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Three Essays on the Health Insurance Coverage of Young Adults

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THREE ESSAYS ON THE HEALTH INSURANCE COVERAGE OF YOUNG ADULTS

DISSERTATION

A dissertation submitted in partial fulfillment of
the requirements for the degree of Doctor of Philosophy in the
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at the University of Kentucky

By

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ABSTRACT OF DISSERTATION

THREE ESSAYS ON THE HEALTH INSURANCE
COVERAGE OF YOUNG ADULTS

This dissertation examines the health insurance status of young adults during the transition to adulthood. In a series of three essays, I analyze what happens as young adults reach important milestones and the effects of public policies. The first essay is a descriptive study on how insurance status changes after reaching age 19 and graduating from college. The likelihood of becoming uninsured rises sharply once turning age 19 and then peaks at age 23. While the proportion uninsured also increases following college graduation, this increase disappears after one year. The second essay analyzes the effect of a dependent age law in New Jersey, which allowed dependent coverage for young adults up to age 30 and did not require full-time student status. Pennsylvania did not pass a law and was used as a control state. Among 19-to-22-year olds, there was a rise in health insurance coverage in New Jersey relative to Pennsylvania. There also was a negative effect on college enrollment in New Jersey relative to Pennsylvania. The final essay considers other unintended consequences of dependent age laws. Using a national dataset, I estimate that there were no clear effects on decisions related to living arrangements, marriage, and full-time employment.

KEYWORDS: Higher education, health insurance, dependent eligibility, transition to adulthood, college lock.

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THREE ESSAYS ON THE HEALTH INSURANCE COVERAGE OF YOUNG ADULTS

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Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

One of the most immediate reforms to take place as a result of the Patient Protection and Affordable Care Act of 2010 was a mandate requiring health insurance providers to define a "dependent" as anyone under the age of 26. Prior to the federal law, many states passed their own definitions of a dependent for health insurance purposes. Some states were more generous than the federal definition, others were less generous. In the absence of a law, the conventional norm used to be that dependent coverage was offered to anyone under age 19, or up to age 24 if the young adult was a full-time student. Most of the state laws were enacted from the year 2005 or later. The recent actions by state and federal lawmakers create two questions of particular interest, which include (1) how have these laws affected health insurance coverage among young adults and (2) did these laws have any unintended consequences.

The first essay of the dissertation provides a detailed examination of health insurance coverage by age in the United States. Because of Medicaid and the State Children's Health Insurance Program (SCHIP), the fraction of children and teenagers without health insurance is quite low. Instead, the age group with the highest proportion uninsured would consist of young adults in their twenties, who lack work experience and are too old to benefit from the generous definitions of public insurance programs. Based on March CPS data for the calendar year 2009, the peak age for being uninsured was age 23 with a rate of 35.9 percent. These facts are probably reasons why policymakers have targeted this age group with dependent age laws.

In the first essay, I show the importance of age 19 in regards to health insurance status. Using repeated cross-sectional data, I find that the increase in the proportion

uninsured has become steeper in magnitude since 1990. It is argued that this is due to expansions in income eligibility for Medicaid and SCHIP for those below age 19. When longitudinal data is used to estimate health insurance status for those older than age 19 based on their status before turning 19, I find that initial status matters tremendously. Those who were uninsured prior to age 19 are more likely to be uninsured after age 19 by 30 percentage points in the early months of being age 19. After one year of turning 19, they are more likely to be uninsured by about 10 percentage points. For those initially on Medicaid, they are more likely to become uninsured by 10 to 15 percentage points compared to those who were not on Medicaid initially.

College graduation is also shown as being a key milestone for health insurance purposes in the first essay. Prior to the passage of the federal health care reforms of 2010, the simultaneous loss of student status and dependent eligibility were often given as arguments for the age extension to age 26. Using panel data from two different sources, I show that there is indeed an upward spike in the proportion uninsured by about 5 percentage points (from 12 percent to 17 percent) following graduation from a four-year program. However, this upward spike mostly disappears after the first year following graduation, suggesting that most graduates obtain their own insurance plans during this time.

The second essay begins the analysis of dependent age laws by focusing on an environment in which finding an effect is mostly likely to be experienced. In 2006, the state of New Jersey enacted a law requiring health insurance providers to consider anyone under age 30 a "dependent" as long as he or she was not married and did not have any dependents of his or her own. This law extended dependent eligibility to non-

students, who were previously treated as dependents only if they were full-time students and younger than age 24. In the second essay, the primary concern is whether this new treatment of non-students has any unintended consequence on college enrollment. In other words, does granting a benefit to non-students, which was previously reserved only for students, create an incentive to avoid college. If requiring student status for dependent eligibility promoted college enrollment, an effect that I refer to as "college lock," then a dependent age law should have a negative effect on enrollment.

In addressing the hypothesis of college lock, I use a two-state comparison between New Jersey and Pennsylvania, a neighboring state that did not pass a dependent age law prior to 2010. I find that the dependent age law in New Jersey increased insurance coverage among 19-to-22-year olds in the state relative to those in Pennsylvania. There was some substitution of private dependent coverage for private self-owned coverage, but the estimated change in overall coverage was positive. Larger effects on insurance coverage were found among non-students, who experienced reductions in the likelihood of being uninsured by about 22 to 24 percent.

In regards to college enrollment, there was a decline in New Jersey relative to Pennsylvania by 15 to 24 percent. This effect was primarily found among those with household incomes above 300 percent of the federal poverty line and had a parent working for a small employer with fewer than 100 employees. Further analysis shows that the effect on college enrollment in New Jersey is due to changes in the decision to attend full time versus not attending rather than a shift between full-time and part-time enrollment. Additionally, the effect was stronger on private college enrollment and weaker on public college enrollment.

Since most individual-level datasets do not identify whether someone is enrolled into a two-year or four-year college program, institution-level data was analyzed to address whether New Jersey's dependent age law affected a specific type of program more than others. This is also important because the college lock hypothesis can also be consistent with a scenario in which students finish college earlier, which could include a substitution between two-year and four-year programs. Based on institution-level data, I show that public college enrollment grew faster in New Jersey compared to Pennsylvania, especially for two-year programs. Furthermore, I find that the age distribution of students at two-year programs became younger. Relative to Pennsylvania, there was a 5 percentage point rise in the proportion of New Jersey students who were age 19 or younger.

The third and final essay builds upon the findings of the New Jersey-Pennsylvania study in three ways. First, it looks at older young adults between ages 23 and 25 who have already graduated from college instead of a younger age group that would be within the traditional college age range (ages 19 to 22). Second, it uses a national sample of data instead of only focusing on two states. However, the main contribution is an investigation of other unintended consequences on the transition to adulthood, which involves a look at decisions regarding living arrangements, marriage, and full-time employment. The primary focus is to address a claim that dependent age laws encourage behavior that is characteristic of boomerang children, who return home to live with parents following an initial departure.

The main findings of the third essay reject the notion that dependent age laws discourage the transition to adulthood. While they can be associated with expansions in

health insurance coverage with some substitution between self-owned private coverage and private dependent coverage, they do not have any substantial effects on any other decisions. The largest effects estimated were on the decision to work full time, but were small in magnitude and not statistically different from zero. In addition, the largest effects on full-time employment were positive instead of negative, which would be in the opposite direction of the boomerang child hypothesis. Estimates using panel data suggested that dependent age laws might encourage graduates to find and accept full-time employment within a shorter duration of time following graduation. This could result if dependent coverage under a parent's plan lowers the reservation wage and results in young adults accepting jobs with less compensation instead of conducting a longer job search after graduation.

Chapter 2: Health Insurance Coverage and Transitions: A Descriptive Analysis of Young Adults

2.1. Introduction

Public policies in the United States have had a great influence on health insurance coverage at different stages of life. Few senior citizens lack health insurance as a result of the Medicare program. Since the early 1990s, some expansions in the Medicaid program were targeted specifically at increasing coverage among children and teenagers as old as age 18. However, the age group with the highest proportion uninsured includes young adults in their twenties, who are too old to be eligible for Medicaid or receive private dependent coverage on their parents' insurance plan. For many years, most young adults qualified for dependent coverage until reaching age 19, or 24 if enrolled in college as a full-time student. In the last six years, many states passed laws extending the legal definition of a dependent for health insurance purposes. Levine et al. (2011) and Monheit et al. (2011) found evidence that these laws increased insurance coverage by a small amount.

In September 2010, a federal law was implemented that mandated age 26 as the upper age limit of a dependent. This was one of many provisions in the health care reform legislation known as the "Patient Protection and Affordable Care Act (PPACA)," which was passed in March 2010. In the early stages of the health care reform debate in Congress, some Republicans expressed support for the dependent age extension. Congressman Dave Camp, the ranking Republican member on the House Ways and Means Committee at the time, argued that a Republican proposal to extend dependent coverage up to age 26 would provide health insurance coverage to 7 million young adults.[1] Days before the House of Representatives passed the reconciliation version of

the PPACA with the Senate amendments in a narrow 219 to 212 vote, President Barack Obama described the bipartisan support for the dependent age extension as follows: "If that first job doesn't offer coverage, you're gonna know that you've got coverage. Because as you start your lives and your careers, the last thing you should be worried about is whether you're gonna go broke or make your parents broke just because you got sick. . . . By the way, when you talk to Republicans and you say ' well, are you against this', a lot of them will say 'no, that part's okay.' "[2]

As the legislative landscape has changed over the past two decades, two outcomes worth analyzing include (1) the composition of coverage among young adults at one point in time and (2) the transition away from dependent or subsidized plans as one reaches an important age threshold, such as turning 19 or graduating from college. It is possible that subsidy programs or dependent age laws may have caused higher rates of insurance, but they also may have influenced individuals to substitute between different types of coverage. For instance, higher Medicaid coverage could partially crowd-out some private coverage. Furthermore, higher dependent coverage following an age extension may give the incentive for a 25-year-old to postpone purchasing his own private plan.

The transition away from Medicaid or private dependent coverage also could be affected by the past policy changes if there is state dependence in health insurance status, meaning past experiences of being uninsured or insured affect future experiences.

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[1] Statement came from a press conference by House Republican leaders on July 17, 2009. The press conference can be found at <http://www.cspanvideo.org/program/ 287102-1>.

[2] Statement came from a speech at George Mason University on March 19, 2010. The text of the speech can be found at <http://www.whitehouse.gov/the-press-office/remarks-president-health-insurance-reform-fairfax-virginia>

Three hypotheses that could explain the existence of state dependence among young

adults include preference formation, status quo bias and inertia, and development to financial maturity. The preference-formation hypothesis would suggest that as individuals develop preferences for health insurance and other goods at the present time, they use them in making future purchasing decisions. For instance, a young and healthy individual may choose not to purchase health insurance after developing strong preferences for other goods and services in the past while receiving Medicaid or dependent health insurance coverage. However, someone with an initially identical utility function who had previously purchased his own insurance may not have developed as strong of a preference for other goods. This hypothesis predicts that policies expanding Medicaid and dependent coverage would increase the likelihood of a young adult becoming uninsured after losing eligibility for his previous type of insurance.

As discussed by Samuelson and Zeckhauser (1988), the hypothesis of status quo bias also suggests that individual preferences are important, but with an emphasis on transaction costs. If present, individuals actually may prefer a type of health insurance they do not currently have in the absence of transaction costs, but are not willing to incur the costs of changing policies. These costs could be in the form of search costs required in finding a new optimal policy among many choices, or needing to change health care providers after switching plans. This hypothesis would predict that policies extending eligibility could have different effects on those who originally were covered by Medicaid or dependent coverage and those who were not. Reductions in the proportion uninsured would come primarily from those who originally had Medicaid or dependent coverage, but would have aged-out of them in the absence of the policy change. However, this hypothesis also would allow for the occurrence of a substitution effect between different

types of health insurance, such as selecting a private dependent plan instead of a private self-owned plan.

Another plausible factor that could explain one's transition toward obtaining self-owned private insurance is one's transition toward financial maturity. Levy (2007) found that half of the spike in uninsurance in young adulthood for men could be explained by employment and job tenure characteristics. For women, it was more than half. Most individuals who purchase their own private insurance obtain it from their employer. If state dependence is observed in the health insurance purchasing decisions among young adults, it may be due to disparities in obtaining relatively higher quality jobs following their 19th birthdays or college graduation. In other words, those who take longer to obtain a job with an employer offering health benefits will be more likely to be uninsured over time. Dependent age extensions are more likely to reduce the overall proportion uninsured for individuals described under this scenario.

The primary goal of this paper is to provide a descriptive analysis of how the health insurance status of young adults changes after reaching the two important events, which include turning age 19 and graduating from college. In addition, the existence or non-existence of state dependence will be tested, but without attempting to identify which of the above hypotheses seem to be present. The descriptive analysis in this paper found that while Medicaid coverage has increased and the proportion uninsured has decreased among teenagers below age 19 since 1990, the proportion uninsured increased at a steeper rate following the 19th birthday. Furthermore, the increase in Medicaid coverage among teenagers appeared to be accompanied by reductions in private dependent coverage.

The analysis on college graduates found that the proportion uninsured rises by 5 percentage points shortly following graduation, but it mostly disappears after two years. Additionally, there is a substantial amount of substitution between private self-owned coverage for private dependent coverage within of a year graduation.

2.2. Background and Past Literature

2.2.1. Medicaid expansions to children and teenagers

Prior to 1990, Medicaid expansions were focused primarily on very young children and pregnant women. The first effort to expand Medicaid coverage to teenagers came with the Omnibus Budget Reconciliation Act (OBRA) of 1990 in which the federal government required states to phase in an expansion in age eligility to children between ages 6 and 18 that lived in families at or below the federal poverty level. Full implementation of this gradual expansion was required by 2002. Prior to the 1990 OBRA, the federal government required states to offer Medicaid coverage to children only up to age 6 if they lived in households with incomes no higher than 133 percent of the federal poverty level. States also had the option of receiving matching federal funds if they offered Medicaid coverage for children up to age 8 that they lived in households within 185 percent of the federal poverty level. Some states used their own tax revenues to extend eligibility to even higher levels of household income and ages.

A larger expansion in eligibility for publicly-provided insurance occurred when the State Children's Health Insurance Program (SCHIP) was established after Congress passed the Balanced Budget Act (BBA) of 1997. The SCHIP is a federal block grant program that initially appropriated $40 billion over a decade to states offering health insurance coverage for individuals under age 19 with household incomes below 200

percent of the federal poverty level. Although state participation was voluntary, all states had become participants by July 2000. There were three options that states had for expanding coverage with the federal funds, which included (1) an expansion in their existing Medicaid programs, (2) the creation of a new SCHIP program that was separate from Medicaid, or (3) a combination of both.

Some studies have found that the SCHIP has reduced the rate of uninsurance among children and teenagers. Lo Sasso and Buchmueller (2004) estimated that the SCHIP had a take-up rate around 9 percent with a crowdout effect close to 50 percent. Lurie (2009) found that the SCHIP's effect on uninsurance rates differed by age and was primarily concentrated among teenagers rather than younger children. The SCHIP initially was set to expire in 2007, but was extended for two years. In August 17, 2007, President George W. Bush issued a directive to the Centers for Medicare and Medicaid Services (CMS) requiring states to have 95 percent of children in families earning less than 200 percent of the federal poverty level enrolled in SCHIP before enrolling children in families earning more than 250 percent of the federal poverty level. This became known as the "August 17th directive." In February 2009, Congress passed the Children's Health Insurance Program Reauthorization Act (CHIPRA), which extended SCHIP with over $30 billion in funding until 2013. Shortly after the passage of CHIPRA, President Obama directed the CMS to withdraw the August 17th directive.

2.2.2. Dependent Age Laws

A key federal law that limited the ability of states to regulate health insurance benefits was the Employee Retirement Income Security Act (ERISA) of 1974, which included a provision allowing laws passed by Congress to pre-empt state regulations on

privately-insured health benefit plans. One implication of this pre-emption provision is an exemption of firms that self-insure from state mandates regarding health insurance benefits, including dependent age laws. Hence, the state dependent age laws passed within the last decade only applied to young adults who had parents with employer-provided coverage from firms that did not self-insure. Depending on the state, dependent age laws also could have applied to young adults whose parents purchased insurance in the nongroup market.

The exemption of self-insured firms from state mandates means that state dependent age laws were more likely to affect firms with a small number of workers. Firms with a large number of workers are more likely to self-insure for a number of reasons. Primarily, large firms have the ability to spread the risk of expensive claims over a larger pool of policyholders. Large firms also could be financially more capable of affording the administrative costs of offering self-insured plans.

A timeline of the implementation of state laws can be seen in table 2.1. A common feature found in many recent laws has been the inclusion of non-students in dependent definitions. Of the 24 dependent age laws passed between 2005 and 2009, 20 of the laws allowed young adults who were not students to qualify for dependent eligibility. Common requirements outside of student status include the conditions that a young adult is not married and does not have any dependents of his or her own. Some states, such as Maryland and Virginia, restricted eligibility of non-students to those who live with their parents. Most states set the dependent age limit at 25. The age limits set by the laws passed since 2005 range from 24 to 30.

Prior to 2010, efforts to expand health insurance coverage among young adults

through dependent coverage mandates primarily have been implemented at the state level. Previous efforts by the federal government have been limited to continuation coverage. One example included provisions in the Consolidated Omnibus Budget Reconciliation Act (COBRA) passed in 1986, which allows certain individuals to continue purchasing group health insurance in situations when their coverage would otherwise be terminated. COBRA allows young adults to purchase employer-sponsored health insurance for up to 36 months after losing eligibility for dependent coverage due to age or loss of student status. Employers providing the continuation coverage under COBRA can charge employees 100 percent of the premium and an administrative fee as high as 2 percent.

Another effort by the federal government was "Michelle's Law," which became effective nationwide in 2009. The law loosens the connection between student status and dependent eligibility for those with serious illnesses by requiring the continuation of dependent coverage for full-time college students who take up to 12 months of medical leave from college. The term "medical leave" could refer to either a complete leave of absence from college or a reduction in course load from a full-time to part-time status.

2.3. Data and Descriptive Analysis

Figure 2.1 shows age profiles for the proportion of the US population covered by different types of health insurance in 2009. The data comes from the 2010 March CPS, which is the last full year of data prior to the federal health insurance reforms of 2010. The March CPS asked respondents questions during March 2010 regarding their health insurance status and other demographic characteristics in 2009. An advantage in using this data set is that it is large and nationally representative. The overall number of

respondents in the 2010 survey totaled 209,802 individuals from 97,263 households. The CPS data reported in figures 2.1 through 2.4 are based on the use of sampling weights provided by the Census Bureau.

One clear observation that can be made from figure 2.1 is that the proportions covered by Medicaid and private dependent coverage are at their highest rates for children and teenagers while the proportion uninsured appears to be rather low. The proportion covered by Medicaid is around 40 percent for newborns and then gradually declines to 16.6 percent by age 18. This downward slope in the Medicaid profile appears to get steeper in the late teenage years as many lose eligibility due to age. Private dependent coverage hits its peak at 59 percent at ages 16 and 17, but then falls steeply with each year following age 18. Meanwhile, the proportion uninsured is around 10 percent for children and teenagers, but then increases steeply during the late teenage years. The peak of the uninsured profile is 35.9 percent at age 23.

The profiles mentioned above suggest that dramatic changes occur in the composition of health insurance coverage as individuals approach age 19. In order to get a clearer understanding of the transition around age 19, figures 2.2 and 2.3 focus on the uninsured and Medicaid profiles around a narrower age range. Furthermore, profiles for the years 1990 and 2000 are used to see if changes occurred as the age and income limits of the Medicaid program were raised. The uninsured profile in figure 2.2 shows the proportion uninsured declined steadily for children and teenagers between 1990 and 2009. However, the rise in the proportion uninsured during the late- teenage years became steeper over time. In 1990, 16 percent of 17-year-olds were uninsured compared to 13.6 percent in 2009. This number rose to 26.6 percent for 20-year-olds in 1990

compared to 30.7 percent in 2009. Overall, this suggests that the magnitude of the rise in the proportion uninsured between ages 17 and 20 increased by 6.5 percent points since 1990.

Figure 3 suggests that the Medicaid program may have contributed to the reduction in uninsured children and teenagers. The Medicaid profile appears to rise over time, but especially for those under age 19. An interesting observation is the sharp decline in the 2009 profile between ages 18 and 19. At age 18 in 2009, the proportion covered by Medicaid was 22.9 percent, which declined by 6.3 percentage points after turning 19. The drops after turning 19 were much smaller in 1990 and 2000, which experienced declines by 0.2 and 2.8 percentage points, respectively. This suggests that the steepening of the uninsured profiles over time may be due to the loss of Medicaid eligibility at age 19.

The percentage point changes in the proportion insured between 1990 and 2009 are shown in figure 2.4. Changes are reported according to the type of coverage and age. For ages under 19, there appeared to be a substantial amount of substitution between Medicaid and private dependent coverage. For example, Medicaid coverage rose by 12.7 percentage points for 18-year-olds while dependent coverage fell by 10.2 percentage points. Overall, the proportion uninsured fell by less than one percentage point. Changes occurred in the same direction for the younger ages, but with larger magnitudes.

Ages over 18, however, experienced rises in the proportion uninsured between 1990 and 2009. Nineteen-year-olds experienced a rise by 3 percentage points. A noticeable trend is that the proportion with self-owned private coverage declined with age. Young adults between the ages of 22 and 26 experienced reductions in self-owned coverage ranging between 5 and 10 percentage points. A small part of these reductions may be due to increases in private dependent coverage, which ranged between 1.5 and 3 percentage points. Higher rates of dependent coverage may have resulted from the passage of several state-imposed dependent age laws.

One conclusion that can be made is that while eligibility for Medicaid rose among children and teenagers, Medicaid was not the only type of coverage that experienced substantial changes in enrollment among this age group. In addition, while dependent age laws attempted to increase coverage among those who previously would have aged-out (22-to-26-year-olds), the percentage point changes in dependent coverage were rather small in magnitude compared to the changes in other types of insurance. Overall, something other than the intended effects of the policies appeared to occur, which may include the combination of a crowd-out effect or higher uninsured rates due to state dependence.

Despite which factor is the cause, a steep increase in the proportion uninsured begins at age 19. The next subsection intends to address whether this is due primarily to the loss of Medicaid eligibility or private dependent coverage. This analysis will require having panel data that permits one to observe respondents and their health insurance status before and after turning 19.

2.4. Descriptive Analysis of Transitions

2.4.1. The transition after turning age 19 using panel data

Using panel data, it is possible to analyze if the transition in health insurance status at age 19 differs between those who were initially covered by Medicaid and those who were initially enrolled on their parents' plan. The panel data used in this analysis was obtained from the 2004 panel of the Survey of Income and Program Participation (SIPP), which includes waves 1 through 12. The overall dataset covers a time period that began in October 2003 and ended in December 2007.

The SIPP is a longitudinal survey that provides a nationally-representative sample of the non-institutionalized civilian population in the US. Survey participants are interviewed once every four months and asked questions that can be classified as either core or topical. Core questions are asked to all participants at every interview and intended to produce information about a respondent's demographic background, labor market participation, public program participation, asset ownership, and health insurance status. Topical questions tend to be far more detailed and are asked less frequently than core questions.

During all waves of the 2004 SIPP, there were 2,670 individuals who were observed as they turned age 19. Using data on these individuals, figure 2.5 reports the proportion insured based on the type of insurance and the age of the individual. Unlike the CPS, the SIPP allows one to observe the insurance status in the months leading up to, including, and after an individual's 19^{th} birthday. The time period shown in figure 2.5 corresponds to the twelve months before and after turning 19. Similar to graphs shown earlier, the proportion uninsured increases as the proportions covered by Medicaid and dependent coverage declines. Compared to the last month of being 18 (month = –1),

Medicaid and private dependent coverage are 7.4 and 6.6 percentage points lower at the end of one year of turning 19 (month = +12). At the same time, the proportion uninsured rose by 7.4 percentage points.

Figures 2.6 and 2.7 show the transitions in status around turning 19 for those who always had private dependent or Medicaid coverage while age 18. The sample consisted of 1,474 individuals who always had private dependent coverage while 18. By age 20, the proportion of these individuals who remained on their parents' plans fell by 13.8 percentage points. This coincided with a 7.3 percentage point rise in the uninsured. For the 197 individuals who initially had Medicaid, the transition appeared more likely to result in being uninsured. Figure 2.7 shows a steep reduction in the proportion covered by Medicaid in the months after turning 19, which was equal to 47.7 percentage points. The proportion uninsured rose by 36.2 percentage points for this group.

The SIPP data shown thus far suggests that the sharp rise in the uninsured at age 19 is due to both the loss of private dependent and Medicaid coverage. Although, it appears that those on Medicaid were more likely to become uninsured during the transition. This finding that current insurance status could differ based on past status gives reason to consider the possibility of state dependence, which will be examined more thoroughly in a later section. The next section, however, considers the other key transition period for young adults, which is graduating from college.

