What Does Health Reform Mean for the Healthcare Industry? Evidence from the Massachusetts Special Senate Election.

By MOHAMAD M. AL-ISSISS AND NOLAN H. MILLER[1]

We exploit the surprise election of Republican Scott Brown to the U.S. Senate to evaluate the market's assessment of the impact of the recent U.S. health reform legislation on the healthcare industry. We find that Brown's election was associated with abnormal returns of 2.1 percent and 6 percent for investments in the healthcare sector overall and managed-care firms, respectively. Investments in the pharmaceutical sector experienced abnormal returns of 2.8 percent, while healthcare facilities (e.g., hospitals) experienced abnormal losses of 3.5 percent. Firms involved with Medicare Advantage benefitted more while those involved with Medicaid Managed Care benefitted less from the election.

"This is the insurance company's dream, this bill"

-- Howard Dean, former Chair, Democratic National Committee, December 16, 2009. [2]

"The health bill creates a massive cash crunch and then bankruptcies for many insurers."

-- Richard Epstein, University of Chicago, December 22, 2009.[3]

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* Al-Ississ: Department of Economics, The American University in Cairo, AUC Avenue, P.O. Box 74, New Cairo, 11835, Egypt (email: alississ@aucegypt.edu); Miller: Department of Finance, University of Illinois at Urbana-Champaign, 515 East Gregory Ave., Champaign, IL 61820 and National Bureau of Economic Research (email: nmiller@illinois.edu). The authors thank Ola Bengtsson, Jeff Brown, Prachi Deuskar, Ben Handel, Robert Jensen, Joshua Pollet, Charles Roehrig, Amanda Starc, Jay Wang, Scott Weisbenner and participants at the Second Annual Midwest Health Economics Conference (Ann Arbor, MI) for helpful comments. Miller gratefully acknowledges financial support from the National Institute of Aging, The Role of Private Plans in Medicare (P01 AG032952).

[2] http://abcnews.go.com/GMA/HealthCare/howard-dean-health-care-bill-bigger-bailout-insurance/story?id=9349392. Such sentiments are not limited to the left. According to former House majority leader Dick Armey (R, Texas), "Only the most blinkered of partisans can look at the "individual mandate" and not see it as the answer to the health insurance industry's prayers." See http://www.usnews.com/articles/opinion/2009/09/28/armey-individual-mandate-would-be-a-healthcare-industry-boondoggle.html

"If Scott Brown wins, it will kill the health bill."

-- Rep. Barney Frank, January 15, 2010.[4]

"In a stunning blow to President Barack Obama, Republican Scott Brown won a bitter Senate race in Massachusetts on Tuesday and promised to be the deciding vote against his sweeping healthcare overhaul."

-- Reuters, January 20, 2010.[5]

In March of 2010, Congress enacted and President Obama signed into law the Patient Protection and Affordable Care Act (PPACA), which fundamentally altered the U.S. healthcare system. The legislation, which was championed by the president and Congressional Democrats, expands health insurance coverage to many of the 46 million uninsured people living in the United States through provisions aimed at increasing the number of people receiving health insurance from both government programs and private firms. In particular, much of the bill is aimed at increasing participation in the private, non-group health insurance market. The plan is neither the single-payer system advocated by the far left, nor the deregulated, free-market approach advocated by the far right. As such, it has drawn energetic criticism from both sides.

Critics on the left have assailed PPACA's approach to expanding insurance as inadequate, preferring the creation of a public insurance option akin to Medicare to the plan's individual mandate, which requires individuals to purchase (sometimes-subsidized) insurance from private firms. They have further argued that these measures, which come at a time of increasing premiums and record-high profits, amount to a bribe to the insurance industry. Critics on the right, on the other hand, have attacked the provisions of the bill that impose additional regulations on the industry, which they argue would make it impossible for private insurers to compete and quickly drive them out of business. They have also objected to the individual mandate, which forces people to buy insurance coverage or pay a penalty, and to the expansion

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[3] Richard A. Epstein, "Harry Reid Turns Insurance Into a Public Utility," The Wall Street Journal, December 22, 2009, http://online.wsj.com/article/SB10001424052748704304504574610040924143158.html.

[4] Montgomery, Lori. "Democrats push for compromise on health bill," The Washington Post, January 16, 2010: A04.

[5] http://www.reuters.com/article/2010/01/20/us-usa-politics-massachusetts-idUSTRE60I5M920100120

of Medicaid, which threatens states that do not implement the expansion with the loss of all Medicaid funding, including funding for programs already in place.[6]

As a more basic level, PPACA is an extremely complex piece of legislation with some provisions that can be expected to benefit healthcare firms and others that can be expected to harm them.[7] With regard to the insurance industry, the bill requires most U.S. citizens to have health insurance, either through purchasing private insurance or through a government program, or else pay a penalty. Employers with more than 50 employees are required to contribute toward their employees' health insurance or face a fine. Health insurance exchanges will be created to help facilitate the purchase of health insurance, and poor people participating in the exchanges will receive subsidies. These provisions, which increase the number of privately insured individuals in the country, might be expected to benefit insurers. On the other hand, the law restricts insurers' ability to place lifetime or annual limits on benefits, to rescind coverage and to charge premiums based on pre-existing conditions (including age). The law also puts limits on the benefit designs that can be offered for sale on the health insurance exchanges including regulations requiring a minimum "medical loss ratio," which require that more than 80 percent of premium dollars be spent on clinical services (as opposed to administration or profit). Finally, PPACA imposes additional taxes and fees on the insurance sector.[8]

PPACA also contains provisions that can be expected to benefit pharmaceutical firms and ones that can be expected to harm them. On the beneficial side, PPACA substantially increases the number of people with health insurance and consequently with prescription drug coverage, both of which would tend to increase use.[9] On the other side, the bill disallows reimbursement for over-the-counter drugs through tax-advantaged flexible spending accounts and increased manufacturers' drug rebates for Medicaid participants. Perhaps most importantly, as part of a

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[6] In *National Federation of Independent Businesses v. Sebelius,* twenty-six states challenged the constitutionality of PPACA's individual mandate and Medicaid expansion. On June 28, 2012, the Supreme Court upheld the individual mandate but found the Medicaid expansion unconstitutional, ruling that states that refused to implement the Medicaid expansion could only have the additional funding Congress promised for those programs withheld, not funding for Medicaid programs already in place. See http://www.supremecourt.gov/opinions/11pdf/11-393c3a2.pdf.

[7] See http://www.kff.org/healthreform/upload/housesenatebill_final.pdf for a summary of the major provisions of the House, Senate and final versions of Health Reform legislation.

[8] Gruber (2011) examines the impact of Massachusetts's health reform plan, which shared many aspects with the national reform proposals, and reports mixed results as far as insurer profitability is concerned. He reports mild "crowd in" of private insurance, with the share of the MA population who receive employer-sponsored health insurance (ESHI) increasing by 0.6 percent in the years after reform was implemented, relative to a 4% decline in the nation overall. Premiums in the individual market declined significantly. Cogan, Hubbard and Kessler (2010) find that premiums for ESHI increased by approximately 6%, although it is unclear whether the increase was caused by increased cost or some other factor.

[9] Long and Masi (2009) show that health reform in Massachusetts led to increased use of prescription drugs.

deal struck with pharmaceutical manufacturers, PPACA requires pharmaceutical manufacturers to provide $80 billion in savings over a decade, part of which would be used to fill the Medicare Part D "doughnut hole" between $2,000 and $6,154 in annual drug expenditures where seniors are currently required to pay 100% of the cost of their prescription drugs.[10] In exchange for this promise, the White House agreed not to pursue further limits on drug companies in Health Reform, including allowing the government to directly negotiate the prices of drugs purchased for Medicare participants.

Ultimately, whether PPACA is expected to be, on net, positive or negative for healthcare firms, and for health insurance and pharmaceutical companies in particular, is an empirical one. Characterizing the sign and magnitude of these effects is the subject of this article.

To identify the impact of PPACA on healthcare stocks, we exploit the surprise victory of Republican Scott Brown over Democrat Martha Coakley in the Massachusetts special election to replace the late Edward Kennedy (Democrat) in the Senate. Although Health Reform[11] eventually passed using a combination of the House passing the Senate's version of the bill and the budget reconciliation process, both contemporaneous news reports and analysis of the data support the view that Brown's election reduced the perceived likelihood of passage. Thus, if Brown's victory, which was largely unanticipated until shortly before the election, is associated with positive abnormal return to healthcare stocks, this suggests that markets interpreted Health Reform as harmful to the healthcare industry, and vice-versa in the case of a negative abnormal return.

Using a regression-based event-study approach, we find that Brown's victory induced a positive and significant overall effect on healthcare stocks. A typical dollar invested in the healthcare sector realized a 2.1 percent Cumulative Abnormal Return (CAR) between January 14, 2010 and January 20, 2010. Investments in pharmaceutical firms earned a CAR of 2.8 percent, and investments in managed-care companies (i.e., health insurers) earned a CAR of 6 percent. Thus, the market appears to have judged Health Reform to be harmful to the healthcare industry overall and in particular to insurance and pharmaceutical firms. However, not all firms experienced gains following the election. In particular, we find that investments in healthcare

[10] http://www.time.com/time/politics/article/0,8599,1915139,00.html

[11] In the fall of 2009, the House and Senate each passed health reform bills. The bills were not identical, and, as such, any final bill would result from negotiations between the two houses. Throughout the paper, we use the term "Health Reform" to refer to the merged bill that would ultimately be passed.

facilities (e.g., hospitals) experienced abnormal losses of 3.5 percent following the election, consistent with the idea that Health Reform, which was expected to reduce the amount of uncompensated care hospitals were forced to provide, was good for the facilities subsector.

The event study approach used in this paper, first introduced by Fama *et al.* (1969), has been used for over forty years to study the behavior of stock market prices around events such as earnings announcements and changes in regulatory, tax, fiscal or monetary policy (MacKinlay, 1997; Binder, 1998; Kothari and Warner, 2007). Although the majority of these studies have focused on "economic" events, a number have considered the impact of political events on equity prices, as does the present study. Knight (2006) studies the Bush/Gore 2000 election and shows that, relative to what would have happened if Al Gore had won the race, "Bush-favored" firms enjoyed a 9 to 16 percent higher return under the Bush administration.[12] Other work on the 2000 election estimates that the delay in determining the results of the 2000 election resulted in lower returns on the U.S. (Nippani and Medlin, 2002) and Mexican and Canadian (Nippani and Arize, 2005) stock markets. Ferri (2008) studies the 2004 Bush/Kerry election and shows that Bush's victory, which was unexpected when stock markets closed on election day, was associated with a positive movement in equity values. Jayachandran (2006) studies Senator James Jeffords' 2001 decision to leave the Republican party, shifting control of the U.S. Senate to the Democrats, and finds that firms that made donations to Republicans in the previous election cycle experienced negative returns following Jeffords' switch, while Democratic donors experienced positive returns. In related work, Den Hartog and Monroe (2008) show that the Jeffords switch was associated with negative returns for the oil and gas industries (which were favored under Republican policy) and positive abnormal returns for renewable energy stocks (which were favored under Democratic policy). Friedman (2009) examines the impact of the passage of Medicare Part D on pharmaceutical firms' profit using stock market returns and finds that Part D significantly increased the profit for makers of prescription drugs with high Medicare demand.

The remainder of this paper proceeds as follows. Section II discusses the timeline of the Massachusetts Special Election and ex ante expectations for the impact of Health Reform on healthcare stocks. Sections III presents the data and empirical strategy, and Section IV contains

[12] In addition to the results of the paper, Knight (2006) also provides an extensive review of the literature on event studies and political events.

the basic results. Section V discusses the Managed Care subsector in greater detail, Section VI discusses robustness and extensions, and Section VII concludes. Additional analysis is contained in an online appendix (available from the journal's web site).

II. Health Reform and the Massachusetts Special Election

A. Background and Timeline

In the summer and fall of 2009, the Democratic Party controlled the House of Representatives, the Senate and the White House. Consequently, the Democrats set the country's legislative agenda and the Health Reform proposals brought before Congress were written and supported almost exclusively by Democrats. During this period, the Democratic caucus controlled 60 votes in the United States Senate, including 58 Democrats and Independents Bernard Sanders (VT) and Joseph Lieberman (CT). Due to the Senate's rules, 60 votes are required to end debate on a proposed bill and move to a vote. And, in light of strong, across-the-board Republican opposition to the proposals, without the support of 60 Senators it was highly unlikely that the Democrats would have been able to bring proposed health care legislation to the floor for a vote.

