Playing the Lottery

The Impact of Interstate Relocation on Massachusetts Jobs

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by John Friar and Megan Gay

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Contents

Foreword 1

Executive Summary 2

Introduction 4

Data and Methodology 4

How Many Companies and Jobs Moved? 5

What States Are Jobs Going To and Coming From? 8

What Types of Establishments Are Moving? 13

What Industries Are Most Active in Interstate Relocation? 14

Which Municipalities Are Gaining and Losing from Interstate Relocation 15

Conclusion and Findings 20

Endnotes 22

About the Authors 21

Appendix I: In-Relocation Data 23

Appendix II: Out-Relocation Data 27

Appendix III: Expanded Methodology Discussion 31

Foreword

The Massachusetts economy has suffered – along with that of other states – through the effects of the latest recession. Massachusetts has faced the same economic pressures as the rest of the country, shedding jobs in 2008 and 2009. The state's unemployment rate has soared; hundreds of thousands of people are out of work, while the threat of a 'jobless recovery' looms for many workers.

In January, Pioneer Institute released *Failure to Thrive*, our first white paper in our series on jobs. It demonstrated that Massachusetts has failed to create jobs over the last eighteen years and is developing a problem with entrepreneurship. We followed that up with *Heading Down*, which showed the devastating impact that losing 5,000 headquarters has had on employment in Massachusetts.

Pioneer will build on these initial releases by continuing to examine important job creation issues. Future installments in the series, authored by John Friar, Pioneer Senior Fellow and Executive Professor of Entrepreneurship and Innovation at Northeastern University, and Megan Gay, Research Assistant, will examine which industries created jobs growth after the last two recessions, analyze Boston's job creation dynamics, and examine the changes in firm size.

As Massachusetts businesses and entrepreneurs take steps to enable the state to rebound from the recession, this series seeks to inform policymakers on how best to support those efforts.

The past eighteen years have marked a period of significant shifts in employment trends in Massachusetts. The end result – job losses as the rest of the nation's employment base has grown significantly – cannot be seen as a positive outcome for Massachusetts. Why has this happened? How can the state reverse this troubling trend? We need to examine the basic assumptions of current policies and find more effective ways to support our state's existing businesses and future entrepreneurs.

James Stergios

Executive Summary

Enticing companies to move to Massachusetts and providing special deals to keep companies from moving out of state has been a staple of economic development at the municipal and state levels. These efforts, however, are similar to playing the lottery: we all hear about people who win big prizes; but the odds of doing so are very long, and other than the occasional winner, everybody else loses. This study analyzes the relocation of establishments into and out of Massachusetts for the eighteen-year period before the current recession (1990-2007).

The study's first major finding is that Massachusetts is losing the relocation game: many more establishments have moved out of state than have entered, and the trend has worsened since 2000. At the net level, Massachusetts has lost 2,152 establishments and 24,088 jobs during this time period.

Although this result is discouraging, the net effect of establishments moving into or out of state in any single year is small. In 2007, a net of 195 establishments left the state. This amounted to a change in the number of establishments in Massachusetts of just one-twentieth of one percent (-.05%). The job loss amounted to a change of -.08%, again not even a rounding error in the overall picture.

Even in relation to job flux, relocation's overall effect is small. In an average year, 17% of all jobs in Massachusetts are created or lost. In 2007, 437,985 jobs were created or lost, of which relocation accounted for just 3.4%. Similarly, 54,808 establishments were created or lost, with only 1.8% of the total due to relocation.

The analysis found that a majority of establishments that relocate into Massachusetts move from neighboring states. Table 1 shows the five states that had the most establishments relocate to Massachusetts via In-Relocation.

Table 2 shows the following five states that had the most Massachusetts establishments move to them via Out-Relocation.

So, in large part, Massachusetts exchanges establishments with the same states. But an analysis of net gains and losses shows that the state's greatest gains come from states with high costs and taxation levels, and the state's largest losses are to states with lower tax levels and business costs.[1]

Table 3 shows the five states that Massachusetts realized the largest net gains in the number of establishments from, as a result of In-Relocation and Out-Relocation.

An examination of the various industries involved in relocation demonstrates that relocation is widespread, covering 732 industries. The industries where Massachusetts has the largest gains, however, are not the ones that immediately come to mind, such as high-technology. The state has gained little in any particular industry, but the leaders are mostly low tech, such as retailers.

Table 1: Total Number of Out-of-State Establishments that Relocated to MA

Ranking	Origin State	Total Number of Out-of-State Establishments that Relocated to MA (% of total In-Relocation establishments)
1	New Hampshire	679 (14.08%)
2	New York	584 (12.11%)
3	Rhode Island	558 (11.57%)
4	Connecticut	534 (11.07%)
5	California	391 (8.11%)

Table 2: Total Number of MA Establishments that Relocated Out of State

Ranking	Destination State	Total Number of MA Establishments that Relocated Out of State (% of total Out-Relocation establishments)
1	New Hampshire	1, 437 (20.60%)
2	Florida	980 (14.05%)
3	Rhode Island	623 (8.93%)
4	New York	493 (7.07%)
5	Connecticut	472 (6.77%)

The losing industries have been more concentrated. Of particular concern is the fact that knowledge-oriented services predominate. Big gains in employment from relocation have been almost exclusively event-driven -- one big company changing locations – a phenomenon the data show to be rare. In recent years, however, close to 90% of the relocating establishments are standalone firms: most of them too small to be noticed or courted. Over the eighteen-year study period, Massachusetts has mostly lost employees due to relocation overall, but has seen a couple of big moves into the state that improved the state's job numbers.

When looking at cities that won or lost as a result of interstate relocation, the analysis shows that every city was involved but the larger cities had the most activity each way. Although a few smaller cities were the net winners as far as establishments, the vast majority of cities were losers. As for employment, 70% of cities lost jobs while 30% gained jobs. Unfortunately, the winning margins were small.

There are several policy implications that may be drawn from this study. The first is that interstate relocation is not very important to economic development in Massachusetts and, in any event, Massachusetts has been losing at it for a long time. There have been a few notable successes; on average it has been a losing game. Few cities have come out as winners, and those cities did not make significant gains. The majority of establishments that moved to the state did not receive special incentives from the state to do so. Therefore, public thinking and public policy with respect to economic development should be reoriented to place less emphasis on interstate relocation.

The study has also found that creating a climate that is more conducive for businesses of all types is more important than helping targeted industries

Table 3

Ranking	State	No. of Establishments that Relocated to Massachusetts from 1990-2007 (In-Relocation)	No. of Establishments that Relocated out of Massachusetts from 1990-2007 (Out-Relocation)	Total Net Gain in No. of Establishments Via Relocation from 1990 to 2007
1	New York	584	493	91
2	Connecticut	534	472	62
3	New Jersey	258	207	51
4	Michigan	58	47	11
5	Puerto Rico	10	2	8

or companies, which reinforces conclusions from our two earlier studies. Massachusetts has been losing establishments and jobs primarily to states that are all more receptive to business with regards to taxes and costs of doing business. What is most troubling about this trend is that Massachusetts has been attracting low tech companies while losing knowledge-intensive ones. This means that the cost of doing business appears to have a limit even for knowledge-based companies. Therefore, policy makers should focus their efforts on improving the general business climate in Massachusetts. Otherwise, Massachusetts will get a few big wins, but lose out over the long term. Just like playing the lottery.

Introduction

This paper relies on data from the National Establishment Time Series Database to analyze job and establishment growth from establishments moving across state borders. In the first section, the paper describes the data and the methodology. Next, the paper analyzes overall trends, demonstrating that Massachusetts has consistently lost establishments and jobs to other states. However, the significance of these losses is small compared to other drivers of growth in the state.

In the following sections, the paper analyzes important components of the overall trends. It first analyzes the major states Massachusetts is involved with in interstate relocation. Most of the activity is with neighboring states, but Massachusetts tends to gain from other high tax states and lose to lower tax states. Next the study analyzes whether the losses are more pronounced in headquarters, branches, or standalones, and finds that Massachusetts is losing in all types. An analysis of the trends by industry finds that companies that move in come from many industries while those that leave are predominantly in high-end services.

The final analysis looks at cities in Massachusetts that have been doing well or poorly with interstate relocation, finding that 70% of cities have been net losers while 30% have been net winners, but the winning margins are very small. The study concludes with recommendations and an appendix with detailed tables.

Data and Methodology

The data used in this brief are from the National Establishment Time-Series Database[2] (NETS Data), which has been used in a number of different studies examining the effects of business relocation on employment change. These data follow all establishments in Massachusetts, both private and public, over time. With this information, we can track total flows at the industry level and not just net results, as other data sources do. Each establishment is permanently assigned a unique number that stays with it whether it moves or is acquired, so we can consistently track factors like number of employees, place of business and operational status.

The NETS data differ from the better known data bases published by the Bureau of Labor Statistics (BLS) because they are measuring different definitions of jobs. NETS data track both employer firms and non employer firms. The BLS' Current Employment Statistics (CES) survey measures the number of jobs at employer firms but excludes non employer firms. CES data track closely to the actual data kept by the State of Massachusetts in its ES202 data base. This is the number of jobs for which employers had to pay unemployment insurance and are, therefore, the 'actual' data. The actual data for non employers come from the US Census Bureau and are based off of tax returns. We compared the NETS jobs data to the ES202 data and the census data on non employers and found the NETS data to track within 1-2% of the actual data.

The other well known BLS data base is the Current Population Survey (CPS) that surveys households in Massachusetts. These data analyze the number of Massachusetts residents employed and so include people employed by firms or who work for themselves. But it excludes non residents and only counts multiple job holders once. The NETS data, therefore, are greater than the CPS data because they are tracking all jobs in Massachusetts and CPS is tracking number of Massachusetts residents who are employed.

A study by Neumark, Zhang and Wall[3] assessed the reliability of the NETS data base on a number of dimensions and found it to be a reliable data source. According to the Neumark, Zhang and Wall analysis, the NETS data base includes the following strengths: (1) it contains data on almost all establishments operating in the U.S. (both small and large) rather than on only a small sample; (2) it is a commercial data set and therefore lacks confidentiality restrictions; (3) it allows researchers to track physical establishment relocations via annual changes in business address; (4) it gives researchers the ability to assess changes in employment at a given establishment over time; and (5) it provides researchers the ability to identify new business creation ("birth") and elimination of existing establishments ("death").

Our sample includes 759,707 observations comprising all of the establishments operating in Massachusetts from 1990 to 2007. It includes annual data for all Massachusetts establishments with respect to their business location, annual sales, number of employees, operational status, industry classification (4-digit SIC code), type of establishment and business relocation details (if applicable).