2.4.2. The transition after graduating from college using panel data

The analysis of how college enrollment affects insurance status also will use the 2004 SIPP, but will be supplemented with data from the National Longitudinal Survey of Youth 1997 (NLSY 97). The NLSY 97 surveyed 8,984 individuals from 1997 to 2008,

who were born between 1980 and 1984. Unlike the SIPP, responses are measured on a yearly-basis instead of monthly. Questions regarding one's health insurance status were asked between 2002 and 2008, which would have been the time period when most respondents were either entering college or already enrolled. The primary reason for using this dataset is to observe the individuals over longer periods of time compared to what the SIPP would allow. This also will be useful when analyzing state dependence later in the essay.

Combined, the SIPP and NLSY 97 datasets will make it possible study the insurance status transitions in both the short and long runs. However, one disadvantage in the NLSY 97 includes the lack of detail in health insurance questions. The questions asked between 2002 and 2005 only ask whether the young adult has insurance or not. Detailed questions about the type of insurance, such as whether someone has dependent or self-owned coverage, are not asked until the 2006 wave.

Figure 2.8 shows the proportion uninsured based on the years following graduation from a four-year program. This sample consists of 1,927 individuals who were in the NLSY 97 and reported earning a bachelor's degree between 2002 and 2008. The proportion seems to be stable around 12 percent during the four years prior to graduating. However, there is a spike upward during the year of graduation by 5 percentage points to 17.3 percent. In the following four years, the proportion uninsured declines to 13 percent, which is still slightly higher than the pre- graduation rates. Figure 2.9 compares the NLSY 97 to the 2001 and 2004 panels of the SIPP during the twelve months before and after graduation. The two datasets appear to show similar transitions. The higher proportion uninsured during 2001 SIPP could be due to the higher rates

of unemployment experienced in the US during that panel.

A closer look around graduation is seen in figure 2.10, which shows how health insurance status changes during the months immediately before and after graduation. Most students have private coverage, but there is a substantial amount of substitution between dependent and self- owned coverage. Prior to graduating, most students (54.1 percent) have dependent coverage and fewer (29.3 percent) have self-owned plans. This composition changes after leaving college. In fact, it appears that the original proportions for the two types of insurance are switched. By the end of the first year after graduation, 28 percent have dependent coverage compared to 55.7 percent with self-owned coverage. During the same months, the proportion uninsured experienced a net increase by 0.5 percentage points. Overall, the profiles shown in figure 2.10 suggest that most graduates of four-year colleges obtain their own health insurance within a year of graduation. Given this information, efforts to reduce the proportion uninsured by extending dependent age laws are expected to have a small effect on those who graduate from college.

2.5. Empirical Methodology

This section will analyze whether state dependence exists in health insurance status for those who turn 19 or graduate from college. In particular, a fixed-effects model will be used to test whether being uninsured or covered by Medicaid prior to these events affects health insurance status in later time periods. The empirical model that will be estimated is shown in Equation 1. The dependent variable indicates individual i's health insurance status in time period t. Separate models will be estimated for having no insurance, Medicaid, any private coverage, private dependent coverage, and self-owned

private coverage. Using 1996, 2001, and 2004 SIPP panels, the time periods range from four months before an individual turns 19 until the month an individual turns 20-years-old, but successive time periods will be four months apart. Defining the next time period as being four months later is done to avoid seem bias in SIPP responses. Overall, there will be five time periods. The empirical model will include fixed effects for each individual and time period. The excluded time period will be defined as the fourth month prior to turning 19.

[Equation 1] $$y_{it} = \alpha_i + \gamma_t + \sum_{t=1}^{4} \beta_{U,it} U_i D_t + \sum_{t=1}^{4} \beta_{M,it} M_i D_t + \sum_{t=1}^{n} \beta_{k,it} X_{k,it} + \varepsilon_{it}$$

The terms U_i and M_i are dummy variables indicating whether an individual was always uninsured or ever covered by Medicaid in the first six months following his or her 18th birthday. In order to test whether a past health insurance status affects future experiences, these variables are interacted with dummy variables indicating each time period. The empirical model also includes a collection of time-variant independent variables, such as marital status, region of residence, urban residence, the state unemployment rate, full-time student status, and real household income. The error term, ε_{it}, is assumed to be normally-distributed with a mean equal to zero.

Since the initial health insurance status during the first six months of being 18 is likely to be endogenous, an instrumental-variable approach is used. Dummy variables indicating the firm size of a parent's employer are used as instrumental variables for the indicator of always being uninsured in the initial period. These instruments are expected to be valid because larger firms are more likely to offer health insurance relative to smaller firms. In this analysis, a large firm will be defined as one with over 100

employees, a medium firm will be defined as one with at least 25 employees but no more than 99, and a small firm will be defined as having fewer than 25 employees. Past studies have used measures of employer firm-size as instruments for health insurance status. Olson (2002) used a husband's firm size as an instrument for a wife's health insurance status in a study on the labor market performance of married women. Kelly and Markowitz (2009) used the fraction of a state's workforce in different firm-size groups to instrument for an individual's health insurance status in their study on the relationship between insurance status and obesity.

The instrumental variable used for ever having Medicaid in the initial period will be the fraction of the sample who would be eligible based on the law in each observation's state at the time of his or her 18th birthday. This approach is similar to a method used by Cutler and Gruber (1996). The instrumental variable will be referred to as the "fraction eligible," and is supposed to measure the generosity of each state's Medicaid eligibility requirements at the time of an individual's 18th birthday. The first-stage regressions for always being uninsured and ever on Medicaid in the initial period are shown later in the paper. For the purpose of comparison, Equation 1 will be estimated with and without the use of instrumental variables.

2.6. Estimates for State Dependence Effects

2.6.1. Effect of Prior Insurance Coverage on Status After Age 19

The results of fixed-effects model estimations without instrumental variables are shown in table 2.2. They suggest that initially being uninsured tends to have a strong correlation with being uninsured after turning 19. By the 12th month following one's 19th birthday, these individuals tend to be more likely to be uninsured by 10 percentage points

compared to someone who initially had private insurance and was never on Medicaid. The largest drop in coverage appeared to be in the form of Medicaid coverage, which was 9 percentage points lower by the time of one's 20th birthday.

The results in table 2.2 also show that individuals who were initially on Medicaid are likely to lose it after turning 19. By their 20th birthdays, the probability that these individuals are still covered by Medicaid is lower by 22 percentage points. They also are more likely to be uninsured by as much as an additional 14 percentage points. This would suggest that much of the rise in being uninsured at age 19 could be due to young adults losing Medicaid eligibility. It also can be seen that the loss of Medicaid coverage is not accompanied by gains in private coverage. Both dependent coverage and self-owned private coverage appear to decline or stay steady for those who were on Medicaid as an 18-year-old.

The IV results shown in table 2.3 are somewhat similar, but appear to have magnitudes that are slightly smaller than the estimates reported in the previous set of results. As expected, it is estimated that being uninsured prior to age 19 is correlated with being uninsured after turning 19. The coefficients suggest that these individuals are more likely to be uninsured by over 40 percentage points within a year of turning 19. Having Medicaid before turning 19 is estimated to be associated with a 10 percentage point increase in the likelihood of being uninsured within a year of the 19th birthday. Although positive in sign, this estimate is not statistically different from zero

Results from Sargan tests for overidentification also are reported in table 2.3. This test is performed by first obtaining the residuals from the 2SLS estimates and then regressing them on all exogenous variables. The test statistic is the product of the total

number of observations and the R-squared from the residual regression. Each test had a p-value below 0.001, which would indicate that at least one of the instruments used in the two-stage least squares estimation was not exogenous. It is possible that the firm size of a parent's employer could be endogenous and correlated with the likelihood of being uninsured after age 19 if parents with children are more prone to seek employment from larger firms compared to adults without any children.

The first-stage regression results for the initial status are shown in table 2.4. Both the size of a parent's employer and the simulated eligibility for Medicaid variables seem to affect the endogenous initial conditions. Having a parent working for a large- or medium-sized firm reduces the likelihood of always being uninsured in the first six months of being age 18. However, only the effect of working at a large firm is statistically significant. The simulated fraction eligible variable has a strong correlation with the likelihood of being on Medicaid among 18-year-olds. The coefficient on this instrumental variable suggests that if a state expanded eligibility from zero percent of the 18-year-old population to 50 percent of it, participation in Medicaid among 18-year-olds would grow by roughly 9.5 percentage points. The corresponding t-statistic on this coefficient had a magnitude of 6.3

2.6.2. Effect of Prior Insurance Coverage on Status After College Graduation

Similar fixed-effects models were estimated using NLSY 97 data. Instead of analyzing insurance status around age 19, the estimations with NLSY 97 data were used to study what happens after college graduation. The time periods in the model ranged from the year of graduation to the fourth year following it. The main question of interest was whether being uninsured in the year before graduation affects the likelihood of being

uninsured after graduation. Since the NLSY 97 does not ask questions indicating the specific type of insurance an individual has until its last three interview years, the only dependent variable that will be modeled is whether an individual is uninsured or not.

Further limitations in the NLSY 97 present a need to find an IV different from the two used earlier. Since the NLSY 97 does not indicate a respondent's state of residence, any IV technique based on state eligibility rules for Medicaid will not be possible. Furthermore, the survey does not indicate the firm size of a parent's employer. As an alternative, quarter of birth will be used as an IV for being uninsured in the year before graduation. If students born in the first and second quarters are more likely to turn age 24 before graduation, they are at a greater risk of losing dependent coverage before graduating.

Similar to the results using SIPP data, the results vary greatly based on whether the IV method was used or not. Without the use of birth-quarter IVs, the results suggest that those uninsured before graduation were more likely to be uninsured after graduation by somewhere between 7 and 12 percentage points. The results based on the fixed effects model with IVs estimates that the likelihood of being uninsured is much lower for these individuals. The large differences in the results may be due to a poor choice of IVs. The first-stage results in table 2.6 indicate the quarter of birth does not appear to be correlated with being uninsured in the year prior to graduation.

2.7. Conclusion

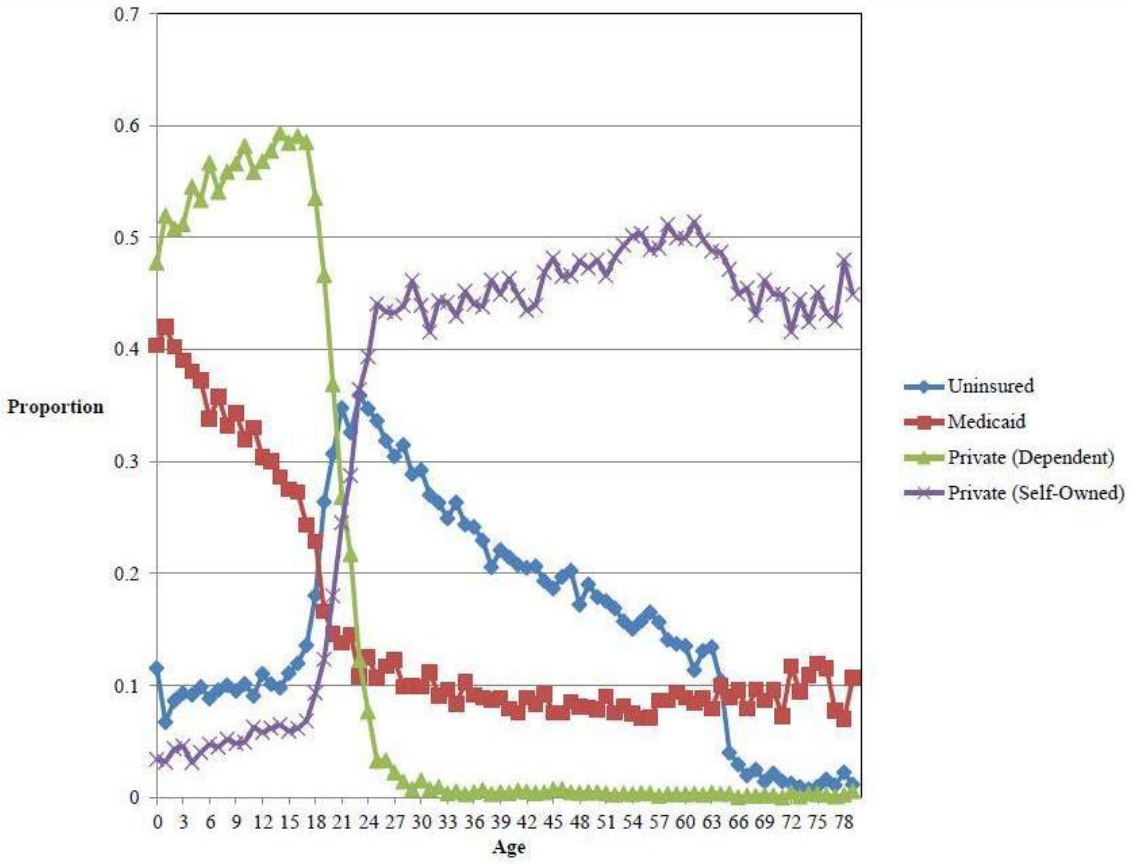
The descriptive analysis presented earlier indicated that the spike in uninsurance that begins around age 19 has steepened throughout the last two decades. Part of this could be due to Medicaid eligibility expansions, which may have reduced the proportion

of children and teenagers without insurance and, hence, lowering the initial base. However, the peak, itself, has increased from 31.5 percent (age 22) in 1990 to 35.9 percent (age 23) in 2009. Further research should attempt to measure the causes of this change.

In regards to the transition of college graduates, the analysis in this paper found that most graduates obtain health insurance after one to two years following graduation. It is possible that the introduction of dependent age laws could affect this transition as it provides an incentive to delay the purchase of self-owned coverage. Since previous studies on dependent age laws have used cross-sectional data in their analysis (Levine et al. (2011) and Monheit et al. (2011)), more can be learned about the effects of these laws based on panel data.

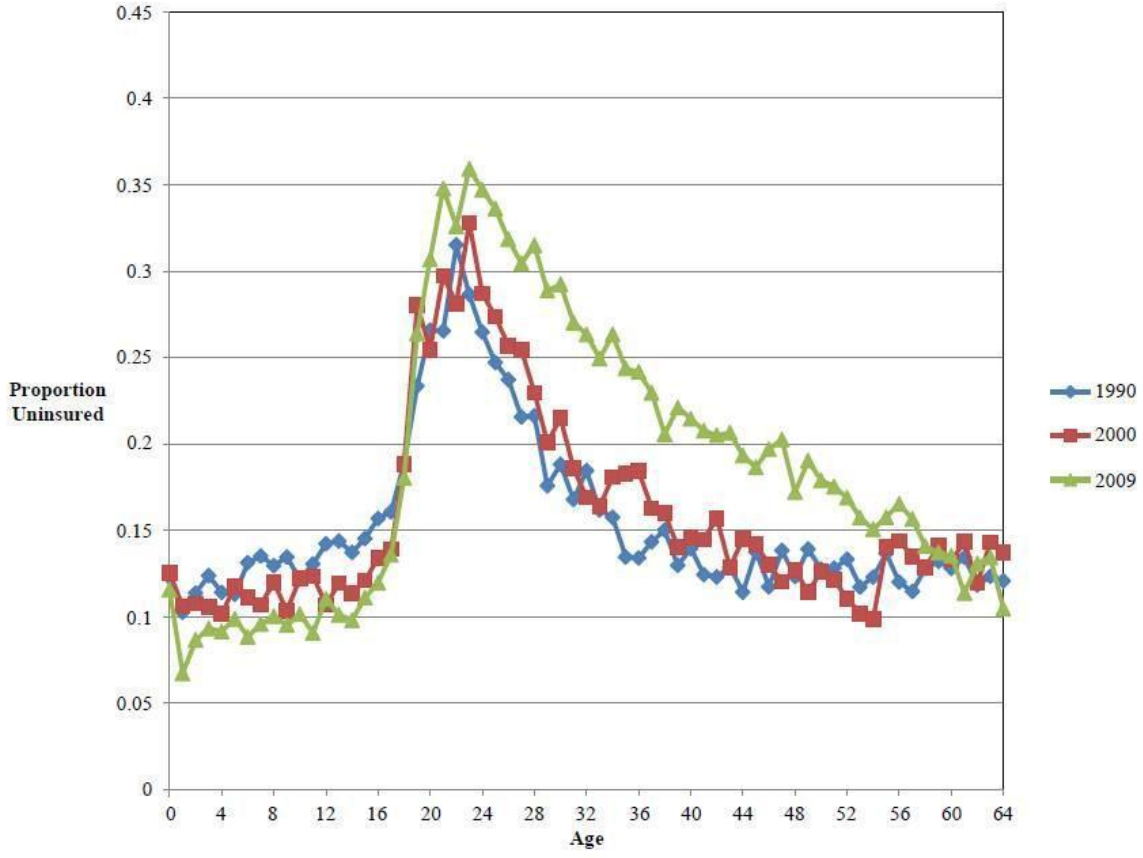
The results in the tests for state dependence suggested that it can be important. However, more work could be done to address this issue. Alternative datasets with valid instruments for the initial health insurance status before turning age 19 could enhance the validity of the results. In this paper, overidentification tests indicated that the best candidates for instruments in the SIPP may not have been valid. Besides analyzing whether state dependence exists or not, future papers could examine different possible causes for it, such as status quo bias or issues related to financial maturity. If there are observable trends in how young adults transition into the workforce and obtain quality jobs, they may be useful in explaining how young adults obtain health insurance.

Figure 2.1: Insurance status by age in 2009.



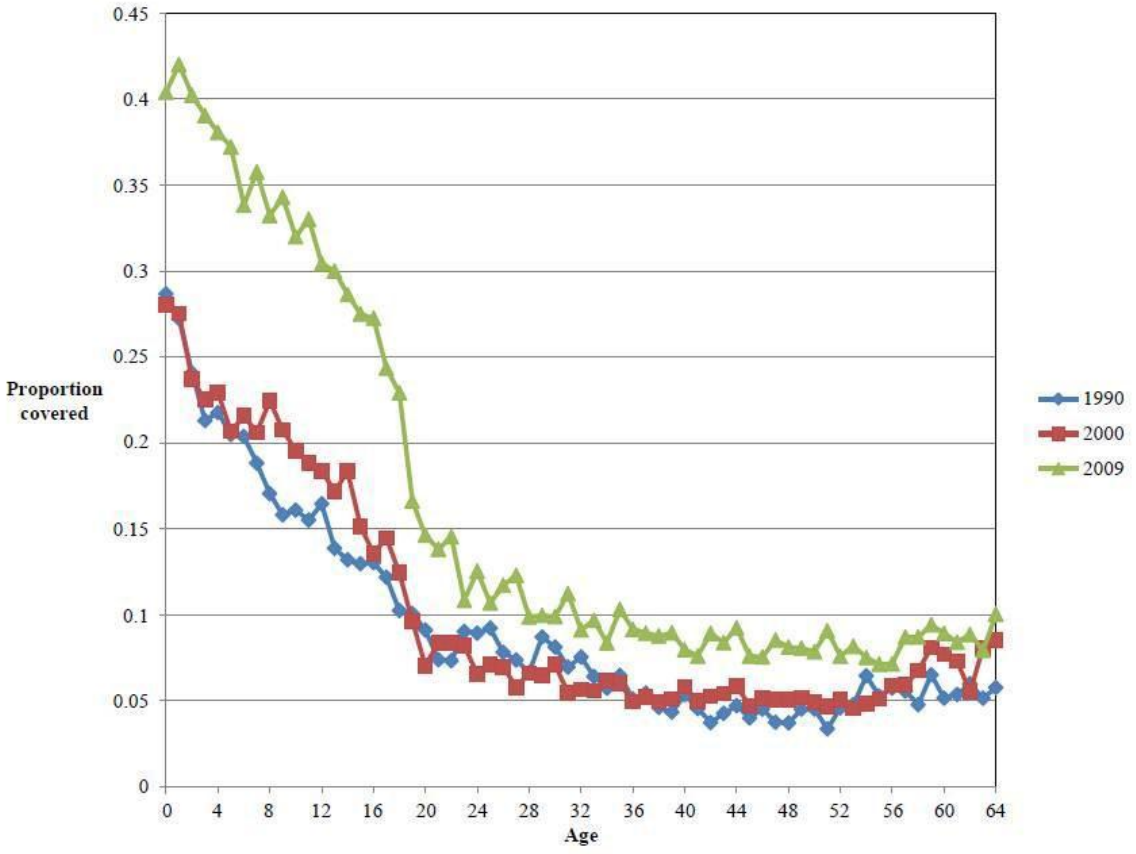
Source: 2010 March CPS.

Figure 2.2: Proportion uninsured by age during 1990, 2000, and 2009.



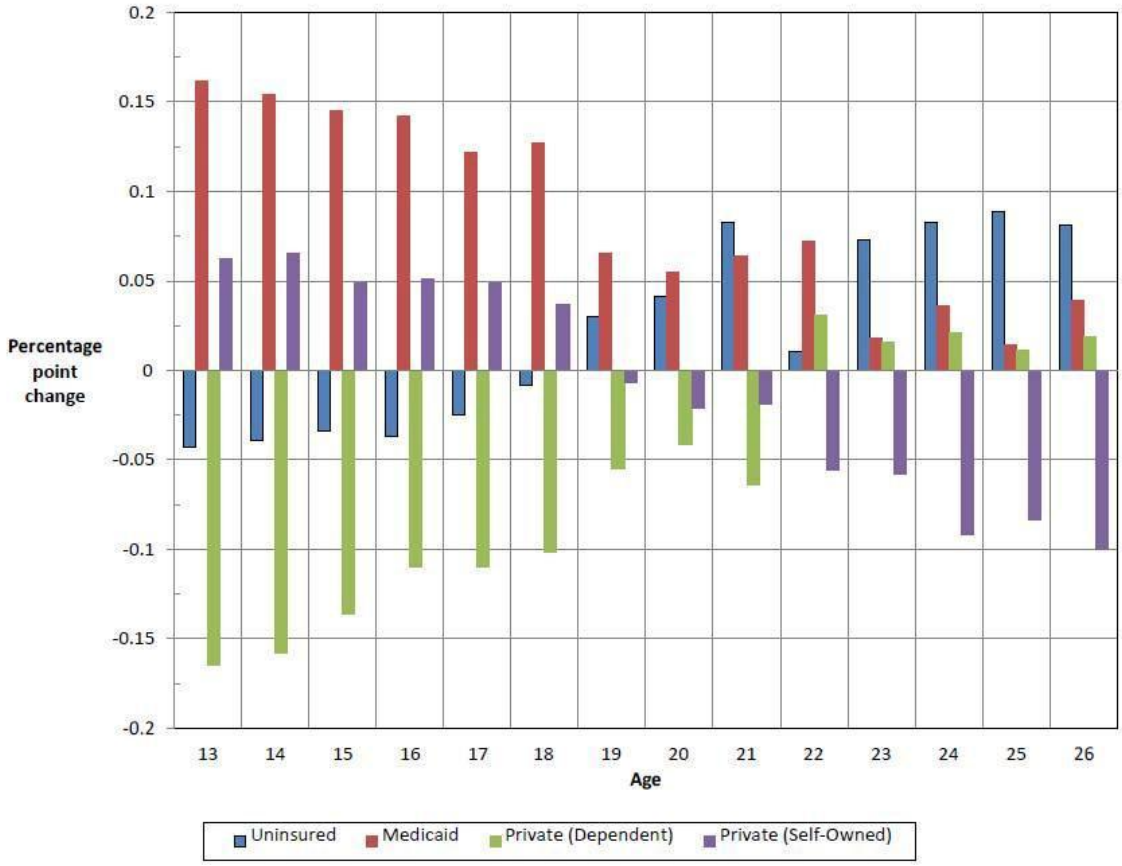
Source: 1991, 2001, and 2010 March CPS.

Figure 2.3: Proportion with Medicaid coverage by age during 1990, 2000, 2009.



