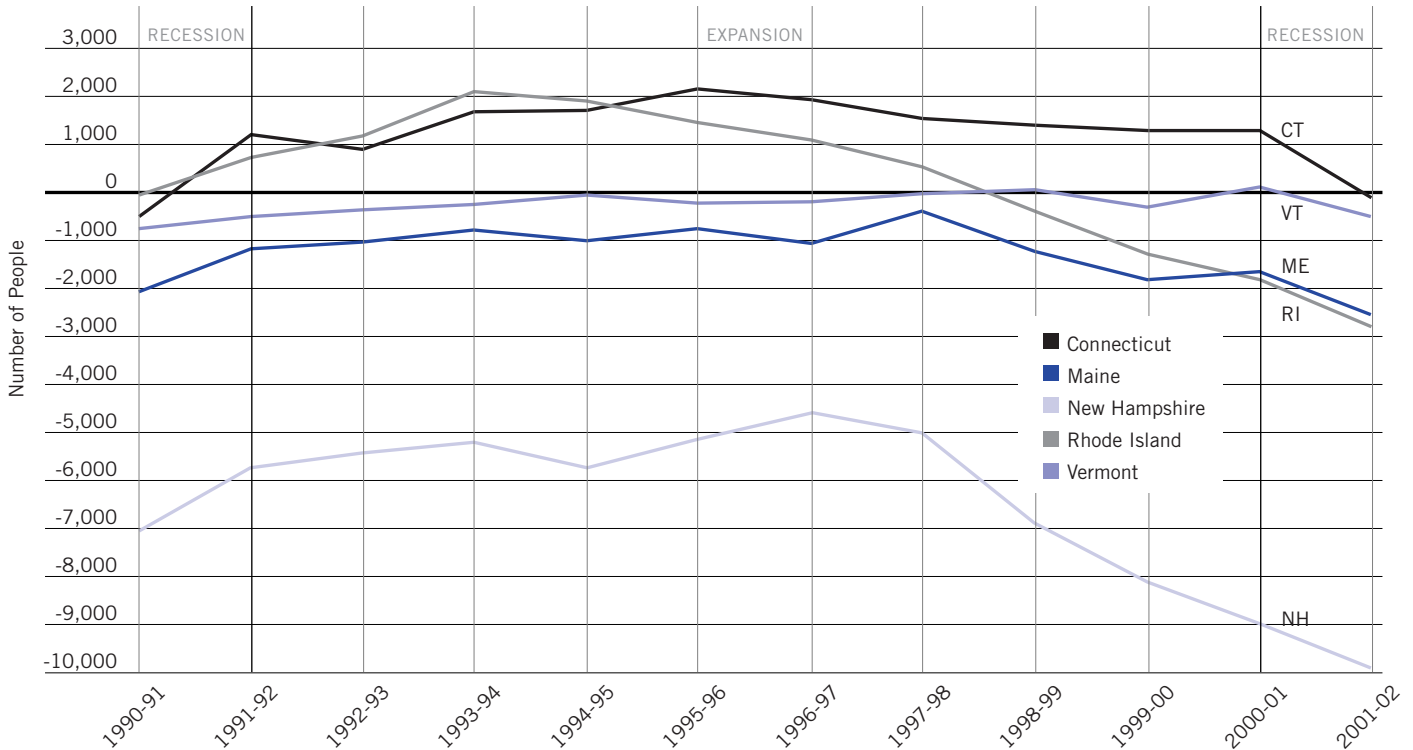
Perhaps not surprisingly, there is significant flow of people between Massachusetts and the other New England states. One out of every four in-migrants (25%) came from a New England state, and of all out-migrants, 27

percent moved to a New England state. Except for Vermont (the least populous state in the region), each of the other four New England states are on the top ten list of origins and destinations. When we examine the patterns of population exchange with our New England neighbors, a troubling pattern emerges. Not only are we exporting Massachusetts residents to the rest of New England, but the rate of loss has been accelerating over the last five years (Figure 6). The vast majority of the loss is to New Hampshire. Indeed, the out-migration of Massachusetts residents to New Hampshire significantly outpaced the flow of in-migrants from the Granite State between 1990 and 2002, with a net loss to the Commonwealth of 78,201 residents. The Commonwealth also steadily lost more residents than it gained to both Maine and Vermont in this same period. Overall, over the last twelve years, Massachusetts, on net, lost 79,031 people to the other New England states.

During this period, there were two New England states—Connecticut and Rhode Island—where Massa-

Figure 6

Net Migration Between Massachusetts and Other New England States, 1990-2002



Source: Author's calculations of IRS data

Massachusetts attracted more residents than it lost. On balance, Massachusetts gained 14,997 people from Connecticut and 2,895 people from Rhode Island. However, during recent years, the trend with both of these states has changed. Since 1996-97, the gain from Connecticut has been decreasing in size, and, in the most recent year (2001-02), on net, Massachusetts actually lost forty-seven people to the Nutmeg State. The change in the population exchange with Rhode Island is even more dramatic. For the last four years, Massachusetts has been net-negative with Rhode Island. In fact, over the last four years, on balance, Massachusetts has lost 6,323 people to Rhode Island.

