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The Early Impact of the Affordable Care Act, State by State

ABSTRACT In this paper I examine the effects that state policy decisions have had on the early impact of the Affordable Care Act (ACA) using data through the first half of 2014. I focus on the individual health insurance market, which includes plans purchased through exchanges as well as plans purchased directly from insurers. In this market, at least 13.2 million people were covered in the second quarter of 2014, representing an increase of at least 4.2 million beyond pre-ACA state-level trends. I use data on coverage, premiums, and costs and a model developed by Martin Hackmann, Jonathan Kolstad, and myself (forthcoming) to calculate changes in selection and markups, which allow me to estimate the welfare impact of the ACA on participants in the individual health insurance market in each state. I then focus on comparisons across groups of states. The estimates from my model imply that market participants in the five "direct enforcement" states—those that ceded all enforcement of the ACA to the federal government—are experiencing welfare losses of approximately $245 per participant on an annualized basis, relative to participants in all other states. The estimates also imply that the impact of setting up a state exchange depends meaningfully on how well the exchange functions. Market participants in the six states that had severe exchange glitches are experiencing welfare losses of approximately $750 per participant on an annualized basis, relative to participants in other states with their own exchanges. Although the national impact of the ACA is likely to change over the course of 2014 as coverage, costs, and premiums evolve, I expect that the differential impacts that are observed across states will persist through the rest of 2014.

As part of the implementation of the Affordable Care Act (ACA), all states had their first open enrollment season for coverage through new health insurance exchanges from October 2013 through March 2014. Using data through the first half of 2014, I take an early look at the impact of the ACA on the individual health insurance market. This market includes plans

purchased through exchanges as well as plans purchased directly from insurers. Although a small fraction of the national population has historically been enrolled in the individual health insurance market, it is an important market to study because it is the market of last resort for the uninsured, and one focus of the ACA is to expand coverage to the uninsured. In my data, 13.2 million people were enrolled in the individual health insurance market per month of the second quarter of 2014. Had the state-level trends from before the implementation of the ACA persisted, 4.2 million fewer people would be enrolled in this market.

I focus on the effect of state policy decisions on the early impact of the ACA. Whether the impact of the ACA differed across states is of central relevance to policy, because states made several important decisions regarding the implementation of the ACA. A small number of states decided to cede all enforcement of the ACA to the federal government. The federal government refers to these states as "direct enforcement" states. Other states took far more responsibility for the implementation of the ACA by setting up their own exchanges and deciding which vendors to use. The U.S. Supreme Court gave states the authority to decide whether to implement the Medicaid expansion legislated by the ACA, and so far just over half of the states have elected to do so. Similarly, the White House gave states the authority to decide whether to allow the renewal of non-ACA-compliant non-grandfathered plans, and just over half of states have elected to do so.

Furthermore, most pre-ACA regulation of the individual health insurance market was at the state level. Some states already had two important regulations that could affect the functioning of the individual health insurance market: "community rating" regulations that require all health insurers to charge the same price to all beneficiaries, regardless of observable characteristics, and "guaranteed issue" regulations that prevent insurers from denying coverage to applicants, regardless of their health status. Both of these regulations were enacted nationally with the ACA, and the relevant "community" for the community rating regulations was specified to be the state. Therefore, in those states that already had those regulations, one can attempt to isolate the impact of other provisions of the ACA, the most prominent of which is the individual mandate. Such an exercise sheds light on what the impact of the ACA would have been in the absence of the individual mandate, which would have been the general environment if the Supreme Court had struck down the individual mandate while upholding the law's other provisions.

Other state policy decisions from before the implementation of the ACA might have lasting impacts. For example, pre-ACA policy decisions could

affect the number of insurers in the individual health insurance market, which, in turn, could affect enrollment under the ACA. The number of insurers could also affect markups.

To make comparisons across groups of states, I first examine the impact of the ACA state by state. I examine data on coverage, premiums, and costs. Using those data and a model that I developed with Martin Hackmann and Jonathan Kolstad (Hackmann, Kolstad, and Kowalski forthcoming), I estimate how much better or worse off the ACA made participants in the individual health insurance market in each state. In this model, the ACA can make market participants better off if it encourages insurers to decrease "markups"—the difference between the premiums that they charge and the costs that they incur. The ACA can also make market participants better off if it mitigates "adverse selection," meaning that it encourages individuals with lower insured costs to join the pool.

There have been numerous assertions in the popular press that not enough young and healthy individuals have signed up for health insurance coverage. These claims imperfectly address whether there was adverse selection by focusing simply on coverage demographics. I assess the presence of adverse selection more systematically using cost data and a model. The main assumption necessitated by the data and the model is that plan generosity did not change with the implementation of the ACA. Plans could have become more or less generous with the implementation of the ACA, since the essential health benefits required by the ACA could have increased plan generosity, but limited network plans offered in exchanges could have decreased plan generosity. By focusing on comparisons across states, I require a weaker assumption regarding changes in plan generosity across states.

The estimates from my model imply that participants in the five direct-enforcement states are worse off by approximately $245 per participant, on an annualized basis, relative to participants in all other states. They also imply that the impact of setting up a state exchange depends meaningfully on how well the exchange functions. Market participants in the six states that had severe exchange glitches are worse off by approximately $750 per participant, on an annualized basis, relative to participants in other states with their own exchanges. The estimates offer suggestive evidence that participants in states that allowed renewal of non-grandfathered plans are worse off than participants in other states. They also provide inconclusive evidence that participants in states with pre-ACA community-rating and guaranteed-issue regulations are better off than participants in other states, likely because these regulations contributed to adverse selection before the

ACA. They provide further inconclusive evidence regarding the impact of having more insurers in the pre-ACA state market. Although the national impact of the ACA is likely to change over the course of 2014 as coverage, costs, and premiums evolve, I expect that the differential impacts that can be observed across states will persist through the rest of 2014.

I present the model in section I and then describe how I estimate the model in section II. I discuss the data in section III, and provide summary statistics in section IV. The results are presented in section V. I compare my results with existing empirical evidence on selection in section VI and conclude in section VII.

I. The Model

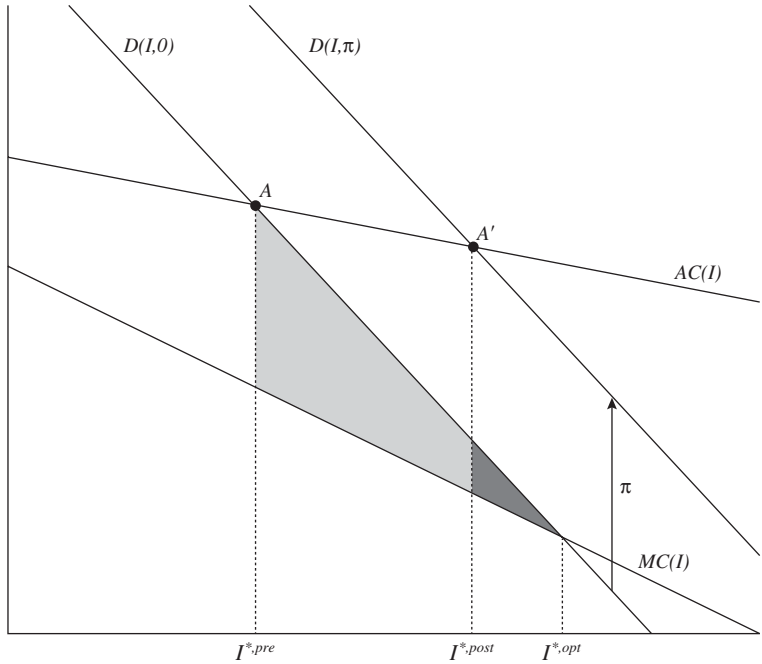
I adapt a simple model from Hackmann, Kolstad, and Kowalski (forthcoming) and use similar notation to facilitate comparison across papers. In the model, changes in welfare come from changes in selection and changes in markups. I first present the model with only changes in selection, following previous work by Liran Einav, Amy Finkelstein, and Mark Cullen (2010). I then present the full model from Hackmann, Kolstad, and Kowalski (forthcoming), which accounts for changes in markups. Both of those studies offer micro-foundations that I omit here for brevity.

I.A. Model without Markups

Assume for now that insurers charge beneficiaries the average cost that they spend to pay medical claims. Because beneficiaries differ in the cost of insuring them, I model the average cost curve $AC(I)$ as a function of the number of individuals in a given market who have coverage I.[1] If the market is adversely selected, then the sickest individuals are the first to sign up for health insurance coverage at any price. When there is an exogenous increase in the number of insured individuals, the new individuals who sign up for coverage will be healthier than the formerly insured, and insurer per-enrollee costs will decrease. As depicted in figure 1, a downward-sloping average cost curve indicates the presence of adverse selection. The main

1. Note that Hackmann, Kolstad, and Kowalski (forthcoming) and Einav, Finkelstein, and Cullen (2010) represent the fraction of individuals in a given market who have health insurance coverage with I. I make a different modeling choice since it is so difficult to estimate the potential size of the individual health insurance market, particularly in the first quarter of 2014 (see Abraham, Karaca-Mandic, and Boudreaux 2013). However, I retain the same notation to emphasize that the formulas for welfare analysis are the same under this definition of I.

Figure 1. Model without Markups



Source: Author's work, based on model developed with Hackmann and Kolstad (forthcoming).
a. See text for definitions of variables.

assumption required is that plan generosity remain constant for any level of coverage. (If plan generosity decreases, then average costs could go down in the absence of adverse selection.) Assuming constant plan generosity, the downward slope of the *AC* curve indicates the presence of adverse selection (an upward slope indicates advantageous selection); however, the slope alone is not enough to identify the welfare cost.

The welfare cost of adverse selection is determined by the demand curve for insurance as well as the average cost curve. The demand curve $D\ (I,\ \pi)$ is a function of enrollment in insurance I and the penalty that individuals must pay if they do not have health insurance coverage π, which is zero before the implementation of the ACA. As shown in figure 1, in the presence of adverse election, pre-reform equilibrium coverage $I^{*,pre}$ occurs at point *A,* where the average cost curve intersects the demand curve. Insurers must charge enrollees their average costs either because enrollee health cannot be observed or because regulations prevent insurers from pricing based on underlying health. Optimal coverage $I^{*,opt}$ would

occur at the intersection of the demand curve and the marginal cost curve $MC(I)$.[2] Because demand exceeds the marginal cost of coverage, but that coverage is not provided in equilibrium, adverse selection induces a welfare loss equal to the entire shaded region (including the lighter area and the darker area) in figure 1.

Now consider the implementation of the ACA. If individuals must now pay a penalty π if they do not have health insurance coverage, their demand shifts upward by π, and the new equilibrium coverage $I^{*,post}$ occurs at point A. Subsidies behave similarly by shifting the demand curve in the same direction, so I include them in the "penalty" π for expositional simplicity. It is at first counterintuitive that subsidies and penalties shift demand in the same direction in the individual health insurance market. However, since the subsidies are only available in the individual health insurance market, while they decrease demand in other markets, they increase demand in the individual health insurance market. In the market for employer-sponsored health insurance, the penalty and the subsidy shift demand in opposite directions, as modeled in Kolstad and Kowalski (2012).

The lighter shaded region in figure 1 gives the welfare gain that results from the mitigation of adverse selection with the ACA. The penalty depicted is not large enough to eliminate the entire welfare loss from adverse selection. However, if the combination of subsidies and penalties induces optimal coverage, $I^{*,opt}$, then the welfare gain from the implementation of the ACA would also include the darker shaded region.

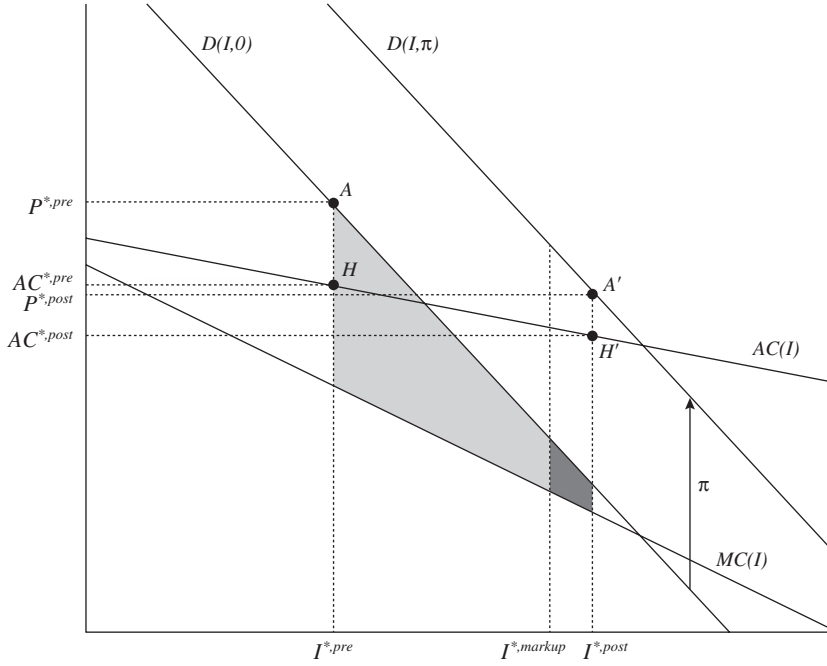
I.B. Model with Markups

Hackmann, Kolstad, and Kowalski (forthcoming) extend the model to allow insurers to charge a markup beyond the average cost of paying claims. This markup is the difference between the premium and the average cost. It is useful to extend the model to incorporate markups in empirical settings in which it is possible to separately observe the premiums charged to beneficiaries and the average costs paid by insurers.

Markups can reflect several factors, including insurer market power and the enrollment predictions of the actuaries that set premiums. Given these factors, one might expect markups to change from before to after the introduction of the ACA. Markups could go down if transparency introduced by the new exchanges decreases market power. Conversely, markups could

2. The average cost curve and the marginal cost curve intersect at zero coverage, but zero coverage is not shown along the horizontal axis so that other phenomena can be observed more easily.

Figure 2. Model with Markups



Source: Author's work, based on model developed with Hackmann and Kolstad (forthcoming).
a. See text for definition of variables.

go up if the actuaries that set premiums attempt to protect their firms from losses that would occur if the new enrollees incur higher than expected costs. State regulations only allow firms to set premiums once per year, well before costs and enrollment from the previous year are realized, so it could take several years for markups to reach equilibrium after the ACA. In the interim, markups set before the implementation of the ACA can induce distortions.

In the model with markups, equilibrium coverage occurs where average cost plus the markup is equal to demand. In figure 2, the pre-reform markup is equal to the vertical distance between the pre-reform premium $P^{*,pre}$ at point A and the pre-reform average cost $AC^{*,pre}$ at point H. Analogously, the post-reform markup is equal to the vertical distance between the post-reform premium $P^{*,post}$ at point A′ and the post-reform average cost $AC^{*,post}$ at point H′. In this extended model, changes in markups and changes in adverse selection affect welfare. As shown in figure 2, the full welfare gain

from the reduction in adverse selection and the reduction in markups is given by the area in which demand for coverage exceeds the marginal cost of coverage between the initial coverage level $I^{*,pre}$ and the post-reform coverage level $I^{*,post}$. Graphically, in figure 2, the full welfare gain is the sum of both shaded regions. Algebraically, the full change in welfare from changes in adverse selection and markups is as follows:[3]

$$
\begin{aligned}
(1) \qquad \Delta W_{full} &= \left(P^{*,pre} - AC^{*,pre}\right) * \left(I^{*,post} - I^{*,pre}\right) \\
&\quad - \left(AC^{*,post} - AC^{*,pre}\right) * \left(I^{*,pre} + \left(I^{*,post} - I^{*,pre}\right)\right) \\
&\quad + \frac{1}{2}\left(\left(P^{*,post} - \pi\right) - P^{*,pre}\right) * \left(I^{*,post} - I^{*,pre}\right).
\end{aligned}
$$

This equation shows that the welfare impact depends on only seven quantities: pre- and post-reform coverage, premiums, and average costs, as well as the penalty. Stated another way, the welfare impact depends on the slope of the average cost curve as well as the slope of the demand curve. The comparison of point H with point H' identifies the slope of the average cost curve. The comparison of point A with point A', minus the penalty, identifies the slope of the demand curve. To separate the welfare impact of the change in adverse selection from the change in markups, Hackmann, Kolstad, and Kowalski (2013) perform an accounting exercise to isolate the welfare impact that would have resulted from the change in adverse selection had the pre-reform markup remained unchanged. This selection-induced change in welfare is as follows:

$$
\begin{aligned}
(2) \qquad \Delta W_{sel} &= \left(P^{*,pre} - AC^{*,pre}\right) * \left(I^{*,markup} - I^{*,pre}\right) \\
&\quad - \frac{AC^{*,post} - AC^{*,pre}}{I^{*,post} - I^{*,pre}} * \left(I^{*,pre} + \left(I^{*,markup} - I^{*,pre}\right)\right) \\
&\quad * \left(I^{*,markup} - I^{*,pre}\right) + \frac{1}{2} * \frac{\left(P^{*,post} - \pi\right) - P^{*,pre}}{I^{*,post} - I^{*,pre}} \\
&\quad * \left(I^{*,markup} - I^{*,pre}\right)^2
\end{aligned}
$$

3. See Hackmann, Kolstad, and Kowalski (forthcoming) for proofs of this equation and the subsequent equations.

where the post-reform coverage level under the pre-reform markup, $I^{*,markup}$, is given by

$$I^{*,\,markup} = max\left[0, min\left(\begin{array}{l} Pop, I^{*,\,pre} \\ +\pi\dfrac{\left(I^{*,\,post} - I^{*,\,pre}\right)}{\left(AC^{*,\,post} - AC^{*,\,pre}\right)} - \left(\left(P^{*,\,post} - \pi\right) - P^{*,\,pre}\right) \end{array}\right)\right],$$

which accounts for the lower bound of zero coverage and the upper bound of full population coverage *Pop*. Intuitively, $I^{*,markup}$ markup equals $I^{*,post}$ if the pre-reform markup equals the post-reform markup. In addition to calculating the welfare impact of the reform, Hackmann, Kolstad, and Kowalski (2013) also calculate the optimal tax penalty π^* that would induce optimal coverage $I^{*,opt}$. Optimal coverage is as follows:

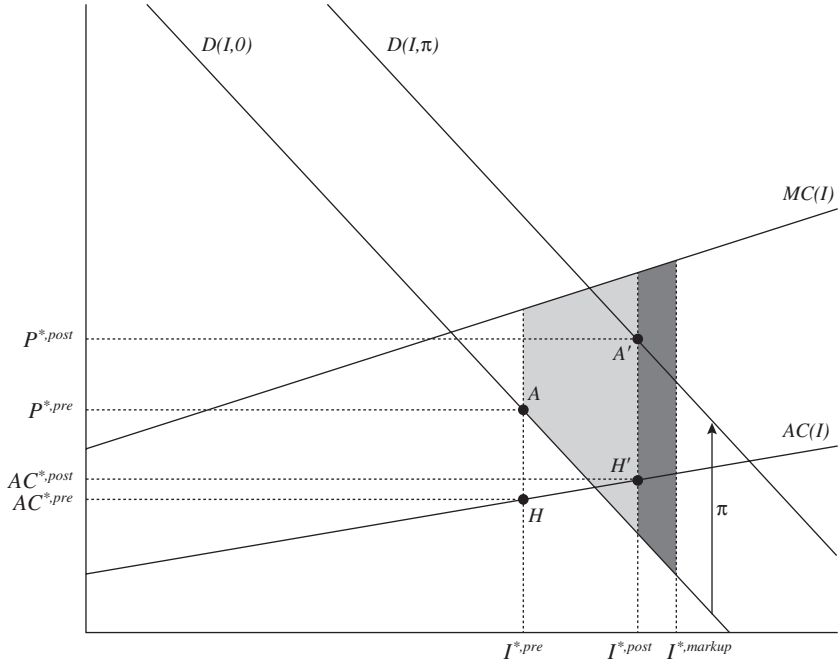
$$I^{*,\,opt} = max\left[0, min\left(\begin{array}{l} Pop, I^{*,\,pre} \\ +\dfrac{\left(P^{*,\,pre} - AC^{*,\,pre}\right) * \left(I^{*,\,post} - I^{*,\,pre}\right)}{2\left(AC^{*,\,post} - AC^{*,\,pre}\right) - \left(\left(P^{*,\,post} - \pi\right) - P^{*,\,pre}\right)} \\ -\dfrac{\left(AC^{*,\,post} - AC^{*,\,pre}\right) * I^{*,\,pre}}{2\left(AC^{*,\,post} - AC^{*,\,pre}\right) - \left(\left(P^{*,\,post} - \pi\right) - P^{*,\,pre}\right)} \end{array}\right)\right].$$

This equation also accounts for the lower bound of zero coverage and the upper bound of full coverage. From optimal coverage, it is possible to calculate the optimal tax penalty π^* as follows:

$$\begin{aligned} \pi^* = {} & \left(P^{*,\,post} - P^{*,\,pre}\right) - \left(AC^{*,\,post} - AC^{*,\,pre}\right) \\ & + \frac{\left(AC^{*,\,post} - AC^{*,\,pre}\right) - \left(\left(P^{*,\,post} - \pi\right) - P^{*,\,pre}\right)}{\left(I^{*,\,post} - I^{*,\,pre}\right)} \\ & * \left(I^{*,\,opt} - I^{*,\,pre}\right). \end{aligned} \tag{3}$$

We can see from equation 3 that the optimal tax penalty increases proportionally as the difference between optimal coverage and pre-reform coverage increases. While the optimal tax penalty is sometimes in the range of the actual penalty, when it is not in that range the assumed linearity of the demand and average cost curves plays a larger role.