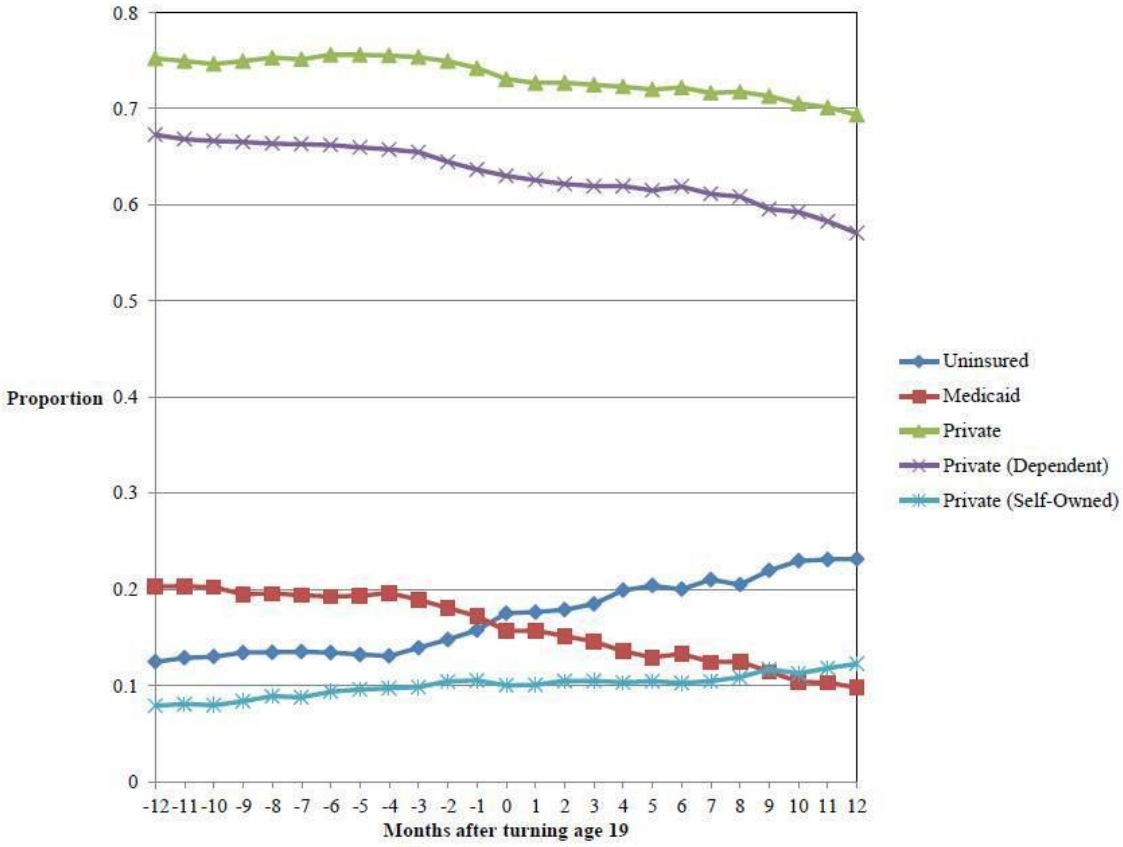
Source: 1991, 2001, 2010 March CPS.

Figure 2.4: Change in the proportion insured by age between 1990 and 2009.



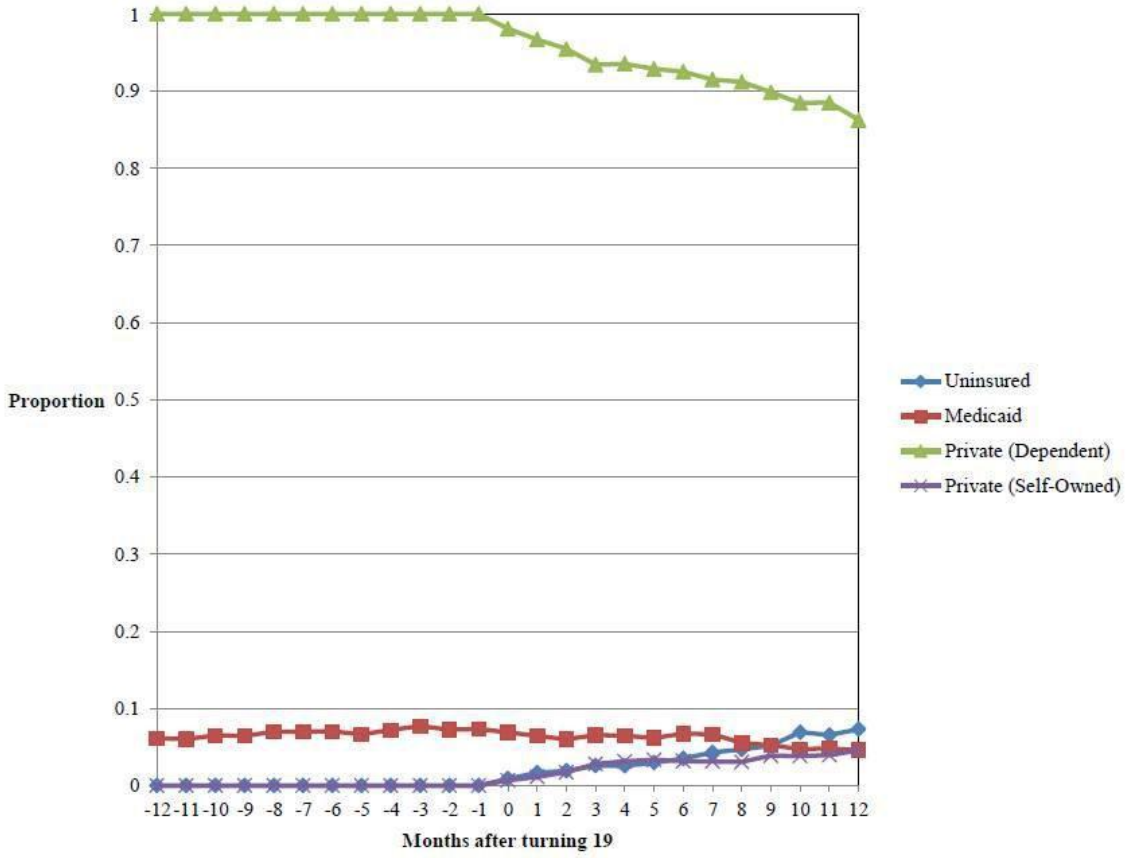
Source: 1991 and 2010 March CPS.

Figure 2.5: Insurance status after turning age 19.



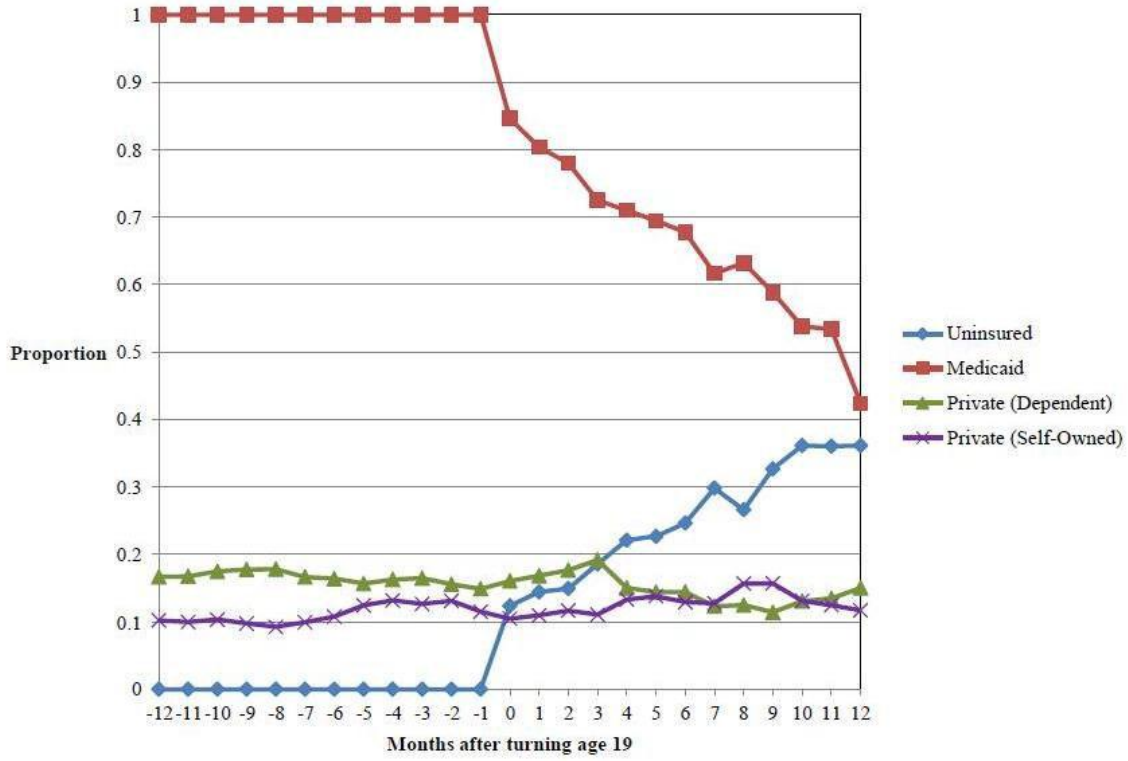
Source: 2004 SIPP.

Figure 2.6: Insurance status after turning age 19 (conditional on initially having dependent coverage)



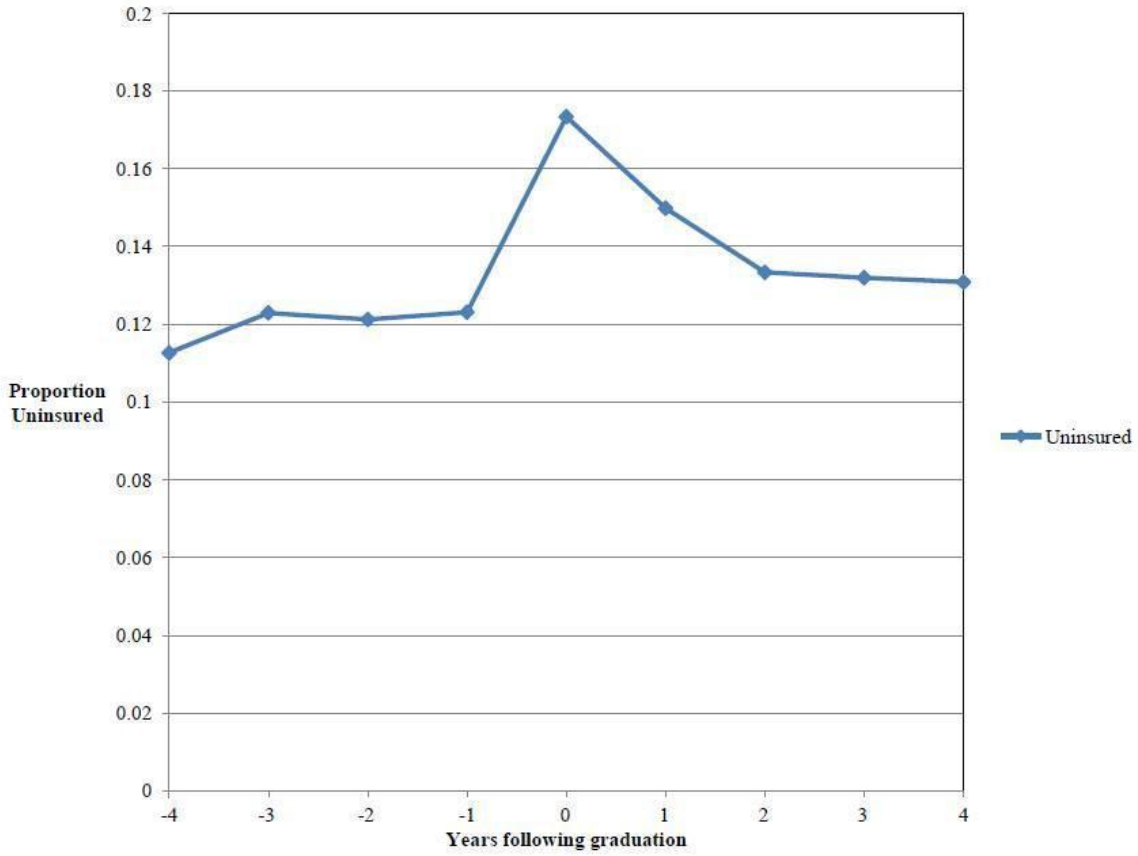
Source: 2004 SIPP.

Figure 2.7: Insurance status after turning age 19 (conditional on initially having Medicaid coverage)



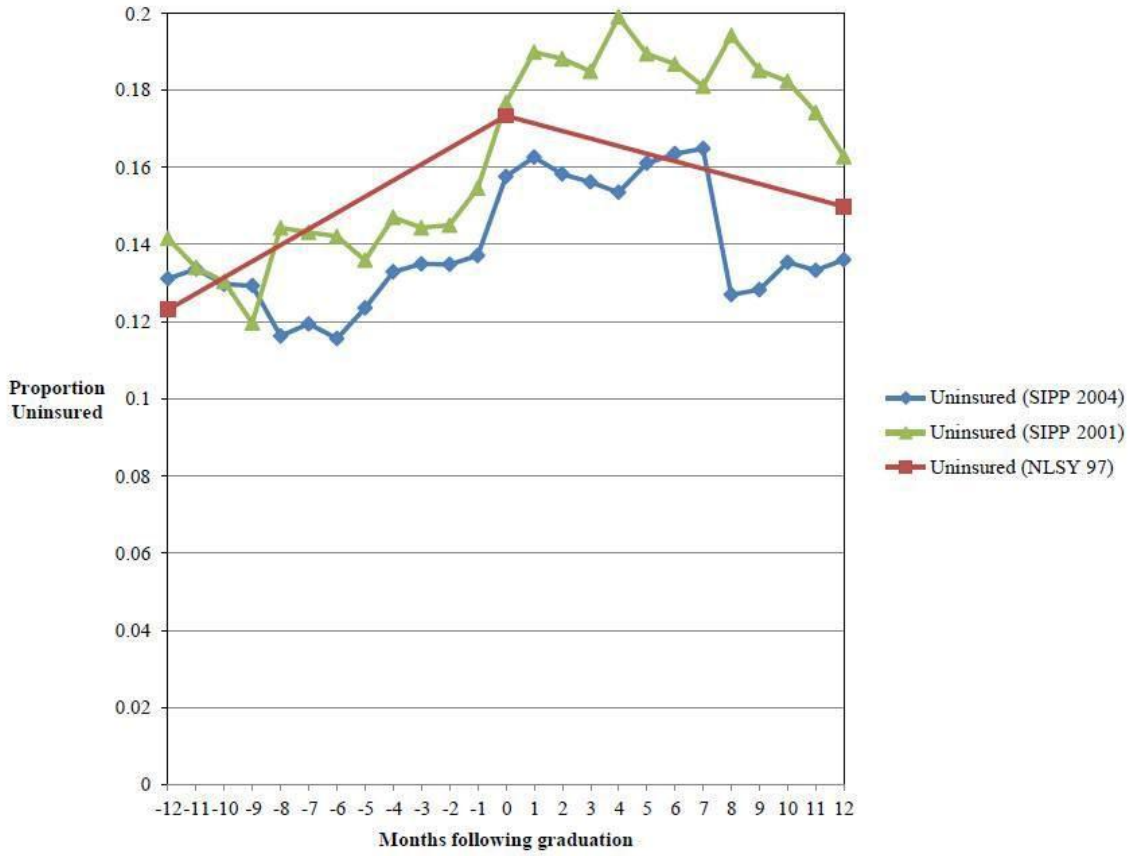
Source: 2004 SIPP.

Figure 2.8: Uninsured rates based on years after graduating from a four-year college.



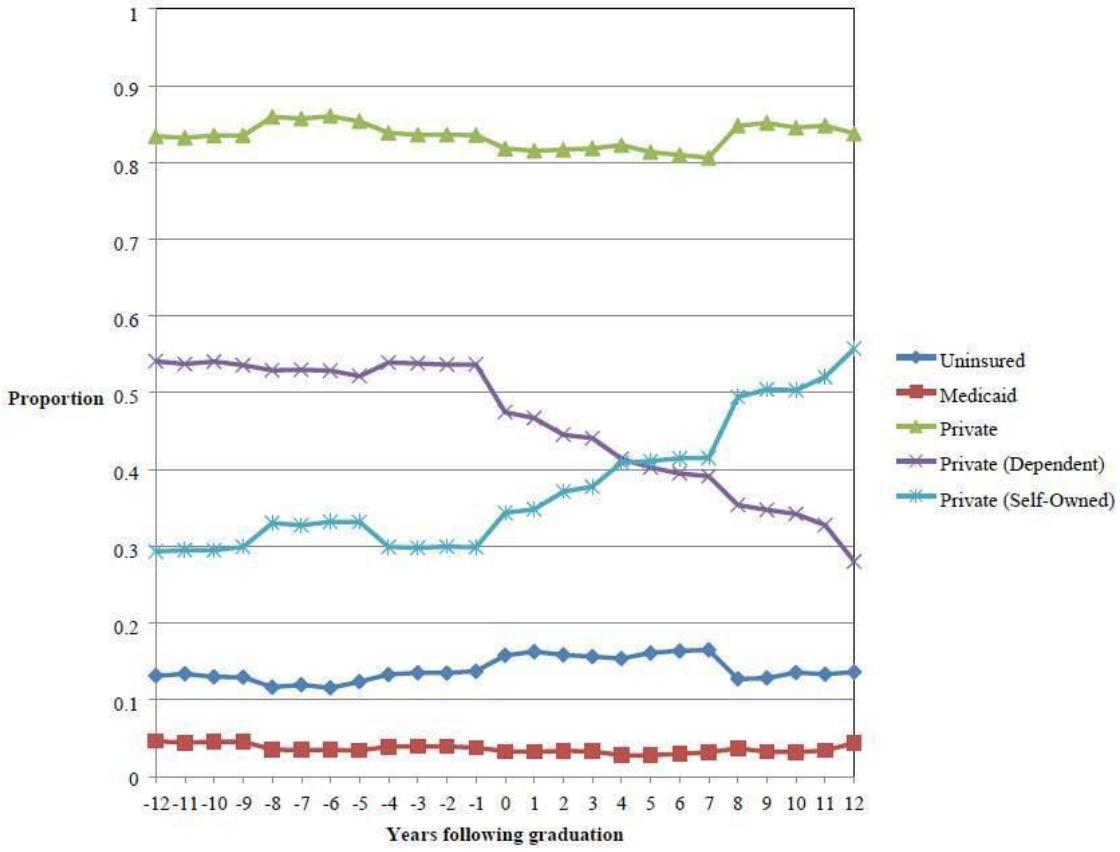
Source: NLSY 97

Figure 2.9: Uninsured rates based on months after graduating from a four-year college.



Source: NLSY 97, 2001 SIPP, and 2004 SIPP.

Figure 2.10: Health insurance status after graduating from a four-year college.



Source: 2004 SIPP.

Table 2.1: Timeline of State Dependent Age Laws.

Prior to 2004	**2004**	**2005**	**2007**	**2008**	**2009**
Florida (25)*	None	South Dakota (24)	**Rhode Island (25)[1]**	**Maryland (25)***	Connecticut (26)*
Georgia (25)			**Virginia (25)***	**Minnesota (25)***	Washington (25)*
Idaho (23)		**2006**	**West Virginia (25)***	Missouri (26)*	Illinois (26)*
Louisiana (24)		Colorado (25)*	Delaware (24)*	Montana (25)*	**Iowa (25)[3]***
Maryland (23)[4]		**Massachusetts (26)***	**South Dakota (29)**	**Florida (30)***	
Massachusetts (25)		New Jersey (30)*	**Idaho (25)**	Iowa (25)[2]	
Minnesota (25)			Indiana (24)*	Kentucky (25)*	
Nevada (24)[4]			Maine (25)*		
New Mexico (25)*			New Hampshire (26)*		
North Dakota (26)[4]					
Rhode Island (25)					
South Carolina (22)[4]					
Tennessee (24)*					
Texas (25)*					
Utah (26)*					
Virginia (25)					
West Virginia (23)					
Wyoming (23)[4]					

* indicates the state had a wide law.

- Bold lettering indicates a law change that amended a previous dependent age law.

[1] Rhode Island allowed part-time students to qualify for dependent coverage. Previously, only full-time students were eligible.

[2] Iowa also allowed full-time students to qualify for dependent coverage without an age limit as long as it was a continuation of coverage.

[3] Iowa removed the requirement of continuation coverage for full-time students above age 24.

[4] The dependent age law only applied to small employers with 50 or fewer employees.

Table 2.2: Fixed-effects model for the health insurance status after turning age 19.

	Uninsured	Medicaid	Private	Dependent	Self-Owned
(Always uninsured) x (month turned 19)	0.31* (0.01)	-0.16* (0.01)	-0.17* (0.01)	-0.11* (0.01)	-0.11* (0.02)
(Always uninsured) x (4 months after turning 19)	0.30* (0.01)	-0.15 (0.01)	-0.16* (0.01)	-0.10* (0.01)	-0.11* (0.02)
(Always uninsured) x (8 months after turning 19)	0.18* (0.01)	-0.11* (0.01)	-0.07* (0.01)	-0.05* (0.01)	-0.05* (0.02)
(Always uninsured) x (12 months after turning 19)	0.10* (0.01)	-0.09* (0.01)	-0.02 (0.01)	-0.02 (0.01)	-0.005 (0.02)
(Ever on Medicaid) x (month turned 19)	-0.02 (0.01)	-0.08* (0.01)	-0.03* (0.01)	-0.02 (0.01)	-0.02 (0.02)
(Ever on Medicaid) x (4 months after turning 19)	0.01 (0.01)	0.03* (0.01)	-0.02 (0.01)	-0.02 (0.01)	-0.01 (0.02)
(Ever on Medicaid) x (8 months after turning 19)	0.06* (0.01)	-0.08* (0.01)	-0.01 (0.01)	-0.02 (0.01)	-0.002 (0.02)
(Ever on Medicaid) x(12 months after turning 19)	0.14* (0.01)	-0.22* (0.01)	-0.002 (0.01)	-0.03* (0.01)	0.03 (0.02)
R^2	0.259	0.004	0.208	0.199	0.006
Sample size	5,340	5,340	5,340	5,340	5,340

Note: Each model also included independent variables for marital status, student status, the state unemployment rate, a metropolitan area dummy variable, and real household income. Fixed effects were included for individuals and time period.
* denotes statistically significant at the 5 percent level.

Table 2.3: Fixed-effects model for health insurance status after turning age 19 using instrumental variables for initial condition.

	Uninsured	Medicaid	Private	Dependent	Self-Owned
(Always uninsured) x (month turned 19)	0.21*	0.11*	-0.24*	-0.10	-0.17
	(0.08)	(0.06)	(0.08)	(0.07)	(0.09)
(Always uninsured) x (4 months after turning 19)	0.22*	0.05	-0.25*	-0.17*	-0.08
	(0.08)	(0.06)	(0.08)	(0.07)	(0.09)
(Always uninsured) x (8 months after turning 19)	0.22*	0.09	-0.27*	-0.13	-0.09
	(0.08)	(0.06)	(0.08)	(0.07)	(0.09)
(Always uninsured) x (12 months after turning 19)	0.41*	0.13*	-0.42*	-0.16*	-0.45*
	(0.08)	(0.06)	(0.08)	(0.07)	(0.09)
(Ever on Medicaid) x (month turned 19)	0.05	-0.29*	0.12	0.01	0.17
	(0.08)	(0.06)	(0.08)	(0.07)	(0.09)
(Ever on Medicaid) x (4 months after turning 19)	0.10	-0.27*	0.10	-0.02	0.15
	(0.08)	(0.06)	(0.08)	(0.07)	(0.09)
(Ever on Medicaid) x (8 months after turning 19)	0.15	-0.32*	0.06	-0.13	0.25*
	(0.08)	(0.06)	(0.07)	(0.07)	(0.09)
(Ever on Medicaid) x (12 months after turning 19)	0.10	-0.46*	0.14*	-0.24*	0.71*
	(0.08)	(0.06)	(0.07)	(0.07)	(0.09)
Overidentification test (p-value)	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*
R^2	0.015	0.011	0.066	0.152	0.001
Sample size	5,340	5,340	5,340	5,340	5,340

Note: Each model also included independent variables for marital status, student status, the state unemployment rate, a metropolitan area dummy variable, and real household income. Fixed effects were included for individuals and time period.
* denotes statistically significant at the 5 percent level.

Table 2.4: First-stage OLS regression for health insurance status during the initial period

	Always Uninsured	Ever on Medicaid
Parent works at a large-sized firm	-0.03*	
	(0.01)	
Parent works at a medium-sized firm	-0.04	
	(0.03)	
Fraction eligible for Medicaid		0.19*
		(0.03)
Married	0.02	0.12*
	(0.03)	(0.03)
Full-time student	-0.12*	-0.06*
	(0.01)	(0.01)
High school dropout	0.09*	0.11*
	(0.01)	(0.01)
Real household income	-0.01*	-0.01*
	(0.00)	(0.00)
Urban area	-0.01	-0.01
	(0.01)	(0.01)
Northeast	0.01	0.07*
	(0.01)	(0.02)
South	0.07	0.02
	(0.01)	(0.01)
West	0.06*	0.06*
	(0.01)	(0.02)
State unemployment rate	0.02*	0.01
	(0.01)	(0.01)
R^2	0.09	0.07
Sample size	5,340	5,340

* denotes statistically significant at the 5 percent level.

Table 2.5: First-effects model for being uninsured after graduating from a four-year college

	Fixed Effects	Fixed Effects with IV
(Uninsured in year before graduation) x (One year after graduation)	0.07*	-0.63*
	(0.02)	(0.17)
(Uninsured in year before graduation) x (Two years after graduation)	0.09*	-0.73*
	(0.02)	(0.18)
(Uninsured in year before graduation) x (Three years after graduation)	0.12*	-0.74*
	(0.02)	(0.19)
(Uninsured in year before graduation) x (Four years after graduation)	0.08*	-0.61*
	(0.02)	(0.18)
R^2	0.02	0.02
Sample size	481	481

* denotes statistically significant at the 5 percent level

Table 2.6: First-stage OLS regression for being uninsured during the initial period.