In the fall of 2009, the House of Representatives and Senate had each passed a health reform bill. The House version of the bill (H.R. 3962, the "Affordable Health Care for America Act) passed 220-115, with support from 219 Democrats and one Republican.[13] Thirty-nine Democrats voted against the bill, in many cases because they thought the bill was not ambitious enough. The Senate version of the bill (H.R. 3590, the "Patient Protection and Affordable Care Act") passed 60 – 39 with one Senator not voting. Every Democrat (along with Independents Sanders and Lieberman) voted for the bill, while every Republican voted against the bill (with the exception of Jim Bunning (KY), who did not vote).[14] Although broadly similar, there were significant differences in the bills. The House version of the bill was somewhat more ambitious

[13] http://clerk.house.gov/evs/2009/roll887.xml

[14] http://www.senate.gov/legislative/LIS/roll_call_lists/roll_call_vote_cfm.cfm?congress=111&session=1&vote=00396

and expensive than the Senate version, including, in particular, a public health insurance option to be offered for sale to individuals on a national health insurance exchange.[15]

Given the disparate bills passed in the two houses of Congress, the standard legislative approach would involve a House-Senate conference committee developing a compromise bill that would then have to be passed again by each house. This approach would only be feasible, however, if the Democrats maintained their 60 vote supermajority in the Senate. In the event that they did not, there were still routes to passage which, although somewhat obscure, were well understood by insiders and analysts. The first method involved the House passing the Senate's version of the bill. In this case, a second vote in the Senate would not be required. The second involved using the "budget reconciliation" procedure in addition to the House passing the Senate's version of the bill, which would allow some changes to be made to the original bills with only a simple majority of supporters in the Senate.[16]

Senator Edward Kennedy (D., MA), a staunch supporter of Health Reform, died on August 25, 2009 after a sixteen month battle with brain cancer.[17] Paul G. Kirk Jr., a former Kennedy aide and supporter of Health Reform was appointed to fill the seat until a special election to serve out the remainder of Kennedy's term could be held on January 19, 2010.[18]

The Democratic candidate in the Massachusetts special election was state Attorney General Martha Coakley, a supporter of Health Reform.[19] Her opponent was Massachusetts State Senator Scott Brown, who made opposition to Health Reform a centerpiece of his campaign.[20] Consequently, leading up to the special election, it was widely believed that a Coakley victory would likely lead to the passage of a compromise bill based on the House and Senate bills of 2009, while a Brown victory would make it extremely unlikely that such a compromise bill would be passed, since the Democrats would only control 59 votes in the Senate. Thus, the Massachusetts special election, falling between passage of the bills in the House and Senate and reconsideration of a combined bill, became a critical test for Health Reform as envisioned by President Obama and the Democrats in 2009.

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[15] See http://www.kff.org/healthreform/upload/housesenatebill_final.pdf.

[16] Ultimately, Health Reform was passed using a combination of the House passing the Senate version of the bill and a reconciliation bill.

[17] http://www.nytimes.com/2009/08/27/us/politics/27kennedy.html

[18] http://www.nytimes.com/2009/09/25/us/politics/25massachusetts.html

[19] http://www.nytimes.com/2009/12/09/us/politics/09mass.html

[20] http://www.brownforussenate.com/issues.

Immediately following the primary elections to select candidates to vie for Kennedy's seat, Martha Coakley was considered a strong favorite, Massachusetts being a strongly Democratic state. Early polling placed Coakley well ahead of Brown, and Coakley maintained a double-digit lead in the polls through the first week of January. The race between Brown and Coakley began to tighten around the second week of January, when a group of polls emerged that showed Brown and Coakley in a statistical dead heat.[21] Then, around January 15th, several polls emerged showing Brown had taken a 10-15 point lead over Coakley. On Friday, January 15th, President Obama announced that he would travel to Massachusetts to campaign for Coakley on Sunday, January 17th.[22]

In the January 19th election, Brown defeated Coakley 51.9 percent to 47.1 percent. The Boston Globe described the Brown victory as "one of the biggest upsets in Massachusetts political history," saying "the stunning, come-from-behind victory caps a dramatic surge in recent days as Brown … roared ahead of Coakley."[23]

The dramatic shift in the race, from polls showing a 15 point lead for Coakley to showing a similarly-sized lead for Brown and culminating in Brown's 5 point victory, can be attributed to several factors. First, due to the Democrats' strength in Massachusetts, Coakley and her staff underestimated Brown's ability to mount a serious challenge and ran a generally lackluster campaign.[24] As a result, Coakley lacked a strong image in voters' minds, and this left her vulnerable to several missteps she made late in the campaign, most notably referring in a January 15th radio interview to Boston Red Sox hero Curt Schilling as a fan of the New York Yankees. The Republicans, on the other hand, took advantage of the Democrats' complacency. Candidate Scott Brown took to the streets in a series of public appearances, and he turned out to be a surprisingly effective "retail campaigner."

Several other factors contributed to the rapid movement in the polls and Brown's surprise victory. One of the most important was that the press was slow to pick up on the changing tides in the Massachusetts election, with major news outlets beginning to run stories suggesting the

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[21] See http://www.realclearpolitics.com/epolls/2010/senate/ma/massachusetts_senate_special_election-1144.html.

[22] http://www.boston.com/news/politics/2008/articles/2010/01/16/obama_steps_into_suddenly_taut_senate_race/

[23] http://www.boston.com/news/nation/articles/2010/01/20/republican_trounces_coakley_for_senate_imperils_obama_health_plan/

[24] http://www.washingtonpost.com/wp-dyn/content/article/2010/01/14/AR2010011404607.html; http://www.washingtonpost.com/wp-dyn/content/article/2010/01/15/AR2010011504069.html. See also http://www.boston.com/news/local/breaking_news/2010/01/coakley_underes.html for an in depth discussion of how and why Coakley's team underestimated Brown.

race might be closer than expected only in the second week of January.[25] Additional contributing factors included the unusual nature of the election (i.e., a special election held in January in a cold-weather climate) and the advent of new automated polls, which made prediction of voter turnout and interpretation of polling data difficult.

Evidence on the surprise embodied in the Brown victory is provided by the prediction market Intrade.com, which offered contracts on the likelihood of a Brown or Coakley victory.[26] The Intrade.com contract on a Brown or Coakley victory paid $100 if the named candidate and $0 otherwise. Thus, the contract price (divided by 100) can be interpreted as the market's view of the likelihood of the named candidate winning the election. Figure 1 depicts the daily closing prices of the Intrade.com contracts on victory for Brown and Coakley. Due to the presence of a third candidate, Joseph Kennedy (no relation to the deceased Senator), the numbers need not sum to 100. Through January 9, the victory probabilities stood steady at around 90% for Coakley and 10% for Brown. Over the next week, the contracts moved around somewhat, inching toward 70/30 in favor of Coakley at the January 15th close.[27] Over the weekend, however, the contracts reversed, closing at 77 for Brown and 25 for Coakley on January 18 before Brown's eventual victory the next day. Conveniently for the sake of this study, the markets were closed on Monday, January 18, in observance of the Martin Luthar King holiday. Thus, while new information regarding the likelihood of a Brown victory accumulated over the weekend, markets were unable to incorporate this information between the close of trading on January 15 and the opening on election day, January 19.

[Insert Figure 1 About Here]

For these reasons and more, Scott Brown's victory in Massachusetts provided an unforeseen shock to the likelihood of Health Reform being passed into law. However as we

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[25] See Howard Kurtz in *The Washington Post* for a comprehensive discussion of the media "Missing the Mark in Massachusetts," http://www.washingtonpost.com/wp-dyn/content/article/2010/01/25/AR2010012500741.html.

[26] Snowberg, Wolfers and Zitzewitz (2011) suggest directly using the intrade.com prices as independent variables rather than the occurrence of a particular event. We do not adopt this here due to the fact that the Brown and Coakely markets were relatively thinly traded and, while a Brown victory would presumably move the market's assessment of the likelihood of Health Reform being enacted, it is not a direct measure of this assessment. Since the election represents a clean event, we instead adopt the simpler event-study approach.

[27] Interestingly, Brown's January 10th bump coincided with the Boston Globe's publication of its poll showing Coakley held a 15 point lead in the polls. However, the same article suggested that there were some "glimmers of hope for the Republican," possibly leading Intrade.com traders to revise their beliefs about the possibility of Brown winning the election. http://www.boston.com/news/politics/2008/articles/2010/01/10/senate_poll_coakley_up_15_points/

have noted, Health Reform did eventually pass through a process that combined the House passing the Senate's version of the bill and the budget reconciliation process. In light of this it is natural to ask whether Brown's election might actually have increased the perceived likelihood of Health Reform passing through, for example, increasing awareness of the availability of these other routes to passage or focusing the Democrats' attention on the reconciliation process rather than on negotiating a compromise bill. We return this point in greater detail in Section VI. For now, we note that this view, while possible, is not supported by press reports at the time, which uniformly portrayed Brown's election as a negative shock to the likelihood of health reform passing. For example, USAToday referred to Brown's election as a "crushing hit" to the prospects for Health Reform, while the New York Times' coverage of the election results bore the headline "Democratic Defeat Imperils Health Care Overhaul."[28]

Consequently, we will interpret Brown's election as an unforeseen, negative shock to the likelihood of Health Reform being passed. As long as Brown's victory was not fully anticipated by equity markets, this event can be used to study the impact of a decrease in the likelihood of health reform on equity prices and thus whether Health Reform was expected to be a "dream" or a "nightmare" for health insurers and other health care firms.

B. Empirical Hypotheses

As discussed in the introduction, in the case of health insurers and pharmaceutical firms, Health Reform contained both beneficial and harmful provisions. Consequently, the expected impact of Health Reform on these sub-industries is ambiguous. Determining the signs of these effects is one of the major purposes of this article.

However, while the *ex ante* impact on insurance and pharmaceutical sub-industries was ambiguous, Health Reform was expected to have an unambiguous effect on a number of other parts of the healthcare industry, including hospitals, medical device manufacturers and participants in government programs such as Medicare Advantage and Medicaid Managed Care.

[28] USAToday, Jan. 20, 2010, pg. 10A; New York Times, Jan. 21, 2010, National Desk. A related issue is whether Brown's election might have changed the nature of the bill that would eventually be passed in addition to affecting the likelihood of passage. Due to the delicate nature of Congressional negotiations, this seems unlikely to be the case. We return to this point in Section VI.

Regarding hospitals, over its first decade Health Reform is expected to substantially reduce the number of uninsured people in the country, which would benefit hospitals in two ways. First, insured consumers tend to use and pay for substantially more health care, including hospital services, than uninsured ones. Second, the movement of so many people from the ranks of the uninsured to the insured is expected to radically reduce the amount of uncompensated care that hospitals will have to provide.[29] Hospitals are required to care for patients who present themselves at the Emergency Department, whether the patient can pay or not. As such, they are forced to care for patients who cannot or will not pay for the care they receive. This unpaid or "charity" care is estimated to have cost hospitals $36 billion in 2008. Health Reform, by insuring many of these patients, is expected to significantly reduce hospitals' unpaid care (as well as increase utilization by those with insurance). As such, we expect that health reform will benefit hospitals and therefore that Brown's election (corresponding to a decrease in the likelihood of Health Reform being passed) would have a negative effect on hospitals' stock prices.[30]

Health Reform was also expected to have an unambiguous impact on medical device manufacturers. Both the House and Senate versions of Health Reform imposed new taxes and/or fees on medical devices, with the Senate bill imposing fees of $2 billion, growing to $3 billion in 2017, and the House bill imposing a 2.5% tax on the first sale of medical devices.[31] Since Health Reform harms device manufacturers, we expect Brown's election to be associated with a positive return to device manufacturers.

Finally, although the overall impact of Health Reform on health insurers was ambiguous ex ante, its impact on participation in various government programs was not. Health Reform significantly scaled back the payments made to firms caring for patients in the Medicare Advantage (Medicare Part C) program. Thus we might expect firms that have significant involvement in this program to benefit (relatively) less from Health Reform. On the other hand, Health Reform increased eligibility for Medicaid, which was expected to benefit firms providing

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[29] For example, in the year after Massachusetts passed its health reform plan, uninsurance decreased by 60 - 70% and uncompensated care declined by 40% (Gruber, 2011).

[30] See Abelson, Reed, "Bills Stalled, Hospitals Fear Rising Unpaid Care," *The New York Times,* Feb. 8, 2010, http://www.nytimes.com/2010/02/09/health/policy/09hospital.html, accessed June 22, 2010.

[31] See http://www.kff.org/healthreform/upload/housesenatebill_final.pdf.

care to these new enrollees through Medicaid Managed Care plans.[32] Thus we expect that insurers with greater Medicaid Managed Care involvement to benefit more from Health Reform. In terms of the election, we expect Scott Brown's election to be better for firms with greater Medicare Advantage involvement, and to be worse for firms with greater Medicaid Managed Care involvement.

III. Data and Empirical Strategy

We analyze the impact of Scott Brown's election on firms in the healthcare industry using total return data on 3673 firms from the Center for Research in Security Prices (CRSP) database (CRSP, 2010). This represents all firms traded on the NYSE and NASDAQ exchanges that are part of the S&P Total Market Index (SPTMI) with total return data available during the study period. The SPTMI seeks to represent the entire universe of U.S. equities. In order to study the impact of the election on the healthcare industry, we classify a firm as belonging to the healthcare industry based on its S&P Global Industry Classification Standard (GICS) code. In particular, we classify a firm as belonging to the healthcare industry if its two digit GICS code is 35. The GICS codes are acquired from COMPUSTAT and cross-matched to the returns data based on their Committee on Uniform Security Procedures (CUSIP) codes.

We begin our analysis of the anticipated impact of Health Reform on the broad health care industry by estimating the impact of Scott Brown's election on all publicly traded healthcare firms in the CRSP database. In order to get a sense of whether the impact of Brown's election on major industry players differed from the impact on smaller ones, we further subdivide firms based on whether they are constituents of one of four S&P Industry Select Portfolios (SPISP): Health Care Equipment, Health Care Services, Pharmaceuticals and Biotechnology. Using SPISP healthcare firms is a more inclusive definition of what it means to be a "major" healthcare firm than using healthcare firms in the S&P 500 index. Using the latter definition changes the results only slightly.

[32] In particular, Health Reform was expected to add about 16 million to the ranks of Medicaid, with the federal government initially providing 100 percent funding for newly-eligible beneficiaries, most of whom would receive care through private managed care plans. Health Reform also increased Medicaid reimbursements. http://www.kff.org/medicaid/upload/8139.pdf

In order to get a more detailed view of the election's impact, we next classify the firms into ten healthcare sub-industries based on their GICS codes: Health Care (HC) Distributors, HC Equipment, HC Facilities, HC Services, HC Supplies, HC Technology, Biotechnology, Life Sciences Tools and Services, Managed HC, and Pharmaceuticals.[33] Health insurers are included in the Managed Healthcare subsector, hospitals are included in the Facilities subsector, and medical device manufacturers are classified in the Equipment subsector.

