

Voting with Their Feet? High House Prices and Migration in New England

Alicia Sasser

New England Public Policy Center

Federal Reserve Bank of Boston

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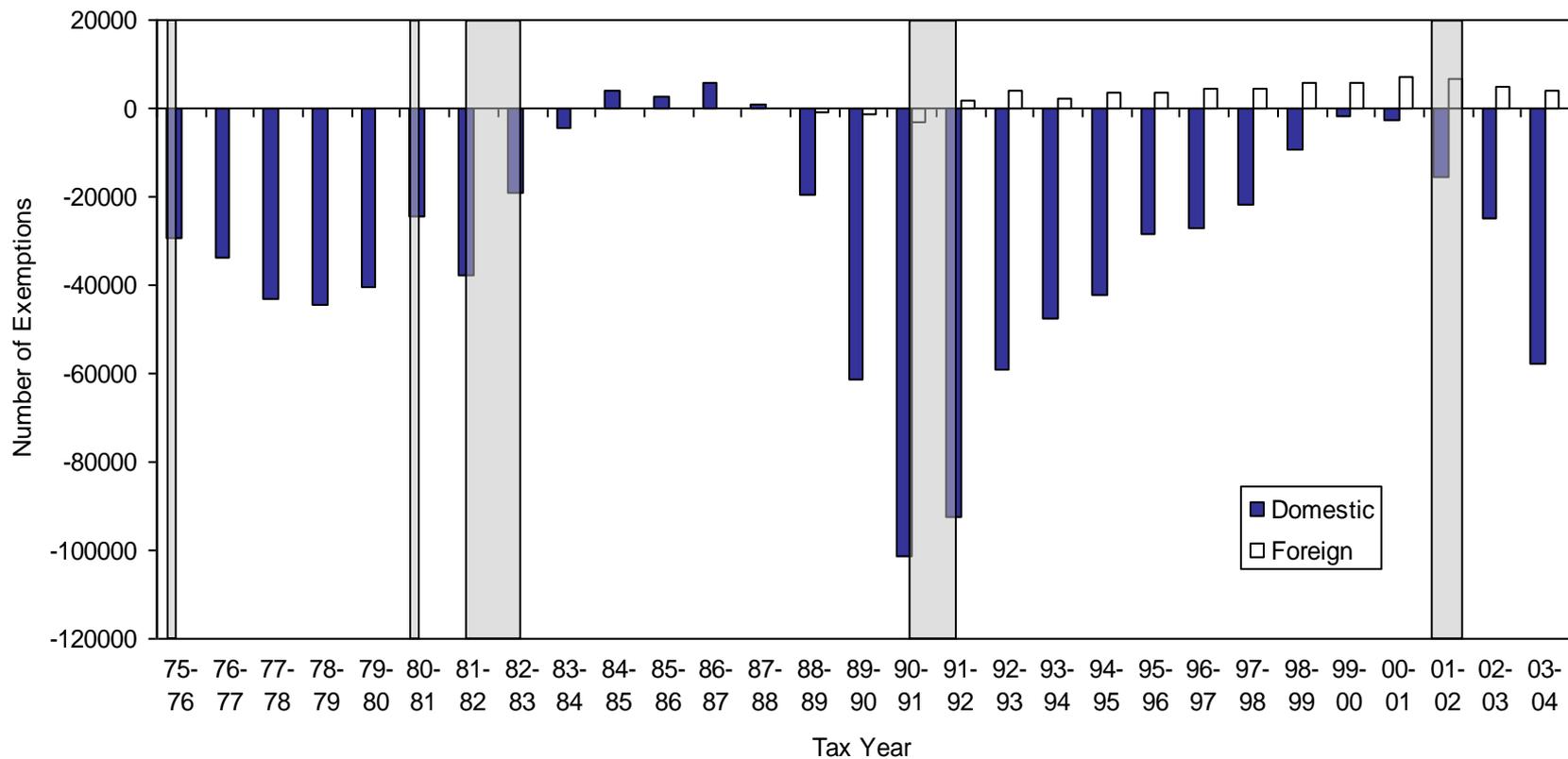
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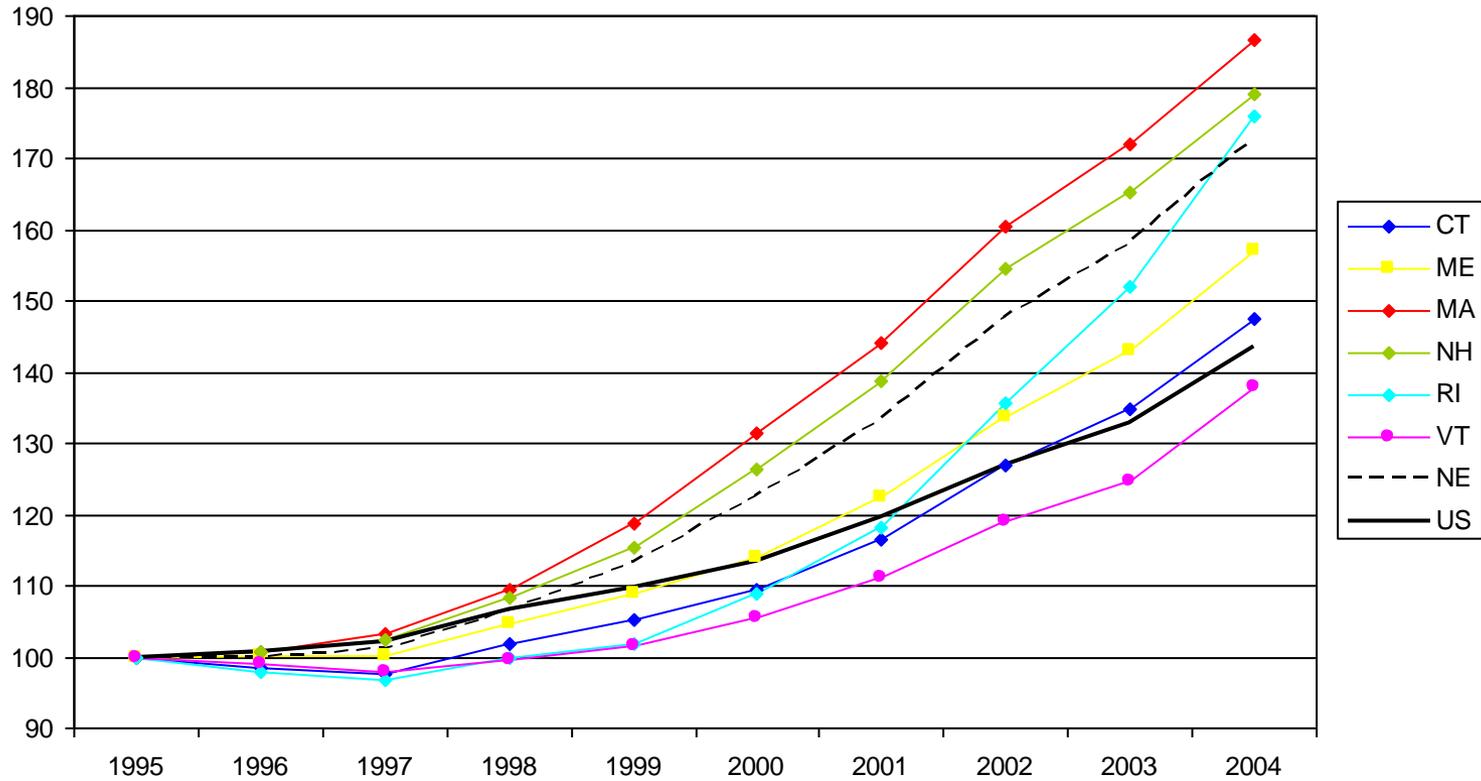
Figure 1
 Net Domestic and Foreign Migration for New England



Source: Author's calculations from the IRS state migration data.

Note: Shading represents NBER recession periods from peak to trough.

