THE EFFECT OF FINANCIAL INCENTIVES ON EMPLOYER-SPONSORED
INSURANCE: DOES THE MANDATE MATTER?

A Massachusetts Case Study

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TABLE OF CONTENTS

I. Introduction

In 2006, Massachusetts passed a comprehensive health reform law designed to expand access to health insurance coverage through a combination of individual and employer mandates, insurance market restructuring, and subsidies through the state's Commonwealth Health Insurance Connector Authority (also known simply as the Connector). This Massachusetts Health Care and Insurance Reform Law required that nearly every state resident obtain a minimum level of insurance coverage. To aid in the facilitation of the mandate, the state government provided free health care insurance for those earning less than 150 percent of the federal poverty line (FPL), and made it compulsory for employers with above a specified number of workers to provide health coverage for their employees. The Massachusetts Health Care and Insurance Reform Law was the forerunner of the federal Patient Protection and Affordable Care Act (PPACA) that was signed into law by President Barack Obama in 2010. Thus, studying the most recent impacts of health care reform on the state of Massachusetts provides valuable insights into the future of the insurance markets, personal finance decisions, and employee benefits package distributions in the United States.

Major revisions to the initial 2006 Massachusetts health reform have taken place in the past few years; the legislation has been amended several times since 2008 to keep it consistent with the federal Affordable Care Act (ACA). One particularly notable change is the repeal of the employer mandate in 2013 in favor of the federal mandate. However,

as enforcement of the federal mandate was delayed until January 2015[1], this provides a unique window into observing the behavior of employers without the monetary penalty of not providing health insurance to their employees. Comparing 2014 health insurance market data with those of prior years will allow researchers to gain a perspective on employer and employee incentives for the United States as a whole that previously could not have been attained.

Because the Massachusetts health care reform was the original prototype of the federal ACA, analyzing the current details of the situation of this state can serve as valuable predictors and provide glimpses of the path that the federal reform will take. Both the state and federal health care systems built upon a long history of health reform efforts— from Progressive reform advocates for health insurance in the 1910s to the failure of the Truman effort in the 1940s to the signing into law of Medicare and Medicaid in 1965— gradually filling in the cracks in health care to create an increasingly complex coverage system. And while the tedious history of American health care reform was running its course, most of the other developed countries throughout the world switched to universal health care systems (England, for instance, established its National Health Service after World War II). Instead, the United States has developed an aspiring plan to promote shared individual, employer, and governmental responsibility.

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[1] Dunning, 2013

Since the turn of the century, national rates of coverage through employer-sponsored insurance decreased nearly every year leading up to the passage of the ACA.[2] Studies have shown these statistics to be consistent across numerous subpopulations, including adults with and without children, individuals of low and high socioeconomic status, and workers in small and large firms.[3] The decline in employer-sponsored insurance was particularly prominent among employees of small firms and lower-income individuals relative to employees of large firms and higher-income individuals.

Clearly, financial incentives matter much in employers' decisions as to whether or not to provide health insurance for their workers and how much to provide—national rates of coverage through employer-sponsored insurance dropped to their two lowest points of the decade during the two most recent recessions of 2001 and 2007-08.[4] In this paper, I address the question of whether the financial incentive of the employer mandate does have a positive impact on rates of employer-sponsored insurance offer and take-up, and, if so, to what extent this impact differs by firm size.

The Massachusetts health care reform made mandatory that all employers over 11 full-time equivalent employees (FTEs) offer health insurance coverage to their workers. However, the contribution requirement for small firms (between 11 and 50 employees) is far more lenient that the contribution requirement for large firms (above 50 employees). Therefore, low-wage employees of small firms that are income-eligible for subsidies may

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[2] Blavin, Holahan, Kenney, & Chen, 2014
[3] Blavin, Holahan, Kenney, & Chen, 2012
[4] Blavin, Holahan, Kenney, & Chen, 2014

have the option to choose between subsidized coverage and their employers' health insurance plan. Conversely, employees of large firms, which are mandated to provide more robust insurance packages than their smaller counterparts, almost never qualify for subsidies to purchase insurance on the Connector. In this paper, I assess the differences in health insurance coverage distributions between employees in small firms and employees in large firms to observe the potential effects of the more lenient small firm mandate as well as the temporary lifting of the large firm mandate in 2014.

To accomplish this, I employ a difference-in-differences approach with the most recent health care data from Massachusetts, the Health Reform Monitoring Survey (HRMS). Instead of merely searching for the same effectual differences between small firms and large firms that has already been covered in previous research, I specifically observe the data from 2014, the unique year where the usual financial incentives that come with the employer-sponsored insurance mandate are absent, and compare the data with that of the previous period of 2013. I hypothesize that the absence of the employer mandate will be negatively correlated with rates of employer-sponsored insurance offer and take-up.

Using data from the HRMS grouped specifically to fit my model, this study illustrates the extent to which the changing financial incentives for small and large firms generate differences in the take-up of subsidized coverage and offerings of employer-sponsored insurance in Massachusetts. Previous analyses of the reforms have tended to focus on health service utilization, costs, and the relationship between coverage and poor health outcomes. The literature that does exist surrounding the topic in question is, more often

than not, contradictory. Here, I extend the literary canon by analyzing the changes in coverage distributions due to the interaction of the employer mandate, firm size, and employee personal finance situations. I minimize the interference of omitted variable bias in my model with fixed effects, and use a random sampling of 10,000 individual workers from other American states as my control group.

My research provides a deeper yet also broader perspective on the financial incentives that are inevitably inherent in the health care reform legislation of both the state of Massachusetts as well as the United States as a whole. Combining HRMS data from Massachusetts with data from a control set of randomized workers from other states for the second quarters of 2013 and 2014, I attain an ample base sample size of about 23,000 (approximately 6,000 individual survey participants in each group of interest for every year). Although my model fails to perfectly control for every other economic or policy change between 2013 and 2014 that may have influenced the changes in coverage distributions, its sound analysis of the subpopulations of Massachusetts compared to the control states and the employees of small firms compared to the employees of large firms will help decision-makers in the policy arena better comprehend the true impact on major stakeholder groups of this statute of the ACA.

My paper evinces that financial incentives do have a significant impact on both the offer and take-up rates of employer-sponsored insurance in Massachusetts between 2013 and 2014. The absence of the employer mandate in 2014 resulted in a shift in the number of employers who offered employer-sponsored insurance to their workers—in scenarios

where the monetary tax penalty previously outweighed the benefits of providing health insurance, it would make logical sense for a business to maximize its revenue. (Of course, this is without weighing in the feelings and potential repercussive actions from workers and unions.)

Coming from a different angle, the more lenient regulations placed on small firms makes it possible for the firms and their employees to work together to allow income-eligible employees to access subsidized coverage without affecting the actual cost of access to the insurance that the employer provides for non-eligible employees. Hence, the relative freedom given to smaller firms is more likely to encourage these firms and their workers to alter their existing insurance benefit plans to take greatest advantage of government subsidies under the exchanges. Under the mandate, this was true for small firms but not as much for large firms, but may be shown to have changed and now hold for large firms as well in the absence of the mandate in Massachusetts in 2014. The quasi-experiment inherent in this case study may have important implications for the validity of the employer mandate. That is, if there truly is a trade-off between allowing more leniency for businesses to comply with the employer mandate and a shifting of income-eligible workers to purchase their own subsidized health insurance, then this could increase efficiency and lower future premiums for not only the Massachusetts Connector, but for other state-run insurance exchanges as well.

The remainder of this paper proceeds as follows. Section II reviews related literature on the Massachusetts health care reform in the context of the federal Affordable Care Act as

well as the financial incentives relevant to health care and insurance. Section III

describes the data set, the Health Reform Monitoring Survey (HRMS). Section IV

outlines my strategy of empirical analysis. Section V details the results and provides a

discussion of the analysis. Section VI concludes.

II. Literature Review

There is a wealth of research that has been conducted on the financial incentives related to insurance as well as incentives for individuals to enroll in health insurance. Although the impact of health care reforms on employer-sponsored insurance (ESI) has been previously studied, and Massachusetts previously used as a medium to predict the future of the ACA, a detailed analysis of the supply and demand for ESI in 2014 has yet to be done. This paper contributes a voice to the ongoing discussion on Massachusetts's health care reform by considering the difference that the unprecedented lifting of the state mandate makes on ESI offer and take-up rates of small and large firms.

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Health Care Reform: A History

To fully understand the economics of these incentives, it is first necessary to comprehend the research that initially prompted these specific health care reforms.

The state of Massachusetts, as the first to adopt reforms to again prod America towards the universal coverage present in nearly every other developed nation (take, for example, the single-payer systems of Germany, the United Kingdom, France, and Canada, to name a few), has long been viewed as a test trial for the federal Affordable Care Act (ACA) of

2010. The basic idea behind the Massachusetts Health Care and Insurance Reform Law of 2006 was to continue the United States' history of "incremental universalism." This term, coined by Jonathan Gruber in his 2008 paper, refers to a gradual shift towards universal health insurance coverage by filling in the gaps of the existing system rather than ripping up the system and starting over.[5]

Gruber (2010) describes the Massachusetts legislation as a "Three-Legged Stool."[6] The first leg is the all-important mandate, the requirement that individuals obtain and keep their health insurance coverage and that employers offer "fair and reasonable" health insurance to all full-time employees. The second leg of the stool is comprised of insurance market reforms, among which include guaranteed issue, community rating, and a merge of the non-group and small-group markets. The third leg of the stool provides subsidized and unsubsidized coverage through the Massachusetts Connector to state residents, with subsidies available to individuals below 300 percent of the federal poverty line. Together, the three legs of the stool work in parallel to reduce premiums in the small and non-group markets by allowing for a larger base risk pool. Gruber, in his promotion of the original Massachusetts health insurance plan, wanted health insurance coverage to be obtainable by individuals even if they have some type of pre-existing condition; the reforms guard against adverse selection by forcing individuals without insurance to pay a financial penalty while still maintaining the employer mandate to not rock the boat of the main source of health insurance coverage for the working population in Massachusetts, and also offer publicly subsidized private health insurance plans to

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[5] Gruber, 2008
[6] Gruber, 2010

provide individuals below 300 percent of the federal poverty line who otherwise cannot

obtain Medicaid a way to purchase affordable health insurance coverage.

The Massachusetts health care reforms drew a significant amount of attention and

inspired a plethora of academic research that has formed the foundation for national

health reform embodied in the ACA. Long and Stockley (2011) note a significant

decrease in unmet medical needs.[7] Kolstad and Kowalski (2012) note a significant

increase in the use of primary and preventive health care services in conjunction with a

small decrease in hospital admissions deemed preventable with quality outpatient care.[8]

Raymond (2009) notes that the federal government funds half of the $707 million annual

cost of the Massachusetts legislation[9]. The numerous studies surrounding the

Massachusetts health care reform and the impacts it had on both the supply-side and

demand-side of the health care and insurance industries do succeed in showing that the

law substantially increased health insurance coverage with little-to-no subsidized

insurance crowd out of ESI.[10] These studies demonstrated that in Massachusetts, both

ESI and publicly subsidized insurance coverage increased subsequent to the

implementation of the state health care reforms. Though this paper actually frames and

terms ESI crowd out and its cause and effects in a different way, the main purpose of my

research is nevertheless to add a thread to the existing blanket discussion of general

reforms.

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[7] Long & Stockley, 2011
[8] Kolstad & Kowalski, 2012
[9] Raymond, 2009
[10] Long, 2010

The employer mandate can be separated into two distinct parts: (1) the requirement to offer an ESI plan in which employer and employee contributions are tax exempt, and (2) the requirement that employers make a "fair and reasonable" contribution to their employees' health plans. Employers with 11 or more full-time-equivalent (FTE) employees who fail to offer an adequate plan are subject to a penalty, which is assessed as a percentage of the dollars spent by the state's health safety net fund that can be attributed to a specific employer's employees and dependents.