Relocation can be measured across two dimensions. The first dimension tracks the number and type of establishments that leave or enter a state:

- In-Relocation = this type of relocation involves existing establishments that relocate to Massachusetts from other states. The relocation of these establishments generates a positive change in the number of establishments in Massachusetts and an increase in total Massachusetts employment.
- Out-Relocation = this type of relocation involves existing Massachusetts establishments that relocate from Massachusetts to other states. The relocation of these establishments generates a negative change in the number of establishments in Massachusetts and a decrease in total Massachusetts employment.

The second dimension tracks the number and type of establishments that relocate between two states and those that relocate within a single state:

- Interstate = relocation from one state to another.
- Intrastate = relocation within Massachusetts.

This paper reviews the impact of interstate in-relocation and out-relocation. Future research will examine the impact of intrastate in-relocation and out-relocation.

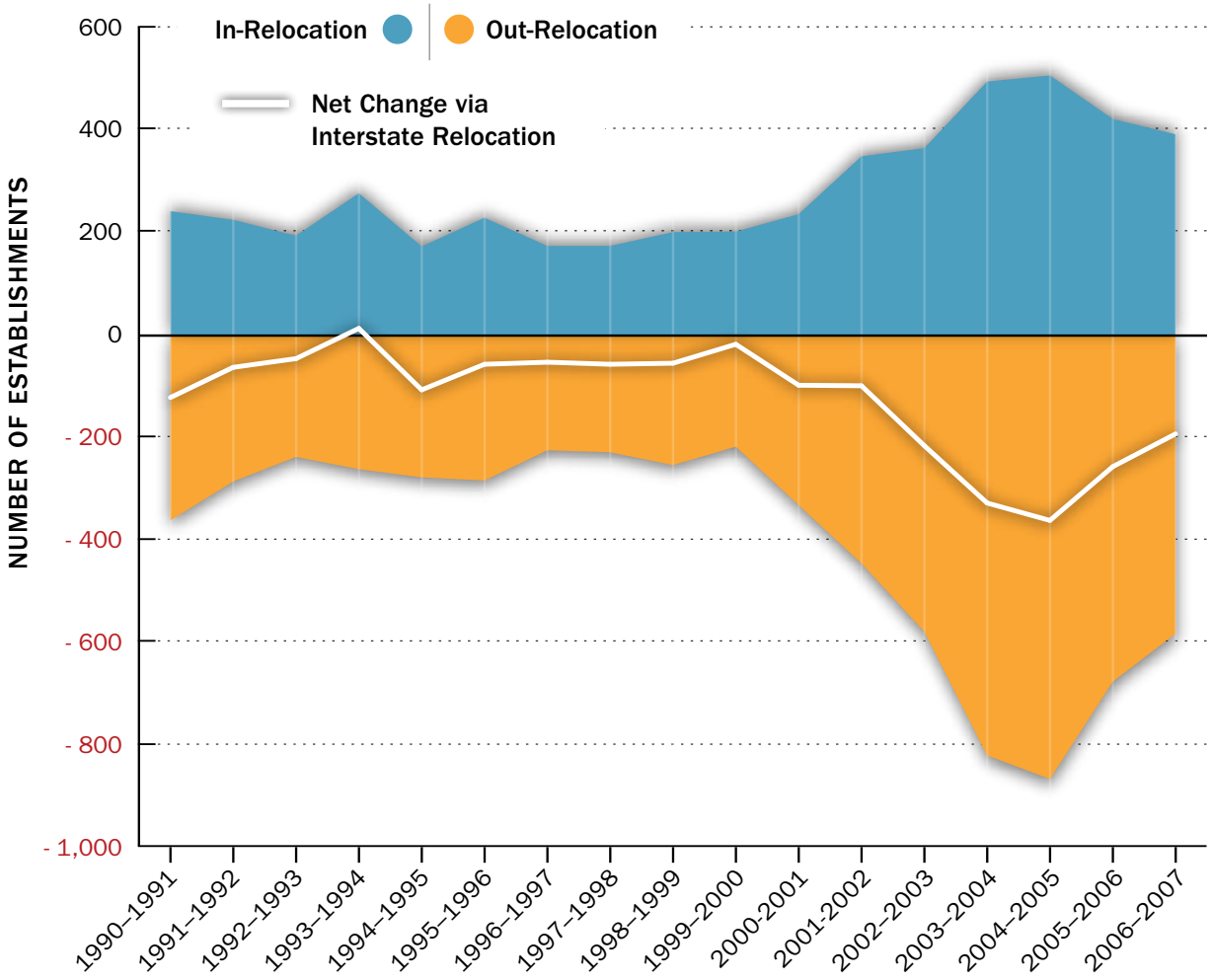
A detailed discussion of the methodology is included in Appendix III: Expanded Methodology Discussion.

How Many Companies and Jobs Moved?

In order to determine the overall effect of relocation on Massachusetts employment and number of establishments, the gains in Massachusetts employment and number of establishments from In-Relocation were compared to the losses from Out-Relocation.

As seen in Figure 1, for every single-year interval from 1990 to 2007 (except 1993-

Figure 1

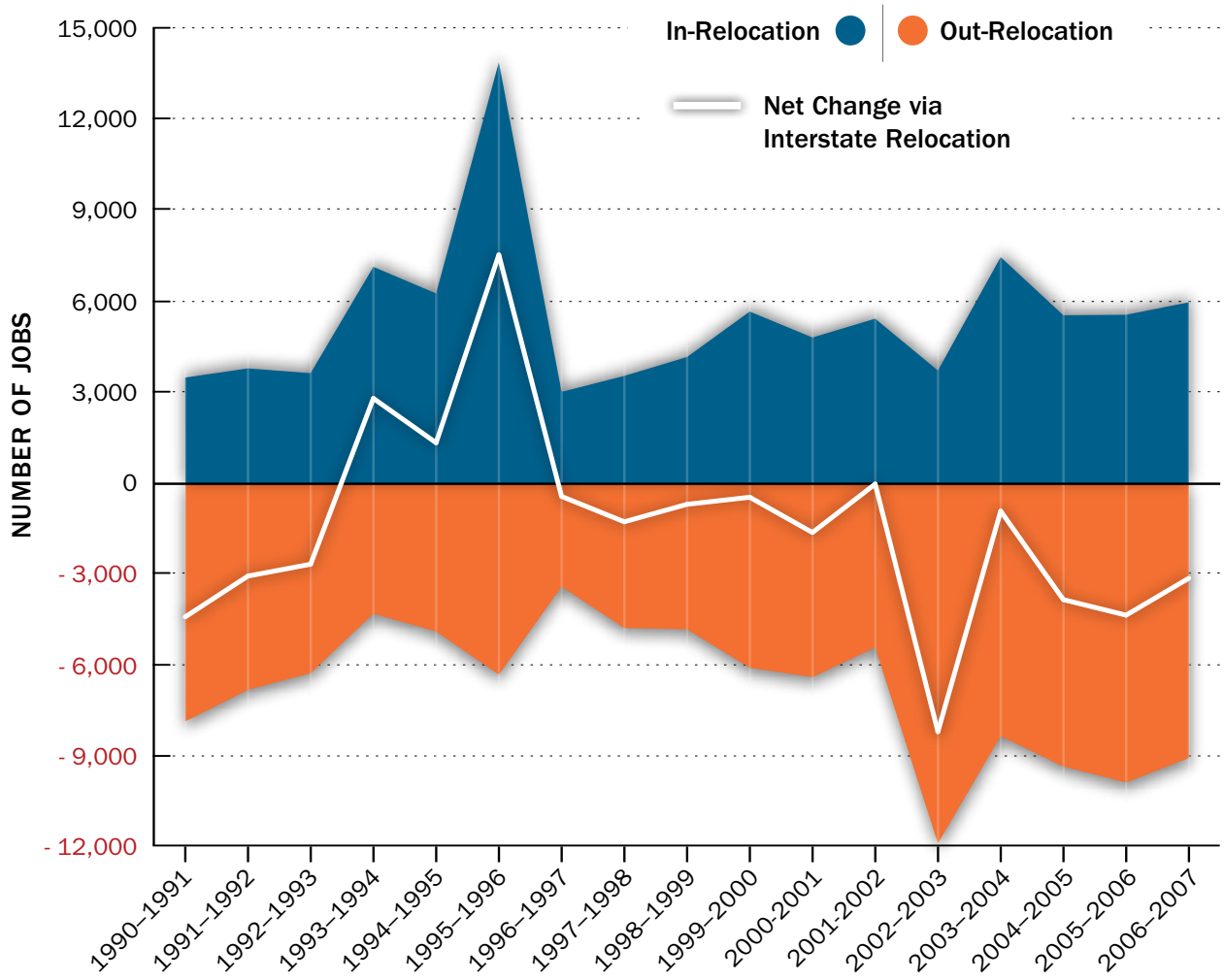


1994), Massachusetts realized a net loss in the number of establishments in the state via the combined effects of In-Relocation and Out-Relocation. The net change in the number of establishments in Massachusetts ranged from a gain of 11 establishments (1993-1994) to a loss of 364 establishments (2004-2005). Overall, Massachusetts lost a total of 2,152 establishments via relocation with an average loss of 127 establishments per year. The net loss in the number of establishments in Massachusetts via relocation has drastically increased since 2000, with an average loss of 224 establishments per year from 2000 to 2007.

The net loss of establishments has, unsurprisingly, resulted in job losses for almost every single-year interval from 1990 to 2007 (except the period from 1993 to 1996) as shown by Figure 2. During the study period, Massachusetts realized a net loss in employment (number of jobs) in the state via the combined effects of In-Relocation and Out-Relocation. The net change in employment in Massachusetts ranged from a gain of 7,503 jobs (1995-1996) to a loss of 8,241 (2002-2003). Overall, Massachusetts lost a total of 24,088 jobs via relocation with an average loss of 1,417 jobs per single-year interval. The net loss in employment in Massachusetts via relocation has increased drastically since 2002, with an average loss of 4,129 jobs per year from 2002 to 2007.

These job losses, while concerning, are relatively minor compared to job flux caused by the other

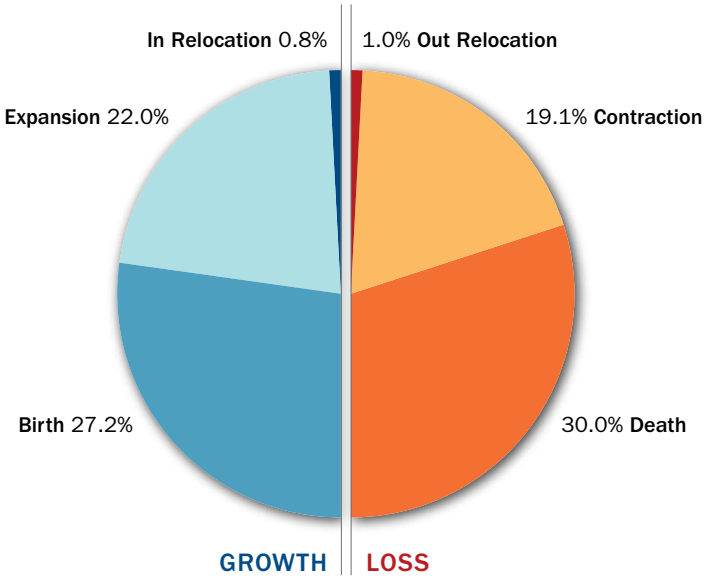
Figure 2



drivers of employment change (establishment birth, death, expansion and contraction) as seen in Figure 3.

