Revisiting the Effects of the Affordable Care Act

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The Patient Protection and Affordable Care Act of 2010 allows young adults to stay on their parents' health insurance. Several recent papers use broad age-time difference-in-difference strategies to argue that this provision causes significant health insurance and labor effects. Using both SIPP and CPS data, I estimate models over several "placebo" dates. I show that difference-in-difference regressions with these dates also produce statistically significant "effects" long before the ACA was implemented, even with reduced age bandwidth. This suggests that the effects attributed to the ACA actually reflect overall dynamics in the age-structure of the health insurance and labor markets. (JEL I13, I18, J08)

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I. Introduction

The Patient Protection and Affordable Care Act (ACA), signed into law by President Obama on March 23, 2010, includes a provision mandating that as of September 23, 2010 young adults must be allowed to stay on their parents' health insurance until age 26. Several recent papers study the potential effects of this early provision. They find intuitive results: an increase in the share of individuals with dependent insurance coverage (Akosa Antwi, Moriya, and Simon 2013; O'Hara and Brault 2013; Cantor et al. 2012b; Sommers and Kronick 2012; Sommers et al. 2012), a decrease in the uninsurance rate (Akosa Antwi, Moriya, and Simon 2013; Mulcahy et al. 2013; O'Hara and Brault 2013; Cantor et al. 2012b; Sommers and Kronick 2012), a decreased likelihood of delaying or not obtaining care due to cost (Sommers et al. 2012), an increased likelihood of having a usual source of care (Sommers et al. 2012), and finally increased labor market flexibility (Akosa Antwi, Moriya, and Simon 2013). Unfortunately, as will be demonstrated below, most of these health insurance and labor supply results are not robust to falsification tests.

Econometrically, all of these studies use an age-time difference-in-difference strategy. For example, Cantor et al. 2012b, using the years 2005-2010, compares those age 19-25 to those age 27-30, before and after the 2010 implementation of the parental insurance mandate. Unfortunately, this approach does not satisfy the

crucial assumption for a difference-in-difference analysis, which is that in the absence of treatment the average outcomes for the affected and comparison groups would have followed parallel trends (Bertrand et al. 2004, Abadie 2005). If this condition is not satisfied, the difference in average trends between the affected and comparison groups in the affected time period can confound the effect of the policy, or even suggest a substantial one when none exists (see mathematical appendix for details).

Over the past few decades, the United States has undergone substantial shifts in the structure of its labor force (e.g. see Card and Lemiuex 2000, DiCrecio et al. 2008). Crucially, these shifts have had differential age effects (e.g. see CBO 2004, Bell and Branchflower 2011, O'Higgins 2012), especially during the Great Recession of 2007-2009 (e.g. see Lazear and Spletzer 2012, Dunn 2013), contaminating any age-time difference-in-difference analysis.

[Insert Figure 1 Here]

For example, Figure 1 shows the proportion of individuals who are full-time workers (greater than 30 hours/week), split by affected (19-25) and comparison (16-18, 27-29) ages, with the vertical line representing the implementation of the federal mandate. If this were an appropriate application of a difference-in-difference strategy, then while the two groups would have unequal step changes directly after the implementation, the subsequent trends should be the same.

Unfortunately, though, the two lines to the right of the vertical line are not parallel and have several different peaks and troughs, suggesting substantial labor market differences between those two groups.

This is not only a problem for studying labor supply outcomes with an age-time difference-in-difference strategy. Since many young adults have health insurance coverage (or the option of it) through their employer, this changing labor market also makes it possible that there were group-specific trends in insurance outcomes during the affected time period that would confound any estimates of policy impacts.

It would be extremely challenging to ascertain whether the conclusions in the literature from a pre-2010/post-2010 difference-in-difference are the result of the ACA or from differential trends. Therefore, in lieu of this I will perform earlier-in-time "placebo" regressions tests on three of the most prominent papers on this topic: Sommers and Kronick 2012 (hereafter SK); Cantor et al. 2012b (Cantor); and Akosa Antwi, Moriya, and Simon 2013 (AMS). These falsification tests will use each paper's specification, shifting their temporal windows (i.e. 2005-2010, 2008-2011) backward in time one year at a time. Since the ACA had yet to be enacted, any resulting statistically significant coefficients would likely be due to group-specific trends. The presence of these differential trends in earlier time periods would imply that analogous trends could be confounding the regressions in the literature, and therefore that their age-time difference-in-difference

approach is unable to separate the differential age effects of the ACA from the differential age dynamics in the health insurance and labor markets.

Using this approach, I find that the differential age-time health insurance and employment effects that appear after the ACA is implemented also appear in other time periods, even with a narrower age bandwidth, thus undermining the conclusion that these effects are causal outcomes of the ACA. Rather, they may be a consequence of the changing labor market in the United States.

II. Data

For this analysis I use three public microdata sources: the Annual Social and Economic Supplement (ASEC) of the Current Population Survey (aka the "March CPS") covering years 1999-2010[1], the Survey of Income and Program Participation (SIPP), for 1993-2011, and the monthly Current Population Survey for 1994-2011 (Census 2013a, 2013b, 2013c). I use the March CPS data to replicate SK's and Cantor's results, whereas for AMS I replicate using SIPP data and add the monthly CPS as an additional comparison.

[1] The March Supplement in 2011 underwent a significant change to its imputation procedure so that any non-policy holder in the household can now be coded as a dependent on another household member's plan. Compared to the old routine, estimates derived from the new one reduced the uninsurance rate by 0.5 percentage points (1.5 million people) and increased the rate of any private coverage by 0.5 percentage points (1.7 million people) (Boudreaux and Turner 2011). Microdata going back to only the 2000 survey (reference year 1999) was re-released under this new procedure.

For all three data sources, I pool across waves (as in AMS, SK, and Cantor) and also across SIPP panels (as in Gruber and Madrian 1997, Ham and Shore-Sheppard 2005, Fujita et al. 2007, and Gruber and Simon 2008). I am able to approximately match the results of all three prior papers, demonstrating that the only difference between my placebo regressions and their main regression is the years used.

For health insurance questions, the SIPP data is superior to the March CPS data for the following reasons. SIPP asks a point in time question referring to the interview month. The March CPS asks a retrospective question about the previous year, which causes two potential problems: 1) recall bias where the respondent answers as of the interview month, and 2) even if there is no recall bias it is unclear when in the reference year the respondent is referring to (AMS, Ham and Shore-Sheppard 2005).

Due to the fact that the SIPP is primarily designed as a panel survey, there are significant gaps in the data between the end of one panel and the beginning of the next (i.e. 2000, 2008). As a result, any multi-year placebo time period covering either of these years is incomplete, resulting in fewer potential regressions for comparison.[2] Therefore, as a complement to the SIPP, I also use the basic

[2] In addition to the gaps mentioned above, the 1996 panel does begin until March, and so there is no data for January and February of that year. Rather than dropping the 1993-1996, 1994-1997, and 1995-1998 placebo regressions, I include

monthly CPS for additional labor supply placebo regressions. The CPS covers every month in the entire sample, and as a result allows for several more placebo regressions.[3] Furthermore, whereas the primary purpose of the SIPP is to quantify numerous outcomes for a longer panel of individuals, the basic CPS is designed to quantify labor supply, making it better suited to this analysis.

III. Method

The "placebo regressions" in this paper run the econometric specifications of the three papers mentioned above on earlier time periods (e.g 1993-1997, 1999-2004). Equation 1 shows SK's relatively simple difference-in-difference structure:

$$(1) \qquad Y_{igst} = \alpha + \gamma Treat_g + \delta Implement_t + \eta\ (Treat_g * Implement_t) + \mathbf{A}_{ig} + \boldsymbol{\tau}_t + \varepsilon_{igst}$$

Here, as below in equation 3, Y_{igst} represents various outcomes for individual *i* in age range *g*, state *s* and time *t*. $Treat_g$ represents a dummy for being in the affected age range, which is 19-26, compared to ages 26-34. $Implement_t$ represents a dummy for the year the reform came into effect (2010), compared to

those with the missing months omitted. The lack of these months should not have a differential effect on those in the affected age group compared to the comparison age groups and therefore should not bias the results.

[3] A minor downside is that the labor variables have small definitional differences compared to the ones in the SIPP. These discrepancies, though, are orthogonal to the age and time dimensions of my difference-in-difference strategy and so should not affect the comparison of different CPS placebo regressions to the main regression.

years 2005-2009. $\mathbf{A}_{ig}$ and $\boldsymbol{\tau}_t$ represents age and year fixed effects respectively. Standard errors are clustered at the household level, as the panel structure of the CPS results in each household appearing in two adjacent years.

Equation 2 shows Cantor's specification:

$$(2) \quad Y_{ist} = a_1 + a_2 FED\_TARGET_i + a_3 ST\_TARGET_{is} + a_4 ST\_POLICY_{st} + a_5 TREND_t + \sum_t b_t YEAR_t + c_1(ST\_TARGET_{is} * ST\_POLICY_{st}) + c_2(FED\_TARGET_i * YEAR_{2010}) + \sum_k d_k X_{kit} + \sum_r f_r Z_{rst} + \sum_s g_s STATE_s + \sum_s h_s(STATE_s * TREND_t) + e_{ist}$$

FED_TARGET_i is analogous to $Treat_g$, where here the affected ages are 19-23 (non full-time students) and all those aged 24-25 and the comparison are 27-30. $YEAR_{2010}$ is identical to $Implement_t$., again comparing 2005-2009 to 2010. As above, there are year fixed effects. Cantor adds controls for age (linear in years, not fixed effects), sex, race, education, marital status, poverty ratio, student status, lives with parents, self-reported health, and a linear time trend.

