**Economic Research Initiative on the Uninsured
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**Health Insurance Availability and Entrepreneurship:
Evidence from New Jersey**

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Abstract

I investigate the impact of New Jersey's Individual Health Coverage Plan on the self-employment of its residents. The IHCP, which was implemented in August 1993, included an extensive set of reforms intended to encourage access to individual health insurance while promoting competition in the non-group market. In principle, the legislation loosened the historical connection between traditional employment and health insurance by facilitating access to a potential source of coverage that was not employer-linked. I find evidence that the IHCP increased self-employment among New Jersey residents, relative to residents of Pennsylvania which did not substantially reform its non-group market over the period in question. This finding is robust to a number of sensitivity checks, including choice of comparison group and length of post-policy period. Consistent with key features of the IHCP, I investigate its impact by marital and health statuses and find more pronounced relationships among individuals for whom the IHCP likely represented a valuable source of alternative coverage. In particular, I find larger average behavioral responses for unmarried individuals, smokers and obese individuals.

1. Introduction

While abundant evidence suggests the availability of health insurance influences labor market choices like the timing of retirement, there is much less research regarding its impact on self-employment decisions. In this paper, I investigate the impact of New Jersey's Individual Health Coverage Plan (IHCP) on the self-employment of its residents. The IHCP, which was implemented in August 1993, included an extensive set of reforms intended to encourage access to individual health insurance, while promoting competition in the non-group market. Chief among these reforms, the IHCP guaranteed the availability and renewability of health insurance purchased in the individual market, while imposing pure community rating on premiums. In principle, the legislation loosened the historical connection between traditional employment and health insurance in the U.S. by facilitating access to a potential source of coverage that was not employer-linked.

Using data from the Behavioral Risk Factor Surveillance System (BRFSS) from 1991 to 1996, I find evidence that the IHCP increased the fraction of New Jersey residents who reported being self-employed, relative to residents of nearby Pennsylvania which did not substantially reform its individual health insurance market over this period. This finding is robust to a number of sensitivity checks, including choice of comparison group, length of post-policy period and model specification. I also allow the impact of the IHCP on self-employment to vary by the degree to which it relaxed the link between traditional employment and health insurance. For example, given that the IHCP guaranteed health insurance availability and renewability in the context of community-rated premiums, one might expect larger behavioral responses from observably less-

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healthy individuals on the assumption that they would otherwise have had more difficulty obtaining health insurance in the individual market. To test this possibility, I allow the impact of the IHCP on self-employment to vary by smoking status and weight-related health. Consistent with expectations, I find evidence of stronger relationships for smokers and clinically obese individuals. In addition, I allow the impact of IHCP to vary by marital status and find estimated effects that are much larger for unmarried individuals who generally do not have an existing source of alternative health insurance coverage via a spouse. That is, I find larger implied effects for a group which, in principle, experienced a greater loosening of the link between health insurance and traditional employment as a result of the IHCP.

The paper proceeds as follows: The following section provides a brief background on why health insurance availability might affect labor market choices and motivates why the IHCP, in particular, may have affected the self-employment decisions of New Jersey residents. Section 3 describes my data, focusing on key variables and my analysis sample. While not a traditional source of employment-related information, the fraction reporting self-employment in the BRFSS closely matches the level reported in the Current Population Surveys (CPS), a more commonly-used source of such information. Section 4 presents my empirical strategy which involves before-and-after comparisons in the context of a difference-in-differences framework. As alluded to above, Pennsylvania is my primary comparison group since it implemented no substantial health insurance reforms over the period in question. I also expand the comparison group to include Mid-Atlantic and Northeastern states that did not enact major health insurance reforms. A key part of my strategy is that I exploit within-state control groups, defined

by health and marital statuses, on the assumption that the IHCP should have differential

impacts on the self-employment decisions of these groups. This assumption is supported

by evidence and intuition which suggest these groups are more likely to experience health

insurance-related job-lock. In essence, I examine the degree to which the IHCP, as a

source of alternative coverage, "unlocked" health insurance-induced attachment to

traditional employment. Section 5 presents my findings and Section 6 concludes the

paper.

2. Background and Motivation

Despite a strong interest in the distribution and determinants of self-employment,

economists have devoted relatively little attention to the role health insurance availability

plays in self-employment decisions. Indeed, there is only one published study on the

topic.[1] This lack of attention is especially surprising in the context of several studies on

the influence of health insurance availability on job mobility. In the remainder of this

section, I first briefly review why health insurance might influence labor market choices,

including self-employment, in the U.S. context. Next, I discuss why the IHCP might

have affected self-employment decisions, focusing on its most relevant features and

providing examples of groups for whom the IHCP likely represented a valuable source of

alternative coverage not linked to traditional employment.

2.1. Why might health insurance availability affect labor market choices?

As is well-known, a majority of working-aged Americans obtain health insurance

coverage as a fringe benefit offered by their employers (Fronstin, 2004). Conditional on

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[1] Holtz-Eakin, Penrod and Rosen (1996) examine the impact of health insurance on the transition from traditional employment to self-employment using panel data. In particular, they compare the characteristics of individuals who transition from traditional to self employment with their counterparts who remained wage earners and conclude that health insurance portability had no systematic effect on this transition.

working for an employer that offers health insurance, it is generally thought that individual coverage is more difficult to obtain and more expensive than equivalent group coverage, due in large part to adverse selection.[2] For example, potential adverse selection leads insurers in the individual market to engage in medical underwriting, a process by which they attempt to gather information on the "riskiness" of applicants. Based on such information, insurers may attach riders or other exclusions on existing conditions, may rate an applicant as "substandard" which results in higher premiums or deny coverage outright.[3] Since individuals who leave jobs with employer-sponsored coverage must eventually forfeit it, the higher costs associated with individual policies, coupled with potential difficulty in obtaining or maintaining coverage, may discourage job mobility (c.f., Cooper and Monheit, 1993; Madrian, 1994; Gruber and Madrian, 1994; Buchmueller and Valletta, 1996). Such immobility may be especially binding for individuals who face relatively high experience-rated premiums in the non-group market (e.g., individuals healthy enough to work, but considered "bad risks" by health insurers) and individuals who lack existing alternative sources of coverage (e.g., unmarried individuals and those ineligible for government-sponsored health insurance). Finally, note that certain individuals, like those with long-term chronic health problems or those who anticipate poor future health, may sort into employment that offers access to group health insurance relatively early in their working lives.