The existing literature currently does not explicitly address the coverage impacts of the temporary lifting of the employer mandate as they pertain to observable differences in firms of varying sizes.

But Lyons (2014), a comprehensive paper in its methodology of looking at the different applications of the employer mandate by firm size between 2000 and 2011, does go beyond the usual topics of the effect of the Massachusetts health reform with respect to health care service utilization, health outcomes, and health care coverage and cost. According to Lyons, the Massachusetts Division of Health Care, Finance, and Policy estimates that the percent of uninsured Massachusetts residents feel to 1.9 percent in September 2010.[11] This marked significant increase in insurance rates in Massachusetts is echoed by other former studies. Lyons' research showed that the employer mandate was a significant financial incentive when it was originally introduced in 2006 because it

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[11] Lyons, 2014

saw an increase in ESI rates.[12] Using a more focused revised model of what Lyons terms

his "triple difference"[13] methodology, I prove the converse with a different set of survey

data—that ESI offer and take-up rates decrease in the absence of the mandate.

Long, Stockley, and Yemane (2009) also take advantage of the initial "natural

experiment" that Massachusetts presented, also employing a difference-in-differences

model to compare health insurance coverage before and after the state implemented its

health reform initiative.[14] Given the complexity of the reform initiative and the state's

focus on expanding coverage among lower-income residents, the researchers estimated

the impacts of reform for the overall adult population and for lower-income (with family

income at 300 percent of the FPL or lower) and higher-income residents (with family

income above 300 percent of FPL). Long, Stockley, and Yemane's model and

methodology were partially an inspiration for Lyons's triple difference model that was

applied to similar Current Population Survey (CPS) data from almost exactly the same

time period. This study of the early impacts of the state's initiative found evidence of a

substantial drop in uninsurance—from 13 to 7 percent for non- elderly adults.[15] My

paper takes this difference-in-differences model structure prevalent in the most

comprehensive analyses of data from this health economics financing field, but applies it

to the most recent data form the Health Reform Monitoring Survey (HRMS) between the

years of 2013 and 2014, and supplements the difference-in-differences model with a

version similar to Lyons' triple difference analysis.

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[12] Lyons, 2014
[13] Ibid
[14] Long, Stockley, & Yemane, 2009
[15] Ibid

The primary purpose, and the proven effect, of the Massachusetts Health Care and Insurance Reform Law was to increase state health insurance coverage rates by providing increased financial incentives for employers to offer coverage, employees to purchase coverage from their employer, and individual adults and their dependents who do not have access to ESI to acquire either Medicaid or subsidized insurance. In light of the recent five-year anniversary of the ACA on March 23, 2015, and the ongoing political, ethical, and legal controversies surrounding the federal law, it is more essential than ever to further the health reform literature by investigating the extent to which pathways to health insurance coverage have changed due to specific Massachusetts policy parameters that are congruent with those reflected in the ACA. This paper achieves this goal by analyzing Massachusetts employer's reactions to the lifting of the state's firm-size-dependent employer mandate and access to subsidies criteria to identify coverage shifts of workers from ESI to other types of health insurance.

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The Research Canon: Employer-Sponsored Insurance

A seminal study that highlights the inconsistencies of the debate surrounding this topic is Blavin, Shartzer, Long, and Holahan's 2014 paper, "An Early Look At Changes In Employer-Sponsored Insurance Under The Affordable Care Act." Blavin and his coauthors communicate early observations on changes in offers of ESI between the two

dates of June 2013 and September 2014.[16] Their work seems to contradict the view that

the ACA is a threat to the continuation of employer-sponsored insurance. This article

takes advantage of the same timely data that I do in this paper: the Health Reform

Monitoring Survey (HRMS). They examine, from the perspective of workers, broad

surface changes in offer, take-up, and coverage rates for employer-sponsored insurance in

Massachusetts between June 2013 and September 2014. Although theoretically,

employers' financial incentives to offer health insurance and workers' economic

incentives to accept them could well be negatively affected by Medicaid expansion and

tax subsidies, the researchers found no initial evidence that any of rates of ESI offers,

acceptances, and coverage have declined between these two periods. In fact, they are

constant at around 82 percent, 86 percent, and 71 percent, respectively, for all workers

and around 63 percent, 71 percent, and 45 percent, respectively, for low-income

workers.[17] However, these initial percentages have not undergone extensive analysis, nor

were any regressions or models specifically outlined in this research. Because their study

relied on a simple pre-post comparison, it is possible that the estimates of the impact of

health reform reflect both the changes under health reform and factors beyond health

reform that changed over the same year, leading to biased estimates of the impacts of

reform. Their paper, though interesting in that it introduced the most recent

Massachusetts health reform data, for the most part simply conveyed percentages on

tables drawn directly from survey data that had not yet been extensively analyzed.

Despite the appearance in this research that the ACA has had no effect on ESI take-up or

offers, financial incentives for companies to gradually decrease insurance coverage

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[16] Blavin, Shartzer, Long, & Holahan, 2014
[17] Ibid

continue to grow in prominence, particularly with the absence of the mandate in 2014.

Since their paper is in direct contrast to a significant portion of the research preceding it, I

believe that a more extensive regression analysis with a difference-in-differences model

similar to that of Long, Stockley, & Yemane (2009) sheds more light and brings more

clarity to the more recent data employed by Blavin, Shartzer, Long, and Holahan (2014).

My paper expands on this earlier work to estimate the impacts of health reform in

Massachusetts using similar data from the same source but with a stronger research

design.

Holahan and Chen (2012), for one, show that employer-sponsored insurance rates are

lower for lower-income individuals and small businesses relative to higher-income

individuals and larger businesses, and they illustrate that ESI has decreased significantly

in the past decade. This is particularly prominent in groups of lower-income workers in

relation to groups of higher-income workers.[18] The research team's results also show that

the correlation is more significant for smaller firms as opposed to larger firms. Their

study, as it covers multiple consecutive years rather than two cross-sections of time as is

the case in Blavin, Shartzer, Long, and Holahan (2014), has more statistical clout to

enforce their findings of change sin ESI during the time of the implementation of the

ACA. Although this time period is before the time period that I focus on in my own

analysis, the important point to note is that this comprehensive and long-term study

demonstrates that the financial incentives presented by the ACA are not an insignificant

factor in employer decision-making. This research evinces that even higher-income

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[18] Holahan & Chen, 2012

people in small firms and lower-income people working in large firms have experienced

large declines in ESI, while higher-income people in larger firms experienced relatively

small declines. The share of full-time workers and their dependents with employer-based

coverage in firms with fewer than ten workers fell from 43 percent in 2000 to 33 percent

in 2010. Coverage for their counterparts working in firms with 1,000 or more employees

fell from 87 per cent to 82 percent over the same period.[19] Critics frequently characterize

the ACA as threatening the survival of employer-sponsored insurance by altering the

choices and responsibilities of employers and their workers. For instance, the availability

of subsidies to lower-income workers in the Marketplaces could adversely affect

employers' incentives to offer health insurance, thereby reducing rates of employer-

sponsored insurance.

A study conducted by the American Action Forum shifts the focus more specifically to

the impact of the shifts in financial incentives for individuals as well as employers after

the implementation of the ACA. The paper predicts that workers with incomes of up to

200 percent of the federal poverty line might be better off with subsidized individual

coverage in the Marketplace than with employer-sponsored insurance.[20] Although this

provided an interesting perspective framed in terms of the rest of the literature, the group

was limited practicality because of the base assumption that these conclusions hold only

for workers with the same income.[21] In reality, not all workers would benefit equally if

the employer dropped coverage, paid the penalty, and shared the savings with employees.

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[19] Holahan & Chen, 2012
[20] Garrett & Buettgens, 2011
[21] Blavin, Shartzer, Long, & Holahan, 2014

However, the results still nevertheless provide interesting implications that contribute to our understanding of insurance choices influenced by financial incentives, because based on these assumptions, the study predicted that thirty-five million workers would lose or drop employer coverage and shift to the Marketplaces, increasing premium subsidy costs by $1.4 trillion over ten years.[22]

Farber and Levy (2000) examine whether the pre-ACA decline in the availability of employer-sponsored health insurance is a phenomenon common to all jobs or is concentrated only on certain portions of the labor force. The authors observed that declines in employer insurance coverage over the period from 1988 to 1997 are driven primarily by declines in take-up for long-term, full-time workers and declines in eligibility for new and part-time workers. Additionally, Farber and Levy also look at trends by employee level of education, and observe the linkages between families with dependents and spouses who share insurance under the family breadwinner. During this specific time period before the conception of the ACA health care reforms or even the Massachusetts health care reforms, the United States was undergoing one of its longest economic expansions in history, and rates of coverage by employer-sponsored insurance were dropping at the same time that the gap in wages between high-income and low-income workers widened.[23] Motivated both by concern about declining availability of employer-sponsored health insurance and by more general concern about declining job quality in the United States, the authors searched for the driving factors behind the decline in coverage and which workers had been affected; they investigated the decline in

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[22] Avalere Health, 2011
[23] Farber & Levy, 2000

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the availability of employer-sponsored health insurance in the context of an examination of the quality of jobs. Their analysis revealed that, for both full-time and part-time workers, health insurance offerings by employers actually increased over this period and therefore explained none of the decline in coverage; rather, the noted coverage decline was instead attributable to declines in eligibility and take-up by the employees themselves. Although at this point in history, neither the employer mandate to provide ESI nor the individual mandate to have health insurance existed, it is extremely interesting to take note of the factors that most heavily incentivize both employers and employees. Basic core decision-making points rarely change drastically in individuals, and hence the factors driving the declines in coverage for both core and peripheral workers should remain similarly significant in our present health reform era. Interestingly, core workers showed a decline in take-up accounting for nearly the entire decline in coverage, while part-time workers on old or new jobs saw the vast majority of the decline in coverage due to a decline in eligibility—the difference between full-time and part-time workers persisted when coverage as a dependent on a spouse's policy was incorporated into the analysis. Finally, the study of workers from four different levels of education (less than high school, high school graduate, some college, and four years of college or more) revealed that among peripheral jobs, declines in coverage and eligibility occurred across the board, while on core jobs the least-educated workers experienced the largest decline in coverage; therefore, while education served as a buffer against coverage declines for full-time and traditionally higher-income workers, for part-time and traditionally lower-income workers it did not.[24] I take the insights gained from their

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[24] Farber & Levy, 2000

findings of a divergence in the take-up decisions of workers of differing education levels

and job types to make valuable inferences for use in my analysis on employees of

differing socioeconomic status, education, and income level.

Shen and Zuckerman (2003) employ the National Survey of America's Families in 1997

and 1999 to investigate the sources of variation in employer-sponsored health insurance

across states. As was the case in Farber and Levy (2000), these findings about employer-

sponsored insurance date from before the time of either the signing into law of the ACA

or the passage of the Massachusetts health reform legislation. However, the analysis of

the behavior of employers and employees communicate useful information that can be

assumed to generally remain constant over time. The researchers of this study discovered

that demographics and family characteristics (such as racial affiliation, ethnic

background, and citizenship status), individual employment characteristics (such as firm

size and labor-force attachment), and local labor market characteristics (such as

unionization) consistently explain the relative position of all of the states with either

relatively high or comparatively low rates of employer coverage.[25] The most surprising

discovery concluded from this study was that the authors found that income actually

plays a smaller role in explaining the state variation but is still an important determinant,

particularly among states whose average income is far from the national average.[26] It is

important to note in my paper that, because I am focusing on the state of Massachusetts

as a case study with the rest of the United States as a control, I ought to keep in mind the

potential for variations between this state and others—I can take into account that there

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[25] Shen & Zuckerman, 2003
[26] Ibid

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may well be factors, such as any of those brought forth in this study, that may effect the

outcomes of my analysis in unforeseen ways. Though I do control for omitted variable

bias in my model with fixed effects, it is impossible to create a methodology robust

enough to take into account any and all conceivable outside influence that may alter my

results.