It is important to realize that this recent downward trend started when the Massachusetts economy was strong. These were times when, because of many job opportunities, our state should have been attracting, not losing, people. Thus, the current losing trend does not simply reflect the recent tough economic times but appears to be a problem with more complex roots. Both Connecticut and Rhode Island have been members of a

small subset of states from which Massachusetts attracts more residents than it loses (Figure 7). If the current trends continue, Massachusetts will be even more net-negative overall in its loss of residents.

Given both the geography and the compact size of the Bay State, it is relatively easy to work in Massachusetts but live in another state. (The same, for instance, is not true for people who work in California's Silicon Valley or the Research Triangle in North Carolina.) Lower housing costs, more open space, and lower taxes are some of the attractions that draw people across the state's borders. Of critical concern is the extent to which the out-migrants who move to other New England states remain connected to the Massachusetts labor market. Our analysis of the 2000 Census data indicates that except for residents of New Hampshire and Rhode Island, the number of people who sleep in another state but work in Massachusetts is negligible. Even in New Hampshire and Rhode Island, a significant majority of out-migrants both live and work in their new state of residence. In New Hampshire,

Table 8

Net Migration Between Massachusetts and the 50 States*

STATE	NET MIGRATION, 1990-2002
Florida	-99,082
New Hampshire	-78,201
California	-23,978
Maine	-15,708
Georgia	-11,331
Arizona	-11,033
North Carolina	-8,983
Texas	-7,231
Virginia	-7,220
Colorado	-5,704
Washington	-4,516
Maryland	-4,354
Nevada	-3,794
South Carolina	-3,506
Vermont	-3,014
District of Columbia	-2,245
Oregon	-1,483
Tennessee	-1,117
New Mexico	-954
Alabama	-341
Minnesota	-246
Hawaii	-231
Kentucky	-201
Alaska	-148
Ohio	-129
Delaware	-95
Louisiana	-74
Idaho	-31
Montana	-21
West Virginia	-21
Mississippi	-13
Oklahoma	11
Wisconsin	17
Wyoming	26
Missouri	30
Arkansas	65
Iowa	122
Kansas	174
Illinois	231
Indiana	236
Nebraska	292
Utah	326
Michigan	809
Pennsylvania	2,433
Rhode Island	2,895
New Jersey	9,672
Connecticut	14,997
New York	28,670

*Because of small migration flows that would violate disclosure rules, North Dakota and South Dakota are excluded from the state migration data.

Source: Author's calculations of IRS data.

slightly more than one-quarter of the out-migrants continue to work in Massachusetts, and in Rhode Island, slightly less than one-quarter continue to work in Massachusetts. For those people who live in New Hampshire or Rhode Island and work in Massachusetts, other questions emerge about increased traffic, loss of local economic activity, and limited opportunities to participate in their local communities. But, again, these people are the exception to the overall pattern of out-migrants. The overwhelming majority of people who leave the Bay State to live in another New England state (80%) do not continue to work in Massachusetts.

When we examine the characteristics of in-migrants, they are remarkably similar. Massachusetts attracts a very specific type of person. No matter where they are coming from, they tend to be young, unmarried, highly educated professionals and managers who work in knowledge sectors of the economy. But, the profile of New England out-migrants is especially noteworthy, because they look different from other out-migrants (Table 9). New England migrants are slightly older than other migrants, and they are much more likely to have been born in Massachusetts. Over half (53%) of the New England migrants were born in Massachusetts, compared with just under 36 percent of all other out-migrants. They are also more likely to be married with children. While they are well-educated, with 38.2 percent holding at least a bachelor's degree, not as many hold a college degree as do the rest of the migrant population, over 53 percent of whom hold at least a bachelor's degree. Furthermore, compared to other out-migrants, they are less likely to

Table 9

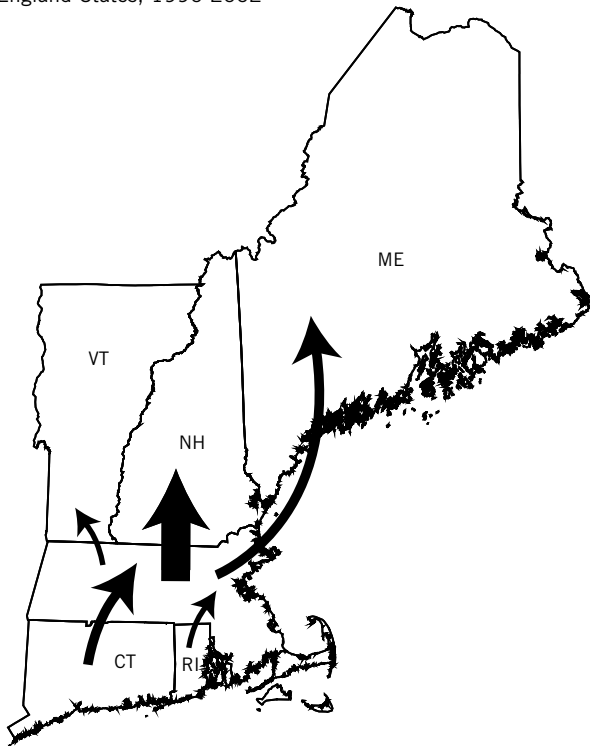
Characteristics of Working-Age New England Out-Migrants Compared to Other Out-Migrants (numbers in percent unless otherwise noted)