2.2. Why might the IHCP have affected self-employment decisions?[4]

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[2] Here, I am referring to the "loading factor" or portion of the premium beyond expected loss, which is commonly considered the price of health insurance. Relative to group coverage, the loading factor for individual health insurance is much higher, on average (Phelps, 1997).

[3] While there is agreement that such actions occur, there is less agreement over their prevalence in the non-group market (c.f., GAO, 1996; Pollitz et al., 2001; Pauly and Nichols, 2002; GAO, 2002).

[4] This section and the next one draw heavily on two papers by Swartz and Garnick (1999, 2000). Nevertheless, it necessarily omits much detail.

Throughout the 1980s and 1990s, states enacted much legislation to reform various aspects of their individual health insurance markets. Between 1993 and 1996, eight states enacted substantial reform of their non-group markets that included guaranteed issue and some form of community rating (LoSasso and Lurie, 2003).[5] The most comprehensive of these reforms was the Individual Health Coverage Plan (IHCP), which was implemented by New Jersey in August 1993. While the IHCP bundled several policy changes, its overriding goal was to create an individual health insurance market characterized by competition and wider access. In what follows, I describe its key provisions, their intentions, and how the IHCP changed the individual market in New Jersey. The latter is most important since it has implications for whether, to what extent, and for whom the IHCP provided a legitimate alternative to employer-sponsored coverage.

Two of the most prominent features of the IHCP—guaranteed issue and guaranteed renewability—were intended to expand the size and scope of New Jersey's individual health insurance market. As is well-documented, insurers in individual markets often engage in risk selection, including refusing to issue coverage, or doing so only at very high premiums. While these actions are intended to reduce their exposure to adverse selection, they may discourage a broader set of individuals from purchasing individual coverage. In particular, they may discourage individuals who prefer to pursue labor market choices that do not entail health insurance, but value coverage. This is especially relevant in the context of forgoing employer-sponsored coverage, which, if offered, typically is available to all employees and rarely are individuals dropped from

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[5] Chronologically, these eight states include: New York (April 1993), Vermont (July 1993), New Jersey (August 1993), Maine (December 1993), New Hampshire (January 1995), Washington (January 1996), Kentucky (July 1996) and Massachusetts (August 1996).

coverage.[6] To the extent that these provisions reduced the uncertainty of obtaining or

maintaining individual health insurance coverage, they may have encouraged its purchase

among such individuals.[7]

Beyond expanding the size of the market, the IHCP contained provisions aimed at

increasing access for persons with poorer health and for whom affordability of health

insurance was a binding constraint. For example, the IHCP limited exclusion from

coverage on the basis of pre-existing conditions to twelve months. Moreover, after

twelve months with an IHCP plan, the waiting period was waived if an individual desired

to change companies. Perhaps more importantly, the IHCP imposed pure community

rating on premiums, so that all individuals purchasing a given plan from a given carrier

would pay the same rate. Indeed, this differentiates the IHCP from other large state

reforms which implemented weaker forms of community rating. To mitigate the

possibility of losses due to adverse selection, the IHCP transferred pricing power to

insurance carriers, who no longer had to obtain approval from the state to increase

premiums, as was previously the case.[8] Nevertheless, these aspects of IHCP have strong

implications for whose labor market behavior is, in principle, most impacted and I

address this issue in detail in Section 2.4.

To deal with the potential of increased enrollment, the IHCP encouraged entry

into the individual market by requiring that all carriers selling health insurance policies in

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[6] The possibility that individuals who would like to be self-employed but remain in traditional employment
due to uncertainties with the individual market seems especially relevant because consumer information on
individual health insurance market is not particularly good. For example, Pollitz et al. (2001) find that
different carriers in the same market treated identical fictitious applications quite differently. In such an
environment, perceptions of difficulty in obtaining or maintaining coverage are likely relevant.
[7] Strictly speaking, this is not required since individuals may be induced to become self-employed by
initiatives like the IHCP even if they do not purchase health insurance. For example, individuals may
choose self-employment knowing that they will be able to purchase health insurance in the future.
[8] See Swartz and Garnick (1999) for more information on the politics of this particular provision.

New Jersey either offer individual policies or, alternatively, subsidize the losses of those firms that sold them. This provision was intended to increase the number of potentially competing firms in the individual market.[9] As documented by Swartz and Garnick (1999) in extensive interviews with insurance company executives and others, this provision led several carriers, most of them managed care firms, to consider selling policies, rather than subsidizing the losses of other companies they perceived as inefficient.

Two final provisions—standardization of plan offerings and portability of coverage—sought to increase competition among firms more directly. As suggested, the IHCP limited offerings to six standardized plans. These included five indemnity plans with varying degrees of completeness and an HMO plan, which allowed individuals to trade higher out-of-pocket expenses for lower premiums and vice versa.[10] While this was an attempt to eliminate "niche" market behavior, it also may have reduced the information costs associated with the purchase of individual health coverage, while preserving some amount of choice.[11] Such information costs may be especially important in a market like the individual health insurance market, where very few individuals participate and policies are often tailored to specific individuals or small groups, rather than groups.[12] The IHCP also sought to induce competition by providing for portability of coverage between plans offered by different carriers within the system. The intention was that consumer search, and possible subsequent mobility, would

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[9] As I will discuss in greater detail, BCBS was virtually the only provider of individual insurance policies in New Jersey prior to the IHCP.
[10] More complete policies were characterized by higher premiums and lower out-of-pocket costs.
[11] Many believe that niche markets reduce competition in individual insurance markets since they are tailored for very small groups and hence not available more generally.
[12] There is evidence that standardization of plan offerings improved the functioning of the Medigap market.

discipline premiums. While plausible, it seems likely that this provision would be viewed favorably by individuals whose next-best alternative is employer-sponsored coverage since they would not be tied exclusively to any individual carrier.