Cantor also adds numerous controls at the state level. Most worrisome to him are the numerous state mandates implemented before the federal mandate. Analogous to the federal mandate difference-in-difference, this specification includes ST_TARGET_{is} (whether an individual is eligible for the state's current or future mandate)[4] and ST_POLICY_{st} (whether the mandate is in effect) and their

[4] Eligibility requirements and effective dates for state mandates are as described in Cantor et al. (2012a).

interaction. Cantor also adds the state-level unemployment (BLS 2013), the share of workers in self-insured employer insurance and share of employers offering health insurance (MEPS 2013a and 2013b) [5], state fixed effects, and state specific time trends. Finally, due to their comprehensive health care programs, Hawaii and Massachusetts are excluded.

AMS' specification is in equation 3:

$$(3)\quad \begin{aligned} Y_{igst} &= \alpha + \gamma Treat_g + \delta Implement_t + \theta Enact_t + \eta\ (Treat_g * Implement_t) \\ &+ \sigma (Treat_g * Enact_t) + \mathbf{X}_{igst}\,\boldsymbol{\beta} + \boldsymbol{\tau}_t + \boldsymbol{\zeta}_s + \varepsilon_{igst} \end{aligned}$$

As opposed to SK and Cantor, AMS' specification is monthly, covering August 2008-November 2011 In addition to a post-implementation dummy as above, they include $Enact_t$ (a dummy for March-September 2010) for when the ACA was enacted but not implemented, and its interaction with $Treat_g$ (which here is 19-25, in comparison to 16-18 and 27-29). This is to control for any anticipatory changes in employer-sponsored policies. For example, a firm whose annual plan year began in this six month period might include young adults before it was mandatory to avoid changing twice in the same year.

$\mathbf{X}_{igst}$ includes age fixed effects, and dummies for sex, race, marital status, student status and a quadratic of household income as a share of federal poverty

[5] In the data for each of 1999-2002, MEPS pools approximately 10 of the least populated states. Therefore, for placebo regressions including any of these years, these states are assigned the average value for all of the pooled states as opposed to the respective value for the individual state.

line. AMS also include monthly linear national and state-specific time trends, the monthly state unemployment rate (and its interaction with $Treat_g$) and state fixed effects. Following from the monthly nature of their survey they include calendar month dummies in $\boldsymbol{\tau}_t$ as well as year fixed effects. Standard errors are clustered at the state level.

As described above, the SIPP data has gaps between panels and so can only be used for a handful of placebo regression. Due to this limitation, I also estimate equation (3) with the CPS monthly survey to perform several more placebo regressions on labor outcomes.[6,7]

With these specifications, and the two data sources previously used (CPS ASEC and SIPP), I am able to both replicate the specifications of the three major papers in this literature. With the addition of the CPS basic, I am able to perform a full

[6] It is difficult to calculate household annual income from the CPS, which is necessary for the poverty ratio control in AMS' specification. The CPS only gives income buckets, which top out at $150,000 ($75,000 before October 2003). I make the assumption that a household's income is the midpoint of the bucket (as in Ramey and Ramey 2009), and that those in the top bucket have annual income of $200,000 ($100,000 before October 2003). In the original AMS results, the coefficient on the square of the poverty ratio is negative while the one on the poverty ratio itself is positive, suggesting an attenuating effect as income increases. This result implies that my specific assumption for the top bucket does not have a large effect on differential labor supply coefficients. Moreover, even if there were an effect, it should not be different for the affected and the comparison age groups and so will not bias the results.

[7] The CPS also is missing the income bucket for about 20% of the observations. To demonstrate that this does not make the sample unrepresentative of the population, I have included the main results without the poverty ratio controls (Appendix Table 1). They show that my conclusions are robust to excluding poverty ratio and its square as control variables.

set of placebo regressions, which ultimately show numerous statistically significant results in earlier time periods.

IV. Results

Primary Placebo Results

Below are the results from performing placebo regressions using the data sources and specifications of SK, Cantor et al., and AMS. Table 1 shows an approximate replication of SK's minimalist regression using CPS ASEC data on health insurance outcomes, where each column represents the same regression on a different 6-year period. For example, the last column (colored grey) – which gives approximately the same results as Table 1 in SK – has 2010 as the affected year and 2005-2009 as the comparison years.[8]

[Insert Table 1 Here]

For each of the seven variables tested, there are significant results in a placebo regression, some at the 5% or even 1% level. For example, there is a 1.7 percentage point increase in employer provided coverage in one's own name in 2006 vs. 2001-2005, which is statistically significant at the 1% level. With this

[8] As described above, the CPS ASEC data for reference year 2010 is considered "affected" since the respondents were answering questions in March 2011 about the previous year and so likely answered with reference to after September 2010 (when the ACA parental insurance mandate took effect).

number of regressions, some spurious results are expected at the 10% (i.e. 1 in 10) or even 5% level (i.e. 1 in 20). Here, though, there are too many of these significant results for them to be false positives. More likely, they suggest underlying age-group-specific trends in health insurance in the "affected" placebo time period. The average difference between these trends would also be measured by SK's difference-in-difference strategy and so could give a strongly significant coefficient in the absence of a policy change (see Mathematical Appendix).

[Insert Table 2 Here]

Table 2 shows the same placebo periods using the same data set, but with Cantor's heavily controlled regression and slightly different age buckets (corresponding to Table 3 in Cantor). As above, there are more statistically significant coefficients (4 at the 5% level and 3 at the 10% level) than can be reasonably attributed to spurious false positives.

The placebo results in Tables 1 and 2 cover a relatively narrow time frame.[9] Using the SIPP data would allow earlier placebo regressions, as the basic question regarding insurance coverage has been consistent. Below, Table 3 shows placebo regressions using SIPP based on AMS's specification. Since this source is

[9] As described above, the March CPS was significantly revised in 2010 and only 1999-2009 data was updated to this new procedure, and so placebo regressions with earlier microdata would not be comparable.

monthly, the placebo periods all start and end with the same months. For example, the last column in Table 3 (colored grey) — which gives results identical to Table 2 in AMS — has November 2008-February 2010 as the comparison time period, March-September 2010 as the enactment period, and October 2010-November 2011 as the implementation period. The first column, on the other hand, uses November 1993-February 1995, March-September 1995, and October 1995-November 1996, respectively.

[Insert Table 3 Here]

For each of the four health insurance variables studied here, there are significant results in placebo time periods. For example, while AMS found a 3.2 percentage point increase in coverage (i.e. the extensive margin), there is 2.3 percentage point increase in 2006-2007 vs. 2004-2006 and a 2.4 percentage point decrease in 1996-1997 vs. 1994-1996, all significant at the 1% level. The other variables also have multiple statistically significant results at that level (e.g. a 3.2 percentage point decrease in own employer coverage in 2004-2005 vs. 2002-2004), despite the fact that the respective questions were not even asked in their current form until 2001 and so only four placebo regressions are possible. Even so, the number of significant results and the fact that several are significant at the 1% level suggest that there are other economic factors measured by this specification. That the

literature (e.g. Ham and Shore-Sheppard 2005) prefers SIPP data over CPS data for health insurance estimates bolsters this result.

One can use both the SIPP and the CPS to study the labor supply consequences of the federal mandate, since each survey asks respondents whether they and their household members are employed and if so how many hours they work. This analysis, in particular, of the labor market effects builds on the literature of "job lock" (Madrian 1994), which is when an employee who otherwise would quit a job does not because the employee would be unable to get the same level of benefits at another job (e.g. due to preexisting conditions or the new job being fewer than full-time hours). This provision of the ACA severs the link between employment and health insurance for young adults, and therefore it is intuitive that it would impact their labor supply decisions.

[Insert Table 4 Here]

Table 4 shows the results of such a placebo analysis using SIPP, corresponding to Table 7 in AMS. For each of the four labor supply variables studied here (employment, full-time employment, hours varying, and hours), there are significant results in placebo time periods. This is especially true in those that compare substantially different labor markets, such as 2002-2004 compared to 2004-2005. There are also significant results for full-time employment in 1994-1997 and 1995-1998. Even the overall probability of being employed, for which

AMS's regression does not show an effect from the ACA, has a significant coefficient in 2001-2004.

Given the limitations of the SIPP pooled dataset described above, Table 4 only allows for a handful of comparisons. Table 5, therefore, uses the CPS instead. Since the CPS ASEC is only performed once a year, the analysis below switches to the monthly basic CPS.

[Insert Table 5 Here]

The results in Table 5, shows every 3 year period starting in 1994 through 2009 (the year after AMS's timeframe) that has significant results.[10] As in the results from using the SIPP, there is a statistically significant reduction in full-time employment during the implementation period of the ACA. However, all four of the labor outcomes tested also have statistically significant coefficients at the 1% level in earlier years (e.g. 1995-1998), some of which even have the opposite magnitude. This suggests again that the relatively narrow age-time specification used here picks up differential age dynamics in the labor market, which could be of either sign. For example, a positive coefficient on hours worked in the 1990s could be due to the fact that during the economic expansion of the 1990s young adults would be more likely to take on more hours than those older (who were

[10] The remaining columns without statistically significant results, cut for space reasons, are in Appendix Table 2.

already working full time) and those younger (who were mostly still in school). The negative coefficient found during the ACA implementation period could also be the result of young adults' hours decreasing more than those older (who have more entrenched jobs) and those younger (who were already working relatively few hours).