In an economy with approximately 3,850,000 jobs and average yearly job flux of roughly 17% of that figure, the impact of relocation is relatively minor, particularly when considered in context with the other drivers – establishment birth, death, expansion and contraction. Despite this, the notion of 'attracting businesses to Massachusetts' and 'stopping establishments from leaving the state' still captures a great deal of attention in the press, at the state, and, notably, at the municipal level.

Figure 3



Because of this attention, this paper will examine the actual effects of relocation and the details of this activity. However, the entire analysis should be viewed in the context of the relative importance of relocation to job creation.

What States Are Jobs Going To and Coming From?

Massachusetts gained establishments from In-Relocation or lost establishments via Out-Relocation from all 50 states, the District of Columbia and Puerto Rico. It gained establishments (on a net basis) from ten states, had no net change with three states, and lost establishments to the remaining 39 states and territories. On average, Massachusetts lost on average 41.5 establishments to other states via relocation.

Of the 4,823 establishments that relocated into Massachusetts from out-of-state, these establishments came from all 50 states (except Idaho), the District of Columbia, and Puerto Rico. These states had a range of one to 679 establishments relocate to Massachusetts from 1990 to 2007 with an average loss of 94.9 establishments to Massachusetts via In-Relocation during the period.

As shown in Figure 4, the states that lost the most establishments (on a gross basis) to Massachusetts via In-Relocation were New Hampshire, New York, Rhode Island, Connecticut, and California.

Figure 4: Top Five States that Had the Most Establishments Relocate to MA via In-Relocation and Out of MA via Out-Relocation from 1990 to 2007

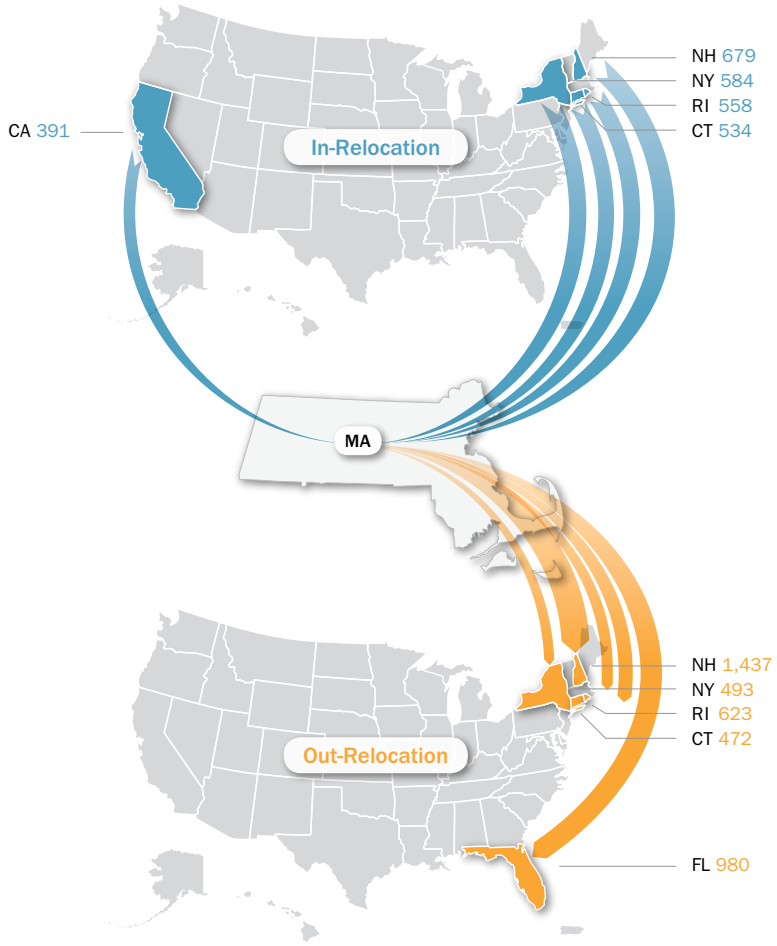


Table 4

Ranking	State	# of Establishments that Relocated to Massachusetts from 1990-2007 (In-Relocation)	# of Establishments that Relocated out of Massachusetts from 1990-2007 (Out-Relocation)	Total Net Gain in # of Establishments Via Relocation from 1990 to 2007
1	New York	584	493	91
2	Connecticut	534	472	62
3	New Jersey	258	207	51
4	Michigan	58	47	11
5	Puerto Rico	10	2	8

Conversely, the states that gained the most establishments from Massachusetts via Out-Relocation were New Hampshire, Florida, Rhode Island, New York, and Connecticut.

Of the 6,975 establishments that relocated out of Massachusetts, these establishments relocated to all 50 states, plus the District of Columbia and Puerto Rico. These states gained anywhere from one to 1,437 Massachusetts establishments via Out-Relocation from 1990 to 2007 with an average gain of 134.6 Massachusetts establishments during the period.

As Figure 4 shows, the gross flows in and out of Massachusetts involve some of the same states, so the net flows also merit examination. Table 4 shows the five states that Massachusetts realized the largest net gains in the number of establishments from as a result of In-Relocation and Out-Relocation.

Table 5 shows the five states that Massachusetts realized the largest net loss in the number of establishments from as a result of In-Relocation and Out-Relocation.

The net imbalance between the level of losses and gains across the top five states – 221 establishments gained to 1,778 lost – is also noteworthy. Given that Massachusetts lost only 2,152 establishments on a net basis overall, 82% of that net loss is explained by relocation to the top five states.

There are several potential explanations for any particular move, but the study examined individual tax burdens to explain establishment moves. In the next section, the study explores the types of businesses that move between states; 72% of all businesses are sole proprietorships. Thus, the individual state tax burden is a good measure of tax differences faced by sole proprietors. Massachusetts gained establishments exclusively from states with similar per capita tax burdens while Massachusetts lost establishments exclusively to states with lower burdens.[4]

Moving from establishments to jobs, the states that had establishments relocate to Massachusetts lost a total of 92,493 jobs to Massachusetts via In-Relocation from 1990 to 2007. These states lost

Table 5

Ranking	State	# of Establishments that Relocated to Massachusetts from 1990-2007 (In-Relocation)	# of Establishments that Relocated out of Massachusetts from 1990-2007 (Out-Relocation)	Total Net Loss in # of Establishments Via Relocation from 1990 to 2007
1	New Hampshire	679	1,437	(758)
2	Florida	290	980	(690)
3	Maine	130	264	(134)
4	North Carolina	67	171	(104)
5	Arizona	33	125	(92)

Figure 5: Top Five States that Had the Most Jobs Relocate to MA via In-Relocation and Out of MA via Out-Relocation from 1990 to 2007

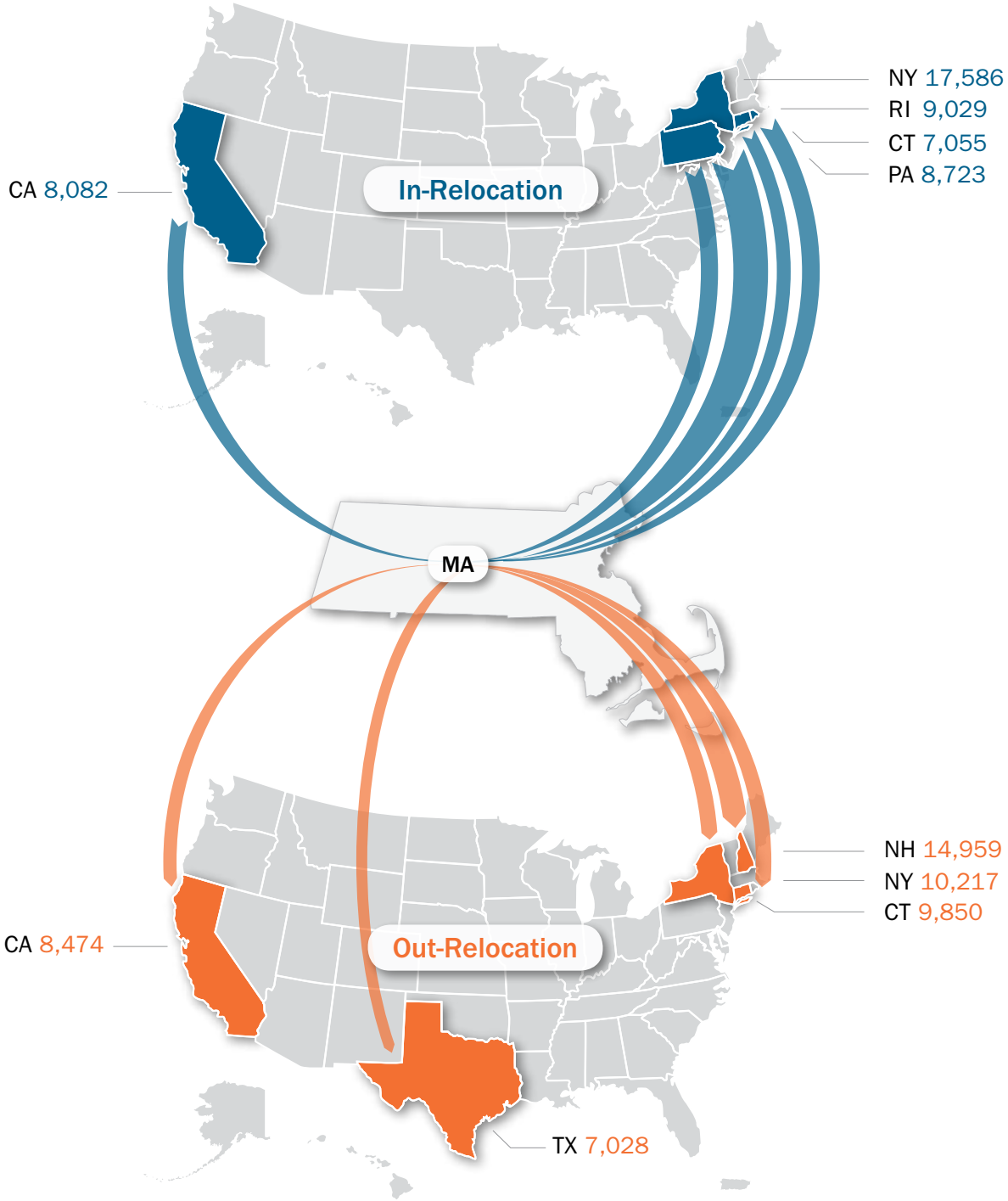


Table 6

Ranking	State	No. of Jobs Gained via In-Relocation	No. of Jobs Lost via Out-Relocation	Total Net Gain in Jobs Via Relocation
1	New York	17,586	10,217	7,369
2	Pennsylvania	8,723	4,527	4,196
3	Rhode Island	9,029	6,408	2,621
4	New Jersey	5,108	2,617	2,491
5	Utah	1,160	44	1,116

Table 7

Ranking	State	No. of Jobs Gained in Massachusetts via In-Relocation from 1990-2007	No. of Jobs Lost in Massachusetts via Out-Relocation from 1990-2007	Total Net Loss in Jobs Via Relocation from 1990 to 2007
1	New Hampshire	6,460	14,959	(8,499)
2	Texas	1,324	7,028	(5,704)
3	Illinois	3,131	6,912	(3,781)
4	Florida	2,925	6,555	(3,630)
5	Louisiana	110	3,268	(3,158)

anywhere from one to 17,586 jobs to Massachusetts via establishment relocation with an average loss of 1,815.49 jobs during the period.