Figure 3. Model with Markups, Assuming Advantageous Selection and Increased Markups



Source: Author's work, based on model developed with Hackmann and Kolstad (forthcoming).
a. See text for definitions of variables.

As drawn in figure 2, the market is adversely selected and the post-reform markup is smaller than the pre-reform markup, but equations 1, 2, and 3 are completely general in the sense that they can also be applied under advantageous selection and increased markups. Figure 3 shows the model under advantageous selection and increased markups. In this scenario, there is a welfare loss from advantageous selection prior to reform because the marginal cost of the last enrollee exceeds her willingness to pay. Therefore, the pre-reform level of coverage $I^{*,pre}$ *exceeds* the optimal level of coverage $I^{*,opt}$, implying that the optimal penalty is negative. The positive penalty implemented with the reform exacerbates the welfare loss from advantageous selection, and the change in welfare, holding markups constant, is the sum of both shaded regions. Increased markups mitigate the welfare loss by discouraging some individuals from signing up for coverage, such that the full welfare change from the reform is given by the lighter shaded region. Equation 1 yields the resulting welfare loss.

II. Empirical Implementation of the Model

The natural health insurance market definition is at the state level, so I apply the theoretical model separately within each state. Most pre-ACA insurance regulation was at the state level, and the ACA establishes a separate risk pool for the individual health insurance market in each state (ASPE 2014).[4] I then compare state-level welfare across states with different policies to isolate the impact of those policies.

II.A. Empirical Implementation by State

As shown above, only seven data moments are needed for identification of the full model, including all welfare-relevant quantities: insurance coverage before the reform $I^{*,pre}$, insurance coverage after the reform $I^{*,post}$, average costs before the reform $AC^{*,pre}$, average costs after the reform $AC^{*,post}$, premiums before the reform $P^{*,pre}$, premiums after the reform $P^{*,post}$, and the size of the penalty π. Using data on these quantities within a state, I could simply plug these data moments into equations 1, 2, and 3 to obtain the full welfare effect, the net welfare effect, and the optimal penalty.

However, making a simple comparison of coverage, premiums, and costs before and after reform is likely to be problematic, because there are secular and seasonal trends in all of these variables. Therefore, to isolate the impact of reform from these trends, I estimate the impact of reform, taking the trends into account. Within each state, I estimate the following equation:

$$(4) \qquad Y_t = \alpha^Y (After)_t + \rho_1^Y t + \rho_2^Y (Q1)_t + \rho_3^Y (Q2)_t + \rho_4^Y (Q3)_t + \varepsilon_t^Y,$$

where Y_t denotes the respective outcome measures of coverage, average costs or premiums. I estimate a separate regression model for each outcome, obtaining a separate set of coefficients for each one, indexed by the corresponding superscript. I use quarterly data from the first quarter of 2008 to the second quarter of 2014. *After* is a dummy variable equal to one in 2014. I do not include data from the fourth quarter of 2013 in the regression, because the open enrollment season had begun but most coverage had not yet begun and the individual mandate had not yet gone into effect. The coefficient of interest for each outcome is α^Y, which denotes the impact of the reform, after taking into account secular and seasonal trends. I account for secular trends with the trend term t and for seasonal trends with the

4. Risk adjustment will result in transfers across insurers within a state, so within-insurer analysis would not be relevant to aggregate welfare; this motivates our analysis by state.

quarterly dummies $Q1$, $Q2$, and $Q3$. Before estimating the regressions, I present graphs that demonstrate the appropriateness of the seasonal and secular trends.

Because the 2014 levels of coverage, premiums, and costs are of independent interest without any adjustment for trends, I calculate $Y^{*,post}$ by taking the average of each variable over the first and second quarter of 2014, weighting by average monthly enrollment. I then adjust $Y^{*,pre}$ for seasonal and secular trends as follows:

$$Y^{*,pre} = Y^{*,post} - \widehat{\alpha^{Y}}, \tag{5}$$

where $\widehat{\alpha^{Y}}$ is the estimated coefficient from equation 4. With this transformation of the data, the values of $Y^{*,post}$ are informative summary statistics that capture actual coverage, premiums, and costs in the first half of 2014. The values of $Y^{*,pre}$ are hypothetical values that represent what coverage, premiums, and costs would have been in the first half of 2014 if the ACA had not been implemented.

With this minimal amount of regression adjustment, I can examine whether the pre-reform health insurance market was adversely or advantageously selected, and I can examine whether markups increased or decreased. Assuming that coverage increased, if $AC^{*,post} - AC^{*,pre} < 0$, then the market was adversely selected, and it was advantageously selected otherwise. Relatedly, markups decreased if $(P^{*,post} - AC^{*,post}) - (P^{*,pre} - AC^{*,pre}) < 0$, and increased otherwise.

Simply knowing whether the market was adversely or advantageously selected and whether markups increased or decreased can indicate the sign of the welfare impact of the reform in certain cases, but in other cases one needs to know the magnitude of the penalty even to know the sign.[5] In all cases, it is necessary to know the magnitude of the penalty to estimate the welfare impact.

5. For example, assume that demand is downward sloping and that coverage increases following reform. First consider the case that Hackmann, Kolstad, and Kowalski (forthcoming) found with respect to Massachusetts reform, as depicted in figure 2. The pre-reform market was adversely selected, and markups decreased, so the full welfare impact was unambiguously positive. However, if the pre-reform market had been adversely selected but the markups had increased, then the full welfare impact would have been ambiguous without further calculation. Similarly, if the pre-reform market had been advantageously selected and markups had increased, then the full welfare impact would have been positive. However, if the pre-reform market had been advantageously selected and markups had increased as shown in figure 3, then the full welfare impact would have been ambiguous.

To conduct welfare analysis, I choose a baseline value of \$1,500 for 12π, and I examine robustness to the plausible range of penalties and subsidies based on their statutory values.[6] There is substantial heterogeneity in subsidies and penalties across individuals, so the assumption of a single penalty is arguably a strong one. With individual-level data, I could potentially extend the model to account for heterogeneity in the statutory penalties and subsidies. However, as I discuss below, I do not have individual-level data. Furthermore, since there is heterogeneity in the penalties and subsidies for the same individuals over time, I would still need an assumption about whether the individuals respond to the contemporaneous penalty or to future penalties. Finally, the behavioral response to the same penalty could differ across individuals based on the perceived penalty and the cost of navigating the individual health insurance market. It is likely that even individuals who are technically exempt from the penalty could respond to it, given the nuance involved in determining who is exempt. Behavioral responses would be difficult to isolate empirically, so I proceed by examining robustness to the calibrated penalty. With a calibrated value for the penalty as well as the empirical moments by state, I use equations 1, 2, and 3 to obtain the full welfare effect, the net welfare effect, and the optimal penalty.

II.B. Empirical Implementation by State Policy Groupings

To make comparisons across states, I first separately calculate the change in welfare within each state, and then I regress state-level change in welfare on indicators for state policies. It would be tempting to simply compare decreases in average costs in one state to decreases in average costs in another state and to claim that the state that experienced greater

6. According to the Congressional Budget Office (2014), "Beginning in 2014, the ACA requires most legal residents of the United States to obtain health insurance or pay a penalty. People who do not obtain coverage will pay the greater of two amounts: either a flat dollar penalty per adult in a family, rising from \$95 in 2014 to \$695 in 2016 and indexed to inflation thereafter (the penalty for a child is half the amount, and an overall cap will apply to family payments); or a percentage of a household's adjusted gross income in excess of the income threshold for mandatory tax-filing—a share that will rise from 1.0 percent in 2014 to 2.5 percent in 2016 and subsequent years (also subject to a cap)" (p. 12). Subsidies, which are based on income, are benchmarked to the cost of the second-lowest-cost silver plan in the exchanges. According to the Congressional Budget Office (2014), "CBO and JCT estimate that the average cost of individual policies for the second-lowest-cost silver plan in the exchanges—the benchmark for determining exchange subsidies—is about \$3,800 in 2014. That estimate represents a national average, and it reflects CBO and JCTs projections of the age, sex, health status, and geographic distribution of those who will obtain coverage through the exchanges in 2014" (p. 6).

decreases in average costs was more adversely selected prior to reform. However, if the slope of the demand curve differed across states, this comparison alone would not be sufficient to identify the welfare impact of reform. Thus, it is more informative to compare changes in welfare across states because changes in welfare allow the demand curve to have a different slope in each state.[7]

One drawback of comparing changes in welfare across states is that the model arguably fits less well in some states than in others. For example, one institutional feature that is outside the model is that potential market participants could be excluded from purchasing health insurance before the ACA, especially in states without guaranteed issue and community regulations before the ACA. In those states, the assumption of a single demand curve for all market participants is likely a much stronger assumption than it is in other states. If there are indeed two demand curves pre-reform, one for participants excluded from the market and one for participants included in the market, then the welfare estimates will be biased in a way that is difficult to assess empirically. However, applying the same model to every state imposes a level of discipline. Rather than altering the model for each state or group of states, I use a single model, but I divide states into groups based on their policies, such as community rating and guaranteed issue regulations. I also show changes in coverage, premiums, and costs separately for each state and group of states to show which changes in these variable drive the reported changes in welfare.

III. Data

I use data collected by the National Association of Insurance Commissioners (NAIC) and compiled by SNL Financial. The data include filings from all insurers in the comprehensive individual health insurance line of business, excluding life insurers in all states and health maintenance organizations (HMOs) in the state of California. These data are more comprehensive than data from the health insurance exchanges because they include policies sold outside of the exchanges. Under the ACA, health insurers can sell policies inside and outside of the exchanges, but all policies must be included in the same risk pool (ASPE 2014). In section V I compare my

7. Although the slope of the demand curve differs across states, the model assumes that the demand curve shifts according to a constant penalty/subsidy π that does not differ across states. This assumption makes sense given that the penalties and subsidies are set nationally. However, to the extent that state policies themselves shift demand, the model will attribute these shifts to changes in the slope, potentially biasing the welfare results.

enrollment estimates to enrollment estimates from the exchanges and survey data.

I focus on the most recently available data from the second quarter of 2014 and back through the first quarter of 2008. Each insurer files quarterly and annual filings with the NAIC, which include enrollment in member months, total premiums collected, and total costs paid. There are 393 insurers that have populated values for member months, costs, and premiums during at least one of the quarters of interest.

Even though much of the regulation of the individual health insurance market is at the state level, the NAIC requires quarterly and annual filings at the insurer level, and some insurers operate in several states. Annual filings are broken down at the insurer-year-state level, but quarterly filings are only broken down at the insurer-quarter level. Because I am interested in examining the early impact of the ACA at the state level without waiting for the annual data, I use quarterly data from the first and second quarters of 2014.

Because I am using quarterly data, I need to make assumptions to allocate the data at the insurer-quarter-state level. I predominantly infer state of coverage by using the corresponding annual filings. For 2014, I use the percentages from the 2013 annual filing, since the 2014 annual filing will not be available until the end of the year. In rare instances, I use supplemental quarterly Schedule T filings to allocate the data by state. Of the 6,727 insurer-quarter observations (393 insurers operating in at least one of 26 quarters), I can uniquely allocate 5,728 to states because the annual data only report coverage in a single state. These observations account for nearly 80 percent of enrollment in member months, total premiums collected, and total costs paid. In such instances, I allocate all insurer-quarter observations within that given year to the unique state.

For the remaining observations, I make assumptions to allocate the data by state using annual filings and supplemental quarterly Schedule T filings if the annual data are not available. (I detail these assumptions in the attached appendix.) These procedures allow all insurer-quarter observations to be allocated across the 50 states and the District of Columbia.

Before allocating data by state, I take several steps to clean the data, which I detail in the attached appendix. The ultimate effect of the data cleaning is rather minor, and as I show in the online appendix, the main results are robust to the usage of the raw data as well as the clean data. It is not surprising that the results are robust because I do not do anything to

clean data from 2014. The 2014 data are the main basis for the results, and the data from earlier years are just used to estimate pre-trends.[8]

I prefer the clean data, which impute anomalous insurer-quarter observations instead of dropping insurers from all quarters, because dropping insurers would make state totals less meaningful. Even after data cleaning, the data from California and New Jersey do not appear to be complete. SNL Financial acknowledges that California HMO plans have different NAICS filing requirements, so those data are not complete. The data from New Jersey are incomplete because the state does not require quarterly filings of all insurers.[9]

In the interest of transparency, I report state-level statistics for California and New Jersey, but I exclude these two states from cross-state comparisons to prevent data anomalies from driving the comparisons.

IV. Summary Statistics

I present state-level summary statistics that are informative in their own right because they paint a picture of the individual health insurance market in the first half of 2014. Furthermore, with only six statistics for each state—coverage, premiums, and average costs before and after reform—I can calculate the state-level impact of the implementation of the ACA on welfare. Simple comparisons of the summary statistics within a state can also provide an intuitive basis for understanding the welfare impact.

IV.A. Coverage

The first two columns of table 1 depict average monthly enrollment I, in thousands, by state. $I^{*,post}$ gives average monthly enrollment in the first half of 2014.[10]

8. I include graphs of the data by state using both the raw and the imputed data in the online appendix, so that the interested reader can examine state trends and the impact of my imputation technique. Online appendixes for all papers in the volume may be accessed at the Brookings Papers web page—www.brookings.edu/economics/bpea.aspx—under "Past Editions."

9. New Jersey does not require quarterly filings from insurers that only write business in the state of New Jersey. Accordingly, Triad Healthcare of NJ, which is the largest insurer in New Jersey during the majority of the period, does not report quarterly data during the period of interest.

10. The data report quarterly enrollment in member months. To obtain average monthly enrollment in the first half of 2014, I sum member months across both quarters of 2014 and divide by 6.

Table 1. Individual Health Insurance Market Summary Statistics, by State, Pre- and Post-ACA Implementation[a]

State	*Coverage (monthly average, thousands of persons)*		*Premium (monthly average, dollars)*		*Average cost (monthly average, dollars)*		*Adverse selection?*	*Markup increase?*	*Exchange enrollment as percentage of post-enrollment*	*Post-enrollment as percentage of population*
	I^{*pre}	I^{*post}	P^{*pre}	P^{*post}	AC^{*pre}	AC^{*post}				
AK	10	65	387	346	242	187	1	1	16	10.8
AL	183	174	185	278	159	218	1	1	50	4.0
AR	100	193	179	271	145	181	0	1	19	7.7
AZ	128	179	234	254	183	192	0	1	59	3.1
CA[b]	871	226	218	243	175	256	1	0	792	0.5
CO	218	257	220	260	184	195	0	1	44	5.4
CT	58	100	335	403	285	250	1	1	66	3.3
DC	13	29	285	291	304	251	1	1	30	5.5
DE	14	21	368	346	265	279	0	0	53	2.9
FL	849	1,204	196	272	157	189	0	1	65	7.8
GA	411	557	188	261	150	167	0	1	48	6.5
HI	33	28	236	242	220	230	1	0	44	1.4
IA	140	180	241	265	206	236	0	0	14	6.7
ID	93	110	202	242	156	200	0	0	60	7.8
IL	330	524	260	326	221	267	0	1	36	4.7

(continued on next page)

Table 1. Individual Health Insurance Market Summary Statistics, by State, Pre- and Post-ACA Implementation (*Continued*)

State	*Coverage (monthly average, thousands of persons)*		*Premium (monthly average, dollars)*		*Average cost (monthly average, dollars)*		*Adverse selection?*	*Markup increase?*	*Exchange enrollment as percentage of post-enrollment*	*Post-enrollment as percentage of population*
	$I^{*,pre}$	$I^{*,post}$	$P^{*,pre}$	$P^{*,post}$	$AC^{*,pre}$	$AC^{*,post}$				
IN	97	225	277	364	222	241	0	1	50	4.0
KS	79	139	153	200	117	166	0	0	37	5.3
KY	140	193	251	290	254	205	1	1	43	4.4
LA	164	227	243	292	174	198	0	1	39	5.6
MA[b]	326	210	438	479	400	413	1	1	16	3.0
MD	122	236	221	224	175	164	1	1	24	4.8
ME	17	45	413	411	410	247	1	1	78	4.3
MI	246	375	214	281	202	204	0	1	62	4.5
MN	218	274	230	256	192	259	0	0	17	5.3
MO	212	223	223	266	160	201	0	1	64	3.9
MS	49	69	216	265	166	177	0	1	84	2.4
MT	11	21	226	415	224	295	0	1	69	5.2
NC	395	554	240	310	203	212	0	1	56	6.5
ND	43	46	284	310	272	269	1	1	23	6.5
NE	79	89	253	277	208	233	0	0	50	4.6
NH	31	39	333	341	200	192	1	1	71	4.3
NJ[b]	28	79	530	331	550	298	1	1	190	1.0
NM	63	69	195	318	188	243	0	1	37	4.1
NV	50	106	222	209	187	163	1	1	40	4.1
NY	212	303	354	371	350	238	1	1	101	1.9

OH	289	301	213	280	149	207	0	1	46	2.9
OK	87	135	191	263	156	205	0	1	42	4.3
OR	150	199	235	290	200	271	0	0	30	5.7
PA	484	632	231	284	229	266	0	1	43	5.7
RI	17	32	367	363	315	283	1	1	74	3.7
SC	86	143	224	285	169	180	0	1	68	3.6
SD	63	72	249	274	215	250	0	0	17	9.0
TN	213	270	203	244	165	190	0	1	50	4.7
TX	737	1,037	167	243	153	187	0	1	61	4.5
UT	121	193	179	228	140	175	0	1	41	7.1
VA	278	343	254	280	198	203	0	1	55	4.7
VT	23	27	403	404	379	360	1	1	132	4.6
WA	284	237	285	337	218	259	1	1	69	3.4
WI	109	393	219	225	181	175	1	1	24	10.3
WV	15	27	271	378	270	306	0	1	58	1.9
WY	14	21	329	389	239	286	0	1	49	4.2
Summary[b]	7,776	10,914	224	280	189	212	16	39	50	4.9
Summary	9,001	11,429	232	282	196	215	19	41	61	4.2

Source: Author's calculations from SNL with exchange enrollment from ASPE and population from Census.

a. Post values are averages from 2014:Q1 and 2014:Q2, weighted by average monthly enrollment. Pre-values are an estimate of what the post value would have been absent the implementation of the ACA. They are obtained by estimating a seasonally-adjusted trend regression for each series from 2008:Q1 to 2014:Q2, omitting 2013:Q4 and allowing for a separate intercept for 2014. The pre-value reflects the post-value minus the 2014 intercept. See text for more details.

b. States with data anomalies omitted from state-level welfare regression analysis. MA is also omitted.