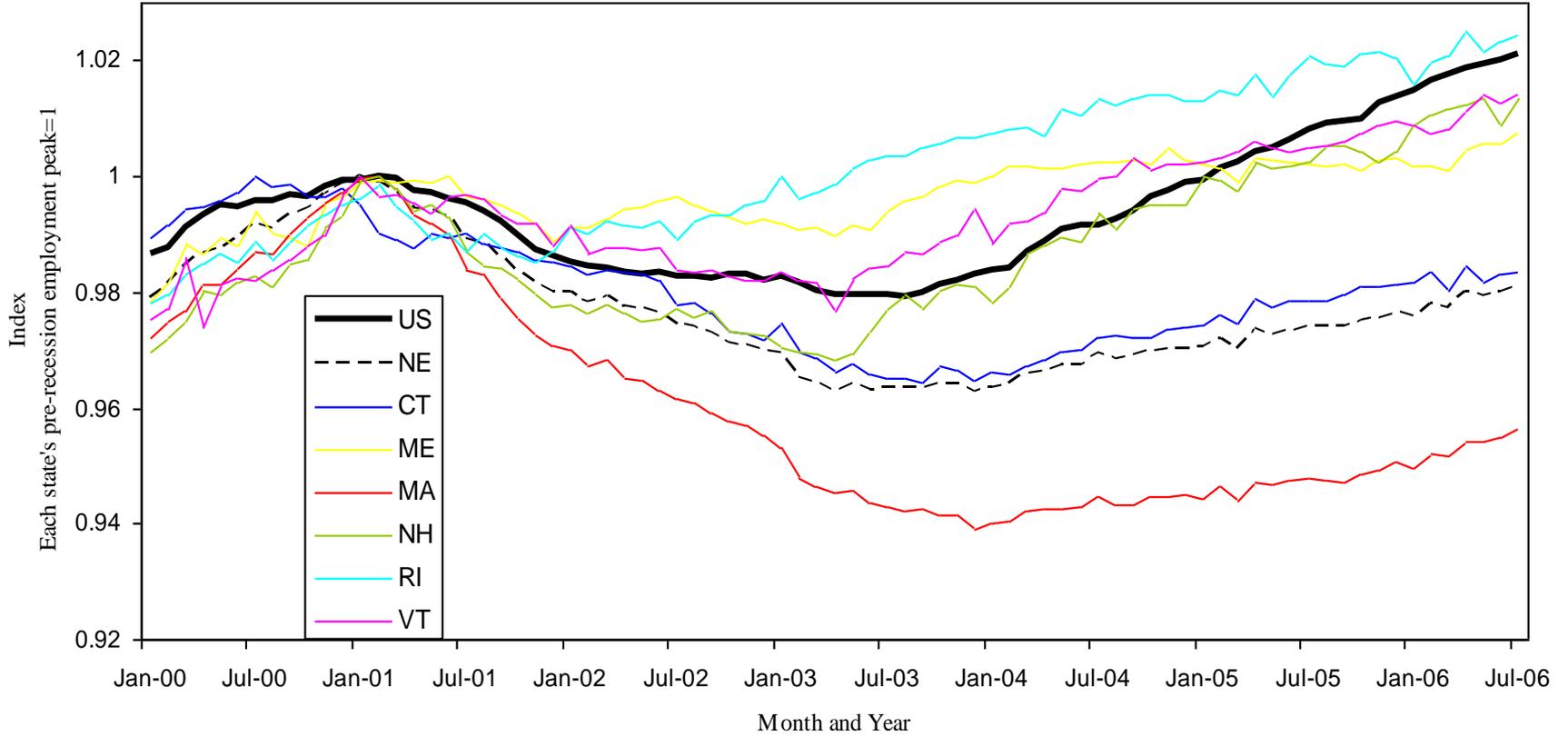
Figure 7
 Growth in Real Single-Family House Prices for New England versus the U.S.



Source:
 Authors' calculations based on the house price index calculated by the Office of Federal Housing Enterprise Oversight (OFHEO).

Notes:
 Adjusted for inflation using the Consumer Price Index, excluding shelter.

Figure 6
Monthly Employment for New England versus the U.S.



Source: U.S. Bureau of Labor Statistics and Federal Reserve Bank of Boston

Motivation

Basic Question: Have high house prices lead to greater out-migration of residents from New England (mostly Massachusetts) in recent years?

“No one knows exactly why people are leaving Massachusetts, but the high cost of living and a volatile job market ... may have something to do with the exodus.”

- Kelly, Matt (2005) “Getting Down to Business.” *Commonwealth Magazine*

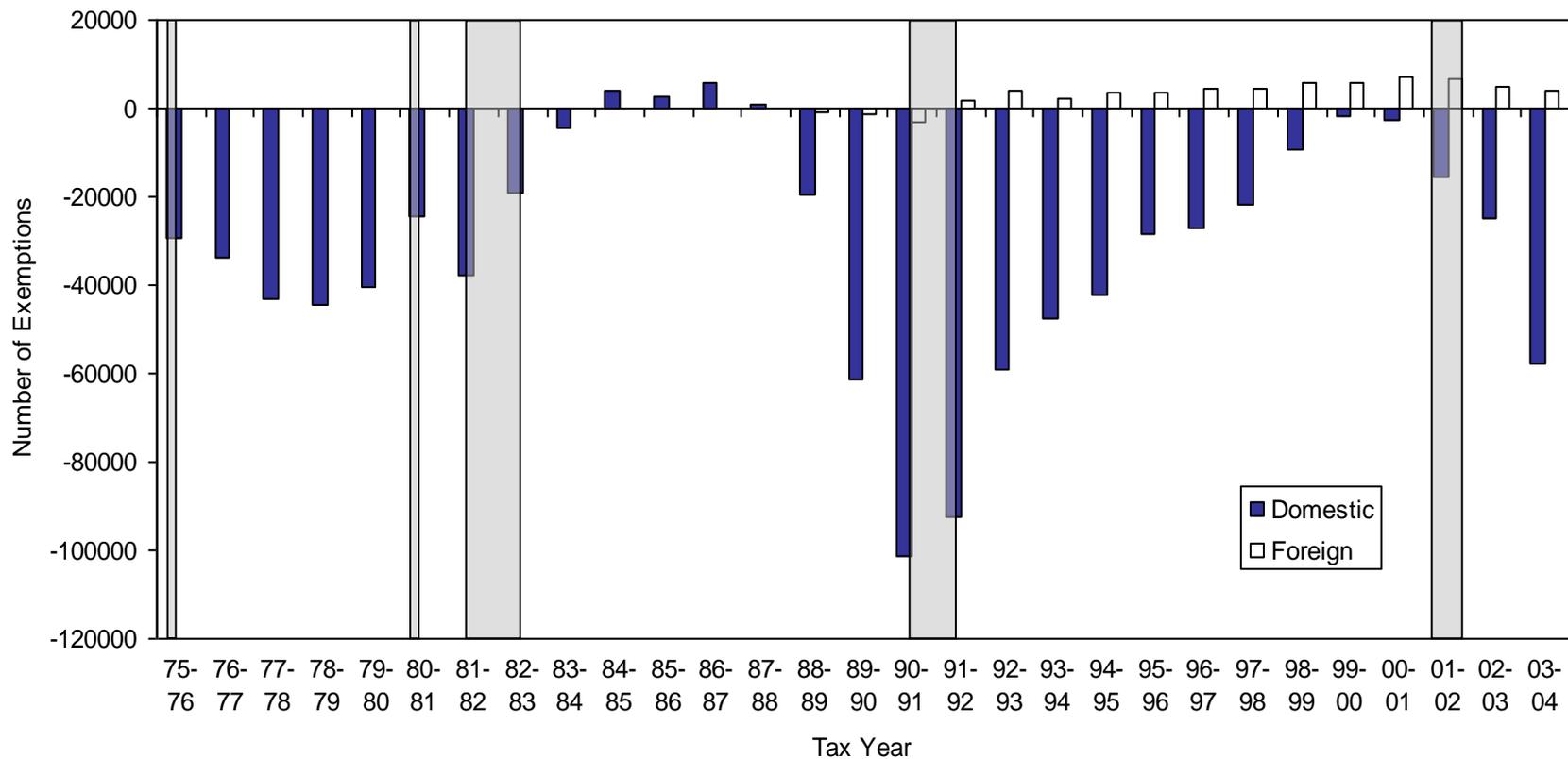
Why do we care?

- If the lack of affordable housing is influencing the location decisions of skilled workers, then there may be a role for public policy (e.g. removing excessively restrictive zoning regulations)
- If recent out-migration is caused by lack of job opportunities then this would suggest a different set of policy approaches (e.g. job retraining, investment in expanding industries)

Roadmap

- I. Domestic migration trends for New England and Massachusetts
- II. Discussion of economic factors affecting migration and logistic model
- III. Results from baseline model
- IV. Simulations and projections for Massachusetts
- V. Conclusion