Figure 5 shows that Massachusetts gained the most jobs (on a gross basis) via In-Relocation from New York, Rhode Island, California, Pennsylvania, and Connecticut. It lost the most jobs via Out-Relocation to New Hampshire, New York, Connecticut, California, and Texas.

The states to which Massachusetts establishments relocated gained a total of 116,581 jobs from Out-Relocation of Massachusetts establishments from 1990 to 2007. These states gained anywhere from 1 to 14,959 jobs from Massachusetts via establishment relocation with an average gain of 2,243.17 jobs during the period.

Table 6 shows the five states that, on a net basis, Massachusetts realized the largest gains in employment from as a result of In-Relocation and Out-Relocation.

Changing the focus from establishments to jobs puts both Pennsylvania and Utah in the top five for states that have relocated jobs to Massachusetts. The bulk of the jobs generated in Massachusetts from Utah were the product on a one-time move of a headquarters from Provo to Waltham, Massachusetts in 2004 that involved 1,108 jobs.

Table 7 shows the five states that Massachusetts realized the largest net losses in employment from as a result of In-Relocation and Out-Relocation.

With jobs as the metric, the costs of doing business and the state business tax climates were analyzed to look for explanations rather than looking at just the individual tax burden. These jobs relocations came mostly from larger organizations so these two indices are better measures of large company decisions. All the states that Massachusetts lost jobs to have lower costs of doing business[5] and better state tax climates.[6] The states Massachusetts gained from (with the exception of Utah, which is explained above) have similar costs of doing business and

similar state business tax climates. So in general, Massachusetts lost to lower cost and lower tax states, and gained from similarly high cost and tax states.

What Types of Establishments Are Moving?

Overall, Massachusetts realized a net loss across all three types of establishments (branches, headquarters, and standalones) via the combined effects of In-Relocation and Out-Relocation.

Table 8 shows the breakdown of establishments that moved to Massachusetts using single-year intervals and establishment type.

As Table 8 illustrates, there has been a marked increase in the number and percent of standalone establishments moving into Massachusetts from other states since 2001. Each year since 2001, over 78% of all establishments that moved to Massachusetts have been standalone establishments.

Table 9 shows the breakdown of establishments that moved out of Massachusetts using single-year intervals and establishment type.

Since 1999, there has been a marked increase in the number and percentage of standalone establishments moving out of Massachusetts to other states. Annually, since 1999, over 73% of all establishments that have moved out of Massachusetts were standalone establishments. This percent increases to over 87% of all establishments moving out of Massachusetts since 2002.

Similarly, since 2002, there has been a marked decrease in the number and percent of headquarters moving out of Massachusetts to

Table 8

Interval	Total # of Establishments that Moved Into MA	# of Branches that Moved to MA(% of Interval Total)	# of Headquarters that Moved to MA (% of Interval Total)	# of Standalones that Moved to MA (% of Interval Total)
1990-1991	240	18 (7.5%)	61 (25.4%)	161 (67.1%)
1991-1992	223	22 (9.9%)	72 (32.3%)	129 (57.9%)
1992-1993	192	14 (7.3%)	84 (43.8%)	94 (49.0%)
1993-1994	275	24 (8.7%)	84 (30.5%)	167 (60.7%)
1994-1995	171	5 (2.9%)	63 (36.8%)	103 (60.2%)
1995-1996	227	22 (9.7%)	82 (36.1%)	123 (54.2%)
1996-1997	172	14 (8.1%)	55 (32.0%)	103 (59.9%)
1997-1998	172	24 (14.0%)	52 (30.2%)	96 (55.8%)
1998-1999	199	23 (11.5%)	69 (34.7%)	107 (53.8%)
1999-2000	200	15 (7.5%)	49 (24.5%)	136 (68.0%)
2000-2001	234	20 (8.5%)	51 (21.8%)	163 (69.7%)
2001-2002	347	23 (6.6%)	51 (14.7%)	273 (78.7%)
2002-2003	363	20 (5.5%)	42 (11.6%)	301 (82.9%)
2003-2004	493	12 (2.4%)	46 (9.3%)	435 (88.2%)
2004-2005	505	7 (1.4%)	51 (10.1%)	447 (88.5%)
2005-2006	420	22 (5.2%)	32 (7.6%)	366 (87.2%)
2006-2007	390	18 (4.6%)	41 (10.5%)	331 (84.9%)
TOTAL	4,823	303 (6.28%)	985 (20.42%)	3,535 (73.30%)

Table 9

Interval	Total # of Establishments that Moved out of Massachusetts	# of Branches that Moved out of Massachusetts (% of Interval Total)	# of Headquarters that Moved out of Massachusetts (% of Interval Total)	# of Standalone that Moved out of Massachusetts (% of Interval Total)
1990-1991	364	23 (6.3%)	82 (22.5%)	259 (71.2%)
1991-1992	288	16 (5.5%)	92 (31.9%)	180 (62.5%)
1992-1993	240	11 (4.6%)	90 (37.5%)	139 (57.9%)
1993-1994	264	32 (12.1%)	78 (29.5%)	154 (58.4%)
1994-1995	280	11 (3.9%)	94 (33.6%)	175 (62.5%)
1995-1996	286	29 (10.1%)	86 (30.1%)	171 (59.8%)
1996-1997	227	9 (3.9%)	80 (35.3%)	138 (60.8%)
1997-1998	231	29 (12.5%)	66 (28.6%)	136 (58.9%)
1998-1999	256	23 (9.0%)	84 (32.8%)	149 (58.2%)
1999-2000	220	13 (5.9%)	43 (19.6%)	164 (74.5%)
2000-2001	334	14 (4.3%)	74 (22.2%)	246 (73.7%)
2001-2002	448	22 (4.9%)	71 (15.9%)	355 (79.2%)
2002-2003	581	25 (4.3%)	45 (7.7%)	511 (88.0%)
2003-2004	823	5 (0.6%)	62 (7.5%)	756 (91.9%)
2004-2005	869	19 (2.2%)	52 (6.0%)	798 (91.8%)
2005-2006	679	23 (3.4%)	59 (8.6%)	597 (87.9%)
2006-2007	585	22 (3.8%)	41 (7.0%)	522 (89.2%)
TOTAL	6,975	326 (4.67%)	1,199 (17.19%)	5,450 (78.14%)

Table 10

Establishment Type	# of Establishments that Moved to Massachusetts via In-Relocation	#of Establishments that Moved out of Massachusetts via Out-Relocation	Net Change in Establishments via Relocation
Branch	303	326	(23)
Headquarters	985	1,199	(214)
Standalones	3,535	5,450	(1,915)
TOTAL	4,823	6,975	(2,152)

Table 11

Establishment Type	# of Jobs Generated in Massachusetts via In-Relocation	# of Jobs lost in Massachusetts via Out-Relocation	Net Change in Employment via Relocation
Branch	7,624	10,303	(2,679)
Headquarters	56,872	63,127	(6,255)
Standalones	27,997	43,151	(15,154)
TOTAL	92,493 Jobs	116,581 Jobs	(24,088) jobs

other states. Since 2002, less than 9% of all the establishments that have moved out of Massachusetts on an annual basis have been headquarters. In a prior paper, we explained that this was mostly due to the shrinking percentage of headquarters in Massachusetts. The state has become predominantly a home to standalone businesses.

Most of the net loss in the number of establishments in Massachusetts via relocation was the result of a loss of 1,915 standalone establishments which constituted 88.99% of the total loss in Massachusetts establishments via relocation from 1990 to 2007 (see Table 10).

This net loss of businesses resulted in a net loss in employment at all three types of establishments (branches, headquarters, and standalones) via the combined effects of In-Relocation and Out-Relocation. The bulk of the net loss in employment in Massachusetts via relocation was the result of a loss of 15,154 positions at standalone establishments, which constituted 62.91% of the total loss in employment in Massachusetts from 1990 to 2007 (see Table 11).

The impact of relocation by various establishment types on jobs reflects differences in establishment size. An imbalance in relocation patterns by standalone establishments drives the largest net change in jobs, but the relocation of headquarters (which are significantly larger) has the largest gross effect, accounting for 57% of job flux caused by interstate relocation.

What Industries Are Most Active in Interstate Relocation?

The establishments that relocated into or out of Massachusetts did business across a total of 732 unique 4-Digit SIC Codes. Thus a total of 732 SIC Codes in Massachusetts realized changes in the number of establishments via In-Relocation, Out-Relocation, or both from 1990 to 2007.

Table 12 lists the seven SIC Codes in Massachusetts that realized the largest net gains in the number of establishments as a result of In-Relocation and Out-Relocation.

Table 13 lists the six SIC Codes in Massachusetts that realized the largest net losses in the number of establishments as a result of In-Relocation and Out-Relocation.