$I^{*,pre}$ gives an estimate of what enrollment would have been in the first half of 2014 absent the implementation of the ACA, calculated according to equation 5. Therefore, $I^{*,post} - I^{*,pre}$ yields an estimate of the change in individual health insurance market coverage attributable to the implementation of the ACA. In most states, the coverage increase attributable to the ACA is substantial in both percentage and level terms. Indeed, only five states, including California and Massachusetts, which are omitted from the state policy groupings, experienced coverage decreases attributable to the ACA.[11]

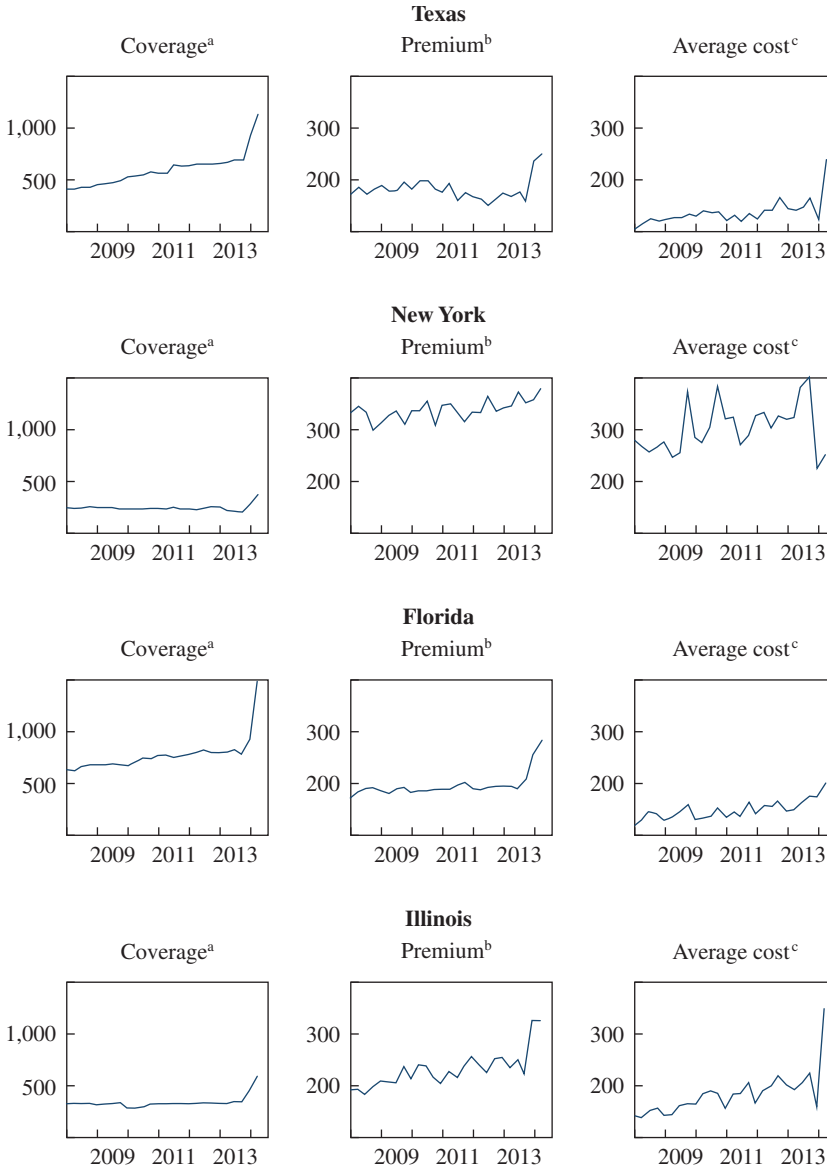
To be clear, those states could have still experienced coverage increases in level terms from 2013 to 2014, but they would not count as coverage increases attributable to the ACA unless they exceeded the coverage predicted given pre-reform seasonally adjusted trends.

Figure 4 illustrates the importance of taking into account seasonally adjusted trends by showing quarterly trends in coverage in the four most populous states: Texas, New York, Florida, and Illinois. The left-most subfigures depict unadjusted coverage trends by quarter from the first quarter of 2008 through the second quarter of 2014. In all four states, there is a striking increase in coverage in the first quarter of 2014 followed by another large coverage increase in the second quarter of 2014. I present unadjusted quarterly data for every state analogous to that in figure A.4 in the online appendix. Almost all states show striking increases in coverage in 2014.

Some of the increase in coverage in the second quarter of 2014 likely reflects new coverage relative to the first quarter, but some of it is likely an artifact of the aggregation of the data by quarter. Since many people enrolled in coverage just before the open enrollment deadline of March 31, they were covered on March 31, but their average monthly enrollment over the course of the first quarter of 2014 was low. Second-quarter average monthly enrollment therefore likely gives a more accurate picture of enrollment at the end of the first quarter.

11. As discussed above, I omit California because the SNL Financial data do not include HMO enrollment, which likely increased with reform. I omit Massachusetts because it had a similar reform to the ACA, but the ACA required some changes in Massachusetts, making it difficult to compare Massachusetts to other states. Although the difference between $I^{*,pre}$ and $I^{*,post}$ in Massachusetts indicates that enrollment in Massachusetts declined relative to a Massachusetts-specific seasonally adjusted trend, enrollment in Massachusetts also declined in absolute terms. Decreases in enrollment in Massachusetts likely reflect problems with the redesign of its state-based exchange.

Figure 4. Trends by State for the Four Most Populous States, 2008–14



Source: Author's calculations based on data from SNL Financial.
a. Measured in thousands of persons covered, on average, in a given quarter.
b. Measured in average dollars per enrollee-month in a given quarter.
c. Measured in average dollars per enrollee-month in a given quarter.

For the welfare analysis, I aggregate the data across the entire first half of 2014. In this market, the calendar year is the welfare-relevant unit of time, because premiums are only set once per calendar year and individuals purchase coverage through the end of the calendar year. Because data for the full 2014 calendar year are not yet available, I present data from the first half of 2014 in table 1. However, since it is of independent interest to report national enrollment estimates that are as up-to-date as possible, in the online appendix I report a table analogous to table 1 that only uses data from the second quarter of 2014. In those data, I re-estimate the seasonally adjusted trends so that $I^{*,post}$ takes on slightly different values.

Aggregating $I^{*,post}$ from the first half of 2014 across all states, I find that 11.4 million people were covered in the individual health insurance market, on average, in each month for the first six months of 2014. This number understates true coverage in the individual health insurance market, because the data do not report enrollment in HMO plans in California and enrollment for one very large insurer is not reported in New Jersey. It also understates the true coverage at the end of June 2014, because coverage increased over time—9.9 million people were covered per month in the first quarter of 2014, but in the second quarter 12.9 million people were covered per month.

Because not all people enrolled for all three months of the second quarter of 2014, the actual number of people enrolled at many points throughout the second quarter of 2014 was higher than 12.9 million. Although I prefer to use coverage in member months for the main analysis because premiums and costs are monthly, one can obtain a separate quarterly enrollment series from the SNL Financial data. I present state-level statistics from the enrollment series in the online appendix. According to that series, there were 13.2 million people enrolled in the second quarter of 2014.

From the summary statistics, I can obtain total enrollment in the individual health insurance market attributable to the implementation of the ACA as the sum of $I^{*,post} - I^{*,pre}$ across all states. Averaged across the first six months of 2014, the coverage increase in the individual health insurance market attributable to the implementation of the ACA was 2.4 million people. Using the quarterly enrollment series, of the 13.2 million people covered in the second quarter of 2014, I attribute 4.2 million to the implementation of the ACA. Stated another way, from before the reform to the second quarter of 2014, national enrollment in the individual health insurance market increased by 32 percent beyond what it would have been had

it simply followed state-level seasonally adjusted trends. It is worth noting that the enrollment in the individual health insurance market attributable to the implementation of the ACA does not necessarily represent new coverage for individuals who were previously uninsured—it could also represent new coverage for individuals who previously had a different type of insurance.

These national estimates complement existing estimates of health insurance enrollment under the ACA. A widely cited report from the Office of the Assistant Secretary for Planning and Evaluation (ASPE) at the Department of Health and Human Services finds that 8 million people enrolled in health insurance exchanges through March 31, including individuals who enrolled during the additional special enrollment period that was put in place through April 19 for individuals who had attempted to enroll by March 31, the last day of the open season (ASPE 2014).[12] My estimate of 13.2 million people covered per month in the second quarter of 2014 is larger than the ASPE number for two main reasons: it uses more recent data, and it includes individual health insurance enrollment outside of the exchanges. In comparison with the ASPE data, one of the strengths of my data is that they allow for the calculation of pre-trends that I can use to isolate the impact of the ACA on enrollment in the individual health insurance market. The ASPE data necessarily do not include enrollment from before 2014, because most of the exchanges only began providing coverage in 2014. While all exchange coverage was "new" in some sense, my analysis of pre-trends suggests that only 4.2 million enrollees can be attributable to the ACA nationally. At the same time, one limitation of my data relative to the ASPE data is that I cannot directly separate exchange coverage from other coverage.

To provide a sense of what fraction of coverage in my data is purchased on exchanges, I present ASPE exchange enrollment in table 1 as a percentage of the SNL Financial quarterly enrollment series. Nationally, the ASPE report accounts for approximately 70 percent of enrollment observed in my data. However, ASPE exchange enrollment as a fraction of the enrollment in my data varies dramatically by state, from a low of 14 percent in Iowa. In some states the fraction exceeds 100 percent; this occurs most prominently in California and New Jersey, states subject to severe underreporting of enrollment in my data. In other states, exchange enrollment can exceed enrollment in my data because I allocate total enrollment by state with some error, as discussed in section III. This measurement error does not affect my national enrollment estimates.

12. HHS Secretary Sylvia Matthews Burwell (2014) announced in September 2014 that 7.3 million people were enrolled in the exchanges and had paid their premiums. The earlier enrollment of 8 million included those who had signed up without yet paying their premiums.

Beyond the widely cited figures from ASPE, which are based on administrative data like my own, I can also compare my national enrollment estimates to estimates from other sources. Based on a variety of sources, the Congressional Budget Office projects that 6 million people will be enrolled on the exchanges over the full course of 2014, an estimate broadly in line with both the ASPE report and my data. Survey estimates differ more substantially. Based on the RAND Health Reform Opinion Study (HROS), Katherine Carman and Christine Eibner (2014) find a much lower estimate of 3.9 million enrolled in exchange plans nationally as of March 28, 2014. Their estimate is likely low, because many interviews took place early in March before the surge in enrollment at the end of the month. The Urban Institute Health Reform Monitoring Survey showed that 5.4 million previously uninsured people gained coverage between September 2013 and March 31, 2014 (Long and others 2014). That estimate is not directly comparable to the other estimates because it accounts for marketplace and Medicaid enrollment and it focuses on the previously uninsured. It also does not capture the surge of late March 2014, since most of the data were collected by March 6. McKinsey and Gallup conducted surveys about health insurance coverage in 2014, but I am not aware of any national enrollment estimates based on their results (Bhardwaj, Cordina, and Rayasam 2014; Levy 2014). Estimates from often-used national surveys, such as the American Community Survey, the Current Population Survey, the Behavioral Risk Factor Surveillance System, the Survey of Income and Program Participation, the National Health Interview Survey, and the Medical Expenditure Panel Survey are not yet available.

To put total enrollment in my data into a context that facilitates better comparison with survey data, I divide total quarterly enrollment in the second quarter of 2014 by 2013 U.S. Census population estimates in the last column of table 1. It is clear that Alaska is the state with the largest enrollment in percentage terms, with 10.8 percent of the population enrolled. Nationally, only 3 percent of the population is enrolled in the individual health insurance market monthly in the first half of 2013. Given the small fraction of the population that is enrolled in this market, it will be very difficult to obtain accurate estimates of the impact of national reform on enrollment in it using survey data, unless the survey is very large or very focused. The increase in coverage of 4.2 million persons in the individual health insurance market that I attribute to the ACA using data from the second quarter of 2014 represents only a 1.3-percentage-point increase in total health coverage nationally.

IV.B. Premium

In the column in table 1 labeled $P^{*,post}$, I show that in the first half of 2014 there was wide variation in average monthly premiums paid by state, with insurers in Kansas collecting average premiums per enrollee of $200 per month and insurers in several other states collecting average premiums per enrollee in excess of $400 per month.[13]

In the vast majority of states, in the first quarter of 2014 premiums rose relative to state seasonally adjusted trends. Health insurance premiums almost always go up, but it is striking that they went up so much relative to trend. As shown in figure 4, premiums increased relative to seasonally adjusted trends in the first half of 2014 in the four most populous states.[14] Across all states, from before the reform to the first half of 2014, enrollment-weighted premiums in the individual health insurance market increased by 24.4 percent beyond what they would have had they simply followed state-level seasonally adjusted trends.[15]

The observed premium increase reflects unsubsidized premiums. Insurers receive the full premiums each month, regardless of whether they are paid by the individual or the federal government (IRS 2014). Thus, although the data reflect premiums received by insurers, individuals likely faced smaller changes in premiums after taking the subsidy into account.[16]

An article in *Forbes* magazine also examines changes in unsubsidized premiums from before to after the ACA by scraping the Internet for premiums for a standardized plan in select counties in 2013 and 2014 (Roy 2014). It concludes that the ACA increased individual health insurance market premiums by an average of 49 percent. This estimate is even higher than my estimate, likely because it is not enrollment-weighted, and individuals in areas with high premiums likely selected cheaper plans.

13. The data report total premiums collected separately by quarter for the first two quarters of 2014. To obtain average premiums collected in the first half of 2014, I sum premiums collected in both quarters, and I divide by the sum of enrollment in member months in both quarters such that my statistic is weighted by average monthly enrollment. Movements in premiums over time within a year reflect changes in enrollment into and across plans, since premiums for a plan do not generally change within a year.

14. The increase in New York was less pronounced, but it started from a much higher level. As I discuss below, New York had a different regulatory environment than the other three states before the implementation of the national reform.

15. I obtained this number by calculating the percentage change in the monthly enrollment-weighted national average premium, $(P^{*,post}_{national} - P^{*,pre}_{national})/P^{*,pre}_{national}$, excluding Massachusetts, California, and New Jersey.

16. Discussions with NAIC and SNL Financial confirm that one cannot separately observe subsidies in the data.

Aside from the *Forbes* article, I am not aware of any other sources that estimate premium changes from before to after the ACA. ASPE (2013) examines premium trends before the ACA, and Cynthia Cox and others (2014) examine premium trends in select cities from 2014 to 2015, reaching a widely cited estimate that unsubsidized premiums will *decrease* by an average of –0.8 percent from 2014 to 2015; nevertheless, neither of these studies addresses premium changes from before to after the ACA. Before the passage of the ACA in 2009, the Congressional Budget Office predicted that the average enrollment-weighted individual health insurance premium would be 10 to 13 percent higher in 2016 under the ACA relative to under current law; it then revised its estimate downward by 15 percent in April 2014. On the whole, the Congressional Budget Office's estimates are in the same ballbark as the estimates borne out in my data. One reason why the Congressional Budget Office predicts lower premium increases relative to trend is that it estimated trends prior to the national slowdown in health spending (see Chandra, Holmes, and Skinner 2013).

IV.C. Average Cost

In the column labeled $AC^{*,post}$ in table 1, I report average costs incurred by insurers in the first half of 2014. Average cost decreases are particularly striking in the states where they occurred, because just as health insurance premiums almost always go up, average costs do too. In many states, average costs went down not only relative to trend but in absolute terms as well. Relative to trend, they decreased in 19 states and increased in all others. Nationally, from before the reform to the first half of 2014, average costs in the individual health insurance market increased by 11 percent relative to state-level seasonally adjusted trends.[17]

Assuming that plan generosity remained constant, combining coverage increases with these decreases in average costs indicates that the pre-reform market was adversely selected (lower-cost people gained coverage after reform). However, a small number of states experienced coverage decreases, so in those states, an increase in average costs indicates adverse selection (because as the market shrank, healthier people exited). Taking into account reported ($I^{*,post} - I^{*,pre}$) as well as ($AC^{*,post} - AC^{*,pre}$), I indicate those states that exhibit adverse selection with a dummy variable in the column labeled "Adverse selection?" Other states exhibit advantageous selection.

17. I obtained this number by calculating the percentage change in the monthly enrollment-weighted national average cost, $(AC^{*,post}_{national} - AC^{*,pre}_{national})/AC^{*,pre}_{national}$, excluding Massachusetts, California, and New Jersey.

I can compare my estimates of cost changes and adverse vs. advantageous selection at the state level to state-level predictions made in a report by the Society of Actuaries (2013) for the status of the individual health insurance market in 2017. Relying on survey data from the Medical Expenditure Panel Survey and the Current Population Survey, the report simulates changes in coverage and costs for each state and the District of Columbia. It predicts increases in coverage and costs in most states, an outcome that is also borne out in my data. At the national level, the report predicts a 32 percent increase in costs as a result of the ACA; however, it finds wide variability across states, with cost changes ranging from a decrease of 14 percent to an increase of 81 percent. My data also show a great deal of variability in average cost changes, but I estimate a much smaller national cost increase of 11 percent. Combining the Society of Actuaries' predictions for coverage and costs and assuming no change in plan generosity, its predictions imply that five states—Massachusetts, New Jersey, New York, Rhode Island, and Vermont—exhibited pre-reform adverse selection. My data imply adverse selection in all of these states except Massachusetts, which I exclude from my analysis for the reasons explained earlier.

It is important to note that findings of adverse selection within states are subject to change over time. Because individuals pay their premiums first and then incur costs, average costs could be artificially low relative to premiums in the start of 2014. Indeed, when I infer adverse selection based on data from the first quarter of 2014 alone, as shown in the online appendix, I find that a much larger number of states—32 states—were adversely selected prior to reform. Figure 4 shows that although initially there was a striking decline in average costs (in the first quarter of 2014), in Texas and Illinois there was subsequently an even more striking increase in average costs. However, in New York average costs decreased in the first quarter of 2014 and remained below trend in the second quarter, perhaps due to the influence of its differential pre-reform regulatory environment, which could have exacerbated adverse selection. While average cost patterns are likely to change over time for several reasons, including pent-up demand among the newly covered, the relative changes across groups of states with different policies are likely to be more robust. Therefore, I focus on comparing welfare across states rather than within states.