To analyze the impact of Scott Brown's election on firms in the healthcare sector, we adopt a regression-based event-study approach to estimate the change in return of these companies operating in the health industry as a result of the surprising election of Scott Brown. The method is, in principle, quite simple. We treat Brown's election as an exogenous shock to the likelihood of health reform being passed, and thus any abnormal returns to health care equities beyond what can be accounted for by movements in the overall market and other known risk factors following the election can be attributed to the impact of the election.

In order to allow for the fact that the likelihood of Brown's victory may have been incorporated into stock prices in the days before the election and/or may not have been fully incorporated on election day (since the polls did not close until after the market did), we consider an event window beginning two trading days before election day and ending one day after it. Thus the four trading days in the event window range from Thursday, January 14th to Wednesday, January 20th.[34] Our choice of the start date of the event window is motivated (as per Snowberg, Wolfers, and Zitzewitz (2011)) by referring to the Intrade prediction market. As Figure 1 shows, the odds of Scott Brown winning the elections started to increase dramatically on January 14, 2010. Although a case could be made for starting the event window slightly earlier, one of the managed care firms we study, Aetna, announced in its 8-K quarterly earnings filing on January 12th that it expected lower earnings in 2010 than 2009. Hence, we start our event window on January 14th in order to allow markets to fully incorporate this news and avoid contaminating our study.

Because events were changing rapidly in the days after the election, we end our event window one day after the election to prevent contamination by confounding events. However, as a secondary specification we examine a ten trading-day event window (Jan. 14 – Jan. 28). This

[33] Similar results hold for sector definitions based on North American Industry Classification System (NAICS) codes.

[34] There was no trading over the weekend or on Monday due to the Martin Luther King Day holiday.

extended window, which included President Obama's State of the Union Address on January 27, would be long enough to give markets time to readjust in case of an initial overreaction and also to incorporate new information that emerged over the next week. We briefly discuss these results, which are similar in sign and magnitude for the healthcare sector overall as well as for the major healthcare subsectors of interest, at the end of Section IV.

The basic strategy of the analysis involves comparing firms' actual returns during the event window with their predicted return based on known risk factors. We begin our analysis by estimating a Fama-French three-factor model for the 1000 trading days preceding the event window for each firm in the CRSP database, whether or not the firm is a healthcare firm.[35] The Fama-French model (Fama and French, 1992; 1993) predicts the firm's return on any given day based on the relationship between the firm's return and the return on the market portfolio and two other risk factors that have been shown to influence equity returns, the difference between the return on stocks with small and large market capitalization (the "small minus big" or SMB factor) and the difference between the return on stocks with high and low book-to-market value (the "high-minus-low" or HML factor). The stock's abnormal return is the portion of the return that cannot be accounted for by these known risk factors. The cumulative abnormal return (CAR) is the sum over the event window of its daily abnormal return.[36]

In the analysis, we examine the results of regressions of the form:

$$(1) \qquad CAR_i = \alpha_i + \sum_j^J \beta_j D_{ji} + \sum_k^K \gamma_k x_{ki} + u_i \,.$$

where CAR_i is the firm *i's* CAR over the four day event window, D_{ij} are a series of sector- or sub-sector-level dummy variables (e.g., whether the firm is a health care firm), x_{ik} are (potentially) a series of individual-level controls and u_i is a firm-specific error term, assumed to have zero mean conditional on the dependent variables. Thus, our estimation strategy is essentially a difference-in-differences strategy, comparing the CAR during the event window for firms in the healthcare sector to those outside of the healthcare sector.[37]

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[35] To be as inclusive as possible, we include all firms for which returns were observed on at least 50 days in the estimation window. The results are substantially unchanged if we restrict the sample to only those firms whose returns are observed for all 1000 days in the estimation period or to only those firms in the S&P 500.

[36] The additive formulation of the CAR is standard in the finance literature. Results are similar if a geometric form is used instead.

[37] Another approach would compare firms' behavior during the event window to behavior before the estimation window, using time-series variation rather than cross-sectional variation to identify the impact of Brown's election. The basic results are similar under this approach.

We run the regressions specified in (1) in both unweighted and weighted forms. The unweighted regressions take the firm as the as the unit of observation, and regression coefficients tell us the impact of the election *on a typical firm.* Unweighted regressions treat small and large firms equally, which may give a distorted view of the sector overall. For example, although 10 percent of healthcare firms are in the S&P 500, they comprise 80 percent of the sector's total market value. To address this, in our preferred specifications we run regressions that are weighted by firms' market capitalization. In this case the coefficients are interpretable as the impact of Brown's election on an average dollar invested, rather than the impact on an average firm.

If equity markets are efficient, then they will incorporate new information into prices relatively quickly. Taking this as given, the assumptions necessary for regression coefficients to identify the impact of Brown's election on healthcare stocks are that (i) the outcome of the election came as a surprise and so its impact was not incorporated into stock prices before the election took place, (ii) that no other events occurred during the event window that might affect firms' abnormal returns, and (iii) that Scott Brown's election did not affect the likelihood of other policy changes along dimensions that cannot be controlled for in our analysis. Two final critical assumptions are (iv), that Scott Brown's election actually *decreased* the market's perceived likelihood of Health Reform's passage, rather than increasing it, and (v), that while Brown's election affected the probability that reform would pass, it did not substantially impact the nature of the legislation. We begin by discussing the first two assumptions here. The final three, which are critical for interpreting the results, are taken up in Section VI.

We argued that Brown's victory was, in fact, a surprise in the previous section, and our choice of the four-day event window was driven by the need to exclude the possibility of other events contaminating the event window. To further address the question of whether there were other events related to the healthcare industry that took place during the event window and might contaminate it, we reviewed the First Call Historical database, the NewsBank World News service, and Lexus/Nexus Academic for relevant news stories concerning health care firms in the SPISP during the event period, searching for each by name and stock ticker. Although some firms received idiosyncratic news during the event period, the news was not systematically good or bad, and such events that did occur were rare and unlikely to have broad effects at the

industry or sub-industry level (e.g., court rulings, recalls).[38] The major exception is Aetna's "negative-surprise" earnings announcement on January 12th discussed above, which could be interpreted as bad news for the industry in general and led us to choose January 14th as the start of the estimation window.

IV. Basic Results

Tables 1 and 1a present the results of the analysis for all health care firms, for firms decomposed into whether or not they are constituents of the SPISP, and for firms decomposed into healthcare subsectors.[39] The dependent variable in Tables 1 and 1a is a firm's CAR over the four day event window. Columns 1 – 3 of Table 1 present results for equally weighted regressions, while columns 4 – 6 repeat the analysis for value-weighted regressions. Robust standard errors are used throughout the paper.

[Insert Table 1 About Here]

Column 1 regresses firm-level CARs on an indicator for whether the firm is in the healthcare sector (i.e., two-digit GICS code 35). We find that a typical healthcare firm experienced an abnormal return of approximately 0.65 percent, statistically significant at the 5 percent level. Column 2 splits the regression by whether the healthcare firm is also in the SPISP and reveals that the positive abnormal return is concentrated among healthcare firms in the SPISP, where we find a CAR of 1.32 percent ($p<0.01$). Figure 2 shows cumulative abnormal returns for all healthcare firms, for SPISP healthcare firms and for non-SPISP healthcare firms over the four event days.

[Insert Figure 2 About Here]

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[38] Events affecting only a single firm are captured by the idiosyncratic shock to firms' abnormal returns and will not bias the estimates of the impact of the election.

[39] During the event window, several prominent firms in the financial sector issued earnings announcements. Consequently we include a dummy variable for whether the firm is in the financial sector in all regressions. The results do not change substantially if financial firms are dropped from the regressions entirely, as is common practice in the finance literature (e.g., Fama and French, 1992). Not including the dummy variable reduces statistical significance in some cases, but the main effects remain highly statistically significant (particularly in the value-weighted regressions).

Column 3 of Table 1 splits the healthcare industry into 10 subsectors, revealing a positive, statistically significant CAR of 2.64 percent in the Managed Care sector. This represents our first evidence that Scott Brown's election benefitted health insurance companies, i.e., that markets perceived Health Reform as being harmful to health insurers.

Column 1 of Table 1a, which presents an equally-weighted regression further splitting the subsectors according to whether firms are in the SPISP, reveals a number of additional interesting nuances to the results. Again, statistically significant results are concentrated in healthcare firms that are also in the SPISP. We find a strong, positive effect on SPISP firms in the Managed care sub-sector, where a typical firm experienced a CAR of 6.65 percent during the event window. SPISP Pharmaceutical firms also experienced significant gains, with a CAR of 3.2 percent. Thus, Brown's election appears to have been beneficial for healthcare stocks as a whole as well as the Managed care and Pharmaceutical sectors.

[Insert Table 1a About Here]

Column 1 of Table 1a also finds a CAR of *negative* 3.3 percent in the SPISP Facilities sector, which includes hospitals.[40] This result confirms the expectation discussed above that Health Reform, by increasing utilization and reducing charity care, would benefit hospitals.

Tables 1 and 1a also reveal positive CARs of around 1.7 percent for the healthcare Equipment sector. Interestingly, this positive CAR is statistically significant even for the non-SPISP firms. Again, this result agrees with *ex ante* expectations for the subsector due to the taxes and fees Health Reform imposed on medical device manufacturers.

Figure 3 depicts CARs by event day for the SPISP Equipment, Facilities, Managed Care and Pharmaceuticals sectors.

[Insert Figure 3 About Here]

The lack of significant findings for firms outside the SPISP may be due to any of several factors. The first is that the firms in the SPISP are the major firms in the market. Firms outside of the SPISP may be lesser-known and somewhat thinly traded, the result being that it takes

[40] Focusing more closely on hospitals, hospital firms in the SPISP (including Community Health Systems, Tenet Healthcare, Universal Health Services, Health Management Association, LifePoint Hospitals, and Kindred Healthcare) experienced an average CAR of negative 6.5 percent, with individual firms' CARs ranging between negative 0.5 (Kindred Healthcare, which is primarily operates nursing homes rather than acute care hospitals) and negative 9.9 percent (Community Health Systems).

longer for shocks to translate into price movements for these stocks. In addition, as noted above, there is expected to be heterogeneity in the impact of Brown's election across healthcare subsectors, and inspection reveals that there seems to be more noise in firms' classification outside of the SPISP than there is inside, which may tend to reduce the likelihood of finding a statistically significant impact (in either direction) of the election on these stocks.

Columns 4 – 6 of Table 1 and Column 2 of Table 1a present the results for market-capitalization weighted regressions. The results here are broadly consistent with those of the equally-weighted regressions, although the effects tend to be larger in magnitude due to the fact that the effects tend to be concentrated in firms in the SPISP and these firms, which tend to be larger, are given greater influence in the weighted regressions. We find that a typical dollar invested in the healthcare sector experienced a CAR of about 2.1 percent, with investments in the managed-care and pharmaceutical subsectors experiencing CARs of 6 and 2.8 percent, respectively. A typical dollar invested in the equipment subsector had a CAR of 1.8 percent, while one invested in the facilities subsector experienced a CAR of *negative* 3.5 percent. Figures 4 and 5 adapt Figures 2 and 3, showing CARs over the event window for all healthcare firms, SPISP healthcare firms, and non-SPISP healthcare firms as well as selected industry subsectors using market-capitalization weighted averages.

[Insert Figure 4 About Here]

[Insert Figure 5 About Here]

As discussed earlier, we chose to end our event window one day after the election in order to minimize the possibility that new events would contaminate our results. The days following the election featured a number of new developments that, in total, may have either increased or decreased the likelihood of reform. For example, during a Town Meeting event in Ohio on January 22, President Obama declared "I'm going to keep up the fight for real, meaningful health insurance reforms. That's why we expanded the children's health insurance program to include four million more kids. And that's why I'll continue fighting for reform that will hold the insurance industry accountable and bring more stability and security to folks in our

health care system."[41] At the same time, Democratic leaders publicly discounted the possibility of passing Health Reform by having the House pass the Senate bill or using the reconciliation process, leaving them without a firm plan for how to proceed.[42] Then, on January 27, 2010, President Obama gave the State of the Union Address, in which he reiterated his commitment to passing health reform legislation.

Despite these complications, our results are robust to extending the event window to include the 10 trading days, beginning with January 14 and ending on January 28, one day after the State of the Union. In particular, the results for the large firms and the value-weighted regressions are the same in sign and similar in magnitude to those presented in the main analysis.[43]

Before continuing the analysis, a comment on interpreting the magnitude of the effects is in order. While we find an overall CAR of 2.1 percent associated with Brown's election, this is not the same as saying that Health Reform was expected to decrease the market value of investments in the healthcare sector by 2.1 percent. This would only be an appropriate conclusion if the probability of reform were one before the election and zero after.[44] Otherwise, the estimate must be scaled by the change in the probability of reform and our results represent lower bounds on the magnitude of the effect of Health Reform on healthcare firms. Thus, if the election decreased the probability of reform from 0.8 to 0.2, the appropriate back-of-the-envelope computation would be that reform was expected to decrease the value of the firms in our sample by 2.1/(0.8-0.2) = 3.5 percent. These concerns do not, however, affect the interpretation of the signs of the effect. Thus, a positive abnormal return associated with the election corresponds to Health Reform being expected to harm firm interests *as long as Brown's election decreases the probability of reform.* We turn to this and other issues in interpreting the results in Section VI.

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[41] http://voices.washingtonpost.com/44/2010/01/obamas-jobs-speech-in-ohio-the.html

[42] The period also featured industry-related news that was not directly related to health reform. For example, on January 26, 2010, Oppenheimer cut its evaluation of CIGNA from "overperform" to "perform."

[43] Results are presented in Appendix Tables A1 and A1a.

[44] As discussed below, it also requires that the election affected only the likelihood of Health Reform passing, not the nature of the bill that the markets expected to be passed.