Supplemental Placebo Results Using Reduced Age-Bandwidth

One strategy for ameliorating the nonparallel trends in the comparison and affected groups is to reduce the bandwidth in the age dimensions. What follows is the same analysis as above, but now only comparing individuals aged 25 to those aged 27. Conceptually, while still a difference-in-difference approach, this has more of the intuition of a regression discontinuity design.[11]

Tables 6-10 below parallel Tables 1-5 above, here with a heavily reduced age bandwidth.

[Insert Table 6 Here]

Table 6 shows placebo regressions on SK's minimalist specification, comparing only those aged 25 to those aged 27. The most direct effect of the mandate, i.e. employer provided dependent health insurance, remains statistically significant at

[11] Unfortunately, what I gain in robustness, I lose in external validity, as the results below are arguably inapplicable to those in the lower ages of the original affected group (e.g. 19-23).

the 1% level. Unfortunately, though, as in Table 1, the corresponding coefficient for 2001-2005 vs. 2006 is also significant at the 1% level. These results unfortunately again suggest that the effects observed by SK may not be primarily the result of the ACA.

[Insert Table 7 Here]

Table 7 shows a reduced-bandwidth regression using Cantor's more heavily controlled specification. Here the results are marginally more uplifting, as the 4.8 percentage point increase in non-spousal dependent coverage remains strongly significant ($p<0.1\%$), whereas the placebo results are only significant at the 5% level. Furthermore, for the 24 placebo regressions here the expected number of false positive coefficients is 1.2 (=24 *.05) is roughly the actual number (2). Therefore, it is plausible that Cantor's main result is measuring a real economic effect and not merely background activity.

However, as in Table 6, the only strongly significant non-placebo coefficient here is the most direct one: dependent, employer-sponsored health insurance. The extensive margin (i.e. the impact on uninsurance) is no longer statistically significant beyond the 10% level. While part of this could be due to the reduced power of the narrow age bandwidth, Cantor's specification to the best of my knowledge does not cluster standard errors and has nearly 30,000 observations, and so it still should have sufficient power.

[Insert Table 8 Here]

Table 8 is comparable to Table 3, showing the results of placebo regressions on health insurance outcomes using SIPP. This table's main still-standing significant result is consistent with those above: an increase in coverage through parental employer sponsored health insurance of 4.5 percentage points, significant at the 1% level, without any correspondingly statistically significant placebo results. Given that this result has the most direct mechanism to the mandate in the ACA, it is intuitive that it would survive a reduced bandwidth falsification test when the other results from the literature would not. Also, as above, the extensive margin implementation effect (3.5 percentage points) is only significant at the 10% level, and has an almost identical placebo result for 2005-2006 vs. 2003-2005. Furthermore, the 5.1 percentage points results for the "enactment" effect in 2006-2007 vs. 2004-2005 is nearly twice the actual AMS result in magnitude, and significant at the 5% level, suggesting that this AMS result fails the falsification test as well.

[Insert Table 9 Here]

Table 9 parallels Table 4, showing placebo results for an age 25 vs. age 27 regression on labor outcomes using SIPP data. Here only a handful of coefficients are statistically significant, none at the 1% level, suggesting that

estimates of the effect of the ACA on labor outcomes presented in the literature are not robust. This weak result is not due to reduced power from the diminished sample size – for example, the magnitude of implementation effect of working full time is only -0.0003.

[Insert Table 10 Here]

Finally, Table 10 (paralleling Table 5) shows placebo results for reduced-bandwidth regressions on labor outcomes using CPS.[12] Here, there are statistically significant results for the main 2008-2011 time period, without any comparable placebo results. These results are also larger in magnitude and more statistically significant than either the narrow age bandwidth results using the SIPP in Table 9 or the broader age bandwidth results using the CPS in Table 5.

There is also a -2.6 percentage point implementation effect (significant at the 1% level) on the probability of being employed, which is not found in the results in Tables 4, 5, or 9. One explanation for this result is that the federal parental mandate really did have a strong impact on the employment status of young adults, but switching to their parents' insurance (the only consistently significant result) allowed the uninsurance rate to remain unchanged. Regardless of the explanation though, the fact that a narrow age bandwidth finds a strongly

[12] As above, the remaining columns without statistically significant results, cut for space reasons, are in Appendix Table 3.

significant result that a broad bandwidth does not casts further doubt upon the validity of the literature's broad bandwidth approach.

V. Conclusion

This paper shows that we should be cautious about using difference-in-difference methods to examine the health insurance and labor market effects of the Patient Protection and Affordable Care Act's provision that young adults must be able to stay on their parents' health insurance. Several recent papers argue that the ACA caused an increase in health insurance coverage, substitution from own to parental coverage, reduction in full-time employment and hours and an increase in the probability of having varying hours. By running placebo regression with both the SIPP and the CPS, this paper finds statistically significant results for all health insurance and labor outcome variables at various points in time predating the ACA. Several of these placebo results are significant at the 1% percent level, suggesting that they are not Type I errors. Furthermore, they occur both during placebo enactment and implementation phases, which precludes any attempt to decompose the results into these two periods.

Reducing the age bandwidth to only compare 25 year olds (those affected) to 27 year olds does slightly improve the robustness of this approach, though mostly by eliminating the statistical significance of the coefficients. The only result that appears to be robust to placebo regressions, across specifications and data

sources, is the one with the most direct mechanism: the increase in employer sponsored health insurance from one's parents.

Beyond this particular result, there may be other substantial effects that this early provision of the ACA has had on the health insurance and labor supply of young adults. However, given the significant placebo results described in this paper, it is not possible to use a broad age-time difference-in-difference strategy to separate many of the consequences of the ACA from the dynamic background economic environment. Going forward, when studying the impacts of expanded health insurance coverage, it would therefore be more prudent to either use an entirely alternate strategy, such as randomization (as in for example the Oregon Medicaid Experiment, studied in Finkelstein et al. 2012), or at the least use a narrower age bandwidth.

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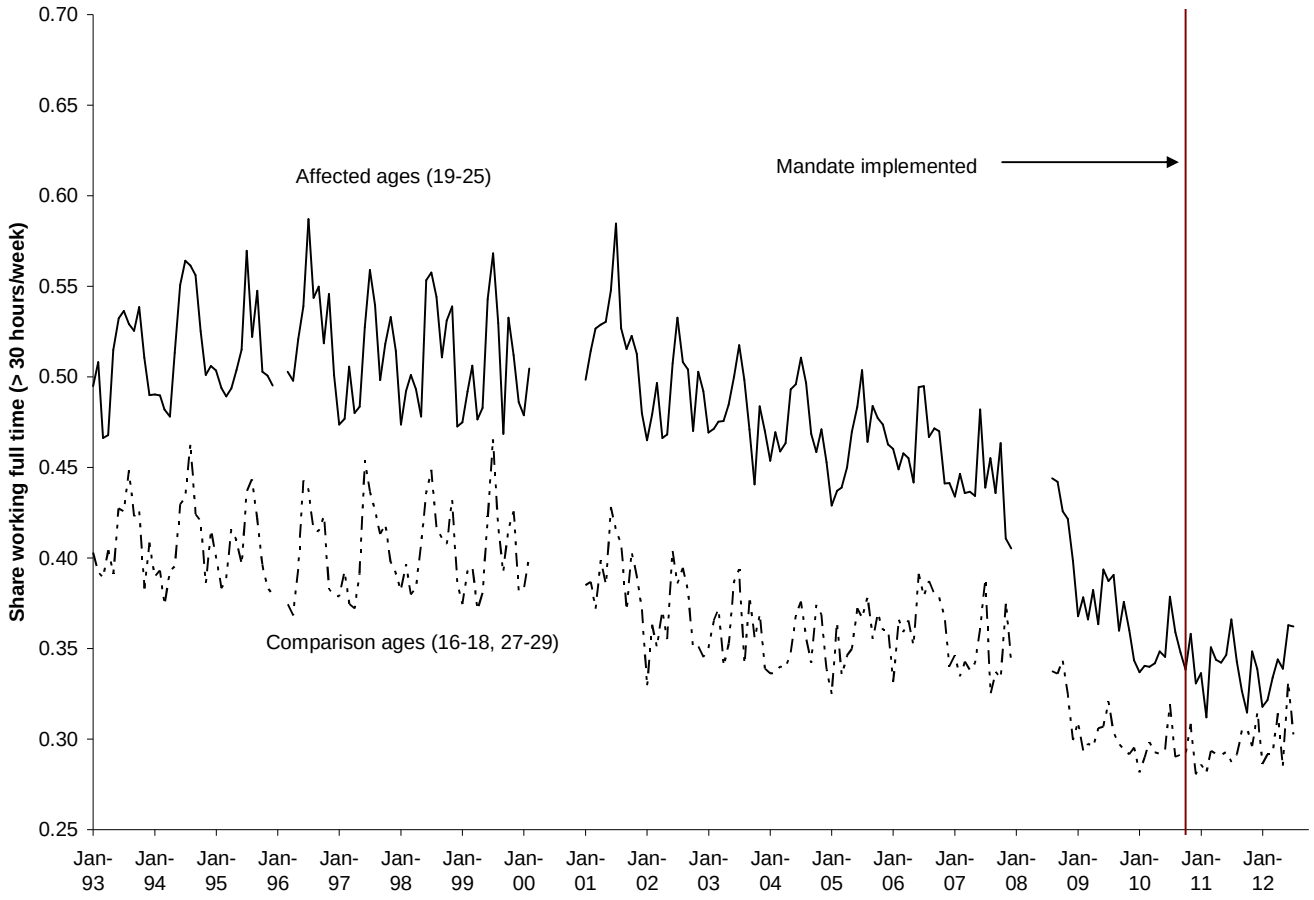

FIGURE 1. SHARE WORKING FULL TIME, SIPP

NOTES: FULL TIME IS DEFINED AS WORKING MORE THAN HOURS/WEEK. WEIGHTED.