Blumenthal (2006) writes an interesting paper that emphasizes how employers and the

health insurance companies who serve them are on the "frontlines of the struggle with the

problems of the costs and quality of health care in the United States."[27] Although the

system of employer-sponsored insurance is, from the author's perspective, not well

designed to deal with these problems, it cannot be denied that a myriad of stakeholders

have attempted throughout the past decade to win this struggle. In this paper, Blumenthal

reviews the implications of relying on the institution of employer-sponsored insurance to

insure as many Americans as the nation does, examining the approaches that employers

and insurers use in order to deal with problems of cost and quality, the success of these

activities, and how employer-sponsored insurance is likely to evolve over the next few

decades.[28] Conclusions of the study indicate that companies in the United States and the

health care plans that insure them have pursued two related but different strategies to

constrain the costs of insurance and improve the quality and efficiency of the health care

available to employees: (1) shifting costs to others either by increasing employees'

payments under employer-sponsored plans or by ceasing to offer health care benefits

altogether, and (2) improving the efficiency and the quality of care through reforms to the

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[27] Blumenthal, 2006
[28] Ibid

health care system, including some that involve increased cost-sharing by employees.[29]

According to Blumenthal, since the tactics employers employ to pursue these strategies were new to the time and constantly evolving even today, reaching firm judgments about the ultimate effect of these reforms remains difficult. I appreciate these conclusions on the unpredictability of ever-changing incentives and actions, and at the same time believe that the research canon as a whole will be able to gain at least a few moments on insight into the behavioral economics of Massachusetts employers if I focus as I do on one specific event and point in time.

Singhal, Stueland, and Ungerman (2011) write a noteworthy paper that supports my hypothesis of significant employer sensitivity to financial incentives taken and given by state and government health care reforms. In a 2011 survey conducted by McKinsey, it was found that 30 percent of the 1,300 employers surveyed would definitely (9 percent) or very likely (21 percent) drop coverage after 2014.[30] Interestingly, there was little variability in firm size in this particular research. But this was clearly seen in another more recent survey by Mercer; of the approximately 2,500 employers surveyed, the researchers found that only 4 percent of large employers and 16 percent of small employers planned to drop coverage in the next few years.[31] Noting that this is federal data and note data specific to Massachusetts, we can still see that there is a marked difference in sensitivity of small and large firms to the changing of the financial incentives that have come about as a result of the implementation of the ACA. Although

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[29] Blumenthal, 2006
[30] Singhal, Stueland, & Ungerman, 2011
[31] Mercer, 2014

there are certainly likely to be other variables influencing the choices of employers as to whether or not they wish to provide insurance, it also cannot be denied that one of the most major new changes in regulations in the years surveyed is the ESI mandate. Thus, analyzing the case study of Massachusetts without the mandate to see whether or not there is a significant change in ESI offerings provides valuable insight into whether the absence of the financial penalty is an influential factor in the decision-making of employers.

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Focusing on Finance: Individual and Employer Incentives

Abraham, Feldman, and Graven (2014) build on their 2012 work to put forth the idea that most employers will still have a strong economic incentive to offer coverage to their workers under the ACA.[32] The authors focus on three major policies that drive whether or not firms realize a net financial benefit from offering employer-sponsored insurance: (1) the tax exemptions for premiums for this insurance, which remain in place under the ACA, (2) the monetary penalties on larger firms that do not offer coverage that is "fair and reasonable," and (3) the premium tax credits for individual coverage in the Marketplaces for people with lower incomes. Abraham, Feldman, and Graven estimate that employers of the vast majority of workers now offered employer-sponsored insurance will continue to have an economic incentive to offer coverage under the ACA.

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[32] Abraham, Feldman, & Graven, 2014

The largest firms will continue to have a strong incentive to do so because the large benefit of the employer coverage tax exclusion and penalties avoided by offering coverage greatly outweigh the value of the premium subsidies that workers would receive if their employers did not offer coverage. Firms with fewer than fifty workers will face significantly lower economic incentives to offer coverage because they employ a larger share of low-income workers and are not subject to the employer mandate. However, the authors estimate that most small firms that already offer coverage are likely to continue to do so.[33]

The largest firms will have the strongest incentives to provide ESI, according to this integral study. I believe their logic and this conclusion holds with that of my research hypothesis; large employers might also be influenced in the opposite direction and there will be an observable impact on the ESI offering rates of larger firms if these significant financial incentives are taken away. Tax penalties, if they influence large firms more so than smaller firms, as has been demonstrated to be true, are rationally also more likely to, in their absence, motivate large firms to stop offering or to offer less comprehensive insurance to their employees. Less comprehensive insurance offerings by employers would also decrease take-up rates by their employees. An important point to bring up here, though, which was presented in the Abraham, Feldman, and Graven (2014) paper, is the contradictory incentive of tax exemptions for employers who provide health care insurance to their workers. It may well be possible for some firms that the benefit of tax exemptions makes it less expensive to provide health insurance to their employees than to

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[33] Abraham, Feldman, & Graven, 2014

compensate their workers with higher wages instead (which would be subject to taxation).

Enthoven and Kronick (1991), in an early paper that provides an extremely interesting historical perspective precedent for looking at the financial incentives of employers and employees, state that the problems of access and cost are inextricably related. These two coauthors write from an era when American health care expenditures were out of control and roughly 35 million Americans were uninsured. They discovered important correctable causes for this, among which are cost-unconscious demand, a system not organized for quality and economy, market failure, and public funds not distributed equitably or effectively to motivate widespread coverage.[34] These economists identified the incentives that would most likely bring the national health care system closer to that of universal coverage. Moreover, they proposed agencies to offer subsidized coverage to those otherwise uninsured, mandated employer-provided health insurance, premium contributions from all employers and employees, a limit on tax-free employer contributions to employee health insurance, and "managed competition"; they believe that efficient managed care does exist and would provide satisfactory care for a cost far below that of the traditional fee-for-service third-party payment system.[35] According to Enthoven and Kronick, when presented with an opportunity to make an economically responsible choice, people choose value for money; the dynamic created by these individual choices will give providers strong incentives to render high-quality, economical care. Their paper stuck out to me in the existing financial literature because

[34] Enthoven & Kronick, 1991
[35] Ibid

24

of the extreme relevance of the points made, despite the just as extremely early date of their research. The very fact that their more salient points are almost exactly the ones being made in the policy arena today speaks to the point that financial incentives and their effect on the choices of firms and individuals can be constant over long periods of time.

And they can be constant, or at least have congruent aspects, over long distances as well. Bergoloa and Cruces (2014) study how social insurance programs shape individual's incentives to take up registered employment and to report earnings to the tax authorities. This analysis, based on a social insurance reform in Uruguay, extended healthcare coverage to the dependent children of registered private-sector workers. Their methodology relies on a comparison between individuals with and without dependent children before and after the reform. Results showed that the reform increased benefit-eligible registered employment by 1.6 percentage points (about 5 percent above the pre-reform level), mainly due to an increase in labor force participation (rather than to movement from unregistered to registered employment).[36] There was variation in the shift for parents with older or younger children and for cohabiting adults whose spouse's employer did not provide the couples' children with access to the benefit, but the main point to take away from this study is neither the specific details nor the country itself, but rather the picture this paints of the motivations behind insurance decision-making. On the negative side, the reform increased the incidence of underreporting of salaried earnings by about 4 percentage points (25 percent higher than the pre-reform level),

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[36] Bergoloa & Cruces, 2014

mostly for workers employed at small firms.[37] This downside is one to keep in mind as I

begin presenting my study methodology and interpretations in the following sections.

However, the increase in fiscal revenue from higher levels of registered employment was

several orders of magnitude greater than the loss of revenue due to an increase in

underreporting.[38] I assume that the basic ideas behind these effects on worker

motivations, such as underreporting income to acquire more benefits, will also be true for

Massachusetts and, by extension, the United States. But, similarly, I will also assume

that this will be overshadowed by an increase in employment and firm revenue as a result

of the new employee incentive to work.

Switching our overview to that of another country, Guan (2015) investigates the effects

of Chinese government financial incentives on firms' innovation performance during the

nation's initial economic transition period in the mid-1990s. Through a large-scale

empirical survey of more than 1000 Chinese manufacturing firms, the empirical

evidences show that whereas the major government financial incentives such as tax

credits were positively influential to innovative economic performance of firms. Not

only was there a failure to enhance innovative economic performance, but there were also

sometimes negative affects as a result. Surprisingly, the findings show that all financial

incentives of governments were unrelated to the patents of either high-tech or general

firms and Direct Earmarks affected the patents of these firms negatively, although not to

a significant degree.[39] These research results imply that the centrally planned funding

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[37] Bergoloa & Cruces, 2014
[38] Ibid
[39] Guan, 2015

system of the 1990s was ineffective in improving technological progress for Chinese

manufacturing firms. The author hence believed that the Chinese government should

increase the role of market force in its reforms even more, because apparently a more

market-driven model would come with more tax initiatives to match the strategic

directions of different enterprises.[40] I am slightly skeptical of the basis behind which

conclusions were drawn in this study. There is no logical way to clearly prove that, just

because a model did not work, a more extreme version of the same model would lead to

any better results. I go beyond merely evaluating the effectiveness of specific

governmental reforms, since, as I explained, it is difficult to prove that increasing a

certain incentive will improve the results and reach the specified end goal. Rather, I

instead believe that it is more helpful to evaluate the decisions behind the results.

Finally, the Massachusetts experience also suggests that the combination of individual

and employer mandates can increase the rate of employer-sponsored insurance, even

when subsidized alternatives to the insurance are introduced. From fall 2006 to fall

2009—a period covering both the implementation of the state's health reforms and a rise

in the state's unemployment rate—the rate of employer-sponsored insurance in

Massachusetts increased about 3 percentage points.[41] Additionally, a survey of 1,003

randomly selected Massachusetts firms in 2008 similarly found that the percentage of

firms offering health benefits had increased from 73 percent in 2007 to 79 percent in

2008.[42] This evidence also supports my hypothesis that the mandate does incentivize

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[40] Guan, 2015
[41] Long & Stockley, 2010
[42] Gabel, Whitmore, Pickreign, Sellheim, Shova, & Bassett, 2008

both employers and individuals to provide and accept ESI—but before now there has

been little opportunity to test this relationship from the other side. With my analysis, I

hope to confirm this link that has been shown by the majority of past literature, but from

the other side of the absence of the mandate for 2014 in Massachusetts.

III. Data

In recent years, the new availability of precise and reliable micro-level data measuring insurance statuses, health conditions, and employer financial decisions through transparency in comparable ways have immensely improved the analytical advantages of health economics and financing research. To comprehensively modify and drastically extend the Blavin, Shartzer, Long, and Holahan (2014) research from that of its current simplistic pre-post comparison, I, like the research team, employ the Health Reform Monitoring Survey (HRMS) as my data source to examine changes in ESI offer and take-up for small and large firms. However, I use data from multiple states to analyze the extent to which the dissimilar application of the Massachusetts employer mandate by firm size differently affects health insurance coverage distributions between small firms and large firms. I compare Massachusetts's insurance outcomes to a control set of insurance outcomes. My control set consists of a randomized sampling of individuals from unspecified participant states within the United States.

The HRMS is a quarterly survey drawn from KnowledgePanel, a probability- based Internet panel maintained by GfK Custom Research and based on a representative sample of American households.[43] The core HRMS targets adults between the ages of 18 and 64, because the ACA coverage expansions primarily affect this population of nonelderly adults. This paper presents an analysis based on data collected from the second quarter

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[43] GfK KnowledgePanel

(March, April, and May) of 2013 and the second quarter (March, April, and May) of 2014.