V. Detailed Analysis for Managed Care

A. Results for Individual Managed Care Firms

One of the main goals of Health Reform is to expand insurance coverage by reforming insurance markets. Due to the importance of the insurance industry for both the political debate and real impact of Health Reform, in this section we investigate the firms in the managed care segment in more detail, focusing on those firms in the SPISP, which includes all of the major commercial insurers.

The firms in the SPISP Managed Care segment are Aetna, CIGNA, Coventry Health Care, Humana, Unitedhealth and WellPoint. These firms are also constituents of the S&P 500, suggesting that not only are they important within healthcare, but that they are major firms even when compared to the overall market. To evaluate the size of the election's impact on these firms, rather than rely on regressions with so few observations we instead employ a simple, nonparametric test, comparing the CAR for each firm in the segment with the distribution of CARs for firms in the S&P 500 outside of the healthcare and financial sectors.[45] The CAR for a firm is unusually large if it appears in the right-tail of this distribution.

Table 2 reports the CAR for each firm and the probability that a randomly chosen CAR from the set of S&P 500 firms in neither the health nor the financial sectors is greater or equal to the firm's CAR. Each of the Managed Care firms reports a positive CAR, ranging from 4.7 percent for Wellpoint to 9.5 percent for Humana. The probability of a randomly drawn CAR being larger than Wellpoint's is approximately 5 percent, while the probability for Humana is less than 1 percent. Thus, in all cases, the CARs for major health insurance companies are unusually large relative to those of other firms in the S&P 500. We thus conclude that not only did the election benefit Managed Care firms on average, but also did so for each major firm individually. Figure 6 plots the CARs for these individual firms over the four day event window.

[Insert Table 2 About Here]

[Insert Figure 6 About Here]

[45] We exclude financial sector firms due to the earnings announcements during the event window discussed above.

B. Relationship Between CARs and Involvement in Government Healthcare Programs

Next, we consider the extent to which individual insurers' CARs varied depending on the firms' involvement in government healthcare programs. As discussed above, Health Reform reduced reimbursements for health insurers participating in the Medicare Advantage program and increased eligibility for Medicaid, which was expected to benefit firms providing care to these new enrollees through Medicaid managed care plans, which stood to benefit greatly from reform. Consequently, we expect to observe firms that are more reliant on the Medicare Advantage program to experience larger CARs and firms that are more reliant on the Medicaid program to experience smaller ones.

As a first test of these hypotheses, we classified firms as serving "Medicare Advantage," or "Medicaid" or "Medicaid Managed Care" based on a search for each of these terms in the firm descriptions on Google finance.[46] Note that, due to the method, all firms classified as participating in Medicaid Managed Care are also classified as participating in Medicaid. Although somewhat crude, reading the descriptions verified that the method, for the most part, succeeded in identifying firms involved with each of these programs. We then regressed firm-level CARs on dummy variables for whether the firm's description contained Medicare Advantage, Medicaid or Medicaid managed care.

Results are presented in Table 3. The first column includes the dummy variables for Medicare Advantage and Medicaid Managed Care only, and we find a strong positive effect for firms participating in Medicare Advantage and a negative effect on firms involved with Medicaid managed care. Column (2) adds dummy variables for the financial sector and whether the firm is in the SPISP, showing that the results are not due to the Medicare Advantage and Medicaid Managed Care variables serving as a proxies for firm size. The third and fourth columns repeat the regressions from the first two columns, adding the Medicaid dummy variable. Here we find that the effect on Medicare Advantage is positive and the effect on Medicaid overall is negative but not statistically significant. In these specifications, the appropriate test for whether there is an impact on firms participating in Medicare Managed Care is the F-test for the null hypothesis that the sum of coefficients on Medicaid and Medicaid Managed Care is zero.

[46] Similar results hold using definitions based on lists of top firms serving Medicare Advantage (Kaiser Family Foundation) and Medicaid Managed Care (USAToday).

This hypothesis can be rejected at the 5 percent level of significance for the regressions in both columns (3) and (4).

[Insert Table 3 About Here]

As a second test of this hypothesis, for each of the firms in the Managed Care subsector we gathered data from the firm's 2009 annual reports and/or 10k filings on the number of members in their Medicare Advantage, Medicaid and commercial insurance segments (measured in thousands) and the amount of revenue received (measured in millions of dollars) from each of these sources.[47]

Table 4 presents results of regressions of firms' CARs on these variables. Columns 1 and 2 demonstrate a positive relationship between a firm's Medicare Advantage membership and its CAR, and a negative relationship between Medicaid membership and CAR, once again confirming ex ante expectations that Health Reform would benefit firms with significant Medicare Advantage business less and benefit firms with significant Medicaid business more. The inclusion in column 2 of a dummy variable for whether the firm is in the SPISP changes the results only slightly, ruling out the possibility that the observed effects arise due to Medicare Advantage or Medicaid involvement serving as a proxy for being in the SPISP, which we know to be positively related to CAR. Columns 3 and 4 show results for regressions of CAR on revenue from the various sectors and demonstrate a similar pattern.

In addition to confirming our ex ante expectations regarding the relationship between Health Reform and participation in Medicare Advantage and Medicaid Managed Care, the results of Table 4 also demonstrate that not only do equity markets react to political events, but that they do so in a rather sophisticated way. Even among health insurers, we find that market returns reflect the firms' heterogeneity with respect to participation in these two programs.

[Insert Table 4 About Here]

[47] Of the 17 firms in the Managed Care subsector, one (America Services Group, ASGR) provides healthcare services to prisons and is not involved in either program. Magellan Health Services (MGLN), provided revenue data but not enrollment data, while UnitedHealth (UNH) and WellPoint (WLP) provided enrollment data but not revenue data by sector. This resulted in 15 observations with complete membership information and 14 observations with complete revenue information.

VI. Robustness and Issues in Interpretation

As discussed above, the interpretation of our results as saying that markets viewed Health Reform as being harmful to the healthcare sector overall and to health insurance companies in particular depends on a number of assumptions. In this section we consider three that have not yet been addressed: that Brown's election actually decreased the likelihood of Health Reform being enacted, that Brown's election affected the likelihood of reform but not the nature of the bill that would be passed (if any), and that Brown's election did not affect the extent or likelihood of other policy changes along dimensions that have not been or cannot be controlled for.

We begin with the question of whether Scott Brown's election actually reduced the likelihood of Health Reform being enacted. While this seems likely, it is by no means obvious. As the same time that Scott Brown's election was taking place, pundits and policymakers were discussing how Health Reform might be passed even if Scott Brown won the election. These mechanisms included both the budget reconciliation process and the House passing the Senate's version of the bill. Thus, while losing the 60th Senator reduced the likelihood of Health Reform passing, increasing knowledge of alternative roads to passage would increase the perceived likelihood of Health Reform passing. Further, to the extent that the inability to pass compromise legislation through the Senate might have focused the Democrats' attention on use of the reconciliation process, this might also have increased the likelihood of passage. Depending on the relative strength of these forces it is possible, at least in principle, that Brown's election coincided with an increase in the market's perceived likelihood of Health Reform. In this case, the interpretation that the positive abnormal return to health insurers implies that markets believed Health Reform to be harmful to their interests would be reversed.

The treatment of the election in the press supports our interpretation. As discussed earlier, news reports in the days before and after the election suggest that Brown's election did, in fact, decrease the likelihood of reform. We were unable to locate sources that supported the opposite view. In addition, both Democrats and Republicans were publicly discussing the potential role of the budget reconciliation process in passing health reform as far back as March,

2009. [48] Consequently, the election itself probably did not provide new information on this point, especially to industry analysts and others most interested in the healthcare sector. Nevertheless, in the days immediately following the election the Democrats publicly announced that they were unwilling to pursue these alternate routes to passage. Thus the press coverage of the election and its aftermath provides no evidence that the election clarified the route forward for the Democrats and increased the likelihood of passage by focusing their attention on the reconciliation process.

A second approach to the question of whether Brown's election increased or decreased the likelihood of passing Health Reform exploits the fact that Health Reform's expected impact on some healthcare sub-sectors was unambiguous. As discussed above, if Brown's election decreased the likelihood of Health Reform passing, we expect Brown's election to have a negative impact on the Facilities (hospitals) subsector and a positive effect on the Equipment (devices) subsector. The results in Table 1 confirm these expectations. Similarly, if Brown's election decreased the likelihood of Health Reform passing, we expect that Brown's election would be better for firms with significant Medicare Advantage involvement and worse for firms with significant Medicaid involvement. The results presented in Tables 3 and 4 confirm these expectations.

A final approach to this issue relies on the idea that when the bill finally was finally signed into law on March 23, 2010, the market should have assessed its probability of passage as equal to one. If Brown's election decreased the market's perception of the likelihood of passage as we contend, then we should observe a reversal in our results in the period between the end of our event window and final passage (since the probability of passage first decreased during the event window and then increased during the "post" period). On the other hand, if the election increased the market's perception of the likelihood of passage, then the results for the post event window should be the same in sign as those for the event window (since the perceived likelihood of passage increased in both periods).

Analysis of the post period is complicated by the fact that the amount of random noise in firms' returns will increase as the length of the window increases, as will the likelihood of confounding events. Taking these concerns as given, examination of the post event window

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[48] See http://in.reuters.com/article/2009/03/14/usa-congress-healthcare-idINN1338614720090314 and http://www.boston.com/bostonglobe/editorial_opinion/editorials/articles/2009/03/15/next_stop_health_reform/.

(Jan. 22 – March 23) exhibits clear signs of a reversal, supporting our contention that the election decreased the likelihood of passage. Focusing on the value-weighted regressions, we observe a return of *negative* 4.8 percent for the Managed Care sector and *positive* 4.5 percent for the facilities subsector, significant at the 1 percent and 10 percent levels, respectively. Although not statistically significant at conventional levels, we also observe reversals in the signs of the coefficient for healthcare overall as well as those of the Pharmaceutical, Facilities and Equipment subsectors, all of which support our contention that the election decreased the market's perception of the likelihood of reform.[49]

A next question that arises with respect to the interpretation of our results is whether, as we have assumed, the principle impact of Scott Brown's election was to reduce the likelihood of Health Reform being enacted into law, or whether the election also impacted beliefs about the *nature* of the bill that would be enacted. If the latter were important, this could affect the interpretation of our results. For example, suppose that the election did not affect the likelihood of a bill being enacted at all, but rather resulted in markets believing that a much more pro-business bill would be enacted. In this case, the positive abnormal returns to health care stocks that we observe would result from the change in the nature of the bill. Consequently, it would not tell us anything about whether the parts of the bill that remained unchanged by the election (which were by far the majority) were good or bad for healthcare stocks.

Although this is theoretically plausible, we begin by noting that a general pro-business shift in policy would be unable to account for the negative impacts we find on the facilities subsector and on firms' participation in Medicaid Managed Care.[50] More broadly, however, it is unlikely that the election caused a major change in perceptions about the nature of the bill that would eventually be passed. While the House passing the Senate's version of the bill or use of the reconciliation process, which allowed only limited changes to be made to the Senate's bill, would result in final legislation that closely resembled the Senate's proposal, at the time of the election it was already widely expected that the House-Senate compromise would lean heavily toward the Senate's version due to the narrow margin by which the reform bill passed the Senate and the fact that the House's proposal was both more expensive and more ambitious than the

[49] We thank an anonymous reviewer for suggesting this approach. Full results for the post period are presented in Appendix Tables A2 and A2a and Appendix Figure A1.

[50] The finding that the election had a negative impact on some subgroups also casts doubt upon another, similar criticism, which argues that the positive abnormal return associated with the election was simply due to a reduction in uncertainty about future regulation.

Senate's. Thus, while Brown's election probably moved the expected final bill from one that was a lot like the Senate bill to one that was almost exactly the Senate bill, this change seems small relative to the difference between having either of the two bills and having no bill at all.[51] Nevertheless, we are unable to completely rule out the possibility that some of the abnormal return to healthcare stocks observed during the event period was due to changes in the nature of the bill, rather than changes in the likelihood of its passage.

Next, we turn to the question of whether Scott Brown's election might have affected other policies that also affected healthcare stocks. While Scott Brown's election came in the middle of the healthcare debate and he had explicitly vowed during the campaign to block the legislation, Brown also broke the Democrats' 60-vote filibuster-proof majority more generally, which could be expected to affect other legislation pending before the Senate and move legislative outcomes in the near future in a more Republican-friendly direction. One such policy change is the increase in the tax rate on dividends set to occur with the expiration at the end of 2010 of the Bush-era tax cuts. A second possible change under discussion was labor reform via the Employee Free Choice Act (EFCA), a piece of pro-labor legislation intended to make it easier for employees to unionize. A final major policy initiative under discussion at the time was the Dodd-Frank financial-sector reform bill that had already been passed by the House and was being actively discussed in the Senate. While our three-factor model controls for market-level risk factors, if the healthcare sector systematically differs from the rest of the market in terms of its exposure to these other policy changes, then the abnormal return we measure in our event study might be attributable to these other policies rather than health care reform.

Although these policies are potentially important, there is a crucial difference between them and Health Reform. While Scott Brown was explicitly the marginal vote needed to pass health reform, the potential for Brown to make a major impact in these other cases was not as clear. On labor reform, while at the start of 2010 there was still some chance of a labor reform bill being passed, the EFCA proposal had already been significantly weakened, and serious doubts remained about whether there were 60 votes in support of *any* version of the labor bill.[52]

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[51] For example, while the House bill was expected to reduce uninsurance by 37 million people by 2019, even the Senate's version was expected to reduce uninsurance by 31 million. Other provisions where the two bills differ, such as federal funding for abortion services, were dimensions that seem unlikely to have a major impact on healthcare equities. http://www.washingtonpost.com/wp-srv/special/nation/compare-health-plans-2009/.