CHARACTERISTIC	NEW ENGLAND OUT-MIGRANTS	ALL OTHER OUT-MIGRANTS
Bachelor's Degree or Higher	38.2	53.6
Professional/Managerial Occupation	41.2	47.9
Knowledge Sector	43.3	48.6
Median Age (years)	33	31
Population 18-34 years old	56.0	60.4
Married	52.6	44.5
Children in Household	31.9	26.5
Born in Massachusetts	52.8	35.8

Source: U.S. Census, 2000 Census 1% Public Use Microdata Sample

Figure 7

Net Migration Flows Between Massachusetts and the other New England States, 1990-2002



Source: Author's calculations of IRS data

work in the knowledge economy or occupy a professional or managerial position. If we add up all of these characteristics, it seems that Massachusetts is losing a significant number of native-born, middle-class families to the rest of New England.

MIGRATION TO AND FROM OUR ECONOMIC COMPETITOR STATES

As our demographic analysis has documented, migrants tend to be relatively young, well-educated, and more highly concentrated in the knowledge sectors of the economy. While Massachusetts is known for its high-tech, high-skilled industry mix, it is certainly not the only such state with this distinction. Accordingly, highly educated “knowledge workers” have many choices about where to live and work. It is important to assess how well Massachusetts competes for these highly mobile and highly valuable workers. To do this, we study the migration between Massachusetts and our economic competitor states. For this analysis, we have identified a set of “high-

technology states” commonly recognized as Economic Competitors for Massachusetts. These states include California, Colorado, Connecticut, Minnesota, New Jersey, and New York, which are the six “Leading Technology States” identified by the Massachusetts Technology Collaborative (MTC).²⁴ We also include North Carolina, long seen as a competitor because of the presence of the Research Triangle area adjacent to the University of North Carolina, Duke University, and North Carolina State University.

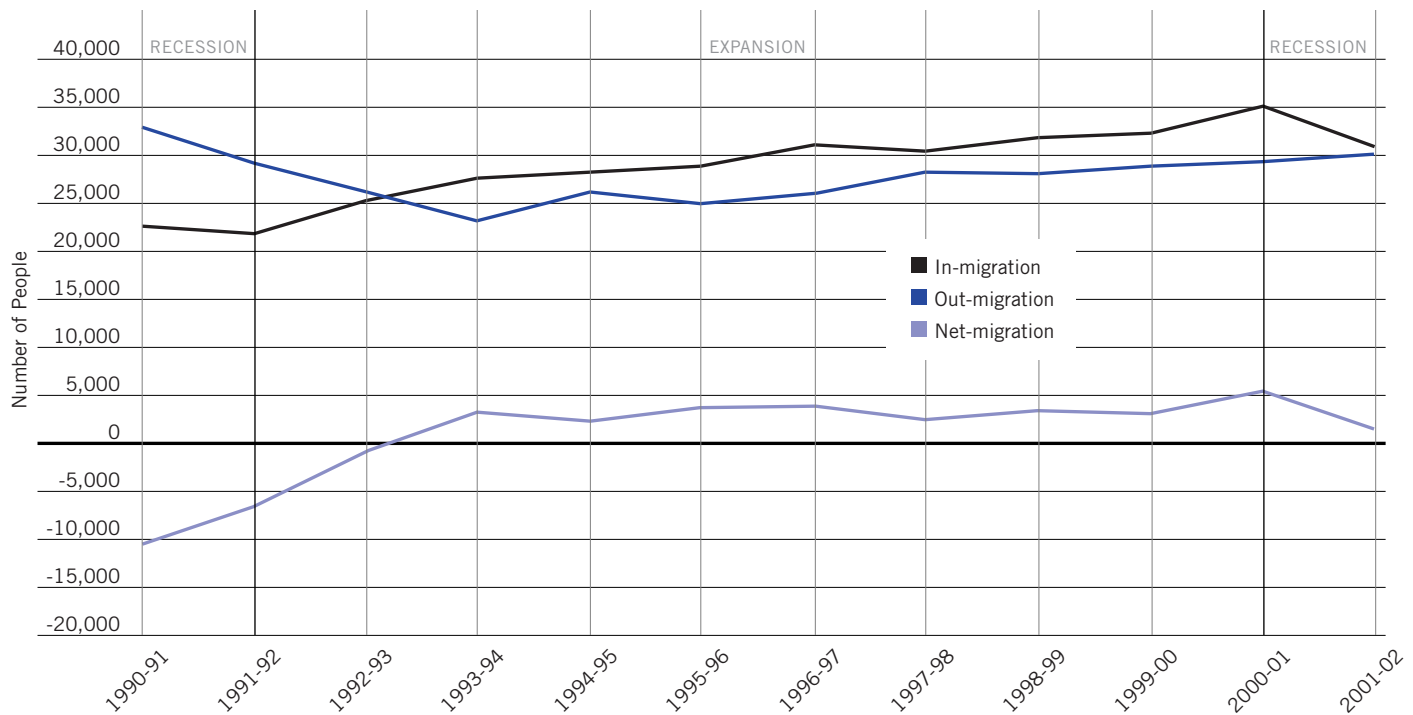
From 1990 through 2002, there was a considerable exchange of residents between Massachusetts and these high-tech competitor states. Approximately 28 percent of all the people entering Massachusetts since 1990 came from one of these seven states, while 23 percent of all the people leaving Massachusetts during the same period moved to one of these high-tech states. Overall, when compared with our economic competitors, Massachusetts has been winning in the contest to attract people. Even with the past two years of shaky economic times, Massachusetts has been net-positive compared with our economic competitors. Overall, Massachusetts gained 14,428 people from our economic competitors over the last twelve years (Figure 8).