Long and colleagues, who headed this survey for the Massachusetts region, found that the HRMS produced reliable estimates for adults when compared to other nationally representative surveys (such as the American Community Survey, Current Population Survey, and the National Health Interview Survey).[44]

Studies assessing KnowledgePanel for its reliability as a survey have found almost no evidence of nonresponse bias in the panel on core demographic and socioeconomic variables.[45] It is also important to note that findings from the HRMS from early 2014 are consistent with the early-release data from the National Health Interview Survey as well as ongoing Gallup survey data.[46]

The sample size for the HRMS is approximately 7,500 non- elderly adults per quarter. In this analysis, it is relevant to mention that a worker in this context is a nonelderly adult between the ages of 18 and 64 who reported working for a source of income from a large firm, a small firm, or who was self- employed. I define a large firm as an employer that has fifty or more workers, and define a small firm as an employer that has fewer than fifty workers. The HRMS counts a single employer's workers at all locations where the employer operates. Also following the phrasing in the HRMS, I consider a worker to be

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[44] Long, Kenney, Zuckerman, Goin, Wissoker, Blavin, et al., 2014
[45] Heeren, Edwards, Dennis, Rodkin, Hingson, & Rosenbloom, 2008
[46] Blavin, Shartzer, Long, & Holahan, 2014

under ESI coverage if they report coverage through their own or a family member's current or former employer. This includes coverage through the Consolidated Omnibus Budget Reconciliation Act (COBRA), TRICARE, military, or Veterans Affairs coverage, as well as write-in responses that listed a valid private group plan.[47] I define the ESI take-up rate as the number of workers who report being currently covered by ESI divided by the number of workers who have an offer of health insurance coverage through their employer.

For each respective 2013 and 2014 quarter, the Massachusetts HRMS provides about 7,500 individual survey respondents. I omit from my data sample all workers who did not report work status or firm size, as well as any workers who reported having both ESI and subsidized health coverage. After this trimming, I still have an adequate sample size of approximately 6,500 workers for the second quarter of 2013 and another 6,500 workers for the second quarter of 2014. My total sample size of Massachusetts employees totals $n = 12,989$. I then combine HRMS data from Massachusetts with data from a control set of randomized workers from other states for each time period. After narrowing the control HRMS data using the same parameters for age and worker status as I did for the Massachusetts data, I randomly select 5,000 respondents for 2013 and another 5,000 for 2014. Merging this control data with my Massachusetts data, I end up with an ample base sample size of $n = 22,989$ (where 12,989 observations are from Massachusetts and 10,000 from the control set). Of the two subgroups of primary interest to my research, employees in Massachusetts working for large firms and employees in

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[47] Blavin, Shartzer, Long, & Holahan, 2014

Massachusetts working for small firms, the sample sizes are as follows: there are 4,512

individual large-firm workers in Massachusetts for my 2013 group and 4,586 for my

2014 group, and 2,186 individual small-firm workers in Massachusetts for my 2013

group and 2,333 for my 2014 group.

IV. Methodology

In this paper, I explore the impact of the repeal of the employer mandate on offer and take-up rates of ESI in the state of Massachusetts. I use a difference-in-differences approach similar to that of Long, Stockley, and Yemane (2009) and other papers cited in the previous sections, and then proceed to supplement this analysis with an extended difference-in-difference-in-differences model based upon the triple difference model used by Lyons (2014).

To identify the impact of the employer mandate on take-up and offering rates by firm size, I first limit my selected HRMS data set to workers who are between the ages of 18 and 64, who work in the private sector, and who do not receive any Supplemental Security Income (SSI) or Social Security Disability Insurance (SSDI) benefits, as explained in the previous data section.

Using this sample, I estimate a difference-in-differences regression model, which allows me to compare the coverage outcomes in Massachusetts while controlling for the counterfactual situation in which Massachusetts did not change its health insurance legislation from 2013 to 2014 by using a reasonable control group of a random sampling of states from the rest of the nation. This control group is slightly skewed in favor of certain states, since it only includes states that are current survey participants of the HRMS, and this is a potential weakness of the study.

Figures 1, 2, and 3 on the following pages compare the distribution of workers by coverage type in Massachusetts in 2013 and 2014 for the specified aforementioned subsamples of employees. Figure 1 displays the data for employees working in large firms (fifty or more workers under the same employer). Figure 2 displays the data for employees working in small firms (less than fifty workers under the same employer). Figure 3 displays the comprehensive data for all employees working in Massachusetts between 2013 and 2014.

The financial tax penalties established by the state of Massachusetts associated with the employer mandate were effectively repealed on January 1, 2014. I use the second quarters of 2013 and 2014 to give sufficient lag time for company benefits policy changes to take effect.
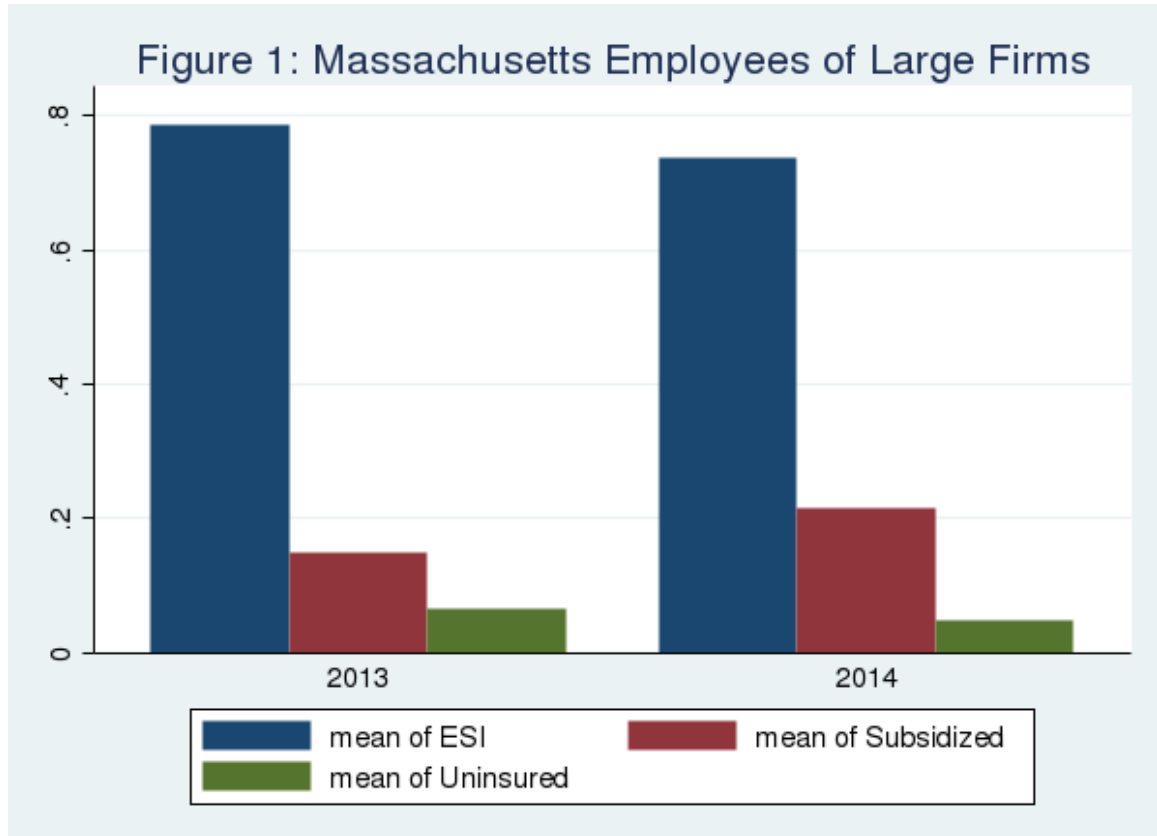
Figure 1: Percentage of Massachusetts Large-Firm Nonelderly Employees with ESI,

Subsidized Insurance, and No Insurance Coverage in April-June of 2013 and 2014

Notes: $n \approx 4{,}500$ for each year ($n = 4{,}512$ for 2013 and $n = 4{,}586$ for 2014). HRMS data.

The sample is restricted to workers in the second quarter of each respective year in large

firms who are of age 18 to 64 working in the private sector and not receiving any SSI or

SSDI benefits. I define a large firm to be an employer with fifty or more FTE workers.
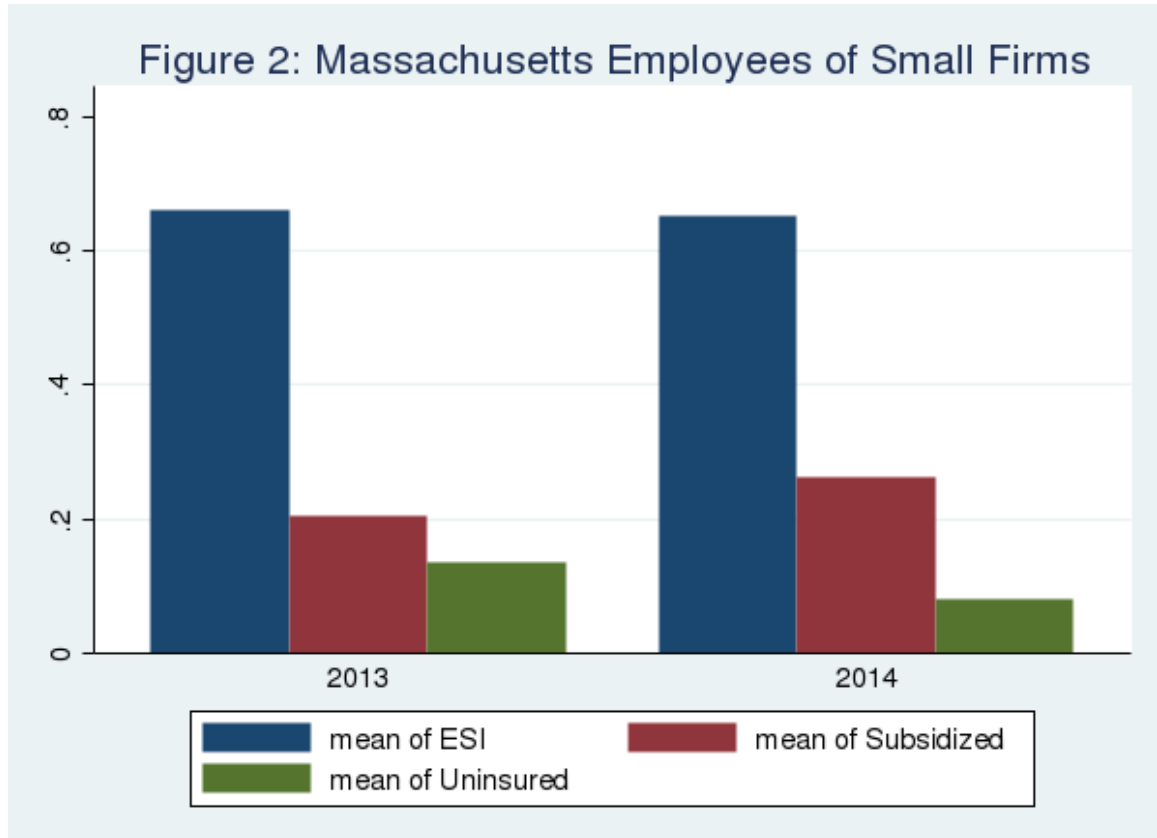
Figure 2: Percentage of Massachusetts Small-Firm Nonelderly Employees with ESI,

Subsidized Insurance, and No Insurance Coverage in April-June of 2013 and 2014

Notes: $n \approx 2,000$ for each year ($n = 2,186$ for 2013 and $n = 2,333$ for 2014). HRMS data.