2.3. Impact of the IHCP on New Jersey's individual health insurance market

While the policy, itself, is quite involved, the relevant question for my analysis is whether the IHCP succeeded in establishing individual coverage as a legitimate alternative to employer-sponsored coverage. More generally, did it effectively loosen the connection between traditional employment and access to health insurance? Relative to the prior regime, where nearly all individual insurance policies were sold by Blue Cross Blue Shield, the answer appears to be "yes", at least in the short-run. For example, as noted by Swartz and Garnick (2000), the number of insurance companies selling policies in New Jersey's individual market increased from effectively one, prior to IHCP, to a maximum of twenty-eight carriers. Beyond numbers, it is clear that the choices available to consumers in the individual market increased markedly after August 1993. As mentioned, the IHCP created six standardized plans which involve different levels of comprehensiveness of coverage. Of the seventeen firms that were selling policies in 1999, twelve sold one of the five indemnity plans and nine sold the proscribed HMO coverage with some firms offering both types of coverage. This differed dramatically from the prior regime where BCBS offered only indemnity coverage and individual policy choices were not uniform across individuals (e.g., smokers were offered different policies than non-smokers).

Another important question is what happened to premiums following the IHCP. During its first two years, premiums fell from levels for comparable policies that were

sold prior to the reform (Swartz and Garnick, 2000). While the hope was that competition in the individual market would continue to reduce premiums over time, there is evidence that they increased modestly over the next two years for some plans and by greater amounts for others. For example, from Q1:1995 to Q4:1996, the lowest real premium for Plan C, an intermediate level of indemnity coverage, and the HMO coverage option increased, respectively, from $127 to $146 per month and from $177 to $183 per month for individual coverage. By contrast, the price of Plan D, which represented the most generous plan offered through the IHCP, increased from $142 to $194 per month for individual coverage over this period. While the latter increase in premiums represents an increase of roughly one-third, it is important to note that these minimum prices were not much greater than average premiums offered via group insurance to employers in the U.S. Northeast.[13] That said, it is possible that some individuals, including already self-employed individuals in "one-life" policies, faced higher premiums because the proscribed IHCP plans that replaced them involved higher levels of coverage and were not allowed to experience rate premiums. While no data are available, it is thought that these plans were a small portion of New Jersey's individual health insurance market (Swartz and Garnick, 1999).

Finally, while total enrollment increased dramatically from roughly 50,000 to over 180,000 in the first two years, it has fallen off since then.[14] By Q4:1996, total enrollment was down to about 160,000. Even more dramatic decreases occurred from Q1:1997 to Q4:2001, with total enrollment falling by roughly half. These declining enrollments suggest that the IHCP has been subject to adverse selection. Indeed,

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[13] These figures refer to single coverage. Differences for family coverage were somewhat larger proportionately. See Swartz and Garnick (2000) for more details.
[14] This paragraph draws heavily on Monheit et al. (2004).

Monheit et al. (2004) present evidence consistent with adverse selection in the IHCP. Falling enrollments, however, like the premium increases noted above, have not occurred uniformly across plans. For example, evidence for adverse selection seems strongest in Plan D, the IHCP's most generous plan. By contrast, there is little evidence of adverse selection with respect to the HMO offering, which itself experienced a dramatic increase in enrollment in the first few years, followed by roughly constant enrollment to the end of 2001.

For my purposes, adverse selection is not a large concern. First, even if adverse selection exists, the individuals responsible for it may be those induced into self-employment by the reform. In other words, any adverse selection may be driven by the behavior I intend to estimate. [15] Since the IHCP imposed pure community rating of premiums, one might expect larger behavioral responses among those who would likely pay higher premiums in the effectively experience-rated individual market that prevailed prior to 1993. As will be seen, I allow the impact of the reform to vary by smoking status and weight-related health as proxies for observable health status. Second, the enrollment declines and larger premium increases that suggest the existence of adverse selection appear to have not started until after the end of my main period of analysis, 1991 to 1996.[16] As noted earlier, I vary the length of my post-policy period, including restricting it to December 1995 and find estimates consistent with my original period.[17]

2.4. Whose labor market choices might be most affected by the IHCP?

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[15] That said, individuals may move into self-employment *prior* to purchasing health insurance with the knowledge that it is now more readily available in the individual market.

[16] In my main models, the pre-policy period is January 1991 to August 1993 and the post-policy period is September 1993 to December 1996. The pre-policy period is constrained since data on New Jersey residents is not available in BRFSS prior to 1991.

[17] I also extend the length of the post-policy period to December 2000 in annual increments.

While the IHCP facilitated access to an alternative source of health insurance coverage generally, it is likely that this was more meaningful for individuals who lacked alternatives to their own employer-sponsored coverage. One example of such a group is unmarried individuals. While married individuals typically are eligible for group health insurance offered by a spouse's employer, unmarried individuals generally do not have this option. By providing access to an alternative source of coverage, the IHCP likely loosened the connection between traditional employment and health insurance for unmarried individuals to a greater extent than their married counterparts. As detailed in Section 4, I allow the impact of the IHCP to vary across individuals by their marital status.[18] If unmarried individuals are indeed more constrained in their choices and if the IHCP provides a plausible alternative, then a greater response among unmarried individuals is expected.

Individuals with lower health status form another group that may have been offered relatively more choice by the IHCP. Such individuals may not qualify for health insurance in the individual market and those who do qualify may be concerned with continuity of coverage or face prohibitively high premiums. By contrast, experience-rating of premiums within the context of employer-sponsored coverage is rare. In conjunction with the guaranteed issue and renewability provisions, limiting exclusion on the basis of pre-existing conditions to one year and, perhaps most importantly, the pure community rating of premiums may have allowed such individuals to pursue labor market options outside the context of traditional employment. In my empirical analysis, I proxy lower health status by whether an individual is a "heavy" smoker, which I define as

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[18] This strategy is similar in spirit to papers that exploit the existence of spousal coverage to examine various labor market implications of health insurance availability (c.f., Madrian (1994), Buchmueller and Valletta (1999) and Chou and Staiger (2001)).

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someone who smokes at least one-half of a pack of cigarettes (i.e., ten cigarettes) per day, for two reasons. First, heavy smoking is correlated with higher current and future medical expenses and, as such, is a characteristic most individual market insurers use to experience-rate premiums. Second, heavy smoking, relative to even "light" smoking, is likely an observable trait. In addition, I proxy lower health status by whether individuals are clinically obese. Like heavy smoking, excess body weight is an observable characteristic correlated with higher health expenditures. As such, it may also deter some individuals from making labor market choices that do not entail access to group health insurance.