Taking welfare within states at face value for now, I see some evidence that the coverage expansions experienced under the ACA improved welfare by reducing adverse selection in the individual health insurance market. Even given the evidence on average costs, to know the sign of the full welfare impact of the ACA as defined by the model, one also needs to show

the impact of the reform on markups. Even in the states with pre-reform adverse selection, increased markups could lessen or reverse the welfare gains from reform. The column labeled "Markup increase?" reports a dummy variable that is equal to one if $(P^{*,post} - AC^{*,post}) - (P^{*,pre} - AC^{*,pre}) > 0$, indicating that markups increased. Markups increased in 41 states. As shown in figure 4, markups increased dramatically in Florida without a corresponding increase in average costs. These changes in markups could reflect uncertainty among the actuaries who had to set premiums without knowing the health status of the individuals likely to enroll. If these increases in markups persist, they could result in the ACA having an overall negative welfare impact in the individual health insurance market.

V. Results

V.A. Welfare Results by State

Using only summary statistics presented in the first six columns of table 1, and three different calibrated values of the annual penalty of $1,000, $1,500, and $2,000, I calculate changes in welfare for each state. For each value of the penalty for each state, I calculate the full change in welfare due to changes in selection and changes in markups according to equation 1, and I calculate the change in welfare due to changes in selection assuming that changes in markups remained constant according to equation 2. To make the welfare impacts easier to compare across states, I divide the welfare effects by post-reform enrollment and report $W_{sel}/I^{*,post}$ and $W_{full}/I^{*,post}$ in appendix table A1. In that table, I also present the optimal tax penalty calculated according to equation 3. As discussed above, I place more emphasis on comparisons across states than I do on changes in welfare within a state since coverage, premiums, and average costs are still evolving for 2014.

Nonetheless, taking changes in welfare from before to after the ACA within each state at face value, my results show that the reform increased welfare in 11 to 18 states, depending on the calibrated value of the annual penalty. These welfare increases generally occurred in states where average costs decreased but increases in markups did not outweigh the welfare gains from reductions in adverse selection.[18]

18. The calculated changes in welfare are still valid under other conditions, but they are more subtle to interpret. For example, the welfare calculation is still valid when demand is upward-sloping, but it is unlikely that demand is actually upward-sloping. In 46 states, demand is downward-sloping for all calibrated values of the penalty. The data for Massachusetts and California suggest upward-sloping demand, giving further credence to my decision to eliminate those states from state groupings.

Among the states included in the state groupings, at a penalty of $1,500, Maine saw the largest welfare gain. The results indicate a welfare gain of $126 per month per market participant over the first six months of 2014. If this welfare gain persists throughout 2014, it will translate into an annual welfare gain of $1,512 per market participant. In contrast, among the states included in the state groupings, Oregon saw the largest decrease in welfare at the same penalty value: a decrease of $66 per market participant per month, or $792 annually.

Given the observed full change in welfare, I report the optimal annual penalty $12\pi^*$, for each calibrated value of the annual penalty 12π, for each state. Because most states experienced welfare decreases, it is not surprising that I find that the penalty is too large. In most states, I find that the optimal penalty is smaller than the calibrated penalty because those states exhibit advantageous selection, so optimal coverage should be lower than observed coverage. Again, I expect the calculated optimal penalty to change with time.

Finally, I report per-enrollee changes in welfare due to changes in selection $W_{sel}/I^{*,post}$. Because changes in markups were so pronounced, it is nontrivial to hold markups constant to calculate the change in welfare due to changes in adverse selection, using equation 2, leading to nonsensical values in some states. Furthermore, given the observed changes in markups, markup changes could have such important real welfare impacts that it would not make sense to focus exclusively on selection. Therefore, in the analysis that follows by state groupings, I only compare the full welfare impact across states.

V.B. Welfare Results by State Policy Groupings

I compare per-enrollee changes in welfare in the individual health insurance market $W_{full}/I^{*,post}$ across states along eight policy dimensions. As discussed above, the only states that I exclude are California, Massachusetts, and New Jersey, which are denoted with asterisks in the tables. I include the District of Columbia as a "state." I consider the effect of each policy on the state-level welfare impact of the ACA on the individual health insurance market, both alone and controlling for other policies.

DIRECT ENFORCEMENT. I first categorize states into five mutually exclusive groups, based on their involvement in the implementation of the ACA. On one end of the spectrum are the five states that ceded all authority to implement the ACA to the federal government. The federal government refers to these states as the "direct enforcement" states (CMS 2014). Table 2 identifies the five direct-enforcement states as Alabama, Missouri, Oklahoma,

Table 2. Summary of ACA-Related Policies and Number of Insurers, by State[a]

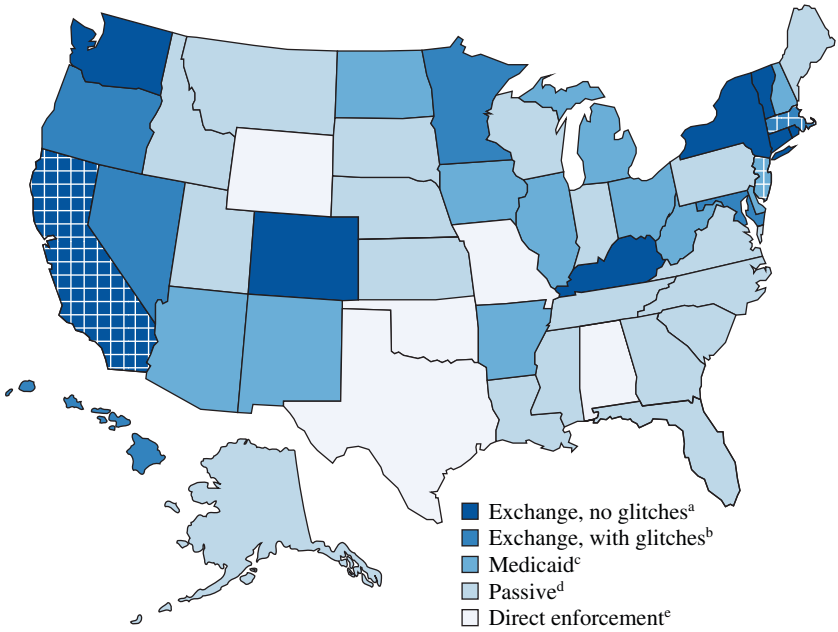
State	*Direct enforcement*	*State exchange*	*Exchange glitches*	*Medicaid expansion*	*Non-grandfathered plans*	*Community rating*	*Guaranteed issue*	*Number of insurers*
AK	0	0	0	0	0	0	0	3
AL	1	0	0	0	1	0	0	1
AR	0	0	0	1	0	0	0	4
AZ	0	0	0	1	0	0	0	6
CA[a]	0	1	0	1	0	0	0	1
CO	0	1	0	1	0	0	0	13
CT	0	1	0	1	0	0	0	5
DC	0	1	0	1	0	1	0	7
DE	0	0	0	1	0	0	0	4
FL	0	0	0	0	1	0	0	18
GA	0	0	0	0	1	0	0	12
HI	0	1	1	1	1	0	0	3
IA	0	0	0	1	1	1	0	4
ID	0	0	0	0	1	1	1	6
IL	0	0	0	1	1	0	0	9
IN	0	0	0	0	0	0	0	5
KS	0	0	0	0	1	0	0	7
KY	0	1	0	1	1	1	0	7
LA	0	0	0	0	1	1	0	6
MA[a]	0	1	1	1	0	1	1	12
MD	0	1	1	1	0	0	0	8
ME	0	0	0	0	1	1	1	5
MI	0	0	0	1	1	0	1	23
MN	0	1	1	1	0	1	0	9
MO	1	0	0	0	1	0	0	11

MS	0	0	0	0	0	0	0	2
MT	0	0	0	0	1	0	0	2
NC	0	0	0	0	1	0	0	5
ND	0	0	0	1	1	1	0	4
NE	0	0	0	0	0	0	0	5
NH	0	0	0	1	1	1	0	3
NJ[a]	0	0	0	1	1	1	1	8
NM	0	0	0	1	0	1	0	3
NV	0	1	1	1	0	1	0	9
NY	0	1	0	1	0	1	1	17
OH	0	0	0	1	1	0	1	15
OK	1	0	0	0	0	0	0	8
OR	0	1	1	1	0	1	1	9
PA	0	0	0	0	1	0	0	22
RI	0	1	0	1	0	0	1	2
SC	0	0	0	0	1	0	0	6
SD	0	0	0	0	1	1	0	6
TN	0	0	0	0	1	0	0	5
TX	1	0	0	0	1	0	0	18
UT	0	0	0	0	1	1	1	6
VA	0	0	0	0	0	0	0	10
VT	0	1	0	1	0	1	1	3
WA	0	1	0	1	0	1	1	11
WI	0	0	0	0	1	0	0	15
WV	0	0	0	1	0	0	1	4
WY	1	0	0	0	1	0	0	3
Summary[a]	5	13	5	24	26	17	11	8
Summary	5	15	6	27	27	19	13	8

Source: Various; see text for details.

a. States with data anomalies omitted from state-level welfare regression analysis. MA is also omitted.

Figure 5. ACA State-Implementation Spectrum

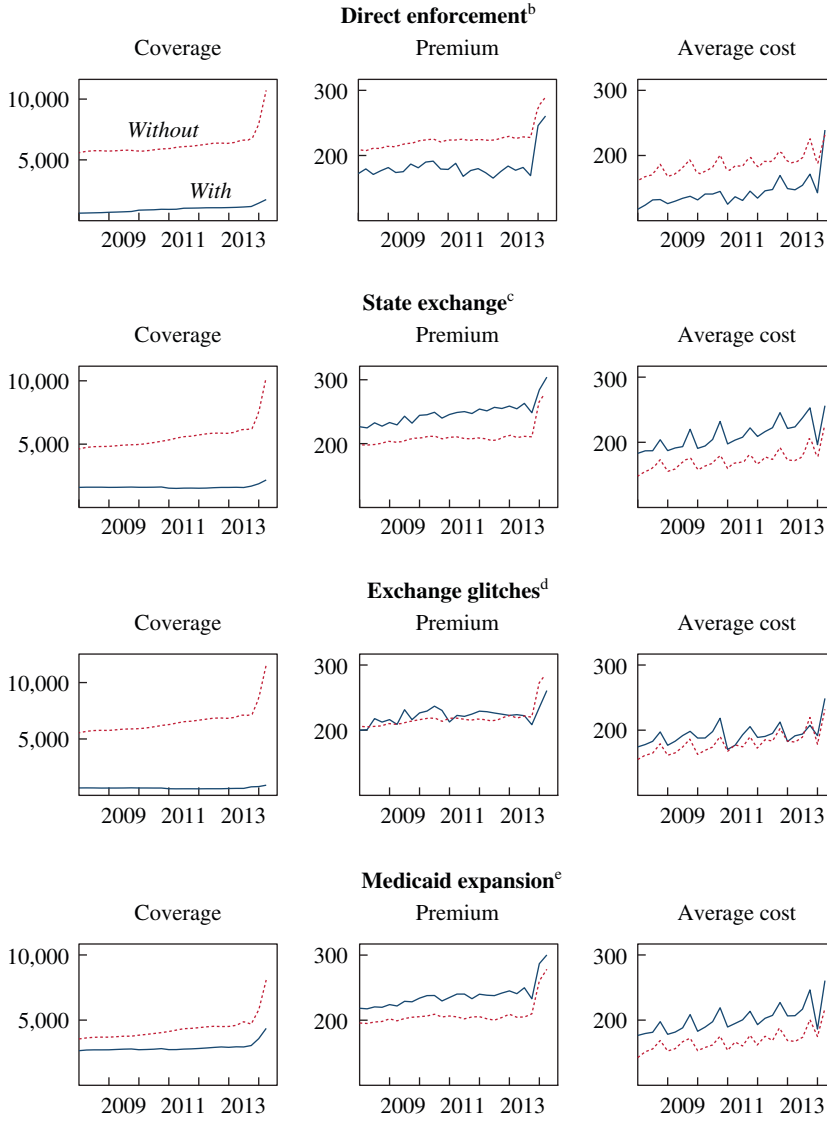


Source: Author's work; see text for explanation of data sources.
a. "Exchange, no glitches": Expanded Medicaid and set up exchange without glitches.
b. "Exchange, w/ glitches": Expanded Medicaid and set up exchange but with glitches.
c. "Medicaid": Expanded Medicaid but did not set up exchange.
d. "Passive": No direct enforcement but neither expanded Medicaid nor set up exchange.
e. "Direct enforcement": States ceded authority to implement ACA to federal government.

Texas, and Wyoming. Figure 5 depicts the direct enforcement states on a map that divides states according to my implementation spectrum. Since support for the ACA is low in direct-enforcement states, it is likely that outreach efforts to increase enrollment are less targeted in these states, resulting in lower enrollment of healthy individuals.

The first row of figure 6 shows trends in total coverage for groups of states with and without direct enforcement, weighted by enrollment. As shown in the left panel, states with direct enforcement (solid line) made up a small share of total coverage before the introduction of the ACA. Although there are slight coverage increases in states with direct enforcement in the first and second quarters of 2014, increases in coverage were dramatically higher in states without direct enforcement (dashed line). The middle panels in figure 6 show trends in enrollment-weighted premiums. Premiums in direct-enforcement states began lower than premiums in other

Figure 6. Trends by State Policy Groupings, 2008–14[a]



Source: Author's calculations, based on data from SNL Financial and other sources; see text for explanation of data sources.

a. See figure 4 for explanation of "Coverage," "Premium," and "Average cost" measures.

b. States with (and without) direct federal enforcement of the ACA.

c. States with (and without) their own state exchanges under the ACA.

d. States with (and without) glitches in the operation of their exchanges.

e. States with (and without) ACA legislated Medicaid expansion.

states, but they almost caught up in the first two quarters of 2014. As shown in the right panels, which illustrate enrollment-weighted average costs on the same scale, the increase in premiums in direct-enforcement states appears necessary to cover the observed increases in average costs. Although average costs in direct-enforcement states started out much lower than average costs in other states, they surpassed average costs in other states in the second quarter of 2014. Assuming that plan generosity remained constant, the increase in average costs observed in direct-enforcement states indicates that sicker people enrolled in coverage after reform. However, as discussed above, without using the model one cannot use comparisons across groups of states to make solid claims about the welfare impact of the ACA due to changes in selection.

The top panel of table 3 presents results from a regression in which state-level changes in welfare per enrollee attributable to the ACA ($W_{full}/I^{*,post}$) are regressed on a dummy variable for direct enforcement and a constant. In each of the three columns, the underlying data reflect a different value of the calibrated monthly penalty π. The second column, reflecting an annual penalty of $1,500, shows that enrollees in the individual health insurance market are $23 worse off per month in the direct-enforcement states than in other states. If these losses persist—and I expect they will, at least until the end of 2014—then the annual welfare loss for enrollees in direct-enforcement states, relative to enrollees in other states, will be approximately $275 (obtained by multiplying the monthly coefficient by 12). Controlling for other state policies (which I discuss below) in the multivariate regression results, shown in the lower panel of table 3, the comparable welfare loss turns out to be $245 per year. Varying the magnitude of the calibrated annual penalty by $500 around the baseline penalty has a small impact on the estimated losses. In all the regression results, this loss is statistically different from zero at the 1-percent level, according to confidence intervals block-bootstrapped by state.[19]

19. The block-bootstrapping by state does not account for the prediction of $I^{*,pre}$, $P^{*,pre}$, or $AC^{*,pre}$ in the underlying state-level welfare estimates because those predictions take place within states. Block-bootstrapping the data generating process and regressions by state-quarter would account for the prediction of $I^{*,pre}$, $P^{*,pre}$, or $AC^{*,pre}$, but the relevant unit of analysis for my regression is the state and not the state-quarter. The same issues apply to clustering by state. I prefer block-bootstrapping to clustering on theoretical grounds because it requires fewer parametric assumptions. In practice, both results yield very similar confidence intervals, and the analysis does not lose statistical significance for any of my estimated parameters if I instead cluster by state.

Table 3. Regressions Identifying Impact of State Policies on Welfare, by State[a,b]

	Calibrated annual penalty (dollars)		
	12π = 1,000	*12π = 1,500*	*12π = 2,000*
	Univariate regression results[a, c]		
Direct enforcement	−24.64	−23.12	−21.61
	[−47.67,−13.14]***	[−41.26,−11.84]***	[−37.92,−10.75]***
State exchange	22.26	23.49	24.73
	[−15.55,68.16]	[−15.45,63.47]	[−11.33,66.44]
Exchange glitches	−17.33	−18.07	−18.81
	[−51.77,31.79]	[−50.71,28.03]	[−52.7,26.44]
Medicaid expansion	7.45	8.32	9.18
	[−16.51,33.21]	[−15.58,32.54]	[−11.38,35.79]
Non-grandfathered plans	−18.51	−18.45	−18.39
	[−49.03,8.4]	[−45.22,5.68]	[−47.2,6.37]
Community rating	10.13	11.85	13.57
	[−22.37,50]	[−20.29,47.85]	[−16.88,49.45]
Guaranteed issue	9.41	11.45	13.48
	[−29.96,62.94]	[−26.57,60.01]	[−24.55,59.07]
Number of insurers	−0.52	−0.52	−0.52
	[−1.96,1.83]	[−1.93,1.49]	[−1.83,1.69]
	Multivariate regression results[b, c]		
Direct enforcement	−22.72	−20.39	−18.07
	[−57.44,−8.74]***	[−50.38,−6.74]***	[−47.43,−5.73]***
State exchange	46.73	48.67	50.60
	[−2.52,101.03]*	[−0.72,99.50]*	[3.22,98.17]**
Exchange glitches	−60.45	−62.94	−65.43
	[−129.97,6.39]*	[−123.82,6.73]*	[−125.60,4.63]*
Medicaid expansion	−13.60	−13.15	−12.70
	[−39.07,11.32]	[−35.55,9.23]	[−35.67,11.21]
Non-grandfathered plans	−11.54	−10.62	−9.70
	[−37.12,13.59]	[−33.11,13.44]	[−29.74,16.35]
Community rating	−3.78	−2.68	−1.59
	[−32.14,32.48]	[−28.39,29.07]	[−29.46,27.70]
Guaranteed issue	1.44	2.87	4.31
	[−38.93,39.35]	[−32.01,39.44]	[−27.49,44.18]
Number of insurers	−0.31	−0.34	−0.37
	[−2.48,2.22]	[−2.31,2.05]	[−2.28,1.69]
Constant	1.63	−5.81	−13.25
	[−19.79,32.55]	[−28.74,20.73]	[−33.39,12.03]

Source: Author's calculations, based on data from SNL Financial and other sources; see text for explanation of data sources.

a. Each cell of the univariate regression results reports the coefficient from a separate regression on each policy variable and a constant (coefficient not reported). See text for more details.

b. Each column of the multivariate regression results reports all coefficients from a single state-level regression of the welfare impact of the ACA for a given calibrated annual penalty on state policy variables and a constant.

c. Statistical significance at the ***1 percent, **5 percent, and *10 percent levels, block-bootstrapped by state.