The sample is restricted to workers in the second quarter of each respective year in small

firms who are of age 18 to 64 working in the private sector and not receiving any SSI or

SSDI benefits. I define a small firm to be an employer with less than fifty FTE workers.
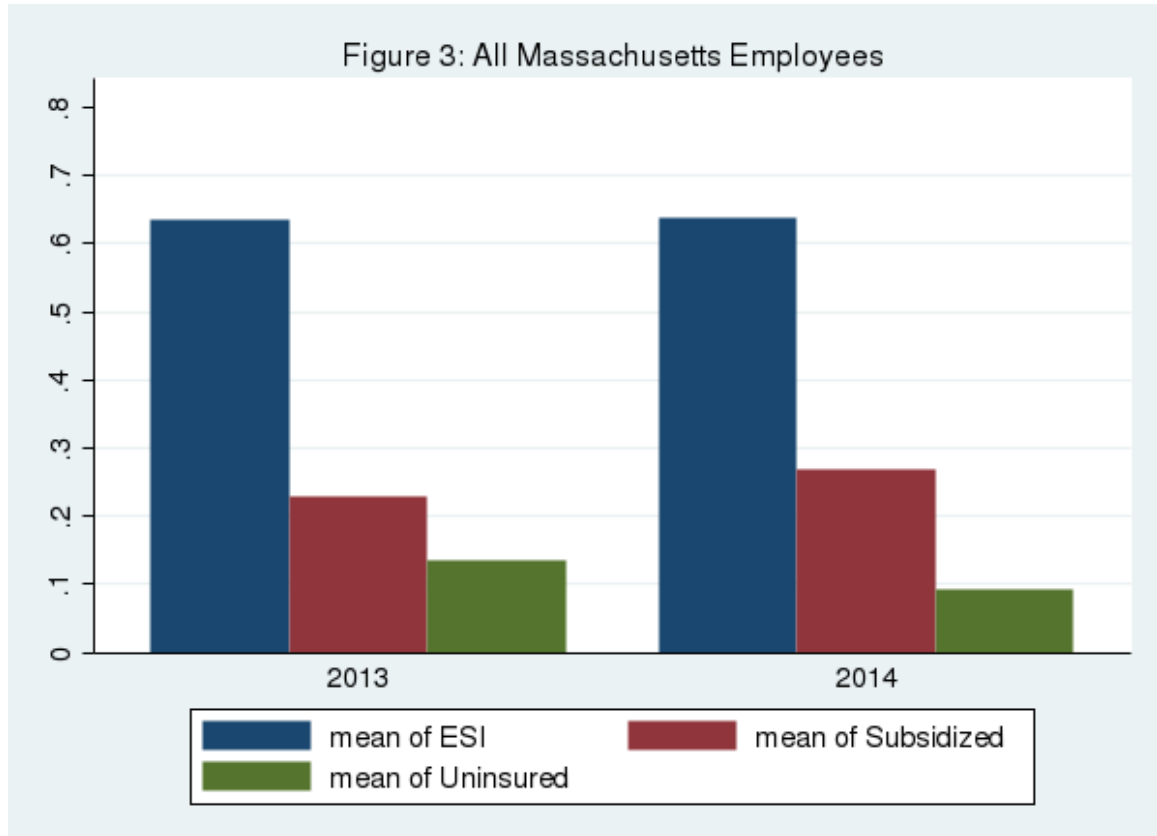
Figure 3: Percentage of All Massachusetts Nonelderly Employees with ESI, Subsidized

Insurance, and No Insurance Coverage in April-June of 2013 and 2014

Notes: $n \approx 6{,}500$ for each year ($n = 6{,}698$ for 2013 and $n = 6{,}919$ for 2014). HRMS data.

The sample is restricted to workers in the second quarter of each respective year in all

firms who are of age 18 to 64 working in the private sector and not receiving any SSI or

SSDI benefits.

The three graphs in Figures 1 to 3 confirm that this subsample of Massachusetts workers supports my hypothesized result that there is evidence of a noticeable decrease in offering rates of ESI among large employers and that the health care reforms continue to prompt an increase in subsidized coverage for both large and small firms. The declining rate of ESI in large firms between the second quarter of 2013 and the second quarter of 2014 is more prominent than the changes in ESI for small firms. This can be attributed to the more lenient mandate requirements for small firms, which makes the absence of the mandate in 2014 a much more meaningful incentive for large firms to cease offering ESI to their employees.

In my primary model, I use the intuition taken from this initial data analysis to estimate the coverage impacts in Massachusetts compared to the rest of the country using a difference-in-differences approach to see whether the state's working population as a whole did in fact experience significant changes in ESI, subsidized coverage, and overall insurance rates.

I implement this model for both take-up and offer rates. The summary statistics for insurance take-up outcomes by employees and predictors of insurance outcomes in Massachusetts and the control states for the pre-period of 2013 compared to the post-period of 2014 are displayed in Tables 1 and 2 of Appendix A, respectively. The difference-in-differences between the two groups of take-up rates is displayed in Table 3, also located in Appendix A. The summary statistics for insurance offer outcomes by

employers and predictors of insurance outcomes in Massachusetts and the control states

for the pre-period of 2013 compared to the post-period of 2014 are displayed in Tables 4

and 5 of Appendix A, respectively. The difference-in-differences between the two

groups of offer rates is displayed in Table 6, which similarly can be found in Appendix

A.

To formalize the intuition from the previous Figures 1 through 3 and Tables 1 through 6,

I estimate the following difference-in-differences regression model (Equation 1):

$$
\begin{aligned}
X_i = \beta_{i0} &+ \beta_{i1}(\text{Year} * \text{MA}) + \beta_{i2}\text{Age} + \beta_{i3}\text{Female} + \beta_{i4}\text{Famsize} + \beta_{i5}\text{Married} \\
&+ \beta_{i6}\text{LargeFirm} + \beta_{i7}\text{IncomeLvl} + \beta_{i7}\text{HHIncomeLvl} + \beta_{i8}\text{White} \\
&+ \beta_{i10}\text{Black} + \beta_{i11}\text{Hispanic} + \beta_{i12}\text{Multiracial} + \beta_{i13}\text{HighSchool} \\
&+ \beta_{i14}\text{SomeCollege} + \beta_{i15}\text{MoreCollege} \\
&+ \sum_s \phi + \sum_t \tau + u_i
\end{aligned}
$$

Where the dependent variable X_i, i=1, 2, and 3, is representative of the three various

regressions of the probability of the discrete ESI, Subsidized, and Uninsured variables.

For each of these three insurance categories, 1 represents that an individual has that type

of coverage (or, in the case of Uninsured, the lack thereof) and 0 that they do not.

In Equation 1 above, and in all following models unless specified otherwise, "Age" is a

simple continuous independent variable denoting age in years. "Female" is a discrete

variable with 1 representing that an individual is female and 0 that an individual is male.

39

The next variable, "FamSize," is a continuous variable denoting the number of

individuals in a respondent's household (the individual plus any spouses or dependents).

"Married" is a discrete variable with 1 representing married and 0 representing currently

not (i.e. if a respondent was married but is presently divorced and no longer under her

spouse's health insurance, she would be considered not currently married). The

explanatory variable "LargeFirm" is discrete with 1 denoting large firm and 0 small firm.

The explanatory variables "IncomeLvl" and "HHIncomeLvl"are continuous and

represent total individual and total household income, respectively (See Appendix B:

Tables 11 and 12). The rest of the explanatory variables are discrete and indicate race

and education level; 1 if an individual is affiliated with that subgroup and 0 otherwise.

Finally, the variable "MA" is discrete with 1 representing Massachusetts and 0 one of the

control states, and the variable "Year" has 1 denoting the respondent is reporting from

2014 and 0 the year 2013.

I control for unobserved factors in my model by using state and year fixed effects. Fixed

effects allows for arbitrary correlation between the error term and the explanatory

variables in the model. Using fixed effects allows me to control for omitted variables that

differ between states or time. This would control for certain specific differences that

affect aid offer and take-up rates but do not change during the period I am examining.

By holding these unobserved differences constant, I am able to perceive how my results

are influenced even when there is variation in the explanatory variables that I use in my

model.

The identification assumption used for the estimation of Equation 1 is that aside from the Massachusetts reform, no other factors differentially impacted the coverage outcome variables between Massachusetts and the control states. I estimate Equation 1 for all three coverage outcomes—ESI, subsidized coverage, and uninsured—jointly using seemingly unrelated regression estimation. β_{i1} is the difference-in-differences coefficient of interest. The other variables include individual and family characteristics, and ϕ and τ are state and year fixed effects, respectively. Ergo, the difference-in-differences estimate is identifying changes within Massachusetts over time. The standard errors from this regression are clustered at the state level.

My model includes a host of financial, familial/individual, and socioeconomic control variables to paint a clear picture of the determinants of employer take-up rates and offering rates. I run this regression once for take-up rates and once for offering rates of Massachusetts and control state employers for the time period 2013 to 2014. A difference-in-differences analysis controls for any omitted factors that influence rates differently for the treatment and control groups and tare constant across time.[48]

Next, I expand the extent of my difference-in-differences model to analyze the effect of Massachusetts health reform legislation changes based on firm size for all three coverage outcomes—ESI, subsidized coverage, and uninsured—jointly using a seemingly unrelated regression estimation. My difference-in-difference-in-differences regression is as follows:

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[48] Marcet, 2011

$$X_i = \beta_{i0} + \beta_{i1}(\text{LargeFirm} * \text{Year} * \text{MA}) + \beta_{i2}(\text{Year} * \text{MA}) + \beta_{i3}\text{Age} + \beta_{i4}\text{Female}$$

$$+ \beta_{i5}\text{FamSize} + \beta_{i6}\text{Married} + \beta_{i7}\text{IncomeLvl} + \beta_{i7}\text{HHIncomeLvl}$$

$$+ \beta_{i8}\text{White} + \beta_{i10}\text{Black} + \beta_{i11}\text{Hispanic} + \beta_{i12}\text{Multiracial}$$

$$+ \beta_{i13}\text{HighSchool} + \beta_{i14}\text{SomeCollege} + \beta_{i15}\text{MoreCollege}$$

$$+ \sum_s \phi(\text{LargeFirm}) + \sum_t \tau(\text{LargeFirm}) + \sum_s \phi + \sum_t \tau$$

$$+ u_i$$

The above is Equation 2. Like the difference-in-differences model written out in Equation 1, I perform this triple differences analysis for take-up as well as offer rates. In this regression, β_{i1} is the difference in difference-in-differences coefficient of interest. As before, I include individual and family characteristics defined to be the same dependent and independent variables as in Equation 1, and ϕ and τ are again the state and year fixed effects, respectively. Ergo, the parameter of interest (β_{i1}) is identified from the variation between small firms and large firms in Massachusetts from the pre-period to the post-period.

The identifying assumption for this extended difference-in-differences estimation strategy is that outside of the Massachusetts reform and the different application of the employer mandate by firm size, no other factors differentially impacted the coverage outcome variables between Massachusetts and the control states and small firms and large firms. Additionally, to explicitly state the trade-offs of applying a firm-size-dependent employer mandate in Massachusetts I must assume that the treatment effect of the Massachusetts

health reforms would have been identical for both small and large firms had both firm sizes been subject to the same employer mandate. Specifically, outside of the different application of the employer mandate, no other factors differentially impacted the coverage outcome variables between small and large firms in Massachusetts.

The important benefit of the triple differences methodology according to Marcet (2011) is that, in addition to controlling for relevant factors, the model will also remove any omitted factors that influence repetition differently across time for individuals in the treatment and control groups.[49] This will help me achieve a more unbiased estimate of the true deterrent effect of the temporary lifting of the employer mandate in Massachusetts.