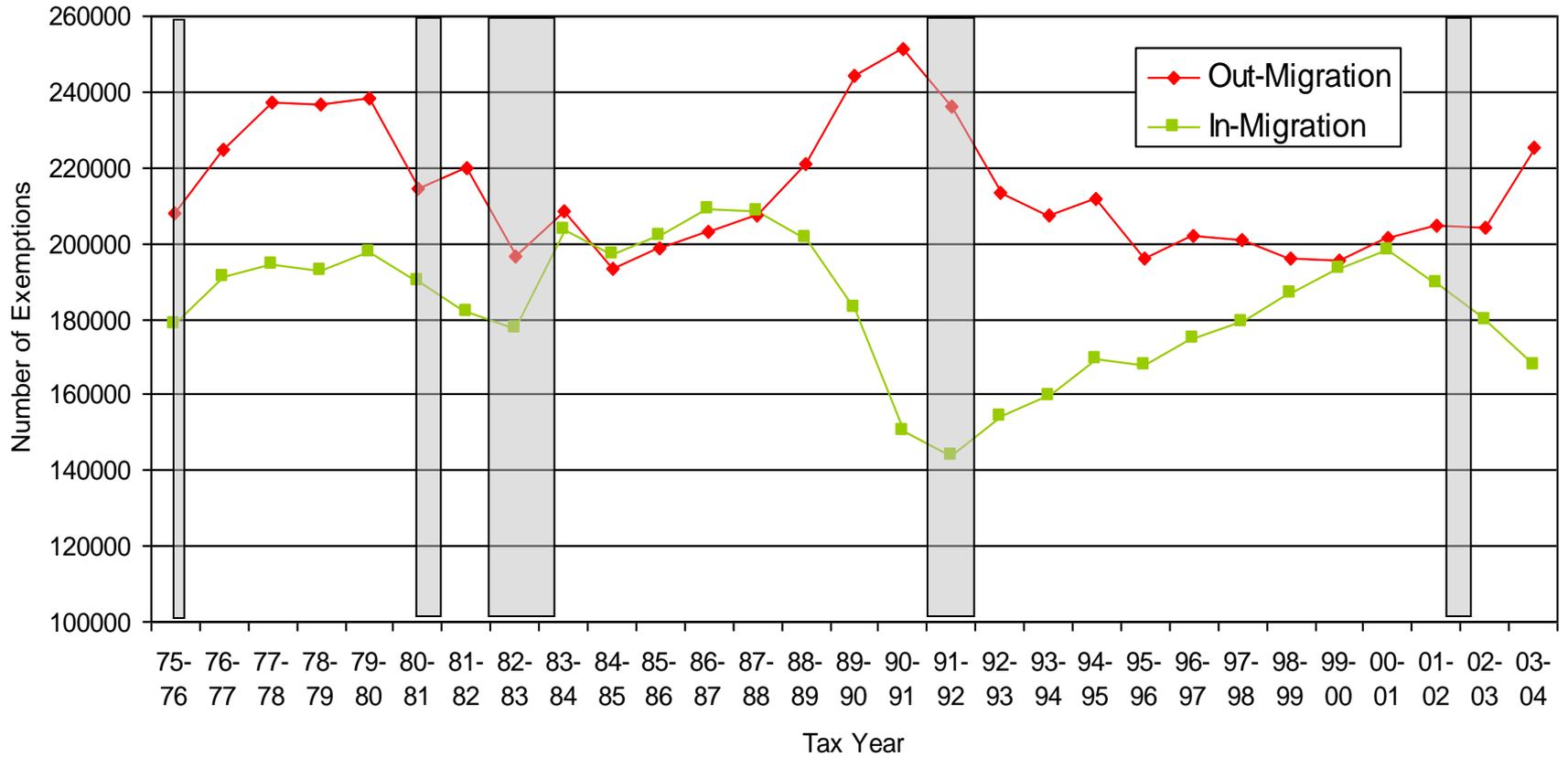
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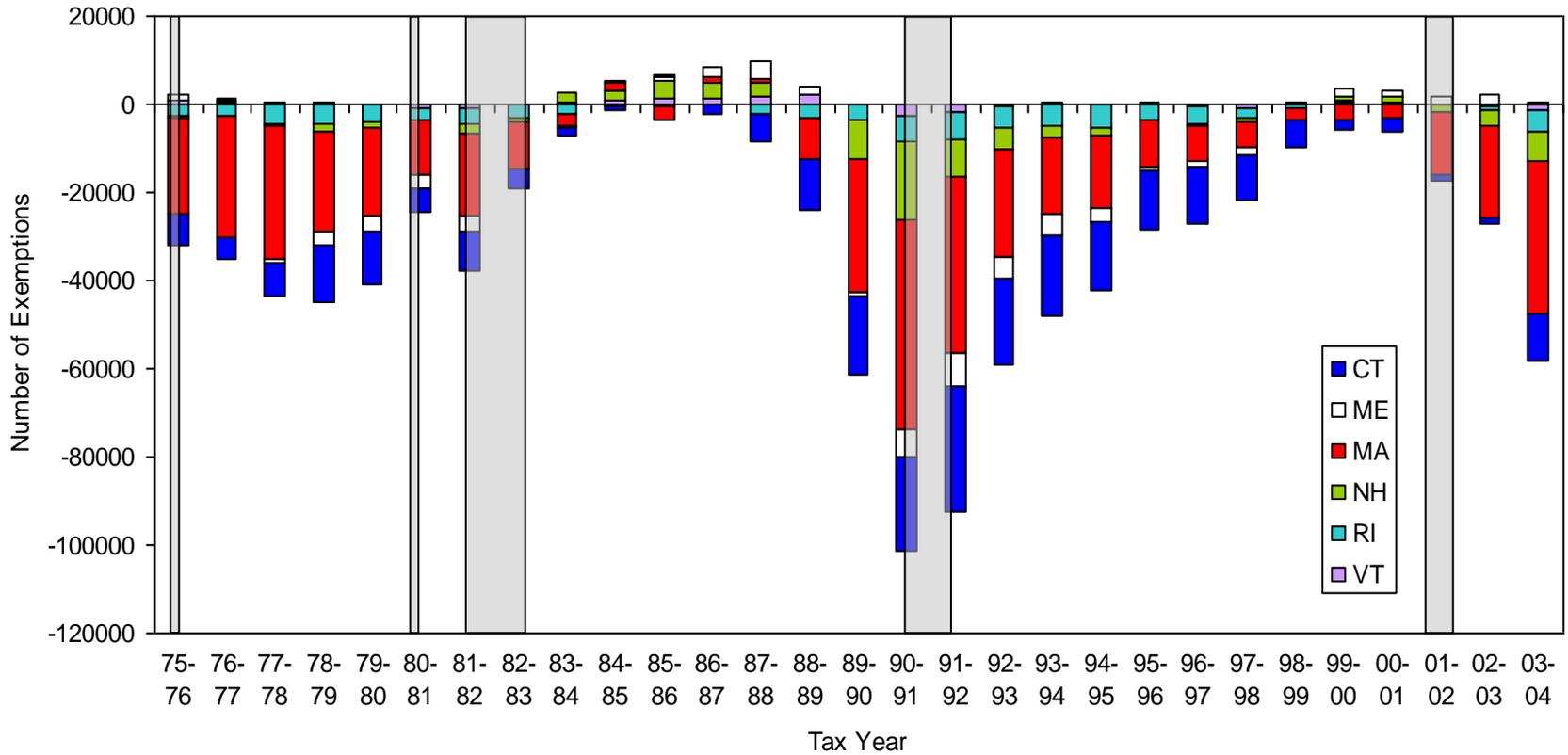
Note: Shading represents NBER recession periods from peak to trough.

Figure 2
Domestic Migration Flows for New England



Source: Author's calculations from the IRS state migration data.
Note: Shading represents NBER recession periods from peak to trough.

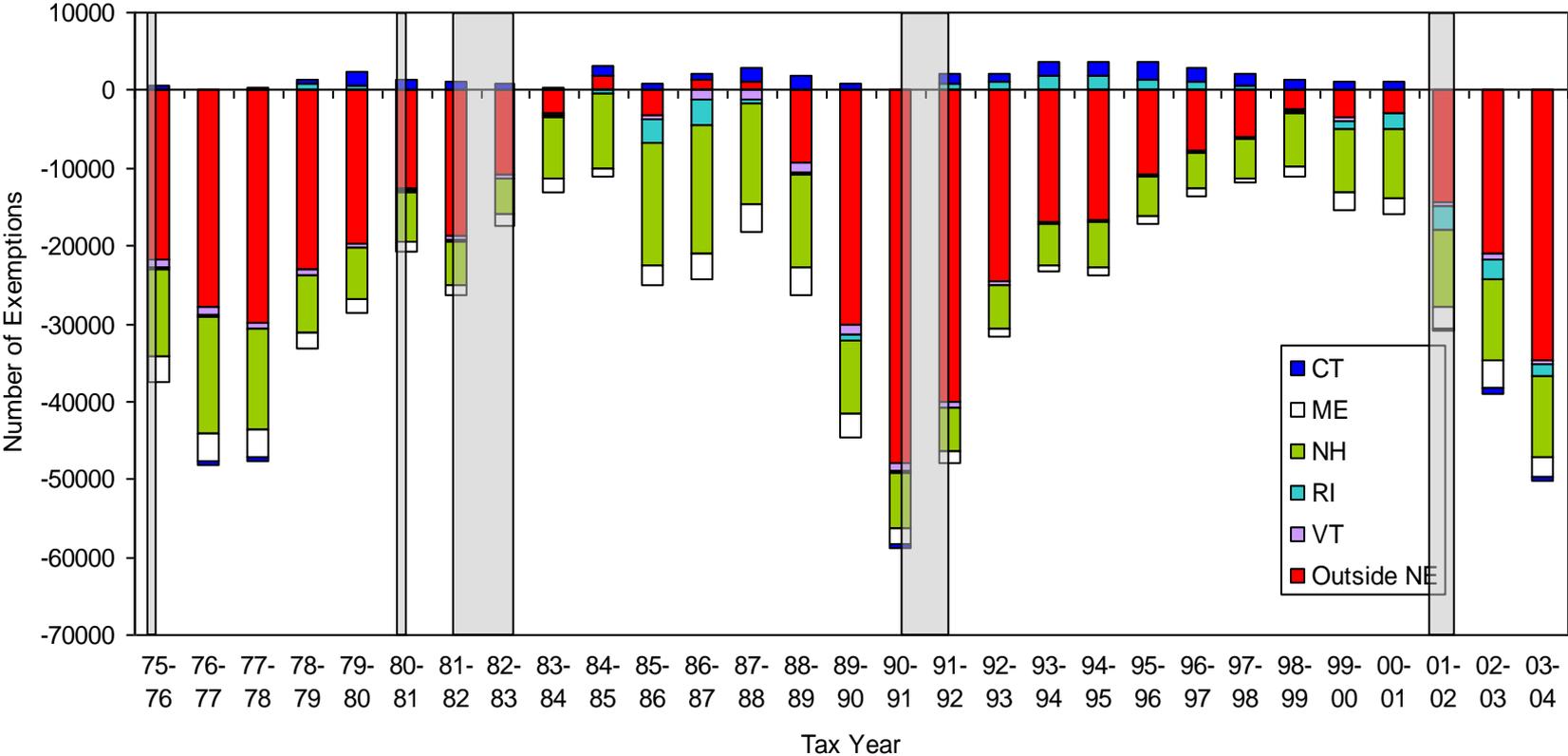
Figure 3
Share of New England Net Domestic Migration Accounted for by Each State



Source: Author's calculations from the IRS state migration data.