TABLE 1—PLACEBO REGRESSION RESULTS USING CPS FOR HEALTH INSURANCE OUTCOMES, MINIMAL CONTROLS (SK)

							SK Results
Comparison period starts	1999	2000	2001	2002	2003	2004	2005
Comparison period ends	2003	2004	2005	2006	2007	2008	2009
Affected year	2004	2005	2006	2007	2008	2009	2010
Dependent variable							
	-0.004	-0.00002	0.01	0.004	0.011*	0.014**	0.03***
Any insurance	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
	-0.009**	-0.004	-0.007*	0.008*	0.006	0.007	0.007
Medicaid	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
	0.001	0.008	0.014**	-0.003	0.006	0.01	0.028***
Private coverage	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Employer provided	0.002	0.008	0.006	0.007	0.005	0.012**	0.043***
(Dependent)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)
Employer provided	-0.001	0.004	0.017***	-0.006	-0.006	0.001	-0.024***
(Own policy)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Directly purchased	-0.004*	0.00003	0.0001	0.0003	-0.0004	0.004*	0.007***
(Dependent)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Directly purchased	-0.005	-0.003	0.002	-0.004	0.004	-0.006**	-0.004
(Own Policy)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
N	244,491	256,998	253,073	249,789	247,558	247,663	247,370

Notes: Data: pooled from 2000-2012 CPS ASEC (i.e. March Supplement), covering reference years 1999-2011. The affected sample is those aged 19-25, whereas the comparison sample is those aged 26-34. Includes age and year fixed effects. Robust standard errors clustered at the household level. Weighted. SK's actual regression highlighted in grey.

Source: Author's calculations using CPS and adapted methodology from SK

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level

TABLE 2—PLACEBO REGRESSION RESULTS USING CPS FOR HEALTH INSURANCE OUTCOMES, MAXIMAL CONTROLS (CANTOR)

							Cantor Results
Comparison period starts	1999	2000	2001	2002	2003	2004	2005
Comparison period ends	2003	2004	2005	2006	2007	2008	2009
Affected year	2004	2005	2006	2007	2008	2009	2010
Dependent variable							
Private-non-spouse	-0.004	0.001	-0.011**	-0.003	-0.003	0.003	0.052***
dependent coverage	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
Private-self or spouse	-0.013*	-0.009	0.013*	-0.002	0.008	0.001	-0.024***
coverage	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
	-0.004	-0.012**	-0.006	0.01*	0.005	0.007	0.006
Public	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)
	0.014**	0.014*	0.0002	-0.002	-0.011	-0.008	-0.032***
None	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)
N	131,349	137,895	135,764	134,505	133,930	134,435	134,009

Notes: Data: pooled from 2000-2012 CPS ASEC (i.e. March Supplement), covering reference years 1999-2011. The affected sample is those aged 19-23 who are not full-time students and all those aged 24-25, whereas the comparison sample is those aged 27-30. Hawaii and Massachusetts are excluded. Includes controls for state policies, age, sex, race, education, marital status, poverty ratio, student status, lives with parents, self-reported health, and state-level unemployment, share of workers in self-insured employer insurance and share of employers offering health insurance. Year and state fixed effects also included, as well as a common and state specific linear time trends. Weighted. Cantor et al.'s actual regression highlighted in grey.

Source: Author's calculations using CPS and adapted methodology from Cantor et al.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level

TABLE 3—PLACEBO REGRESSION RESULTS USING SIPP FOR HEALTH INSURANCE OUTCOMES (AMS)

										AMS results
Start comparison period (August)		1993	1994	1995	1996	2001	2002	2003	2004	2008
Start enactment period (March)		1995	1996	1997	1998	2003	2004	2005	2006	2010
Start implementation period (October)		1995	1996	1997	1998	2003	2004	2005	2006	2010
End implementation period (November)		1996	1997	1998	1999	2004	2005	2006	2007	2011
Dependent variable										
Any source	Enactment effect	0.005	-0.032***	-0.007	-0.013*	0.001	0.0002	0.004	0.012	-0.002
		(0.008)	(0.009)	(0.006)	(0.008)	(0.007)	(0.007)	(0.008)	(0.007)	(0.006)
	Implementation effect	-0.023***	-0.024***	-0.01	-0.01	-0.004	0.006	0.013	0.023***	0.032***
		(0.008)	(0.007)	(0.006)	(0.007)	(0.007)	(0.008)	(0.008)	(0.007)	(0.007)
Employer dep. coverage (through parents)[a]	Enactment effect	No data	No data	No data	No data	-0.001	0.006	0.009	-0.026***	0.024***
						(0.009)	(0.008)	(0.008)	(0.006)	(0.006)
	Implementation effect	No data	No data	No data	No data	0.017***	0.022**	-0.02***	-0.03***	0.07***
						(0.006)	(0.009)	(0.007)	(0.007)	(0.007)
Individually purchased insurance in own name[a]	Enactment effect	No data	No data	No data	No data	0.004	-0.004	-0.001	0.007	0.002
						(0.003)	(0.003)	(0.003)	(0.004)	(0.003)
	Implementation effect	No data	No data	No data	No data	-0.003	-0.008***	0.004	0.014**	-0.008***
						(0.003)	(0.003)	(0.004)	(0.006)	(0.002)
Employer own coverage[a]	Enactment effect	No data	No data	No data	No data	-0.006	-0.007	-0.021***	0.014	-0.017***
						(0.007)	(0.008)	(0.006)	(0.01)	(0.005)
	Implementation effect	No data	No data	No data	No data	-0.018**	-0.032***	-0.004	0.033***	-0.031***
						(0.007)	(0.008)	(0.008)	(0.009)	(0.006)
N		94,526	113,015	128,767	136,873	133,974	146,534	151,933	127,210	150,997

Notes: Data: pooled waves of the 1993, 1996, 2001, 2004, and 2008 SIPP panels, using only the 4th reference month observations. The affected sample is those aged 19-25, whereas the comparison sample is those aged 16-18 and 27-29. Includes controls for age, gender, race/ethnicity, marital status, student status, household income as a share of federal poverty line, monthly linear national and state-specific time trends, the monthly state unemployment rate, an interaction of the treatment dummy variable and the state unemployment rate, year and calendar month, and state fixed effects. Robust standard errors are clustered at the state level. Weighted. AMS' actual regression highlighted in grey.

Source: Author's calculations using SIPP and adapted methodology from AMS.

[a] Only available from 2001 panel onwards.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level

TABLE 4—PLACEBO REGRESSION RESULTS USING SIPP FOR LABOR OUTCOMES (AMS)

										AMS results
Start comparison period (August)		1993	1994	1995	1996	2001	2002	2003	2004	2008
Start enactment period (March)		1995	1996	1997	1998	2003	2004	2005	2006	2010
Start implementation period (October)		1995	1996	1997	1998	2003	2004	2005	2006	2010
End implementation period (November)		1996	1997	1998	1999	2004	2005	2006	2007	2011
Dependent variable										
Probability of being employed	Enactment effect	-0.006	-0.004	0.007	0.0003	-0.0001	0.011	-0.01	-0.009	-0.002
		(0.008)	(0.008)	(0.006)	(0.009)	(0.009)	(0.008)	(0.011)	(0.007)	(0.006)
	Implementation effect	-0.0003	-0.001	0.003	0.0003	0.016**	-0.003	-0.006	0.012	-0.006
		(0.008)	(0.007)	(0.011)	(0.009)	(0.007)	(0.01)	(0.013)	(0.01)	(0.006)
Probability of working full time	Enactment effect	-0.017*	0.018**	-0.01	-0.002	-0.001	0.016*	-0.004	-0.008	-0.015***
		(0.009)	(0.008)	(0.006)	(0.007)	(0.009)	(0.008)	(0.008)	(0.009)	(0.006)
	Implementation effect	-0.007	-0.01	-0.016**	-0.015	-0.001	-0.015*	-0.019**	-0.012*	-0.022***
		(0.006)	(0.007)	(0.007)	(0.009)	(0.008)	(0.007)	(0.009)	(0.006)	(0.007)
Probability of having hours that vary[a]	Enactment effect	No data	No data	No data	No data	0.0002	0.015***	0.008	-0.006	0.014***
						(0.0005)	(0.003)	(0.005)	(0.004)	(0.005)
	Implementation effect	No data	No data	No data	No data	0.015***	0.02***	0.003	-0.003	0.012**
						(0.002)	(0.003)	(0.004)	(0.005)	(0.006)
Hours worked	Enactment effect	-0.28	1.383***	0.052	-0.526	-0.147	1.227***	-0.305	-0.358	-0.474**
		(0.338)	(0.421)	(0.301)	(0.379)	(0.421)	(0.33)	(0.459)	(0.48)	(0.233)
	Implementation effect	0.953***	0.877**	-0.528	-1.151***	0.454	-0.166	-0.791*	-0.432	-0.807***
		(0.322)	(0.35)	(0.337)	(0.359)	(0.399)	(0.343)	(0.453)	(0.404)	(0.258)
N (Employed, Full Time, Hours Vary)		94,526	113,015	128,767	136,873	133,974	146,534	151,933	127,210	150,997
N (Hours, excludes w/ varied hours)		94,526	113,015	128,767	136,873	130,182	139,185	141,629	117,747	137,841

Notes: Data: pooled waves of the 1993, 1996, 2001, 2004, and 2008 SIPP panels, using only the 4th reference month observations. The affected sample is those aged 19-25, whereas the comparison sample is those aged 16-18 and 27-29. Includes controls for age, gender, race/ethnicity, marital status, student status, household income as a share of federal poverty line, monthly linear national and state-specific time trends, the monthly state unemployment rate, an interaction of the treatment dummy variable and the state unemployment rate, year and calendar month, and state fixed effects. Robust standard errors are clustered at the state level. Weigthed. AMS' actual regression highlighted in grey.