However, in addition to strengths of my model, it is also important to note the potential weaknesses. There are several possible methodological threats to my analysis, such as other changes in the economic and political environment between 2013 and 2014 that might be influencing insurance coverage and ESI take-up and offer rates that were unrelated to the mandate. I assume that the most significant determining factor of shifting ESI rates in Massachusetts during this period of interest is the temporary lifting of the mandate, but am unable in my model to account for, as an example, changing unemployment rates. My interaction difference coefficients of interest in Equations 1 and 2 might also be picking up other unforeseen confounding factors unrelated to my original assumed hypothesis. For instance, my observed effects may be a result of

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[49] Marcet, 2011

immigration and emigration of certain individuals in and out of the state, wage increases

due to inflation or an upturn in the economy between 2013 and 2014, or merely an

increase or decrease in certain coverage rates because of the selection of individual

survey participants for a particular quarter.

V. Results and Discussion

I predicted that the lifting of the employer mandate in 2014 would have a negative effect on the offer and take-up rates of employer-sponsored insurance in Massachusetts, which ought to have a congruently positive effect on the rates of subsidized insurance and uninsurance rates. As the existing canon of research can attest to, rates of employer-sponsored insurance as well as subsidized insurance rates increased when the mandate was instated, so I wished to demonstrate with the timely natural experiment presented by Massachusetts that the converse was also true—for the validity of this financial incentive to hold, rates must go down in the absence of the tax penalty. I also hypothesized that this impact would be noticeably more significant in large firms than in small firms, as large firms have stricter requirements for ESI and thus a heavier incentive to provide ESI. From relevant related studies that have already been conducted, it appears as though there does exist a distinction that correlates with firm size. However, whether or not this can be completely explained by the different degree of financial incentives associated with the employer mandate remains to be seen and will be explored only in part in this analysis.

Table 7 on the following page displays regression coefficients from the estimation of my difference-in-differences model (Equation 1) for take-up rates of ESI, subsidized insurance, and uninsurance. Table 8 on the proceeding page displays regression

coefficients from the estimation of my difference-in-differences model (Equation 1) for

offer rates of ESI, subsidized insurance, and uninsurance.

Table 7: Difference-in-Differences Regression Results (see Equation 1) for Insurance

Take-up Rates in Massachusetts with the Control Group in 2013-2014

VARIABLES	(1) ESI	(2) Subsidized	(3) Uninsured
Year_MA	-0.0540***	0.0535***	0.000479
	(0.00963)	(0.00705)	(0.00382)
Age	-6.31e-05	0.00171***	-0.00164***
	(0.000212)	(0.000213)	(0.000166)
Female	0.0240***	0.00518	-0.0292***
	(0.00462)	(0.00469)	(0.00357)
Famsize	0.0170***	-0.00735***	-0.00962***
	(0.00211)	(0.00214)	(0.00175)
Married	0.0495***	-0.0433***	-0.00620
	(0.00588)	(0.00595)	(0.00470)
LargeFirm	0.219***	-0.199***	-0.0198***
	(0.00562)	(0.00558)	(0.00411)
IncomeLvl	0.158***	-0.0860***	-0.0717***
	(0.00361)	(0.00369)	(0.00299)
HHIncomeLvl	0.00963***	-0.00797***	-0.00166**
	(0.000884)	(0.000934)	(0.000776)
White	0.0280**	-0.0241**	-0.00397
	(0.0123)	(0.0122)	(0.00860)
Black	0.00604	0.0100	-0.0161
	(0.0146)	(0.0147)	(0.0109)
Hispanic	-0.0267*	-0.0674***	0.0942***
	(0.0143)	(0.0143)	(0.0113)
MultiRacial	-0.0183	0.0293	-0.0109
	(0.0187)	(0.0192)	(0.0143)
HighSchool	0.0540***	-0.00277	-0.0512***
	(0.0112)	(0.0127)	(0.0121)
SomeCollege	0.0558***	0.0215*	-0.0773***
	(0.0111)	(0.0125)	(0.0118)
MoreCollege	0.0744***	0.0201	-0.0945***
	(0.0115)	(0.0127)	(0.0118)
State Fixed Effects	…	…	…
Year Fixed Effects	…	…	…
Constant	…	....	…
Observations	22,989	22,989	22,989
R-squared	0.363	0.191	0.147

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Difference-in-Differences Regression Results (see Equation 1) for Insurance

Offer Rates in Massachusetts with the Control Group in 2013-2014

VARIABLES	(1) ESI	(2) Subsidized	(3) Uninsured
Year_MA	-0.0448***	0.0485***	-0.00364
	(0.01508)	(0.00851)	(0.00407)
Age	-0.000128	0.00175***	-0.00162***
	(0.000226)	(0.000227)	(0.000176)
Female	0.0220***	0.00601	-0.0280***
	(0.00509)	(0.00516)	(0.00387)
Famsize	0.0147***	-0.00548**	-0.00919***
	(0.00276)	(0.00278)	(0.00223)
Married	0.0491***	-0.0449***	-0.00423
	(0.00647)	(0.00648)	(0.00497)
LargeFirm	0.229***	-0.214***	-0.0149***
	(0.00627)	(0.00619)	(0.00449)
IncomeLvl	0.160***	-0.0872***	-0.0724***
	(0.00395)	(0.00403)	(0.00324)
HHIncomeLvl	0.00926***	-0.00778***	-0.00148*
	(0.000972)	(0.00101)	(0.000824)
White	0.0306**	-0.0167	-0.0139
	(0.0139)	(0.0139)	(0.0106)
Black	0.0106	0.0223	-0.0329***
	(0.0163)	(0.0166)	(0.0127)
Hispanic	-0.0120	-0.0597***	0.0717***
	(0.0162)	(0.0163)	(0.0136)
MultiRacial	-0.0147	0.0315	-0.0168
	(0.0206)	(0.0213)	(0.0163)
LessHS	-0.0575***	-0.0248*	0.0823***
	(0.0133)	(0.0146)	(0.0135)
HighSchool	-0.0157**	-0.0298***	0.0455***
	(0.00748)	(0.00746)	(0.00581)
SomeCollege	-0.0149**	-0.00477	0.0197***
	(0.00629)	(0.00618)	(0.00414)
State Fixed Effects	…	…	…
Year Fixed Effects	…	…	…
Constant	…	....	…
Observations	22,988	22,988	22,988
R-squared	0.363	0.203	0.137

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The estimates of the parameters of interest (β_{i1}) from Equation 1 are significant at the 1 percent level for our main dependent variable of interest, ESI, as well as significant at the 1 percent level for subsidized insurance. The coefficient of interest was not significant at the 1 percent level for uninsurance.

The preceding estimates indicate a decrease in both take-up and offering rates of ESI in Massachusetts between the second quarter of 2013 and the second quarter of 2014. This is consistent with my initial hypothesis and data tabulations illustrated in my earlier graphs. The model also indicates an increase in both take-up and offering rates of subsidized insurance in Massachusetts between the second quarter of 2013 and the second quarter of 2014. The sum of the coefficients from the ESI and subsidized coverage equations for take-up and offer equals the increase (in the former case) or decrease (in the latter case) in overall insurance rates.

The results of this analysis suggest that the policy changes that constituted the lifting of the employer mandate implemented by Massachusetts on January 1, 2014, did indeed motivate employers to decrease their offering of ESI. The parallel decrease in ESI take-up rates by employees of Massachusetts firms also implies that the quality of the insurance that did remain as provided by employers went down in 2013 compared to 2014, incentivizing workers to seek other means of health coverage.

Table 9 on the following page displays regression coefficients from the estimation of my extended difference-in-differences model (Equation 2) for take-up rates of ESI, subsidized insurance, and uninsurance. Table 10 on the proceeding page displays regression coefficients from the estimation of my triple difference model (Equation 2) for offer rates of ESI, subsidized insurance, and uninsurance.

Table 9: Triple Difference Regression Results (see Equation 2) for Insurance Take-up

Rates in Massachusetts with the Control Group in 2013-2014

VARIABLES	(1) ESI	(2) Subsidized	(3) Uninsured
Year_MA_LargeFirm	0.173***	-0.201***	0.0277***
	(0.00851)	(0.00947)	(0.00684)
Year_MA	-0.163***	0.177***	-0.0147**
	(0.00707)	(0.00830)	(0.00618)
Age	-0.00133***	0.00278***	-0.00145***
	(0.000212)	(0.000214)	(0.000163)
Female	0.0126***	0.0144***	-0.0269***
	(0.00475)	(0.00476)	(0.00356)
Famsize	0.0144***	-0.00521**	-0.00921***
	(0.00214)	(0.00215)	(0.00175)
Married	0.0484***	-0.0424***	-0.00595
	(0.00605)	(0.00605)	(0.00470)
IncomeLvl	0.170***	-0.0944***	-0.0753***
	(0.00367)	(0.00375)	(0.00300)
HHIncomeLvl	0.0111***	-0.00917***	-0.00193**
	(0.000894)	(0.000942)	(0.000773)
White	0.0372***	-0.0318**	-0.00533
	(0.0127)	(0.0124)	(0.00857)
Black	0.0145	0.00246	-0.0170
	(0.0151)	(0.0151)	(0.0108)
Hispanic	-0.0161	-0.0764***	0.0925***
	(0.0147)	(0.0146)	(0.0113)
MultiRacial	-0.0199	0.0286	-0.00868
	(0.0194)	(0.0198)	(0.0143)
HighSchool	0.0766***	-0.0224*	-0.0543***
	(0.0114)	(0.0129)	(0.0121)
SomeCollege	0.0829***	-0.00184	-0.0811***
	(0.0113)	(0.0128)	(0.0118)
MoreCollege	0.106***	-0.00743	-0.0988***
	(0.0117)	(0.0129)	(0.0117)
State Fixed Effects	…	…	…
Year Fixed Effects	…	…	…
Constant	…	…	…
Observations	22,989	22,989	22,989
R-squared	0.328	0.162	0.146

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10: Triple Difference Regression Results (see Equation 1) for Insurance Offer

Rates in Massachusetts with the Control Group in 2013-2014

VARIABLES	(1) ESI	(2) Subsidized	(3) Uninsured
Year_MA_LargeFirm	0.184***	-0.215***	0.0307***
	(0.01042)	(0.0103)	(0.00721)
Year_MA	-0.160***	0.181***	-0.0207***
	(0.00793)	(0.00916)	(0.00660)
Age	-0.00155***	0.00300***	-0.00145***
	(0.000226)	(0.000227)	(0.000172)
Female	0.0164***	0.0104**	-0.0268***
	(0.00523)	(0.00526)	(0.00387)
Famsize	0.0110***	-0.00239	-0.00859***
	(0.00282)	(0.00281)	(0.00224)
Married	0.0488***	-0.0446***	-0.00413
	(0.00667)	(0.00661)	(0.00497)
IncomeLvl	0.173***	-0.0969***	-0.0759***
	(0.00401)	(0.00408)	(0.00325)
HHIncomeLvl	0.0108***	-0.00908***	-0.00171**
	(0.000983)	(0.00102)	(0.000821)
White	0.0385***	-0.0232*	-0.0153
	(0.0143)	(0.0141)	(0.0105)
Black	0.0158	0.0176	-0.0335***
	(0.0168)	(0.0169)	(0.0127)
Hispanic	-0.00387	-0.0663***	0.0701***
	(0.0166)	(0.0166)	(0.0136)
MultiRacial	-0.0204	0.0351	-0.0147
	(0.0214)	(0.0218)	(0.0163)
LessHS	-0.0912***	0.00544	0.0857***
	(0.0136)	(0.0151)	(0.0134)
HighSchool	-0.0234***	-0.0229***	0.0463***
	(0.00765)	(0.00758)	(0.00580)
SomeCollege	-0.0191***	-0.000979	0.0201***
	(0.00644)	(0.00629)	(0.00414)
State Fixed Effects	…	…	…
Year Fixed Effects	…	…	…
Constant	…	…	…
Observations	22,988	22,988	22,988
R-squared	0.327	0.170	0.137

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The estimates of the parameters of interest (β_{i1}) from Equation 2 are significant at the 1 percent level here for all three of our dependent variables: ESI, subsidized insurance, and uninsured.