STATE EXCHANGE. I next compare states based on whether they implemented their own exchanges, following the findings of the Kaiser Family Foundation (2014b). As table 2 shows, 15 states implemented their own exchanges.[20] These states fall on the opposite end of the implementation spectrum from the direct-enforcement states, as shown in figure 5. They were also generally states whose governments had stronger enthusiasm for the ACA and that therefore might have solicited enrollment with more enthusiasm. The one countervailing factor, which I consider immediately below, is that several state-based exchanges had high-profile implementation glitches that could have affected enrollment.

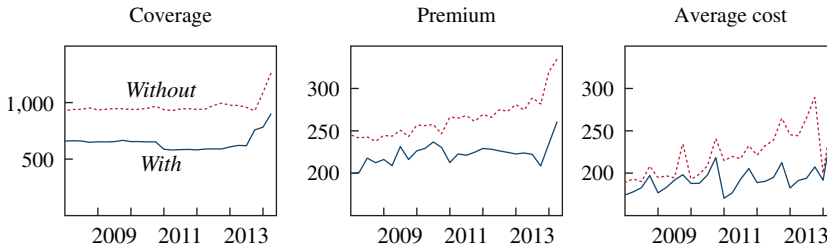
Average costs decreased substantially relative to trend in the first quarter of 2014 in states that implemented their own exchanges (figure 6, second row, right panel), indicating that lower-cost individuals selected into the pool, if one assumes that plan generosity remained constant. However, costs picked up again in the second quarter of 2014. Averaging across the first two quarters of 2014, costs were below trend in these states, indicating that reductions in adverse selection could have led to some welfare gains. However, premiums in these states grew markedly, suggesting potential welfare losses from increased markups.

The regression results in table 3 show that if one does not control for any other state-level policies, at the baseline penalty value enrollees in states that set up their own exchanges were better off by about $23.50 per month, which translates into $282 annually. This coefficient is not statistically different from zero, but it doubles and becomes statistically different from zero at the 10 percent level when one controls for whether the exchange had an implementation glitch and whether it expanded Medicaid, among other policies. I will defer interpretation of the latter results until I have considered these two other policies.

EXCHANGE GLITCHES. Exchange glitches reflect states policies' in the sense that the states that set up exchanges were responsible for the selection of vendors. In my characterization of state policies, only states that set up their own exchanges had implementation glitches, even though the federal exchange had its own difficulties. According to Sarah Dash and Amy Thomas (2014) as well as other widespread media reports, six states with their own exchanges—Hawaii, Maryland, Massachusetts, Minnesota, Nevada, and Oregon—had severe technology problems. Several sources have questioned whether these technology problems could have lasting

20. Idaho and New Mexico have been approved to implement their own exchanges, but they used the federal exchange in 2014, so I consider Idaho and New Mexico to be non-exchange states.

Figure 7. Trends in States with Exchanges, with and without Glitches



Source: Author's calculations, based on data from SNL Financial and other sources; see text for explanation of data sources.

a. See figure 4 for explanation of "Coverage," "Premium," and "Average cost" measures.

b. States with (and without) direct federal enforcement of the ACA.

c. States with (and without) their own state exchanges under the ACA.

d. States with (and without) glitches in the operation of their exchanges.

e. States with (and without) ACA legislated Medicaid expansion.

effects on the welfare impact of the ACA, including research by Florian Scheuer and Kent Smetters (2014). If those snags deterred lower-cost individuals from navigating the system to purchase coverage before the open season ended, the reductions in adverse selection that the implementation of the ACA was expected to bring about might not have been as great. Furthermore, the high future premiums necessitated by current adverse selection could deter future enrollees.

In the third row of figure 6, I compare states with exchange glitches to all other states. No remarkable patterns are noticeable. However, the impact of glitches is more salient when one restricts the focus to states with state exchanges, as in figure 7. In this figure, there is no clearly visible hindrance to enrollment in states with glitches. In fact, enrollment began increasing in states with glitches in the fourth quarter of 2013, sooner than it increased in other states. Furthermore, states with and without glitches experienced similar changes in premiums, which is to be expected given that actuaries would not have known in advance which states would experience glitches.

Though enrollment and premium trends are similar, there is a visible difference in average costs. In the states with well-functioning state exchanges, average costs decreased substantially in the first quarter of 2014 while remaining in line with trends in the comparison states. This decline is particularly striking because it seems intuitive that states without glitches would have to start paying claims sooner because their beneficiaries could enroll sooner. While average costs increased in the second quarter of 2014 in states with well-functioning state exchanges, they remained below trend,

suggesting that those states succeeded in enrolling healthier individuals if one assumes constant plan generosity. In contrast, states with exchange glitches saw marked increases in average costs in the second quarter of 2014.

Given this visual evidence, the regression evidence shown in table 3 is not surprising. The coefficients show that states with exchange glitches are worse off than other states. The difference is not statistically significant in the univariate regression, but it triples in magnitude and becomes statistically significant at the 10 percent level in the regression that controls for other state policies, including whether states expanded Medicaid. (I defer interpreting the magnitude until state policy on Medicaid expansion is considered, below.)

MEDICAID EXPANSION. The Supreme Court gave states the power to decide whether to expand Medicaid as legislated by the ACA. Currently, 27 states are implementing the Medicaid expansion, and Pennsylvania is set to implement it starting in 2015 (Kaiser Family Foundation 2014b). In states that implemented the Medicaid expansion, fewer individuals might have turned to the individual health insurance market for coverage because Medicaid was newly available to them. In that case, the impact on adverse selection would depend on whether the Medicaid-eligibles are higher- or lower-cost than other participants in the individual health insurance market.

One can examine figure 6 to discern trends in states that implemented the ACA Medicaid expansion as compared with those that did not. The bottom-left subfigure shows that non-implementing states experienced greater increases in individual health insurance market coverage than other states. Possibly, in those states more individuals turned to the individual health insurance market for new coverage. It could also be the case that in the implementing states people who had individual health insurance market coverage exited it for Medicaid coverage. Whatever the mechanism, if the new Medicaid eligibles were sicker than the rest of the population and the Medicaid expansion crowded them out of the individual health insurance market, I would expect a differential decrease in average costs in the implementing states. Indeed, such a decrease is visible in the first quarter of 2014, as shown in figure 6 (bottom-right subpanel). However, average costs increased dramatically in the second quarter of 2014 such that average costs over the first half of 2014 were only slightly lower than predicted.

Indeed, in table 3 the univariate regression results (upper panel) show suggestive evidence that the states that adopted the Medicaid expansion were better off than all other states by approximately \$100 ($\$8.32 \times 12$) per year, but this difference is not statistically distinguishable from zero.

At first glance, the multivariate regression results (lower panel) appear to show a different story. However, the Medicaid expansion is highly correlated with the three other policies already discussed, so they must all be considered simultaneously.

All 15 states that set up their own exchanges also implemented the Medicaid expansion (see table 2). Another group of states took less of an active role by implementing the Medicaid expansion but not setting up an exchange. Therefore, one could fill in the middle of the ACA implementation spectrum shown in figure 5 with the 12 states that implemented the Medicaid expansion but did not set up their own exchanges. A final group of states—labeled "Passive" in figure 5—were not so extreme as to leave direct enforcement to the federal government but did not set up state exchanges or implement the Medicaid expansion either—these states are in the category omitted from the first four state policies presented in the multivariate regression results. (The next four state policies included in the multivariate regression do not fit neatly into this spectrum).

Therefore, the coefficient on "Medicaid expansion" in the multivariate regression results gives the welfare impact of deciding to expand Medicaid, among states that did not opt either for direct enforcement, on one side of the spectrum, nor for a state exchange, on the other side.

To recover the welfare impact of setting up a state exchange with a glitch relative to the passive states, I add together the coefficients on "State exchange," "Exchange w/glitches," and "Medicaid expansion." I find that the participants in the individual health insurance market in states that set up exchanges with glitches were worse off than they would have been had their states been passive—at the baseline value of the calibrated penalty, they were worse off by \$27 (= 48.67 – 62.94 – 13.15) per month or \$330 (= 27.42 × 12) annually. In contrast, participants in states that set up well-functioning exchanges were better off than they would have been had their states been passive, by \$426 [= (48.67 – 13.15) × 12] annually. Therefore, the impact of having an exchange glitch far outweighs the impact of the other policy decisions that I have considered thus far. Market participants in the six states that had severe exchange glitches are worse off by approximately \$750 (approximately 330 + 426) per participant, on an annualized basis, relative to participants in other states with their own exchanges.

NON-GRANDFATHERED PLANS. Next, I compare states on the basis of whether they allowed beneficiaries to renew non-grandfathered plans that did not meet the standards for coverage required by the ACA. As shown in table 2, just over half of states allow renewal of non-grandfathered

plans (NCSL Health Reform Task Force 2013). The decision to allow non-grandfathered plans appears to be separate from other state decisions, since direct-enforcement states, state-exchange states, and Medicaid expansion states do not have uniform policies on non-grandfathered plans.

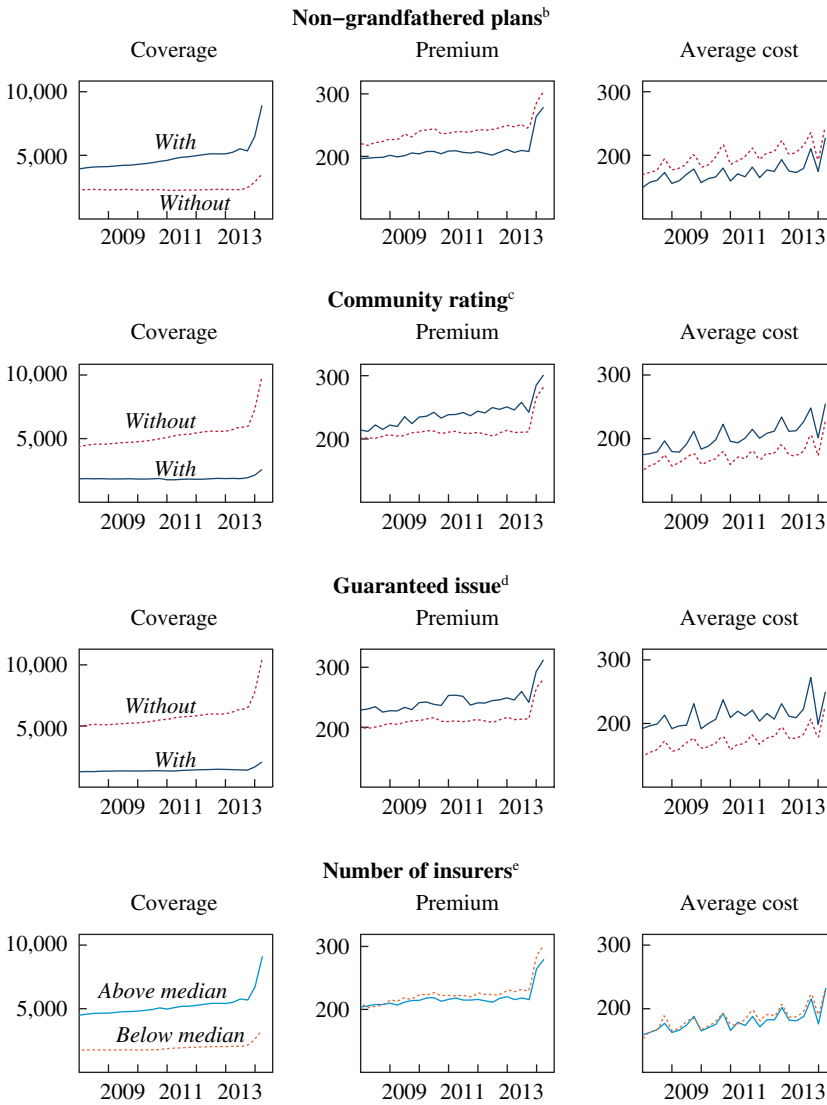
If the beneficiaries enrolled in non-grandfathered plans are lower-cost than other beneficiaries, the general individual market health insurance pool might have experienced smaller reductions in adverse selection with the implementation of the ACA. The Congressional Budget Office, the Joint Committee on Taxation, a former senior actuary from the Centers for Medicare and Medicaid Services, and researchers from the RAND Corporation all predict that healthier individuals will remain in non-ACA-compliant plans, but they differ in their assessment of whether the market-level impact will be large or small (see CBO 2014; Bertko 2014; and Saltzman and Eibner 2014). I address this question empirically.

Figure 8 shows trends in states that allow renewal of non-grandfathered plans relative to trends in all other states. As shown in the top-left panel, states with non-grandfathered plans clearly experienced greater coverage increases than other states both in absolute terms and relative to trend. Perhaps allowing individuals to keep their plans encouraged them to remain in the individual health insurance market instead of seeking other forms of coverage. As shown in the next two (top row) panels of figure 8, while premiums increased more in states with non-grandfathered plans, it is difficult to discern any differential movements in average costs.

In the top panel of table 3, the coefficients on "Non-grandfathered plans" give suggestive evidence that participants in the individual health insurance market in states that allow renewal of non-grandfathered plans are worse off from the implementation of the ACA by approximately $18 per month, or $221 annually. However, this difference is not statistically different from zero. If one controls for other state policies, the results are half as large, and they are still not statistically different from zero. Therefore, suggestive evidence indicates that the allowed renewal of non-ACA-compliant plans has a negative impact on the individual health insurance market, though only time will tell if this evidence is conclusive.

COMMUNITY RATING AND GUARANTEED ISSUE. I next compare states on the basis of two individual health insurance market regulations that are often implemented jointly. First, I compare states on the basis of the community rating regulations that require all health insurers to charge the same price to all beneficiaries, regardless of observable characteristics. As table 2 shows, 19 states had such restrictions before the implementation of the ACA (Kaiser Family Foundation 2014a). These regulations could

Figure 8. Trends by State Policy Groupings, 2008–14[a]



Source: Author's calculations, based on data from SNL Financial and other sources; see text for explanation of data sources.

a. See figure 4 for explanation of "Coverage," "Premium," and "Average cost" measures.

b. States with (and without) a policy allowing beneficiaries to renew non-grandfathered plans.

c. States with (and without) a community rating regulation of allowable prices.

d. States with (and without) a guaranteed issue regulation prohibiting the denial of coverage.

e. States where the number of available insurers is above (and below) the national median.

exacerbate adverse selection by increasing the asymmetry of the information exchanged between insurers and beneficiaries: if insurers cannot charge lower prices to healthy beneficiaries and must instead charge the average price to all beneficiaries, only sick beneficiaries will find it worthwhile to enroll and the community-rated price will be the average price for the sick. Second, I compare states on the basis of guaranteed-issue regulations, which prevent insurers from denying coverage to applicants regardless of their health status. As table 2 shows, 13 states already had such restrictions before the implementation of the ACA, and 4 of those states did not have accompanying community rating regulations.[21]

These regulations alone need not induce adverse selection. However, they could exacerbate adverse selection in the presence of community rating regulations, because in the presence of both regulations insurers must accept all comers and charge them the same price.

The ACA established community rating and guaranteed issue regulations that were implemented nationally in 2014. These regulations have been among the most popular provisions of the ACA, because people like the idea of being able to purchase health insurance regardless of health status at a uniform price. However, in the absence of the individual mandate—one of the least popular provisions of the ACA—these regulations could exacerbate adverse selection. By comparing states with these regulations before and after the implementation of the ACA, I isolate the impact of these regulations from the individual mandate.

States with community rating and guaranteed issue regulations experienced coverage increases smaller than those experienced in other states, as figure 8 (middle rows) shows. Given particular interest in the welfare cost of adverse selection imposed by community rating and guaranteed issue regulations, I am especially interested in differential changes in average costs before and after the ACA for states that already had those regulations relative to states that implemented them with the ACA. As discussed above, one would expect more adverse selection in states with community rating and guaranteed issue regulations. Therefore, holding the slope of the demand curve and its shift constant, a greater decline in average costs is expected in states with these regulations. Such a pattern could be there, but it is difficult to discern graphically.

Turning to the regression results in table 3, examining community rating and guaranteed issue regulations individually and not controlling for any

21. I define the guaranteed-issue states as states in which all insurers must issue all or some products, either periodically or continuously (Kaiser Family Foundation 2013).

other state policies, the signs of the coefficients suggest that states with these policies had higher welfare gains from the establishment of the ACA than other states. Multiplying the community rating or guaranteed issue coefficient from the middle column by 12 suggests that individuals in states with either one of these regulations will be better off from the implementation of the ACA by approximately $140 annually, possibly because these regulations induced, or exacerbated, adverse selection in the pre-ACA market.

These estimated welfare gains for states with community rating/guaranteed issue regulations under the ACA are less than half as large as the annual welfare gains of $442 per person experienced in Massachusetts following its reform, as calculated by Hackmann, Kolstad, and Kowalski (forthcoming). Massachusetts had community rating and guaranteed issue regulations that could have exacerbated adverse selection before its reform. However, Hackmann, Kolstad, and Kowalski (forthcoming) show that Massachusetts experienced welfare gains from reductions in adverse selection and from decreases in markups, whereas most states seem to have experienced increases in markups under the ACA. They use annual SNL Financial filings, as opposed to quarterly filings, so comparisons with Massachusetts will be more conclusive when the 2014 annual filings become available. Although it is interesting to analyze the magnitudes of the community rating and guaranteed issue coefficients, they are not statistically different from zero. Furthermore, the community rating coefficient changes sign in the multivariate regression. Therefore, as of the second quarter of 2014 these results are inconclusive.

NUMBER OF INSURERS. Finally, I compare states on the basis of how many insurers were operating in their individual health insurance markets in the third quarter of 2013, just before ACA open enrollment began. Although the number of insurers in the market is not technically a state policy, it could reflect other state policy decisions. I obtain the number of insurers directly from the SNL Financial data. As shown in the last column of table 2, before the implementation of the ACA there was widespread variation in the number of insurers by state, ranging from three or fewer in 11 states to 9 or more in 17 states.[22]

One might expect the individual health insurance market to function better in states with more insurers (see Dafny 2012; Haislmaier 2013; and

22. Not all insurers operating in a given state offer coverage statewide. Furthermore, I overstate the number of insurers in some sense because "insurers" in my data can be carriers under the same parent company. However, comparisons of the total number across states should still be informative.

Dafny, Gruber, and Ody 2014). Therefore, to the extent that the individual health insurance market was already functioning well in states with more insurers, the welfare impact of the ACA might not be as positive in those states. Conversely, if states with more insurers have better-functioning markets, then the implementation of the ACA might also go more smoothly, leading to higher welfare.

The last row of figure 8 compares states with an above-median number of insurers to states with a below-median number of insurers, showing that states with more insurers saw greater increases in coverage under the ACA. Differential patterns in premiums and average costs are difficult to discern, however. The regression results in the top panel of table 3 show that for each additional 10 insurers in the market before the reform, state-level welfare from the implementation of the ACA was lower by $5.20 per participant on a monthly basis, or $62 annually. However, the coefficient is not statistically different from zero, and its magnitude decreases by a third when one controls for other state policies. Therefore, no statistical relationship is evident between the number of insurers in a state before the reform and the welfare impact of the ACA.