A closer look, however, reveals considerable variation in migration patterns between Massachusetts and individual high-tech states (Figure 9). The distance of a prospective move appears to be an important consideration to a migrant (Figure 10). Since 1990, the largest exchange of migrants occurred between Massachusetts and the other Northeastern high-tech states—New York, New Jersey, and Connecticut. From 1990 through 2002, about one out of every five migrants (249,772 people) moved to Massachusetts from these three states. At the same time, about 14 percent of migrants leaving Massachusetts (196,433 people) went to these three states. Even with the onset of the latest recession, Massachusetts gained 53,339 people from our regional competitor states during the last twelve years.

The story changes when we examine migration patterns with more distant high-tech competitor states. Recall that the set of high-tech states outside the Northeast includes California, Colorado, Minnesota, and North Carolina. From 1990 through 2002, Massachusetts received 99,807 migrants from these states, representing

Figure 8

In-Migration and Out-Migration with Economic Competitor States, 1990-2002



Source: Author's calculations of IRS data

8 percent of all migration into the state. In contrast, 138,718 migrants left Massachusetts for one of these four states, representing nearly 10 percent of all out-migrants. Thus, we lost a total of 38,911 people to our long-distance competitors. California, the most populous state, dominates the migration flows among these four states. From 1990 through 2002, 74,652 migrants moved from

California to Massachusetts, while 98,630 migrants left the state for California. That represents a total net loss of 23,978 people to California. Over time, we are losing more people to our competitor states outside the Northeast than we are attracting.

As has been noted, the profiles of the in-migrants are remarkable in their similarities (Table 10). Beyond just

Table 10

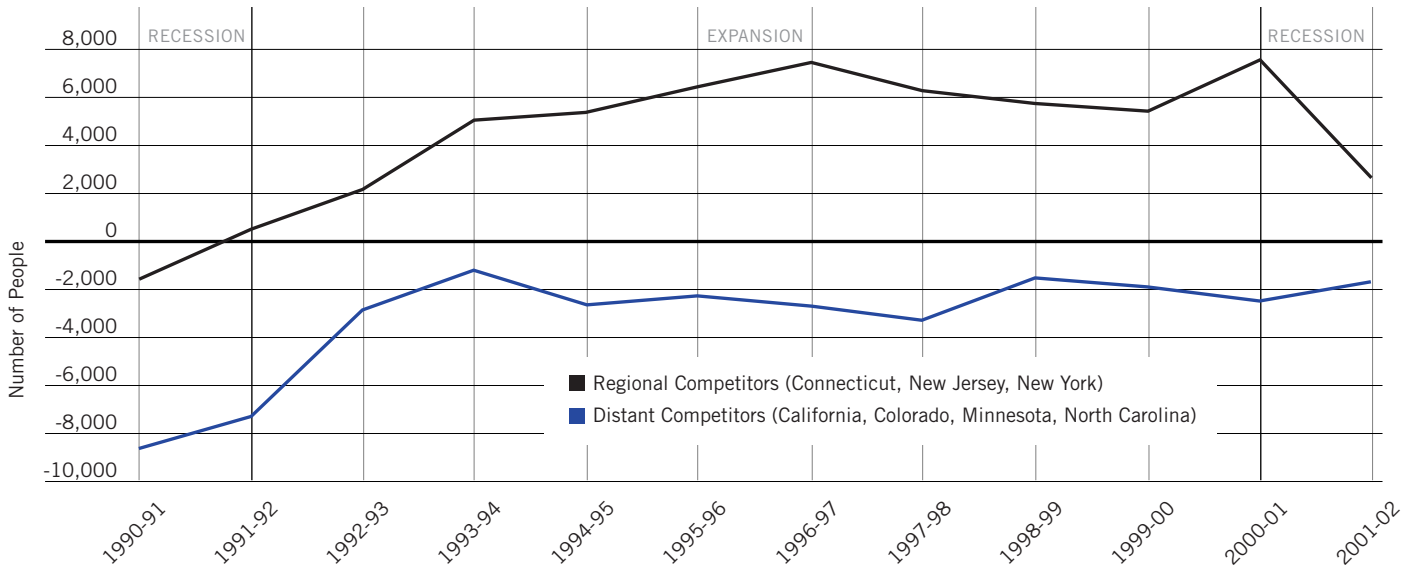
Characteristics of Different Working-Age In-Migrants Compared to the Non-Migrant Population (numbers in percent unless otherwise noted)

CHARACTERISTIC	ECONOMIC COMPETITOR IN-MIGRANTS	NEW ENGLAND IN-MIGRANTS	ALL OTHER IN-MIGRANTS	NON-MIGRANTS
Bachelor's Degree or Higher	50.1	49.2	54.1	32.4
Professional/Managerial Occupation	48.3	47.2	46.1	34.7
Knowledge Sector	52.2	51.0	52.0	41.5
Median Age (years)	28	29	30	41
Population 18-34 years old	67.2	65.3	65.3	32.9
Married	38.7	38.7	41.9	56.6
Children in Household	27.0	28.4	28.9	40.2
Born in Massachusetts	13.6	27.9	20.6	64.8