The preceding estimates of the triple interaction terms indicate that both take-up and offering rates of ESI in Massachusetts between the second quarter of 2013 and the second quarter of 2014 are positively correlated with a larger firm size. This interaction had a negative coefficient for subsidized insurance for both offer and take-up, and a positive relationship coefficient for uninsurance rates. To some extent, this finding is not inconsistent with my initial hypothesis. But this second model yields results slightly inconsistent with the first, as it indicates a decrease in both take-up and offering rates of ESI in Massachusetts between the second quarter of 2013 and the second quarter of 2014. The second coefficient of Equation 2 also suggests that, when placing a greater emphasis on firm size in our interaction terms, it influences the regression such that subsidized insurance rates are significantly positive in their increase, and uninsurance rates are significantly negative. To some extent, the only clear indication that these results suggest is that we can be sure rates of subsidized insurance increased between the years of 2013 and 2014 in Massachusetts compared to the set of control states. The other results of this second model are rather ambiguous.

This uncertainty transitions us into a discussion of limitations. My study had several limitations. Importantly, my differences could not account for unobserved differences of

other minor demographic factors that may affect access to care, such as the specific industry of an employer that may be more or less prone to offing ESI. I also did not place a great emphasis on the specific difference in take-up and offer rates between workers of specific income groups. For instance, in a future study I would ideally also include a difference analysis for individuals between 133 and 300 percent of the FPL, and then focus on the portion of this group that worked for smaller firms, as these are the attributes of employees most likely to need and qualify for subsidized insurance in the Marketplace.

For both take-up and offers of ESI, as well as for the specific state of Massachusetts and my random sampling of the United States population from a set of control states, the source of insurance within the family—self or another worker, such as a spouse—is unable to be distinguished in the HRMS. Therefore, a limitation of this specific data set is that the survey did not indicate which member of a familial unit each respondent actually was. Additionally, each round of the HRMS is weighted to be nationally representative, but it is important in examining changes over time for researchers to base estimates on comparable samples (for example, if the share of people with ESI grew simply because more respondents were older or from higher-income groups in one round of the survey, it would be incorrect to associate such a change with the ACA coverage provisions).[50] This is a particular challenge in comparing estimates from survey samples over time because the composition of the sample that is surveyed can change between potentially every survey period to the next in ways that are not fully captured in the weights and that may distort the estimates of change.

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[50] McMorrow, Kenney, Anderson, Clemans-Cope, Dubay, Long, & Wissoker, 2014

A final limitation of this study is the control set itself. Because the HRMS is not state-specific except for the data from Long and her colleagues that I used for Massachusetts between 2013 and 2014, the random sampling of states that I employed for my control set may have skewed the result if they were weighted more heavily in favor of states with more tendencies to provide ESI or not, or if the set trended towards states that had or had not yet already established a state-run insurance exchanges as opposed to having a federal exchange.

VI. Conclusion

In this paper, I have answered several questions with my regression approach. My initial statistical adjusted difference estimations demonstrated that large firms in Massachusetts did indeed offer less ESI to their workers in 2014 in the absence of the employer mandate than in 2013 when the employer mandate had been in effect. The central model of this paper, my difference-in-differences regression approach, evinced that, relative to a randomized set of control states, Massachusetts did see declining rates of both ESI offer and take-up between the pre- and post-treatment periods. These research findings were all significant to the 1 percent statistical significance level. Although my final extended triple difference model yielded somewhat ambiguous results for the precise interaction between firm size and time for my treatment group of workers in Massachusetts, it did supply interesting data that will contribute to the existing literary canon on the financial incentives behind ESI in both Massachusetts and the United States as a whole.

The main goal of this research was to assess the asymmetric impact of the Massachusetts employer mandate on health insurance coverage distributions between small and large firms during the period of 2013 to 2014. The one-year temporary absence of the employer mandate as well as the difference in treatment of small and large firms in Massachusetts during this time of the ACA implementation generated a quasi-experiment within the state. I estimated the coverage impacts in Massachusetts using a difference-in-differences estimation to verify that the income-eligible working population in

Massachusetts did in fact experience decreases in ESI and increases in subsidized coverage rates. I defined workers in my subsample to be individuals between the ages of 18 and 64 who work in the private sector and who do not receive any SSI or SSDI benefits. My data source was the 2013 to 2014 HRMS, and my amalgamated sample size was $n = 22,989$ individual survey respondents.

These findings are the first to empirically show that removing the existing employer mandate, and thus the financial tax penalty incentives to provide "fair and reasonable" health insurance coverage to workers, will have a significant effect on employers' rates of EESI provision. What is more, this paper also showed that financial incentives meant for employers have a chain reaction for employees in influencing their movement onto subsidized coverage instead of ESI.

This case study of Massachusetts has important implications for the ACA, which includes very similar reform elements with respect to subsidy access for workers and more lenient mandates on smaller firms. The similar employer mandate structure and access to subsidy criteria in both the original Massachusetts health care reforms and the federal ACA underscores the policy relevance of studies like this which analyze the extent to which Massachusetts state reforms have influenced the previously existing pathways to health insurance coverage for employers of different types and individual workers of differing demographics.

As outlined in my literature review, the official effectual implementation of the ACA's

employer mandate was postponed until January 1, 2015 to allow firms more time to

adjust their health insurance benefit packages. The natural experiment that the state of

Massachusetts presents, both during the passage of its initial health reform legislation in

2006 and during its current gradual individual revisions, provides researchers with

valuable data that helps present insights to decision-makers of various stakeholder groups

within the policy arena. The future of the American health care system is slated to be as

complex and multifaceted as its past has been before it, and studies such as this, though

far from omnipotent, lend a necessary voice to the long-standing yet heated discussion on

what factors will help our nation move forward.

References

Abraham JM, Feldman R, Graven P. (2014). How will the Affordable Care Act change employers' incentives to offer insurance? Washington (DC): Census Bureau, *Center for Economic Studies*. <http:// www2.census.gov/ces/wp/2014/ CES-WP-14-02.pdf>.

Avalere Health. (2011). The Affordable Care Act's impact on employer sponsored insurance: a look at the micro-simulation models and other analyses. Washington (DC): *Avalere Health*. <http://www .avalerehealth.net/pdfs/2011-06-17_ ESI_memo.pdf>.

Bergoloa M, and Cruces G. (2014). Work and tax evasion incentive effects of social i nsurance programs: Evidence from an employment-based benefit extension. *Journal of Public Economics*. 117:211–228. <http://www.sciencedirect.com/ science/article/pii/S0047272714001066>.

Blavin F, Holahan J, Kenney G, Chen V. (2014). A decade of coverage losses: implications for the Affordable Care Act. Washington (DC): *Urban Institute*. <http://www.urban.org/ UploadedPDF/412514-Implications- for-the-Affordable-Care-Act.pdf>.

Blavin F, Holahan J, Kenney G, Chen V. (2012). Deteriorating health insurance coverage from 2000 to 2010: cover- age takes the biggest hit in the South and Midwest. Washington (DC): *Urban Institute*. <http://www.urban.org/UploadedPDF/ 412638-Deteriorating-Health- Insurance-Coverage.pdf>.

Blavin F, Shartzer A, Long SK, and Holahan J. (2014). An Early Look At Changes In
Employer-Sponsored Insurance Under The Affordable Care Act. *Health Affairs*.
34.1: 170-77. <http://content.healthaffairs.org/content/34/1/170.full.pdf+html>.

Blumenthal, D. (2006). Employer-sponsored insurance: riding the health care tiger. *New
England Journal of Medicine*. <http://journal.9med.net/qikan/article.php?id
=221930>.

Dunning, M. (2013). Mass. Health Care Reform Law's Employer Mandate Repealed.
Business Insurance. Benefits Management. <http://www.businessinsurance.com/
article/20130717/NEWS03/130719866/mass-health-care-reform-laws-employer-
mandate-repealed>.

Enthoven A, and Kronick R. (1991). Universal Health Insurance Through Incentives
Reform. *The Journal of the American Medical Association*. 265(19):2532-2536.
<http://jama.jamanetwork.com/article.aspx?articleid=385942>.

Farber HS, and Levy H. (2000). Recent trends in employer-sponsored health insurance
coverage: are bad jobs getting worse? *Journal of Health Economics*. 19(1):93–
119. <http://ac.els-cdn.com/S0167629699000272/1-s2.0-S0167629699000272-
main.pdf?_tid=934cc4fa-dfb3-11e4-a3d8-
00000aacb35e&acdnat=1428692489_11273a0fb246f0c08130302584190339>.

Gabel JR, Whitmore H, Pickreign J, Sellheim W, Shova KC, and Bassett V. (2008). After
the mandates: Massachusetts employers continue to support health reform as more
firms offer coverage. *Health Affairs* (Millwood). 27(6):w566–75. DOI: 10.1377/
hlthaff.27.6.w566.

Garrett B, Buettgens M. (2011). Employer- sponsored insurance under health reform: reports of its demise are premature. Washington (DC): *Urban Institute*. <http://www.urban.org/uploaded pdf/412295-Employer-Sponsored-Insurance.pdf>.

GfK. GfK KnowledgePanel. New York (NY): GfK. <http://www.gfk.com/us/Solutions/consumer-panels/Pages/GfK-KnowledgePanel.aspx>.

Gruber, J. (2008). Incremental Universalism for the United States: The States First Move? *Journal of Economic Perspectives*, 22(4):51-68. <http://economics.mit.edu/files/6417>.

Gruber, J. (2010). Health Care Reform is a "Three-Legged Stool": The Costs of Partially Repealing the Affordable Care Act. *Center for American Progress*. <http://www.americanprogress.org/wp-content/uploads/issues/2010/08/pdf/repealing_reform.pdf>.

Guan, JC. (2015). Effects of government financial incentives on firms' innovation performance in China: Evidences from Beijing in the 1990s. *Research Policy*. 44(1):273–282. <http://www.sciencedirect.com/science/article/pii/S00487333 14001577>.

Heeren T, EdwardsEM, Dennis JM, Rodkin S, Hingson RW, and Rosenbloom DL. (2008). A comparison of results from an alcohol survey of a prerecruited Internet panel and the National Epidemiologic Survey on Alcohol and Related Conditions. Alcohol Clin Exp 32(2): 222–9.

Holahan J, and Blumberg L. (2006). "Massachusetts Health Care Reform: A Look At The Issues." *Health Affairs*.

Holahan J, and Chen V. (2012). Declining health insurance in low-income working families and small businesses. Washington (DC): *Urban Institute*. <http://www.urban.org/UploadedPDF/412546-Declining-Health-Insurance-in-Low-Income-Working-Families-and-Small-Businesses.pdf>.

Kolstad J T, and Kowalski AE. (2012). The Impact of an Individual Health Insurance Mandate on Hospital and Preventive Care: Evidence from Massachusetts. Journal of Public Economics, 96(11-12):909-929.

Long, S. (2010). A Comment On "The Massachusetts Health Plan: Much Pain Little Gain." Urban Institute Health Policy Center Brief.

Long SK, and Stockley K. (2010). Sustaining health reform in a recession: an update on Massachusetts as of fall 2009. *Health Affairs* (Millwood). 29(6):1234–41.

Long SK, and Stockley K. (2011). The Impacts of State Health Reform Initiatives on Adults in New York and Massachusetts. Health Services Research, 46(1-2):365-428.

Long SK, StockleyK , and Yemane A. (2009). Another Look at the Impacts of Health Reform in Massachusetts: Evidence Using New Data and a Stronger Model. *American Economic Review Papers and Proceedings*, 99(2):508-511.

Lyons, SM. (2014). Health Reform, Physician Market Power, and Income Disparity. <http://ecommons.library.cornell.edu/bitstream/1813/39012/1/sml55.pdf>.

Marcet, D. (2011). Three Strikes and You're Out: A Triple Differences Approach to Estimating the Deterrent Effect of California's Three Strikes Law. <http://web.williams.edu/Economics/Honors/2011/MarcetFinalDraft.pdf>.