Independent Variable	Initially Uninsured
Born in first quarter	0.02 (0.04)
Born in second quarter	0.07 (0.04)
Born in third quarter	0.01 (0.04)
Married	0.11 (0.06)
Enrolled in school	0.00 (0.06)
Has a high school diploma	-0.91* (0.27)
Regional unemployment rate	-0.01 (0.04)
Midwest	-0.03 (0.04)
South	0.04 (0.04)
West	0.01 (0.05)
Real household income	-0.001* (0.000)
R^2	0.07
Sample size	481

* denotes statistically significant at the 5 percent level.

Chapter 3: Dependent Health Insurance Laws and College Enrollment: Is There Evidence of College Lock?

3.1. Introduction

Compared to other age groups, a large fraction of young adults between ages 19 and 29 do not have health insurance. According to the March 2010 Current Population Survey (CPS), 30 percent of young adults in this age range were uninsured in 2009. The proportion uninsured was the highest among 23-year-olds at 36 percent. Explanations for the relatively high percentage of uninsured include better health, lower earnings capacity, selection into low quality jobs, and age limits on eligibility for public health insurance programs such as Medicaid and the State Children's Health Insurance Plan (SCHIP). Also, since most young adults are not married, they may lack access to insurance coverage under a spouse's plan. For many years, it was common for insurance providers to declare young adults ineligible for dependent coverage once they reached age 19, or age 24 if a full-time college student and not married. This was primarily due to the federal tax code, which excluded the value of health insurance benefits for dependents up to those ages from taxable income (Internal Revenue Service, 2010). The Patient Protection and Affordable Care Act (PPACA) passed by Congress in March 2010 included a provision that requires young adults to be eligible for dependent coverage until their 26th birthday, regardless of student status. This requirement applied to all states and became effective in September 2010.

Recent survey results suggest that the proportion uninsured has fallen among those who were targeted by the federal law. The Centers for Disease Control and Prevention (CDC) reported that the proportion uninsured among young adults between ages 19 and 25 fell from 33.9 percent in 2010 to 30.4 percent in the first three months of

2011, which reduced the number uninsured by 900,000 people (Cohen and Martinez, 2011). Compared to other provisions in the PPACA, the dependent age mandate appears to have more bipartisan support. A recent Wall Street Journal article described its popularity as follows:

> "And the new stats raise a tricky question for Republicans: would they peel back a popular provision like this if they retook the White House? All the GOP presidential candidates have vowed to repeal the health overhaul if they win. But Americans may chafe at that notion if that means their post-college kids, struggling to find work in a weak economy, get booted from their health plan."[1]

Much of the discussion surrounding the dependent age mandate has been focused on those who already have graduated from college and are older than the traditional undergraduate student. When discussing the benefits of the mandate to a group of college students, President Barack Obama said:

> "Every single one of you, when you get out of college, if you have not found a job that offers you health care, you're going to be able to stay on your parents' health care until you're 26 years old, so you don't end up taking the risk of getting sick and being bankrupt."[2]

Perhaps a similar degree of attention should be given to those who have yet to graduate from college or even those who have yet to enroll. The new federal mandate requiring dependent coverage up to age 26 is a stark change from what was the

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[1] "Health law means fewer young adults go without insurance," *Wall Street Journal*, 21 September 2011.

[2] Remarks by the President at DNC Rally in Madison Wisconsin, 2011. President Barack Obama. <http://www.whitehouse.gov/the-press-office/2010/09/28/remarks-president-dnc-rally-madison-wisconsin>

conventional norm in many states. Although some state legislatures passed separate dependent age mandates prior to 2010, most did not raise the age limit as high as 26. But in regards to young adults who could have received dependent coverage in the past, those between ages 19 and 22, the new federal law erased the requirement that they enroll into college as a full-time student. It is possible that granting non-students the benefit of qualifying for dependent coverage, a benefit that previously was reserved only for students, may create an incentive to avoid college. Another possible effect, besides by-passing college completely, could be a reduction in the duration of time for which one is enrolled in college. For example, someone enrolled in a four-year program may be more likely to finish his or her degree earlier without the fear of losing dependent coverage. Alternatively, some prospective students may find that two-year degree programs become relatively more attractive compared to four-year programs.

A great amount of literature has discussed the implications of another conventional norm in America's health care system, the exclusion of pre-existing conditions in non-group health insurance plans. One implication is less job mobility among those who have health problems and receive insurance through their employer. This reduction in job mobility is commonly referred to as "job lock." Some studies have found evidence of job lock among those who would have a high likelihood of needing health insurance. An early and influential paper by Madrian (1994) found evidence of job lock among men with larger families and pregnant wives. This was followed by later studies on the topic in which some reported evidence of job lock (Buchmueller and Vallette, 1996; Hamersma and Kim, 2009) while others found little or no evidence of it (Kapur, 1998; Berger et al., 2004). Other research has found that early retirement before

age 65 could be encouraged by employer-provided retiree health insurance (Blau and Gilleskie, 2001; Kapur and Rogowski, 2007) and state-mandated continuation coverage of employer-sponsored health insurance (Gruber and Madrian, 1995).[3]

Similar to the idea of job lock, it is possible that the requirement of full-time college enrollment for dependent coverage may create "college lock," which is a circumstance where young adults are reluctant to lose their student status because of this requirement. If college lock existed because of these previous requirements, dependent insurance mandates similar to the one in the PPACA would cause reductions in college enrollment among young adults. This paper will study the possible existence of college lock by analyzing the effects of a dependent insurance mandate imposed by the state of New Jersey in 2006.

The main findings of the paper suggest that health insurance coverage increased significantly after the introduction of New Jersey's law. The expansion in coverage was observed in many subsamples of young adults between ages 19 and 22 who were not married. The estimated reductions in the proportion uninsured in New Jersey relative to Pennsylvania ranged between 19% and 56%, depending on the subsample. Among non-students, there was a 22.8% reduction in the proportion uninsured. Meanwhile, college enrollment also was estimated to have declined as a result of New Jersey's law. The reduction was experienced primarily by those most likely to be attending college in the first place (those living in high-income households and have parents with employer-sponsored insurance from small firms) and had a magnitude between 15% and 24%.

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[3] See Currie and Madrian (1998) for a more extensive review of the job lock literature.

3.2. Literature Review

3.2.1. Young Adults and Health Insurance Coverage

The college lock hypothesis is related to three topics that have received attention in past literature, which include (1) the effects of state dependent age laws, (2) insurance coverage among young adults, and (3) carrot-and-stick policies to encourage educational attainment. Only three studies have analyzed the effects of dependent insurance laws on health insurance coverage: Antwi et al. (2012), Monheit et al. (2011), and Levine et al. (2011). Based on SIPP data, Antwi et al. find that the federal dependent age law in the PPACA of 2010 increased health insurance coverage among 19-to-25-year olds by 30 percent. The other two studies looked at laws passed at the state level. Monheit el al. estimated that dependent age laws had no overall effect on the proportion of young adults who were uninsured, but did result in a substitution of dependent coverage for one's own employer-provided health insurance. The estimated magnitude of this substitution effect was around 2 to 3 percentage points. Unlike Monheit el al., Levine et al. estimated separate effects of the laws according to family-income level and parental health-insurance status. Their results suggested that dependent age laws increased health insurance coverage by as much as five percentage points among young adults who are in middle-income families and have parents with employer-sponsored health insurance from small firms that are not likely to self-insure. They also found evidence of a reverse crowdout effect in which young adults substituted publicly-provided health insurance for private coverage, but did not report results regarding the possible substitution of private dependent coverage for other types of private health insurance. Previous studies on eligibility expansions in the Medicaid program have found that the size of crowdout

effects could be quite large (Cutler and Gruber, 1996; Blumberg et al., 2000; LoSasso and Buchmueller, 2004; Gruber and Simon, 2008) while other studies have found smaller effects (Card and Shore-Sheppard, 2004; Ham and Shore-Sheppard, 2005).

Given the existing literature, more research can give a better understanding of the full effects of dependent insurance mandates. Little is known about whether there are unintended effects on decisions besides the choice of insurance status.[4] The primary contribution of this paper will be to examine whether dependent age laws affect college enrollment, which the previous literature has not addressed. Another contribution of this paper will be the use of an alternative design in estimating the effects of the mandates on health insurance status. As discussed earlier, a two-state comparison between New Jersey and Pennsylvania will be used. These two states were the focus of previous studies on minimum wage laws (Card and Krueger (1994) and Neumark and Wascher (2000)). For this study, these states provide a cleaner quasi-experiment in comparison to the earlier works on dependent insurance mandates, which used larger numbers of states in their analysis. The New Jersey-Pennsylvania comparison will avoid treating mandates that extend eligibility to all young adults as the same as those that only applied to full-time students. Additionally, New Jersey's new definition of a dependent had the highest age extension and the widest non-age criteria. If any state's mandate expanded coverage or caused a substitution toward dependent coverage, it would most likely be the one passed in New Jersey.

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[4] One previous study considered an unintended effect of the decision to live with one's parents. Levine et al. (2011) found that state mandates on dependent coverage caused a slight increase in the proportion of young adults living with their parents.

Compared to other age groups, it can be argued that young adults have received much less attention in the literature on health insurance coverage. For instance, the Medicaid and SCHIP programs have generated many studies on children and teenagers while Medicare has resulted in much research on the elderly population. Besides a smaller literature of research on young adults, public health insurance programs in the United States also contribute to why young adults have the largest fraction uninsured compared to any other age group. The ages between 19 and 24 are a period of transition in many aspects of one's life, and health insurance coverage is no exception. Individuals at these ages are too old for Medicaid eligibility. In addition, many lack the education or experience to obtain a job that offers employer-provided coverage as well as the financial maturity to purchase it in the non-group market.

Some studies have attempted to identify the main factors that explain the variation in insurance coverage within samples of young adults. Markowitz et al. (1991) and Gius (2010) both used logit models on a single year of cross-sectional data to identify factors correlated with the likelihood of a young adult having health insurance. Both studies found that full-time student status and family income are key factors that increase the likelihood of being insured for 18-to-24-year-olds. Gius also included estimates for an older sample of 25-to-29-year olds and found that employment status increased the likelihood of being insured whereas student status did not. This suggests that studies on dependent coverage mandates should anticipate different effects among those in their late-teens and early twenties compared to those in their mid-to-upper twenties. Furthermore, the effects may differ within the younger group depending on whether someone is a student or not.

One shortcoming in using cross-sectional data to analyze coverage among young adults is the inability to observe individuals before and after turning certain ages. For instance, an individual's 19th birthday has been important for two reasons: (1) the loss of SCHIP eligibility for those in low-income families and (2) the loss of dependent eligibility for non-students previously on employer-provided plans. Similarly, the age of twenty-two could be important if that is the age at which most students graduate from four-year degree programs and lose dependent eligibility. Longitudinal data would be ideal for an analysis of dependent insurance mandates if one expected different effects among those who had Medicaid coverage before age 19 and those who had private coverage, or different effects on students who had insurance before graduation compared to those who were uninsured.

Two studies have emphasized the importance of reaching specific ages in analyzing health insurance status, but only Levy (2004) has used longitudinal data. In a paper that primarily provides a descriptive analysis using data from the Survey of Income and Program Participation (SIPP), Levy illustrates an advantage in using longitudinal data. Among other findings, she shows that the proportion uninsured rises to a level as high as 36% at age 22 for men (30% for females) when using a single wave of the SIPP as cross-sectional data. However, by taking advantage of the longitudinal nature of the data, she shows that over 60% of 22-year-old-males (58% of females) report becoming uninsured for some period of time. As one would expect, she also showed that the rise in the proportion uninsured up to age 22 was due primarily to flows out of parent-owned dependent coverage, and that subsequent drops in the proportion uninsured occurred as young adults obtained private insurance plans of their own.

The other study that considered the effects of specific age thresholds was conducted by Anderson et al. (2012). Using repeated cross-sectional data from the National Health Interview Survey (NHIS) from 1997 to 2007, they estimated a 4.1 percentage point increase in the proportion of young adults who became uninsured after reaching age 19, but a 7.1 percentage point increase out of those who were not enrolled in school. Their main research question, however, was whether turning age 19 had any effects on health care utilization. Based on hospital discharge data from six states, they found large reductions in both emergency room (40%) and inpatient admissions (61%) after turning age 19. Callahan and Cooper (2005) also examined the effect of insurance status and health care utilization and found that the uninsured were three to four times more likely to delay or forego medical care compared to those with health insurance.

The previous work on insurance status and health care utilization suggest that large reductions in health care utilization may result as young adults become uninsured. If dependent insurance mandates expand coverage among young adults, the previous research suggests it may also result in large increases in hospital visits and possibly health status. More research could be done to understand the relationship between insurance coverage and the health status of young adults in both the short run and long run.

3.2.2. Educational Attainment and Incentive Policies

One previous study by Jung et al. (2012) has looked at the relationship between dependent insurance coverage and college enrollment. Using data from the SIPP, they find that 17-to-23-year olds are up to 22 percent more likely to attend college as a full-time student if covered by insurance on his or her parent's plan. However, this could

likely be an overestimate because their probit and multinomial logit estimates do not account for any endogeneity in the health insurance status of one's parents. They also did not consider any effects of dependent age laws passed by states or the federal government.

A number of recent studies have examined the use of incentive programs that either reward academic achievement or punish attrition. Cash incentives have had positive effects on the academic performance of female students at the secondary and postsecondary levels, but little impact on male students (Angrist and Levy, 2009; Angrist et al., 2009). However, Fryer (2011) found that cash incentives had little effect on the state standardized test scores of primary school students. One study by Vidal-Fernandez (2012) looked at state laws that linked teenage driver's license eligibility with high school attendance. Her main findings indicated that these "No Pass, No Drive" laws significantly increased high school graduation among black males, but had no effect on other demographic subgroups. This paper will build onto this body of literature by examining a law that creates a new benefit for non-students. Whereas past studies have looked at "carrots" given to students or "sticks" used on non-students, the newly-gained eligibility of dependent coverage will provide an opportunity to study the effect of allowing non-students to have a carrot that was previously reserved for students.

3.3. Background

3.3.1. Legislative Background

Although laws defining a dependent for health insurance purposes are not new, the inclusion of non-students above age 18 has occurred more recently. A timeline of the implementation of state laws can be seen in table 3.2. A common feature found in many

recent laws has been the inclusion of non-students in dependent definitions, which will be referred to as a "wide law." Of the 24 dependent age laws passed between 2005 and 2009, 20 of the laws allowed young adults who were not students to qualify for dependent eligibility. Common requirements outside of student status include the conditions that a young adult is not married and does not have any dependents of his or her own. Some states, such as Maryland and Virginia, restricted eligibility of non-students to those who live with their parents. Most states set the dependent age limit at 25. The age limits set by the laws passed since 2005 have ranged from 24 to 30.

A key federal law that limited the ability of states to regulate health insurance benefits was the Employee Retirement Income Security Act (ERISA) of 1974, which included a provision allowing laws passed by Congress to pre-empt state regulations on privately-insured health benefit plans. One implication of this pre-emption provision is an exemption of firms that self-insure from state mandates regarding health insurance benefits, including dependent insurance mandates. Hence, the state dependent insurance mandates discussed earlier only applied to young adults who had parents with employer-provided coverage from firms that did not self-insure. Depending on the state, dependent insurance mandates also could have applied to young adults whose parents purchased insurance in the non-group market.

The exemption of self-insured firms from state mandates means that dependent age laws are more likely to affect firms with a small number of workers. Firms with a large number of workers are more likely to self-insure for a number of reasons. Primarily, large firms have the ability to spread the risk of expensive claims over a larger pool of policyholders. Large firms also could be financially more capable of affording

the administrative costs of offering self-insured plans. The prediction of a higher probability of self-insured plans being found in large firms has been reflected in the results of surveys conducted by the Kaiser Family Foundation (2009), which are shown in table 3.1. For firms with 3 to 199 workers, the percentage of covered workers with partially or completely self-insured plans ranged from 10 to 17 percent between 1999 and 2009. As the number of workers defining a firm category grows, so does the percentage covered by self-insured plans. In the most recent year, 88 percent of covered workers within the firm category of having over 5,000 workers had self-insured plans. Overall, there appears to be a strong relationship between firm size and the likelihood of self-insuring. Furthermore, the results in table 3.1 suggest that the effects of a state's dependent age law on insurance coverage and college enrollment are likely to be concentrated among young adults who have parents working for and receiving health insurance benefits from small firms.

Prior to Patient Protection and Affordable Care Act of 2010, efforts to expand health insurance coverage among young adults through dependent coverage mandates primarily have been implemented at the state level.[5] Previous efforts by the federal government have been limited to continuation coverage. One example included provisions in the Consolidated Omnibus Budget Reconciliation Act (COBRA) passed in

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[5] Another effort by the federal government was "Michelle's Law," which became effective nationwide in 2009. The law loosens the connection between student status and dependent eligibility for those with serious illnesses by requiring the continuation of dependent coverage for full-time college students who take up to 12 months of medical leave from college. The term "medical leave" could refer to either a complete leave of absence from college or a reduction in course load from a full-time to part-time status.

1986, which allows certain individuals to continue purchasing group health insurance in situations when their coverage would otherwise be terminated. COBRA allows young adults to purchase employer-sponsored health insurance for up to 36 months after losing eligibility for dependent coverage due to age or loss of student status. Employers providing the continuation coverage under COBRA can charge employees 100 percent of the premium and an administrative fee as high as 2 percent.

3.3.2. Conditions and Institutions in New Jersey and Pennsylvania

As mentioned earlier, New Jersey's dependent age law will be the primary focus of this paper due to its uniqueness from other state laws. On January 12, 2006, New Jersey Governor Richard Codey signed legislation that established a dependent age limit in the state and expanded the non-age criteria used in defining a "dependent." Previously, the state did not regulate dependent coverage, although most young adults were considered eligible until age 19, or 24 if a full-time student. The 2006 law mandated that the age limit be set at age 30 and did not require student status if a young adult was a New Jersey resident or was living in the state. This change became effective on May 12, 2006. In 2009, the state legislature passed another law that increased the dependent age limit to age 31.

Compared to other states in the Mid-Atlantic region, Pennsylvania appears to be a more appropriate control group for this study. Two state- and time-varying factors that could have a profound impact on health insurance coverage and college enrollment among young adults are the state unemployment rate and college tuition rates. Both appear to have similar values and follow similar trends in Pennsylvania and New Jersey.

Figure 3.1 shows the unemployment rates for five Mid-Atlantic states from 2004 until 2009. It appears that New Jersey and Pennsylvania along with New York and Connecticut had similar unemployment rates that moved together in a similar pattern. Maryland's unemployment rate followed the same pattern, but was systematically lower. Figure 3.2 illustrates the enrollment-weighted average tuition and fees at four-year public colleges in the same five Mid-Atlantic states. New Jersey and Pennsylvania had similar tuition rates that exceeded those in the other nearby states. New Jersey's (Pennsylvania's) enrollment-weighted average of tuition and fees at four-year public schools totaled $7,560 ($8,020) in the 2004-2005 academic year and rose by 48 percent (35 percent) over the next five years to $11,167 ($10,786). Figure 3.3 shows that New Jersey and Pennsylvania also saw similar changes in the tuition and fees at four-year private schools.

Another factor to consider in judging the suitability of control state will be the types of firms located within it. As mentioned earlier, the ERISA exemption for self-insured firms means that New Jersey's law will most likely affect smaller firms. Table 3.3 shows the proportion of civilian employees in New Jersey and Pennsylvania according to firm size, where "firm size" refers to the number of employees working for the firm. The distribution of firm sizes appears to be quite similar across the two states.

Besides the distribution of firms according to size, the types of industries located within each state are also important to consider. Table 3.4 shows additional survey results from Kaiser (2009), which show large variations in the likelihood of self-insuring based on industry classification. In a national sample of employers, the proportion of self-insuring firms was the highest in the Transportation/Communications/Utilities

industries at 70 percent and lowest in the Agriculture/Mining/Construction industries at 35 percent. This is important to consider because large differences in the types of industries located within states could affect the proportion of young adults who are potentially-eligible for dependent coverage under state laws, especially if available datasets do not explicitly ask respondents if their employers self-insure. Table 3.5 shows the distribution of civilian employees based on industry classification, which is similar in New Jersey and Pennsylvania.

New Jersey and Pennsylvania also had no major differences in the types of public insurance programs available to their residents. For young adults, the Medicaid/CHIP eligibility criteria for pregnant women are the most generous in regards to the income cutoffs, which can vary by state. Figure 3.6 shows the income cutoffs for a collection of Mid-Atlantic states. New Jersey's cutoff is at 200 percent of the federal poverty line, which is slightly more generous than Pennsylvania's limit of 180 percent.

Pennsylvania also had a state-funded insurance program called Adult Basic Care, which offered coverage for childless adults with incomes up to 200 percent of the federal poverty line. New Jersey did not have an equivalent program, but this is not expected to be a significant factor. Due to budgetary restrictions, enrollment into Pennsylvania's Adult Basic Care was rationed on a first-come, first-serve basis. Before the program was terminated in 2010, the annual average number of enrollees ranged between 37,635 and 51,104 people. However, young adults did not represent a large fraction of program participants. One study by Wood et al. (2010) reported that only 4 percent of the people enrolled into Adult Basic Care were between ages 19 and 25.

3.4. Data

Between 2004 and 2010, seventeen states introduced new dependent age laws while other states with existing laws extended their age limits or loosened some other non-age requirements. By the beginning of 2010, 37 states had some kind of dependent age law. In the most well-known example, New Jersey's law enacted in 2006 initially covered young adults until age 30 if they were unmarried. The state legislature extended it again in 2009 to include 30-year-olds, which was the highest required age limit for any state in the country at that time.

Compared to other states prior to 2010, the state legislature in New Jersey made the most aggressive changes to its definition of a "dependent" in regards to both the age and non-age requirements. During the same time period, the neighboring state of Pennsylvania had no law defining the meaning of a dependent for health insurance purposes. The differences in legislative actions by New Jersey and Pennsylvania present a quasi-experiment to test the effectiveness of a dependent age law on health insurance coverage among young adults. If there are any effects resulting from dependent age laws, one would expect to see them in this comparison between two similar states with drastically different laws. But more importantly in regards to the research question presented earlier, the eligibility of non-students under New Jersey's law presents an opportunity to analyze the potential existence of college lock. Because of these characteristics, this paper will focus on a two-state comparison between New Jersey and Pennsylvania. In this comparison, New Jersey's law introduces three main dimensions of variation, which include variation by age, state residence, and time period. Difference-in-difference models on select ages will be used to exploit this variation and obtain

estimates for the partial effect of becoming eligible on insurance coverage and college enrollment.

Before one is able to address whether or not dependent insurance mandates, such as those passed by the New Jersey state legislature and the United States Congress, affect college enrollment, it is necessary to observe an effect on health insurance coverage among non-students. From a theoretical perspective, it is anticipated that more young adults will obtain coverage under their parents' plans if the incremental costs of adding them as dependents are cheaper than if they were to purchase individual plans. This also would require that the burden of state mandates does not cause firms to drop dependent coverage from their company policies. However, the expected impact on overall health insurance coverage is not one-for-one. A net increase in overall coverage would result if some portion of an observed increase in dependent coverage can be attributed to a segment of the young adult population transitioning out of an uninsured status. Even if an increase in dependent coverage is observed, it is possible to see little change in overall coverage. For example, an increase in dependent coverage could result from a substantial amount of substitution of dependent coverage for individually-owned insurance.

If "college lock" does exist, it is not expected to be uniform across all young adults. Instead, the strength of college lock should vary based on an individual's ability to afford college and his or her preference for attending college. For simplicity, consider four groups of potential students that vary based on their family income and desire to pursue postsecondary education, which can be classified as (1) high income, high desire, (2) high income, low desire, (3) low income, high desire, and (4) low income, low desire. It is unlikely that groups (1) and (4) would alter their behavior in response to a dependent

age law. Young adults in group (1) will likely attend college anyway while those in group (4) are less likely to have parents with employer-sponsored insurance.

The strongest case for the existence of college lock can be made for group (2), which has a relatively high likelihood of attending college and having dependent insurance coverage. This group also could contain a disproportionately high number of marginal students whose enrollment decisions are sensitive to gaining the benefit of dependent eligibility as a non-student. Group (3), however, may be the prime candidate for an increase in college enrollment in response to a dependent age law. Eligibility for cheaper dependent insurance would make college enrollment more affordable and cause an income effect.