V.C. Robustness

As discussed, even though the premium and average cost data are measured at the same time, they could contain differential information, because actuaries must set premiums and individuals must pay them before incurring any costs. To exploit the differential informational content of each data series, I conduct two separate exercises to measure premiums and average costs in the model: one using premium data and one using average cost data. To interpret the results, I assume that markups are zero but only selection changes.

By using premium data to measure average costs, one can get a sense of what the actuaries expected to happen to average costs in each state before anyone enrolled (keeping in mind that the premium data do contain some information on enrollment insofar as the weighted average premiums reflect the generosity of the selected plans). For each exercise, I present results analogous to those in table 3 and table A1 in the online appendix.

The signs and magnitudes of the univariate regression results in the analog to table 3 suggest that actuaries generally expected selection to vary across state policy groupings along the lines observed using the full data. However, using the premium data alone yields a large and statistically significant positive coefficient on welfare in states with exchange glitches, a finding that stands in contrast to the smaller and less significant negative

coefficient obtained with the full data. This finding gives credibility to my results, because it suggests that the selection observed was real and foreseen by the actuaries, apart from the exchange glitches, which actuaries would not have foreseen. Turning to other coefficients, using the premium data alone yields a larger and more statistically significant coefficient on community rating, suggesting that the actuaries expected even greater changes in selection in states with previous community rating regulations than are observed using the full data. Perhaps the actuaries overestimated the impact of existing community rating regulations, or perhaps the observed impact of those regulations will sharpen as time passes.

Next, by using average cost data to measure premiums, one might get a sense of what the longer-run market equilibrium might look like if the currently observed markups returned to their pre-reform levels. In this exercise, measured changes in welfare reflect changes in selection, but they do not account for changes in markups. Comparing the univariate regression results from the analog of table 3 to those in table 3 shows that the signs and magnitudes of the welfare impacts are similar. This comparison suggests that even though there are large changes in markups in many states, changes in selection drive the reported differences in changes in welfare.

VI. Comparison to Existing Empirical Evidence on Selection

This paper contributes empirical evidence to a growing literature on the welfare impact of adverse selection. Adverse selection is a key market failure from a theoretical perspective (Akerlof 1970; Rothschild and Stiglitz 1976), but there is little work on its magnitude from an empirical perspective. The early empirical literature focused on testing for the presence of adverse selection, but it did not establish whether the welfare cost of selection was large or small (Chiappori and Salanie 2000; Finkelstein and Poterba 2006). Accordingly, while the large existing empirical literature on community rating and guaranteed issue regulations suggests they lead to adverse selection, it does not quantify the welfare cost (see, for example, Ericson, Marzilli, and Starc [2012] and my own previous joint work with William Congdon and Mark Showalter [2008]).

The more recent empirical literature has established how to measure the welfare cost of adverse selection (Einav, Finkelstein, and Cullen 2010; Einav, Finkelstein, and Levin 2010; Bundorf, Levin, and Mahoney 2012), and it provides empirical estimates. However, it generally has focused on empirical contexts in which adverse selection is likely to have a small welfare cost. These contexts focus on intensive margin (across insurance

plan) selection for individuals with access to employer-sponsored health insurance. There is reason to expect that the extensive margin (insured vs. uninsured) selection among individuals without access to employer-sponsored health insurance could be larger, if only because the individual mandate is intended to address this type of selection.

Hackmann, Kolstad, and Kowalski (2012, forthcoming) examine extensive margin selection using variation induced by the implementation of the Massachusetts health reform of 2006. The results show that the Massachusetts individual health insurance market was adversely selected before the reform and that markups decreased after the reform. The total welfare gain in Massachusetts was large—around 8.4 percent of insurer expenditures, or $442 per person annually—which is roughly twice as large as the welfare cost of intensive-margin selection found by Einav, Finkelstein, and Cullen (2010). However, it is unclear if the Massachusetts results will generalize to other states.

Using data from the first quarter of 2014, I find that most states experienced welfare gains from decreases in adverse selection, as Massachusetts did. However, data through the first half of 2014 show advantageous selection in most states. While Massachusetts experienced decreases in markups, data from the first quarter and first half of 2014 show markup increases in most states. One cannot say conclusively if the Massachusetts experience will generalize to other states because the data on coverage, premiums, and costs are still evolving. However, the current finding that higher-cost individuals entered the pool in most states stands in stark contrast to the more established finding that lower-cost individuals entered the Massachusetts pool after its reform. One potential driver of the difference is that individuals who obtained subsidized coverage in Massachusetts had to purchase it through the CommCare exchange, which was separate from the unsubsidized exchange and was excluded from the analysis by Hackmann, Kolstad, and Kowalski (forthcoming). In contrast, under the national reform, individuals who obtain subsidized coverage must obtain it through the same exchange that offers unsubsidized coverage. If individuals who are eligible for subsidized coverage have higher costs than other individuals, they could drive the increases in average costs observed in most states in the first half of 2014, but they would not have appeared in the Massachusetts pool.

In Massachusetts, existing participants in the individual health insurance market did not have to cross-subsidize new subsidized participants through higher premiums after the state's reform because there were two separate exchanges. However, the results suggest that participants in some states had to cross-subsidize new subsidized participants after national reform

because there was only a single exchange. To the extent that existing participants in the individual health insurance market were already a vulnerable group—in the sense that they did not have employer-sponsored coverage, which is generally cheaper and more generous than individual market coverage—it is undesirable that this population would have to cross-subsidize new subsidized enrollees through both higher premiums and higher tax payments, whereas individuals with employer-sponsored coverage would only cross-subsidize new subsidized enrollees through higher tax payments. As individual-level data become available, it will be interesting to investigate whether the newly subsidized individuals do indeed have higher costs than previous participants.

For the purposes of this paper, Massachusetts cannot be used as a reliable control group for other states. Massachusetts is different from other states in many ways, but the main reason it cannot be used as a reliable control group here is that empirically it experienced anomalous decreases in enrollment after the ACA. These enrollment decreases were likely due to substantial changes that Massachusetts made to its exchange. Even though there is no reliable control state that did not experience the implementation of the ACA, by focusing on comparisons between groups of states instead of comparisons within states one can better control for national trends and for changes in data reporting after the influx in coverage. Furthermore, one can examine the welfare impact of some state policies as well as the impact of the ACA.

Several policies that potentially affect the individual health insurance market do not vary by state, and this analysis holds them constant. For example, tax subsidies for employer-sponsored health insurance could affect selection into the individual health insurance market. The availability of bankruptcy as a backstop for medical bills in the absence of insurance could also affect selection into the individual health insurance market (see Mahoney 2012). However, the analysis in this paper does not require one to be agnostic about potential sources of adverse selection; its state-level comparisons do allow us to isolate the impact of some state-level policies.

VII. Conclusion

I examine the impact of state policy decisions on the early effects of the ACA, focusing only on the individual health insurance market. This is an important market to study because many of the uninsured turn to this market for coverage. Admittedly, the overall impact of the ACA will depend on impacts on several other markets, so findings that imply that individual

health insurance market participants in some states were "better off" or "worse off" do not capture the overall impact of the ACA. Even in the states where I find that participants in the individual health insurance market were worse off, the overall impact of the ACA could be positive.

Using a model I helped develop earlier (Hackmann, Kolstad, and Kowalski forthcoming), I examine the impact of the ACA on adverse selection and markups in the individual health insurance market state by state. Estimates from my model imply that market participants in the five "direct enforcement" states that ceded all enforcement of the ACA to the federal government are worse off by approximately $245 per participant on an annualized basis, relative to participants in all other states. They also imply that the impact of setting up a state exchange depends meaningfully on how well the exchange functions. Market participants in the six states that had severe exchange glitches are worse off by approximately $750 per participant on an annualized basis, relative to participants in other states with their own exchanges. My estimates provide suggestive evidence that participants in states that allowed renewal of non-grandfathered plans are worse off than participants in other states. They also provide inconclusive evidence that participants in states with pre-ACA community rating and guaranteed issue regulations are better off than participants in other states. The estimates imply further inconclusive evidence regarding the impact of having more insurers in the pre-ACA state market.

This paper relies on data from the first half of 2014, and the national experience might evolve over time. Given that the open season for coverage on the exchanges ended at the end of the first quarter, enrollment is unlikely to change dramatically in the short term. However, it might be the case that even though newly insured individuals paid their premiums in the first half of 2014, they will use their coverage with a lag, resulting in smaller markups as the year progresses. As long as the cost lag does not vary along the same dimension as other state policies (and there is no reason to expect that it will), my results that compare states with different policies should be more robust than my results within any given state. The differential impact of state policies is likely to be stable in the short term, at least until the next open season for coverage and likely until those policies are changed.

APPENDIX

DATA CLEANING. The underlying SNL data at the insurer-quarter level display several anomalies, such as missing, negative, or extreme values for enrollment, coverage, premiums, and costs. My discussions with SNL

suggest that these anomalies persist because the NAIC does not have regulatory authority over the insurers that submit the filings. To address these anomalies, I perform several cleaning techniques before allocating the data by state.

I begin the data cleaning process by first identifying the periods of time for which each firm is active in the market. I define the active period as the period that begins when a firm first appears with non-zero, positive enrollment, premiums, and costs and ends when the firm no longer appears with non-zero, positive enrollment, premiums, and costs. This definition assumes that there are no firms that enter the market, exit the market, and then re-enter the market at a later period.[23] Once I have identified the non-defunct periods of operation for firms, I drop the defunct insurer-quarter observations from the sample.

One relatively common data anomaly appears to be that insurers file annual numbers in a single end-of-year filing rather than in quarterly reports throughout the year.[24] In the case of this data anomaly, I allocate the values reported in the fourth quarter across the entire year, in proportion to an estimated seasonally adjusted trend for the given firm from the first quarter of 2008 through the third quarter of 2013. (I do not include later data, which could be influenced by health reform). I apply this treatment only to the larger firms that are capable of having a substantial impact on the state-level analysis. Nevertheless, it should be clear that this method of imputation is a clear improvement over using the raw data. Fortunately, this data anomaly does not seem to be a major concern for the 2014 data. Throughout the period from 2008:Q1 through 2013:Q4, the prevalence and severity of this data anomaly decrease substantially. In 2008–10, this type of data error affected firms accounting for nearly 6 percent of enrollment in terms of member months. By 2013, however, the comparable figure drops to 0.2 percent of coverage. In addition, firms that appear in the data during 2013 but not in 2014 (some of which may be legitimate examples of firm exit) account for less than 1 percent of enrollment in terms of member

23. There are several cases for which a firm reports numbers for enrollment, premiums, and costs that are negligible relative to other numbers in their active periods. In order to properly perform firm-level imputation, I exclude these insurer-quarter observations from the non-defunct period and flag them for later imputation. Specifically, I flag such observations as those for which the enrollment, premiums, or costs are less than one-tenth the median value.

24. When this particular error occurs, the data reported by the firm in Q4 are roughly four times as large as the data reported by the firm in quarters of other, non-anomalous years.

months, suggesting that reporting is only rarely an issue with respect to our 2014 data.

Finally, for each remaining firm, I identify and address remaining data anomalies using regression techniques at the firm level. For each firm, for each of the three variables of interest, I first run a seasonally adjusted trend regression from 2008:Q1 through 2013:Q3. These seasonally adjusted trend regressions exclude observations with a reported value of 0. Using fitted values from these regressions, I identify outlier observations by predicting the studentized residual for each observation and flagging those observations for which this statistic is greater than 2. I then re-run each seasonally adjusted trend regression, this time also excluding the flagged outlier observations, and replace those observations, as well as observations with reported values of zero (or less than zero), with the fitted value from the second-stage of estimation. I assess the effect of my imputation procedure by comparing my imputed data to the raw data.[25]

All in all, though the data cleaning process requires many steps, it affects a very small number of observations. For enrollment in terms of member months, 7.3 percent of observations, accounting for less than 7 percent of aggregate member months, are imputed; for premiums, 8.6 percent of observations, accounting for less than 7 percent of aggregate premiums, are imputed; for costs, 10.0 percent of observations, accounting for less than 8 percent of aggregate costs, are imputed. Furthermore, for the variables of interest—enrollment, premiums, and costs—the coefficient of correlation between the raw data and clean data is in excess of 0.97. As I show in the attached appendix, the state graphs constructed using the imputed data are noticeably "cleaner" than those constructed using the raw data; however, our corrections to these apparent outliers have no material impact upon our results and conclusions. Therefore, I am confident that the imputations I have made are, at worst, benign and likely present the analysis more transparently.

DATA ALLOCATION BY STATE. After cleaning the data at the insurer-quarter level, I allocate the data to the insurer-quarter-state level. Allocation by state is trivial if the annual or Schedule T filings indicate a unique state. If the filings do not indicate that the insurer operates in a unique state, I use the filings to inform state allocation.

25. For some firms, I have identified instances where analysis of firm-level time series patterns suggests that imputation was unnecessary. In these cases, I have replaced the imputed data with the raw data.

I first allocate the data by state according to the corresponding annual filing. For the 2014 quarters, I use the percentages from the 2013 annual filing, since the 2014 annual filing will not be available until the end of the year. From the corresponding annual filing, I calculate the percentage of aggregate enrollment in member months, total premiums collected, and total costs paid by state, and I apply that percentage to aggregate coverage, premiums, and costs by state, respectively, from the quarterly filing. This allocation methodology ensures that the aggregate amounts of enrollment, premiums, and total costs (when summed across all states) are preserved for each insurer-quarter observation.

For insurer-quarter observations for which a corresponding annual filing is not available, I allocate the data using supplemental Schedule T filings. The Schedule T filings are reported quarterly, but they aggregate the individual health insurance line of business with other lines of business, including "accident & health," "life & annuity," and "property/casualty." Furthermore, they only include premiums, and not enrollment or coverage, leading me to prefer the annual filings. My allocation methodology using the Schedule T filings is as follows: I calculate the percentage of total premiums attributable to each state for the insurer-quarter, and I apply those percentages to the insurer-quarter data from the individual health insurance line of business.

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Table A1. Welfare Results, by State (in Dollars)

	Calibrated annual penalty (dollars) 12π = 1,000			*Calibrated annual penalty (dollars) 12π = 1,500*			*Calibrated annual penalty (dollars) 12π = 2,000*		
	Full monthly welfare change per enrollee	*Monthly welfare change from selection per enrollee*	*Optimal annual penalty*	*Full monthly welfare change per enrollee*	*Monthly welfare change from selection per enrollee*	*Optimal annual penalty*	*Full monthly welfare change per enrollee*	*Monthly welfare change from selection per enrollee*	*Optimal annual penalty*
State	$W_{full}/I^{*,post}$	$W_{sel}/I^{*,post}$	12π	W_{full}/I^{*post}	W_{sel}/I^{*post}	12π	W_{full}/I^{*post}	W_{sel}/I^{*post}	12π
AK	125	147	8,727	107	117	3,824	90	94	3,067
AL	−61	−100	7,015	−60	−80	9,221	−59	−72	10,468
AR	−18	−145	644	−28	−86	633	−38	−83	628
AZ	−3	−6	438	−9	−12	451	−15	−18	457
CA[a]	−119	−147	479	−60	−122	586	−1	−82	663
CO	−9	−17	108	−12	−19	89	−15	−21	81
CT	53	−35	1,574	44	338	890	35	68	3,882
DC	21	150	492	10	13	2,313	−2	−15	1,291
DE	3	7	389	−4	2	411	−11	−3	425
FL	−22	−70	260	−28	−57	184	−35	−58	148
GA	−9	−62	590	−14	−42	567	−20	−42	558
HI	−6	−6	799	−2	−2	828	2	2	843
IA	−29	−26	−714	−33	−31	−771	−38	−36	−804
ID	−40	−37	−1,525	−43	−41	−1,702	−46	−45	−1,810
IL	−34	−55	−22	−42	−57	−77	−50	−63	−108

IN	13	−179	1,031	1	−55	1,181	−11	−58	1,224
KS	−41	−39	−241	−50	−48	−270	−59	−58	−287
KY	42	−41	1,177	36	134	−145	31	55	5,085
LA	−10	−21	356	−16	−25	363	−21	−30	366
MA[a]	−23	−20	1,067	−11	−3	1,132	0	11	1,162
MD	14	13	976	3	1	925	−7	−10	904
ME	139	−12	2,339	126	−17	2,159	113	41,581	1,887
MI	0	−62	893	−7	−41	898	−14	−43	899
MN	−65	−39	−2,216	−70	−48	−2,383	−74	−55	−2,500
MO	−38	−40	−5,407	−39	−40	−6,108	−40	−41	−6,523
MS	−2	−15	666	−8	−20	688	−14	−25	697
MT	−44	28	1,878	−54	−7,813	1,350	−64	−466	1,066
NC	−1	−49	841	−7	−33	868	−13	−35	875
ND	2	2	1,084	1	0	1,066	−1	−2	1,059
NE	−24	−23	−1,536	−26	−26	−1,664	−28	−28	−1,736
NH	29	34	2,429	25	26	2,313	20	20	2,265
NJ[a]	149	754	441	135	309	157	122	209	−121
NM	−53	−364	−561	−55	−134	−2,385	−57	−104	−3,224
NV	17	18	1,162	7	5	1,003	−4	−7	945
NY	104	−67	2,472	97	−91	1,658	91	574	493
OH	−55	−63	−8,781	−56	−61	−10,451	−57	−61	−11,472
OK	−38	−64	−73	−46	−64	−153	−53	−69	−199
OR	−66	−52	−1,467	−71	−60	−1,645	−76	−67	−1,765
PA	−40	−53	−716	−45	−54	−859	−50	−58	−939
RI	36	50	2,755	26	27	1,869	16	13	1,673

(continued on next page)

Table A1. Welfare Results, by State (*Continued*)

	Calibrated annual penalty (dollars) 12π = 1,000			*Calibrated annual penalty (dollars) 12π = 1,500*			*Calibrated annual penalty (dollars) 12π = 2,000*		
	Full monthly welfare change per enrollee	*Monthly welfare change from selection per enrollee*	*Optimal annual penalty*	*Full monthly welfare change per enrollee*	*Monthly welfare change from selection per enrollee*	*Optimal annual penalty*	*Full monthly welfare change per enrollee*	*Monthly welfare change from selection per enrollee*	*Optimal annual penalty*
State	$W_{full}/I^{*,post}$	$W_{sel}/I^{*,post}$	12π	$W_{full}/I^{*,post}$	$W_{sel}/I^{*,post}$	12π	$W_{full}/I^{*,post}$	$W_{sel}/I^{*,post}$	12π
SC	6	−18	937	−2	−23	993	−10	−30	1,013
SD	−34	−30	−2,094	−36	−33	−2,278	−39	−36	−2,389
TN	−22	−29	−308	−26	−32	−365	−30	−36	−394
TX	−31	−85	38	−37	−69	−98	−43	−68	−163
UT	−27	−37	6	−35	−43	−17	−42	−50	−30
VA	0	−2	654	−4	−7	665	−7	−11	671
VT	16	20	2,484	13	14	2,167	10	10	2,056
WA	−52	−58	2,553	−48	−51	2,925	−44	−45	3,141
WI	6	2	683	−9	−15	665	−24	−31	658
WV	−31	−607	713	−40	−153	534	−49	−124	468
WY	−19	−27	201	−27	−33	211	−34	−40	216
Summary[a]	−15	−53		−21	−53		−27	143	
Sumary	−16	−48		−20	−51		−25	137	

Source: Author's calculations, based on data from SNL Financial and other sources; see text for explanation of data sources.

a. States with data anomalies omitted from state-level welfare regression analysis. Massachusetts is also omitted.