[52] http://www.nytimes.com/2009/09/05/business/05labor.html

In the case of dividend tax reform, current law, which was favored by the Democrat majority, had the dividend tax rate increasing at the end of 2010. Since Brown presumably favored lower dividend tax rates, he represented a 41st vote on the Republican side of the issue, far short of the 60 votes that would be needed to change current law and extend the dividend tax cut. Finally, in the case of the Dodd-Frank financial-sector reform bill, Brown's position was far more moderate, and in the end he was one of three Republican Senators who voted in favor of Dodd-Frank, although he did likely affect the final bill by gaining concessions for Massachusetts-based mutual fund companies in exchange for his support.

In Appendix B, we add controls for exposure to labor reform, dividend tax reform and financial sector reform to our basic analysis. Doing so changes the main coefficients of interest only slightly.

A final criticism of our interpretation of the results along these same lines is that not only did Brown's election deal a severe blow to Health Reform, it also might have signaled that additional regulations aimed at the health care sector would become less likely in the future. Although our analysis is unable to separately identify these effects, if we interpret the Health Reform as containing not only the original legislation but also the additional regulations that would follow from it in the future, then both of these types of effects would be included in the broader definition of Health Reform.

VII. Conclusion

This paper demonstrates a strong link between Scott Brown's victory and positive abnormal returns for firms in the healthcare sector, and in the health insurance and pharmaceutical sub-sectors in particular. Given that Brown campaigned explicitly to defeat Health Reform and by virtue of being the 41st Republican vote had the power to do so, we have interpreted the evidence as saying that markets expected the reform effort to be harmful to healthcare firms overall and to insurers, pharmaceutical firms and medical device manufacturers in particular, but beneficial to hospitals.

While we have focused on using equity markets to shed light on whether Health Reform was expected to benefit or harm the healthcare sector, this study also contributes to the literature

on the link between political events and stock market returns. We find that not only did stock markets react to Brown's election, but they did so in a rather nuanced way, with the impact varying by subsector (e.g., facilities vs. equipment) and by involvement in particular government programs (e.g., Medicare Advantage vs. Medicaid Managed Care). Thus the findings of this paper extend the existing literature on the connection between political events and equity markets by showing that markets are able to differentiate among firms even within a particular sector (e.g., healthcare) and even among individual insurance firms that differ in their exposure to government programs.

We began this article by referencing the debate over whether Health Reform was a dream or a nightmare for private insurers. Our results suggest that the markets sided with those who view Health Reform as harmful to the insurance industry. However, it should be pointed out that the positive abnormal returns associated with Brown's election do not necessarily invalidate the claims from the left that the bills were too generous to insurance companies, since it is likely that the two sides were referring to different counterfactuals in their statements. In particular, many liberal activists believe strongly that the right health care system is a single payer system such as the Canadian system or else a "Medicare-for-all" type system. Relative to this benchmark, the current bills were certainly more generous to insurance companies than a single-payer system was likely to be.

A related issue arises in the interpretation of our finding that Health Reform was expected to harm pharmaceutical firms. During the summer of 2009, the country's major pharmaceutical firms entered into a much-publicized agreement whereby they would support Health Reform and contribute $80 billion over a decade to reduce the cost of prescription drugs for senior citizens, particularly for those in the Medicare Part D "doughnut hole" between $2,000 and $6,154 per year who are expected to pay the full cost of their drugs. Thus it might appear from our results showing that Health Reform harmed drug companies that drug companies made a bad deal. However, this interpretation is complicated by the changing landscape of health reform. At the time the drug companies entered into the deal, they were faced with the threat of even stronger action and the possibility, for example, that Medicare would take a direct role in negotiating drug prices. Relative to that, the drug companies' decision to strike a deal made sense. On the other hand, by the time of the Brown election it was clear that if Health Reform failed, it was unlikely to be replaced by another significant piece of legislation in the near future. Thus, following

Brown's election, drug companies and their owners were expecting to get out of paying $80 billion over the next decade and return to a world without significant additional regulation. Seen in this light, it is not surprising that we observe pharmaceutical firms benefitting from Brown's election.

Finally, it is important to note that the focus of this paper has been on equity-price responses to changes in the likelihood of Health Reform. To the extent that changes in equity-prices capture changes in producer surplus, the analysis in this paper provides an early view of part of the impact of Health Reform on overall welfare.[53] Although Health Reform may be expected to reduce producer surplus, it has the potential to increase consumer welfare through expanding coverage, increasing quality and lowering cost in the long run. However, since the provisions of the bill will only be phased in over the next several years, it may be a decade or more before this impact can be measured and an overall welfare assessment can be developed. Nevertheless, our findings of significant but moderate effects of Health Reform on the healthcare industry suggest that overall expectations of Health Reform are that it is not likely to bring about catastrophic consequences such as ending private insurance, driving hospitals out of business or crushing pharmaceutical innovation.

[53] However, it must also be recognized that publicly-traded firms are only a part of the overall industry. A full welfare analysis would also need to take into account other for-profit firms, non-profit firms, and government providers.

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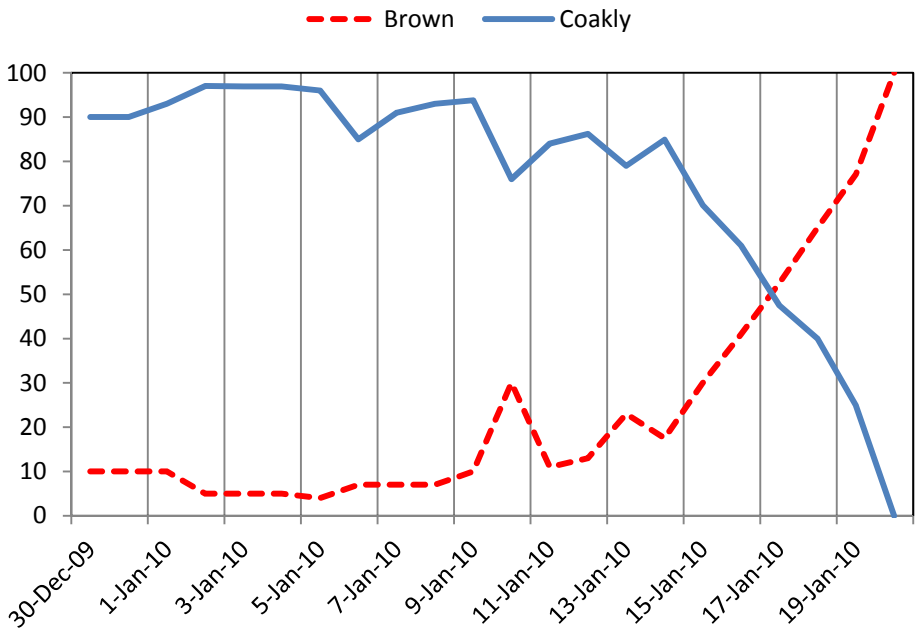

FIGURE 1: INTRADE.COM DAILY CLOSING PRICES FOR THE "BROWN VICTORY" AND "COAKLEY VICTORY" CONTRACTS.

*Note*s: Each of the contracts paid $100 if the named candidate won.

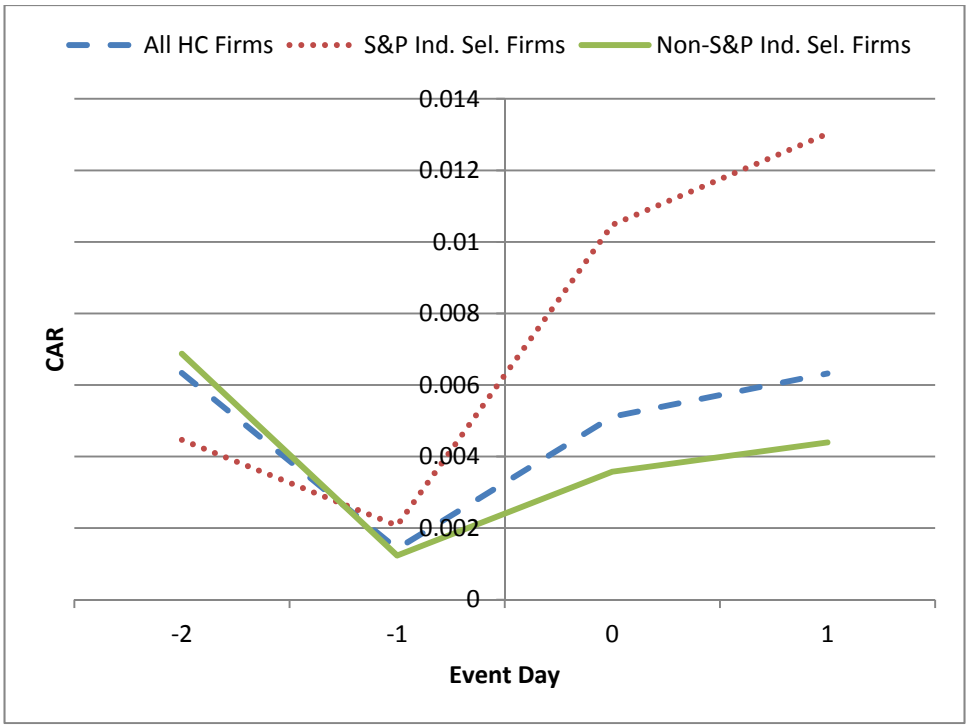

FIGURE 2: CUMULATIVE ABNORMAL RETURN (EQUALLY WEIGHTED) BY EVENT DAY FOR ALL HEALTHCARE FIRMS, HEALTHCARE FIRMS IN THE SPISP, AND HEALTHCARE FIRMS NOT IN THE SPISP.

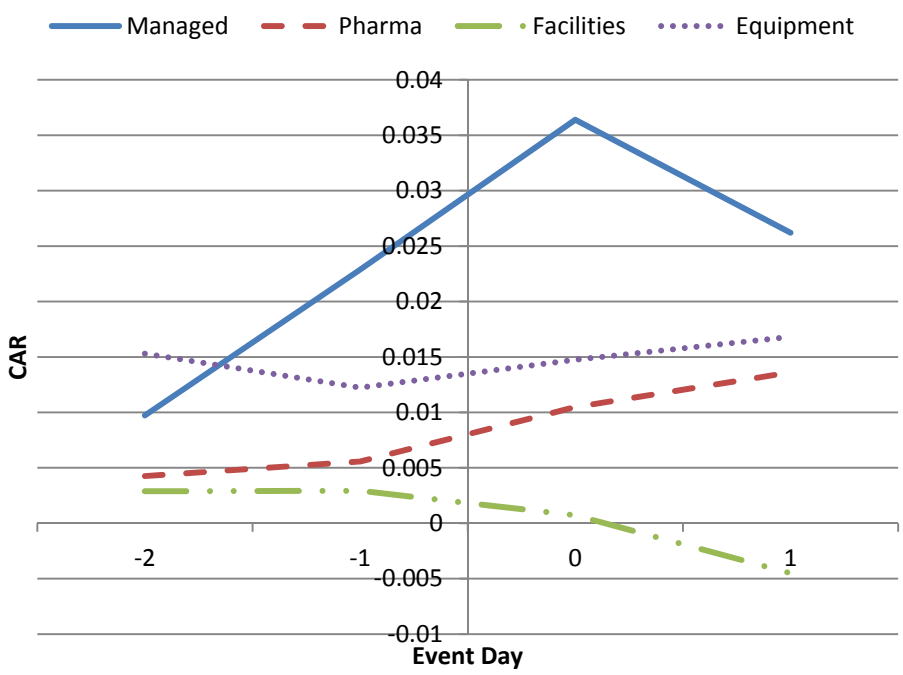

FIGURE 3: CUMULATIVE ABNORMAL RETURN (EQUALLY WEIGHTED) BY EVENT DAY FOR FIRMS IN THE SPISP EQUIPMENT, FACILITIES, MANAGED CARE AND PHARMACEUTICALS SUBSECTORS.

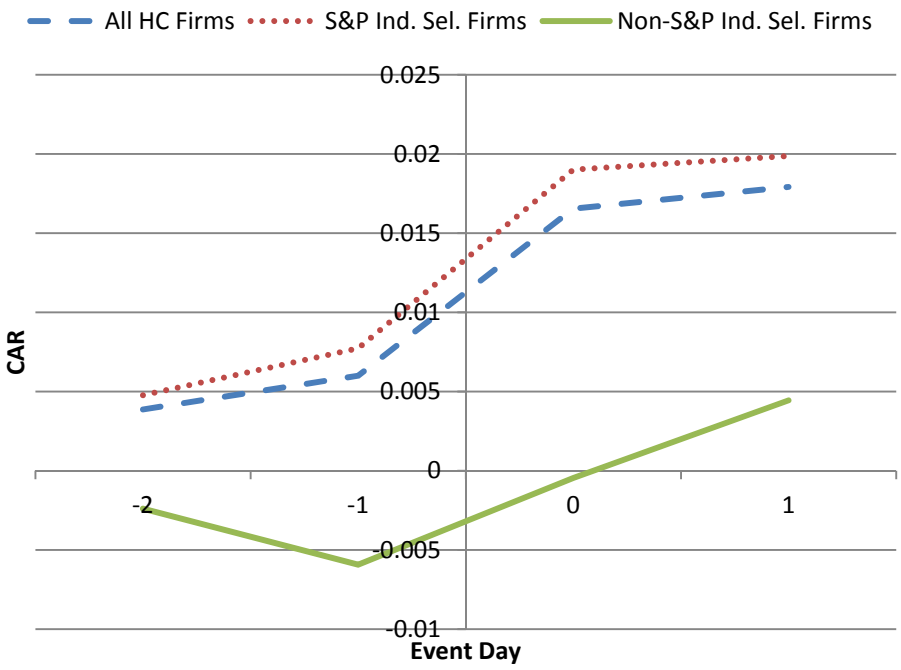

FIGURE 4: CUMULATIVE ABNORMAL RETURN (WEIGHTED BY MARKET CAPITALIZATION) BY EVENT DAY FOR ALL HEALTHCARE FIRMS, HEALTHCARE FIRMS IN THE SPISP, AND HEALTHCARE FIRMS NOT IN THE SPISP.