This study will estimate the relationship between private dependent coverage and college enrollment using two primary datasets, which include the Annual Social and Economic Supplement to the March Current Population Survey (CPS) and the American Community Survey (ACS). The March CPS is a survey conducted by the Bureau of Labor Statistics each year throughout the month of March and is distributed to a random sample of the noninstitutionalized civilian population. In an initial analysis on a national dataset, this paper will use the 1998 through 2011 releases of the survey, which contain data for the years 1997 through 2010, to measure the partial effect of having private dependent coverage on college enrollment. Later in the main analysis on the effects of New Jersey's dependent age law, a subset of data covering the calendar years 2003 through 2009 will be used to analyze changes in health insurance coverage and college enrollment. Data for the calendar year 2006 will be excluded since New Jersey's dependent age law was implemented during that year. For each of the years used in the

main analysis, there were over 97,000 households and 206,000 persons that were sampled annually in the overall March CPS. The subsample used in the main analysis includes all individuals between ages 19 and 22 from New Jersey and Pennsylvania, which totaled 3,227 observations for all years.

In addition to questions on basic demographic variables, such as age, gender, race, and income, the March CPS also includes questions on key variables describing a respondent's health insurance status. It is possible to identify whether someone has health insurance from a private or public source as well as whether that person has his or her own plan or is covered as a dependent on the plan of someone else. The March CPS also allows one to match the members of a household and observe the type of family relationship and other data among all the members. This will enable one to identify the health insurance status of a young adult's parents as long as the young adult lives in the same household as them. Unfortunately, it is not possible to observe the health insurance status of someone's parents if they live in a different household. This will be an important limitation of the dataset when estimating who is potentially eligible for dependent coverage through their parents' employer-sponsored plan. Another limitation of the March CPS is that student status is only reported for individuals through age 24. Since New Jersey's law went up to age 30, the ACS will be used in the analysis of college enrollment among older young adults.

The ACS is a compulsory monthly survey conducted by the US Census Bureau. Since full implementation of the survey began in 2005, it has been distributed to approximately 250,000 addresses each month, which totals 3 million addresses annually. The public-use files of the ACS contain a subset of the total observations in the overall

survey. This paper will use the ACS public-use files from 2003 through 2009, but again will exclude 2006. The subsample of ACS data used in this paper includes all individuals between ages 19 and 29 from New Jersey and Pennsylvania. For the entire time period, the overall subsample has 85,163 observations. This illustrates another advantage in using the ACS instead of the CPS for the analysis on college enrollment, which is the larger size of the ACS. The ACS could not be used to analyze health insurance coverage because the survey does not include health insurance data until 2008, which was two years after New Jersey's law was enacted.

The use of both the ACS and March CPS will be necessary to conduct a thorough analysis of New Jersey's dependent age law and identify the types of students and colleges that were most likely affected by college lock. Although both surveys ask whether someone is enrolled in college, they ask different follow-up questions. For example, the March CPS asks whether someone is enrolled as a full-time or part-time student whereas the ACS does not. This is an important distinction because the theory predicts New Jersey's dependent age law could have a negative effect on full-time enrollment, but a positive effect on part-time enrollment. However, the ACS asks whether someone is enrolled in a public or private college while the March CPS does not. This information will be needed to identify the types of universities that would most likely experience a reversal of college lock following a dependent age law. For example, if public school students are more sensitive to the cost of attending college than private school students, larger effects on public school enrollment may be expected.

One shortcoming in using the ACS and March CPS is that they do not identify many other features about a student's college or university. For instance, they do not

indicate whether a student is enrolled in a four-year program or a two-year program. Past research suggests that a failure to make this distinction could have a profound impact on the results. In their analysis of Georgia's HOPE Program, Cornwell et al. (2006) showed that there could be significant differences in the enrollment responses of students at public four-year and two-year colleges. Also, in comparison to an earlier study by Dynarski (2000), they found that results based on October CPS data resulted in an overestimate of the effect on enrollment into four-year programs.[6] If a dependent age law causes more students to enter two-year programs instead of four-year programs, it would be consistent with the hypothesis of college lock, but would not be observable with the data. Hence, a dataset containing this information would be desirable in order to avoid understating the effects of New Jersey's law.

Even though the ACS distinguishes private colleges from public colleges, it does not provide any information about the selectivity of the college. For example, a private college in the ACS could either be a highly-selective institution, such as Princeton University, or one that is much less selective, such as the University of Phoenix. Past research on graduation rates by Bound et al. (2010) found that less selective public colleges and community colleges have seen decreases in graduation rates whereas private colleges and more selective public colleges have experienced increases. As a way of addressing these omitted variables, the final part of the empirical analysis will use institution-level data from the Integrated Postsecondary Education Data System (IPEDS)

[6] Like the March CPS, the October CPS also does not make a distinction between private and public college enrollment, or whether someone is in a four-year or two-year program. However, an additional cause of the difference in estimates was that the data used in Cornwell et al. (2006) was able to identify the original residence of a student whereas Dynarski (2000) was unable to observe it.

in order to conduct a more thorough analysis of the types of colleges that are being affected by New Jersey's law.

The IPEDS is an institution-level dataset of US colleges and universities collected by the Department of Education's Center for Education Statistics. The survey is conducted on an annual basis and participation is mandatory for all schools that receive any form of federal student financial aid or apply for eligibility. In the 2010 dataset, the IPEDS contained information on over 7,500 postsecondary institutions. The survey questions cover topics regarding enrollment, financial aid, retention rates, graduation rates, faculty sizes, revenues and expenditures, and other institution characteristics. Of particular importance to this study is the ability to distinguish four-year programs from two-year programs. The data will be used to see how New Jersey's law affected enrollment at four-year private colleges, four-year public colleges, and two-year public colleges. Furthermore, one will be able to identify whether there are different effects among younger and older students because the IPEDS reports enrollment data by age groups. This will be important for addressing the question of whether dependent age laws discourage entry into college by high school graduates or encourage upper-classmen in college to finish their degrees quicker.

Although longitudinal data would be ideal, the SIPP in particular would not be the best dataset for an analysis of a small number of states. For the two-state comparison in this paper, the sample size for a panel of SIPP data would be too small for precise estimation. The same would be true for other longitudinal datasets, such as the National Longitudinal Survey of Youth 1997 (NLSY97). A more feasible approach would be to use repeated cross-sectional data as used in Anderson et al. (2012) and Buchmueller and

DiNardo (2002). The two main datasets used will be the March Current Population Survey and the American Community Survey. Both will be explained in further detail in the section III.

3.5. Empirical Methodology

The main interest of this paper is to estimate the relationship between private dependent coverage and college enrollment and determine whether dependent age laws can weaken this relationship. A preliminary analysis will estimate the partial effect of having private dependent insurance on college enrollment. Because of the endogeneity of private dependent coverage, the partial effect will be estimated using the two stage least squares (2SLS) estimation technique. In the first stage, a model predicting private dependent coverage will be estimated using ordinary least squares (OLS) estimation. The functional form of this model is shown in (1):

$$(1) \quad \text{Dependent Coverage}_{ist} = \alpha_0 + \alpha_1(\text{Medium firm}_{it}) + \alpha_2(\text{Large firm}_{it}) + \alpha_3 X_{ist} + \delta_s + \gamma_t + \varepsilon_{ist}$$

The variable $\text{DependentCoverage}_{ist}$ is a binary variable indicating whether or not the young adult has private dependent coverage under a parent's plan. MediumFirm_{it} and LargeFirm_{it} will be used as instrumental variables indicating whether or not a young adult has a parent who works for a large-sized or medium-sized firm. A large-sized firm will be defined as a company with over 1,000 employees whereas a medium-sized firm has between 100 and 999 employees. The vector X_{ist} contains other variables that are expected to be correlated with having private dependent coverage, which include the state unemployment rate, the state enrollment-weighted average tuition rates for four-year public and private colleges, the number of siblings living in the household, and dummy variables indicating whether someone is female, nonwhite, living with household income

between 150% and 300% of the federal poverty line, and living in household with income above 300% of the federal poverty line. The regression also will include state- and year-fixed effects. The error term, ε_{ist}, is assumed to have an expected value of zero and follow a normal distribution. All standard errors in the regression results will be clustered based on state and year.

The second stage of the estimation will regress a binary variable for being enrolled in college ($College_{ist}$) on the same set of exogenous covariates (X_{ist}) from the previous stage, state- and time-fixed effects, and the predicted value for $DependentCoverage_{ist}$ based on the model shown in (1). The functional form for the second-stage regression is shown in (2). The main coefficient of interest will be β_1.

$$(2) \quad College_{ist} = \beta_0 + \beta_{1,}(\text{Dependent Coverage})_{ist} + \beta_2 X_{ist} + \delta_s + \gamma_t + \varepsilon_{ist}$$

Summary statistics for the March CPS data used in this initial analysis can be seen in table 3.6. Since having insurance on a parent's plan can only be observed if a young adult lives with that parent, all respondents used in the analysis live with at least one parent and are between ages 19 and 22. Since the partial effect of private dependent coverage will be examined over time, separate summary statistics are used for the three time periods that will be used later in the paper. In order to correct for any sampling bias, all descriptive statistics were tabulated with the use of frequency weights provide by the Census Bureau.

The proportion enrolled in college and the proportion enrolled on a parent's health insurance plan both were slightly above 50 percent. The March CPS data is supplemented with state unemployment rates reported by the Bureau of Labor Statistics and state enrollment-weighted tuition rates for public and private colleges based on

IPEDS data. Because of missing responses in the IPEDS data regarding tuition levels, the analysis will exclude the states of California, Nevada, Idaho, and Wyoming as well as the District of Columbia.

The effects of New Jersey's dependent age law on health insurance coverage and college enrollment will be estimated using a difference-in-difference regression framework. The main functional form of the difference-in-difference regressions used in this study is shown in (3):

$$(3) \quad Y_{ist} = \beta_0 + \beta_1(Post_t) + \beta_2(Treatment_s) + \beta_3(Post_t * Treatment_s) + \beta_4 X_{ist} + \varepsilon_{ist}$$

where Y_{ist} is the outcome of interest, which could be a dummy variable indicating if an individual either has health insurance or is enrolled in college. In estimating the difference-in-difference regressions, the individuals in the sample come from the state with the loosest definition of a dependent (New Jersey) and a neighboring state that did not adopt a dependent age law (Pennsylvania) prior to 2010.

In (3), $Post_t$ and $Treatment_s$ are dummy variables indicating whether the time period is during the years 2007 through 2009 and the respondent's state of residence is in New Jersey. The main coefficient of interest will be β_3, which is the difference-in-difference estimator for the effect of dependent age laws on either health insurance coverage or college enrollment. The vector of additional covariates, X_{ist}, will include the same independent variables that were used in the previous model. Marital status will be excluded since the regressions will be estimated separately for single and married individuals. Since New Jersey's law required an eligible dependent to be unmarried, the coefficient β_3 is expected to be zero in the results based on married individuals. The error term, ε_{ist}, is assumed to have an expected value of zero and follow a normal

distribution. All standard errors in the regression results will be clustered based on state and year.

Table 3.7 describes the dataset for the 19-to-22 age group used in the quasi-experiment using only New Jersey and Pennsylvania. The samples used in this analysis include all 19-to-22-year-olds. Similar to the national sample, around half of the respondents in the younger sample are enrolled in college. With the exception of racial background, both states appear to be quite similar in regards to the other demographic characteristics. The proportion of the population that belongs to an ethnic minority is noticeably larger in New Jersey. Some disparities appear to exist between the states in regards to health insurance coverage and composition. A higher fraction of young adults in New Jersey appear to be uninsured while Medicaid coverage is higher in Pennsylvania. Most young adults have private coverage with 41 to 49 percent receiving private insurance through a parent's plan in Pennsylvania compared to 39 to 47 percent in New Jersey.

The analysis using the institution-level data will utilize a difference-in-difference regression framework similar to (3). However, the dependent variable will be the proportion of students at a college who belong to a particular age group. Separate estimations will be obtained using four groups of age classification, which include (1) age 19 and younger, (2) ages 20 and 21, (3) ages 22 through 24, and (4) age 25 and older. The model will include independent variables for the cost of tuition, the county unemployment rate, and the average grant given to a student from the federal government, state government, and the institution itself. All variables measured in dollars were adjusted for inflation and reported in 2009 dollars.

Summary statistics for the IPEDS data can be seen in table 3.8. There is a noticeable difference in each state's age distribution for four-year colleges. In particular, New Jersey's students tend to be older. The proportion of public school students who are age 19 or younger is about 40% in Pennsylvania and 30% in New Jersey. This is due to New Jersey having a higher proportion of students ages 22 and above. The proportion ages 20 and 21 is about the same for each state. The differences are smaller for private college enrollment, but New Jersey still appears to have an older distribution of students. For the two-year public colleges, each state's age distribution is about the same.

3.6. Results

3.6.1. How Strong is the Relationship Between Dependent Insurance Coverage and College Enrollment?

The analysis of college lock begins with the question of how private dependent coverage affects college enrollment and to what extent. As a growing number of states and the federal government introduced their own dependent age laws, more young adults would have obtained the option of maintaining eligibility for dependent coverage as a non-student. Because of this, it is expected that the partial effect of having private dependent insurance on full-time college enrollment should have declined over the last decade. Using a national sample of data, estimates for the effect of having private dependent coverage on college enrollment are reported in table 3.9.

Separate results are reported for each estimation technique and time period. Since having private dependent coverage is endogenous, an instrumental variable approach will be appropriate for estimating the partial effect on college enrollment. The 2SLS estimates were obtained by using dummy variables indicating the firm size of a parent's employer as instrumental variables. It will be assumed that children will be more likely

to have private dependent coverage if they have a parent working for a large-sized firm, but firm size will have no effect on college enrollment. The dummy variables included will indicate whether a parent works for a large- or medium-sized firm. A large firm will be defined as one with over 1,000 workers and a medium firm will be defined as one having between 100 and 999 workers. Results using OLS estimation are reported for the purpose of comparison. First-stage results are shown in table 3.10 and indicate that the firm-size variables have a statistically significant relationship with health insurance status.

The results in table 3.9 indicate that the partial effect of private dependent coverage on college enrollment may have weakened in recent years. All of the results are based on samples of 19-to-22-year-olds from the March CPS. The OLS estimates based on a national sample indicate that the partial effect has diminished gradually over time. Based on the main sample between 1997 and 2001, the likelihood of attending college was 30 percentage points higher for young adults who took up private dependent coverage compared to those who did not take it up, which was similar to the estimate found by Jung et. al (2012). In the main sample between 2007 and 2010, the magnitude of this partial effect fell by 5 percentage points.

The 2SLS estimates are largely different from the OLS estimates, but have the same expected sign and are statistically significant in the later years. When accounting for the endogeneity of having private dependent coverage, the partial effect is smaller and follows a different pattern over time. This is likely due to a strong positive correlation existing between health insurance status and student status. Whereas the OLS estimates suggested there was a gradual weakening in the relationship between the two variables,

the 2SLS estimates suggest that college lock strengthened between 2002 and 2006 but then weakened between 2007 and 2010. If one recalls the timeline of when dependent age laws where implemented, which was shown in table 3.2, a gradual and linear weakening of college lock would not be expected. Most wide laws at the state-level came into existence after 2006. In addition, the cost of medical care was gradually rising during all of the considered time periods. According to the Consumer Price Index for medical care that was reported by the Bureau of Labor Statistics, the annual average growth rate for the cost of medical care was 3.96% between 1997 and 2010. Since the 2002-to-2006 period could be characterized with rising medical costs and very few dependent age laws, a weakening of college lock is not be expected until the 2007-to-2010 period. The 2SLS results indicate that the college-lock effect weakened by 5.1 percentage points (31.9%) from 16.0% to 10.9% between the last two periods.

Additional estimates for the college-lock effect are reported for various subsamples. As discussed earlier, a finding of college lock is expected to be most likely for young adults who have parents with employer-provided insurance and are most likely to attend college in the first place. Two proxy variables that are used to indicate the likelihood of attending college are household income as a percentage of the federal poverty line and a dummy variable indicating whether the young adult has a parent with a college degree. The results based on these subsamples are shown in table 3.9 and exhibit similar patterns over time compared to the results based on the main sample. As before, the partial effect of having private dependent coverage strengthens between 2002 and 2006 and then weakens between 2007 and 2010. During these two time periods, the college-lock effect was statistically significant and weakened for subsamples of young

adults who had a parent with employer-provided insurance (80.3% decline) as well as those who lived in households above 300% of the federal poverty line (33.8% decline). There also was a smaller reduction (17.1% decline) in the college-lock effect for the subsample of young adults who were below 300% of the federal poverty line.

Sargan tests for overidentification were conducted for each 2SLS estimation and are available upon request. The test is performed by first obtaining the residuals from the 2SLS estimates and then regressing them on all exogenous variables. The test statistic is the product of the total number of observations and the R-squared from the residual regression. Each test had a p-value below greater than 5 percent, which would suggest that the firm size variables used in the analysis are exogenous and valid instruments.

3.6.2. The Effect of New Jersey's Dependent Age Law on Health Insurance Coverage

In order to get a better understanding of the role that dependent age laws had in weakening the link between private dependent coverage and college enrollment, the analysis will continue with a careful examination of the law passed in New Jersey. As discussed earlier, New Jersey had the most generous definition of a dependent for health insurance purposes, which would make it the most likely candidate for finding the anticipated effects. The first part of this analysis will look at the effects on health insurance coverage. Although an expansion in private dependent coverage among all 19-to-22-year olds is not a necessary condition for a weakening of college lock, it is worthwhile to obtain an understanding of how New Jersey's law affected health insurance coverage. However, in regards to the question of college lock, the main

question of interest will be whether private dependent coverage had increased among non-students.

The estimates for the effect of New Jersey's law on insurance coverage are shown in table 3.11. Since the law did not apply to young adults who were married, all of the results in table 3.11 were based on subsamples of individuals who were not married.[7] For the purpose of comparison, the proportion of 19-to-22-year-olds in New Jersey who reported being uninsured between 2003 and 2005 (the pre-period) is reported. Since the federal tax code provided an incentive for firms to offer dependent insurance up to age 24, it would be worthwhile to obtain separate estimates based on age. College lock is expected to have affected those under age 24, but not older young adults.

Although older young adults would have been eligible for dependent coverage under New Jersey's law, they would not have been "locked" into college enrollment because they typically were not eligible for dependent coverage prior to the law even if they were full-time students. For this reason, the main analysis will cover those between ages 19 and 22, which is the age group that represents the majority of college students. Later in the discussion, individuals between ages 24 and 27 will be analyzed as well. Each column in table 3.11 is for a different dependent variable indicating one's health insurance status. The intended effect of the dependent age law appeared to occur among 19-to-22-year-olds. Following New Jersey's law, there was an estimated reduction in the proportion uninsured by 7 percentage points (or 27%) in the full sample. This appeared to be due to an increase in private insurance coverage, which

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[7] It is possible that dependent age laws, such as the one in New Jersey, could affect the marriage decisions of young adults. Yelowitz (1991) found that expansions in Medicaid eligibility to married couples resulted in a modest increase in the marriage rate.

was estimated to have risen by 11.7 percentage points in New Jersey relative to Pennsylvania. Both of these estimated effects are statistically significant at the 5 percent level.

Similar results were estimated with subsamples based on household income and student status. Of particular interest is the reduction in the proportion uninsured among non-students, which fell by 8.7 percentage points (or 22.8%) and is statistically significant. This finding further raises the question of whether New Jersey's dependent age law caused an unintended disenrollment effect. However, the proportion uninsured also fell among full-time students by a magnitude of 6.4 percentage points (or 49.2%).

One limitation in using the CPS that was mentioned earlier is the inability to match young adults with their parents when they live in separate households. Since it is only possible to know if someone is covered under a parent's plan if that person lives with his or her parents, additional estimates will be based on subsamples of young adults who live with their parents. These results are shown in table 3.12.

Unlike Monheit et al. (2011), the results do not indicate a statistically significant substitution of private dependent coverage for self-owned private coverage. In fact, some estimations show positive effects on self-owned coverage. The largest expansions in dependent coverage were found where expected, which were among those living with a parent with employer-sponsored coverage and those with lower household income levels. Similar to Levine et al. (2011), the results suggest that New Jersey's dependent age law resulted in an overall expansion in health insurance coverage. The reductions in the proportion uninsured were as small as 30% for young adults who had a parent working for a small firm and as large as 72% for those living with a parent with a bachelor's

degree or higher. Also like Levine et al., a reverse "crowd-out" effect was found for those with parents receiving employer-sponsored insurance (a reduction in Medicaid coverage between 2.9 and 6.3 percentage points).

The results in table 3.12 also suggest that health insurance coverage among non-students living with their parents rose in New Jersey relative to Pennsylvania. The proportion of non-students in New Jersey who were uninsured was estimated to have fallen by 14 percent points (or by 42%) relative to Pennsylvania. There is an estimated increase in private dependent coverage, which has a magnitude of 9.6 percent points but is not statistically significant.

Overall, the impact of New Jersey's dependent age law on the health insurance coverage of 19-to-22-year-olds appeared to expand health insurance coverage without substantial reductions in self-owned private coverage. However, the subsamples used in the empirical analysis only include a subset of young adults who are potentially eligible for dependent coverage.

3.6.3. The Effect of New Jersey's Law on College Enrollment

Given the evidence suggesting that New Jersey's law had the intended effect of expanding health insurance coverage, especially among non-students, it is now worthwhile to address the question of whether there was an unintended effect on college enrollment. Difference-in-difference estimations for college enrollment models are reported in table 3.13. As before, all results are based on samples of non-married young adults between ages 19 and 22. Relative to Pennsylvania, New Jersey witnessed a drop in college enrollment among young adults in this age group following the introduction of its law. Estimations using both the ACS and March CPS data suggested that college

enrollment in New Jersey fell by 2 percentage points (or 4%) compared to Pennsylvania. However, this effect is not statistically significant at the 5 percent level.

Evidence of a weakening in college lock was strongest among young adults living in upper-income households and with a parent receiving employer-sponsored insurance from a small firm. This should be expected because these individuals should have had the highest likelihood of attending college before the law and the highest likelihood of being eligible for dependent coverage after the law was enacted. The estimations from the ACS and March CPS data provide similar results, suggesting that college enrollment fell in New Jersey relative to Pennsylvania among those living in households above 300% of the federal poverty line. The reduction was statistically significant and had a magnitude between 8.6 and 9.9 percentage points (or between 14.6% and 15.7%). For the subsample of young adults living with a parent working for a small firm, the estimated reduction had a magnitude of 14.3 percentage points (or 24%).

The estimated effect of New Jersey's law was different among young adults in lower income households. For these individuals, there is an estimated increase in college enrollment by a magnitude between 5.5 and 9.3 percentage points (or between 14.4% and 27.0%). A similar effect is found for those in the same income range and living with their parents. This may be expected considering the lower level of college enrollment that this group had prior to the law. It is possible that the option of buying cheaper dependent coverage created an income effect making college more affordable for these individuals.

Given the disparity in the effects of New Jersey's law based on income category, a deeper analysis into the relationship with income is provided in table 3.14. Difference-

in-difference estimates are provided for samples with narrower income ranges and further confirm that the magnitude of the college-lock effect rises with income. Among young adults in relatively low income households (below 100% of the FPL and between 100% - 300% of the FPL), the estimated sign is positive and not statistically different from zero. Instead, the college-lock effect is found among young adults in relatively high income households (between 300% and 500% of the FPL and above 500% of the FPL) who were more likely to attend college in the first place. The group between 300% and 500% of the FPL experienced a 2.9 percentage point (or 5.5%) reduction in college enrollment while the group above 500% of the FPL experienced an 8.7 percentage point (or 13.7%) decline.

Additionally, an estimate is provided for young adults who live in households with real incomes exceeding $200,000 in 2009 dollars, which would be around 8 to 10 times the federal poverty level for a family of four. For this group, there is no effect on college enrollment due to New Jersey's dependent age law. This suggests that although there is no college-lock effect among low income households, it is not concentrated among what many would consider "rich" households, but rather among upper-middle class households.

Besides income level, the regression estimates also find that the changes in college enrollment varied by gender and health status. The college-lock effect was stronger among males and those who reported having a health problem that made some aspect of daily living more difficult. These results can be seen in table 3.15. The difference-in-difference estimates based on the full sample are shown for comparison. The two percentage point reduction in college enrollment in New Jersey relative to

Pennsylvania was driven by the behavior of male students between ages 19 and 22, who experienced a five percentage point reduction in college enrollment (or 11.3%). Meanwhile, a college-lock effect was not observed among females, which would suggest that male students were less attached to college compared to female students. In other words, the college enrollment decisions of males are more sensitive to monetary incentives, such as eligibility for dependent health insurance.

As one might expect, the disparities in the college-lock effect are much larger when comparing the estimates across groups varying by health status. Despite having a much lower proportion enrollment in college, those in relatively poor health are less attached to college and witness larger drops in enrollment in response to New Jersey's dependent age law. Using the ACS, it is possible to define "poor" health as having a condition that makes daily functioning difficult for an individual. Possible conditions include having a health problem that makes it difficult for someone to hear, see, remember things, dress himself, go out into public, work, or perform any other physical activity. If an individual reported having difficulty with any of these activities, he was defined as having poor health. Within this group, the proportion attending college in New Jersey before the dependent age law was equal to 32.4 percent. Anyone who did not report having a health condition that causes difficulty with daily functioning was classified as having good health. Among this group, college enrollment was much higher at 51.5 percent. The difference-in-difference estimates indicates a strong college-lock effect among those in the poor health group, who experienced a 9.9 percent point (or 30.5%) reduction in college enrollment. A reduction in college enrollment also was

estimated among those in good health, but it was much smaller (1.9 percentage points, or 3.7%) and not statistically different from zero.