A comparison of the two tables above shows a noteworthy difference in magnitude: the top

Table 12: Total Net Gain in # of Establishments Via Relocation from 1990 to 2007

Ranking	4-Digit SIC Code	Business Category	Total Net Gain in # of Establishments Via Relocation from 1990 to 2007
1	5661	Shoe Stores	14
2 (tie)	6513	Operators ofApartment Buildings	9
2 (tie)	7375	Information Retrieval Services	9
4	6411	Insurance Agents, Brokers and Services	8
5 (tie)	3829	Measuring and Controlling Devices	7
5 (tie)	5411	Grocery Stores	7
5 (tie)	8071	Medical Laboratories	7

Table 13: Total Net Loss in Establishments

Ranking	4-Digit SIC Code	Business Category	Total Net Loss in # of Establishments Via Relocation from 1990 to 2007
1	7389	Business Services	(100)
2	8742	Management Consulting Services	(96)
3	8748	Business Consulting Services	(60)
4	7371	Computer Programming Services	(52)
5 (tie)	7379	Computer Related Services	(38)
5 (tie)	1711	Plumbing, Heating and Air-Conditioning	(38)

Table 14: Total Net Gain in Employment

Ranking	4-Digit SIC Code	Business Category	Total Net Gain in Employment Via Relocation from 1990 to 2007
1	7363	Help Supply Services	4,938
2	6331	Fire, Marine and Casualty Insurance	3,351
3	6719	Offices of Holding Companies	3,350
4	8711	Engineering Services	3,009
5	8731	Commercial Physical and Biological Research	998

Table 15: Total Net Loss in Employment

Ranking	4-Digit SIC Code	Business Category	Total Net Loss in Employment Via Relocation
1	3431	Enameled Iron and Metal Sanitary Ware	(3,716)
2	1629	Heavy Construction	(3,405)
3	5311	Department Stores	(2,169)
4	6022	State Commercial Banks	(2,034)
5	2011	Meat Packaging Plants	(1,978)

seven SIC Codes that gained establishments account for just 61 establishments while the top six SIC Codes that lost establishments account for 384 establishments. The differences in establishment type are also noteworthy: the top five gainers contain a number of retail establishments while the top five losers are predominantly knowledge-oriented service businesses.

Table 14 lists the five SIC Codes in Massachusetts that realized the largest net gains in employment as a result of In-Relocation and Out-Relocation.

The relocation of headquarters drove almost every gain in the top four categories. The effect illustrates one of the paradoxes of relocation – although it is relatively unimportant in the aggregate, a single headquarters relocation can bring a large number of jobs at a single time to a single location.

The impact of headquarters relocation on the top industry gainers from relocation is clear:

- 94% of the jobs generated in Help Supply Services (SIC Code 7363) were the product of a one-time move of a headquarters from Albany, NY to Framingham, MA in 1995, which involved 5,042 jobs;
- 93% of the jobs generated in Fire, Marine, and Casualty Insurance (SIC Code 6331) were the product of four moves of headquarters to Boston, MA in 1999, which involved a total of 3,190 jobs;
- 96% the jobs generated in Offices of Holding Companies (SIC Code 6719) were the product of a one-time move of a headquarters from New York City to Boston, MA in 1994, which involved 3,467 jobs;
- The bulk of the jobs generated in Engineering Services (SIC Code 8711) were the product of two headquarters moves, one from Philadelphia to Lexington, MA in 1995 involving 2,000 jobs and another from Chantilly to Waltham, MA in 1993 involving 1,200 jobs.

(Note that the above table contains the net gain in each SIC code, while the job gains figure is on a gross basis).

Table 15 lists the five SIC Codes in Massachusetts that realized the largest net losses in employment as a result of Interstate Relocation.

Life Sciences Mecca?

Massachusetts considers itself a center of the life sciences, and one of the several SIC codes that is included in this industry (SIC Code 8731 (Commercial Physical and Biological Research) shows a net gain in employment but a net loss of establishments during the study period.

There were a total of 42 establishments that relocated to Massachusetts in this 4-digit SIC Code from 1990 to 2007, with 17 relocating to Massachusetts in the last three years. Also, 12 of the establishments that relocated to Massachusetts were from California. Twenty-seven of these establishments were standalones, 12 were headquarters, and 3 were branches.

The majority of the jobs generated in SIC Code 8731 (a total of 1,552 jobs) were the product of two moves, one of a branch from California to Woburn, Massachusetts in 2006, which involved 350 jobs; and another of a headquarters from California to Cambridge, Massachusetts in 2005, which involved 348 jobs. Together, these two moves constitute over 45% of the jobs generated in this SIC Code from out-of-state establishments relocating to Massachusetts. In all, over 50.5% (748 jobs) of the jobs generated in this SIC Code were from out-of-state establishments relocating to Cambridge, Massachusetts.

A total of 43 establishments classified in SIC Code 8731 relocated out of Massachusetts to other states from 1990 to 2007, with 7 establishments relocating to California and 6 establishments relocating to Florida. Approximately 34.9% of the establishments relocating out of Massachusetts in this SIC Code (15 establishments) relocated out of Massachusetts in the last three years (since 2004). These establishments took 554 Massachusetts jobs with them.

As noted previously, the relocation of a single headquarters can have a dramatic impact:

- 99.6% of the jobs lost in Enameled Iron and Metal Sanitary Ware (SIC Code 3431) were the product of a one-time move of a standalone establishment from Dartmouth, Massachusetts to Oak Brook, IL in 2005, which involved 3,700 jobs.
- 92.3% of the jobs lost in Heavy Construction (SIC Code 1629) were the product of a one-time move of a standalone establishment from Boston, MA to Baton Rouge, LA in 2002, which involved 3,200 jobs.
- 64.9% of the jobs lost in Department Stores (SIC Code 5311) were the product of a one-time move of a headquarters from Boston, MA to Cincinnati, OH in 1992, which involved 1,500 jobs.

See Appendices I and II for a listing of the top ten industry gainers and losers overall, as well as a listing by top gainers and losers by yearly interval.

Which Municipalities Are Gaining and Losing from Interstate Relocation?

Finally, the study examines the cities in the Commonwealth that were winners or losers in the interstate relocation game. Although 293 cities had establishments relocate into them, the biggest cities had the most activity both in and out. On a net level, however, the biggest cities ended up as losers. Figure 5 shows the top ten cities with the greatest number of establishments moving into them.

Of the 293 cities and towns in Massachusetts that had out-of-state establishments relocate to them, these cities gained a total of 92,493 new jobs from 1990 to 2007. These cities and towns each gained between one and 23,663 new jobs from In-Relocation, with an average gain in new jobs of 315.67 during the period.

Figure 6 shows the ten cities and towns in Massachusetts that gained the most new jobs via In-Relocation.

The difference between the two figures is noteworthy and discouraging for those urban centers outside of metro Boston, as Springfield, Worcester, and Fall River were among the leaders in attracting establishments (on a gross basis) but failed to capture the same rankings in terms of employment growth.

Turning from In-Relocation to Out-Relocation, a total of 299 cities and towns in Massachusetts had establishments relocate from them to other states. However, these cities and towns lost anywhere from one to 671 establishments to other states via Out-Relocation from 1990 to 2007, with an average loss of 23.33 establishments during the period.

Figure 7 shows the ten cities and towns in Massachusetts that lost the most establishments (on a gross basis) via Out-Relocation:

Table 16 lists the five cities and towns in Massachusetts that realized the largest net gains in the number of establishments as a result of In-Relocation and Out-Relocation.

Given the relatively low levels of net increase in establishments, it is difficult to draw conclusions about specific actions taken by these communities that may have resulted in these gains. In addition, as the following data on net job gains by city shows, none of the above five communities were among the top ten for net job creation from interstate relocation, suggesting that these establishment gains were from small firms.

Table 17 lists the cities and towns in Massachusetts realized the largest net loss in the number of establishments as a result of In-Relocation and Out-Relocation:

A total of 312 cities and towns in Massachusetts realized changes in the number of establishments via In-Relocation, Out-Relocation or both from 1990 to 2007. Approximately 21% of the cities

Figure 5: Top Ten Cities with the Greatest Number of Out-of-State Establishments that Relocated to them from 1990-2007

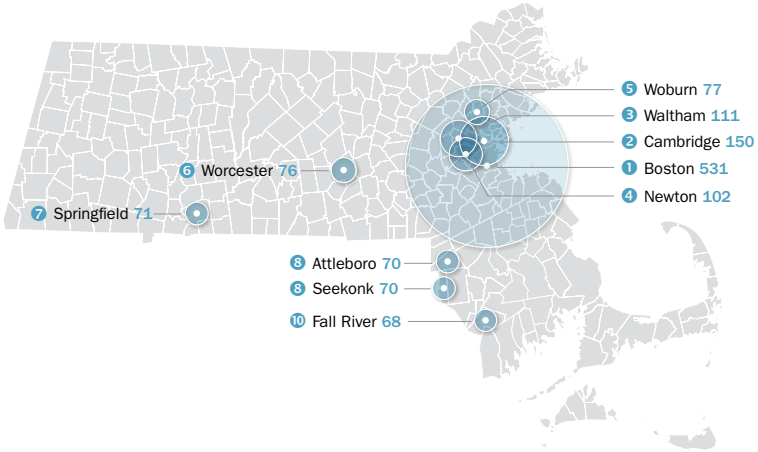
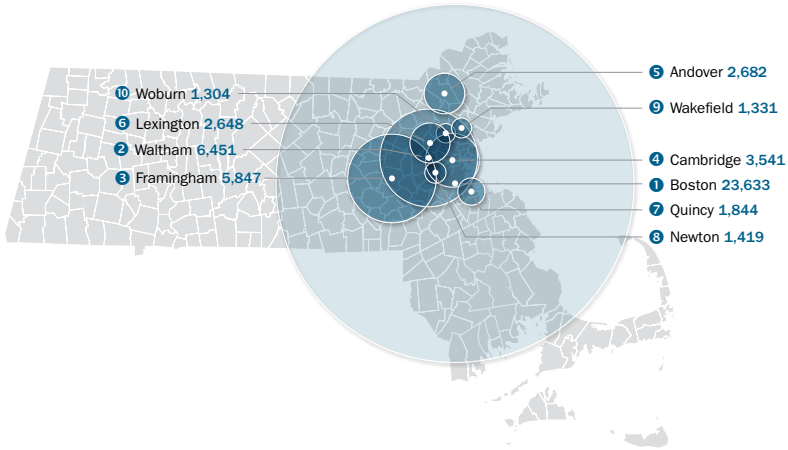


Figure 6: Top Ten Cities with the Greatest Number of Jobs Gained from In-Relocation from 1990-2007



and towns in Massachusetts (65 cities and towns) were net winners from establishment relocation, realizing a net gain in the number of establishments via In-Relocation and Out-Relocation); 23 cities and towns (7.37%) had no net change; and the remaining 224 cities and towns in Massachusetts (71.79%) were net losers. On average cities and towns in Massachusetts lost an average of 6.9 establishments via relocation from 1990 to 2007.

Of the 299 cities and town in Massachusetts that had establishments relocate out of them to other states, these cities lost a total of 116,581 jobs from 1990 to 2007. Each of these cities and towns lost anywhere from one to 21,229 jobs to other states via Out-Relocation, with an average loss in jobs of 389.9 during the period.