Source: Author's calculations using SIPP and adapted methodology from AMS.

[a] Only available from 2001 panel onwards.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

TABLE 5—PLACEBO REGRESSION RESULTS USING CPS FOR LABOR OUTCOMES (AMS)

									AMS period
Start comparison period (August)		1994	1995	1996	1997	2001	2002	2007	2008
Start enactment period (March)		1996	1997	1998	1999	2003	2004	2009	2010
Start implementation period (October)		1996	1997	1998	1999	2003	2004	2009	2010
End implementation period (November)		1997	1998	1999	2000	2004	2005	2010	2011
Dependent variable									
Probability of being employed	Enactment effect	0.006	0.02***	0.007*	0.008*	0.001	0.007*	-0.017**	0.002
		(0.005)	(0.007)	(0.004)	(0.005)	(0.005)	(0.003)	(0.008)	(0.006)
	Implementation effect	0.016**	0.02***	0.016***	0.01**	0.008*	0.013**	-0.015	0.002
		(0.008)	(0.005)	(0.006)	(0.004)	(0.004)	(0.005)	(0.009)	(0.005)
Probability of working full time	Enactment effect	0.009*	0.015***	0.013***	0.008**	0.01***	-0.002	0.004	0.004
		(0.005)	(0.004)	(0.004)	(0.003)	(0.003)	(0.005)	(0.006)	(0.005)
	Implementation effect	0.0001	0.005	0.005	0.001	-0.007*	-0.003	-0.011*	-0.009**
		(0.005)	(0.003)	(0.004)	(0.003)	(0.004)	(0.004)	(0.006)	(0.004)
Probability of having hours that vary	Enactment effect	-0.0004	0.003	0.001	0.002	0.001	0.002	-0.002	0.002
		(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)
	Implementation effect	0.005***	0.005***	0.005**	0.001	0.004***	0.005***	-0.001	0.003
		(0.001)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)	(0.002)
Hours worked	Enactment effect	0.329	0.575***	0.425***	0.281	0.289*	0.064	0.079	0.121
		(0.209)	(0.2)	(0.155)	(0.174)	(0.166)	(0.191)	(0.27)	(0.204)
	Implementation effect	0.048	0.225	0.214	0.052	-0.144	-0.073	-0.354	-0.266
		(0.235)	(0.142)	(0.173)	(0.141)	(0.161)	(0.203)	(0.282)	(0.166)
N (Employed, Full Time, Hours Vary)		794,562	752,779	738,819	729,145	789,231	778,399	788,446	833,590
N (Hours, excludes w/ varied hours)		746,864	705,728	692,966	684,923	741,000	729,978	748,005	791,172

Notes: Data: pooled from 1994-2013 CPS. The affected sample is those aged 19-25, whereas the comparison sample is those aged 16-18 and 27-29. Includes controls for age, gender, race/ethnicity, marital status, student status, household income as a share of federal poverty line, monthly linear national and state-specific time trends, the monthly state unemployment rate, an interaction of the treatment dummy variable and the state unemployment rate, year and calendar month, and state fixed effects. Robust standard errors are clustered at the state level. Weighted. AMS' actual regression highlighted in grey.

Source: Author's calculations using CPS and adapted methodology from AMS.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

TABLE 6—PLACEBO REGRESSION RESULTS USING CPS FOR HEALTH INSURANCE OUTCOMES, MINIMAL CONTROLS, REDUCED AGE BANDWIDTH (SK)

							SK Results
Comparison period starts	1999	2000	2001	2002	2003	2004	2005
Comparison period ends	2003	2004	2005	2006	2007	2008	2009
Affected year	2004	2005	2006	2007	2008	2009	2010
Dependent variable							
	-0.001	-0.017	0.008	-0.006	0.003	0.006	0.028
Any insurance	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
	-0.003	-0.008	-0.013	0.005	-0.002	-0.016	0.022**
Medicaid	(0.01)	(0.01)	(0.01)	(0.01)	(0.011)	(0.011)	(0.011)
	0.005	-0.002	0.017	-0.016	0.004	0.02	0.022
Private coverage	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.019)
Employer provided	0.021	0.002	0.034***	-0.012	-0.003	-0.006	0.04***
(Dependent)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.012)	(0.013)
Employer provided	-0.015	-0.012	0.01	-0.004	0.011	0.014	-0.024
(Own policy)	(0.019)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Directly purchased	0.008*	0.002	-0.008**	-0.001	-0.005	0.003	0.005
(Dependent)	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)
Directly purchased	-0.004	-0.008	-0.002	-0.003	0.0002	-0.006	-0.003
(Own Policy)	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)
N	28,328	29,955	29,939	30,053	30,096	30,452	30,408

Notes: Data: pooled from 2000-2012 CPS ASEC (i.e. March Supplement), covering reference years 1999-2011. The affected sample is those aged 25, whereas the comparison sample is those aged 27. Includes age and year fixed effects. Robust standard errors clustered at the household level. Weighted. SK's actual regression highlighted in grey.

Source: Author's calculations using CPS and adapted methodology from SK

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level

TABLE 7—PLACEBO REGRESSION RESULTS USING CPS FOR HEALTH INSURANCE OUTCOMES, MAXIMAL CONTROLS, REDUCED AGED BANDWIDTH (CANTOR)

							Cantor Results
Comparison period starts	1999	2000	2001	2002	2003	2004	2005
Comparison period ends	2003	2004	2005	2006	2007	2008	2009
Affected year	2004	2005	2006	2007	2008	2009	2010
Dependent variable							
Private-non-spouse	0.019**	0.005	-0.001	-0.018**	-0.007	0.004	0.048***
dependent coverage	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.01)
Private-self or spouse	-0.018	-0.011	0.017	-0.001	0.019	0.004	-0.016
coverage	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
	0.004	-0.012	-0.017	0.006	0.002	-0.017	0.011
Public	(0.012)	(0.011)	(0.011)	(0.011)	(0.012)	(0.012)	(0.012)
	0.003	0.011	-0.006	0.007	-0.008	0.002	-0.029*
None	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.016)
N	27,422	29,014	28,981	29,074	29,113	29,463	29,461

Notes: Data: pooled from 2000-2012 CPS ASEC (i.e. March Supplement), covering reference years 1999-2011. The affected sample is those aged 25, whereas the comparison sample is those aged 27. Hawaii and Massachusetts are excluded. Includes controls for state policies, sex, race, education, marital status, poverty ratio, lives with parents, self-reported health, and state-level unemployment, share of workers in self-insured employer insurance and share of employers offering health insurance. Year and state fixed effects also included, as well as a common and state specific linear time trends. Weighted. Cantor et al.'s actual regression highlighted in grey.