3. Data

I use data from the Behavioral Risk Factor Surveillance System (BRFSS) for the years 1991 to 1996. The BRFSS is an annual telephone survey of adults aged eighteen and older from across the United States. While not a traditional source for labor market data, the BRFSS collects a limited set of employment-related information, including employment status. The data have several advantages. Two key features are its relatively large sample sizes and, more importantly, it is representative of state populations by design. Another important advantage is that the BRFSS collects data on health status and health behaviors, unlike traditional sources of employment-related information. For reasons discussed in the previous section, health-related information is desirable since the alternative source of coverage provided by the IHCP may be relatively more valuable to observably less-healthy individuals, due to prior barriers in obtaining coverage in the individual market. In what follows, I compare the self-employment

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information in the BRFSS to corresponding information from a more commonly-used source of employment-related information. Finally, I describe my analysis sample.

3.1. Self-Employment Status

As noted, the BRFSS is not a traditional source for employment-related data. As a result, while respondents are asked about their employment status, the relevant question is very general in nature. In particular, there are eight legitimate responses, including "employed for wages", "out of work for more than one year", "out of work for less than one year", "homemaker", "student", "retired", "unable to work" and, of course, "self-employed". Moreover, there is no information on multiple jobs and no information on intensity of work effort (e.g., hours worked per week). Despite this generality, the proportion reporting self-employment in the BRFSS is quite similar to estimates from a more traditional source of employment-related information. Table 1 compares the fraction self-employed in BRFSS to the March Current Population Surveys from 1994 to 1996. The first column of Table 1 compares self-employment among individuals aged 25-59 years old, which matches the sample I analyze. Corresponding estimates are quite similar (10.2% in BRFSS and 9.6% in the CPS) and this similarity extends across the age distribution with differences converging to equality with age. While the differences are small, the fraction self-employed is consistently lower in the CPS. This is likely due to the additional level of detail in the wording of the relevant CPS question, which asks respondents about the status of their main job held in the previous week.[19] As can be seen, these patterns hold for men and women.

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[19] For example, individuals engaged in both traditional and self-employment may report being self-employed when presented with the more general BRFSS question, even if they are primarily employed in a traditional job.

The repeated cross-sectional nature of my data imply that I can not model specific transitions to self-employment (e.g., from traditional employment to self-employment). As detailed in Section 4, my empirical strategy essentially compares how the fraction self-employed changed following implementation of the IHCP in New Jersey versus Pennsylvania. My inability to model specific transitions is perhaps not as relevant a limitation as it might seem since relatively infrequent labor market transitions are likely subject to substantial measurement error in the context of panel data. That said, the inability to examine specific types of transitions separately implies that I can not pinpoint the source of any policy effect that might be found. Finally, my estimates are not subject to bias from differential sample attrition, as with panel data. This is especially relevant since recent work on self-employment finds that displaced workers are more likely to transition to self-employment than their non-displaced counterparts (Krashinsky, 2004). Perhaps more importantly, this finding suggests that focusing only on the transition from traditional employment will miss much relevant behavior.[20]

3.2. Analysis Sample

The 1991-1996 BRFSS files contain data on 28,472 individuals residing in New Jersey or Pennsylvania. I limit my sample to individuals aged 25 to 59 years old. On the lower end, I intend to exclude individuals who place very low values on health insurance or who have little attachment to the labor force. On the upper end, I aim to avoid measuring behavior driven principally by retirement-related decisions. These age restrictions reduce my sample to 18,409 individuals. Given that I include indicators for missing covariate

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[20] This finding also emphasizes the importance of controlling for economic conditions and, as described in Section 4, I include monthly state unemployment rates in all models.

information, this figure represents my main analysis sample.[21] I also estimate models

that contain no covariates, other than relevant difference-in-differences terms and month

and year indicators, to check whether treating missing covariate information in this

manner affects my estimates. Table 2 presents selected sample characteristics for New

Jersey and Pennsylvania residents for the pre-policy period.

4. Empirical Strategy

Given the nature of the policy change, I employ a difference-in-differences strategy. In

principle, one could compare the fraction self-employed in New Jersey before and after

the IHCP. However, this information alone may be biased due to secular trends in self-

employment or potential confounders such as changing economic conditions. As a result,

a plausible comparison group is needed. I use Pennsylvania residents as an initial control

group since the state did not substantially reform its individual health insurance market

over the period in question.[22] In effect, I compare the before-after change in self-

employment in New Jersey to the same measure for Pennsylvania residents. A standard

regression-based implementation of this approach is as follows:

$$SE_{ijt} = \alpha + \rho POST + \eta NJ + \gamma POST * NJ + X\beta + \tau + \varepsilon_{ijt} \qquad (1)$$

In this context, **SE** represents self-employment status, **POST** is an indicator that equals

one for individuals surveyed between September 1993 and December 1996 and equals

zero for individuals surveyed between January 1991 and August 1993, **NJ** is an indicator

that equals one for New Jersey residents and zero for Pennsylvania residents, **X** is a set of

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[21] Given that I perform several robustness checks, including changing the length of the post-policy period and expanding the comparison group in terms of the states included, I analyze multiple samples subject to these basic restrictions.
[22] My strategy is similar to Buchmueller and DiNardo (2002) who use Pennsylvania residents as a comparison group in assessing adverse selection following the imposition of community rating of premiums in New York.

individual and state-level covariates, including monthly unemployment rates, that may affect self-employment decisions, and τ represents a full set of month and year indicators.[23] The coefficient of greatest interest is γ since it represents the impact of IHCP implementation on self-employment in New Jersey, relative to that of Pennsylvania residents, who were unaffected by these reforms. In addition, I estimate models that vary the length of the post-policy period, as defined above, and expand the comparison group with residents of nearby states that did not experience major reforms in their individual markets over the period in question. All models are estimated with sample weights and all standard errors are clustered by state.