Table 3.16 reports the estimated effects of New Jersey's law on full-time and part-time enrollment separately. If the estimated reductions in college enrollment that were reported above are due to a weakening in college lock, it should have occurred primarily among full-time students. This is expected because dependent eligibility was usually reserved for full-time students only prior to the law change. The results in table 3.16 support this prediction. The effects on full-time students are similar to the effects reported above. Reductions in college enrollment are estimated for those in higher-income households (by 11.3 percentage points) and live with a parent who has employer-sponsored insurance from a small firm (by 18.9 percentage points). The magnitudes are slightly higher than the estimates reported earlier because there are small increases in part-time enrollment. However, the effects on part-time enrollment are not statistically significant.

Another question worth addressing is whether New Jersey's law had different effects on public and private college enrollments. If the estimated reductions in college enrollment are due to a reversal of college lock, one may expect it to occur among students who are at the margin of attending college. This would have a disproportionately larger effect on public colleges if they have, on average, lower admissions standards and students who are price sensitive. This, however, is not observed with the ACS data, which allows one to distinguish between public and private college enrollment. Table 3.17 shows results from difference-in-difference estimations for the effect of New Jersey's law on public and private enrollment separately. There

appears to have been no reduction in public college enrollment. Instead, the reductions in college enrollment reported earlier appear to have occurred primarily among private colleges. For the subsample of young adults at or above 300% of the federal poverty line, there was an estimated reduction in New Jersey's private college enrollment by 11 percentage points (or 51.4%) relative to Pennsylvania. The increase in college enrollment for those in lower income households occurred mainly at public colleges. Enrollment at public colleges for the lower income subsample rose by 8.4 percentage points (or 30%) in New Jersey relative to Pennsylvania.

As mentioned earlier, one limitation in using ACS data is the inability to control for health insurance status during the earlier years of this study. Health insurance questions were not included in the ACS until its 2008 release. As an alternative, the college enrollment equations were estimated on subsamples of young adults who had a high likelihood of having private insurance based on other observable characteristics in the ACS, such has household income and parental education. Another approach used in this study was to construct a subsample of ACS respondents with a high likelihood of having private insurance based on predictions of the health insurance model that was estimated with March CPS data. College enrollment equations were re-estimated on a subsample of ACS respondents with a high predicted probability of having private insurance ($\geq 50\%$) and a subsample with a low predicted probability ($< 50\%$). For ACS respondents living with their parents, a similar partitioning of the sample was conducted using the prediction model for private dependent coverage.

The results based on the simulated samples are shown in table 3.18 and are consistent with the results discussed earlier. For the high likelihood sample, New

Jersey's law appeared to decrease college enrollment by 5.1 percent points (or 9.1%). This is close to the effects estimated earlier for those in high-income households and living with parents with employer-sponsored insurance. As seen earlier with low-income households, the effect on college enrollment for the low likelihood sample was positive and primarily due to higher enrollment in public colleges and universities. These results reinforce the hypothesis that college lock was stronger among those who were most likely to be attending college in the first place whereas an income effect may have been stronger for those who were not. In order to provide more insight into this finding, the IPEDS data will be used to see if there were any measurable changes in the age distributions at four-year private colleges, four-year public colleges, and two-year public colleges.

The results in table 3.19 represent difference-in-difference estimates for the effect of New Jersey's law on the proportion of students belonging to a particular age group. Separate estimates are obtained for four different age groups. For full-time students in four-year programs, there are estimated reductions in the proportion ages 19 and younger at both private and public colleges by 4.2 percentage points and 8.3 percentage points, respectively. The effects on the older age groups are much smaller. This would suggest that New Jersey's dependent age law has a stronger effect on the decision to enter college than it does on the decision to finish college. However, these effects are not statistically significant.

There is a statistically significant increase in the proportion of full-time students at New Jersey's two-year public colleges who are ages 19 and younger. The estimated increase is statistically significant and has a magnitude of 5.1 percentage points (or

12.8%). Combined with the estimate for four-year public colleges, these results suggest that a higher proportion of new college students in New Jersey may have chosen two-year programs over four-year programs following the dependent age law. Enrollment statistics for students ages 19 and younger based on a sample of colleges can be seen in figure 3.5, which shows the level of enrollment at New Jersey's two-year public colleges growing at a faster rate than its four-year public colleges and public colleges in Pennsylvania between 2003 and 2009.[8] The enrollment statistics are index numbers using the year 2003 as a base year with a value equal to 100. Between 2003 and 2009, enrollment at New Jersey's (Pennsylvania's) two-year public college rose by 50% (25%) while its four-year public colleges saw enrollment rise by 16.6% (11.5%). Part of the relative rise in community college enrollment in New Jersey relative to its four-year state college enrollment could be due to the dependent age law. Future research could enhance the understanding of this relationship by using individual-level data that could distinguish four-year programs from two-year programs while controlling for a student characteristics such as income level and ability.

3.6.4. The Effect on Older Young Adults

Further tests on validity of the college-lock reversal effect from New Jersey's law will be conducted by estimating the same models using samples that are expected to result in a finding of no effect. The subsamples used in this section will consist of 24-to-

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[8] Since the IPEDS can have missing data for some schools in particular years, the statistics in figure 3.5 are based on schools that had no missing data between 2003 and 2009. The statistics are based on 11 of New Jersey's four-year public schools and 19 of its two-year public schools. For Pennsylvania, the statistics are based on 19 four-year public schools and 12 two-year public schools.

27-year-olds in New Jersey and Pennsylvania. Although this age group was eligible for dependent coverage under New Jersey's law, they should not have been eligible for dependent coverage as full-time students before the law. Hence, college lock should not have existed at these ages in the first place. Table 3.20 shows the difference-in-difference estimates based on a sample of unmarried 24-to-27-year-olds, who should not have been affected by college lock before the law. Again, there does not appear to be any evidence to question the main finding that New Jersey's dependent age law reduced enrollment among those in higher-income households. The difference-in-difference estimate based on this subsample of unmarried 24-to-27-year-olds is -0.016 and statistically insignificant. However, there is an estimated reduction in enrollment among low-income individuals with a magnitude of 5.6 percentage points (or 27%).

3.6.5. Robustness Checks

One concern about the estimates discussed above is that they can be driven by state-specific factors that are not observable. For instance, perhaps the estimate of a negative effect on college enrollment could have been caused by a disproportionately higher number of Pennsylvania students attending private colleges in their home state due to the recession instead of going out-of-state. Another possibility could be changes in admissions standards at colleges and universities in either of the states.

Another concern about the main findings could involve the methods used in defining certain variables, such as the location of residence for a student's parents and the level of household income. In earlier discussions, it was assumed that a parent lived in

the same state as the young adult. Since it is possible for some young adults to live in Pennsylvania while having parents in New Jersey, and vice-versa, this assumption could cause inaccurate classifications of who belongs in the treatment and control groups. The earlier discussions also limited the measurement of a young adult's income level to the total amount of income earned by everyone in the young adult's household. This could be a misleading measure of income level for young adults who do not live with their parents but still receive financial support from them. In order to address these potential concerns, additional information contained in the ACS will be utilized.

In addition to being asked their current state of residence, ACS respondents also are asked about their state of residence during the previous year. As a robustness check, college enrollment equations will be estimated using the state of residence during the previous year as the criteria for determining treatment and control groups. The treatment group will consist of young adults who lived in New Jersey during the previous year while the control group will consist of those who lived in Pennsylvania. Since it is possible that out-of-state juniors and seniors in college could still be erroneously classified under this approach, the sample will be limited to 19-year-olds. The results of this robustness check are shown in table 3.21 and are similar to the earlier findings. As before, reductions in private college enrollment are estimated for higher-income individuals (by 14.4 percentage points) while public college enrollment increased among lower-income individuals (by 8.3 percentage points).

In the second robustness check, the analysis focuses on 19-to-22-year-olds who do not live with their parents. The inability to observe parental income for these individuals makes it difficult to determine whether they should be classified as having a

high or low level of income, which is important when considering the disparities in the earlier estimates based on household income level. Table 3.22 shows difference-in-difference estimates for the effect of New Jersey's law on college enrollment using an alternative method for controlling for income. Each specification includes the log of personal income and its squared value as regressors instead of dummy variables indicating the level of household income as a percentage of the federal poverty line. In the main sample, there is no effect on overall college enrollment, but there are significant changes in public and private college enrollments by roughly 11 percentage points. This is mostly driven by changes in college enrollment by individuals with personal income below the federal poverty line.

3.7. Policy Discussion and Conclusion

The main findings of this paper suggest that state efforts to increase insurance coverage through dependent insurance mandates have had some success, suggesting further expansions will result from the provision included in the Patient Protection and Affordable Care Act of 2010. In 2010, most states did not have an age limit as high as 26, which was the one set by the federal mandate. Additionally, the federal provision will affect self-insuring firms whereas the state laws did not. Future studies could examine how the federal mandate affects young adults in states, such as New Jersey, that initially had a generous dependent age law versus a state that did not have one, such as Pennsylvania.

Another "intended" consequence that deserves more attention is the effect on health care utilization. Anderson et al. (2012) examined how utilization changes around important ages, such as 19, but there has been no literature regarding the effect of

dependent age laws. In this paper, large expansions in health insurance coverage were estimated for young adults in both low and high income households as a result of New Jersey's law. If there is an increase in health care utilization, it would lead to better health outcomes and higher medical care costs. The next phases of analysis should estimate and compare the values of these benefits and costs.

In regards to college enrollment, there was significant evidence of college lock among 19-to-22-year-olds living higher-income households and with parents receiving employer-sponsored insurance from a small employer. Using March CPS data, it was shown that the enrollment effect was experienced primarily by full-time students and not part-time students, which was expected. Based on ACS data, the negative effect on enrollment appeared to be concentrated on private college enrollment. Further studies could address whether this effect differs according to an individual's ability and the admissions standards of the school. One would expect that college lock encouraged low-ability students to attend less selective schools, but was not exhibited by high-ability students at prestigious schools.

Preliminary evidence suggests that tying dependent eligibility with full-time student status distorts school-student matches. Considering that the strongest enrollment reactions to New Jersey's law occurred among those in poor health conditions and those in higher-income households, it appears that factors other than the quality of a school's fit with a student had influenced college enrollment decisions. An important implication of this finding is that there could be a potential effect on student outcomes. If dependent age laws, such as those passed by New Jersey and the federal government, remove the requirement of full-time student status, there could be a more efficient system of

matching students with schools. For example, a high school graduate who now decides to seek full-time employment or attend a two-year community college may become better-suited for the labor market by age 23 than if he had graduated from a four-year liberal arts college. Likewise, the learning atmosphere at four-year liberal arts colleges could be enhanced if fewer less-motivated students attend. Future research should addres whether the prior link between dependent eligibility and full-time student status was indeed an inefficient distortion or a helpful nudge encouraging young adults to obtain more human capital.

Besides college enrollment, another possible unintended consequence could involve employer reactions to dependent age laws. Critics of some health insurance mandates imposed by the federal and state governments often argue about the potential for added costs associated with them. Two examples include the potential for higher premiums or reductions in the offering of health insurance by employers. The effects on both of these could vary based on the intended generosity to the dependent. For instance, New Jersey's law could have a larger impact of employer decisions in comparison to the law passed in Indiana, which extended the age of non-student dependents to 24 instead of 30.

Future work could also apply concepts from behavioral economics, such as status quo bias and inertia. Past work has found them to be important in other markets with complex products or services, such as 401(K) enrollment (Madrian and Shea, 2001). Status quo bias in health insurance decisions was first discussed in Neipp and Zeckhauser (1985) and Samuelson and Zeckhauser (1988). The idea of status quo bias revolves around the importance of transition costs. If transition costs are significant, a status quo

bias may arise in which people tend to remain on their current health insurance plans despite the presence of cost savings or quality improvements in alternative plans. For young adults and their parents, transition costs could come in the form of gathering and analyzing information on different health insurance plans as well as the action of formally changing one's own plan, which may sometimes require a change in healthcare provider. For some parents who previously did not have employer-provided coverage, transition costs may involve making the costly adjustment of purchasing a plan from their employer.

If transition costs lead to status quo bias, it is possible that the effects of dependent age laws on health insurance coverage and college enrollment can vary systematically among those who initially were covered as dependents on their parents' health insurance plans and those who were not. First consider the case of a young adult who is not covered by his or her parents' health insurance plan due to age, but then becomes eligible for dependent coverage after a law change. Even if dependent coverage on his or her parents' plan is more affordable and his or her preferences remain the same after the law change, the presence of transition costs may prevent enrollment on the parents' plan. For young adults who initially were on their parents' health insurance plans and now can retain dependent status after a law change, the presence of transition costs could create an inertia effect in which the young adult is more likely to stay of his or her parents' plan. Hence, if status quo bias exists, failure to account for it could produce estimates for the effect of dependent age laws on health insurance coverage and college enrollment for the average young adult that are misleading for those initially on and not on their parents' plans.

Table 3.1: Proportion of Covered Workers in Partially or Completely Self-Funded Plans, by Firm Size, 1999-2009.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
3 - 199 Workers	0.13	0.15	0.17	0.13	0.10	0.10	0.13	0.13	0.12	0.12	0.15
200 - 999 Workers	0.51	0.53	0.52	0.48	0.50	0.50	0.53	0.53	0.53	0.47	0.48
1,000 - 4,999 Workers	0.62	0.69	0.66	0.67	0.71	0.78	0.78	0.77	0.76	0.76	0.80
5,000 or More Workers	0.62	0.72	0.70	0.72	0.79	0.80	0.82	0.89	0.86	0.89	0.88
All Firms	0.44	0.49	0.49	0.49	0.52	0.54	0.54	0.55	0.55	0.55	0.57

Source: Kaiser Family Foundation (2009)

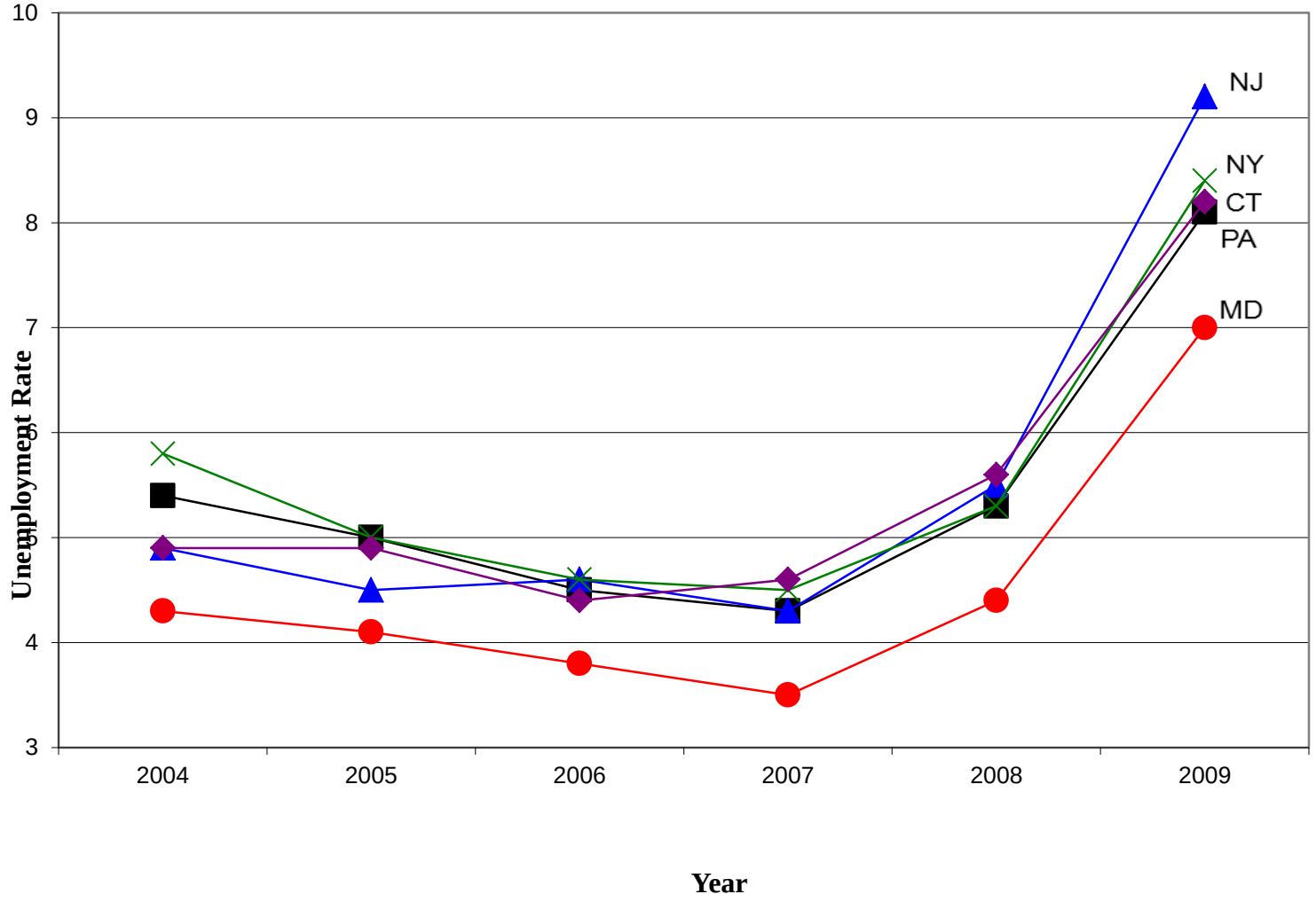
Table 3.2: Timeline of State Dependent Age Laws.

Prior to 2004	**2004**	**2005**	**2007**	**2008**	**2009**
Florida (25)*	None	South Dakota (24)	**Rhode Island (25)[1]**	**Maryland (25)***	Connecticut (26)*
Georgia (25)			**Virginia (25)***	**Minnesota (25)***	Washington (25)*
Idaho (23)		**2006**	**West Virginia (25)***	Missouri (26)*	Illinois (26)*
Louisiana (24)		Colorado (25)*	Delaware (24)*	Montana (25)*	**Iowa (25)[3]***
Maryland (23)[4]		**Massachusetts (26)***	**South Dakota (29)**	**Florida (30)***	
Massachusetts (25)		New Jersey (30)*	**Idaho (25)**	Iowa (25)[2]	
Minnesota (25)			Indiana (24)*	Kentucky (25)*	
Nevada (24)[4]			Maine (25)*		
New Mexico (25)*			New Hampshire (26)*		
North Dakota (26)[4]					
Rhode Island (25)					
South Carolina (22)[4]					
Tennessee (24)*					
Texas (25)*					
Utah (26)*					
Virginia (25)					
West Virginia (23)					
Wyoming (23)[4]					

* indicates the state had a wide law.

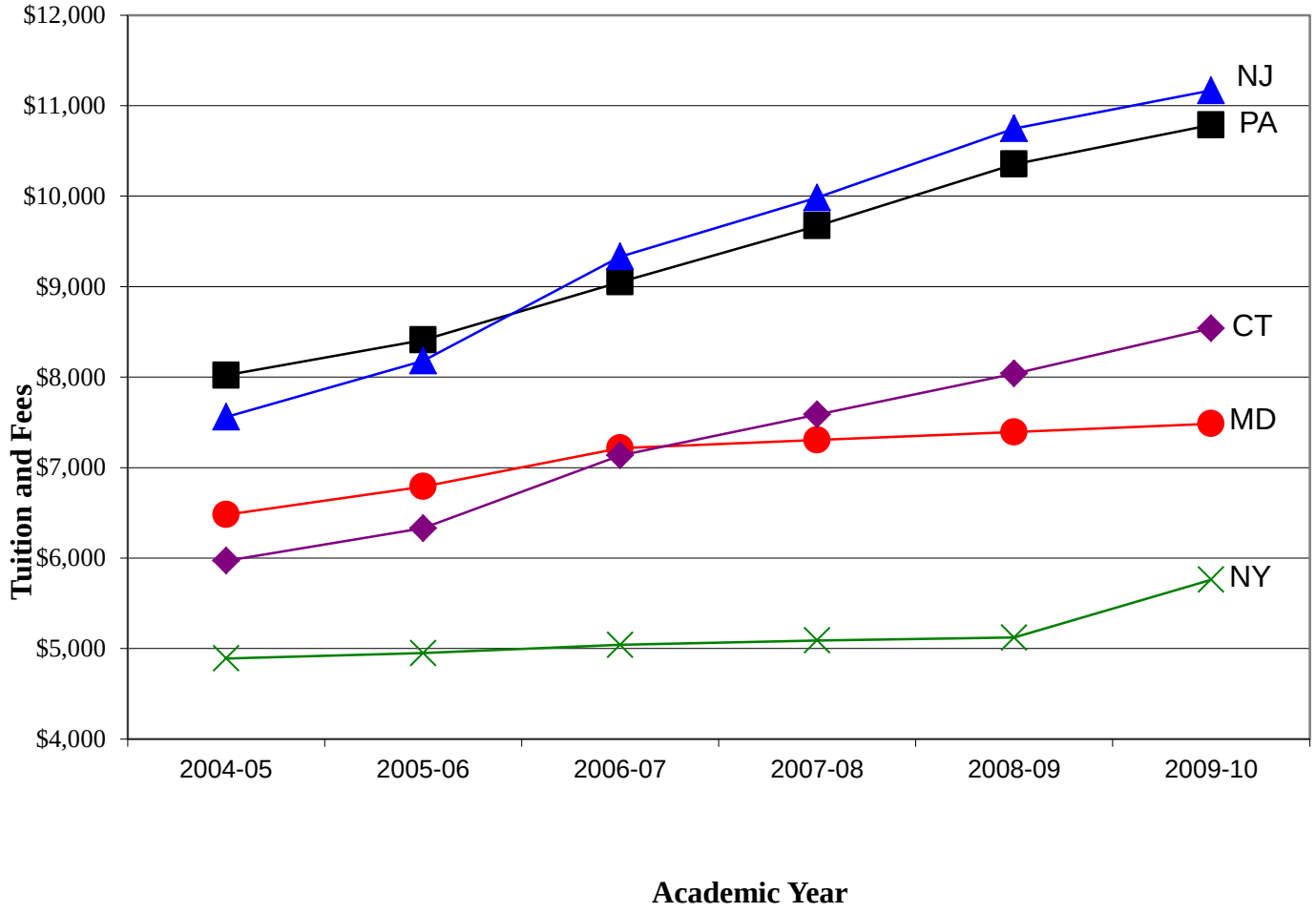
- Bold lettering indicates a law change that amended a previous dependent age law.
- [1] Rhode Island allowed part-time students to qualify for dependent coverage. Previously, only full-time students were eligible.
- [2] Iowa also allowed full-time students to qualify for dependent coverage without an age limit as long as it was a continuation of coverage.
- [3] Iowa removed the requirement of continuation coverage for full-time students above age 24.
- [4] The dependent age law only applied to small employers with 50 or fewer employees.

Figure 3.1: State Unemployment Rates.