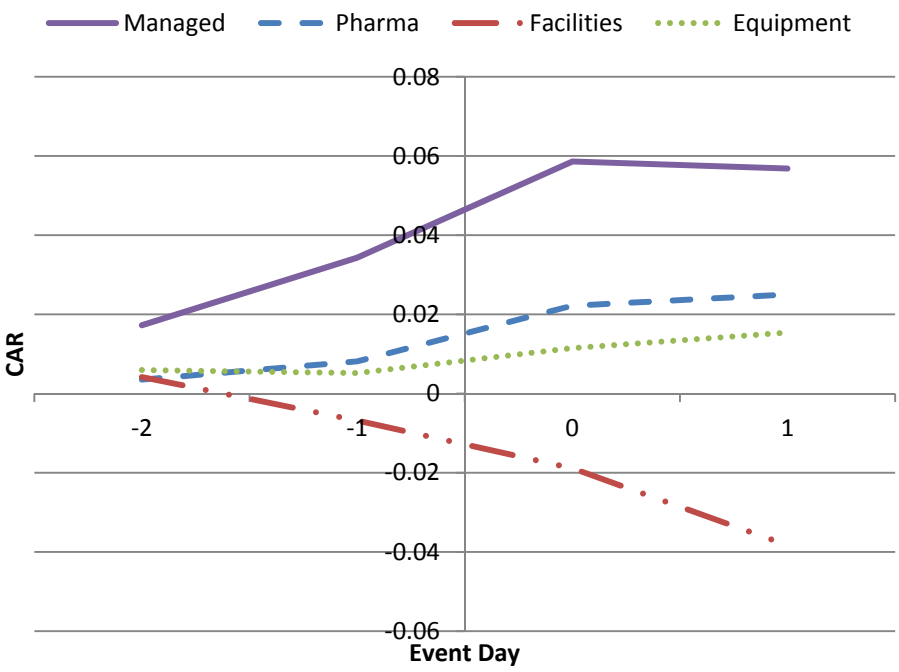

FIGURE 5: CUMULATIVE ABNORMAL RETURN (WEIGHTED BY MARKET CAPITALIZATION) BY EVENT DAY FOR FIRMS IN THE SPISP EQUIPMENT, FACILITIES, MANAGED CARE AND PHARMACEUTICALS SUBSECTORS. ELECTION DAY IS DAY 0.

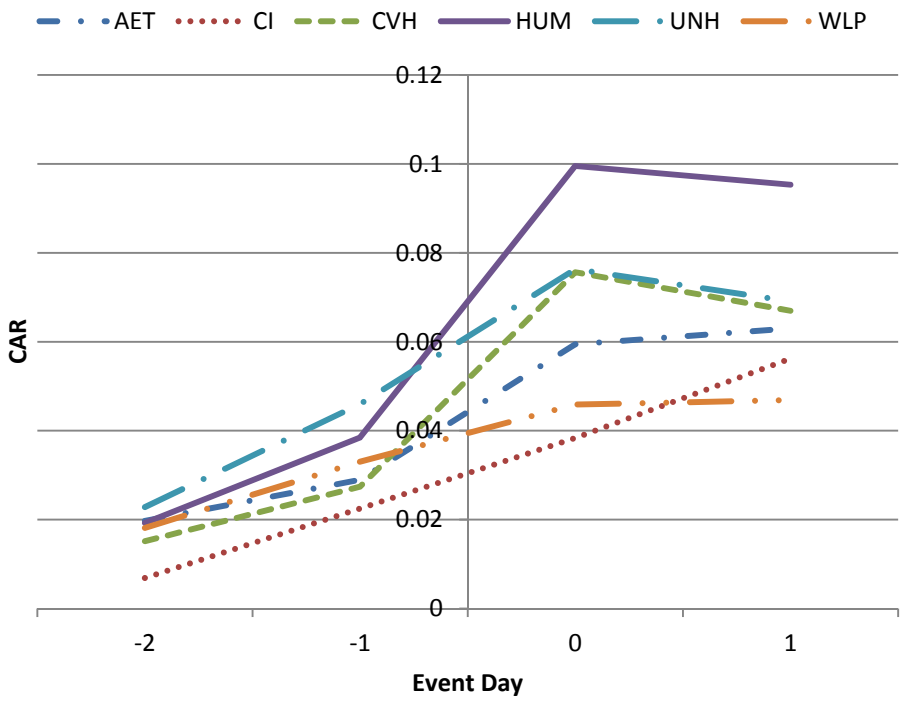

FIGURE 6: CUMULATIVE ABNORMAL RETURN BY EVENT DAY FOR MAJOR MANAGED CARE FIRMS AETNA (AET), HUMANA (HUM), CIGNA (CI), WELLPOINT (WLP), UNITED HEALTHCARE (UNH) AND COVENTRY (CVH). ELECTION DAY IS DAY 0.

TABLE 1: MAIN RESULTS

	CAR - Equally Weighted Regressions			CAR - Value Weighted Regressions		
	(1)	(2)	(3)	(4)	(5)	(6)
Healthcare	0.0065**			0.0208***		
	(0.0031)			(0.0039)		
Healthcare, SPISP		0.0132***			0.0227***	
		(0.0040)			(0.0042)	
Healthcare, not SPISP		0.0046			0.0073	
		(0.0038)			(0.0065)	
Healthcare Subsectors: Managed Care			0.0264**			0.0597***
			(0.0124)			(0.0062)
Pharmaceuticals			0.0138			0.0279***
			(0.0093)			(0.0077)
Facilities			-0.0043			-0.0354***
			(0.0091)			(0.0124)
Equipment			0.0170***			0.0183***
			(0.0061)			(0.0040)
Distributors			0.0065			0.0117*
			(0.0101)			(0.0061)
Supplies			0.0085			0.0079**
			(0.0077)			(0.0035)
Services			0.0091			0.0041
			(0.0070)			(0.0050)
Technology			0.0238			-0.0035
			(0.0220)			(0.0047)
Biotechnology			-0.0064			0.0163***
			(0.0061)			(0.0035)
Life Sci. Tools & Serv.			0.0059			-0.0111
			(0.0106)			(0.0096)
Financial Sector	0.0258***	0.0258***	0.0258***	0.0115***	0.0115***	0.0115***
	(0.0041)	(0.0041)	(0.0041)	(0.0034)	(0.0034)	(0.0034)
Constant	-0.0002	-0.0002	-0.0002	-0.0029**	-0.0023**	-0.0029**
	(0.0012)	(0.0012)	(0.0012)	(0.0014)	(0.0014)	(0.0014)
Observations	3,673	3,673	3,673	3,673	3,673	3,673
R-squared	0.020	0.020	0.022	0.077	0.082	0.124

Notes: Columns 1 – 3 each report estimates from equally weighted OLS regressions of the firms' CARs on the variables listed in the rows. Columns 4 – 6 each report estimates from OLS regressions weighted by the firms' market capitalization. Healthcare is an indicator variable for firms classified in two-digit GICS code 35, "Healthcare". Healthcare SPISP and Healthcare non-SPISP are indicator variables that further divide firms in to whether or not they are constituents of one of four S&P Industry Select Portfolios (Health Care Equipment, Health Care Services, Pharmaceuticals, or Biotechnology). The variables labeled "Healthcare Subsectors" further divide all healthcare firms into subsectors based on seven digit GICS codes. Financial Sector is an indicator variable for whether the firm is in the financial sector. Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1.

TABLE 1A: MAIN RESULTS (CONTINUED)

		CAR - Equally Weighted (1)	CAR - Value Weighted (2)
SPISP	Managed Care	0.0665***	0.0656***
		(0.0062)	(0.0058)
	Pharmaceuticals	0.0321***	0.0284***
		(0.0072)	(0.0079)
	Facilities	-0.0333**	-0.0473***
		(0.0153)	(0.0155)
	Equipment	0.0181***	0.0150***
		(0.0044)	(0.0034)
	Distributors	0.0055	0.0126*
		(0.0068)	(0.0066)
	Supplies	0.0101**	0.0094**
		(0.0045)	(0.0038)
	Services	0.00436	0.0023
		(0.0168)	(0.0051)
	Biotechnology	0.00729	0.0169***
		(0.0074)	(0.0036)
	Life Sci. Tools & Serv.	0.0009	0.0066
		(0.0073)	(0.0061)
Non-SPISP	Managed Care	0.00457	0.0059
		(0.0152)	(0.0162)
	Pharmaceuticals	0.0051	0.0097
		(0.0131)	(0.0095)
	Facilities	0.0083	-0.0068
		(0.0102)	(0.0087)
	Equipment	0.0167**	0.0336***
		(0.0076)	(0.0062)
	Distributors	0.00714	0.0025
		(0.0158)	(0.0069)
	Supplies	0.0078	0.0020
		(0.0106)	(0.0088)
	Services	0.0109	0.0201***
		(0.0071)	(0.0075)
	Technology	-0.0091	0.0123
		(0.0071)	(0.0089)
	Biotechnology	0.0238	-0.0035
		(0.0220)	(0.0047)
	Life Sci. Tools & Serv.	0.0064	-0.0258***
		(0.0117)	(0.0089)
	Financial Sector	0.0258***	0.0115***
		(0.0041)	(0.0034)
	Constant	-0.0002	-0.0029**
		(0.0012)	(0.0014)
	Observations	3,673	3,673
	R-squared	0.024	0.134

Note: Column 1 reports estimates from equally weighted OLS regressions of the firms' CARs on the variables listed in the rows. Columns 2 reports estimates from OLS regressions weighted by the firms' market capitalization. The variables labeled "SPISP" are indicator variables that divide all healthcare firms into subsectors based on seven digit GICS codes and whether they are in one of four S&P Industry Select Portfolios (Health Care Equipment, Health Care Services, Pharmaceuticals, or Biotechnology). The variables labeled Non-SPISP are indicator variables that divide firms based on subsector for firms that are not in one of the SPISP portfolios. Financial Sector is an indicator variable for whether the firm is in the financial sector. Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

TABLE 2: INDIVIDUAL MANAGED-CARE FIRMS

Firm	CAR	p-value
Aetna	0.0630	0.024
Cigna	0.0562	0.033
Coventry Health	0.0670	0.020
Humana	0.0953	0.005
United Healthcare	0.0691	0.019
Wellpoint	0.0469	0.049

Note: This table gives the CAR over the event window for each of the six Managed Care firms that are also in one of the S&P Industry Select healthcare portfolios. The p-value is the probability that a CAR drawn from the distribution of CARs for all non-healthcare, non-financial, S&P 500 firms is greater than or equal to the firm's CAR.

TABLE 3: IMPACT OF GOVERNMENT PROGRAMS

	CAR – Equally Weighted			
	(1)	(2)	(3)	(4)
Medicare Advantage	0.0426***	0.0436***	0.0524***	0.0526***
	(0.0076)	(0.0075)	(0.0123)	(0.0124)
Medicaid Managed Care	-0.0707**	-0.0650**	-0.0550	-0.0501
	(0.0289)	(0.0290)	(0.0340)	(0.0339)
Medicaid			-0.0190	-0.0179
			(0.0195)	(0.0193)
Financial Sector		0.0252***		0.0252***
		(0.0041)		(0.0041)
SPISP		0.0111***		0.0115***
		(0.0039)		(0.0038)
Constant	0.0065***	0.00045	0.0065***	0.00047
	(0.0013)	(0.0011)	(0.0013)	(0.0011)
Observations	3,673	3,673	3,673	3,673
R-squared	0.001	0.021	0.001	0.021

Note: Columns 1 through 4 report estimates for equally weighted regressions of the firms' CAR on the variables listed in the rows. "Medicare Advantage," "Medicare" and "Medicare Managed Care" are indicator variables for whether the firm description on google finance contains each of these terms. Financial Sector and SPISP are indicators for whether the firm is in the financial sector or in one of the S&P Industry Select Portfolios for healthcare. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

TABLE 4: IMPACT OF GOVERNMENT PROGRAM MEMBERSHIP AND REVENUE

	CAR – Equally Weighted			
	(1)	(2)	(3)	(4)
MA Members	5.08e-05***	5.16e-05**		
	(1.34e-05)	(1.65e-05)		
Medicaid Members	-4.95e-05***	-5.00e-05***		
	(1.21e-05)	(1.41e-05)		
Comm. Members	3.15e-06**	3.28e-06**		
	(1.25e-06)	(1.43e-06)		
MA Revenue			4.45e-06***	3.96e-06**
			(1.13e-06)	(1.27e-06)
Medicaid Revenue			-2.25e-05***	-2.23e-05***
			(5.60e-06)	(6.03e-06)
Comm. Revenue			7.27e-07	1.18e-07
			(5.70e-07)	(7.28e-07)
SPISP		-0.0027		0.0134
		(0.0217)		(0.0144)
Constant	0.0434***	0.0441***	0.0435***	0.0430***
	(0.0086)	(0.0105)	(0.0113)	(0.0122)
Observations	15	15	14	14
R-squared	0.717	0.718	0.760	0.764

Notes: Columns 1 and 2 report the results of regressions of each firm's CAR on the number of members in its Medicare Advantage (MA), Medicaid, and Commercial segments (measured in thousands). SPIS is an indicator variable for whether the firm is in one of the S&P Industry Select Portfolios. Columns 3 and 4 report the results of regressions of each firm's CAR on the revenue earned in its Medicare Advantage (MA), Medicaid, and Commercial segments (measured in millions of dollars). Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Online Appendix
What Does Health Reform Mean for the Healthcare Industry? Evidence from the Massachusetts Special Senate Election.

BY Mohamad M. Al-Ississ and Nolan H. Miller

Appendix A: Extended Event Window and Post Period Analysis

This Appendix contains tables supporting the analysis for the extended event window. Tables A1 and A1a present results for the extended event window, January 14, 2010 – January 28, 2010. Tables A2 and A2a present results for the "post period" event window, January 21, 2010 – March 23, 2010.