Similar to the changes in number of establishments, a total of 312 cities and towns in Massachusetts realized changes in employment level via In-Relocation, Out-Relocation, or both from 1990 to 2007. Approximately 31% of the cities and towns in Massachusetts (96 communities) were net winners from interstate establishment relocation, 3 communities (0.96%)

Figure 7: Top Ten Cities and Towns that Lost the Most Establishments via Out-Relocation to Other States from 1990-2007

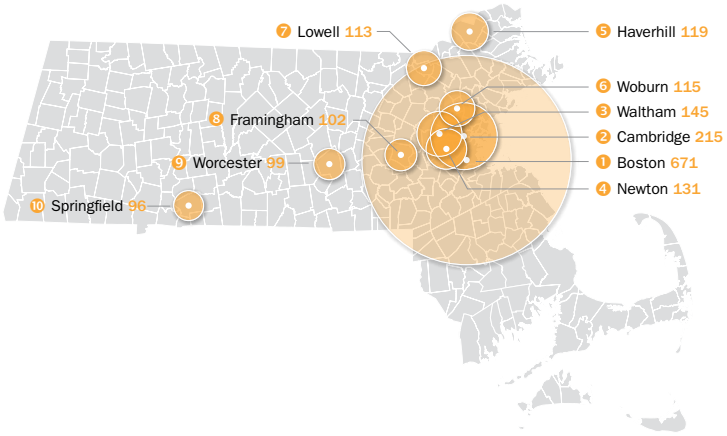


Table 16:

Ranking	City or Town	Total Net Gain in # of Establishments Via Relocation
1	Rehoboth	13
2 (tie)	Chatham	10
2 (tie)	Hull	10
4	Westborough	9
5	Sheffield	7

Table 17:

Ranking	City or Town	Total Net Loss in # of Establishments Via Relocation
1	Boston	(140)
2	Lowell	(73)
3	Cambridge	(65)
4	Haverhill	(61)
5	Lawrence	(49)

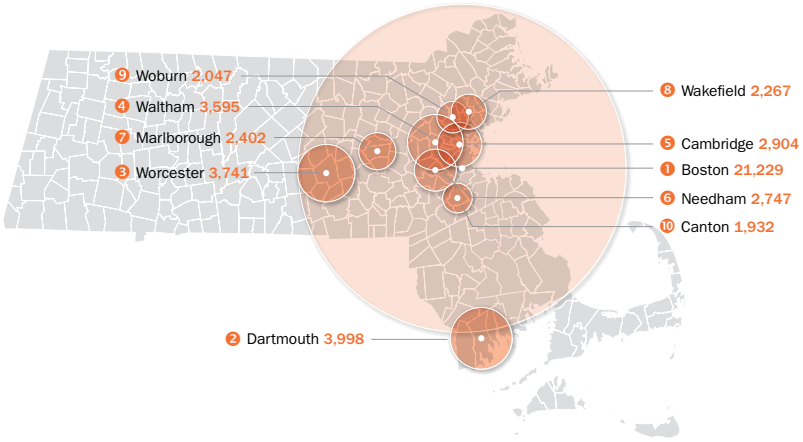
Table 18:

Ranking	City or Town	Total Net Gain in Employment Via Interstate Relocation
1	Framingham	4,153
2	Waltham	2,856
3	Boston	2,434
4	Lexington	2,066
5	Andover	1,302
6	Quincy	1,254
7	Leicester	1,090
8	Cambridge	637
9	Grafton	527
10	Yarmouth	445

Table 19:

Ranking	City or Town	Total Net Loss in Employment Via Interstate Relocation
1	Dartmouth	(3,944)
2	Worcester	(2,726)
3	Needham	(1,677)
4	Marlborough	(1,379)
5	Lynnfield	(1,358)
6	Canton	(1,333)
7	Lowell	(1,231)
8	Methuen	(1,136)
9	Springfield	(1,059)
10	Taunton	(1,032)

Figure 8: Top Ten Cities and Towns that Lost the Most Jobs via Out-Relocation to Other States from 1990-2007



in Massachusetts had no net change, and the remaining 213 cities and towns in Massachusetts (68.27%) were net losers. On average, Massachusetts cities and towns lost 77 jobs via relocation from 1990 to 2007.

Figure 8 shows the ten cities and towns in Massachusetts that lost the most jobs via Out-Relocation.

Table 18 lists the ten cities and towns in Massachusetts that realized the largest net gains in employment as a result of In-Relocation and Out-Relocation.

Table 19 lists the ten cities and towns in Massachusetts that realized the largest net loss in employment as a result of In-Relocation and Out-Relocation.

The employment results of interstate relocation demonstrate that there were a few winners, but mostly there were losers, as 213 cities and towns in Massachusetts were net losers On average, Massachusetts cities and towns lost 77 jobs via relocation from 1990 to 2007.The winners, moreover, did not actually make significant gains. Boston, for instance, was a loser in establishments but a winner in jobs. Even then, Boston gained on average only 143 jobs a year.

All figures provided above are net results for each of the communities. Appendices I and II show data for each of the individual gross measures (e.g., relocation of establishments in and jobs lost through relocation).

Conclusion and Findings

This study analyzes the relocation of establishments into and out of Massachusetts for the eighteen-year period before the current recession (1990-2007). The first major finding is that Massachusetts is losing the relocation game: many more establishments have moved out of state than have entered, and the trend has worsened since 2000. At the net level, Massachusetts has lost 2,152 establishments and 24,088 jobs during this time period.

Although this result is discouraging, the net effect of establishments moving into or out of state in any year is small. In 2007, a net of 195 establishments left the state. This amounted to a change in the number of establishments in Massachusetts of just one twentieth of one percent (-.05%). The job loss amounted to a change of -.08%, again not even a rounding error in the overall scheme.

Even in relation to job flux, relocation has minimal impact. In an average year, 17% of all jobs in Massachusetts are created or lost. In 2007, 437,985 jobs were created or lost, of which relocation accounted for just 3.4%. Similarly, 54,808 establishments were created or lost, with 1.8% of the total due to relocation.

There are many possible reasons for establishments relocating either into or out of Massachusetts. The study shows that establishments usually move from neighboring states. So, in large part,

Massachusetts is exchanging establishments with the same states. However, the study demonstrates that the state's greatest net gains are from other high tax and cost of doing business states, and our largest net losses are to states with lower taxes and costs of doing business.

An examination of the various industries that have been impacted by relocation shows that relocation is widespread, covering 732 industries. Furthermore, the industries that have shown the most gain are not industries, like high technology, with which Massachusetts typically identifies itself. Massachusetts has gained little in any particular industry but the leaders are mostly low tech, such as retailers. However, industries that have lost establishments and jobs over the study period have been more concentrated. Of particular concern is the fact that knowledge-oriented services lead all other industries in terms of establishment and job losses.

During the study period, significant gains in employment from relocation have derived from big companies changing locations – a phenomenon the data show to be rare. In recent years, however, close to 90% of relocating establishments are standalone firms – most of them too small to be noticed or courted. Over the eighteen-year study period, Massachusetts has consistently lost employees due to relocation, but has had a couple of big moves that ended up adding jobs.

When looking at cities that may have won or loss from interstate relocation, we found that every city was impacted but larger cities had the most activity in terms of In-Relocation and Out-Relocation. A few smaller cities were the net winners in terms of establishments, but the vast majority of cities were losers. As to employment, 70% of cities were losers and 30% winners. Unfortunately, the winning margins were small.

Several policy implications may be drawn from this study. First, relative to other forms of business and job creation, interstate relocation is of minor importance to economic development in Massachusetts. Moreover, Massachusetts has been losing at it for a long time. There have been a few notable successes, but on the whole it has been a losing game. Few cities have come out as winners, and those that have did not gain much. The vast majority of establishments that moved were not courted. What the study has also found, which reinforces conclusions from our two earlier studies, is that creating a lower cost business climate appears much more effective in attracting businesses of all types rather than targeting industries or companies. Massachusetts has lost establishments and jobs to states that are generally more receptive to business in terms of taxation and costs of doing business. Improving the general business climate in Massachusetts is the appropriate place for policy emphasis. Otherwise, Massachusetts faces the prospect of continuing to lose establishments and jobs to other states.

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About Pioneer:

Pioneer Institute is an independent, non-partisan, privately funded research organization that seeks to change the intellectual climate in the Commonwealth by supporting scholarship that challenges the "conventional wisdom" on Massachusetts public policy issues.

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Facing the Economic Crisis: Challenges for Massachusetts Police Chiefs, White Paper, April 2010

Fair to Middling: A National Standards Progress Report, White Paper, April 2010

Endnotes

1. http://www.taxfoundation.org/files/bp59_es.pdf

2. The NETS Data is time-series data assembled by Walls and Associates and Dun and Bradstreet. Dun and Bradstreet gathers annual information from all establishments on firm operating in the United States. In its data collection process, Dun and Bradstreet assigns a unique identification number, referred to as a DUNS number, to each establishment as a means of tracking the establishment. Walls & Associates uses the DUNS number to link the Dun and Bradstreet cross-sections into a longitudinal file for each establishment.

3. Neumark, D. Zhang, J. and Wall, B. "Employment Dynamics and Business Relocation: New Evidence from the National Establishment Time Series," NBER Working Paper No. W11647, (November 2005). The authors concluded that use of the unique DUNS number and annual business address information ensured that the NETS data on firm relocation was highly accurate. They also compared NETS data to a variety of other data sources for employment levels and changes, and found it to be as good as or superior to all others available.

4. http://www.statemaster.com, using 2004 Census Data

5. Milken Institute, 2007 Cost of Doing Business Index

6. State Business Tax Climate, 2006-2010, Tax Foundation.

Appendix 1: In-Relocation Data

While a total of 732 different 4-digit SIC Codes were involved in both In-Relocation and Out-Relocation, the establishments that relocated from out-of-state to Massachusetts did business/were classified in 611 unique 4-digit SIC Codes. Thus, 611 different business areas in Massachusetts gained establishments and jobs via In-Relocation. These SIC Codes in Massachusetts gained anywhere from 1 to 415 new out-of-state establishments from 1990 to 2007 with an average increase of 7.92 establishments during the period.

Table I-A lists the ten SIC Codes in Massachusetts that gained the most new establishments via In-Relocation.

The SIC Codes in Massachusetts that had establishments relocate to them gained anywhere from 1 to 5,369 new jobs from in-Relocation with an average gain in new jobs of 151.54 during the period. Table I-B lists the ten SIC Codes in Massachusetts that gained the most new jobs via In-Relocation.