Source: U.S. Census, 2000 Census 1% Public Use Microdata Sample

Figure 9

Net Migration with Regional and Distant Economic Competitor States, 1990-2002



Source: Author's calculations of IRS data

raw numbers, the contrast between the profile of Economic Competitor out-migrants and all other out-migrants is striking, however (Table 11). Over 50 percent of migrants arriving in Massachusetts from our economic competitors have a baccalaureate degree or higher, as do over 61 percent of those leaving for these states. The extraordinarily high level of education of these migrants is quite different from that of the migrants who do not move to these competitor states. For those out-migrants, a considerably smaller proportion—approximately 43 percent—have a baccalaureate degree or higher.

In addition, more than 54 percent of migrants leaving Massachusetts for the Economic Competitor states are managers and professionals, while over 48 percent of those arriving from the competitor states are in these occupations. That figure compares with just under 42 percent among the migrants leaving Massachusetts for all other states. Thus, the “brain exchange” with our Economic Competitors doesn’t only represent a significant portion of the total migration flows for Massachusetts. Just as importantly, the Economic Competitor migrants are highly educated workers concentrated in jobs that epitomize the future of the Massachusetts economy.

Table 11

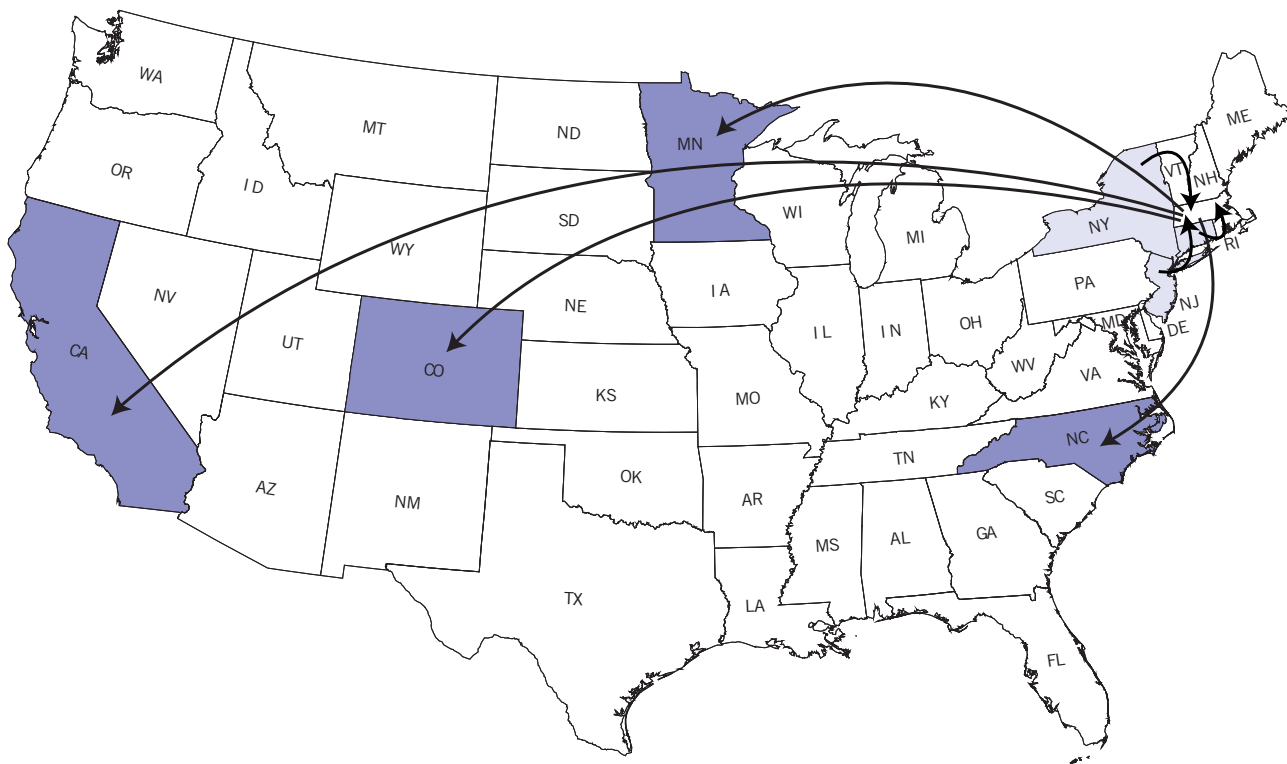
Characteristics of Working-Age Economic Competitor Out-Migrants Compared to Other Out-Migrants (numbers in percent unless otherwise noted)

CHARACTERISTIC	ECONOMIC COMPETITOR OUT-MIGRANTS	ALL OTHER OUT-MIGRANTS
Bachelor’s Degree or Higher	61.2	43.0
Professional/Managerial Occupation	54.2	41.7
Knowledge Sector	55.5	42.8
Median Age (years)	30	33
Population 18-34 years old	67.8	54.7
Married	41.9	49.3
Children in Household	24.2	30.0
Born in Massachusetts	33.2	44.7