TABLE A1: MAIN RESULTS FOR THE EXTENDED EVENT WINDOW (JAN 14, 2010 – JAN. 28, 2010)

		CAR - Equally Weighted Regressions			CAR - Value Weighted Regressions		
		(1)	(2)	(3)	(4)	(5)	(6)
	VARIABLES	CAR	CAR	CAR	CAR	CAR	CAR
	Healthcare	-0.0114**			0.0177***		
		(0.0047)			(0.0049)		
	Healthcare, SPISP		0.0107**			0.0203***	
			(0.0054)			(0.0054)	
	Healthcare, not SPISP		-0.0178***			-0.0006	
			(0.0057)			(0.0090)	
	Managed Care			0.0106			0.0514***
				(0.0124)			(0.0137)
	Pharmaceuticals			0.0051			0.0150***
				(0.0174)			(0.0038)
	Facilities			-0.0154			-0.0502***
				(0.0116)			(0.0135)
Healthcare Subsectors	Equipment			0.0036			0.0167
				(0.0078)			(0.0109)
	Distributors			-0.0156			0.0238*
				(0.0120)			(0.0141)
	Supplies			-0.0176			-0.0215**
				(0.0125)			(0.0098)
	Services			-0.0198**			-0.0100**
				(0.0089)			(0.0048)
	Technology			0.0013			-0.0533***
				(0.0330)			(0.0088)
	Biotechnology			-0.0281***			0.0444***
				(0.0094)			(0.0108)
	Life Sci. Tools & Serv.			-0.0100			-0.0045
				(0.0143)			(0.0064)
	Financial Sector	0.0524***	0.0524***	0.0524***	0.0406***	0.0406***	0.0406***
		(0.0049)	(0.0049)	(0.0049)	(0.00809)	(0.0081)	(0.0081)
	Constant	0.0016	0.0016	0.0016	-0.00441*	-0.0044*	-0.0044*
		(0.0017)	(0.0017)	(0.0018)	(0.00245)	(0.0025)	(0.0025)
	Observations	3,672	3,672	3,672	3,672	3,672	3,672
	R-squared	0.052	0.054	0.055	0.097	0.100	0.120

Notes: Columns 1 – 3 each report estimates from equally weighted OLS regressions of the firms' CARs on the variables listed in the rows. Columns 4 – 6 each report estimates from OLS regressions weighted by the firms' market capitalization. Healthcare is an indicator variable for firms classified in two-digit GICS code 35, "Healthcare". Healthcare SPISP and Healthcare non-SPISP are indicator variables that further divide firms in to whether or not they are constituents of one of four S&P Industry Select Portfolios (Health Care Equipment, Health Care Services, Pharmaceuticals, or Biotechnology). The variables labeled "Healthcare Subsectors" further divide all healthcare firms into subsectors based on seven digit GICS codes. Financial Sector is an indicator variable for whether the firm is in the financial sector. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The number of observations is different from those in the original window due to the delisting of firms during this extended event window.

Table A1a: Main Results for the Extended Event Window (Jan. 14, 2010 – Jan. 28, 2010, continued)

		CAR – Equally Weighted	CAR – Value Weighted
		(1)	(2)
SPISP	Managed Care	0.0421***	0.0583***
		(0.0127)	(0.0136)
	Pharmaceuticals	0.0206*	0.0155***
		(0.0108)	(0.0038)
	Facilities	-0.0628***	-0.0708***
		(0.0144)	(0.0142)
	Equipment	0.0218**	0.0130
		(0.0098)	(0.0119)
	Distributors	0.0132	0.0276*
		(0.0158)	(0.0152)
	Supplies	-0.0164	-0.0172
		(0.0150)	(0.0118)
	Services	-0.0019	-0.0093*
		(0.0139)	(0.0052)
	Biotechnology	0.0329***	0.0520***
		(0.0116)	(0.0104)
	Life Sci. Tools & Serv.	-0.0145*	-0.0053
		(0.0082)	(0.0071)
Non-SPISP	Managed Care	-0.0066	-0.0108
		(0.0155)	(0.0153)
	Pharmaceuticals	-0.0023	-0.0047
		(0.0252)	(0.0110)
	Facilities	0.0052	-6.21e-05
		(0.0132)	(0.0117)
	Equipment	-0.0016	0.0345***
		(0.0095)	(0.0126)
	Distributors	-0.0336**	-0.0143**
		(0.0133)	(0.0058)
	Supplies	-0.0181	-0.0389***
		(0.0164)	(0.0137)
	Services	-0.0267**	-0.0160*
		(0.0108)	(0.0096)
	Technology	0.00133	-0.0533***
		(0.0331)	(0.0088)
	Biotechnology	-0.0402***	-0.0055
		(0.0106)	(0.0123)
	Life Sci. Tools & Serv.	-0.0096	-0.0037
		(0.0158)	(0.0098)
	Financial Sector	0.0524***	0.0406***
		(0.0049)	(0.0081)
	Constant	0.0016	-0.0044*
		(0.0018)	(0.0025)
	Observations	3,672	3,672
	R-squared	0.059	0.127

Notes: Column 1 reports estimates from equally weighted OLS regressions of the firms' CARs on the variables listed in the rows. Columns 2 reports estimates from OLS regressions weighted by the firms' market capitalization. The variables labeled "SPISP" are indicator variables that divide all healthcare firms into subsectors based on seven digit GICS codes and whether they are in one of four S&P Industry Select Portfolios (Health Care Equipment, Health Care Services, Pharmaceuticals, or Biotechnology). The variables labeled Non-SPISP are indicator variables that divide firms based on subsector for firms that are not in one of the SPISP portfolios. Financial Sector is an indicator variable for whether the firm is in the financial sector. Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. The number of observations is different from those in the original window due to the delisting of firms during this extended event window.

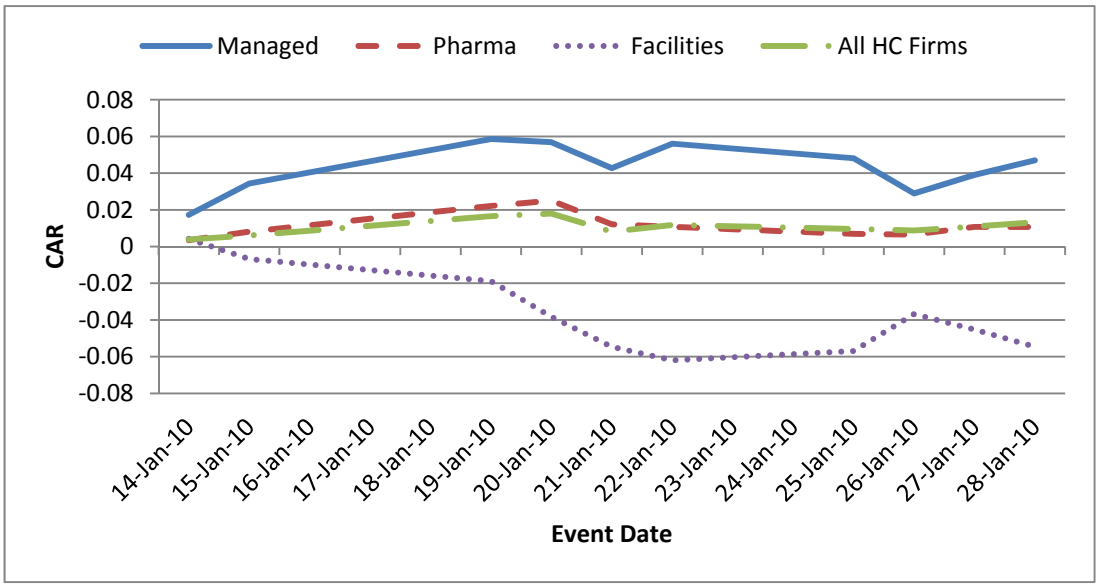

FIGURE A.1: CUMULATIVE ABNORMAL RETURN (WEIGHTED BY MARKET CAPITALIZATION) BY EVENT DAY FOR ALL HC FIRMS IN THE SPISP, AND FOR FIRMS IN THE FACILITIES, MANAGED CARE AND PHARMACEUTICALS SUBSECTORS.

Notes: Event window extending from Jan 14, 2010 till Jan 28, 2010, one day after President Obama's State of the Union address.

TABLE A2: ANALYSIS OF POST PERIOD EVENT WINDOW (JAN 21, 2010 – MAR 23, 2010)

	CAR - Equally Weighted Regressions			CAR - Value Weighted Regressions		
	(1)	(2)	(3)	(4)	(5)	(6)
Healthcare	-0.0020			-0.0093		
	(0.0109)			(0.0150)		
Healthcare, SPISP		0.0184			-0.0079	
		(0.0142)			(0.0170)	
Healthcare, not SPISP		-0.0078			-0.0184*	
		(0.0130)			(0.0108)	
Healthcare Subsectors: Managed Care			-0.0088			-0.0479***
			(0.0283)			(0.0164)
Pharmaceuticals			0.0138			-0.0339
			(0.0459)			(0.0302)
Facilities			0.0603*			0.0448*
			(0.0319)			(0.0229)
Equipment			-0.0063			-0.0107
			(0.0146)			(0.0178)
Distributors			-0.0006			0.0434***
			(0.0314)			(0.0133)
Supplies			-0.0275			-0.0548***
			(0.0276)			(0.0199)
Services			-0.0096			0.0212
			(0.0198)			(0.0255)
Technology			-0.0246			-0.0458**
			(0.0454)			(0.0206)
Biotechnology			-0.0220			0.0269**
			(0.0204)			(0.0120)
Life Sci. Tools & Serv.			0.0420			0.0613
			(0.0355)			(0.0444)
Financial Sector	0.0157**	0.0157**	0.0157**	-0.0271***	-0.0271***	-0.0271***
	(0.0074)	(0.0074)	(0.0074)	(0.0098)	(0.0098)	(0.0098)
Constant	0.0095**	0.0095**	0.0095**	-8.84e-05	-8.84e-05	-8.84e-05
	(0.0043)	(0.0043)	(0.0043)	(0.0047)	(0.0047)	(0.0047)
Observations	3,653	3,653	3,653	3,653	3,653	3,653
R-squared	0.001	0.002	0.003	0.013	0.013	0.029

Notes: Columns 1 – 3 each report estimates from equally weighted OLS regressions of the firms' CARs on the variables listed in the rows. Columns 4 – 6 each report estimates from OLS regressions weighted by the firms' market capitalization. Healthcare is an indicator variable for firms classified in two-digit GICS code 35, "Healthcare". Healthcare SPISP and Healthcare non-SPISP are indicator variables that further divide firms in to whether or not they are constituents of one of four S&P Industry Select Portfolios (Health Care Equipment, Health Care Services, Pharmaceuticals, or Biotechnology). The variables labeled "Healthcare Subsectors" further divide all healthcare firms into subsectors based on seven digit GICS codes. Financial Sector is an indicator variable for whether the firm is in the financial sector. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The number of observations is different from those in the original window due to the delisting of firms during this extended event window.

TABLE A2A: POST PERIOD EVENT WINDOW (JAN. 21, 2010 – MARCH 23, 2010, CONTINUED)

		(1) CAR - Equally Weighted	(2) CAR - Value Weighted
SPISP	Managed Care	-0.0578***	-0.0522***
		(0.0179)	(0.0170)
	Pharmaceuticals	0.0224	-0.0330
		(0.0317)	(0.0311)
	Facilities	0.0447	0.0672***
		(0.0284)	(0.0236)
	Equipment	0.0101	-0.0114
		(0.0231)	(0.0211)
	Distributors	0.0255*	0.0434***
		(0.0152)	(0.0144)
	Supplies	-0.0327	-0.0469**
		(0.0226)	(0.0236)
	Services	0.0252	0.0269
		(0.0208)	(0.0279)
	Biotechnology	0.0090	0.0370***
		(0.0382)	(0.0111)
	Life Sci. Tools & Serv.	0.221	0.117
		(0.153)	(0.108)
Non-SPISP	Managed Care	0.0179	-0.0090
		(0.0403)	(0.0426)
	Pharmaceuticals	0.00965	-0.0693***
		(0.0660)	(0.0262)
	Facilities	0.0671	-0.0093
		(0.0439)	(0.0375)
	Equipment	-0.0109	-0.0070
		(0.0172)	(0.0173)
	Distributors	-0.0170	0.0430**
		(0.0490)	(0.0197)
	Supplies	-0.0254	-0.0869**
		(0.0375)	(0.0375)
	Services	-0.0229	-0.0297
		(0.0256)	(0.0251)
	Technology	-0.0246	-0.0458**
		(0.0454)	(0.0206)
	Biotechnology	-0.0282	-0.0395
		(0.0231)	(0.0393)
	Life Sci. Tools & Serv.	0.0232	0.0146
		(0.0345)	(0.0120)
	Financial Sector	0.0157**	-0.0271***
		(0.0074)	(0.0098)
	Constant	0.0095**	-8.84e-05
		(0.0044)	(0.0047)
	Observations	3,653	3,653
	R-squared	0.005	0.033

Note: Column 1 reports estimates from equally weighted OLS regressions of the firms' CARs on the variables listed in the rows. Columns 2 reports estimates from OLS regressions weighted by the firms' market capitalization. The variables labeled "SPISP" are indicator variables that divide all healthcare firms into subsectors based on seven digit GICS codes and whether they are in one of four S&P Industry Select Portfolios (Health Care Equipment, Health Care Services, Pharmaceuticals, or Biotechnology). The variables labeled Non-SPISP are indicator variables that divide firms based on subsector for firms that are not in one of the SPISP portfolios. Financial Sector is an indicator variable for whether the firm is in the financial sector. Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. The number of observations is different from those in the original window due to the delisting of firms during this extended event window.