Source: Author's calculations using CPS and adapted methodology from Cantor et al.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level

TABLE 8—PLACEBO REGRESSION RESULTS USING SIPP FOR HEALTH INSURANCE OUTCOMES, REDUCED AGE BANDWIDTH (AMS)

										AMS results
Start comparison period (August)		1993	1994	1995	1996	2001	2002	2003	2004	2008
Start enactment period (March)		1995	1996	1997	1998	2003	2004	2005	2006	2010
Start implementation period (October)		1995	1996	1997	1998	2003	2004	2005	2006	2010
End implementation period (November)		1996	1997	1998	1999	2004	2005	2006	2007	2011
Dependent variable										
Any source	Enactment effect	-0.008	0.013	-0.001	0.024	-0.006	0.005	0.009	0.051**	0.029
		(0.019)	(0.02)	(0.023)	(0.02)	(0.024)	(0.022)	(0.017)	(0.024)	(0.02)
	Implementation effect	-0.009	0.006	0.01	0.012	0.002	-0.001	0.036*	0.013	0.035*
		(0.018)	(0.022)	(0.023)	(0.021)	(0.017)	(0.022)	(0.022)	(0.027)	(0.02)
Employer dep. coverage (through parents)[a]	Enactment effect	No data	No data	No data	No data	-0.006	-0.001	0.007	0.001	0.013
						(0.008)	(0.005)	(0.008)	(0.009)	(0.01)
	Implementation effect	No data	No data	No data	No data	-0.01*	0.006	-0.003	0.004	0.045***
						(0.006)	(0.008)	(0.009)	(0.009)	(0.01)
Individually purchased insurance in own name[a]	Enactment effect	No data	No data	No data	No data	0.001	-0.005	0.005	0.001	0.003
						(0.007)	(0.007)	(0.006)	(0.008)	(0.006)
	Implementation effect	No data	No data	No data	No data	0.003	-0.005	0.007	-0.013	-0.001
						(0.005)	(0.006)	(0.009)	(0.014)	(0.007)
Employer own coverage[a]	Enactment effect	No data	No data	No data	No data	-0.018	0.001	0.016	0.004	0.018
						(0.023)	(0.019)	(0.016)	(0.026)	(0.016)
	Implementation effect	No data	No data	No data	No data	-0.019	0.004	0.023	0.032	-0.006
						(0.018)	(0.022)	(0.02)	(0.032)	(0.022)
N		14,735	17,687	19,980	20,550	19,080	21,146	21,762	18,022	21,616

Notes: Data: pooled waves of the 1993, 1996, 2001, 2004, and 2008 SIPP panels, using only the 4th reference month observations. The affected sample is those aged 25, whereas the comparison sample is those aged 27. Includes controls for age, gender, race/ethnicity, marital status, student status, household income as a share of federal poverty line, monthly linear national and state-specific time trends, the monthly state unemployment rate, an interaction of the treatment dummy variable and the state unemployment rate, year and calendar month, and state fixed effects. Robust standard errors are clustered at the state level. Weighted. AMS' actual regression highlighted in grey.

Source: Author's calculations using SIPP and adapted methodology from AMS.

[a] Only available from 2001 panel onwards.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

TABLE 9—PLACEBO REGRESSION RESULTS USING SIPP FOR LABOR OUTCOMES, REDUCED AGE BANDWIDTH (AMS)

										AMS results
Start comparison period (August)		1993	1994	1995	1996	2001	2002	2003	2004	2008
Start enactment period (March)		1995	1996	1997	1998	2003	2004	2005	2006	2010
Start implementation period (October)		1995	1996	1997	1998	2003	2004	2005	2006	2010
End implementation period (November)		1996	1997	1998	1999	2004	2005	2006	2007	2011
Dependent variable										
Probability of being employed	Enactment effect	-0.015	0.02	-0.016	-0.019	-0.004	0.002	-0.014	-0.027	0.028
		(0.022)	(0.019)	(0.016)	(0.017)	(0.019)	(0.016)	(0.012)	(0.02)	(0.022)
	Implementation effect	-0.003	-0.004	-0.014	-0.005	0.008	-0.017	-0.036**	0.046	0.01
		(0.024)	(0.014)	(0.017)	(0.025)	(0.012)	(0.015)	(0.017)	(0.028)	(0.019)
Probability of working full time	Enactment effect	-0.043*	0.028	-0.026	-0.025	-0.016	-0.011	0.021	-0.042*	-0.002
		(0.023)	(0.023)	(0.018)	(0.02)	(0.025)	(0.019)	(0.018)	(0.022)	(0.025)
	Implementation effect	-0.016	-0.001	-0.014	-0.0005	-0.006	-0.025	-0.044*	0.022	-0.0003
		(0.03)	(0.015)	(0.02)	(0.032)	(0.02)	(0.019)	(0.025)	(0.03)	(0.018)
Probability of having hours that vary[a]	Enactment effect	No data	No data	No data	No data	0.0003	-0.006	-0.009	0.003	0.019
						(0.001)	(0.009)	(0.011)	(0.013)	(0.013)
	Implementation effect	No data	No data	No data	No data	0.004	0.006	0.008	-0.004	0.004
						(0.006)	(0.005)	(0.012)	(0.014)	(0.009)
Hours worked	Enactment effect	-1.502	0.532	-0.115	-1.928	0.369	-0.167	-0.061	-1.205	-0.447
		(0.982)	(0.907)	(0.832)	(1.218)	(0.974)	(1.01)	(0.936)	(1.233)	(1.015)
	Implementation effect	-0.385	0.797	-0.457	-1.231	0.553	-1.485*	-1.746	2.253	0.236
		(1.022)	(0.763)	(1.113)	(1.442)	(0.792)	(0.829)	(1.128)	(1.41)	(0.742)
N (Employed, Full Time, Hours Vary)		14,735	17,687	19,980	20,550	19,080	21,146	21,762	18,022	21,616
N (Hours, excludes w/ varied hours)		14,735	17,687	19,980	20,550	18,637	20,246	20,487	16,812	19,759

Notes: Data: pooled waves of the 1993, 1996, 2001, 2004, and 2008 SIPP panels, using only the 4th reference month observations. The affected sample is those aged 25, whereas the comparison sample is those aged 27. Includes controls for age, gender, race/ethnicity, marital status, student status, household income as a share of federal poverty line, monthly linear national and state-specific time trends, the monthly state unemployment rate, an interaction of the treatment dummy variable and the state unemployment rate, year and calendar month, and state fixed effects. Robust standard errors are clustered at the state level. Weighted. AMS' actual regression highlighted in grey.

Source: Author's calculations using SIPP and adapted methodology from AMS.

[a] Only available from 2001 panel onwards.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

TABLE 10—PLACEBO REGRESSION RESULTS USING CPS FOR LABOR OUTCOMES, REDUCED AGE BANDWIDTH (AMS)

									AMS period
Start comparison period (August)		1994	1995	1996	1997	2001	2002	2007	2008
Start enactment period (March)		1996	1997	1998	1999	2003	2004	2009	2010
Start implementation period (October)		1996	1997	1998	1999	2003	2004	2009	2010
End implementation period (November)		1997	1998	1999	2000	2004	2005	2010	2011
Dependent variable									
Probability of being employed	Enactment effect	0.005	-0.001	0.01	-0.004	-0.002	-0.021*	0.0004	0.013
		(0.012)	(0.009)	(0.009)	(0.008)	(0.012)	(0.011)	(0.011)	(0.008)
	Implementation effect	-0.004	0.003	0.008	-0.009	-0.013	-0.017	-0.005	-0.026***
		(0.01)	(0.008)	(0.008)	(0.008)	(0.011)	(0.012)	(0.012)	(0.009)
Probability of working full time	Enactment effect	0.005	-0.003	0.004	-0.009	-0.006	-0.022	0.005	0.017*
		(0.012)	(0.01)	(0.011)	(0.009)	(0.011)	(0.018)	(0.011)	(0.009)
	Implementation effect	-0.002	-0.002	0.0001	-0.012	-0.02	-0.021	0.003	-0.025**
		(0.01)	(0.01)	(0.009)	(0.007)	(0.014)	(0.014)	(0.013)	(0.01)
Probability of having hours that vary	Enactment effect	0.002	0.001	0.007	0.004	-0.003	-0.0005	0.01*	0.005
		(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.004)
	Implementation effect	0.001	-0.001	0.011**	-0.003	-0.001	0.0004	0.008	0.001
		(0.004)	(0.004)	(0.004)	(0.003)	(0.006)	(0.005)	(0.006)	(0.004)
Hours worked	Enactment effect	0.09	-0.032	0.112	-0.38	-0.274	-0.86	0.211	0.515
		(0.555)	(0.438)	(0.481)	(0.437)	(0.5)	(0.674)	(0.446)	(0.354)
	Implementation effect	-0.116	-0.146	-0.246	-0.299	-0.89	-0.96*	-0.065	-1.178**
		(0.506)	(0.413)	(0.457)	(0.387)	(0.596)	(0.553)	(0.522)	(0.502)
N (Employed, Full Time, Hours Vary)		127,588	120,042	113,742	109,141	115,619	114,768	120,938	127,454
N (Hours, excludes w/ varied hours)		120,048	112,624	106,809	102,645	108,757	107,884	114,503	120,603

Notes: Data: pooled from 1994-2013 CPS. The affected sample is those aged 25, whereas the comparison sample is those aged 27. Includes controls for age, gender, race/ethnicity, marital status, student status, household income as a share of federal poverty line, monthly linear national and state-specific time trends, the monthly state unemployment rate, an interaction of the treatment dummy variable and the state unemployment rate, year and calendar month, and state fixed effects. Robust standard errors are clustered at the state level. Weighted. AMS' actual regression highlighted in grey.