Source: U.S. Census, 2000 Census 1% Public Use Microdata Sample

Figure 10

Net Migration Flows Between Massachusetts and Economic Competitor States, 1990-2002



Source: Author's calculations of IRS data

DISCUSSION

One of the principal findings of this study is that the migrant population is not like everybody else. Migrants are younger, better educated, and more likely to work in the knowledge economy than are the non-migrant population. These highly mobile individuals are attracted to regions of the country that can best utilize their education and skills. Massachusetts, therefore, not only must compete with other high-technology regions of the country for jobs; it also must compete for qualified workers to fill those jobs.²⁵

Over the past twelve years Massachusetts' performance in this competition has been mixed. Overall, during this period, Massachusetts has lost significantly more people than it has attracted—leaving the state with a deficit of 213,000 domestic migrants. (The state's population and labor force grew slightly during this period because of a gain of international immigrants.) That aggregate number, however, masks important differences. While the

in-migrants that Massachusetts attracts are remarkably similar in their characteristics—young, unmarried, highly educated professionals and managers who work in the knowledge sectors of the economy—there are key differences among the out-migrants.

In the case of the New England out-migrant, Massachusetts appears to be losing many native-born, middle-class families to the other New England states. Between 1990 and 2002, on net, Massachusetts lost almost 80,000 people to the other New England states over the past twelve years. Moreover, the loss of these families has accelerated over the last five years. Significantly, the vast majority of the people who migrate to another New England state do not continue to work in Massachusetts.

In contrast, Massachusetts has been winning the competition for the Economic Competitor migrants, gaining, on net, over 14,000 of them over the last twelve years. Although we have been gaining residents from our regional competitors, we have been losing residents to our long-

distance competitors. It is uncertain what the future exchange will look like, however, because the pattern of exchange with Connecticut—a New England neighbor and an Economic Competitor—has changed in recent years. Historically, Connecticut has been an important feeder state for the Commonwealth, but if the current trend continues, Massachusetts will no longer be net-positive with Connecticut. This is clear evidence that migration patterns can and do change, suggesting that policy-makers cannot afford to be complacent in their efforts to attract and retain knowledge workers and their families.

Although this study has focused on domestic migration, it is important to note that another source of population inflow is international immigration. Immigrants have become a key source of labor force growth in Massachusetts. A recent study by Andrew Sum and his colleagues documents the magnitude of international immigration to New England and its importance to the Massachusetts labor market.²⁶ It is clear that foreign immigrants to our state are playing a critical role in helping to keep our economy afloat. In a state with a steady outflow of workers, we have no workers to spare.

At the same time, it would be a mistake to think of these new immigrants as an economic substitute for the migrants who are leaving the state. Sum and his colleagues document substantially lower levels of education among the new immigrants compared with the native-born. “About 25 percent of New England’s new immigrants lacked a high school diploma or GED, compared with only 9 percent of the native born. At the same time, 31 percent of the new immigrant workers held a bachelor’s degree or higher, only slightly below the native-born share of 34 percent.”²⁷ As this study documents, domestic migrants have significantly higher levels of educational attainment than either international immigrants or even the non-migrants. Furthermore, to the extent that the Commonwealth increasingly depends on international immigrants to fuel its economy, it will have to be willing to bear the consequences if federal immigration policies change, decreasing the number of visas available to foreigners.

Policy-makers and business leaders across the Commonwealth should recognize that the growth of the knowledge sector industries in Massachusetts and all of its

regions—and the state’s economic recovery—will depend in important ways on the degree to which we can retain and expand the available pool of well-educated “knowledge workers.” This includes both the Economic Competitor and New England migrants. Massachusetts faces the ongoing challenge of making the Commonwealth the most attractive place for both highly mobile individuals and native-born families to settle down and lay deep roots, in good and bad economic times.

A recent MassINC survey offers some insights about this challenge. In this survey, one quarter of Massachusetts residents said they would like to move out of the state if they had the opportunity. The people who would like to move were clearly dissatisfied with the quality of life in Massachusetts, with 49 percent calling it either fair or poor. The potential movers were also three times as likely as those who did not want to move to believe that life in Massachusetts is worse than in other parts of the country. Personal finances and the high cost of living were dominant concerns for these people. In fact, their number one reason for wanting to move was “to go somewhere with a lower cost of living or lower taxes.” In addition, the potential movers cited other concerns such as the weather and congestion as reasons for their desire to leave.²⁸ Overall, the survey demonstrates how issues around the quality of life must become a key part of the state’s economic strategy.

While leaders across the state must invest in both attracting and retaining migrants, it would be a mistake for the Commonwealth to depend entirely on in-migrants for its supply of knowledge workers. As this and other studies of migration have demonstrated, those that migrate to Massachusetts from other states are more likely to migrate from Massachusetts to other states in the future. While native residents of Massachusetts are generally more reluctant to leave, the accelerating middle-class flight to New England suggests the need for strategies to help them stay as well. In addition, policy-makers should further support efforts to improve access to the education and training programs—from basic skills and English language classes to improved access to higher education—needed by many native Massachusetts residents to thrive in the state’s 21st-century workplace.²⁹ Previous analysis of the employment and wage experiences of workers across the Commonwealth suggests that achiev-

ing this goal would assure and sustain future economic growth for the Commonwealth while providing new and better opportunities for a greater number of the state's working families.³⁰

So there are multiple and simultaneous challenges: We must continue to attract—and do more to retain—skilled employees drawn to Massachusetts from other states. We must also work to enable native-born middle-

class families to make Massachusetts their home. And, finally, we must invest and extend opportunities to people who already live here, giving them access to the education and training they need to be able to command the better salaries provided by our leading industries. Then, they too will be able to share more broadly in the economic benefits, while helping to fuel a strong Massachusetts economy.