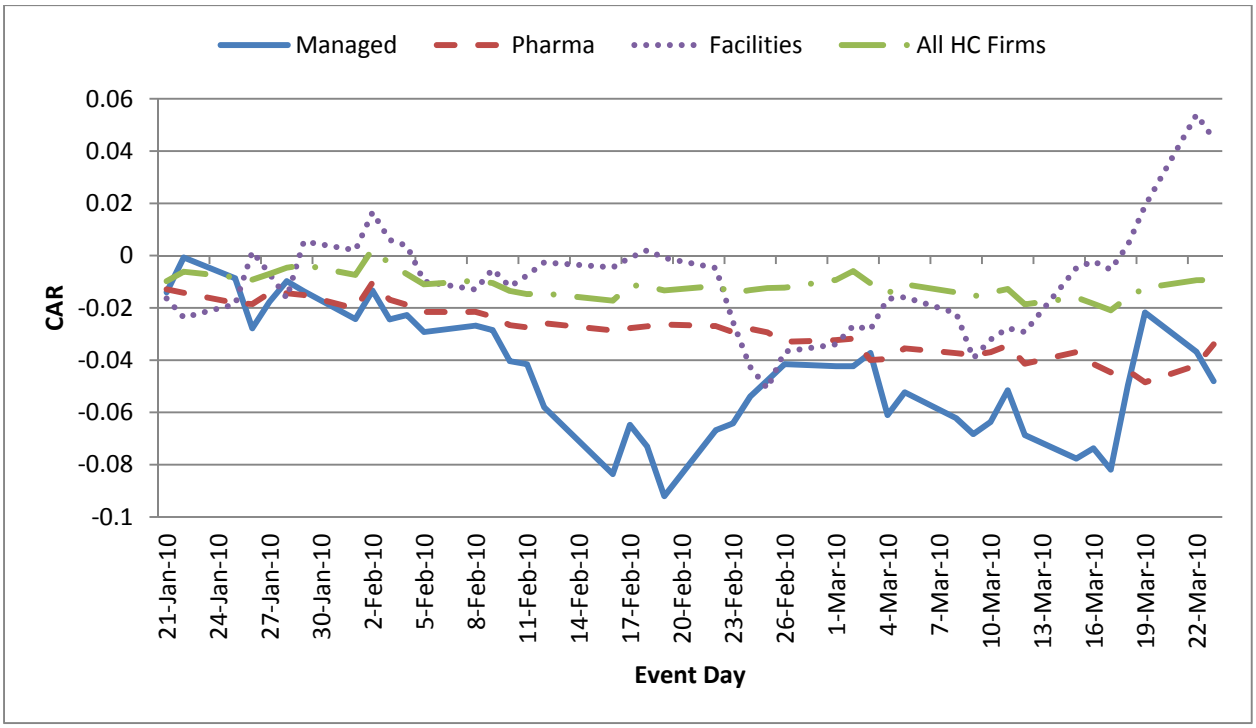

FIGURE A.2: CUMULATIVE ABNORMAL RETURN (WEIGHTED BY MARKET CAPITALIZATION) BY EVENT DAY FOR ALL HC FIRMS IN THE SPISP, AND FOR FIRMS IN THE FACILITIES, MANAGED CARE AND PHARMACEUTICALS SUBSECTORS.

Notes: Event window extending from Jan 21, 2010 till March 23, 2010 when the Health Care law was signed into law.

Appendix B: Robustness to Controlling for Exposure to Other Potential Policy Changes

In this Appendix we describe and present regression results in which we control for firms' exposure to other policy changes whose likelihood may have changed contemporaneously with Scott Brown's election. These policies include labor market reform, dividend tax reform, and financial market reform.

We control for exposure to labor reform and dividend tax reform by including unionization rates and dividend rates as controls in our event study regressions. The dividend data come from the CRSP database and include, for each firm, its 2009 dividend rate. Union membership data is based on the Current Population Survey as compiled in the Union Membership and Coverage Database from the CPS and include 2009 union membership rates for each firm based on its classification into one of 263 different CPS Industry Classification Codes.[54]

Exposure to financial sector reform is somewhat more complicated, as it is less obvious what cross-sectional variables might proxy for exposure to changes in financial-sector regulations. To address this, we re-run the three factor Fama-French model including as a fourth factor the return on a portfolio of financial-sector stocks minus the risk free rate of return according to equation (A1):

$$(B1) \qquad R_{it} - R_{ft} = \alpha_i + \beta_i \left(R_{mt} - R_{ft} \right) + \beta_{si} \cdot SMB_t + \beta_{hi} \cdot HML_t + \beta_{FINi} \left(R_{FINt} - R_{ft} \right) + \varepsilon_{it}.$$

where R_{FINt} is the return on a portfolio of financial-sector stocks. The resulting coefficient on financial sector returns, β_{FINi}, captures the partial correlation between a firm's return and financial sector returns. We then use the firm-level "financial-sector beta" coefficients as independent variables in our regressions aimed at capturing the relationship between the firm's abnormal returns and exposure to the financial sector.[55]

While controlling for the influence of these factors will help address the question of whether the impact of Scott Brown's election on healthcare stocks might have worked through channels other than Health Reform, it will obscure any effects of Health Reform that are correlated with the new control variables. For example, Health Reform included the "Cadillac

[54] The dataset is compiled by Barry Hirsh and David Macpherson and available at www.unionstats.com.

[55] Alternatively, we used the version of the Fama-French model including the performance of the financial-sector portfolio as a fourth factor to predict firms' abnormal returns *net* of exposure to the financial sector. Doing so has very little impact on the overall results.

tax" on high-cost health plans, and such plans are often found in the benefit packages for union employees. Thus, even if the entire impact of the election worked through changes in the likelihood of Health Reform, we would expect that some of the effect would be correlated at the firm (or sector) level with unionization rates. While we will not be able to separately identify effects that work through changes in the likelihood of labor reform and changes that work through changes in the likelihood of health reform but are correlated with unionization, to the extent that our results are robust to including unionization and other controls we can conclude that the effect of the election was not *solely* due to changes in the likelihood of labor reform or other policies.

Tables A1 and A1a replicate the analysis in Tables 1 and 1a adding controls for the firm's 2009 dividend payout rate, (sector-level) unionization rate, and exposure to the financial sector as measured by the firm's "financial beta." Results are similar when we also include the square of each of these control variables. Due to the fact that β_{FINi} might be expected to behave differently for financial-sector firms, we exclude them from the regressions. The results for the impact of the election on healthcare stocks do not change substantially if they are included, although the coefficients on β_{FINi} do change.

Tables 5 and 5a show that the main coefficients of interest change only slightly. We now find a 1.84 percent CAR to dollars invested in the healthcare sector, compared to 2.15 in the regressions without these controls. The returns to dollars invested in Managed Care, Equipment, Facilities and Pharmaceuticals remain statistically significant, with the magnitudes decreasing slightly.

Taking a closer look at the new controls, we find that unionization is significantly and negatively related to firms' CARs during the event window. As discussed above, this could be due to Brown's election leading the market to believe that labor reform was less likely to pass. Since one of the aims of labor reform was to make it easier for firms to unionize, we would expect the benefit of this to be felt most strongly by firms in industries with low unionization rates. Overall, healthcare firms had a mean unionization rate of 3.9 percent, slightly less than the overall rate of 6.7 percent, although as one might expect the hospital sector had a higher unionization rate of 8.8 percent. Thus, roughly speaking, the healthcare sector's lower unionization rate accounts for less than one tenth of one percentage point of the observed abnormal return to healthcare stocks compared to the market overall.

The coefficient on firms' lagged dividend rate is insignificant in all specifications.

The coefficient on financial-betas are positive and significant in most specifications. However, the qualitative impact of financial-sector dependence is small, once again accounting for less than one tenth of one percentage point of the difference between returns to healthcare stocks and returns to the market overall.

TABLE B1: ROBUSTNESS

	CAR - Equally Weighted			CAR - Value Weighted		
	(1)	(2)	(3)	(4)	(5)	(6)
Healthcare	0.00489			0.0178***		
	(0.0032)			(0.00387)		
Healthcare, SPISP		0.0111***			0.0197***	
		(0.0041)			(0.0042)	
Healthcare, not SPISP		0.00310			0.00540	
		(0.0038)			(0.0066)	
Healthcare Subsectors: Managed Care			0.0239*			0.0573***
			(0.0124)			(0.0060)
Pharmaceuticals			0.0118			0.0245***
			(0.0094)			(0.0076)
Facilities			-0.00517			-0.0353***
			(0.0091)			(0.0121)
Equipment			0.0156**			0.0161***
			(0.0061)			(0.0042)
Distributors			0.00579			0.0070
			(0.0104)			(0.0051)
Supplies			0.00657			0.00565
			(0.0078)			(0.0037)
Services			0.00811			0.00252
			(0.0070)			(0.0052)
Technology			0.0222			-0.00624
			(0.0221)			(0.0048)
Biotechnology			-0.00820			0.0141***
			(0.0061)			(0.0037)
Life Sci. Tools & Serv.			0.0036			-0.0142
			(0.0106)			(0.0097)
Dividend	-0.00881	-0.0103	-0.0135	0.0513	0.0431	0.0360
	(0.0450)	(0.0444)	(0.0435)	(0.0488)	(0.0477)	(0.0480)
Unionization	-0.0002*	-0.0002*	-0.0002*	-0.0003***	-0.0003***	-0.0003***
	(9.61e-05)	(9.61e-05)	(9.61e-05)	(0.0001)	(0.0001)	(0.0001)
Financial Beta	0.477*	0.462*	0.474*	0.378	0.369	0.308
	(0.257)	(0.257)	(0.257)	(0.261)	(0.261)	(0.260)
Constant	0.00201	0.00202	0.00203	-0.0004	-0.0003	-0.0003
	(0.0017)	(0.0017)	(0.0017)	(0.0018)	(0.0018)	(0.0018)
Observations	2,845	2,845	2,845	2,845	2,845	2,845
R-squared	0.004	0.005	0.010	0.097	0.101	0.151

Note: Columns 1 – 3 each report estimates from equally weighted OLS regressions of the firms' CARs on the variables listed in the rows. Columns 4 – 6 each report estimates from OLS regressions weighted by the firms' market capitalization. Healthcare is an indicator variable for firms classified in two-digit GICS code 35, "Healthcare". Healthcare SPISP and Healthcare non-SPISP are indicator variables that further divide firms in to whether or not they are constituents of one of four S&P Industry Select Portfolios (Health Care Equipment, Health Care Services, Pharmaceuticals, or Biotechnology). The variables labeled "Healthcare Subsectors" further divide all healthcare firms into subsectors based on seven digit GICS codes. Dividend is the firm's 2009 dividend rate, Unionization is the 2009 proportion of the firm's workers who are union members (measures on a scale form 0 – 100), Financial Beta is the partial correlation between the firm's return and that of a portfolio of financial sector stocks. Financial Sector firms are not included in the regressions. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

TABLE B1A: ROBUSTNESS

		CAR - Equally Weighted (1)	CAR - Value Weighted (2)
SPISP	Managed Care	0.0636***	0.0632***
		(0.00621)	(0.00550)
	Pharmaceuticals	0.0304***	0.0249***
		(0.00726)	(0.00787)
	Facilities	-0.0335**	-0.0465***
		(0.0150)	(0.0152)
	Equipment	0.0163***	0.0127***
		(0.00447)	(0.00362)
	Distributors	0.00483	0.00775
		(0.00794)	(0.00561)
	Supplies	0.00776*	0.00707*
		(0.00456)	(0.00388)
	Services	0.00251	0.000621
		(0.0170)	(0.00535)
	Biotechnology	0.00472	0.0147***
		(0.00752)	(0.00382)
	Life Sci. Tools & Serv.	-0.00642	0.00196
		(0.00575)	(0.00683)
SPISP	Managed Care	0.00237	0.00362
		(0.0154)	(0.0162)
	Pharmaceuticals	0.00300	0.00818
		(0.0132)	(0.00929)
	Facilities	0.00716	-0.00832
		(0.0102)	(0.00898)
	Equipment	0.0154**	0.0317***
		(0.00765)	(0.00614)
	Distributors	0.00654	0.000436
		(0.0161)	(0.00700)
	Supplies	0.00616	-0.000241
		(0.0107)	(0.00881)
	Services	0.0103	0.0189**
		(0.00707)	(0.00771)
	Technology	0.0223	-0.00625
		(0.0222)	(0.00483)
	Biotechnology	-0.0107	0.0104
		(0.00712)	(0.00892)
	Life Sci. Tools & Serv.	0.00472	-0.0277***
		(0.0117)	(0.00910)
	Dividend	-0.0160	0.0341
		(0.0429)	(0.0483)
	Unionization	-0.000177*	-0.000274***
		(9.61e-05)	(0.000103)
	Financial Beta	0.455*	0.311
		(0.257)	(0.261)
	Constant	0.00199	-0.000260
		(0.00174)	(0.00181)
	Observations	2,845	2,845
	R-squared	0.014	0.162

Notes: Columns 1 reports estimates from equally weighted OLS regressions of the firms' CARs on the variables listed in the rows. Columns 2 reports estimates from OLS regressions weighted by the firms' market capitalization. The variables labeled "SPISP" are indicator variables that divide all healthcare firms into subsectors based on seven digit GICS codes and whether they are in one of four S&P Industry Select Portfolios (Health Care Equipment, Health Care Services, Pharmaceuticals, or Biotechnology). The variables labeled Non-SPISP are indicator variables that divide firms based on subsector for firms that are not in one of the SPISP portfolios. Dividend is the firm's 2009 dividend rate, Unionization is the 2009 proportion of the firm's workers who are union members (measures on a scale from 0 – 100), Financial Beta is the partial correlation between the firm's return and that of a portfolio of financial sector stocks. Financial firms are not included in the regressions. Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.