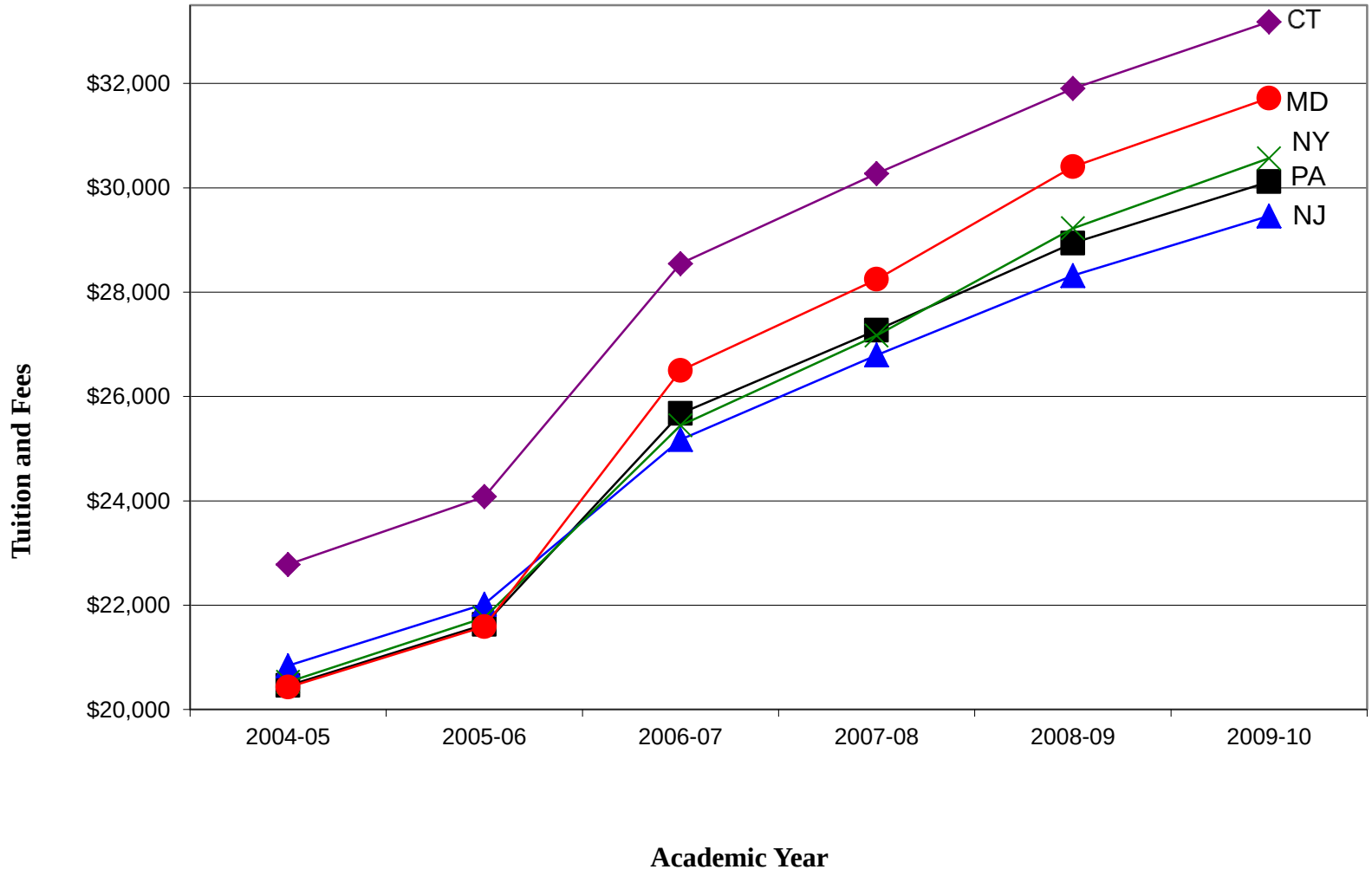
Source: Bureau of Labor Statistics (2010)

Figure 3.2: Tuition and Fees at Public 4-Year Colleges and Universities.



Source: College Board (2010)

Figure 3.3: Tuition and Fees at Private 4-Year Colleges and Universities.



Source: College Board (2010)

Table 3.3: Proportion of Employed Civilians by Firm Size.

Firm Size	New Jersey	Pennsylvania
Under 100 Workers	0.329	0.301
100 - 499 Workers	0.167	0.188
500 - 999 Workers	0.063	0.076
Over 1,000 Workers	0.441	0.435

Source: March CPS (2010)

Table 3.4: Proportion of Covered Workers in Partially or Completely Self-Funded Plans, by Industry.

Industry	Proportion covered by self-insured plans
Manufacturing	0.70
Health Care	0.72
Agriculture/Mining/Construction	0.35
Retail Trade	0.40
Public Administration	0.59
Wholesale Trade	0.53
Transportation/Communications/Utilities	0.76
Finance	0.61
Other Services	0.49

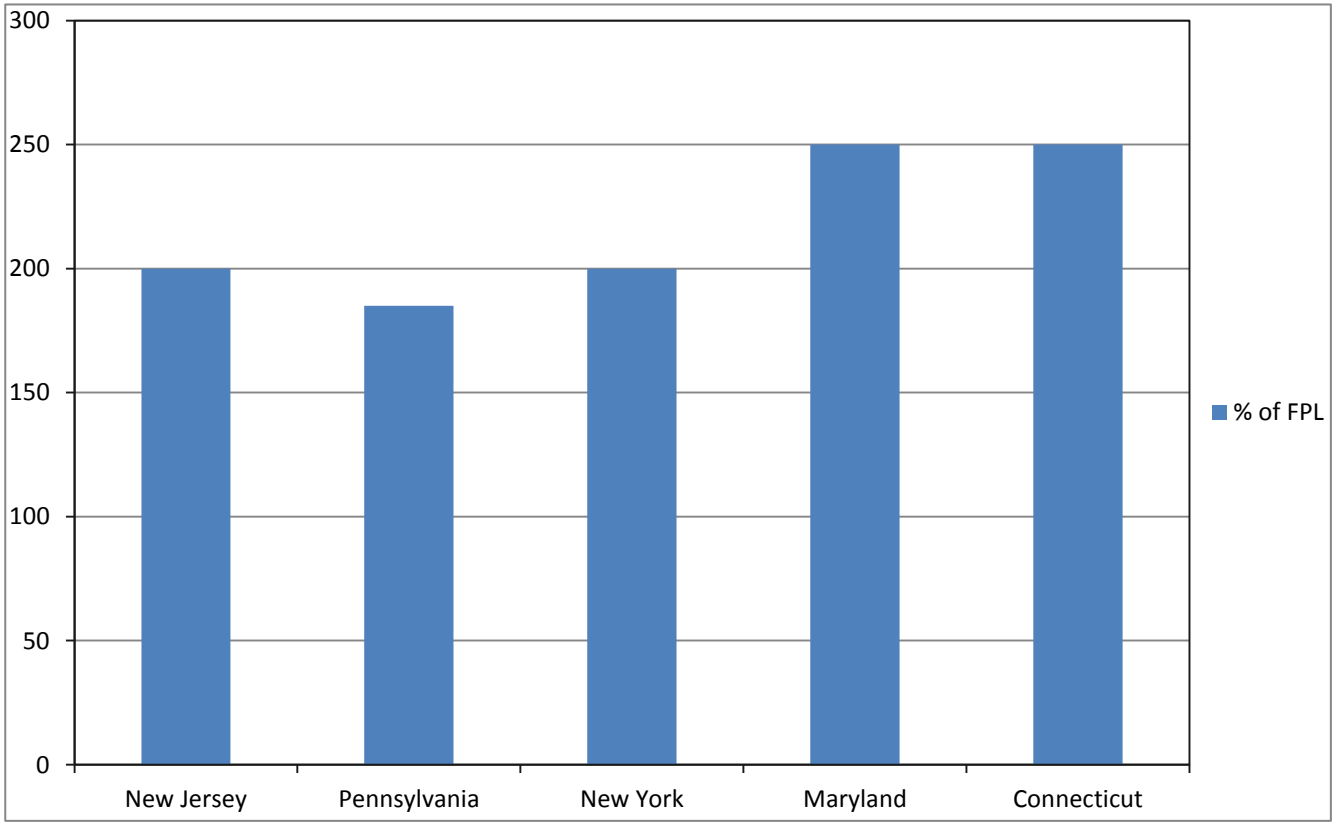
Source: Kaiser Family Foundation (2010)

Table 3.5: Proportion of Employed Civilians by Industry.

Industry	New Jersey	Pennsylvania
Manufacturing	0.090	0.128
Health Care	0.105	0.136
Agriculture/Mining/Construction	0.061	0.073
Retail Trade	0.108	0.114
Public Administration	0.047	0.041
Wholesale Trade	0.040	0.028
Transportation/Communications/Utilities	0.090	0.073
Finance	0.094	0.065

Source: American Community Survey (2009)

Figure 3.4: Medicaid/CHIP Eligibility Levels for Pregnant Women.



Source: Kaiser Family Foundation (2011)

Table 3.6: Descriptive statistics for the March CPS (1997 - 2010).

Variable	(1997 - 2001)	(2002 - 2006)	(2007 - 2010)
Enrolled in college (0,1)	0.506 (0.500)	0.521 (0.500)	0.528 (0.499)
Private dependent insurance (0,1)	0.540 (0.498)	0.537 (0.499)	0.516 (0.500)
Lives with parent who has a bachelor's degree or higher (0,1)	0.312 (0.463)	0.350 (0.477)	0.347 (0.476)
Female (0,1)	0.447 (0.497)	0.450 (0.498)	0.454 (0.498)
Nonwhite (0,1)	0.200 (0.400)	0.220 (0.414)	0.228 (0.419)
Number of siblings in household	0.092 (0.411)	0.086 (0.399)	0.103 (0.433)
Between 150% and 300% of the FPL (0,1)	0.225 (0.417)	0.229 (0.420)	0.245 (0.430)
At or Above 300% of the FPL (0,1)	0.642 (0.480)	0.635 (0.482)	0.586 (0.493)
Lives with parent who works for a medium-sized firm (0,1)	0.301 (0.462)	0.296 (0.456)	0.273 (0.493)
Lives with parent who works for a large-sized firm (0,1)	0.491 (0.500)	0.462 (0.499)	0.461 (0.499)
Sample size	18,391	26,320	21,667

Table 3.7: Descriptive statistics for the New Jersey versus Pennsylvania analysis.

	ACS				March CPS			
	2003 - 2005		2007 - 2009		2003 - 2005		2007 – 2009	
	PA	NJ	PA	NJ	PA	NJ	PA	NJ
Uninsured					0.192	0.266	0.207	0.235
					(0.397)	(0.442)	(0.405)	(0.424)
Private insurance coverage					0.704	0.670	0.657	0.676
					(0.457)	(0.470)	(0.475)	(0.468)
Private insurance through parent's plan					0.410	0.490	0.392	0.468
					(0.492)	(0.500)	(0.488)	(0.499)
Medicaid coverage					0.120	0.062	0.156	0.117
					(0.325)	(0.240)	(0.363)	(0.321)
Lives with parent with insurance from small employer					0.161	0.196	0.196	0.172
					(0.368)	(0.397)	(0.397)	(0.378)
Enrolled in college	0.450	0.485	0.564	0.554	0.463	0.517	0.469	0.512
	(0.497)	(0.500)	(0.496)	(0.497)	(0.499)	(0.500)	(0.499)	(0.500)
Lives with parent	0.606	0.705	0.491	0.658	0.703	0.798	0.738	0.763
	(0.489)	(0.456)	(0.500)	(0.474)	(0.457)	(0.401)	(0.440)	(0.425)
Married	0.065	0.066	0.040	0.033	0.063	0.029	0.035	0.049
	(0.246)	(0.249)	(0.197)	(0.180)	(0.243)	(0.169)	(0.184)	(0.216)
Black	0.113	0.158	0.126	0.171	0.143	0.162	0.119	0.177
	(0.317)	(0.365)	(0.332)	(0.377)	(0.351)	(0.368)	(0.324)	(0.382)
Hispanic	0.054	0.211	0.062	0.193	0.094	0.193	0.061	0.214
	(0.226)	(0.408)	(0.241)	(0.395)	(0.292)	(0.395)	(0.239)	(0.410)
Sample size	8,726	5,661	18,619	11,421	949	691	901	686

Table 3.8: Descriptive statistics for the IPEDS data.

	Public 4-year colleges				Private 4-year colleges				Public 2-year colleges			
	2003 – 2005		2007 - 2009		2003 - 2005		2007 - 2009		2003 - 2005		2007 - 2009	
	PA	NJ	PA	NJ	PA	NJ	PA	NJ	PA	NJ	PA	NJ
Proportion age 19 and younger (Full-time students)	0.416 (0.045)	0.295 (0.046)	0.409 (0.039)	0.295 (0.057)	0.390 (0.144)	0.356 (0.098)	0.433 (0.086)	0.366 (0.096)	0.437 (0.142)	0.399 (0.084)	0.446 (0.097)	0.442 (0.089)
Proportion ages 20 and 21 (Full-time students)	0.353 (0.037)	0.346 (0.058)	0.365 (0.030)	0.351 (0.061)	0.341 (0.125)	0.342 (0.089)	0.383 (0.069)	0.359 (0.068)	0.239 (0.067)	0.264 (0.045)	0.260 (0.034)	0.274 (0.030)
Proportion ages 22 through 24 (Full-time students)	0.157 (0.027)	0.233 (0.041)	0.160 (0.021)	0.235 (0.049)	0.100 (0.055)	0.155 (0.057)	0.105 (0.048)	0.169 (0.062)	0.105 (0.036)	0.123 (0.022)	0.114 (0.028)	0.117 (0.027)
Proportion age 25 and older (Full-time students)	0.072 (0.034)	0.126 (0.064)	0.065 (0.033)	0.119 (0.069)	0.083 (0.113)	0.101 (0.087)	0.075 (0.112)	0.099 (0.087)	0.165 (0.078)	0.199 (0.095)	0.161 (0.055)	0.163 (0.089)
Tuition and fees (in thousands of 2009 dollars)	8.138 (1.981)	8.989 (0.995)	8.457 (2.229)	10.676 (1.186)	27.768 (6.577)	27.375 (6.116)	31.376 (7.402)	30.970 (5.628)	3.614 (1.879)	2.931 (0.398)	3.891 (1.930)	3.283 (0.394)
County unemployment rate	5.523 (1.019)	5.558 (0.999)	5.895 (1.814)	6.865 (2.359)	5.494 (1.075)	5.016 (1.183)	6.056 (1.868)	6.146 (2.267)	5.445 (0.947)	5.054 (1.110)	5.955 (1.789)	6.402 (2.428)
Average federal grant (in thousands of 2009 dollars)	3.146 (0.501)	3.418 (0.711)	4.110 (0.731)	4.177 (0.793)	4.365 (1.187)	4.736 (0.949)	5.378 (1.569)	5.454 (0.938)	3.498 (0.583)	3.211 (0.741)	3.960 (0.812)	3.957 (0.673)
Average state grant (in thousands of 2009 dollars)	2.829 (0.510)	4.403 (1.109)	3.229 (0.714)	5.133 (1.092)	3.934 (0.389)	7.253 (1.750)	3.760 (0.619)	8.734 (1.950)	1.395 (0.851)	2.033 (0.897)	1.433 (0.928)	2.271 (0.355)
Average institution grant (in thousands of 2009 dollars)	3.439 (2.003)	3.777 (1.786)	3.965 (2.255)	5.235 (2.302)	13.020 (5.945)	13.218 (5.988)	15.701 (6.833)	14.981 (6.113)	2.147 (1.511)	1.319 (0.697)	1.878 (1.426)	1.382 (0.760)
Number of observations	61	36	61	34	211	45	192	41	47	52	44	52

Table 3.9: Estimations for the effect of private dependent coverage on college enrollment.

	1997 - 2001		2002 - 2006		2007 - 2010	
Sample	OLS	2SLS	OLS	2SLS	OLS	2SLS
Lives with parent	0.300*	0.079	0.298*	0.160*	0.249*	0.109*
	(0.007)	(0.042)	(0.006)	(0.035)	(0.007)	(0.036)
	n = 18,391		n = 26,320		n = 21,667	
Lives with parent who has ESI	0.371*	0.042	0.373*	0.356*	0.344*	0.070
	(0.009)	(0.177)	(0.007)	(0.154)	(0.009)	(0.186)
	n = 13,824		n = 19,443		n = 15,133	
Lives with parent who has a bachelor's degree or higher	0.302*	0.015	0.297*	0.125	0.220*	0.003
	(0.014)	(0.085)	(0.011)	(0.072)	(0.012)	(0.069)
	n = 5,747		n = 9,970		n = 9,250	
Below 300% of the FPL	0.259*	0.095*	0.249*	0.170*	0.202*	0.141*
	(0.011)	(0.048)	(0.010)	(0.039)	(0.011)	(0.044)
	n = 6,905		n = 16,350		n = 12,417	
At or above 300% of the FPL	0.324*	0.119*	0.329*	0.198*	0.288*	0.131*
	(0.009)	(0.057)	(0.008)	(0.049)	(0.009)	(0.049)
	n = 11,486		n = 9,128		n = 7,482	

Note: Each estimate is the coefficient from a separate regression based on March CPS data. Standard errors are in parentheses. The samples consist of 19-to-22-year-olds who live with at least one parent. Due to missing tuition data, respondents from the states of California, Nevada, Idaho, and Wyoming as well as the District of Columbia are excluded.

* denotes statistically significant at the 5 percent level.

Table 3.10: First-stage OLS regressions.

	1997 - 2001		2002 - 2006		2007 - 2010	
Sample	Medium Firm	Large Firm	Medium Firm	Large Firm	Medium Firm	Large Firm
Lives with parent	0.10*	0.18*	0.13*	0.19*	0.14*	0.20*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	n = 18,391		n = 26,320		n = 21,667	
Lives with parent who has ESI	0.02	0.06*	0.03*	0.05*	0.03*	0.05*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	n = 13,824		n = 19,443		n = 15,133	
Lives with parent who has a bachelor's degree or higher	0.08*	0.17*	0.21*	0.25*	0.13*	0.18*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	n = 5,747		n = 9,970		n = 9,250	
Below 300% of the FPL	0.16*	0.26*	0.10*	0.17*	0.19*	0.24*
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	n = 6,905		n = 16,350		n = 12,417	
At or above 300% of the FPL	0.08*	0.17*	0.10*	0.15*	0.13*	0.19*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
	n = 11,486		n = 9,128		n = 7,482	

Note: Each estimate is the coefficient from a separate regression based on March CPS data. Standard errors are in parentheses. The samples consist of 19-to-22-year-olds who live with at least one parent. Due to missing tuition data, respondents from the states of California, Nevada, Idaho, and Wyoming as well as the District of Columbia are excluded.

* denotes statistically significant at the 5 percent level.

Table 3.11: Difference-in-difference estimates for the effect on health insurance coverage.

Sample	Proportion Uninsured in NJ (2003 - 2005)	Uninsured	Medicaid	Private Insurance
Full sample (n = 3,076)	0.259	-0.070* (0.031)	-0.018 (0.011)	0.117* (0.040)
Below 300% of the FPL (n = 1,410)	0.511	-0.098* (0.046)	-0.003 (0.019)	0.155* (0.053)
At or above 300% of the FPL (n = 1,666)	0.125	-0.070* (0.033)	-0.006 (0.011)	0.079* (0.040)
Full-time college student (n = 1,434)	0.130	-0.064* (0.033)	-0.016 (0.016)	0.086* (0.037)
Non-student (n = 1,522)	0.382	-0.087* (0.038)	0.001 (0.017)	0.140* 0.048

Note: Each estimate is the coefficient from a separate regression based on March CPS data. Standard errors are in parentheses. The samples consist of 19-to-22-year-olds who are not married.
* denotes statistically significant at the 5 percent level.

Table 3.12: Difference-in-difference estimates for the effect on health insurance coverage among those living with parents.

Sample	Proportion Uninsured in NJ (2003 - 2005)	Uninsured	Medicaid	Private, (Any)	Private, (Dependent)	Private, (Self-Owned)
Lives with parent	0.205	-0.099*	0.004	0.132*	0.074	0.055*
(n = 2,402)		(0.036)	(0.013)	(0.046)	(0.056)	(0.015)
Lives with parent who has ESI	0.124	-0.078*	-0.029*	0.133*	0.109*	0.040*
(n = 1,886)		(0.033)	(0.010)	(0.043)	(0.050)	(0.020)
Lives with parent who has ESI from a small firm	0.150	-0.045	-0.063*	0.123*	0.271*	-0.050
(n = 590)		(0.046)	(0.027)	(0.047)	(0.079)	(0.039)
Lives with parent who has a bachelor's degree	0.100	-0.072*	-0.029	0.072*	0.075*	-0.059
(n = 900)		(0.030)	(0.019)	(0.034)	(0.039)	(0.037)
Lives with parent and below 300% of FPL	0.480	-0.173*	0.047	0.217*	0.182*	0.029
(n = 837)		(0.035)	(0.027)	(0.040)	(0.062)	(0.016)
Lives with parent and at or above 300% of FPL	0.114	-0.077	0.001	0.084	0.030	0.062*
(n = 1,565)		(0.039)	(0.013)	(0.050)	(0.057)	(0.025)
Lives with parent and full-time college student	0.103	-0.062*	0.002	0.070*	0.029	0.007
(n = 1,254)		(0.030)	(0.022)	(0.034)	(0.051)	(0.018)
Lives with parent and non-student	0.336	-0.140*	0.034	0.181*	0.096	0.129*
(n = 1,053)		(0.050)	(0.032)	(0.059)	(0.078)	(0.029)

Note: Each estimate is the coefficient from a separate regression based on March CPS data. Standard errors are in parentheses. The samples consist of 19-to-22-year-olds who are not married and live with a parent.
* denotes statistically significant at the 5 percent level.

Table 3.13: Difference-in-difference estimates for the effect on college enrollment.

	ACS		CPS	
Sample	Proportion Enrolled in NJ (2003 - 2005)	College Enrollment (DD Estimate)	Proportion Enrolled in NJ (2003 - 2005)	College Enrollment (DD Estimate)
Full sample	0.505	-0.020 (0.022) [n = 42,361]	0.531	-0.020 (0.062) [n = 3,076]
Below 300% of the FPL	0.383	0.055 (0.044) [n = 17,366]	0.344	0.093 (0.077) [n = 1,410]
At or above 300% of the FPL	0.589	-0.086* (0.014) [n = 24,995]	0.631	-0.099* (0.047) [n = 1,666]
Lives with parent	0.571	0.020 (0.010) [n = 27,490]	0.593	-0.007 (0.081) [n = 2,402]
Lives with parent who has ESI			0.625	-0.023 (0.073) [n = 1,886]
Lives with parent who has ESI from a small firm			0.587	-0.143* (0.062) [n = 590]
Lives with parent who has a bachelor's degree	0.740	-0.012 (0.025) [n = 9,607]	0.796	-0.049 (0.063) [n = 900]
Lives with parent and below 300% of FPL	0.444	0.065* (0.022) [n = 8,530]	0.387	0.140 (0.123) [n = 837]
Lives with parent and at or above 300% of FPL	0.625	0.002 (0.016) [n = 18,960]	0.661	-0.063 (0.063) [n = 1,565]

Note: Each estimate is the coefficient from a separate regression. Standard errors are in parentheses. The samples consist of 19-to-22-year-olds who are not married.

* denotes statistically significant at the 5 percent level.

Table 3.14: Difference-in-difference estimates for the effect on college enrollment based on income level.

	ACS	
Sample	Proportion Enrolled in NJ (2003 - 2005)	College Enrollment (DD Estimate)
Full sample	0.505	-0.020 (0.022) [n = 42,361]
Below 100% of the FPL	0.346	0.088 (0.065) [n = 6,439]
Between 100% and 300% of the FPL	0.400	0.036 (0.022) [n = 10,927]
Between 300% and 500% of the FPL	0.525	-0.029* (0.013) [n = 10,107]
Above 500% of the FPL	0.637	-0.087* (0.015) [n = 14,888]
Household income above $200,000 (in 2009 dollars)	0.548	0.029 (0.048) [n = 11,926]

Note: Each estimate is the coefficient from a separate regression. Standard errors are in parentheses. The samples consist of 19-to-22-year-olds who are not married.

* denotes statistically significant at the 5 percent level.

Table 3.15: Difference-in-difference estimates for the effect on college enrollment based on gender and health status.

	ACS	
Sample	Proportion Enrolled in NJ (2003 - 2005)	College Enrollment (DD Estimate)
Full sample	0.505	-0.020 (0.022) [n = 42,361]
Male	0.452	-0.051* (0.024) [n = 21,951]
Female	0.564	0.021 (0.018) [n = 20,410]
Good Health	0.515	-0.019 (0.021) [n = 39,652]
Poor Health	0.324	-0.099* (0.041) [n = 2,709]

Note: Each estimate is the coefficient from a separate regression. Standard errors are in parentheses. The samples consist of 19-to-22-year-olds who are not married.

* denotes statistically significant at the 5 percent level.

Table 3.16: Difference-in-difference estimates for the effect on full-time and part-time college enrollment.

	Full-time Enrollment		Part-Time Enrollment	
Sample	Proportion Enrolled in NJ (2003 - 2005)	DD Estimate	Proportion Enrolled in NJ (2003 - 2005)	DD Estimate
Full sample	0.487	-0.012	0.044	-0.008
(n = 3,076)		(0.067)		(0.014)
Below 300% of the FPL	0.288	0.120	0.055	-0.027
(n = 1,410)		(0.081)		(0.015)
At or above 300% of the FPL	0.593	-0.113*	0.038	0.014
(n = 1,666)		(0.047)		(0.020)
Lives with parent	0.548	0.008	0.045	-0.015
(n = 2,402)		(0.090)		(0.016)
Lives with parent who has ESI	0.585	-0.021	0.039	-0.003
(n = 1,886)		(0.086)		(0.017)
Lives with parent who has ESI from a small firm	0.541	-0.189*	0.046	0.045
(n = 590)		(0.049)		(0.051)
Lives with parent who has a bachelor's degree	0.768	-0.093	0.028	0.043
(n = 900)		(0.073)		(0.026)
Lives with parent and below 300% of FPL	0.330	0.176	0.057	-0.036
(n = 837)		(0.123)		(0.030)
Lives with parent and at or above 300% of FPL	0.621	-0.060	0.040	-0.003
(n = 1,565)		(0.067)		(0.021)

Note: Each estimate is the coefficient from a separate regression based on March CPS data. Standard errors are in parentheses. The samples consist of 19-to-22-year-olds who are not married.

* denotes statistically significant at the 5 percent level.

Table 3.17: Difference-in-difference estimates for the effect on public and private college enrollment.