McMorrow S, Kenney GM, Anderson N, Clemans-Cope L, Dubay L, Long SK, and

    Wissoker D. (2014). Trade-Offs Between Public And Private Coverage For Low-

    Income Children Have Implications For Future Policy Debates." *Health Affairs*.

    33(8): 1367–1374.

Mercer. (2014). Modest health benefit cost growth continues as consumerism kicks into

    high gear. New York (NY): *Mercer*. <http://www.mercer.com/

    newsroom/modest-health-benefit- cost-growth-continues-as- consumerism-kicks-

    into-high-gear .html>.

Raymond, A. (2009). Massachusetts Health Reform: The Myth of Uncontrolled Costs.

    Massachusetts Taxpayer Foundation. <http://www.masstaxpayers.org/sites/

    masstaxpayers.org/files/Health%20care-NT.pdf>.

Shen YC, and Zuckerman S. (2003). Why Is There State Variation In Employer-

    Sponsored Insurance? *Health Affairs*. 22(1):241-251. <http://content.

    healthaffairs.org/content/22/1/241.short>.

Singhal S, Stueland J, Ungerman D. (2011). How US health care reform will affect

    employee benefits. *McKinsey Quarterly*. <http://www.mckinsey

    .com/~/media/mckinsey/dotcom/ US%20employer%20healthcare

    %20survey/How_US_health_care_ reform_will_affect_employee_

    benefits.ashx>.

	Table 1: Massachusetts Summary Statistics, Take-up			
Variable	**2013**	**2014**	**Total**	**Difference**
ESI	0.6600738	0.6531378	0.6566357	-0.006936
Subsid~d	0.2041569	0.2643247	0.2339814	0.0601678
Uninsu~d	0.1357694	0.0825375	0.1093829	-0.0532319
Age	44.57928	45.00512	44.79036	0.42584
Female	0.5316795	0.5399045	0.5357566	0.008225
Famsize	2.730473	2.654819	2.693011	-0.075654
Married	0.5853168	0.5624147	0.5739645	-0.0229021
LargeF~m	0.6272209	0.6094816	0.6184277	-0.0177393
Income~l	2.542742	2.534176	2.538501	-0.008566
HHInco~l	11.3758	11.30116	11.3388	-0.07464
White	0.753939	0.7438608	0.7489434	-0.0100782
Black	0.0750922	0.0876535	0.0813187	0.0125613
Hispanic	0.1086155	0.1070941	0.1078614	-0.0015214
Other	0.0338585	0.0337653	0.0338123	-9.32E-05
MultiR~l	0.0284948	0.0276262	0.0280642	-0.0008686
LessHS	0.0415689	0.0542292	0.0478445	0.0126603
HighSc~l	0.2423734	0.2578445	0.2500423	0.0154711
SomeCo~e	0.3627221	0.3444748	0.3536771	-0.0182473
MoreCo~e	0.3533356	0.3434516	0.3484362	-0.009884

Table 1: Massachusetts Summary Statistics, Mean Values for Take-up Rates and the

Difference between April-June 2013 and 2014

Notes: $n = 12{,}989$. HRMS data. The sample is restricted to workers age 18 to 64 in the

second quarter of each year working in the private sector and not receiving any SSI or

SSDI benefits.

	Table 2: Control Group Summary Statistics, Take-up			
Variable	**2013**	**2014**	**Total**	**Difference**
ESI	0.6172713	0.626322	0.6219856	0.0090507
Subsid~d	0.2475728	0.2730905	0.2608642	0.0255177
Uninsu~d	0.1351559	0.1005875	0.1171502	-0.0345684
Age	45.85718	46.42327	46.15204	0.56609
Female	0.537302	0.5048179	0.5203819	-0.0324841
Famsize	2.542923	2.451248	2.495221	-0.091675
Married	0.5873786	0.5633373	0.5748562	-0.0240413
LargeF~m	0.5827798	0.5920094	0.5875872	0.0092296
Income~l	2.946091	2.952897	2.949632	0.006806
HHInco~l	12.2279	12.43267	12.33456	0.20477
White	0.7271334	0.7217391	0.7243237	-0.0053943
Black	0.0850792	0.0977673	0.0916881	0.0126881
Hispanic	0.1231477	0.1121034	0.117395	-0.0110443
Other	0.0370465	0.039483	0.0383156	0.0024365
MultiR~l	0.0275933	0.0289072	0.0282776	0.0013139
LessHS	0.0707716	0.0690952	0.0698984	-0.0016764
HighSc~l	0.1944303	0.1915394	0.1929245	-0.0028909
SomeCo~e	0.2874297	0.2893067	0.2884074	0.001877
MoreCo~e	0.4473684	0.4500588	0.4487697	0.0026904

Table 2: Control Group Summary Statistics, Mean Values for Take-up Rates and the

Difference between April-June 2013 and 2014

Notes: *n* = 10,000. HRMS data. The sample is restricted to workers age 18 to 64 in the

second quarter of each year working in the private sector and not receiving any SSI or

SSDI benefits.

Table 3: Difference-in-Differences, Take-up	
Variable	**Difference in Differences**
ESI	-0.0159867
Subsid~d	0.0346501
Uninsu~d	-0.0186635
Age	-0.14025
Female	0.0407091
Famsize	0.016021
Married	0.0011392
LargeF~m	-0.0269689
Income~l	-0.015372
HHInco~l	-0.27941
White	-0.0046839
Black	-0.0001268
Hispanic	0.0095229
Other	-0.0025297
MultiR~l	-0.0021825
LessHS	0.0143367
HighSc~l	0.018362
SomeCo~e	-0.0201243
MoreCo~e	-0.0125744

Table 3: Difference-in-Differences in Mean Take-up Variable Values between the

Control Group and Massachusetts from 2013 to 2014

Notes: *n* = 22,989. HRMS data. The sample is restricted to workers age 18 to 64 in the

second quarter of each year working in the private sector and not receiving any SSI or

SSDI benefits.

	Table 4: Massachusetts Summary Statistics, Offers			
Variable	**2013**	**2014**	**Total**	**Difference**
ESI	0.6368974	0.6452703	0.6412787	0.0083729
Subsid~d	0.2407293	0.2663288	0.2541249	0.0255995
Uninsu~d	0.1223733	0.0884009	0.1045963	-0.0339724
Age	47.03739	47.61627	47.34031	0.57888
Female	0.5296663	0.4898649	0.5088391	-0.0398014
Famsize	2.210754	2.133183	2.170206	-0.077571
Married	0.565513	0.5343468	0.5492045	-0.0311662
LargeF~m	0.5877627	0.5974099	0.5928108	0.0096472
Income~l	3.063659	3.052765	3.057965	-0.010894
HHInco~l	12.41842	12.58024	12.50309	0.16182
White	0.7567985	0.7477477	0.7520625	-0.0090508
Black	0.0855995	0.0968468	0.091485	0.0112473
Hispanic	0.0948702	0.0881194	0.0913377	-0.0067508
Other	0.0343016	0.0371622	0.0357985	0.0028606
MultiR~l	0.0284302	0.0301239	0.0293164	0.0016937
LessHS	0.0580964	0.0551802	0.0565704	-0.0029162
HighSc~l	0.1854141	0.1846847	0.1850324	-0.0007294
SomeCo~e	0.2935723	0.2998311	0.2968474	0.0062588
MoreCo~e	0.4629172	0.4603041	0.4615498	-0.0026131

Table 4: Massachusetts Summary Statistics, Mean Values for Take-up Rates and the

Difference between April-June 2013 and 2014

Notes: *n* = 12,988. HRMS data. The sample is restricted to workers age 18 to 64 in the second quarter of each year working in the private sector and not receiving any SSI or SSDI benefits.

	Table 5: Control Group Summary Statistics, Offers			
Variable	**2013**	**2014**	**Total**	**Difference**
ESI	0.6450657	0.6310433	0.6380589	-0.0140224
Subsid~d	0.2138924	0.2828668	0.2483577	0.0689744
Uninsu~d	0.1410419	0.0860899	0.1135834	-0.054952
Age	45.75815	46.08694	45.92244	0.32879
Female	0.5311309	0.5373198	0.5342234	0.0061889
Famsize	2.335451	2.268593	2.302079	-0.066858
Married	0.5328251	0.5101781	0.5215088	-0.022647
LargeF~m	0.6158407	0.6022053	0.6090273	-0.0136354
Income~l	2.557814	2.540161	2.549003	-0.017653
HHInco~l	11.06057	10.98304	11.02183	-0.07753
White	0.7619653	0.7527566	0.7573638	-0.0092087
Black	0.0783566	0.0920271	0.0851875	0.0136705
Hispanic	0.0969928	0.0966921	0.0968426	-0.0003007
Other	0.0326133	0.0313825	0.0319983	-0.0012308
MultiR~l	0.030072	0.0271416	0.0286078	-0.0029304
LessHS	0.0376959	0.053011	0.0453486	0.0153151
HighSc~l	0.2554003	0.2714165	0.2634033	0.0160162
SomeCo~e	0.3638289	0.3502969	0.3570672	-0.013532
MoreCo~e	0.343075	0.3252757	0.334181	-0.0177993

Table 5: Control Group Summary Statistics, Mean Values for Offer Rates and the

Difference between April-June 2013 and 2014

Notes: *n* = 10,000. HRMS data. The sample is restricted to workers age 18 to 64 in the

second quarter of each year working in the private sector and not receiving any SSI or

SSDI benefits.

Table 6: Difference-in-Differences, Offers	
Variable	**Difference in Differences**
ESI	-0.0223953
Subsid~d	0.0433749
Uninsu~d	-0.0209796
Age	-0.25009
Female	0.0459903
Famsize	0.010713
Married	0.0085192
LargeF~m	-0.0232826
Income~l	-0.006759
HHInco~l	-0.23935
White	-0.0001579
Black	0.0024232
Hispanic	0.0064501
Other	-0.0040914
MultiR~l	-0.0046241
LessHS	0.0182313
HighSc~l	0.0167456
SomeCo~e	-0.0197908
MoreCo~e	-0.0151862

Table 6: Difference-in-Differences in Mean Offer Variable Values between the Control

Group and Massachusetts from 2013 to 2014

Notes: n = 22,988. HRMS data. The sample is restricted to workers age 18 to 64 in the

second quarter of each year working in the private sector and not receiving any SSI or

SSDI benefits.

Appendix B

Table 11: The "IncomeLvl" Variable	
Code or Value	Value Description
1	$ 0 to $ 4,999
2	$ 5,000 to $ 9,999
3	$10,000 to $14,999
4	$15,000 to $19,999
5	$20,000 to $24,999
6	$25,000 to $34,999
7	$35,000 to $44,999
8	$45,000 to $54,999
9	$55,000 to $64,999
10	$65,000 to $74,999
12	Over $20,000
13	Under $20,000
14	$75,000 to $99,999
15	$100,000 and Over

Table 11: Range Values of the "IncomeLvl" Variable in Equations 1 and 2

Table 12: The "HHIncomeLvl" Variable	
Code or Value	Value Description
1	Less than $5,000
2	$5,000 to $7,499
3	$7,500 to $9,999
4	$10,000 to $12,499
5	$12,500 to $14,999
6	$15,000 to $19,999
7	$20,000 to $24,999
8	$25,000 to $29,999
9	$30,000 to $34,999
10	$35,000 to $39,999
11	$40,000 to $49,999
12	$50,000 to $59,999
13	$60,000 to $74,999
14	$75,000 to $84,999
15	$85,000 to $99,999
16	$100,000 to $124,999
17	$125,000 to $149,999
18	$150,000 to $174,999
19	$175,000 or more

Table 12: Range Values of the "HHIncomeLvl" Variable in Equations 1 and 2

PLEDGE:

This paper represents my own work in accordance with University regulations.