Source: Author's calculations using CPS and adapted methodology from AMS.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

APPENDIX TABLE 1—PLACEBO REGRESSION RESULTS USING CPS WITHOUT INCOME CONTROLS (AMS)

Panel A: Placebo periods starting in 1994-2003											
Start comparison period (August)		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Start enactment period (March)		1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Start implementation period (October)		1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
End implementation period (November)		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Dependent variable											
Probability of being employed	Enactment effect	0.006	0.022***	0.006	0.01**	-0.005	-0.003	-0.01	-0.001	0.006**	0.004
		(0.004)	(0.007)	(0.004)	(0.005)	(0.005)	(0.006)	(0.006)	(0.005)	(0.003)	(0.005)
	Implementation effect	0.017**	0.019***	0.016***	0.01**	0.002	-0.015	-0.008	0.007**	0.011**	0.005
		(0.007)	(0.004)	(0.006)	(0.005)	(0.004)	(0.01)	(0.006)	(0.003)	(0.005)	(0.005)
Probability of working full time	Enactment effect	0.007*	0.018***	0.011***	0.01***	0.005	0.005	0.008	0.009***	-0.001	0.005
		(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)	(0.003)	(0.006)	(0.004)
	Implementation effect	0.001	0.004	0.005	0.001	0.002	-0.002	-0.001	-0.006*	-0.004	0.001
		(0.005)	(0.003)	(0.004)	(0.004)	(0.003)	(0.006)	(0.004)	(0.004)	(0.004)	(0.004)
Probability of having hours that vary	Enactment effect	-0.0002	0.003*	0.001	0.002	-0.003	-0.001	-0.004*	0.0003	0.001	-0.002
		(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	Implementation effect	0.005***	0.005***	0.005**	0.002	0.001	-0.005	-0.003	0.005***	0.005**	0.001
		(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)	(0.001)	(0.002)	(0.002)
Hours worked	Enactment effect	0.277	0.711***	0.351**	0.377**	0.12	0.253	0.125	0.22	0.112	0.179
		(0.168)	(0.198)	(0.151)	(0.171)	(0.174)	(0.169)	(0.196)	(0.167)	(0.195)	(0.173)
	Implementation effect	0.11	0.187	0.191	0.057	0.154	-0.035	-0.123	-0.197	-0.101	-0.011
		(0.213)	(0.13)	(0.189)	(0.147)	(0.11)	(0.238)	(0.193)	(0.154)	(0.179)	(0.184)
N (Employed, Full Time, Hours Vary)		871,794	831,741	821,061	819,427	828,333	861,000	888,580	919,556	914,263	909,269
N (Hours, excludes w/ varied hours)		817,928	778,208	768,531	768,039	777,340	808,420	833,694	861,351	855,151	850,408

Panel B: Placebo periods starting in 2004-2008

						AMS period
Start comparison period (August)		2004	2005	2006	2007	2008
Start enactment period (March)		2006	2007	2008	2009	2010
Start implementation period (October)		2006	2007	2008	2009	2010
End implementation period (November)		2007	2008	2009	2010	2011
Dependent variable						
Probability of being employed	Enactment effect	0.001	0.005	-0.00005	-0.015**	0.002
		(0.005)	(0.004)	(0.006)	(0.007)	(0.005)
	Implementation effect	0.005	0.001	-0.006	-0.016*	0.001
		(0.005)	(0.006)	(0.009)	(0.009)	(0.004)
Probability of working full time	Enactment effect	0.006	0.003	0.002	0.006	0.002
		(0.004)	(0.004)	(0.005)	(0.007)	(0.005)
	Implementation effect	0.0004	-0.006	-0.005	-0.012*	-0.011***
		(0.004)	(0.005)	(0.007)	(0.007)	(0.004)
Probability of having hours that vary	Enactment effect	-0.0001	-0.001	-0.0002	-0.003	0.001
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	Implementation effect	-0.001	-0.002	0.001	-0.002	0.001
		(0.002)	(0.002)	(0.003)	(0.002)	(0.002)
Hours worked	Enactment effect	0.162	0.213	0.031	0.176	0.096
		(0.172)	(0.179)	(0.215)	(0.253)	(0.185)
	Implementation effect	0.093	-0.098	-0.269	-0.346	-0.315**
		(0.19)	(0.219)	(0.306)	(0.279)	(0.143)
N (Employed, Full Time, Hours Vary)		906,110	901,863	898,911	900,200	896,505
N (Hours, excludes w/ varied hours)		849,826	848,795	848,871	852,034	849,765

Notes: Data: pooled from 1994-2013 CPS. The affected sample is those aged 19-25, whereas the comparison sample is those aged 16-18 and 27-29. Includes controls for age, gender, race/ethnicity, marital status, student status, household income as a share of federal poverty line, monthly linear national and state-specific time trends, the monthly state unemployment rate, an interaction of the treatment dummy variable and the state unemployment rate, year and calendar month, and state fixed effects. Robust standard errors are clustered at the state level. Weighted. AMS' actual regression highlighted in grey.

Source: Author's calculations using CPS and adapted methodology from AMS.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

APPENDIX TABLE 2—PLACEBO REGRESSION RESULTS USING CPS, ADDITIONAL COHORTS (AMS)

Start comparison period (August)		1998	1999	2000	2003	2004	2005	2006
Start enactment period (March)		2000	2001	2002	2005	2006	2007	2008
Start implementation period (October)		2000	2001	2002	2005	2006	2007	2008
End implementation period (November)		2001	2002	2003	2006	2007	2008	2009
Dependent variable								
Probability of being employed	Enactment effect	-0.005	-0.004	-0.008	0.004	-0.002	0.007	-0.001
		(0.004)	(0.006)	(0.006)	(0.006)	(0.006)	(0.004)	(0.006)
	Implementation effect	0.001	-0.017*	-0.008	0.002	0.002	0.003	-0.007
		(0.004)	(0.01)	(0.006)	(0.005)	(0.006)	(0.006)	(0.01)
Probability of working full time	Enactment effect	0.007	0.004	0.01*	0.006	0.004	0.005	0.002
		(0.004)	(0.004)	(0.006)	(0.004)	(0.005)	(0.004)	(0.005)
	Implementation effect	0.001	-0.005	-0.001	-0.002	-0.003	-0.005	-0.007
		(0.003)	(0.005)	(0.005)	(0.004)	(0.005)	(0.004)	(0.007)
Probability of having hours that vary	Enactment effect	-0.003	-0.00003	-0.004	-0.002	0.001	-0.002	0.001
		(0.003)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
	Implementation effect	-0.0003	-0.004	-0.003	0.002	-0.002	-0.002	0.001
		(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)
Hours worked	Enactment effect	0.143	0.185	0.17	0.13	0.06	0.301	0.023
		(0.16)	(0.154)	(0.213)	(0.196)	(0.21)	(0.198)	(0.227)
	Implementation effect	0.095	-0.187	-0.092	-0.159	-0.071	-0.026	-0.245
		(0.112)	(0.242)	(0.203)	(0.214)	(0.226)	(0.198)	(0.325)
N (Employed, Full Time, Hours Vary)		729360	752,013	770,255	768,506	762,091	755,162	749,985
N (Hours, excludes w/ varied hours)		686010	707,516	724,147	720,877	716,899	713,059	710,528

Notes: Data: pooled from 1994-2013 CPS. The affected sample is those aged 19-25, whereas the comparison sample is those aged 16-18 and 27-29 Includes controls for age, gender, race/ethnicity, marital status, student status, household income as a share of federal poverty line, monthly linear national and state-specific time trends, the monthly state unemployment rate, an interaction of the treatment dummy variable and the state unemployment rate, year and calendar month, and state fixed effects. Robust standard errors are clustered at the state level. Weighted. AMS' actual regression highlighted in grey.

Source: Author's calculations using CPS and adapted methodology from AMS.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

APPENDIX TABLE 3—PLACEBO REGRESSION RESULTS USING CPS, ADDITIONAL COHORTS, REDUCED AGE BANDWIDTH (AMS)

Start comparison period (August)		1998	1999	2000	2003	2004	2005	2006
Start enactment period (March)		2000	2001	2002	2005	2006	2007	2008
Start implementation period (October)		2000	2001	2002	2005	2006	2007	2008
End implementation period (November)		2001	2002	2003	2006	2007	2008	2009
Dependent variable								
Probability of being employed	Enactment effect	-0.011	0.001	0.011	0.0001	0.002	-0.005	0.008
		(0.009)	(0.009)	(0.01)	(0.012)	(0.012)	(0.011)	(0.011)
	Implementation effect	-0.003	0.003	0.002	0.008	-0.002	-0.008	0.017
		(0.006)	(0.01)	(0.008)	(0.01)	(0.01)	(0.01)	(0.016)
Probability of working full time	Enactment effect	-0.004	0.007	0.011	-0.003	0.011	-0.006	0.01
		(0.011)	(0.008)	(0.011)	(0.014)	(0.013)	(0.013)	(0.011)
	Implementation effect	0.003	0.003	-0.003	0.013	0.002	-0.011	0.011
		(0.007)	(0.012)	(0.009)	(0.011)	(0.012)	(0.01)	(0.016)
Probability of having hours that vary	Enactment effect	-0.004	0.005	-0.001	-0.002	0.001	-0.002	0.003
		(0.004)	(0.004)	(0.005)	(0.005)	(0.006)	(0.005)	(0.006)
	Implementation effect	-0.004	-0.002	-0.006	0.002	-0.006	0.003	0.011*
		(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.007)
Hours worked	Enactment effect	-0.14	0.115	0.05	-0.331	0.315	0.043	0.066
		(0.479)	(0.394)	(0.473)	(0.548)	(0.563)	(0.562)	(0.465)
	Implementation effect	0.464	0.073	-0.403	0.404	0.305	-0.46	0.292
		(0.404)	(0.493)	(0.394)	(0.453)	(0.512)	(0.473)	(0.774)
N (Employed, Full Time, Hours Vary)		106,803	109,932	112,256	114,805	115,418	115,421	114,919
N (Hours, excludes w/ varied hours)		100,618	103,561	105,683	107,929	108,680	108,983	108,781

Notes: Data: pooled from 1994-2013 CPS. The affected sample is those aged 25, whereas the comparison sample is those aged 27 Includes controls for age, gender, race/ethnicity, marital status, student status, household income as a share of federal poverty line, monthly linear national and state-specific time trends, the monthly state unemployment rate, an interaction of the treatment dummy variable and the state unemployment rate, year and calendar month, and state fixed effects. Robust standard errors are clustered at the state level. Weighted. AMS' actual regression highlighted in grey.