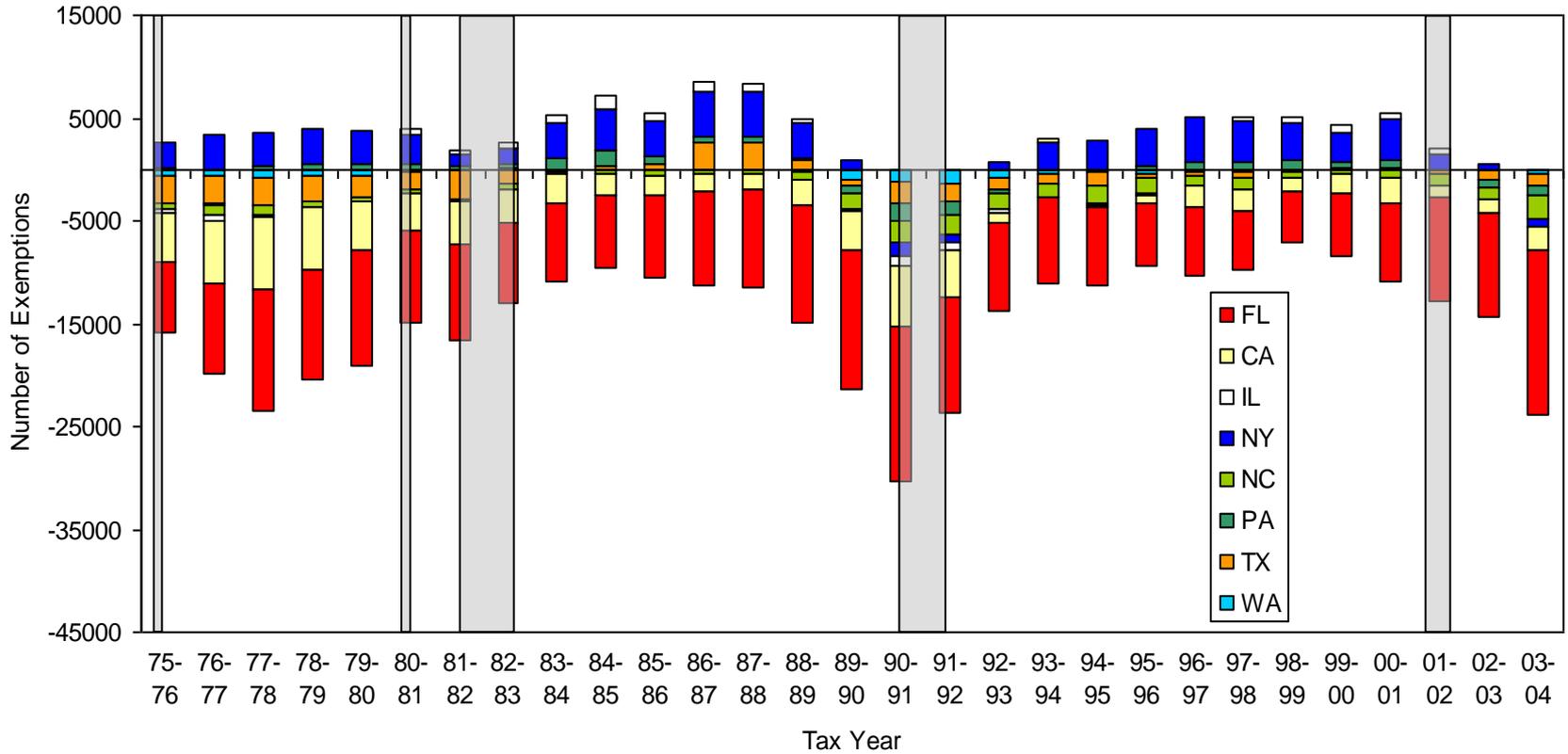
Note: Shading represents NBER recession periods from peak to trough.

Figure 4
 Share of Massachusetts Net Domestic Migration within versus outside New England



Source: Author's calculations from the IRS state migration data.
 Note: Shading represents NBER recession periods from peak to trough.

Figure 5
 Share of Massachusetts Net Domestic Migration Across Competitor States and Florida



Source: Author's calculations from the IRS state migration data.

Note: Shading represents NBER recession periods from peak to trough.

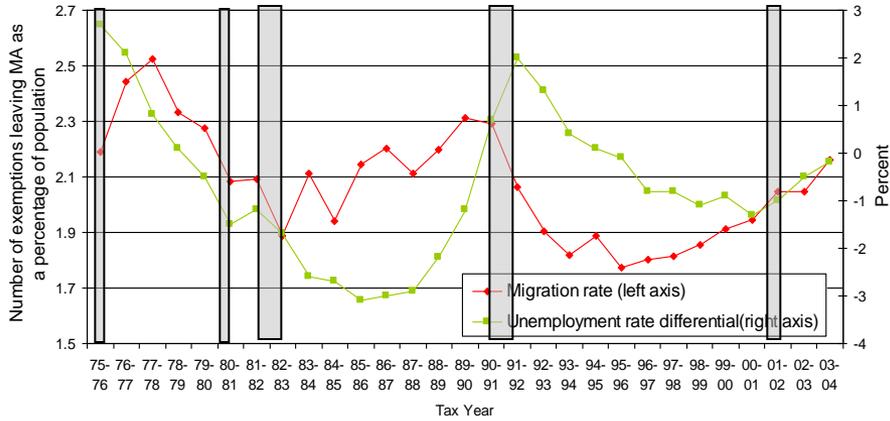
Economic Factors Affecting Migration

According to economic theory, individuals will choose to migrate to places where they can maximize their utility.

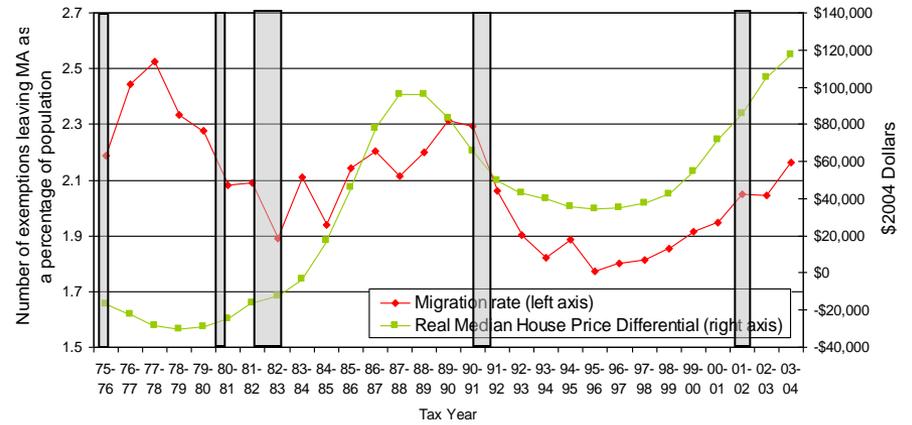
- Economic factors: job opportunities, incomes, cost of living
- Non-economic factors: ethnic or family ties, local amenities, willingness to relocate

Figure 8
 Massachusetts Domestic Out-Migration Rate versus Relative Economic Conditions

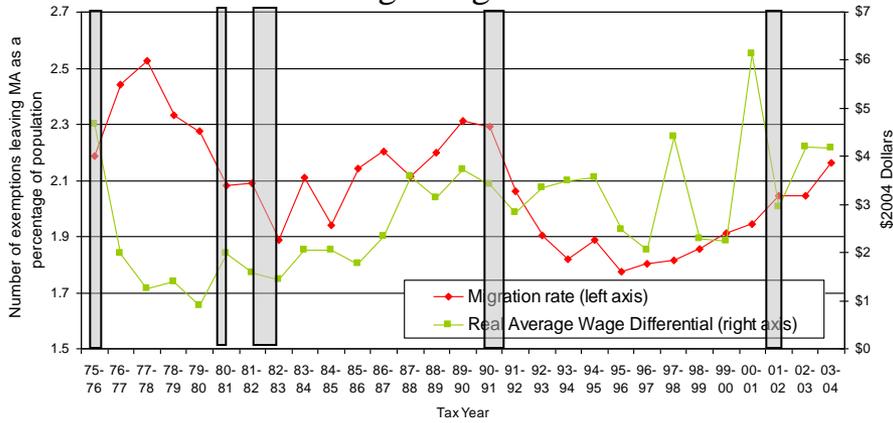
Unemployment Rate Differential



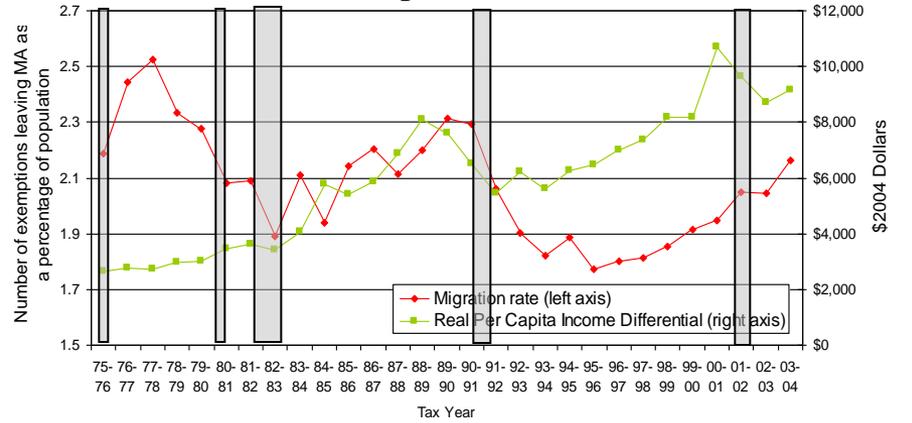
Real House Price Differential



Real Average Wage Differential



Real Per Capita Income Differential



Logistic Regression Model

The basic model is a logistic specification where individuals are assumed to choose the location yielding the highest expected net discounted return on migration from among a finite number of destinations (Davies, Greenwood and Li 2001; Gabriel, Matthey, and Wascher 1995).

The probability of migrating from state i to state j in year t is equal to:

$$(1) \quad \Pi_{ijt} = \exp(Z_{ijt}) / [\sum_k \exp(Z_{ikt})] \quad i, j = 1, \dots, 50; \quad t = 1, \dots, \tau$$

where the Z variables are indices of the expected return to moving to different places. The likelihood of migrating from state i to state j in year t versus remaining in state i , is then given by the ratio Π_{ijt} / Π_{iit} .