Building on this basic specification, I estimate the impact of the policy change based on characteristics that should affect the degree to which the IHCP relaxed the link between traditional employment and health insurance. I perform two analyses along these lines. First, I estimate equation (1) by marital status since unmarried individuals generally do not have an existing source of alternative coverage via their spouse. Hence, one might expect a larger average response to the policy among unmarried individuals. Second, I estimate the relationship by smoking and clinical obesity statuses, as proxies for observable health status, since the alternative source of coverage provided by the IHCP should be relatively more important to individuals who may have had greater difficulty in obtaining coverage in the individual market before IHCP implementation or, more generally, may have anticipated such difficulty. Indeed, unlike the group market, where de-facto community rating is the norm, it is well-established that smokers pay

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[23] I include monthly unemployment rates since previous work finds that displaced workers, whose numbers will vary with labor market fluctuations, have high rates of entry into self-employment (Farber, 1999; Krashinsky, 2004).

substantially higher premiums than non-smokers.[24] Beyond general interest, observing

more pronounced relationships for such sub-groups should boost the credibility of any

finding that implies increased self-employment in response to the IHCP.

5. Estimates

In what follows, I first present self-employment means for New Jersey, Pennsylvania and

two alternative comparison groups for periods before and after implementation of the

IHCP. I then present regression-based estimates from models which use Pennsylvania

residents as the relevant control group. As discussed, Pennsylvania provides the most

natural comparison group since it experienced no substantial reforms to its health

insurance markets over the period in question and because of its proximity to New Jersey.

Next, I present estimates from two types of sensitivity analyses. First, I expand my

comparison group to include nearby states other than Pennsylvania and, second, I report

results from models that vary the length of my post-policy period. Finally, I estimate

models that exploit within-state control groups that, in principle, should be more

impacted by the reforms inherent in the IHCP. In particular, I allow the impact of the

IHCP on self-employment decisions to vary by marital status and observable health

status, where I proxy the latter by smoking behavior and obesity status.

5.1. Self-employment before and after the IHCP

Table 3 presents the fraction self-employed in New Jersey and Pennsylvania in the period

before the IHCP and the period following it. I define the pre-policy period from January

1991 to August 1993 and the post-policy period is September 1993 to December 1996.

As seen in the table, the fraction of New Jersey residents who report being self-employed

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[24] While I examine differential response by groups defined by smoking and obesity statuses, there are other
groups for whom this logic applies (e.g., individuals whose children have chronic health problems).

prior to the IHCP is somewhat lower than Pennsylvania residents. However, while this

fraction increases only slightly for Pennsylvania residents, it rises considerably for the

New Jersey sample. In particular, moving from the pre- to post-policy period, the

fraction self-employed in Pennsylvania increases from 0.0918 to 0.0932 and the fraction

self-employed in New Jersey increases from 0.0798 to 0.0960, which implies a

difference-in-differences estimate of 0.0148. In other words, the implication is that the

fraction self-employed in New Jersey rose by nearly 1.5 percentage points as a result of

the alternative source of health insurance coverage provided by the implementation of the

IHCP.[25]

5.2. Regression-based estimates

Table 4 presents my main estimates. In particular, it reports estimates of γ in a

regression-based difference-in-differences specification that uses Pennsylvania residents

as the relevant control group. As discussed, this is essentially the purest comparison

group since Pennsylvania experienced no substantial health insurance reforms over the

period in question. The first column of Table 4 presents estimates from a version of

equation (1) that contains no covariates other than the relevant difference-in-differences

terms and full sets of month and year indicators. As expected, the resulting coefficient

estimate corresponds to the difference-in-differences estimate from Table 3. The second

column of Table 4 reports estimates from a specification that adds the covariates listed.

While the addition of these covariates, including state-specific monthly unemployment

rates, lessens the precision with which γ is estimated, the resulting point estimate is very

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[25] Table 3 also presents relevant pre- and post-policy means for two alternate comparison groups, "Mid-
Atlantic" and "Northeast" states, both of which exclude states that experienced similar reforms around the
same time as the IHCP. I discuss related estimates when I perform regression-based robustness checks that
use these two sets of states as alternative comparison groups.

similar to the model without covariates. In particular, the estimate implies that the IHCP increased the fraction self-employed in New Jersey by roughly 1.34 percentage points. Relative to an initial level of self-employment of nearly eight percent, this represents an increase of almost seventeen percent.

Table 5 presents estimates from models that employ alternative comparison groups. In particular, I compare the New Jersey experience to that of two expanded sets comparison states I label "Mid-Atlantic" and "Northeast" states. Mid-Atlantic states include Delaware, Maryland and, of course, Pennsylvania and Northeast states include these Mid-Atlantic states plus Connecticut, Massachusetts, New Hampshire, and Rhode Island. Throughout, I exclude New York, Maine and Vermont residents from the relevant comparison groups because each of these states implemented substantial non-group market reforms that included guaranteed issue and some form of community rating of premiums at roughly the same time as implementation of the IHCP.[26] For convenience, the first two columns of Table 5 repeat estimates of γ from Table 4, where Pennsylvania residents are the relevant control group. Consistent with the observed differences in self-employment means from rows 3 and 4 of Table 3, the relevant estimate from Table 5 suggests the IHCP increased the rate of self-employment in New Jersey, relative to these two sets of nearby states. Moreover, both estimates are quite similar to the estimate from the initial model which uses Pennsylvania as the comparison group. For example, in the models that include covariates the implied impacts of the IHCP on self-employment translate into gains of seventeen and fourteen percent for Mid-Atlantic and Northeast specifications, respectively.

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[26] I include New Hampshire and Massachusetts which implemented similar reforms, but not until 1995 and 1996, respectively. Models that exclude New Hampshire produce estimates that are nearly identical to existing Northeast models.

Table 6 reports estimates from the second type of sensitivity analysis I perform. In particular, I vary the length of the post-policy period in the context of the model that uses Pennsylvania residents as the relevant comparison group. The first column of Table 6 presents estimates from a model that shortens the length of this period to the end of 1995 and the remaining columns sequentially lengthen it by one year until the end of 2000. While estimates of γ are slightly larger than those in Table 4, they are very similar in magnitude and most remain precisely estimated. This pattern of estimates suggests the impact of the IHCP on self-employment in New Jersey was relatively instantaneous and persistent over time. Finally, though not reported, models that use Mid-Atlantic and Northeast states, as defined, as the relevant comparison group yield substantively identical patterns.