Endnotes

- 1 Sum, Andrew M., Paul Harrington, Neeta Fogg, et al. 2002. *The State of the American Dream in Massachusetts, 2002*. MassINC.
- 2 Migration flow data are estimated from IRS tax records. The Internal Revenue Service compiles tax return data in order to estimate annual state migration flows. This is done by comparing from year to year the states in which households file tax returns. A migration is recorded whenever the state of filing is different from one year to the next. Each annual migration flow estimate contains information on the aggregate number of exemptions. By using the exemptions data (which approximate household size), we were able to estimate the number of individuals. As with all data, there are limitations to the IRS data. In the case of the IRS data, only federal tax filers are included in the database. In addition, a person must appear in two consecutive years in order to enter the database, which means the movements of some people may be missed by the IRS. Certain populations, particularly students, will not be tracked well by this data. Because of privacy concerns for individual families, there must be at least 10 observations in a given year for that state to be identified. If there are fewer than 10 observations, the migration is still recorded but not attached to the state.

As an alternative source of migration data, the Census Bureau calculates annual net migration estimates by state. It bases its estimate on the IRS data but modifies these data to adjust for the over-65 population and for people who live in group quarters (mental institutions, prisons, residential military bases, and student dormitories). There are limitations to the Census estimates, in particular because of the difficulties of accurately estimating the student population. In addition, the Census data are net, rather than gross migration. For each state, out-migration is subtracted from in-migration, leaving the net flow. Net migration data make it impossible to chart origins or destinations of migrants, a key part of this study. We chose to use the IRS estimates because they allow us to examine the destinations of those who leave Massachusetts and the origins of those who move to Massachusetts. Despite its limitations, we are confident that the IRS data capture the pattern of migration related to labor force movement as well as any other available data. We use Census data in this report to analyze individual characteristics of in-migrants and out-migrants, something that the IRS data does not allow us to do.
- 3 Some of the migration measured by the IRS is related to retirement. Although the IRS data are not disaggregated by age, we use the 2000 Census data to estimate the magnitude of retirement migration. Approximately 95 percent of all tax filers migrating into Massachusetts were between 18 and 64 years old, and about 91 percent of the out-migrants were of working age. Clearly, almost all of the migration is labor-force-related. However, there is one key exception: the state of Florida. Approximately 29 percent of the migrants departing Massachusetts for Florida are over 65 years old. Interestingly, 18 percent of the in-migrants to Massachusetts from Florida are retirement age. Migration to the other New England states contains a slightly higher than average portion of people older than 65.
- 4 For more about the role of immigrants in the Massachusetts economy, see Sum, Andrew M., W. Neal Fogg, et al. 1999. *The Changing Workforce: Immigrants and the New Economy in Massachusetts*, MassINC.
- 5 According to County Business Patterns, employment in the financial services industry (defined as banking, insurance, and asset management) in Massachusetts in 2001 was 215,087. For more detail, see <http://censtats.census.gov/cbpnaic/cbpnaic.shtml>.
- 6 Massachusetts Biotechnology Council and the Boston Consulting Group. 2003. *Mass Biotech 2010: Achieving Leadership in the Life Sciences Economy*.
- 7 See Harrington, P. and Fogg, N. 1997. *Is There a Labor Shortage? A Review of the Evidence for Massachusetts and New England*, Center for Labor Market Studies, Northeastern University.
- 8 This analysis does not consider international immigration, although some of the people who migrate domestically are immigrants who are already living in the United States.