Taking the logarithm yields the following estimation equation:

$$(2) \quad \ln(\Pi_{ijt} / \Pi_{iit}) = Z_{ijt} - Z_{iit} \quad i, j = 1, \dots, 51; \quad i \neq j; \quad \text{and} \quad t = 1, \dots, \tau$$

Index of Expected Returns to Moving, Z_{ijt}

The index variable of expected returns to moving, Z , is a linear combination of the relevant demographic, economic, and location-specific amenities as well as the transaction costs of moving between states i and j :

$$\begin{aligned} Z_{ijt} &= \Phi X_{it} + \varphi X_{jt} + \gamma T_{it} + \delta D_{ij} && \text{if } i \neq j && \text{(moving)} \\ &= \Phi X_{it} + \varphi X_{jt} - \gamma T_{it} && \text{if } i = j && \text{(staying)} \end{aligned}$$

where $i, j = 1, \dots, 51$ and $t = 1, \dots, \tau$

And

$$\begin{aligned} \Phi X_{st} &= A_s^o + \beta_1 UR_{st} + \beta_2 PCI_{st} + \beta_3 W_{st} + \beta_4 HP_{st} && \text{for } s \text{ indexing origins (i)} \\ \Phi X_{st} &= A_s^d + \beta_1 UR_{st} + \beta_2 PCI_{st} + \beta_3 W_{st} + \beta_4 HP_{st} && \text{for } s \text{ indexing destinations (j)} \end{aligned}$$

where A_s^o and A_s^d are origin and destination fixed effects,
UR = unemployment rate, PCI = per capita income
W = real median wages, and HP = real house prices.

Reduced Form Equation

Thus, the state-to-state migration model that is estimated is:

$$(2) \quad \ln (\Pi_{ijt} / \Pi_{iit}) = Z_{ijt} - Z_{iit}$$

or
$$\ln (\Pi_{ijt} / \Pi_{iit}) = \Phi(X_{it} - X_{jt}) + 2\gamma T_{it} + \delta D_{ij}$$

And the reduced form equation is:

$$(3) \quad Y_{ijt} = \alpha + \beta_1 (UR_{it} - UR_{jt}) + \beta_2 (PCI_{it} - PCI_{jt}) + \beta_3 (W_{it} - W_{jt}) \\ + \beta_4 (HP_{it} - HP_{jt}) + 2\gamma T_{it} + \delta D_{ij} + \sum_s A_s^o F_{js} - \sum_s A_s^d F_{is} + \varepsilon_{ijt}$$

where Y_{ijt} is the log of the ratio of the migration rate to the rate at which individuals remain in the state.

Table 3: Estimating the Importance of Economic Factors on Migration

Independent Variable	Specification		
	1	2	7
UR differential	-0.039***	0.045***	0.044***
PCI differential	0.011***	-0.005***	-0.016***
W differential	-0.027***	-0.002***	-0.002***
HP differential	-0.001***	0.001***	0.001***
Distance	0.000***	-0.001***	-0.001***
MA as origin	-----	0.399***	0.145
MA as destination	-----	0.353***	0.263**
state fixed effects?	No	Yes	Yes
Year fixed effects?	No	Yes	Yes
R-squared	0.055	0.771	0.772
Number of obs.	73,950	73,950	73,950

Note: ***Indicates significance at the 1 percent level, ** at the 5 percent level

Specification 7 also includes controls for origin characteristics (age, race, ethnicity, education, family status).

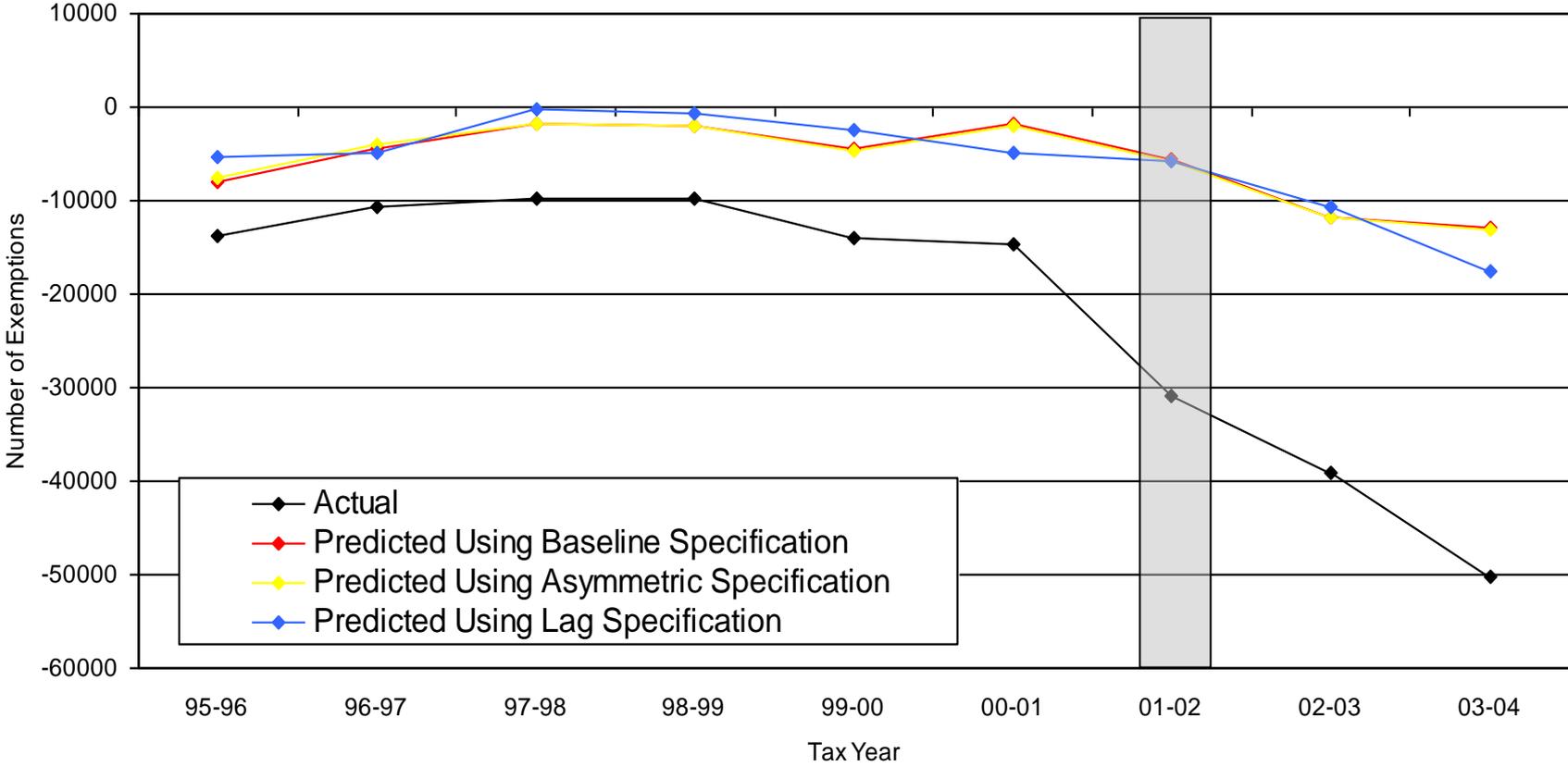
Table 4: The Impact of Economic Factors on Migration by Decade

Independent Variable	Time Period		
	1975-1984	1985-1994	1975-2003
UR differential	0.026***	0.068***	0.033***
PCI differential	-0.025***	-0.014***	-0.011***
W differential	-0.001	-0.002**	-0.001***
HP differential	0.000	0.001***	0.001***
Distance	-0.001***	-0.001***	-0.001***
MA as origin	0.622***	0.079	0.619***
MA as destination	0.219*	0.212*	0.399***
state fixed effects?	Yes	Yes	Yes
Year fixed effects?	Yes	Yes	Yes
R-squared	0.786	0.789	0.772
Number of obs.	25,500	25,500	22,950

Note: ***Indicates significance at the 1 percent level, ** at the 5 percent level, * at the 10 percent level.