Table I-A: Total # of Out-of-State Establishments that Relocated (% of total establishments relocated) from 1990-2007

Ranking	4-Digit SIC Code	Business Category	Total # of Out-of-State Establishments that Relocated (% of total establishments relocated) from 1990-2007
1	7389	Business Services	215 (4.5%)
2	8742	Management Consulting Services	207 (4.3%)
3	8748	Business Consulting Services	127 (2.6%)
4	7371	Computer Programming Services	123 (2.6%)
5	5812	Eating Places	75 (1.6%)
6	7379	Computer Related Services	74 (1.5%)
7	1521	General Contractors – Single Family Houses	69 (1.4%)
8	8711	Engineering Services	67 (1.4%)
9	6531	Real Estate Agents and Managers	66 (1.4%)
10	8011	Offices and Clinics of Doctors of Medicine	58 (1.2%)

Table I-B: Total # of Jobs gained from In-Relocation (% of total relocation jobs) from 1990-2007

Ranking	4-Digit SIC Code	Business Category	Total # of Jobs gained from In-Relocation (% of total relocation jobs) from 1990-2007
1	7363	Help Supply Services	5,369 (5.8%)
2	8711	Engineering Services	5,157 (5.6%)
3	6719	Offices of Holding Companies	3,587 (3.9%)
4	6331	Fire, Marine and Casualty Insurance	3,424 (3.7%)
5	6021	National Commercial Banks	2,520 (2.7%)
6	7372	Prepackaged Software	2,200 (2.4%)
7	6411	Insurance Agents, Brokers and Services	2,179 (2.4%)
8	7371	Computer Programming Services	2,168 (2.3%)
9	5812	Eating Places	2,102 (2.3%)
10	7389	Business Services	1,648 (1.8%)

Establishments by SIC Code that Relocated to Massachusetts by Single-Year Intervals

To show trends in the gain in jobs by SIC Code during the sample period, Table I-C shows single-year intervals (1990-2007) of the top three SIC Codes in Massachusetts which gained the most jobs from In-Relocation.

Some observations from Table I-C:

(1) SIC Code 8711 (Engineering Services) has been in the top 3 SIC Codes which have gained the most jobs from establishments relocating to Massachusetts from other states for five of the past 17 single-year intervals (1993-1994, 1995-1996, 1997-1998, 1998-1999, and 2002-2003);

(2) SIC Code 3577 has been in the top 3 SIC Codes which have gained the most jobs from establishments relocating to Massachusetts from other states for three of the past 17 single-year intervals (1997-1999, and 2003-2004);

(3) In 1999-2000, over 56% of the jobs generated from In-Relocation to Massachusetts were in SIC Code 6331 (Fire, Marine and Casualty Insurance);

(4) In 1994-1995, over 55% of the jobs generated from In-Relocation to Massachusetts were in SIC Code 6719 (Offices of Holding Companies);

(5) In 1995-1996, over 37% of the jobs generated from In-Relocation to Massachusetts were in SIC Code 7363 (Help Supply Services);

(6) In 1990-1991, 2003-2004 and 2004-2005, over 20% of the jobs generated from In-Relocation to Massachusetts were in single SIC Codes.

Table I-C: Part One: Yearly Interval Leaders in Jobs Gained from In-Relocation

Interval	4-Digit SIC Code	Business Category	Total # of Jobs Gained from In-Relocation
1990-1991	3624	Carbon and Graphite Products	700 (20.3%)
	5013	Motor Vehicle Supplies and New Parts	300 (8.7%)
	7374	Computer Processing and Data Preparation	213 (6.2%)
1991-1992	2759	Commercial Printing	281 (7.5%)
	5065	Electronic Parts and Equipment	258 (6.9%)
	3829	Measuring and Controlling Devices	228 (6.1%)
1992-1993	5621	Women's Clothing Stores	480 (13.3%)
	2519	Household Furniture	342 (9.5%)
	8063	Psychiatric Hospitals	218 (6.1%)
1993-1994	5812	Eating Places	1305 (18.3%)
	8711	Engineering Services	1270 (17.8%)
	8071	Medical Laboratories	788 (11.1%)
1994-1995	6719	Offices of Holding Companies	3467 (55.7%)
	2752	Commercial Printing – Lithographic	250 (4.0%)
	2721	Periodicals - Publishing and Printing	240 (3.9%)
1995-1996	7363	Help Supply Services	5197 (37.5%)
	6021	National Commercial Banks	2500 (18.0%)
	8711	Engineering Services	2081 (15.0%)
1996-1997	3724	Aircraft Engines and Engine Parts	400 (13.4%)
	3111	Leather Tanning and Finishing	200 (6.7%)
	7381	Detective, Guard and Armored Car Services	200 (6.7%)
1997-1998	8711	Engineering Services	639 (18.2%)
	3577	Computer Peripheral Equipment	284 (8.1%)
	3949	Sporting and Athletic Goods	200 (5.7%)

Table I-C: Part Two: (see previous)

Interval	Code	Business Category	Total #
1998-1999	4941	Water Supply	400 (9.7%)
	8711	Engineering Services	327 (7.9%)
	3577	Computer Peripheral Equipment	280 (6.8%)
1999-2000	6331	Fire, Marine and Casualty Insurance	3190 (56.7%)
	7389	Business Services	322 (5.7%)
	7372	Prepackaged Software	298 (5.3%)
2000-2001	2731	Books – Publishing and Printing	875 (18.3%)
	8249	Vocational Schools	650 (13.6%)
	7383	News Syndicates	270 (5.6%)
2001-2002	7999	Amusement and Recreation Services	604 (11.1%)
	6211	Securing Brokers, Dealers and Flotation Companies	416 (7.6%)
	2834	Pharmaceutical Preparations	360 (6.6%)
2002-2003	7379	Computer Related Services	291 (7.9%)
	7371	Computer Programming Services	274 (7.4%)
	8711	Engineering Services	235 (6.4%)
2003-2004	6411	Insurance Agents, Brokers and Services	1504 (20.2%)
	3577	Computer Peripheral Equipment	600 (8.1%)
	3826	Laboratory Analytical Instruments	453 (6.1%)
2004-2005	7372	Prepackaged Software	1117 (20.3%)
	3826	Laboratory Analytical Instruments	257 (4.7%)
	3845	Electromedical and Electrotherapeutic Apparatus	246 (4.5%)
2005-2006	8299	Schools and Education Services	1001 (18.1%)
	7389	Business Services	527 (9.5%)
	3661	Telephone and Telegraph Apparatus	525 (9.5%)
2006-2007	8111	Legal Services	582 (9.8%)
	8731	Commercial Physical and Biological Research	576 (9.7%)
	7373	Computer Integrated System Design	570 (9.6%)

Appendix II: Out-Relocation Data

Establishments by 4-Digit SIC Code that Moved from Massachusetts

While a total of 732 different 4-digit SIC Codes were involved in both In-Relocation and Out-Relocation, the establishments that relocated out of Massachusetts did business/were classified in 647 unique 4-digit SIC Codes. Thus, 647 different business areas in Massachusetts lost establishments and jobs via Out-Relocation. These SIC Codes in Massachusetts lost anywhere from 1 to 315 establishments to other states from 1990 to 2007 with an average loss of 10.8 establishments during the period.

Table II-A lists the ten SIC Codes in Massachusetts that lost the most establishments via Out-Relocation.

The SIC Codes in Massachusetts that had establishments relocate out of them lost anywhere from one to 3,716 establishments from Out-Relocation, with an average loss of jobs of 180.3 during the study period.

Table II-B lists the ten SIC Codes in Massachusetts that lost the most jobs via Out-Relocation:

Table II-A: Total # of Massachusetts Establishments that Relocated from 1990-2007

Ranking	4-Digit SIC Code	Business Category	Total # of Massachusetts Establishments that Relocated (% of total establishments relocated) from 1990-2007
1	7389	Business Services	315 (4.5%)
2	8742	Management Consulting Services	303 (4.3%)
3	8748	Business Consulting Services	187 (2.7%)
4	7371	Computer Programming Services	175 (2.5%)
5	7379	Computer Related Services	112 (1.6%)
6	1521	General Contractors – Single Family Houses	99 (1.4%)
7	8711	Engineering Services	93 (1.3%)
8	5812	Eating Places	90 (1.3%)
9	6531	Real Estate Agents and Managers	88 (1.3%)
10	8011	Offices and Clinics of Doctors of Medicine	79 (1.1%)

Table II-B: Total # of Jobs Lost from Out-Relocation from 1990-2007

Ranking	4-Digit SIC Code	Business Category	Total # of Jobs lost from Out-Relocation (% of total job relocation) from 1990-2007
1	3431	Enameled Iron and Metal Sanitary Ware	3,716 (3.23%)
2	1629	Heavy Construction	3,467 (2.97%)
3	7371	Computer Programming Services	2,727 (2.34%)
4	3661	Telephone and Telegraph Apparatus	2,659 (2.28%)
5	5812	Eating Places	2,506 (2.15%)
6	6411	Insurance Agents, Brokers and Service	2,457 (2.11%)
7	7373	Computer Integrated Systems Design	2,427 (2.08%)
8	7372	Prepackaged Software	2,380 (2.04%)
9	5311	Department Stores	2,311 (1.98%)
10	8742	Management Consulting Services	2,210 (1.90%)

a. Establishments by SIC Code that Relocated from Massachusetts by Single-Year Interval

To see trends in job loss by SIC Code during the sample period, Table II-C shows single-year intervals (1990-2007) of the top three SIC Codes in Massachusetts which lost the most jobs via Out-Relocation.

Some observations from Table II-C:

(1) In 2005-2006, over 37% of the jobs lost from Out-Relocation were in SIC Code 3431 (Enameled Iron and Metal Sanitary Ware);

(2) In 1990-1991, 1991-1992 and 2002-2003, over 25% of the jobs lost from Out-Relocation were in single SIC Codes;

(3) In 1998-1999, 1999-2000, and 2006-2007, over 20% of the jobs lost from Out-Relocation were in single SIC Codes.