Source: Author's calculations using CPS and adapted methodology from AMS.

*** Significant at the 1 percent level.

** Significant at the 5 percent level.

* Significant at the 10 percent level.

Mathematical Appendix

Effect of non parallel trends on difference-in-difference results

Consider the following regression of an outcome variable y_{it} on a constant and a dummy for after a particular time (e.g. September 2010), where *i* denotes an individual and *t* denotes a time.

$$y_{it} = \beta_0 + \beta_1 * (Date_t >= 9/10) + \varepsilon_{it}$$

One can show that

$$\hat{\beta}_1 = \bar{y}_{after} - \bar{y}_{before}$$

meaning that an estimate of β_1 is the difference in the mean (over *i*) of y_{it} for those observations before 9/10 and mean of those observations after 9/10 (see proof below).

Now consider the following canonical difference-in-difference model:

$$y_{it} = \beta_0 + \beta_1 (Group_i = Affected) + \beta_2 * (Date_t >= 9/10)$$
$$+ \beta_3 * (Group_i = Affected) * (Date_t >= 9/10) + \varepsilon_{it}$$

There are two groups, *Affected* and *Comparison* (omitted), and the same two time periods as above. The logistical extension of the expression for the estimate of β_1 from above is that

$$\hat{\beta}_3 = (\bar{y}_{affected,\ after} - \bar{y}_{affected,\ before}) - (\bar{y}_{comparison,\ after} - \bar{y}_{comparison,\ before})$$

We can separate these terms as follows. Each *before* mean is the initial level for that group and then the average trend for that group and in the *before* time period. Each *after* mean is the initial level for that group, the average trend for that group in the *before* time period, the step change for that group due to the policy, and the average trend for that group in the *after* period. Mathematically, the expansion is:

$$\begin{aligned}
&= [(y_{affected,\ 0} + \bar{y}^{trend}_{affected,\ before} + y_{affected,\ policy} + \bar{y}^{trend}_{affected,\ after}) \\
&- (y_{affected,\ 0} + \bar{y}^{trend}_{affected,\ before})] \\
&- [(y_{comparison,\ 0} + \bar{y}^{trend}_{comparison,\ before} + y_{comparison,\ policy} + \bar{y}^{trend}_{comparison,\ after}) \\
&- (y_{comparison,\ 0} + \bar{y}^{trend}_{comparison,\ before})]
\end{aligned}$$

Canceling out where possible (which is the goal in constructing a difference-in-difference) leaves the following terms:

$$= (y_{affected,\ policy} + \bar{y}^{trend}_{affected,\ after} - y_{comparison,\ policy} - \bar{y}^{trend}_{comparison,\ after})$$

which can be rearranged to:

$$= (y_{affected,\ policy} - y_{comparison,\ policy}) + (\bar{y}^{trend}_{affected,\ after} - \bar{y}^{trend}_{comparison,\ after})$$

In an ideal difference-in-difference strategy, $y_{comaprison,policy} = 0$, and

$$\bar{y}^{trend}_{affected,\ after} = \bar{y}^{trend}_{comparison,\ after}$$

which gives

$$\hat{\beta}_3 = y_{affected,\ policy}$$

as desired.

Unfortunately, if these two groups do not have the same average trend in the *after* period, these two terms do not cancel out, and the estimate of β_3 will be biased. Even if the policy has no affect on either group (and so the first two terms above are zero), if the average trend is different for the two groups in the *after* period this strategy could still recover a statistically significant but spurious policy effect. As demonstrated in this paper, this is likely the situation with many of the results in the literature of the effects of the ACA's parental insurance mandate.

Proof that the coefficient on a dummy variable is the difference in means

Below is a proof that the coefficient on a dummy variable is the difference between the mean of the group for which the variable equals 1 and the mean of the group for which the variable equals 0. For example, in the following example equation:

$$y_{it} = \beta_0 + \beta_1 * (Date_t >= 9/10) + \varepsilon_{it}$$

β_1 would be the difference in the mean (over *i*) of y_{it} for those observations before 9/10 and mean of those observations after 9/10. Defining

$$x_{it} = (Date_t >= 9/10)$$

and dropping the *t* subscript (assuming no individual appears in multiple periods), the proof is as follows:

$$\hat{\beta}_1 = S_{XX}^{-1} S_{XY} = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sum_{i=1}^{n}(x_i - \bar{x})^2}$$

$$= \frac{\frac{1}{n}\sum_{i=1}^{n}(x_i y_i - \bar{x}y_i - x_i\bar{y} + \bar{x}\bar{y})}{\frac{1}{n}\sum_{i=1}^{n}(x_i^2 + \bar{x}^2 - 2x_i\bar{x})}$$

$$= \frac{(\frac{1}{n}\sum_{i=1}^{n}x_i y_i) - (\frac{\bar{x}}{n}\sum_{i=1}^{n}y_i) - (\frac{\bar{y}}{n}\sum_{i=1}^{n}x_i) + \bar{x}\bar{y}}{(\frac{1}{n}\sum_{i=1}^{n}x_i^2) - \bar{x}^2}$$

$$= \frac{(\frac{1}{n}\sum_{i=1}^{n}x_i y_i) - \frac{1}{n^2}\sum_{i=1}^{n}x_i\sum_{i=1}^{n}y_i - \frac{1}{n^2}\sum_{i=1}^{n}y_i\sum_{i=1}^{n}x_i + \frac{1}{n^2}\sum_{i=1}^{n}x_i\sum_{i=1}^{n}y_i}{(\frac{1}{n}\sum_{i=1}^{n}x_i^2) - \bar{x}^2}$$

$$= \frac{(\frac{1}{n}\sum_{i=1}^{n}x_i y_i) - \frac{1}{n^2}\sum_{i=1}^{n}x_i\sum_{i=1}^{n}y_i}{(\frac{1}{n}\sum_{i=1}^{n}x_i^2) - \bar{x}^2}$$

Since x_i is a binary dummy variable, $x_i^2 = x_i \quad \forall i$

$$\frac{(\frac{1}{n}\sum_{i=1}^{n}x_i y_i) - \frac{1}{n^2}\sum_{i=1}^{n}x_i\sum_{i=1}^{n}y_i}{(\frac{1}{n}\sum_{i=1}^{n}x_i^2) - \bar{x}^2} = \frac{\frac{1}{n}\sum_{i=1}^{n}x_i y_i - \frac{1}{n^2}\sum_{i=1}^{n}x_i\sum_{i=1}^{n}y_i}{(\frac{1}{n}\sum_{i=1}^{n}x_i) - \bar{x}^2} = \frac{\frac{1}{n}\sum_{i=1}^{n}x_i y_i - \frac{1}{n^2}\sum_{i=1}^{n}x_i\sum_{i=1}^{n}y_i}{\bar{x} - \bar{x}^2}$$

$$= \frac{\frac{1}{n}\sum_{i=1}^{n}x_i y_i - \frac{\bar{x}}{n}\sum_{i=1}^{n}y_i}{\bar{x} - \bar{x}^2}$$

Adding zero to the numerator:

$$= \frac{\frac{1}{n}\sum_{i=1}^{n} x_i y_i - \frac{\bar{x}}{n}\sum_{i=1}^{n} y_i - \frac{\bar{x}}{n}\sum_{i=1}^{n} x_i y_i + \frac{\bar{x}}{n}\sum_{i=1}^{n} x_i y_i}{\bar{x} - \bar{x}^2}$$

$$= \frac{\frac{1}{n}\sum_{i=1}^{n} x_i y_i - \frac{\bar{x}}{n}\sum_{i=1}^{n} x_i y_i - \frac{\bar{x}}{n}\sum_{i=1}^{n} y_i + \frac{\bar{x}}{n}\sum_{i=1}^{n} x_i y_i}{\bar{x} - \bar{x}^2}$$

$$= \frac{\frac{1-\bar{x}}{n}\sum_{i=1}^{n} x_i y_i - \bar{x}(\frac{1}{n}\sum_{i=1}^{n} y_i - \frac{1}{n}\sum_{i=1}^{n} x_i y_i)}{(1-\bar{x})\bar{x}} = \frac{\frac{1}{n}\sum_{i=1}^{n} x_i y_i}{\bar{x}} - \frac{\frac{1}{n}\sum_{i=1}^{n} y_i - \frac{1}{n}\sum_{i=1}^{n} x_i y_i}{1-\bar{x}}$$

$$= \frac{\frac{1}{n}\sum_{i=1}^{n} x_i y_i}{\frac{1}{n}\sum_{i=1}^{n} x_i} - \frac{\frac{1}{n}\sum_{i=1}^{n} y_i - \frac{1}{n}\sum_{i=1}^{n} x_i y_i}{1 - \frac{1}{n}\sum_{i=1}^{n} x_i} = \frac{\sum_{i=1}^{n} x_i y_i}{\sum_{i=1}^{n} x_i} - \frac{\sum_{i=1}^{n} y_i - \sum_{i=1}^{n} x_i y_i}{n - \sum_{i=1}^{n} x_i}$$

$$= \bar{y}_{x_i=1} - \bar{y}_{x_i=0}$$