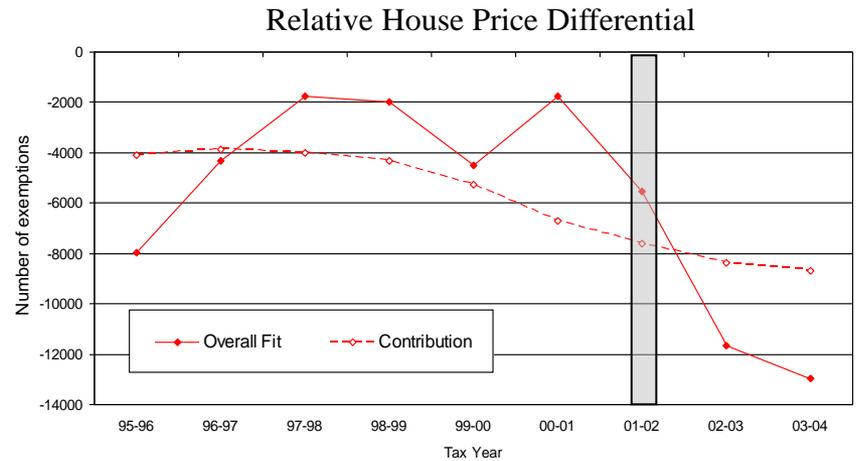
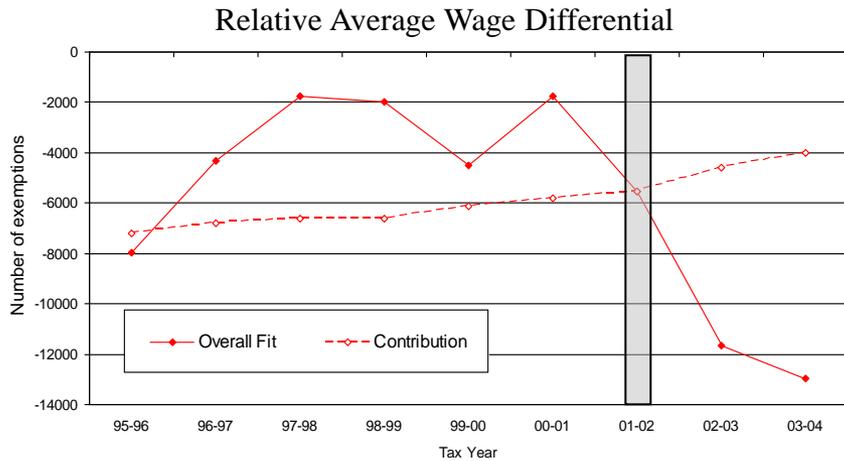
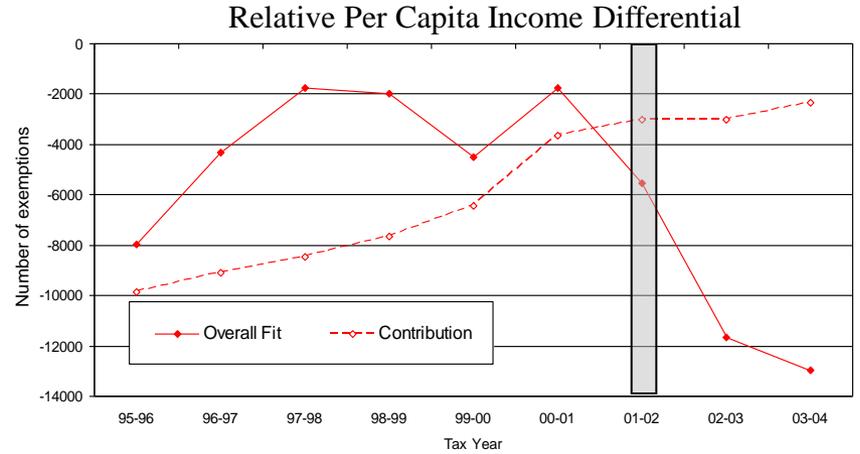
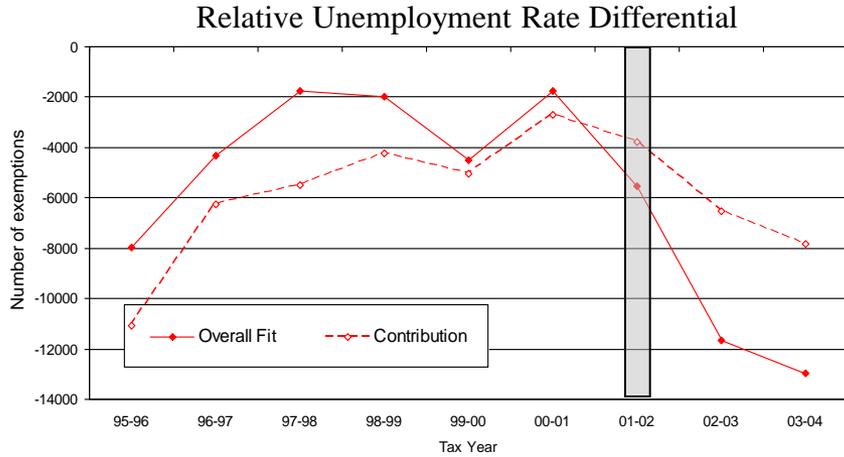
Each regression also includes controls for origin characteristics (age, race, ethnicity, education, family status).

Figure 9
 Actual Versus Predicted Domestic Net Migration Flows for Massachusetts



Source: Author's calculations from the IRS state migration data.
 Note: Shading represents NBER recession periods from peak to trough.

Figure 10
 Relative Contribution of Economic Conditions to Goodness of Fit for
 Massachusetts Net Domestic Migration

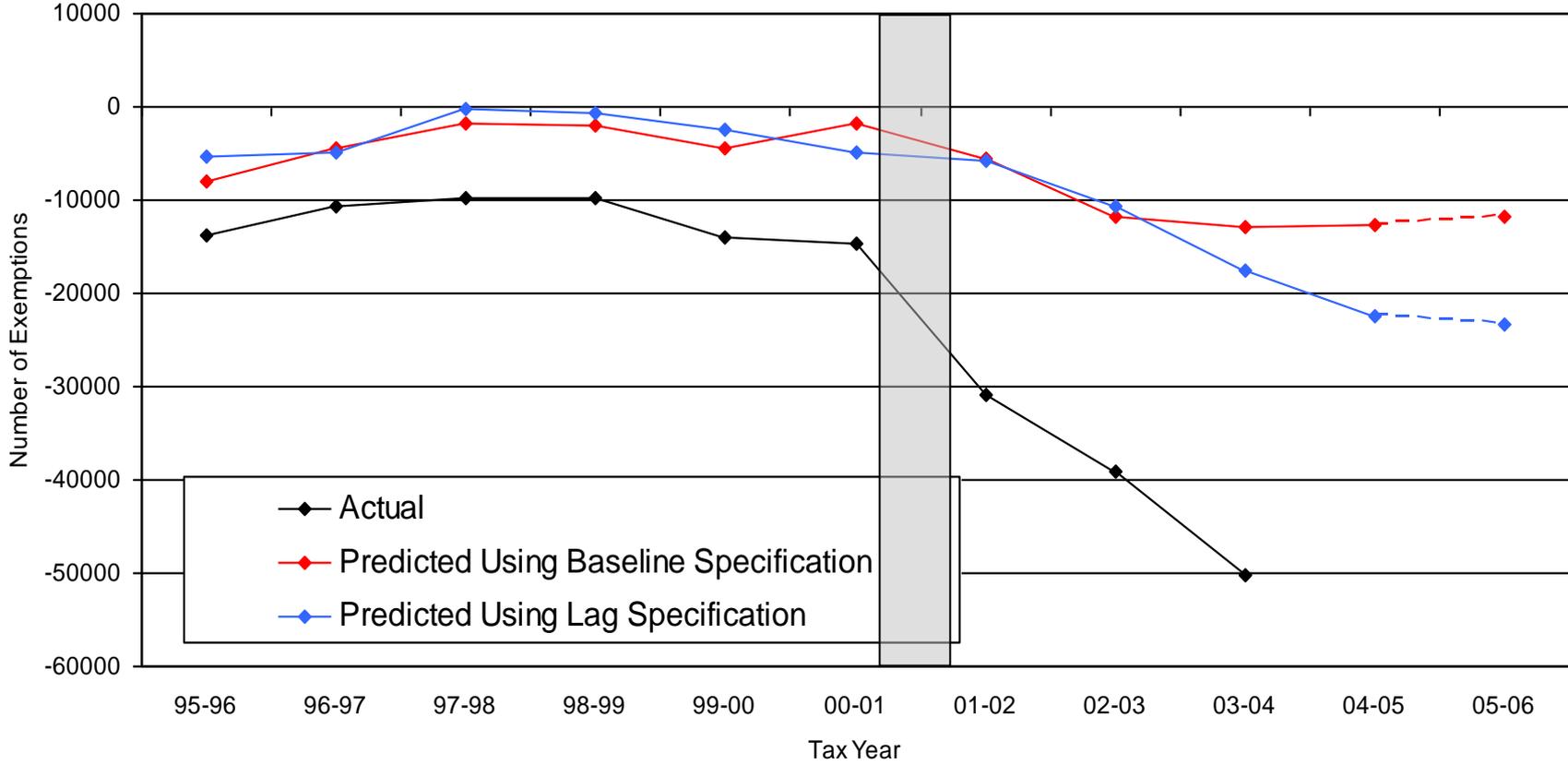


Note: Relative contribution determined by comparing the overall fit of the model to a simulation that isolates the contribution of the chosen variable. The simulation allows the chosen variable to vary but holds the other factors constant at the sample means.

Shading represents NBER recession periods from peak to trough.