Table II-C: Part One: Yearly Interval of Biggest Job Losses via Out-Relocation

Interval	4-Digit SIC Code	Business Category	Total # of Jobs Lost via Out-Relocation
1990-1991	6021	National Commercial Banks	2,100 (26.6%)
	3625	Relays and Industrial Controls	565 (7.2%)
	3728	Aircraft Parts and Auxiliary Equipment	475 (6.0%)
1991-1992	2011	Meat Packaging Plants	1,975 (28.8%)
	3648	Lighting Equipment	700 (10.2%)
	3089	Plastic Products	500 (7.3%)
1992-1993	5311	Department Stores	1900 (30.1%)
	5023	Home Furnishings	850 (13.5%)
	5045	Computer and Computer Peripheral Equipments and Software	355 (5.6%)
1993-1994	5311	Department Stores	385 (8.3%)
	6162	Mortgage Bankers and Loan Correspondents	300 (6.5%)
	3575	Computer Terminals	250 (5.4%)
1994-1995	7519	Utility Trailer and Recreational Vehicle Repair	340 (6.9%)
	3714	Motor Vehicle Parts and Accessories	250 (5.1%)
	3724	Aircraft Engines and Engine Parts	250 (5.1%)
1995-1996	5812	Eating Places	625 (9.8%)
	3826	Laboratory Analytical Instruments	375 (5.9%)
	5093	Scrap and Waste Materials	300 (4.7%)
1996-1997	5731	Radio, Television and Commercial Electronic Stores	500 (14.5%)
	4953	Refuse Systems	214 (6.2%)
	2835	In Vitro and In vitro Diagnostic Substances	180 (5.2%)
1997-1998	5045	Computer and Computer Peripheral Equipments and Software	786 (16.3%)

Table II-C: Part Two: (see previous)

Interval	Code	Business Category	Total #
1998-1999	6321	Accident and Health Insurance	1000 (20.6%)
	7371	Computer Programming Services	241 (5.0%)
	3991	Brooms and Brushes	200 (4.1%)
1999-2000	3661	Telephone and Telegraph Apparatus	1500 (24.5%)
	7999	Amusement and Recreation Services	1150 (18.8%)
	2899	Chemicals and Chemical Preparations	504 (8.2%)
2000-2001	7372	Prepackaged Software	553 (8.6%)
	3841	Surgical and Medical Instruments and Apparatus	525 (8.2%)
	8742	Management Consulting Services	265 (4.1%)
2001-2002	3555	Printing Trades Machinery and Equipment	599 (11.0%)
	8741	Management Services	404 (7.4%)
	7372	Prepackaged Software	372 (6.8%)
2002-2003	1629	Heavy Construction	3,200 (26.8%)
	6411	Insurance Agents, Brokers and Service	1,500 (12.6%)
	2731	Books – Publishing or Printing	1,006 (8.4%)
2003-2004	3661	Telephone and Telegraph Apparatus	1,000 (11.9%)
	2261	Finishers of Broad-woven Fabrics of Cotton	500 (6.0%)
	2387	Apparel – Belts	500 (6.0%)
2004-2005	8711	Engineering Services	1,089 (11.6%)
	7011	Hotels and Motels	811 (8.6%)
	6321	Accident and Medical Insurance	601 (6.4%)
2005-2006	3431	Enameled Iron and Metal Sanitary Ware	3,700 (37.3%)
	7373	Computer Integrated Systems Design	987 (9.9%)
	3732	Boat Building and Repairs	473 (4.8%)
2006-2007	6022	State Commercial Banks	2,034 (22.3%)
	2869	Industrial Organic Chemicals	750 (8.2%)
	6153	Short-term Business Credit Institutions	510 (5.6%)

Appendix III: Expanded Methodology Discussion

In order to calculate the number of firms originally operating in MA in 1990 (the base year), we remove all firms from the NETS data who were not operating in MA during 1990. This entails discarding observations for firms that were in operation outside of MA in 1990 but would subsequently relocate to MA (i.e. these firms had yet to move to MA which is evident by the In-Relocation years of 1990 and beyond) and any firms which never did business in MA (i.e. the state information for these firm was listed as any other state than MA). Using this methodology we calculated the number of firms originally operating in MA in 1990 (the base year) which is 231,860 with a starting employment level of 3,870,637.

In order to calculate the number of firms in the state in each subsequent or next year, we start with the number of firms in the base year and then use the net result of the four possible flows from which firms can either be created (positive change) or lost in the state (negative change): (1) New Firm Births (positive); (2) Existing Firm Deaths (negative); (3) Existing Out-of-State Firm In-Relocation (positive); and (4) Existing MA Firm Out-Relocation (negative). I explain each of these flows in detail below.

The following is the basic firm formula:

Next Year Firms = Base Year Firms + (Firm Births - Firm Deaths) + (Firm In-Relocation - Firm Out-Relocation)

Please note that when using single-year intervals, if the base year is 1990 - then the next year is 1991. On the other hand, when using three-year intervals, if the base year is 1990 - then the next year is 1993.

The number of firms reported for each year in our analyses is conservative. These numbers do not include a small number of firms which moved multiple time during the sample to and from MA. The numbers also do not include any net change in the NETS data regarding firms operating in MA which cannot be directly attributed to one of the four "flows" listed above.

In order to calculate the number of jobs (or employment) in the state in each subsequent year, we start with the number of jobs in the base year and then use the net result of the six possible flows from which jobs can either be created (positive change) or lost in the state (negative change): (1) Jobs created via New Firm Births (positive); (2) Jobs lost via Existing Firm Deaths (negative); (3) Jobs created via Existing Out-of-State Firm In-Relocation (positive); (4) Jobs lost via Existing MA Firm Out-Relocation (negative); (5) Jobs created via Existing MA Firm Expansion (positive); and (6) Jobs lost via Existing MA Firm Contraction (negative). I explain each of these flows in detail below.

The following is the basic jobs formula:

Next Year Jobs = Base Year Jobs + (Jobs created via Firm Births - Jobs lost via Firm Deaths) + (Jobs created via In-Relocation - Jobs lost via Out-Relocation) + (Jobs created via Existing MA Firm Expansion - Jobs lost via Existing MA Firm Contraction)

Again, the number of jobs reported for each year in our analyses are conservative. These numbers do not include jobs from a small number of firms which moved multiple time during the sample to and from MA. The numbers also do not include any net change in the NETS data regarding jobs associated with firms operating in MA which cannot be directly attributed to one of the six "flows" listed above.

The following are a detailed explanation of how each of the six "flows" were created. For simplicity I will use single-year intervals when discussing how each of these variables were calculated.

In-Relocation and Out-Relocation

There are two different types of relocation which impact both the number of firms operating in MA and the employment in MA:

(1) **In-Relocation** = this type of relocation involves existing firms that relocate to MA from other states. The relocation of these firms generates a positive change in the number of firms in MA and an increase in total MA employment or jobs.

(2) **Out-Relocation** = this type of relocation involves existing MA firms that relocate from MA to other states. The relocation of these firms generates a negative change in the number of firms in MA and a decrease in total MA employment.

Firms (and jobs) which were attributed to In-Relocation had to meet the following two criteria: (1) in the base year, the state the firm was operating in could not be listed as MA and (2) in the next year, the state the firm was operating in had to be listed as MA. Any firm which met these two criteria during the single-year interval were counted as In-Relocation Firms and the number of employees they had during the year they relocated to MA were counted as Jobs Created in MA via In-Relocation during the single-year interval.

Firms (and jobs) which were attributed to Out-Relocation had to meet the following two criteria: (1) in the base year, the state the firm was operating in had to be listed as MA and (2) in the next year, the state the firm was operating in could not be listed as MA. Any firm which met these two criteria during the single-year interval were counted as Out-Relocation Firms and the number of employees they had during the year they relocated out of MA were counted as Jobs Lost in MA via Out-Relocation during the single-year interval.

(Please note: Any firms which were listed as operating in MA in both the base year and the next year however the city listed changed during the single-year interval was included in a third type of relocation: With-in Relocation. This type of relocation does not impact the overall number of firms or jobs in MA but does impact the geographical distribution of these firms and jobs with-in the state.)

Births and Deaths

There are two ways in which Firm creation and elimination can impact the number of firms and employment in MA:

(1) **Firm Births** = this involves the creation of new firms in MA. The creation of these firms generates a positive change in the number of firms in MA and an increase in total MA employment.

(2) **Firm Deaths** = this involves the elimination of existing firms in MA. The elimination of these firms generates a negative change in the number of firms in MA and a decrease in total MA employment.

Firms (and jobs) which were attributed to Firm Births had to meet the following three criteria: (1) in the base year, the firm could not have been in operation (which was indicated by a 0 in the number of employees at the firm); (2) in the next year, the state the firm was operating in had to be listed as MA; and (3) in the next year, the firm was in operation (which was indicated by a positive number of employees at the firm). Any firm which met these three criteria during the single-year interval were counted as New Firm Births and the number of employees they had

during the year they were created were counted as Jobs Created in MA via Firm Births during the single-year interval. (Thus these firms could not have been in operation in the base year but were created and employing individuals in MA by the next year.)

As an additional verification for Firm Births, one can use the birth year information assigned to each firm observation and the number of employees at the firm in the next year assigned by the NETS data. One must use this method because the NETS data does not calculate the number of employees at a firm in the year it was first created. Instead, the first year employee information is available/recorded for the new firm in the NETS data is the year after the firm was established. In this process, a firm that was created in 1990 (birth year=1990), the number of jobs generated by that firm birth is the number of employees at that firm in 1991. However, the use of single-year intervals allows us to overcome this data limitation.

The number of Firm Births and Jobs Created in MA via Firm Births was consistent using either methodology.

Firms (and jobs) which were attributed to Firm Deaths had to meet the following three criteria: (1) in the base year, the state the firm was operating had to be listed as MA; (2) in the base year, the firm had to be in operation (which was indicated by a positive in the number of employees at the firm); and (3) in the next year, the firm could not be in operation (which was indicated by a 0 number of employees at the firm). Any firm which met these three criteria during the single-year interval were counted as Existing Firm Deaths and the number of employees they had during the last year they were in business (the base year) were counted as jobs lost in MA via Firm Deaths during the single-year interval. (Thus these firms were in operation in the base year but were shut-down and no longer employing individuals in MA by the next year.)

As an additional verification for Firm Deaths, one can use the death year information assigned to each firm observation and the number of employees at the firm in the year the firm was shut-down by the NETS data. In this process, a firm that was shut-down in 1990 (death year=1990), the number of jobs lost by that firm death is the number of employees at that firm in 1990.

The number of Firm Deaths and Jobs Lost in MA via Firm Deaths was consistent using either methodology.

Expansion and Contraction

Existing firm expansion and contraction does not impact the number of firms operating in MA in a single-year interval because the firm was in operation in MA in both the base year and the next year. However, there are two ways in which existing firm expansion and contraction can impact employment in MA:

(1) **Firm Expansion** = this involves the addition of employees to existing firms in MA. The expansion of these firms generates an increase in total MA employment.

(2) **Firm Contraction** = this involves the elimination of employees from existing firms in MA. The contraction of these firms generates a decrease in total MA employment.

In order to calculate the net change in employment at an existing firm in MA, we simply compared the number of employees at the firm in the base year and the next year.

Jobs which were attributed to Existing Firm Expansion had to meet the following criterion: in the next year, the number of employees at the firm had to be greater than the number of employees at the firm in the base year (which was indicated

by a positive net change in the number employees at the firm in the single-year interval). Any firm which met this criterion during the single-year interval were counted as Existing MA Firms which expanded and the positive net change in the employment at the firm during the single-year interval was attributed to Jobs Created via Existing Firm Expansion. Therefore, a firm was classified as expanding if it increased its employment by at least one employee during a single-year interval.

Jobs which were attributed to Existing Firm Contraction had to meet the following criterion: in the next year, the number of employees at the firm had to be less than the number of employees at the firm in the base year (which was indicated by a negative net change in the number employees at the firm in the single-year interval). Any firm which met this criterion during the single-year interval were counted as Existing MA Firms which contracted and the negative net change in the employment at the firm during the single-year interval was attributed to Jobs Lost via Existing Firm Contraction. Therefore, a firm was classified as contracting if it decreased its employment by at least one employee during a single-year interval.

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