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Comments and Discussion

COMMENT BY

M. KATE BUNDORF The Affordable Care Act (ACA) has dramatically changed the market for individual health insurance in the United States. It established community rating and guaranteed issue regulations for insurers, income-based subsidies and penalties for consumers, and health insurance exchanges for the purchase and sale of health insurance. The majority of insurance market provisions of the ACA were implemented in the fall of 2013 for coverage in 2014.

Although the purchase of health coverage in the newly established exchanges was the main mechanism by which the ACA was intended to increase private coverage (CBO 2013), estimates of the magnitude of the law's effects on coverage in the individual market were very uncertain. Not only did the ACA dramatically change the structure of the individual market, but the coverage provisions targeted people who had relatively little experience either with private insurance or with purchasing coverage individually rather than through an employer. Not surprisingly, whether the ACA would achieve its enrollment objectives and its ultimate impact on consumers was and continues to be highly controversial. The main contribution of this paper by Amanda Kowalski is to bring evidence to these discussions. The paper provides an important first look at the impact of the ACA on insurance coverage in the individual market.

OVERVIEW OF THE PAPER. The analysis is based on data from the National Association of Insurance Commissioners (NAIC). The NAIC aggregates information from the financial statements of insurers on enrollment in and the premiums and claims experience of their products. These reports provide the most comprehensive and consistent source of information on health insurance coverage in the individual market (Abraham, Karaca-Mandic, and Boudreaux 2013). A key strength of the NAIC data for this analysis

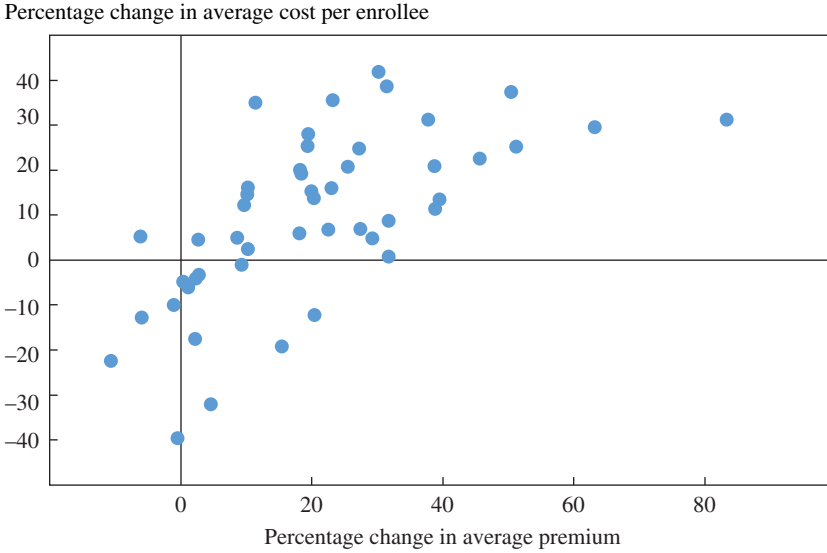
is that they cover nearly all insurance sold on the individual market in the country. Because a relatively small portion of the population purchases coverage in the individual market, both before and after reform, the sample size of the national surveys typically used to study health insurance markets, such as the Medical Expenditure Panel Survey and the Current Population Survey, is usually inadequate for comprehensive analyses of the individual market, particularly at the state level. In addition, the NAIC data include policies purchased through the health insurance exchanges created by the ACA as well as those purchased outside the exchanges. Because some people may have responded to the provisions of the ACA by purchasing coverage directly from an insurer or through an agent rather than from the exchange and others may have dropped coverage they purchased in the individual market prior to the reform in favor of coverage from the exchange, using comprehensive data from the individual market is important for accurately evaluating the ACA's effects.

Kowalski first reports trends in enrollment, average premiums, and average costs before and after the implementation of the main insurance market provisions of the ACA. She then uses this information to create a welfare-based summary measure of the implications of these changes. These calculations are based on a method developed by Liran Einav, Amy Finkelstein, and Mark Cullen (2010) to analyze the welfare implications of adverse selection in insurance markets and extended by Martin Hackmann, Jonathan Kolstad, and Amanda Kowalski (2012) to incorporate the impact of markups on premiums. The welfare calculation essentially combines information on how many additional people were covered in the individual market in response to the ACA, how much it cost to insure them, and how much they valued that coverage.

Kowalski documents that enrollment in the individual market increased in nearly all states and increased dramatically in many states after the implementation of the main provisions of the ACA.[1] (See table 1 in Kowalski's paper). While average premiums also increased in the vast majority of states, controlling for trends in premiums prior to ACA implementation, changes in the average costs of enrollees were more varied across states (see my figure 1). In 13 states, the average claims experience improved, meaning the average cost of enrollees declined. In a few states it did not change much, but the average cost per enrollee increased in the remaining

1. When reviewing the results, I exclude the subset of states that Kowalski excluded from her welfare calculations due to either data issues or other reasons: California, Massachusetts, and New Jersey.

Figure 1. Distribution of Changes in Average Premiums and Average Costs per Enrollee before and after the Implementation of the ACA, by State



Source: Author's calculations based on data available in the online data appendix.

states. Thus, for the majority of states, those in the upper right quadrant of my figure 1, enrollment in the individual market increased and both average premiums and the average cost of those enrolled also increased.

When analyzing the results of her welfare calculations, Kowalski compares changes in welfare across states based on their policy choices and documents that state experience varied according to these choices. For example, the results of the regression analyses presented in her table 3 indicate that enrollees in states that completely ceded control of the exchanges to the federal government (referred to as "direct-enforcement" states) were worse off by about $23 per month relative to those in states that established and operated their own exchanges. The welfare calculation underlying this analysis makes an even stronger statement. In particular, in the five states that adopted a direct-enforcement approach to managing their exchanges, welfare actually declined. In other words, people in the individual market in these states were *worse off* on average after the implementation of the ACA.

The mechanics of this calculation are driven by adverse selection. In particular, while these five states experienced a small increase in enrollment,

they also experienced a large increase in average covered expenditures. The implication is that the cost of coverage increased for most people in the individual market and, for many, the higher premiums exceeded their willingness to pay. They continued to purchase coverage, presumably because they either received a subsidy or would have had to pay a penalty without coverage. The welfare calculation indicates, however, that any net benefits to high risks of the coverage expansion were outweighed by the higher costs of coverage to low risks, at least based on the estimates from these data of their willingness to pay.

ARE THE NAIC DATA UP TO THE CHALLENGE? Kowalski makes important assumptions when interpreting the data. While these assumptions are necessary to make the welfare analyses tractable given the features of the data set, they deserve some scrutiny, particularly because they are directly related to some of the key controversies regarding the effects of the ACA. First, she assumes that increases in enrollment in individual insurance represent a reduction in the number of uninsured. However, people may have switched in response to the policy from a different source of insurance, such as employment-based coverage or even Medicaid, to coverage through the individual market. As mentioned above, Kowalski's use of data that encompass individual market enrollment both in and out of the exchanges likely addresses most of this concern by capturing people who switch from the individual market to coverage in the exchange. Other types of shifts, however, would be more problematic. For example, if employers dropped insurance in favor of sending workers to the exchanges, increases in enrollment in the individual market might not reflect newly covered individuals. Such changes in employment-based coverage likely represent the most important source of concern. Even small proportional reductions in the employer-sponsored market would represent a large portion of enrollment in the individual market, since the employer-sponsored market is so much larger than the individual market.

Second, the analyses assume that coverage generosity did not change with the implementation of the ACA. While this assumption is again controversial, it is less clear in which direction the ACA changed coverage generosity. There were many anecdotes of premiums increasing dramatically for people who had obtained individual coverage prior to the ACA, and these anecdotes were at least in part responsible for giving states the flexibility to choose to allow enrollees to renew non-grandfathered plans that did not meet the requirements of the ACA. More generous coverage due to the establishment of minimum essential benefits is one mechanism by which the ACA may have increased premiums in the individual

market. On the other hand, many insurers participating in the exchanges chose to offer less generous "narrow-network" plans that limit coverage to a relatively small set of providers in the market. In either case, the implication is that changes in claims experience may not reflect changes in the health status of people enrolling in the plans, as assumed in the analysis, but rather changes in the generosity of the product consumers are purchasing. Evidence of the extent to which the ACA caused people to shift their coverage from other sectors to the individual market and led to changes in coverage generosity is necessary to evaluate the validity of these assumptions.

WAS THE ACA INTENDED TO REDUCE ADVERSE SELECTION IN THE INDIVIDUAL INSURANCE MARKET? As mentioned above, Kowalski's analysis is based on a theoretical framework originally developed by Einav, Finkelstein, and Cullen (2010) for analyzing the welfare consequences of risk selection in insurance markets. These authors propose that, in the presence of exogenous premium variation, it is possible both to test for the presence of risk-based selection in insurance markets and to approximate the welfare costs associated with risk selection using a limited set of information and relatively straightforward empirical methods. Their key insight is that a distinguishing feature of markets for insurance, as compared with markets for other types of goods and services, is the link between the demand and the cost curves in the presence of risk-based selection (Einav and Finkelstein 2011). In the textbook case of adverse selection, for example, lower-risk consumers have a lower willingness to pay for coverage than higher-risk consumers, since they are likely to use fewer covered services from a given policy. Thus, as the price of insurance declines, not only does demand for coverage increase, but the average cost of those purchasing coverage declines as lower-risk consumers enter the market. Figure 1 in the Kowalski paper demonstrates this case.

Exogenous variation in the premium allows the analyst to trace out both the demand curve and the cost curve. The relationship between the premium and the cost curve provides a test for risk-based selection. If the average cost declines with a reduction in the premium for coverage, for example, then the market experiences adverse selection. The relationship between the premium and the demand curve provides information on how consumers of differing risk value coverage, providing the second piece of information necessary to calculate welfare. Einav, Finkelstein, and Cullen (2010) demonstrate this approach using arguably exogenous variation across worksites in a community-rated employee contribution in a large employment-based group. Hackmann, Kolstad, and Kowalski (2012)

use a similar approach to test for risk selection in the individual market in Massachusetts prior to its health insurance reform in 2006 and to evaluate the welfare implications of the implementation of the state's individual mandate. The implementation of the individual mandate and its associated penalty, which effectively reduced the price of health insurance by increasing the price of remaining without coverage, are the source for identifying the effect of price on demand and costs. Both studies document the existence of adverse selection in health insurance markets in the presence of community-rated premiums and point to the potential for subsidies and penalties to benefit consumers by reducing the negative consequences of adverse selection.

The effects of the ACA, in contrast, were very different according to Kowalski's analysis. In the prior analyses, lower (subsidized) premiums led to both greater enrollment in health insurance and a reduction in the average cost of the covered population (Einav, Finkelstein, and Cullen 2010; Hackmann, Kolstad, and Kowalski 2012). However, Kowalski's paper documents that the ACA led to increases in coverage but an *increase* in the average cost of the covered population in the majority of states.

Two important distinctions between the settings examined in these prior papers and the ACA are relevant for interpreting these contrasting results.

First, Massachusetts had already enacted strong community-rating laws prior to the implementation of its individual mandate, making it likely that the insurance market there had already been experiencing adverse selection (Clemens 2014). Similarly, Einav, Finkelstein, and Cullen (2010) study an employment-based group in which the out-of-pocket premium facing employees does not vary by risk within a worksite but does vary across worksites, potentially creating adverse selection within each worksite.

Many states, though, did not have community-rating laws in place in the individual market prior to the implementation of the ACA. Even among states that had them, many did not have the guaranteed-issue requirements that make these laws binding (Simon 2005). Thus, it is likely that insurers in these states used risk rating when pricing coverage and that these states were experiencing less adverse selection prior to the ACA than states with strong community-rating laws. As a result, in these risk-rating states the ACA may have effectively introduced a problem of adverse selection through the community-rating requirement and then tried to alleviate it through the introduction of income-based subsidies and penalties.

How would the outcome under community rating and subsidization compare to the efficient outcome or at least to an equilibrium in which there was relatively little inefficiency due to adverse selection? If the

regulator chose the optimal level of subsidization, the outcomes would be identical. Using the framework developed by Kowalski in figure 1 of her paper, the quantity of insurance in a risk-rated equilibrium in the presence of perfect information is represented by $I^{*,opt}$. This is consistent with a subsidy that would shift the demand curve to the point at which it intersects with the average cost curve at $I^{*,opt}$ under community rating. If the subsidy or the penalty were too small, the quantity purchased would decrease to an amount less than $I^{*,opt}$ and the average cost of the covered population would increase. If the subsidy or the penalty were too large, in contrast, the quantity purchased would increase to a level greater than $I^{*,opt}$ and the average cost of the covered population would decline. Neither outcome is consistent with the empirical finding for the majority of states, namely higher rates of coverage and higher average costs among those enrolled in individual insurance.

The second key difference between the implementation of the ACA and the settings of the prior studies is the complexity of the changes in the effective price facing consumers. In the case of Massachusetts, premiums did not vary much by age or health risk due to the existence of strong community-rating laws prior to the implementation of the individual penalty, and the analysis focuses on the population with incomes too high to qualify for income-based subsidies (Hackmann, Kolstad, and Kowalski 2012). Thus, the exogenous change in the price of insurance for consumers was simply the new penalty for not obtaining coverage. In the case of the ACA, however, two types of mechanisms changed the effective prices facing consumers. First, income-based subsidies and penalties reduced the effective price of insurance either by reducing the premium (in the case of subsidies) or by increasing the price of remaining uninsured (in the case of penalties), and the magnitude of these changes varied by income. Second, the implementation of community rating, all else equal, reduced premiums for high risks and increased them for low risks. Thus, the premium shock generated by the ACA varied significantly across consumers purchasing coverage in the individual market and was likely correlated with both consumer risk and income. This complicates the identification of the demand and cost curves, particularly if the price elasticity of demand varies by risk type.

These differences from prior studies in the regulatory environment point to an alternative explanation for Kowalski's findings. They suggest that many states experienced rising enrollment combined with rising average costs among those covered in the individual market because high risks were either more highly subsidized on average than low risks

or were more responsive to a given level of subsidization. The implication is that a more precise analysis of the welfare implications of the law would require micro data on individual risk and the effective price facing consumers, considering both the premium and any relevant subsidies or penalties. These differences also suggest that the ACA was not explicitly designed for the purpose of increasing efficiency by addressing problems of adverse selection in health insurance markets but, instead, was intended to make health insurance more affordable for high-risk people and low-income people.

CAN REGULATORS UNDO THE INEFFICIENCY CREATED BY COMMUNITY-RATING REGULATIONS IN HEALTH INSURANCE MARKETS? Overall, this analysis points to the challenges facing regulators using community rating as a tool to increase rates of health insurance coverage among high-risk people. Standard economic analysis suggests that these types of regulations create inefficiency due to asymmetric information between consumers and insurers (Rothschild and Stiglitz 1976). While the textbook analysis points to the potential for a single optimal subsidy to alleviate the inefficiency associated with adverse selection (see Einav and Finkelstein 2011 for a demonstration), this simple solution assumes that demand for health insurance is determined only by risk. In contrast, Bundorf, Jonathan Levin, and Neale Mahoney (2012) demonstrate that, when consumers vary in both their risks and their preferences, a single price cannot induce efficient insurance choices among consumers. While risk-based subsidies could undo the negative effects of community rating and alleviate the problem of adverse selection, income-based subsidies alone are unlikely to address the inefficiency.

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COMMENT BY

AMANDA STARC The Patient Protection and Affordable Care Act (ACA) sparked intense debate when it was passed in March 2010. The fierce rhetoric surrounding the details of the bill has continued since its enactment due, in part, to its wide-reaching effects on the health care system. A critical feature of the ACA is the reorganization of the individual insurance market through a system of mandates, subsidies, and exchanges. While the full impact of the ACA will not be known for many years, this paper takes an important first step in quantifying the role the ACA has played in reducing adverse selection in individual insurance markets by leveraging recent data and an equilibrium model of insurance markets.

In the paper, Amanda Kowalski argues that the impact of the ACA depends on its implementation. By examining the impact of the ACA across states, Kowalski makes the case that state-level implementation decisions had a large impact on consumers in the individual market. For example, five states—Alabama, Missouri, Oklahoma, Texas, and Wyoming—left all implementation decisions up to the federal government. The author refers to these as "direct-enforcement" states. The paper argues that these states fared less well than states that took a larger role in implementing the law.

New York and Texas serve as excellent examples of the contrast between states with and without direct enforcement. Figure 3 in Kowalski's paper shows that Texas, a direct-enforcement state, saw higher enrollments, higher average costs, and higher premiums post-ACA, while New York saw higher enrollment but lower average costs and premiums. New York

was very active, expanding Medicaid eligibility and establishing a state-run exchange with standardized insurance products. Furthermore, New York's experience is consistent with a classic adverse-selection story. Before the ACA, community rating left all but the sickest customers in New York State unwilling to purchase insurance at market prices. Kowalski argues that this market failure was corrected by the ACA.

This paper has a number of very nice features. First and foremost, Kowalski has provided a theoretically grounded empirical analysis of a critical policy question in real time. Second, she has presented all of the relevant data (in her tables 1 and 2). The model requires only six moments of the data, all of which can be found in her table 1. As I will show, these data can be used to perform other calculations of interest as well. My (less sophisticated) analysis will show that Kowalski's conclusions are not artifacts of the model, but rather are driven by patterns in the data.

Often, individual insurance markets do not function well, due in part to multiple market failures. Adverse selection, which the model employed in this paper focuses on, is a classic market failure. However, imperfect competition may also play a role in shaping market outcomes (Dafny 2010; Dafny, Duggan, and Ramanarayanan 2012; Lustig 2010; Starc 2014). The paper touches on the importance of market power, which I will first explore in more depth. Given these twin market failures, I will then explore a number of metrics by which we can judge the effectiveness of insurance market reform.

The author finds that 19 out of 50 states experienced adverse selection before the ACA was enacted. Only five states saw a drop in coverage post-ACA. Therefore, many of the states that experienced adverse selection saw increases in average costs. However, there may be reasons beyond the composition of the insurance market for costs to increase.

First, the contractual features of insurance plans may have changed in the wake of the ACA. Individual insurance plans offered before the ACA often had high deductibles and limited coverage. By contrast, the ACA required minimum essential benefits and provider network adequacy. It also introduced insurance market reforms—including guaranteed issue and renewability and the elimination of lifetime benefit caps—that may increase the value of insurance to consumers. Kowalski's analysis cannot incorporate those differences.

Second, if plans are more generous post-ACA, moral hazard, rather than adverse selection, may cause costs to rise. The model presented in the paper abstracts from the issue of moral hazard. However, just as increased coverage can provide additional risk protection, it can also exacerbate

moral hazard in that consumers might utilize more care if their effective price for medical services falls. Finally, the first two quarters of data might not reflect costs in equilibrium. This is especially likely to be true if there is pent-up demand for medical services. The author plans to extend her analysis with additional data, which should be illuminating.

Kowalski pays less attention to the role of imperfect competition in shaping insurance markets. Yet after the ACA was implemented, 41 of 51 markets experienced an increase in markups, defined as the difference between premiums and medical claims. However, many insurance markets, including the exchanges, experience high concentration, and increased concentration can in turn cause premiums to rise (Dafny, Gruber, and Ody 2014).