- 9 The following discussion of the migration literature is informed by the work of J.L. Gallup and Michael Greenwood. See Gallup, J.L. 1997. Theories of Migration. *Development Discussion Paper No. 569*, Harvard Institute for International Development, Harvard University; Greenwood, Michael. 1985. Human Migration: Theory, Models, and Empirical Studies. *Journal of Regional Science*, Vol. 25, pp. 521-544; and Greenwood, Michael. 1996. Research on Internal Migration in the United States: A Survey. In *Regional Housing and Labor Markets*, Manfred M. Fischer, Kenneth J. Button, and Peter Nijkamp, editors, pp. 397-433. Lyme, NH: Elgar.
- 10 See Granovetter, M. 1973. The Strength of Weak Ties. *American Journal of Sociology* 78 (6), pp. 1360-1380; Granovetter, Mark S. 1974. *Getting a Job*. Cambridge, MA: Harvard University Press.
- 11 Characteristics of migrants and non-migrants are derived from the 1% Public Use Microdata Sample (PUMS) of the 2000 Census of Population and Housing. These files contain records for a sample of households with information on the characteristics of each unit and each person in it, while preserving confidentiality (by removing identifiers). These microdata files permit users to analyze the demographic/socioeconomic characteristics of 1% of the respondents to the Census long-form questionnaire, administered to one in six housing units/households. Migrants and non-migrants are identified based on responses to the "five-year residence question." The long form which is used to construct the Public Use Sample of the 2000 Census contained a question on the state of residence of the respondent in 1995. By comparing the state of residence in 1995 with the state of residence in 2000, migrants can be identified. Note that if an individual migrates more than once between 1995 and 2000, only one of the moves will be recorded. In addition, if a person leaves a state after 1995 and returns to the same state prior to the Census date in 2000, this migration will go unrecorded.
- 12 Some of the in-migrants are immigrants from foreign countries. For the purpose of this study, if Massachusetts is not an international immigrant's first stop in the United States, that person would be counted as a domestic migrant because he moves to Massachusetts from another state. In fact, slightly more than 15 percent of in-migrants were not born in the United States.
- 13 Some of the out-migrants who leave Massachusetts for another state are international immigrants. We find that slightly more than 13 percent of out-migrants were not born in the United States.
- 14 U.S. Department of Education, National Center for Education Statistics. 2001. *Integrated Postsecondary Education Data System (IPEDS), Spring 2001* (Table 19, page 37). Title IV Institutions include degree and certificate granting postsecondary institutions that participate in the federal financial aid programs. This includes vocational and trade schools as well as more traditional higher education institutions.
- 15 Estimating the migration patterns of students is a tricky enterprise because of their transient nature. Neither the Census nor the IRS does a good job of capturing their movement. For the decennial Census, students are supposed to be counted at their actual address at the time of the census, not as members of their parents' household, but in reality the latter often occurs. In addition, the Census has a difficult time counting students because their response rate is so low. Because of the problem of getting an accurate count of the student population, it is difficult to follow their migration patterns. We know that some students who come to Massachusetts for college decide to stay in Massachusetts after graduation, joining the Massachusetts labor force. These students will not be picked up by the IRS as in-migrants unless they filed federal tax returns on their own listing a non-Massachusetts address during their student years. The number who fit that description is likely small. Rather, it would seem that the majority of undergraduates would be claimed as dependents by their parents and hence would not file their own tax return during their college years. If their first tax return is filed in Massachusetts, then they will not be counted as an in-migrant. On the flip side, we have the same "counting" problem in reverse with Massachusetts students who leave the state to attend college and do not return after graduation. Thus, to some extent, the Massachusetts students who do not return to the state offset the new out-of-state graduates who join the Massachusetts workforce. But the magnitude of this exchange is not known. Given that we attract more students into the state than we lose, it seems likely that we are net-positive in the after-graduation exchange. There is also the difficulty of how students affect the count of out-migrants. One advantage of the IRS data is that we will not inadvertently count out-of-state students who leave Massachusetts after graduation as out-migrants. While this research focuses on the migration patterns of workers, the student question deserves further investigation.

- 16 We thank UMass Boston Professor Alan Clayton-Matthews for suggesting this procedure.
- 17 This figure does not take into account any of the state's residents who initially came into the state to attend college and have remained in the state after graduation.
- 18 For more information, see Kodrzycki, Yolanda. 2001. Migration of Recent College Graduates: Evidence from the National Longitudinal Survey of Youth, *New England Economic Review* 1 (January-February).
- 19 Farrant, Robert, Phillip Moss, and Chris Tilly. 2001. *Knowledge Sector Powerhouse: Reshaping Massachusetts Industries and Employment during the 1980s and 1990s*. Donahue Institute, University of Massachusetts.
- 20 The knowledge sector includes the following industries, as defined by the North American Industry Classification system: Information Technology; Finance, Insurance, and Real Estate; Professional, Scientific, Administrative, and Management Services; and Education, Health, and Social Services.
- 21 For this analysis, we rely on the IRS data and thus it is not limited to the working-age population, although recall that almost all of migration consists of working-age people.
- 22 Because of privacy concerns, the IRS does not disclose the number of migrants in a given state in a given year if the number of migrants is fewer than 10 people. Both North and South Dakota had fewer than 10 migrants every year between 1990 and 2002, and therefore, neither state appears in the final rankings.
- 23 U.S. Census Bureau. 2003. *Migration of the Young, Single, and College Educated: 1995 to 2000*. Census 2000 Special Reports, November.
- 24 Note that there is one state, Connecticut, that counts as both as an Economic Competitor and as a New England state.
- 25 Florida, Richard. 2002. *The Rise of the Creative Class: And How It's Transforming Work, Leisure, Community and Everyday Life*. New York: Basic Books.
- 26 Sum, Andrew, Mykhaylo Trubs'kyi, and Neeta P. Fogg. 2003. Imported Talent. *Connection: The Journal of the New England Board of Higher Education*, Summer, pp. 16-18.
- 27 *Ibid*, page 18.
- 28 See Princeton Survey Research Associates. 2003. *The Pursuit of Happiness: A Survey on the Quality of Life in Massachusetts*. MassINC.
- 29 Comings, John, Andrew Sum, and Johan Uvin. 2000. *New Skills for a New Economy: Adult Education's Key Role in Sustaining Economic Growth and Expanding Opportunity*, MassINC.
- 30 Goodman, M. and Nakosteen R. 2002. The Massachusetts Knowledge Sector: A Regional Perspective. *Massachusetts Benchmarks* 5 (2).

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