5.3. Important heterogeneity in main estimates

As discussed, particular sub-groups should be more likely to respond behaviorally to the IHCP. In particular, I posit that unmarried individuals and observably less-healthy individuals should value the alternative source of coverage provided by the IHCP to a greater extent than their married and healthier counterparts, respectively. With respect to marital status, unmarried individuals are less likely to have an existing alternative source of health insurance because they have no spouse. With respect to health status, it is likely that observably less-healthy individuals faced, or otherwise perceived, greater barriers in obtaining health insurance coverage in the individual market. As a result, the nature of the IHCP reforms which included guaranteed insurability and renewability in the context of pure community rating of premiums and restrictions on pre-existing conditions

exclusions, suggests that less-healthy individuals should value the IHCP to a greater

extent than their healthier counterparts.

Table 7 presents estimates by marital status across the three different comparison

groups originally included in Table 5. Relevant coefficient estimates are uniformly larger

for unmarried individuals, than their married counterparts, consistent with the notion that

the IHCP was more valuable as an alternative source of coverage to individuals who did

not have one available via a spouse.[27] Empirically, this result is consistent in magnitude

and precision across all three comparison groups. There is also evidence that the IHCP

increased self-employment among married New Jersey residents. For example, the Mid-

Atlantic specification provides statistically-precise evidence that implementation of the

IHCP increased the fraction self-employed among married individuals, though the effect

is much smaller in magnitude relative to the corresponding estimate for unmarrieds.

While not precisely estimated, the coefficient estimates in the other two married

specifications indicate similar implied effects.

Table 8 displays estimates by smoking status for the different comparison groups

previously used. Each of the first columns represents non-smokers while the second

columns represent smokers. I label someone as a smoker if they smoke at least one-half

pack of cigarettes per day (i.e., ten cigarettes).[28] I make this restriction since health status

differences must be observable, and while it is likely that light smoking could be hidden

from a potential insurer, it seems unlikely that this level of daily smoking could be

concealed.   The estimates in Table 8 suggest that the effect of the IHCP on self-

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[27] The finding is also similar in spirit to Madrian (1994) who finds that individuals with spousal health insurance are more likely to change jobs than those without it.
[28] As a result, non-smokers include individuals who do not smoke as well as those who smoke less than ten cigarettes per day.

employment decisions is much more pronounced for individuals who smoke at least one-half pack of cigarettes per day. Moreover, estimates of γ for these smokers are nearly identical across the three comparison groups. In addition, there is some evidence of an impact for non-smokers, as defined, but the implied magnitudes are much smaller than for smokers. These estimates, which suggest that the behavioral responses of smokers who can not easily conceal their habit were much larger than those of their non-smoking counterparts, are consistent with the notion that the IHCP provided a more valuable alternative source of coverage to a set of individuals relatively more likely to have difficulty obtaining such coverage pre-reform.[29]

Finally, Table 9 presents estimates by obesity status. Again, estimates from models with alternative comparison groups are presented. Each of the first columns represents non-obese individuals and each of the second columns represents obese individuals. I label someone as obese if they report weight and height such that their implied body mass index is greater than or equal to twenty-eight. While the clinical definition of adult obesity is a BMI of at least thirty, it is well-documented that individuals systematically under-report their weight when it is asked, as in the BRFSS, rather than explicitly measured (Cawley, 1999). Indeed, my own calculations using anthropometric data on height and weight from the third National Health and Nutrition Examination Survey (NHANES III) which was gathered from 1988-1994, a period slightly earlier than mine, suggest that nearly twenty-three percent of individuals are measured to be clinically obese. In my BRFSS samples, roughly the same proportion report an implied BMI of twenty-eight or higher, consistent with individuals under-

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[29] Though not reported, this set of estimates is not very sensitive to the definition of a smoker.

reporting their weight.[30] Using this definition, estimates in Table 9 suggest that while the

IHCP had a systematic effect on non-obese individuals, the magnitude of its impact was

much greater for individuals defined as obese. As with estimates by smoking status,

these are consistent with the notion that the IHCP, as a source of alternative health

insurance coverage, was more valuable to individuals who may have had a more difficult

time obtaining insurance in the individual market prior to its implementation.

6. Conclusions

My main findings, displayed in Tables 4-6, suggest that the IHCP increased self-

employment in New Jersey, relative to three comparison groups, by roughly fifteen to

twenty-five percent. While not trivial, these findings are at the lower end of the range of

estimates with respect to job mobility and retirement which suggest that health insurance

availability, in the many forms studied, increases the relevant behavior by between

twenty-five and fifty percent (Madrian, 2006). Consistent with key features of the IHCP,

I investigate its impact on self-employment by marital, smoking and obesity statuses and

find that my overall results are driven by the behavior of individuals for whom the IHCP

likely represented a valuable alternative source of coverage not linked to traditional

employment. Estimates for these groups, in percentage terms, lie at the upper end of this

range, consistent with the notion that I am more closely identifying those whose behavior

was actually impacted by the policy.

In sum, my findings suggest that health insurance availability increases self-

employment. As such, it contributes to a relatively thin portion of the larger literature

that relates the availability of health insurance to labor market choices. Beyond academic

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[30] By contrast, only about seventeen percent of individuals report a BMI of thirty or greater. Though not reported, estimates for individuals with a BMI of thirty or greater produce substantively similar results to those presented.

interest, my findings have implications for policy since the types of reforms embodied in

the IHCP are consistent with the types of health insurance reforms that are often proposed

and that may become more relevant in the lead-up to the 2008 U.S. Presidential election.

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Table 1. Comparing the fraction self-employed in the BRFSS and CPS, 1994-1996.

Age Group	25-59	25-34	35-44	45-59
All				
BRFSS	0.1024	0.0732	0.1086	0.1258
CPS	0.0963	0.0630	0.1016	0.1238
Men				
BRFSS	0.1321	0.0924	0.1403	0.1649
CPS	0.1256	0.0792	0.1331	0.1653
Women				
BRFSS	0.0733	0.0538	0.0776	0.0883
CPS	0.0677	0.0470	0.0709	0.0846

Notes: The figures in the first column correspond to my analysis sample which includes respondents aged twenty-five to fifty-nine years old.

Table 2. Selected sample characteristics in New Jersey and Pennsylvania, prior to IHCP.