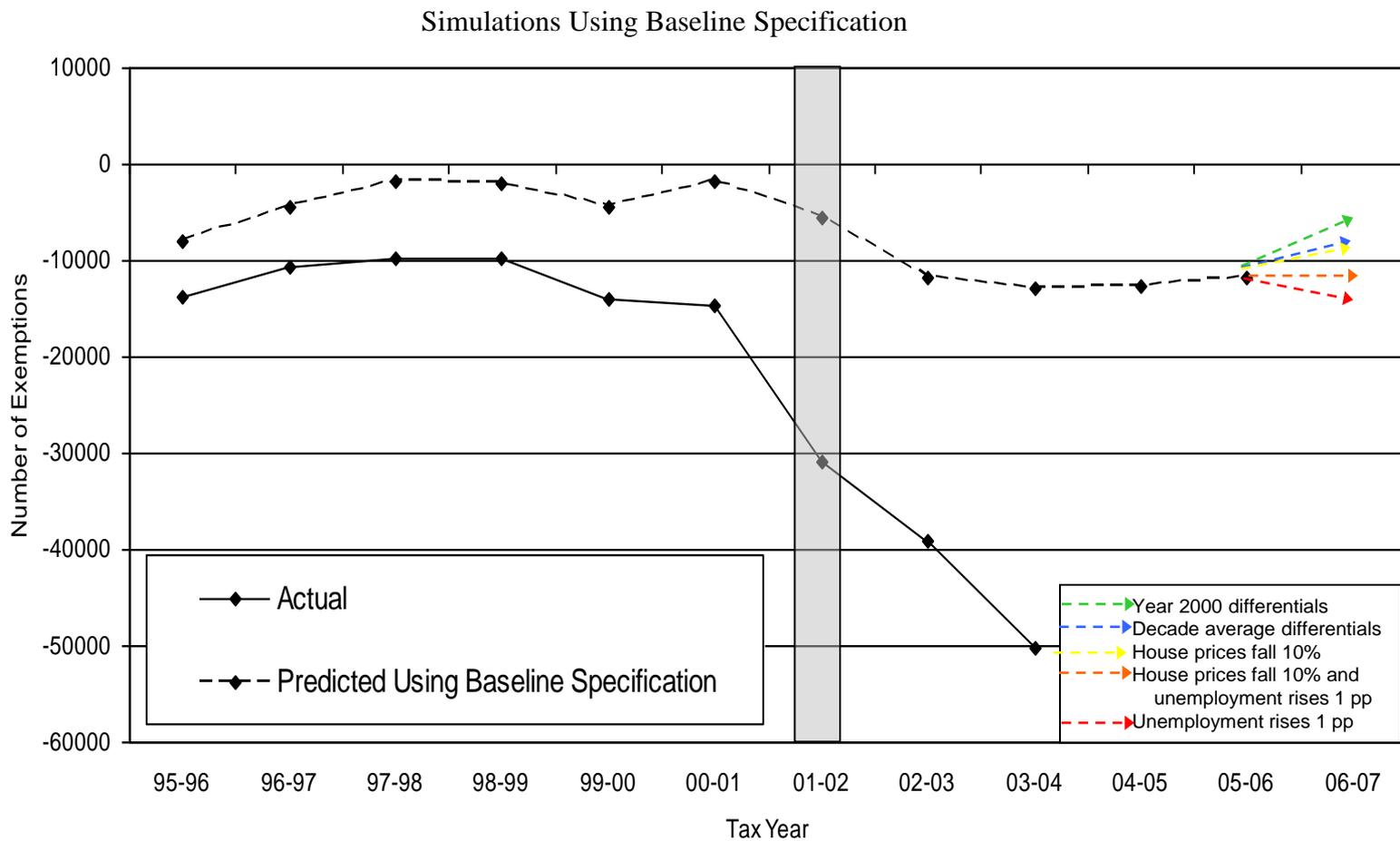
Source: Author's calculations using IRS state migration data.

Figure 11
 Migration Projections for Massachusetts: 2004-05 and 2005-06



Source: Author's calculations from the IRS state migration data.
 Note: Shading represents NBER recession periods from peak to trough.

Figure 12
Alternative Simulations for Massachusetts Net Domestic Migration



Source: Author's calculations from the IRS state migration data.

Note: Shading represents NBER recession periods from peak to trough.

Conclusions

The usual relationship between domestic out-migration and the unemployment rate, per capita income, and wages holds with some variation over time.

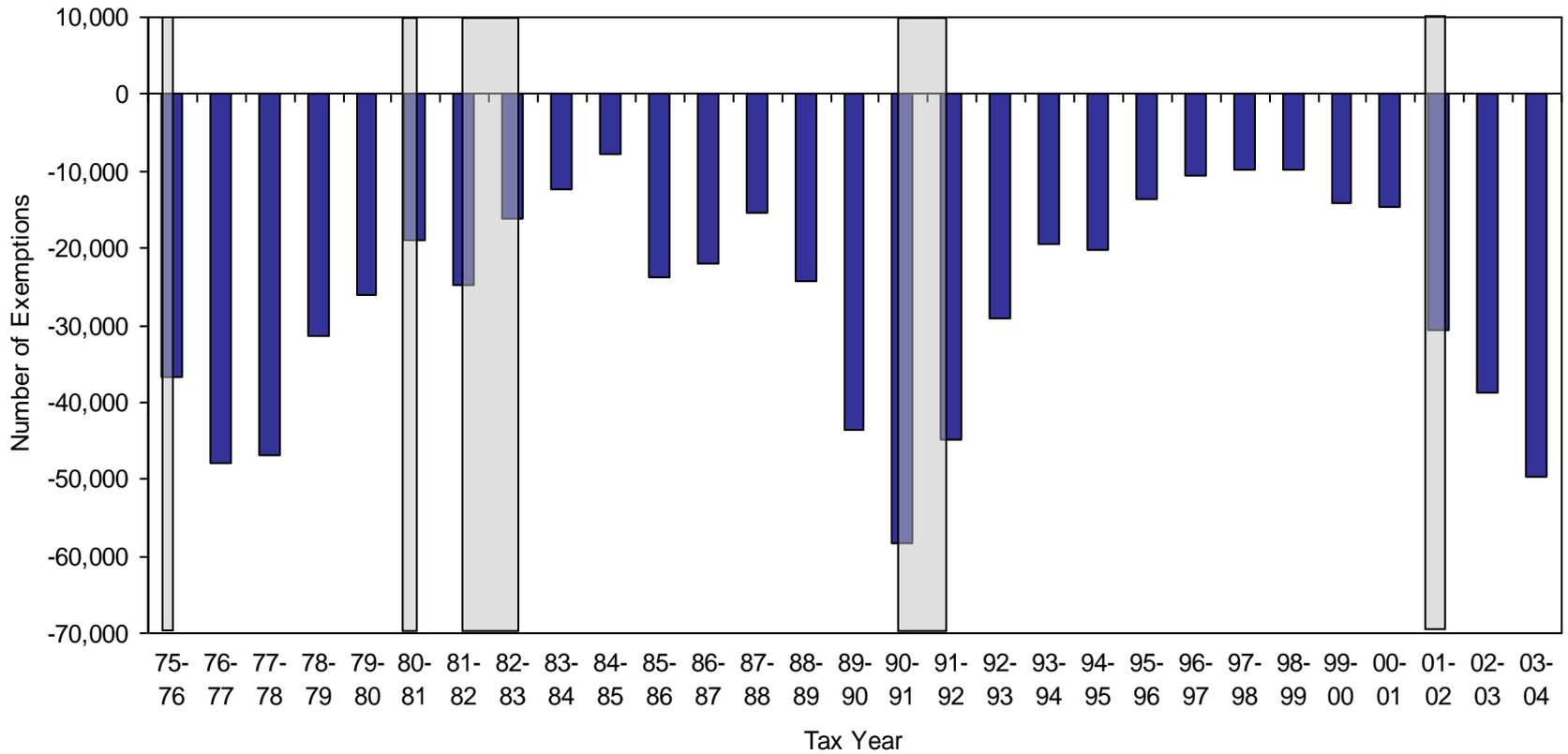
The relationship between migration and house prices has changed over time, having no significant impact for the period 1975-1984 but with higher housing prices being associated with a greater probability of leaving an area for the two more recent periods.

Changes over time in state unemployment rate differentials have the greatest influence on migration among the economic factors. Yet rising house prices also induced additional out-migration, particularly between 1998 and 2003.

Buyer beware: although it might be tempting to conclude from the simulations that the recent trends in out-migration might reverse themselves if the state's housing market cools and economic conditions continue to improve, a few caveats are in order.