There are a number of possible reasons why the author finds evidence of higher markups. First and foremost, markets might not have been in equilibrium as of early 2014. Actuaries did not have any claims experience on which to base premiums, which are therefore likely to be adjusted over time based on the composition of consumers in the exchange in 2014 and beyond. In fact, premiums fell slightly in 2015, despite continued medical care inflation (Cox and others 2014).

Furthermore, insurers are constrained by regulations on their minimum loss ratio. If average claims continue to be substantially below premiums, insurers will need to provide rebates to consumers. This effectively creates a profit cap for insurers. If first and second quarter claims are representative, approximately 65 percent of states (but not of firms, which is critical) will violate minimum loss ratio regulations. This makes further regulation more likely.

Selection and market power both affect consumer outcomes in the individual insurance market. Yet they can coexist, and the welfare effects of selection depend on market structure. Neale Mahoney and E. Glen Weyl (2014) have shown that policies that correct for adverse selection may have positive or negative effects on consumer welfare, depending on market structure. Specifically, they posit that under monopoly, in which marginal costs equal marginal revenue, reducing the degree of adverse selection can raise or lower consumer surplus, depending on the level of demand.

Just as policymakers may have an interest in correcting adverse selection, they also have an interest in correcting market power. Antitrust authorities have focused on provider consolidation in the wake of the ACA (Dafny 2014). However, if minimum loss ratio regulations and exchange design prove to be ineffective tools, there may be greater interest in limiting insurer consolidation.

The model that Kowalski presents to quantify the role of adverse selection provides one useful metric to define the success of the ACA. However, there are a number of assumptions in the two frameworks she makes use of (one from Einav, Finkelstein, and Cullen 2010; and the other from Hackmann, Kolstad, and Kowalski 2013) that are difficult to justify in this setting. It is unlikely that the generosity of plans is unchanged post-ACA. Second, product differentiation and selection may imply more complex markups than those described in those two frameworks. Given these limitations, it may be useful to look at other measures in parallel.

THREE ALTERNATIVE METRICS THAT SUPPORT THE AUTHOR'S ARGUMENTS. I focus on alternative metrics that can serve as a complement to, not a substitute for, the metric proposed in the paper. I show that simpler metrics replicate the patterns in the welfare measures and reflect additional goals of the ACA, including increased coverage, insurance affordability, and reduced rates of growth in medical spending. My measures also highlight the importance of policy design and implementation and the broad sets of tools that states can use to improve market outcomes for consumers. My metrics are meant to support the key arguments made by the author.

I construct three measures: one for average costs, one for premiums, and one for coverage levels. For each outcome, I calculate the percentage change after the ACA. For a given state, I calculate the percentage change in average costs as the average costs in 2014 minus those in 2013 divided by the average costs in 2013. The premium and coverage measures are constructed similarly. These measures are implicitly inputs into the welfare criterion in the paper, though in a nonlinear way. Although this approach is imperfect, it succeeds in isolating the key market outcomes of interest.

In the average state (not weighted by population), coverage increased by 59 percent, premiums increased by 19 percent, and average costs increased by 9 percent. These numbers mask a great deal of heterogeneity. In order to explore how implementation choices affect market outcomes, I replicate a sample of the analyses shown in table 3 of the paper with each of the outcome variables. My table 1 presents the results for changes in insurance coverage. The data for the level and change in insurance coverage are especially noisy. Therefore, few explanatory variables are statistically significant, even when they are large in magnitude.

Therefore, the welfare results must be driven by changes in premiums and average costs. I examine premiums first. My table 2 presents analogous regressions. There are a few things to note in this table. First, premiums are much higher in direct-enforcement states. During the first year of the program, much of the variation in premiums is caused by insurers'

Table 1. Regressions Identifying Contributors to Changes in Insurance Coverage[a]

	(1)	*(2)*	*(3)*	*(4)*
	Dependent variable: Percent difference in health coverage			
State exchange		–0.341		
		(0.327)		
Exchange glitches		0.00281		
		(0.463)		
Direct enforcement	–0.314			
	(0.413)			
Community rating			–0.204	
			(0.254)	
Medicaid expansion				–0.343
				(0.243)
Constant	0.623***	0.692***	0.668***	0.773***
	(0.129)	(0.146)	(0.155)	(0.177)
R^2	0.012	0.032	0.013	0.039
No. of observations	51	51	51	51

Source: A. Kowalski's calculations from SNL with exchange-level enrollment and population from the Census. See Kowalski's text for more details.

a. Statistical significance at the *10 percent, **5 percent, and ***1 percent level.

Table 2. Regressions Identifying Contributors to Changes in Average Premiums[a]

	(1)	*(2)*	*(3)*	*(4)*
	Dependent variable: Percent difference in average premiums			
State exchange		–0.132*		
		(0.0720)		
Exchange glitches		–0.0296		
		(0.102)		
Direct enforcement	0.170*			
	(0.0924)			
Community rating			–0.131**	
			(0.0557)	
Medicaid expansion				–0.119**
				(0.0543)
Constant	0.173***	0.232***	0.239***	0.253***
	(0.0289)	(0.0322)	(0.0340)	(0.0395)
R^2	0.065	0.111	0.102	0.089
No. of observations	51	51	51	51

Source: A. Kowalski's calculations from SNL with exchange-level enrollment and population from the Census. See Kowalski's text for more details.

a. Statistical significance at the *10 percent, **5 percent, and ***1 percent level.

Table 3. Regressions Identifying Contributors to Changes in Average Costs[a]

	(1)	*(2)*	*(3)*	*(4)*
	Dependent variable: Percent difference in average costs			
State exchange		–0.148*		
		(0.0748)		
Exchange glitches		0.127		
		(0.106)		
Direct enforcement	0.201**			
	(0.0930)			
Community rating			–0.111*	
			(0.0577)	
Medicaid expansion				–0.0877
				(0.0566)
Constant	0.0718**	0.120***	0.133***	0.138***
	(0.0291)	(0.0335)	(0.0352)	(0.0412)
R^2	0.087	0.076	0.070	0.047
No. of observations	51	51	51	51

Source: A. Kowalski's calculations from SNL with exchange-level enrollment and population from the Census. See Kowalski's text for more details.

a. Statistical significance at the *10 percent, **5 percent, and ***1 percent level.

expectations and, possibly, the level of market competition. It is reasonable to believe that firms expected to experience higher claims in direct-enforcement states. In column 2, we see that premium price changes are lower in states that set up exchanges and did not experience glitches, although the effect of glitches is not statistically significant. In column 3, we see lower post-ACA premium price changes in states that had community rating before the ACA. This is consistent with expectations that the mandate would reduce adverse selection and that adverse selection was likely to be especially severe in states with community rating. Finally, premium changes are lower in Medicaid expansion states (column 4). This may be because the decision to expand Medicaid is correlated with numerous implementation decisions. However, it may also reflect the expectation of a better risk pool (see Clemens 2014 for additional details).

To some extent, changes in premiums represent firms' expectations about the risk pool and competitive environment, while changes in average costs represent the realizations of risks. My table 3 presents analogous regressions for the percentage change in average costs. The results are similar to the premium regressions in the previous table. Average changes in claims are, in fact, higher in direct-enforcement states. By contrast, average changes in claims are lower in states that chose to set

up exchanges. States with exchanges may have been able to engage in more effective outreach, especially among younger and healthier consumers. Consistent with adverse selection, average costs fall in states that had community rating before the ACA. By contrast, the impact of the Medicaid expansion on costs is not statistically significant.

These results decompose the welfare results presented by Kowalski and show that the patterns described in the paper are not directly dependent on the assumptions of the model. That being said, two questions are left unanswered. First, what is the value of protection from the combination of more generous plans at any point in time and reduced risk of reclassification over time? Second, how does competition in insurance and provider markets affect consumer welfare and, potentially, interact with adverse selection? These are interesting avenues for future research. While premium, claim, coverage, and welfare levels may vary over time, Kowalski argues that the comparisons between states are likely to remain valid. The comparisons point to the critical importance of both policy implementation and policy design. While some states were very active, others were resistant and, by these measures, their residents suffered as a result.

What characteristics helped states implement the ACA successfully? States that were active, rather than deferring to federal officials, had greater success. This could have resulted from political environments that were correlated with market outcomes, but it is still instructive. Further, successful states actively marketed the ACA. Many did this by actively managing a state exchange. The decision to design a state exchange is likely to be correlated with additional outreach, including navigator programs and advertising campaigns. These ads, which were often targeted at the "young invincibles," could potentially have large effects on the risk pool, even if they are not easily accommodated in a model of adverse selection.

Implementation of the ACA is not complete. Furthermore, states will face additional challenges during each new open enrollment period. Among these challenges is how to provide useful and succinct support for consumers to make their decisions. Insurance is a complex financial product, and helping consumers to choose the best plan for their needs is a difficult task. Recent research, including my own (Ericson and Starc 2013, 2014) has highlighted the importance of both the information available and the way that information is presented. These results motivate the need for good design and implementation, which will hopefully extend to decision support for consumers.

A central goal of the ACA was the expansion of health insurance coverage through a combination of mandates, subsidies, and public coverage. This paper by Amanda Kowalski examines the individual insurance market and shows that the effects of the ACA depend on how it was implemented across different states. Future analysis will provide useful insights as more data and possibly more institutional details can be incorporated. Allowing for product differentiation, imperfect competition, subsidies, and rate regulation will further enrich the model and allow for additional counterfactuals.

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GENERAL DISCUSSION Henry Aaron opened the discussion by acknowledging that the paper addresses a very difficult and controversial subject. In his view, however, neither of its two headline conclusions—that due to the Affordable Care Act (ACA), on balance welfare went down, and that the welfare changes differed widely from state to state—was supported by the analysis. He raised several problems.

He found the baseline assumption of stable generosity across states and time to be fundamentally incorrect, noting that each state has mandatory benefits, which it has passed statutorily, and that their scope differs widely from state to state. In addition, the ACA mandated a substantial liberalization in benefits, including an end to lifetime maximums, an end to annual maximums, and new maximums on out-of-pocket payments, as well as specific medical services that now have to be included in a benefit package. Consequently, the impact on generosity was almost certainly not zero, and it certainly differed from state to state.

A second problem with the analysis, in Aaron's view, was that it overlooked the differing baseline situations in the states. Baseline insurance coverage differs greatly, for example, with the uninsurance rate in Massachusetts being just 3 or 4 percent compared with about 25 percent in Texas, and that in turn implies significant differences in the character of the individual insurance market. Likewise, incomes differ widely from state to state, so the average subsidy for which people could qualify would also differ. Ages differ as well, and age-based insurance rating is still permitted under the ACA, with as much as a three-to-one variation in premiums.

Insurance regulation also differs greatly among states, including in their rate supervision, so the prices they charge differ greatly. California is illustrative of this variation, as its health insurance exchanges have chosen to regulate, restrict, and influence the offerings by insurance companies in the individual exchanges.

Aaron also felt the paper was wrong to divide states into those with glitches in the roll-out and those without. Every state had glitches, as he understood it, and some were just better publicized than others; moreover, most states continue to have very serious administrative challenges. The nature of those glitches and their timing is critical to when and what kinds of enrollment actually occurred, so an analysis that labels a few states as "glitch states" omits a large amount of richness.

His final point was a caution that great care be exercised in using the term "welfare effects." The true welfare effects of the ACA, in his view, far transcend what the paper was trying to measure, including the extension of Medicaid in many places. The real welfare effects, he argued, are the impact on individuals, net of subsidies.

Kristin Forbes raised a question on how Kowalski interpreted her results. Although the statistics on welfare losses and costs for different groups of states were useful and seemed clear, she wondered whether it was right to attribute those variations to the choices states made with the ACA or whether there could also have been other fundamental differences across those groups of states.

Specifically, she wondered whether there was any selection bias. Certain types of states may have chosen to be passive about the ACA, or to invite direct federal enforcement, or else may been more likely to have glitches. The causality with the outcome variables seemed unclear. For example, among states that had glitches and subsequent substantial welfare losses, might it be that the losses were caused not by the glitches but by the fact that those same states tended to have more uninsured people, or lower levels of education, in the first place? More broadly, maybe some states knew their enrollment was going to be messy, chose a certain strategy based on that, and then had a messier outcome anyway, not because of their strategy but because theirs was a more challenging state population. Forbes suggested to Kowalski that if she agreed with this critique, going forward she might apply propensity score matching to group similar types of states, and then look again at the variations within clusters of similar types to better identify the effects.

David Romer raised three points. First, he noted that while the paper found premiums to have risen sharply, the media coverage he has seen has been saying that this has not happened. Has the news coverage simply been wrong? Second, he agreed with the criticisms of the model made by discussant Kate Bundorf and a moment earlier by Aaron, and felt he needed to add one more. The model assumes that the order in which people are going to appear in the health insurance market as the price is lowered, subsidies

kick in, or penalties begin to apply is exogenous. This allows the author to infer whether there was adverse, favorable, or no selection beforehand based on the characteristics of those who obtained health insurance in response to the ACA. However, as discussant Amanda Starc pointed out, that seems the wrong way to think about it, since there is no exogenous order that determines who comes into the coverage next. In practice, in some states, such as Texas, the availability of options was virtually kept a secret, so the people who needed health insurance the most urgently were the first ones to enroll. By contrast, in New York they advertised the options at Yankees and Mets games, so predictably New York had a lot of young, healthy people enrolling.

Romer's third point was that it might not be useful to simply condemn the model as wrong, since all models are wrong. The question is whether the omissions or flaws in this model are distorting the findings in a first-order way, so that one cannot yet draw any conclusions, or whether one must wait until there are enough data. Or could one actually account for the missing elements? While the problems with this model struck him as more significant than usual, it remained unclear whether the model might not provide something that could be improved on.

Bradford DeLong was surprised that costs had risen in so many places, and this suggested to him that many of the previously uninsured were not low-value consumers, the kind who would not demand much health care, as in the case in Massachusetts. The foregone consumer surplus caused by not insuring the uninsured earlier turned out to be very much bigger in the pre-ACA regime than he had thought, so the potential positive social welfare effects of the ACA were significantly greater than he had believed likely.

Second, it seemed to DeLong that the paper showed the division of the surplus from the subsidies—between insurance companies on the one hand and consumers on the other—was very different between the states that aggressively pursued ACA enforcement and those that did not. He noted that in the passive and nonimplementing states, insurance companies grabbed a greater amount of the surplus, and he wondered if that might reflect the absence of a strong insurance lobby there for more aggressive implementation. Although the companies would forgo some of the subsidy pool, the pressures in the ACA to increase their market competition would also be absent.

Douglas Staiger questioned the assumption that the changes in premiums were not due to changing coverage. In the current setting, he believes, there is adverse selection and the risk pool is changing. Models suggest that

insurers are going to respond in equilibrium by changing their coverage, and that in turn will affect demand. It struck him that this is a fundamental issue with the cost data, both because insurers themselves change coverage and because consumers shift across plans, resulting in changes in aggregate coverage. Ideally one could find more data on this or find a way to explain what is happening through theory.

Justin Wolfers noted that the paper's conclusions depended on whether, in the long run, the newly insured were going to incur high or low health care costs. Thus the paper is forced to take the cost data seriously, even though it is based only on data. Wolfers' intuition is that when people first gain health insurance, they first seek treatment for the pent-up medical problems that they have neglected for years—and as a result, many of the newly insured will appear in the short-run data to be high-cost, something that Kowalski analyzes, even if they turn out to be low-cost in the long run, as models of adverse selection suggest.

Although Kowalski was careful to caution against taking a lot of the data too seriously and focused instead on the aggregate cross-state comparisons, Wolfers argued that this approach might actually bias those comparisons. For example, using the lens of the model, a state that greatly increased the number of people insured and where costs also increased in the short run, the model would interpret this as a big decrease in welfare. However, if many newly insured people first had all their old health problems fixed, but their underlying health was good—as suggested by models of adverse selection—the long-run average costs would decrease following health care reform, yielding a long-run welfare gain. Could such a short-run pattern be biasing the cross-state comparisons?

Caroline Hoxby found that the paper does as good a job as is possible making cross-state comparisons, based on the differences one would expect according to variations in state implementation, or differences in their underlying populations, or differences in their preexisting policies. But it was not obvious to her that with only 50 states and such complex variations in policies the analysis had sufficient degrees of freedom to work with. She also wondered if one reason costs have gone up is that the regulatory environment in all states now prohibited plans from excluding health benefits that were previously uncommon, especially in the individual market. Is there any way one could use cost data to determine how much of the cost increase has been caused by such requirements?

Henry Aaron noted that one of the effects of the ACA is to change the proportion of total health care spending that an insurance policy covers. There are four tiers—60, 70, 80, and 90 percent of actuarial value—that

plans can cover. States that regulate insurance must have plans in the middle two tiers. This is not based on the total cost of the insurance benefits or on the premium, but is net of subsidy, plus out-of-pocket payments, and less out-of-pocket subsidies, which are also offered under the ACA. He questioned whether the dependent variable in the model, which does not consider all of this, can tell us a great deal.

While Ricardo Reis agreed with Hoxby that having more than 50 states gives more degrees of freedom in the analysis, he noted that the ACA is a common macro policy that affected all the states at once. So, adding more states might not actually add much more information. He felt there was too little discussion in the paper about why some states rather than others adopted the policy and the econometric selection problems associated with this, or even about interactions between states and the general-equilibrium influences through prices across states.

Reis agreed with Forbes that a lot of selection should be evident in how states chose to apply the ACA. Additionally, he thought that in response to the ACA, on the supply side there might be cross-subsidization across states in private insurers' behavior, and on the demand side there might be some evidence of insured populations migrating across states and firms doing the same. By treating each state independently as a separate market, the model might be oversimplifying these interactions, making it hard to interpret the paper's state analysis.

Louise Sheiner returned to a point Aaron had made about age rating. She found the paper's assumption that there is a community rate puzzling, because the ACA allows for premiums to depend on age. In fact, whenever there is a change in the age distribution of those covered by health insurance, that can change the average payment, although it doesn't necessarily affect premiums for people who are already covered.

Amanda Kowalski responded first with a general comment and then answered several of the points raised. She noted that she used the earliest data available, although the quality was less than optimal, because the more well known survey data on claims will not be available for several more years. This meant she could not take into account state variations in subsidies, as Bundorf suggested she should, although she agrees that those variations might be playing a significant role. When individual-level data become available, she could enrich the model to account for those variations. She believes the model can be enriched over time.

Kowalski added that she used quarterly data from state insurers to run her state-level analysis, rather than doing a national analysis, because in the individual health insurance market all the regulation and the relevant risk

pools are at the state level. The paper makes her state-level data available to anyone interested in using them, and she encouraged those with alternative theories about which groups of states ought to be compared to run those comparisons.

As to why her analysis found that premiums are going up, in seeming contradiction to much of the media reporting, Kowalski reminded everyone that her comparisons were from pre-ACA to post-ACA. Other recent statistics are from post-ACA to post-ACA, with the Kaiser Family Foundation recently reporting that the current (2014) rate increases are actually very low and that rates are expected to go *down* by 0.8 percent from 2014 to 2015.

She noted that the Congressional Budget Office's (CBO's) early (2009) forecast of rate trends from pre-ACA to post-ACA predicted premium increases that were smaller than what she actually found, though still substantial at about 15 percent. The CBO has since revised that forecast downward, and since then there has also been a health care cost slowdown. Meanwhile, one year ago the Society of Actuaries forecast even larger premium increases than she found. She therefore feels confident that her rate trend data are in the ballpark.