	New Jersey	Pennsylvania
Self Employed	0.080	0.092
Age	39.61	39.96
Male	0.479	0.484
White	0.772	0.882
African-American	0.086	0.078
Hispanic	0.081	0.022
Other Race	0.061	0.028
Less than High School	0.070	0.091
High School	0.302	0.444
Some College	0.248	0.202
University or Higher	0.380	0.263
Married	0.723	0.702
State Unemployment Rate	7.67	7.30
N	2,446	4,036

Notes: Figures are weighted means for the period January 1991 to August 1993, inclusive, which corresponds to my pre-policy period.

Table 3. Fraction self-employed, pre and post-policy: New Jersey vs. various comparison groups.

	Pre-IHCP	Post-IHCP	Difference	Difference-in-Differences
New Jersey	0.0798	0.0960	0.0162	----
Pennsylvania	0.0918	0.0932	0.0014	0.0148
Mid-Atlantic States	0.0884	0.0903	0.0019	0.0143
Northeast States	0.0910	0.0939	0.0029	0.0133

Notes: Figures reported are weighted means. "Pre-IHCP" refers to the time period January 1991 to August 1993 and "Post-IHCP" refers to the period September 1993 to December 1996. "Difference-in-Differences" estimates are calculated relative to the estimated New Jersey difference. Means for "Mid-Atlantic States" do not include New York and "Northeast States" excludes New York, Maine and Vermont. These exclusions are due to similar policies being enacted at roughly the same time as New Jersey's IHCP. See Section 2 of the text for additional details.

Table 4. Impact of health insurance availability on self-employment: NJ vs. PA.

	Difference-in-Differences (1)	With Covariates Listed (2)
Post*New Jersey (γ)	0.0148	0.0134
	(0.0006)	(0.0012)
	[0.0264]	[0.0558]
	{0.185}	{0.168}
New Jersey	-0.0117	-0.0163
	(0.0004)	(0.0006)
Post	-0.0167	-0.0115
	(0.0240)	(0.0168)
Age		0.0072
		(0.0018)
Age Squared		-0.0001
		(0.00002)
Male		0.0638
		(0.0092)
White		0.0128
		(0.0008)
African-American		-0.0154
		(0.0058)
Hispanic		-0.000004
		(0.0115)
Married		0.0134
		(0.0039)
State Unemployment Rate		0.0084
		(0.0075)
Month and Year Dummies	Yes	Yes
N	18,409	18,409

Notes: Sample includes individuals 25 to 59 years old from 1991-1996 BRFSS files. Column (1) presents difference-in-differences estimates, while the model in Column (2) adds the covariates listed as well as a set of indicators for formal education. Implied percentage impacts are in curly brackets; these are computed as the coefficient listed divided by the pre-period fraction self-employed in New Jersey listed in Table 1. Probit marginal effects are nearly identical in all cases. Standard errors, in parentheses, are adjusted for heteroskedasticity and correlation of observations within state cells. Corresponding p-values are in square brackets for γ.

Table 5. Estimated impact of health insurance availability on self-employment status: Multiple comparison groups.

	Pennsylvania		Mid-Atlantic States		Northeast States	
	(1)	(2)	(1)	(2)	(1)	(2)
Post*NJ (γ)	0.0148	0.0134	0.0141	0.0136	0.0132	0.0112
	(0.0006)	(0.0012)	(0.0024)	(0.0017)	(0.0035)	(0.0031)
	[0.0264]	[0.0558]	[0.0010]	[0.0039]	[0.0066]	[0.0081]
	{0.185}	{0.168}	{0.177}	{0.170}	{0.165}	{0.140}
NJ	-0.0117	-0.0163	-0.0084	-0.0157	-0.0113	-0.0120
	(0.0004)	(0.0006)	(0.0035)	(0.0025)	(0.0026)	(0.0015)
Post	-0.0167	-0.0115	-0.0118	-0.0077	-0.0003	0.0016
	(0.0240)	(0.0168)	(0.0147)	(0.0131)	(0.0112)	(0.0097)
Dependent Mean	0.0912	0.0912	0.0894	0.0894	0.0919	0.0919
N	18,409	18,409	40,880	40,880	66,893	66,893

Notes: Samples include individuals 25 to 59 years old from 1991-1996 BRFSS files. The first two columns are repeated from Table 2 for convenience. Model (1) is represents a difference-in-differences model (i.e., no covariates other than month and year dummies) and Model (2) adds controls for age, race, education, marital status and state unemployment rate. The comparsion group "Mid-Atlantic" includes individuals from Delaware, Maryland, and Pennsylvania, and "Northeast" includes these Mid-Atlantic states as well as Connecticut, Massachusetts, New Hampshire, and Rhode Island. Implied percentage impacts are in curly brackets; these are computed as the coefficient listed divided by the pre-period fraction self-employed in New Jersey. Probit marginal effects are nearly identical in all cases. Standard errors, in parentheses, are adjusted for heteroskedasticity and correlation of observations within state cells. Corresponding p-values are in square brackets for γ.

Table 6. Estimated effect of health insurance availability and self-employment, by length of post-period: NJ vs. PA.

	1995		1997		1998		1999		2000	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Post*NJ	0.0179	0.0169	0.0188	0.0184	0.0198	0.0199	0.0169	0.0180	0.0150	0.0174
(γ)	(0.0003)	(0.0014)	(0.0002)	(0.0015)	(0.0002)	(0.0003)	(0.0003)	(0.0004)	(0.0002)	(0.0008)
	[0.0013]	[0.0527]	[0.0056]	[0.0508]	[0.0066]	[0.0099]	[0.0107]	[0.0145]	[0.0085]	[0.0301]
	{0.224}	{0.212}	{0.236}	{0.231}	{0.248}	{0.249}	{0.212}	{0.226}	{0.188}	{0.218}
NJ	-0.0119	-0.0186	-0.0114	-0.0154	-0.0113	-0.0146	-0.0141	-0.0140	-0.0115	-0.0141
	(0.0002)	(0.0009)	(0.0004)	(0.0020)	(0.0003)	(0.0023)	(0.0003)	(0.0010)	(0.0002)	(0.0007)
Post	-0.0151	-0.0077	-0.0187	-0.0149	-0.0169	-0.0142	-0.0161	-0.0142	-0.0151	-0.0135
	(0.0241)	(0.0146)	(0.0237)	(0.0169)	(0.0248)	(0.0196)	(0.0250)	(0.0221)	(0.0215)	(0.0205)
N	13,980	13,980	22,520	22,520	26,484	26,484	30,698	30,698	35,626	35,626

Notes: Samples include individuals 25 to 59 years old. This table presents models that vary the length of the post-period, which extended to the end of 1996 in main models. For example, the two models under the heading "1997" add 1997 observations to the analysis sample, and so forth. Column (1) presents estimates from a difference-in-difference model with only month and year indicators as covariates, while Column (2) adds controls for age, sex, race, education, marital status and state unemployment rate. Implied percentage impacts are in curly brackets; these are computed as the coefficient listed divided by the pre-period fraction self-employed in New Jersey. Probit marginal effects are nearly identical in all cases. Standard errors, in parentheses, are adjusted for heteroskedasticity and correlation of observations within states. Corresponding p-values are in square brackets for γ.