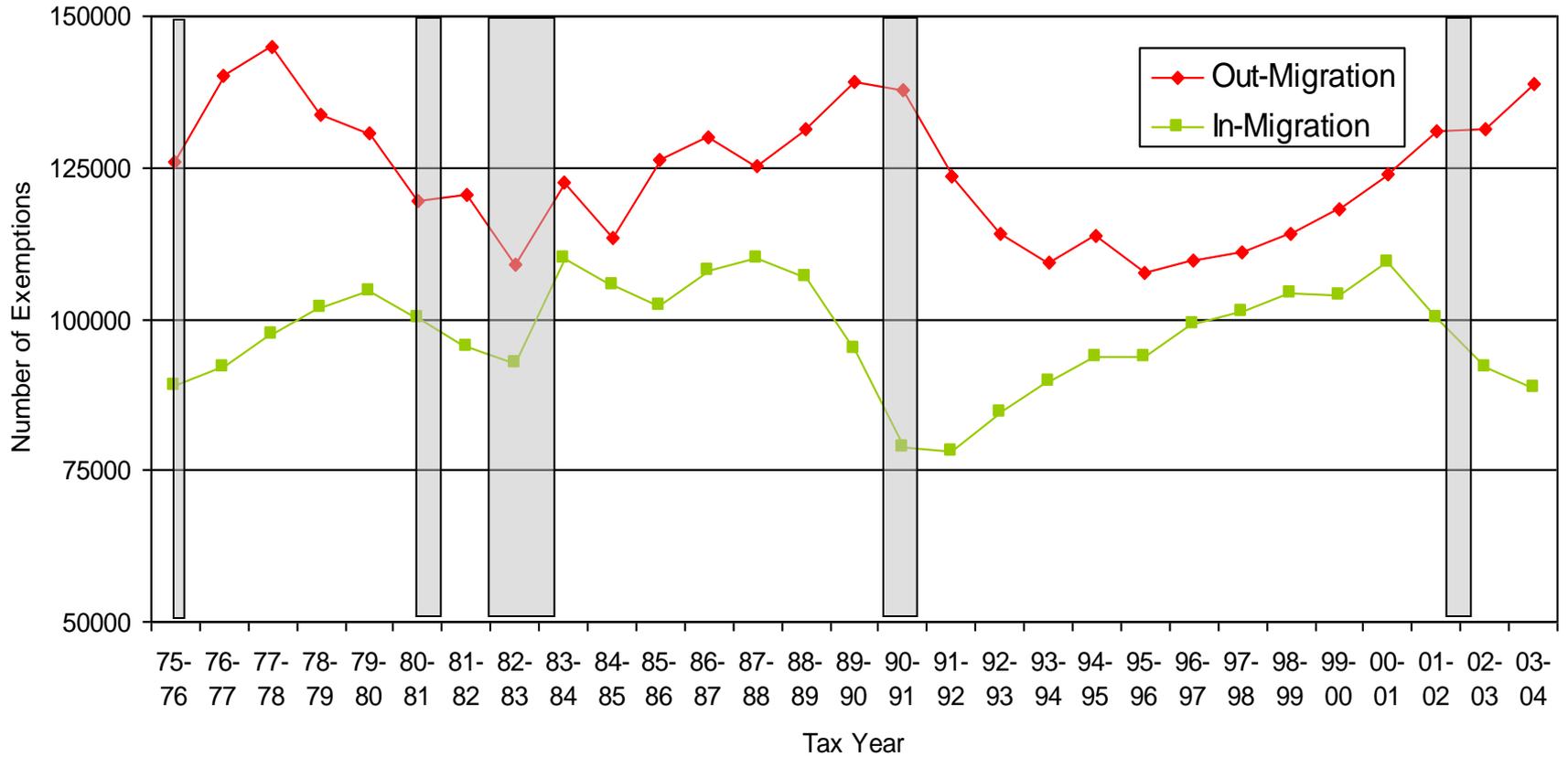
EXTRA SLIDES

extra
 Net Domestic Migration for Massachusetts
 (including migration to and from other New England states)



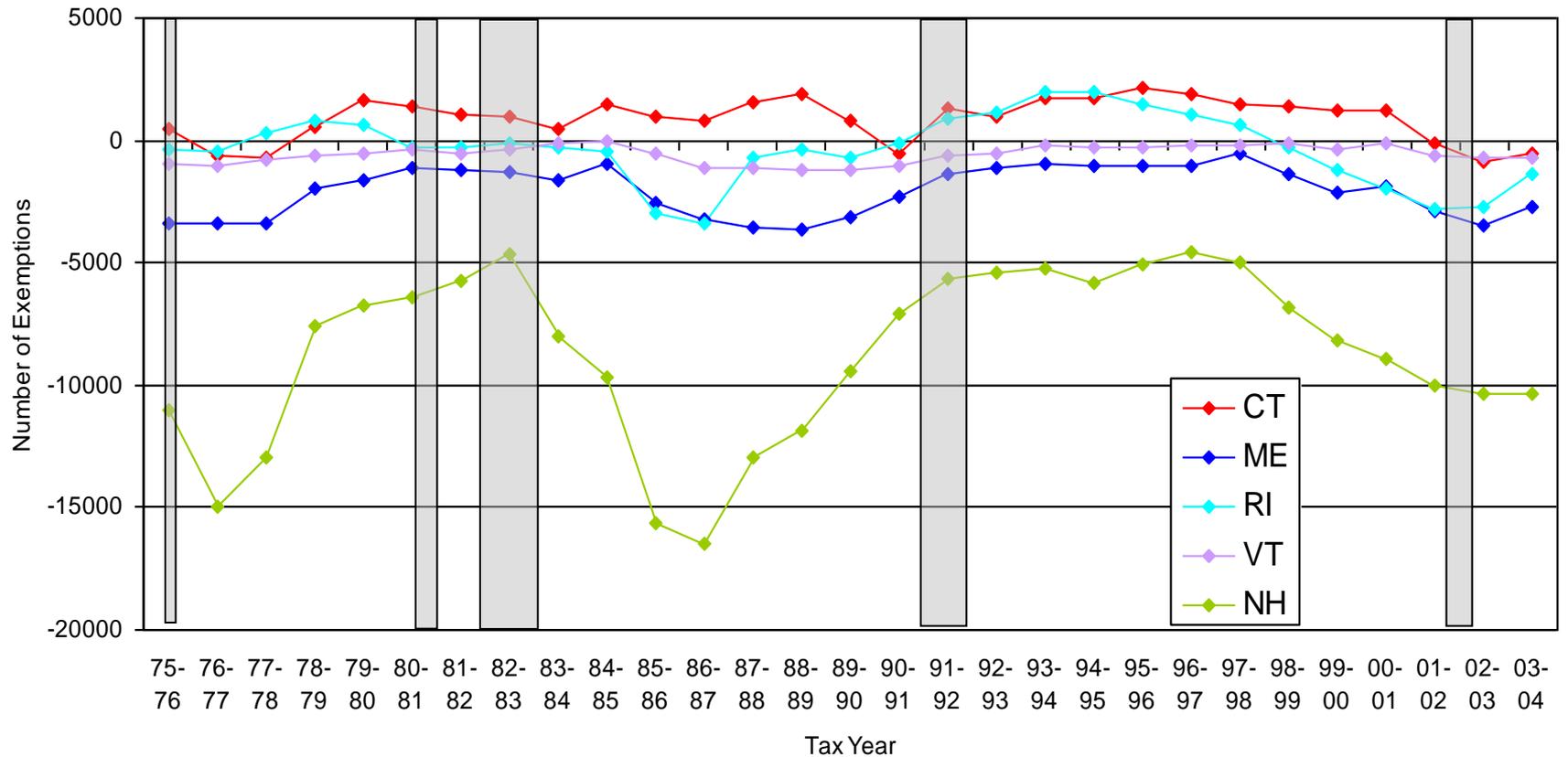
Source: Author's calculations from the IRS state migration data.
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extra
Domestic Migration Flows for Massachusetts



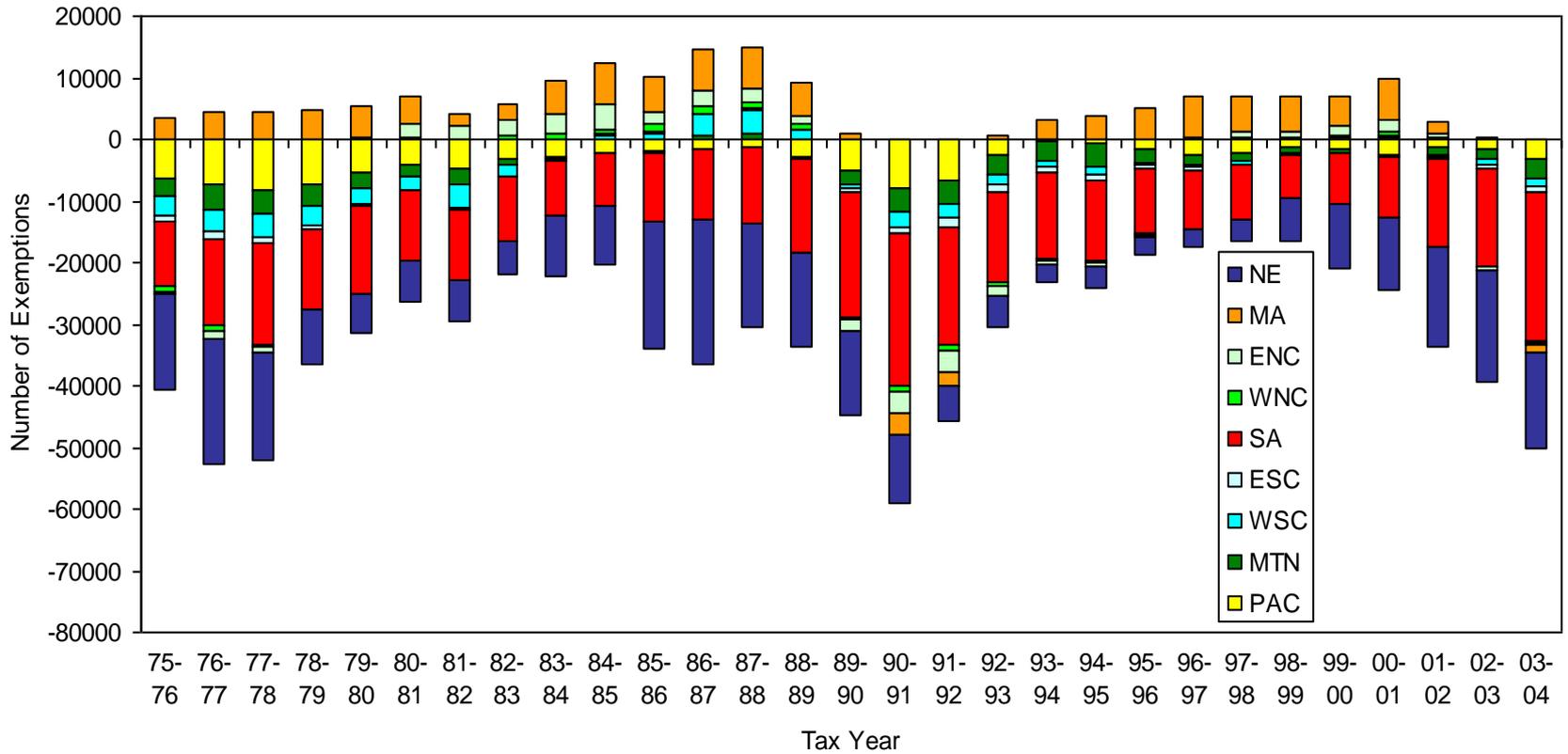
Source: Author's calculations from the IRS state migration data.
Note: Shading represents NBER recession periods from peak to trough.

extra
 Net Domestic Migration Flows Between Massachusetts and Other New England States



Source: Author's calculations from the IRS state migration data.
 Note: Shading represents NBER recession periods from peak to trough.

extra
 Share of Massachusetts Net Domestic Migration Across Census Divisions



Source: Author's calculations from the IRS state migration data.