Table 7. Estimated impact of health insurance availability on self-employment status, by marital status: Multiple comparison groups.

	Pennsylvania		Mid-Atlantic States		Northeast States	
	(1)	(2)	(1)	(2)	(1)	(2)
Post*NJ (γ)	0.0052	0.0341	0.0070	0.0299	0.0043	0.0270
	(0.0026)	(0.0031)	(0.0019)	(0.0029)	(0.0036)	(0.0023)
	[0.2891]	[0.0586]	[0.0362]	[0.0020]	[0.2734]	[0.0001]
NJ	-0.0181	-0.0110	-0.0160	-0.0149	-0.0109	-0.0149
	(0.0027)	(0.0030)	(0.0028)	(0.0035)	(0.0022)	(0.0017)
Post	0.0049	-0.0496	0.0039	-0.0337	0.0085	-0.0135
	(0.0190)	(0.0105)	(0.0160)	(0.0115)	(0.0105)	(0.0143)
Dependent Mean	0.0985	0.0862	0.0970	0.0722	0.0994	0.0756
N	11,715	6,694	25,388	15,492	41,335	25,558

Notes: Samples include individuals 25 to 59 years old from 1991-1996 BRFSS files. Models (1) and (2) report estimates for married and unmarried individuals, respectively. All models include controls for age, race, education, and state unemployment rate, in addition to month and year indicators. "Mid-Atlantic States" includes Delaware, Maryland, and Pennsylvania, and "Northeast States" includes the Mid-Atlantic states as well as Connecticut, Massachusetts, New Hampshire, and Rhode Island. All models include individuals for years 1991 to 1996, inclusive. Standard errors, in parentheses, are adjusted for heteroskedasticity and correlation of observations within state cells. Corresponding p-values are in square brackets for γ.

Table 8. Estimated impact of health insurance availability on self-employment status, by smoking status: Multiple comparison groups.

	Pennsylvania		Mid-Atlantic States		Northeast States	
	(1)	(2)	(1)	(2)	(1)	(2)
Post*NJ (γ)	0.0040	0.0502	0.0046	0.0507	0.0022	0.0487
	(0.0018)	(0.0023)	(0.0021)	(0.0013)	(0.0037)	(0.0029)
	[0.2657]	[0.0293]	[0.1176]	[0.0001]	[0.5703]	[0.0001]
NJ	-0.0146	-0.0185	-0.0140	-0.0194	-0.0112	-0.0141
	(0.0012)	(0.0078)	(0.0023)	(0.0054)	(0.0016)	(0.0052)
Post	-0.0074	-0.0257	-0.0053	-0.0171	0.0064	-0.0161
	(0.0113)	(0.0444)	(0.0099)	(0.0304)	(0.0095)	(0.0187)
Dependent Mean	0.0930	0.0843	0.0907	0.0844	0.0938	0.0847
N	14,589	3,820	32,639	8,241	53,321	13,572

Notes: Samples include individuals 25 to 59 years old from 1991-1996 BRFSS files. Models (1) and (2) report estimates for non-smokers (which includes those who smoke less than ten cigarettes per day) and smokers who smoke at least a half-pack (ten cigarettes) per day, respectively. All models include controls for age, race, education, and state unemployment rate, in addition to month and year indicators. "Mid-Atlantic States" includes Delaware, Maryland, and Pennsylvania, and "Northeast States" includes the Mid-Atlantic states as well as Connecticut, Massachusetts, New Hampshire, and Rhode Island. All models include individuals for years 1991 to 1996, inclusive. Standard errors, in parentheses, are adjusted for heteroskedasticity and correlation of observations within state cells. Corresponding p-values are in square brackets for γ.

Table 9. Estimated impact of health insurance availability on self-employment status, by obesity status: Multiple comparison groups.

	Pennsylvania		Mid-Atlantic States		Northeast States	
	(1)	(2)	(1)	(2)	(1)	(2)
Post*NJ (γ)	0.0055	0.0420	0.0083	0.0328	0.0054	0.0299
	(0.0002)	(0.0039)	(0.0025)	(0.0099)	(0.0037)	(0.0082)
	[0.0236]	[0.0583]	[0.0465]	[0.0454]	[0.1816]	[0.0081]
NJ	-0.0200	-0.0063	-0.0211	-0.0028	-0.0163	0.0018
	(0.0009)	(0.0077)	(0.0022)	(0.0058)	(0.0019)	(0.0049)
Post	-0.0216	0.0136	-0.0153	0.0134	-0.0036	0.0172
	(0.0039)	(0.0174)	(0.0128)	(0.0137)	(0.0110)	(0.0086)
Dependent Mean	0.0928	0.0862	0.0914	0.0833	0.0943	0.0845
N	13,992	4,417	30,745	10,135	51,186	15,707

Notes: Samples include individuals 25 to 59 years old from 1991-1996 BRFSS files. Models (1) and (2) report estimates for non-obese and obese individuals, respectively. All models include controls for age, race, education, and state unemployment rate, in addition to month and year indicators. "Mid-Atlantic States" includes Delaware, Maryland, and Pennsylvania, and "Northeast States" includes the Mid-Atlantic states as well as Connecticut, Massachusetts, New Hampshire, and Rhode Island. All models include individuals for years 1991 to 1996, inclusive. Standard errors, in parentheses, are adjusted for heteroskedasticity and correlation of observations within state cells. Corresponding p-values are in square brackets for γ.