	Public Enrollment		Private Enrollment	
Sample	Proportion Enrolled in NJ (2003 - 2005)	DD Estimate	Proportion Enrolled in NJ (2003 - 2005)	DD Estimate
Full sample (n = 42,361)	0.337	0.050 (0.035)	0.167	-0.069* (0.017)
Below 300% of the FPL (n = 17,366)	0.283	0.084* (0.042)	0.100	-0.029* (0.011)
At or above 300% of the FPL (n = 24,995)	0.375	0.022 (0.031)	0.214	-0.110* (0.027)
Lives with parent (n = 27,490)	0.370	0.029 (0.025)	0.201	-0.009 (0.018)
Lives with parent who has a bachelor's degree or higher (n = 9,607)	0.420	0.044 (0.031)	0.320	-0.056 (0.048)
Lives with parent and below 300% of FPL (n = 8,530)	0.314	0.066* (0.030)	0.129	-0.001 (0.017)
Lives with parent and at or above 300% of FPL (n = 18,960)	0.394	0.015 (0.024)	0.231	-0.013 (0.024)

Note: Each estimate is the coefficient from a separate regression based on ACS data. Standard errors are in parentheses. The samples consist of 19-to-22-year-olds who are not married.
* denotes statistically significant at the 5 percent level.

Table 3.18: Difference-in-difference estimates for the effect on college enrollment based on simulated samples.

	College Enrollment		Public Enrollment		Private Enrollment	
Sample	Proportion Enrolled in NJ (2003 - 2005)	DD Estimate	Proportion Enrolled in NJ (2003 - 2005)	DD Estimate	Proportion Enrolled in NJ (2003 - 2005)	DD Estimate
Predicted probability ≥ 0.50 (n = 32,137)	0.561	-0.051* (0.010)	0.364	0.028 (0.025)	0.196	-0.079* (0.023)
Predicted probability < 0.50 (n = 10,224)	0.340	0.056 (0.064)	0.257	0.102 (0.063)	0.083	-0.046* (0.011)
Predicted probability ≥ 0.50 and lives with parent (n = 19,538)	0.641	-0.0004 (0.016)	0.404	0.017 (0.018)	0.237	-0.018 (0.024)
Predicted probability < 0.50 and lives with parent (n = 7,952)	0.357	0.059 (0.033)	0.287	0.055 (0.043)	0.112	0.005 (0.025)

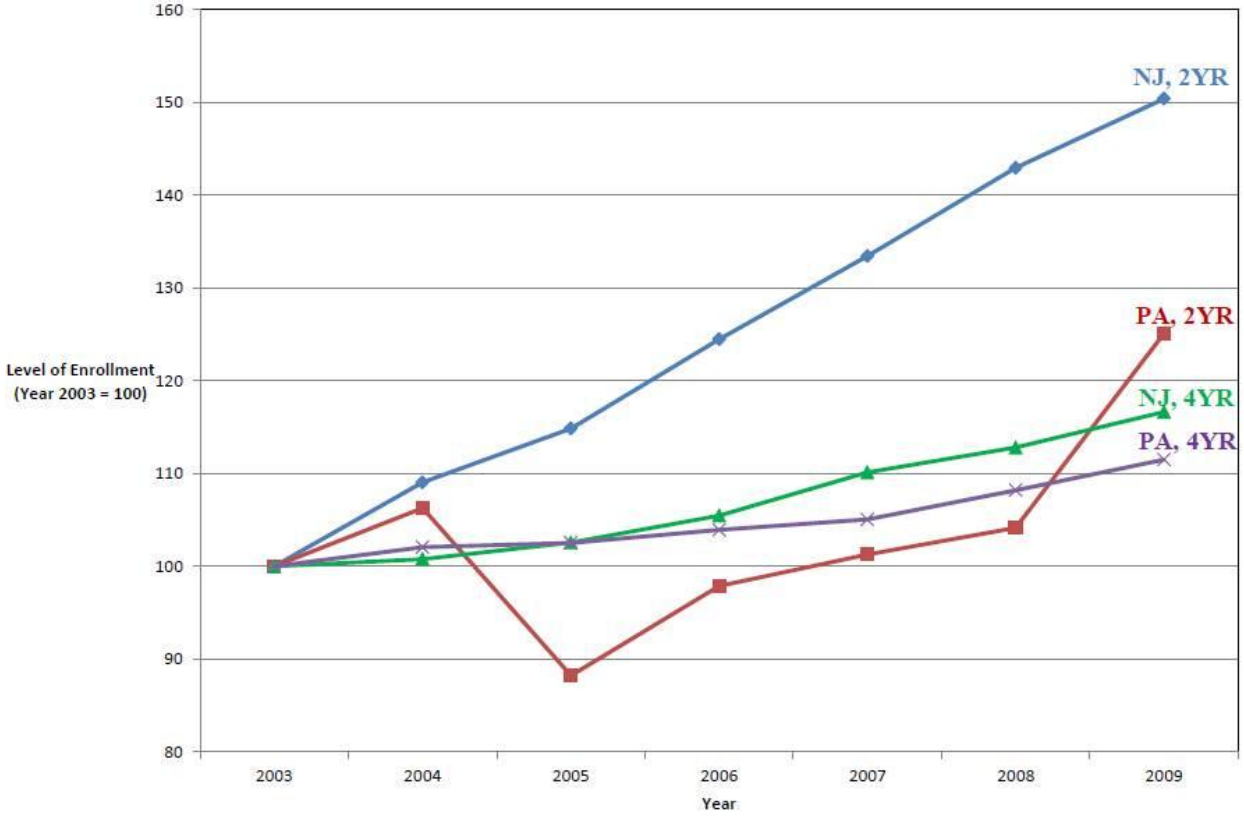
Note: Each estimate is the coefficient from a separate regression based on ACS data. Standard errors are in parentheses. The samples consist of 19-to-22-year-olds who are not married.
* denotes statistically significant at the 5 percent level.

Table 3.19: Difference-in-difference estimates for the effect on the age distribution of students using the IPEDS data.

	Proportion enrolled full-time by age		
Sample	Private 4-yr	Public 4-yr	Public 2-yr
Ages 19 and younger	-0.042	-0.083	0.051*
	(0.035)	(0.071)	(0.020)
Ages 20 and 21	-0.019	-0.033	-0.003
	(0.030)	(0.038)	(0.014)
Ages 22 through 24	0.001	-0.015	-0.016
	(0.008)	(0.016)	(0.010)
Ages 25 and older	0.004	-0.021	-0.047
	(0.015)	(0.021)	(0.025)
Sample size	489	296	193

* denotes statistically significant at the 5 percent level.

Figure 3.5: Public college enrollment in New Jersey and Pennsylvania (Ages 19 and younger).



Source: IPEDS (2003 – 2009)

Table 3.20: Difference-in-difference estimates for the effect on college enrollment using a sample of 24-to-27-year-olds.

	College Enrollment	
Sample	Proportion Enrolled in NJ (2003 - 2005)	DD estimate
Full sample (n = 28,604)	0.199	-0.029* (0.011)
Below 300% of the FPL (n = 11,556)	0.207	-0.056* (0.010)
At or above 300% of the FPL (n = 17,048)	0.194	-0.016 (0.015)
Lives with parent (n = 12,471)	0.237	0.006 (0.014)
Lives with parent who has a bachelor's degree (n = 4,209)	0.286	0.003 (0.018)
Lives with parent and below 300% of FPL (n = 2,480)	0.223	0.074* (0.014)
Lives with parent and at or above 300% of FPL (n = 9,991)	0.240	-0.012 (0.017)

Note: Each estimate is the coefficient from a separate regression based on ACS data. Standard errors are in parentheses. The samples consist of 24-to-27-year-olds who are not married.
* denotes statistically significant at the 5 percent level.

Table 3.21: Difference-in-difference estimates based on the state of residence in the previous year (Robustness check 1).

		DD Estimates		
Sample	Proportion Enrolled in NJ (2003 - 2005)	College Enrollment	Public Enrollment	Private Enrollment
Age 19 (n = 11,365)	0.563	-0.011 (0.028)	0.058 (0.030)	-0.067* (0.025)
Age 19 and below 300% of the FPL (n = 4,273)	0.417	0.118* (0.049)	0.083 (0.046)	0.036 (0.033)
Age 19 and at or above 300% of the FPL (n = 7,092)	0.664	-0.101* (0.035)	0.044 (0.039)	-0.144* (0.035)

Note: Each estimate is the coefficient from a separate regression based on ACS data. Standard errors are in parentheses. The samples consist of 19-year-olds who are not married.
* denotes statistically significant at the 5 percent level.

Table 3.22: Difference-in-difference estimates controlling for personal income levels (Robustness check 2).

		DD Estimates		
Sample	Proportion Enrolled in NJ (2003 - 2005)	College Enrollment	Public Enrollment	Private Enrollment
Does not live with parents (n = 14,871)	0.314	-0.007 (0.025)	0.108* (0.025)	-0.114* (0.022)
Personal income below FPL and does not live with parents (n = 10,294)	0.409	0.047 (0.031)	0.146* (0.034)	-0.099* (0.031)
Personal income at or above FPL and does not live with parents (n = 4,577)	0.226	-0.004 (0.041)	0.058 (0.036)	-0.061 (0.027)

Note: Each estimate is the coefficient from a separate regression based on ACS data. Standard errors are in parentheses. The samples consist of 19-to-22-year-olds who are not married.
* denotes statistically significant at the 5 percent level.

Chapter 4: Dependent Age Laws and College Graduates: A Bridge Toward Independence or a Boomerang Policy?

"One of the things I found when I watch the talk shows is…always the first they say is the most important thing about ObamaCare is that parents can keep their children on their health insurance plan until they reach age 26. I think all four of us right now would be glad to put that into law as an amendment in a New York minute. If they want to stay until they are 30 in the basement, that's fine with me." - Senator John McCain, March 27, 2012

4.1. Introduction

Among other things, the Great Recession of 2007 – 2009 brought renewed attention to the term "boomerang child," which refers to a young adult who has moved out of his or her parents' home only to return in the near future due to financial reasons. This could involve a college graduate who is unable to find a job after leaving school, someone who didn't attend college but also has difficulty finding employment, or someone who has a job but earns an inadequate salary to pay his or her living expenses. A recent study by the Pew Research Center (2012) found that 21.6% of young adults between ages 25 and 34 were living in multigenerational households in 2010, which was the highest proportion in the US since the 1950s.[1] Besides changes in the business cycle, other non-cyclical factors also may be contributing to this finding. The increase in young adults living in multigenerational households has been accompanied by rising costs of health care and college tuition, which have both exceeded the rate of inflation. Housing and transportation costs also have been on an upward trend and could play a role in decisions regarding living arrangements. Combined with rising student debt levels and

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[1] According to the same study by the Pew Research Center (2012), the proportion of young adults living in multigenerational households was at its lowest in 1980 at 11 percent, meaning it has increased by almost 100 percent over a thirty-year time period.

the growing supply of college graduates from four-year programs, which may have weakened the value of a bachelor's degree, the decision to live with one's parents may have become more attractive for new college graduates over time.

Public policies also may have contributed to the boomerang child phenomenon. This essay will provide further analysis on the effects that state-mandated dependent age extensions have had on the transition to adulthood. Furthermore, this essay will close a gap between the two previous essays of the dissertation. The first essay identified a spike in the proportion uninsured in the year following college graduation based on a national sample of young adults, but it did not address the role of dependent age laws in alleviating this transition out of college. The second essay used a two-state comparison to analyze the effect of New Jersey's dependent age law on decisions related to health insurance coverage and college enrollment and focused on a sample of traditionally-aged undergraduate students (ages 19 to 22). However, neither essay addressed the effect of dependent age laws on characteristics that would truly define a boomerang child, such as decisions related to living arrangements, employment, or marriage.

This essay analyzes the effect of dependent age laws on these three outcomes and focuses on a national sample of college graduates between ages 22 and 25. Most of the results suggest that dependent age laws did not play a role in the decisions to work full time, live with parents, or get married. At most, some estimates suggested that there could have been small effects on the decisions to work full time. However, the most significant effects on labor supply were for 22-year-olds and had a positive sign. Instead of discouraging work, it is possible that dependent age laws might have encouraged new graduates to shorten the duration of their post-graduation job searches.

4.2. Background and Literature Review

4.2.1. State Dependent Age Laws

Most dependent age laws have been enacted within the last six years. Prior to the Patient Protection and Affordable Care Act (PPACA) of 2010, there were twenty-eight states that had their own laws extending eligibility to non-students. A chart summarizing these laws can be seen in table 4.1. The age limits for non-students ranged from ages 21 to 30 with the mode being age 25. Besides expanding health insurance coverage, it is possible that these laws could have additional effects on the transition to adulthood. For example, the availability of dependent coverage on a parent's plan may lower the reservation wages of recent college graduates, or make them more willing to accept employment offers that do not include employer-provided health insurance benefits. Additionally, there could be effects on other decisions, such as those involving marriage and living arrangements. Most states excluded married individuals from the eligibility extensions, which could act as an incentive to postpone eventual marriages. Although most states allowed young adults to live in a household that was separate from their parents' household, any effect on labor market outcomes would likely result in an effect on living arrangements. If dependent age laws provide a disincentive to work, the proportion of young adults living with their parents would be expected to rise. Previous studies have found a strong positive effect of the labor market performance of young adults on their likelihood of living outside of their parents' home while also finding a negative relationship with parental income (Aassve et al. (2002); Kaplan (2012)).

Similarly, it can be argued that a negative effect on labor supply also could have a negative impact on the proportion of young adults who decide to get married. However, the expected effects may differ based on gender. Past studies have found that marriage rates for young women tend to decline during periods of economic performance that are

relatively better for men than women (Schultz (1994); Blau et al. (2000); Kondo (2011)), which would agree with the theoretical predictions of an earlier model introduced by Becker (1973).

4.2.2. National Trends in Marriage Rates and Literature on the Effects of Public Policies

National trends suggest that the transition to adulthood may have occurred at a slower pace in recent years. Figure 4.1 shows that gradual declines in the marriage rate have been experienced among young adults between ages 18 and 30. In terms of both percentage points and percentages, there were large declines in the marriage rate for young adults at ages just above the traditional age range of undergraduate college students, which includes ages 18 through 22. The largest decline was experienced by 23-year-olds for whom the marriage rate fell by 12.8 percentage points from a base of 27.7 percent (or a 46.2% decline) between 1995 and 2010. Similar declines were observed among young adults at ages 24 and 25. Interestingly, the 23-to-25 age group also happens to be the primary beneficiaries of dependent age laws, which usually exclude married people from the definition of a dependent.

Past literature has found that public policies linking benefit eligibility to marital status could have implications for marriage decisions. Many studies have looked at the impact of US welfare programs on marriage decisions. Prior to the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996, the main cash assistance program in the US was the Aid to Families with Dependent Children (AFDC) program, which was mostly reserved for single mothers. Some critics of the AFDC program argued that its design was "anti-marriage." When reforms to the welfare system were passed in the PRWORA of 1996, the AFDC program was replaced by the Temporary Assistance to Needy Families (TANF) program. Besides establishing time

limits for receiving welfare benefits and work requirements for recipients, the PRWORA granted states the flexibility to expand the eligibility criteria to include more married people. Some studies on the AFDC program found that welfare benefits were negatively related with the likelihood of being married (Schultz (1994); Grogger and Bronars (2001)) when estimates were based on a single year of cross-sectional data. However, other studies based on multiple years of data have found that the correlation between household structure and the generosity of a state's welfare benefits mostly disappears when controlling for geographic-specific fixed effects associated with states or metropolitan statistical areas (MSAs) (Moffitt (1994); Hoynes (1997); Blau et al. (2004); Moehling (2007)). Bitler et al. (2004) found that welfare reform provisions in the PRWORA reduced marriage rates based on state-level data, which would indicate an independence effect. Fitzgerald and Ribar (2004) found that welfare participation reduced the likelihood of transitioning out of female headship, but did not estimate any effect of welfare reform on female headship.

Besides cash assistance programs, the role of public health insurance programs have also been examined in previous research. Yelowitz (1997) studied the effect of Medicaid expansions on marriage decisions. Between 1987 and 1993, a series of Congressional legislation eliminated the direct link between Medicaid and AFDC eligibility. This change was made by extending Medicaid eligibility to two-parent families and increasing the Medicaid income thresholds above the AFDC income thresholds. Yelowitz (1997) found that these expansions resulted in an increase in the likelihood of married by 1.7 percentage points.

Other studies looking at the effect of program participation on marriage decisions include Eriksen (2010) and Hogan and Seifert (2010). Eriksen (2010) studied how home

ownership was effected by participation in an Individual Development Account (IDA) program, which is an asset-building program that provides matching funds to low-income households for the purchase of homes and other types of personal development expenses. Participants in an IDA program belong to a savings account program and would receive matching funds if a withdrawal of funds was used for home buying. Based on results from an experimental IDA program in Tulsa, OK, Eriksen (2010) estimated that program participants who were initially unmarried became 42 percent more likely to be married relative to non-participants within four years of beginning the program.

The study by Hogan and Seifert (2010) analyzed how joining the military affected the marriage rates of enlisted members. The focus of their discussion surrounded the practice of compensating members who do not live in military-provided housing with basic allowances for housing (BAH). The design of the military's BAH policy has been relatively more generous to married members compared to those who have been single. Their main findings suggest that 23-to-25-year olds who served on active duty were three times more likely to be married compared to those who never enrolled.

Although numerous studies have analyzed the effects of public policies on marriage rates, few of them have focused on young adults exclusively. In other words, it is unclear whether the declining marriage rates that were shown in Figure 4.1 can be attributed to policy changes or behavioral changes among young adults that are separate from public policy. This paper's analysis of dependent age laws will fill a gap in the existing literature by studying how responsive the marriage decisions of young adults has been with respect to changes in dependent eligibility and insurance costs. The results discussed later in the paper will find no evidence to support the hypothesis that dependent age laws played a role in the marriage decisions of young adults.

4.2.3. Literature on Young Adults and Living Arrangements

Similar to the changes in marriage rates discussed above, it appears that changes in the living arrangements of young adults over the last fifteen years also indicate that the transition to adulthood has become longer in duration. As shown in Figure 4.2, the proportion of young adults living with their parents has been rising since 2002. Among 23-to-25-year olds, the proportion living with their parents has risen by 7 percentage points (or 24%) from 29 percent to 36 percent. It also can be seen in Figure 4.2 that the likelihood of living with one's parents increased at a steeper rate during the recession of 2007-2009.

Previous research on the household formation of young adults has looked at the effects of economic variables and how they affect the likelihood of independent living and the transition process. Using British panel data, Ermisch and DiSalvo (1997) and Ermisch (1999) found that higher housing prices slowed the rate of exit out of parental homes while rises in personal income accelerated it. The earlier of the two studies found that the effect was stronger on women that it was for men. Later studies by Le Blanc and Wolff (2006) and Chiuri and Del Boca (2010) found similar effects using panel data from multiple countries in Europe.

Other studies based on US data suggest that the role of housing costs in explaining moving decisions could be small. Using Census data, Yelowitz (2006) found the moving out of a parent's home was negatively related with housing and transportation costs, but these factors could only explain 15 percent of the changes in living arrangements between 1980 and 2000. Haurin and Rosenthal (2007) also use Census data and found the decline in household headship between young adults could explain a one percentage point reduction in the homeownership rate of this age group.

Garasky et al. (2001) examined the size of the households that young adults would move to after leaving their parents. In particular, they analyzed the factors that caused young adults to move into a new household with a large group of roommates, small group of roommates, or live alone. Based on their findings, economic variables played no significant role in explaining whether young adults moved into a group living arrangement or lived alone. Instead, demographic variables were more important. For example, they found that the likelihood of moving into a large group setting was positively related with the number of siblings someone grew up with, residing in an urban area, being a college student, being white, and being Catholic. Based on gender, race, geographic region, and characteristics of parents, Buck and Scott (1993) observed large differences in the likelihood of moving out of a parent's home due to marriage and moving out for independent living. They also noticed that moving out due to marriage was becoming less common over time, but moving out due to independent living wasn't increasing in likelihood either.

The main findings of this paper indicate that dependent age laws are not significantly related with the decision to move out of a parent's home, at least for college graduates between ages 23 and 25. This differs from a finding by Levine et al. (2011), who looked at all young adults between ages 19 and 24. These two findings would suggest that the effect on living with one's parents could be stronger for those who are young and did not go to college. If this hypothesis were true, it would suggest that dependent age laws could slow the transition to adulthood by discouraging the initial stages of the transition altogether rather than encouraging those who have already left a parental home to return. Compared with the zero effect on marriage found in this paper,

the findings in this paper would be further evidence to suggest that dependent age laws cannot be blamed as being a "boomerang" policy.

4.2.4. Literature on Health Insurance and Labor Market Activity

One recent study by Hahn and Yang (2012) has analyzed the effects of state dependent age laws on the labor force participation decisions of young adults. Their main finding was that dependent age laws reduced full-time employment among newly eligible young adults by roughly 2 to 3 percentage points (from a base of 52 percent). The empirical analysis in this chapter will re-examine the labor force participation question by focusing only on recent college graduates. The sample used in Hahn and Yang (2012) included all 19-to-24-year-olds, regardless of whether they attended college or not. Their result may not provide an accurate estimate for the effect on the labor market outcomes of recent graduates if significant differences exist between college graduates and non-graduates in regards to unobservable characteristics, such as innate ability, available job opportunities, or the likelihood of having access to parental income and health insurance. Hence, the analysis in this chapter will only consider recent college graduates between ages 23 and 25, who also are unmarried.

Over the last fifteen years, it can be argued that college graduates have become less attached to the labor force. Figure 4.3 shows the proportion of college graduates with full-time employment over this period of time. Reductions in the likelihood of full-time employment are observed for both the 23-to-25 age group and the 30-to-55 age group, but a larger drop occurred among the younger graduates. Between 1995 and 2010, the proportion of graduates with full-time employment fell by 10 percentage points (or 13.6 percent) from 73 percent to 63 percent.

One question that was not addressed by Hahn and Young (2012) was whether newly-acquired dependent eligibility to graduates who have left school would affect the duration of time between graduation and the start of full-time employment. Using longitudinal data from the Survey of Income and Program Participation (SIPP), a descriptive analysis based on the 2001, 2004, and 2008 releases of the survey is provided in Figure 4.4. For each survey release, the proportion of college graduates with full-time employment is displayed based on the months that have passed since graduation. In the reported calculations, only graduates from bachelor's degree programs were included.

One interesting observation that can be made from Figure 4.4 is that the profile appears to flatten over time. More specifically, fewer college graduates work full time after graduation despite there being a higher fraction of young adults working full time while in college. During the months before graduation, around 30 percent of graduates had full-time employment in the 2008 release of the SIPP compared to 20 percent in the 2001 release. As expected a sharp rise in the proportion with full-time employment occurs after graduation, but the rise became less steep over time. Compared to the 2001 release of the SIPP, the proportion of graduates working full time during the first-year of leaving college fell by roughly 10 percentage points (from 60 percent to 50 percent). Later in the paper, I will estimate whether the decline in labor supply after graduation can be attributed to the dependent age laws that were passed at the state level. I find no evidence to support this hypothesis, which would be contrary to the findings reported by Hahn and Young (2012).

Although only one previous study has examined the effect of dependent age laws on labor supply decisions, there exists an extensive literature on the connection between labor supply decisions and health insurance in general.[2] Many studies have looked at

how spousal coverage has affected the labor supply of married women while other studies have looked at the effects of Medicaid eligibility following expansions in program. Olson (1998), Buchmueller and Valletta (1999), and Murasko (2008) have found a negative relationship between spousal insurance coverage and the labor supply of married women. This effect is concentrated on the decision to exit the workforce entirely, rather than a shift between full-time and part-time employment. Research on the Medicaid and State Children's Health Insurance Program (SCHIP) have exploited the variation in benefits across states and have estimated a negative relationship between benefit generosity and female labor supply (Winkler (1991); Tomohara and Lee (2007)). Other studies have found evidence suggesting that these programs reduced job-lock among unmarried women and married men (Bansak and Raphael (2008); (Hamersma and Kim (2009)).

Before using these findings to form expectations on the effects of dependent age laws, it is important to consider how the newly eligible individuals differ between these studies. Compared to the relationship between married women and their husbands, young adults are less attached to parents. Social convention encourages young adults in their twenties to separate from their parents. A similar tendency does not exist for married women. And unlike Medicaid participants, young adults with access to dependent coverage under a parent's plan could differ in regards to observable characteristics, such as educational attainment, that would make them more able to obtain their own employer-provided coverage. This could weaken the anticipated effect of dependent age laws.

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[2] A more thorough analysis of past literature on the relationship between health insurance status and labor market outcomes can be seen in Currie and Madrian (1999).

4.3. Data

The analysis of dependent age laws in this chapter will focus on young adults who have recently graduated from college. In order to allow enough time for someone to complete his or her schooling, the sample will consist of only 23-to-25-year olds. With the exception of the estimations for the effect on marriage, each sample of data will be restricted to young adults who are not married. As mentioned earlier in Figure 4.1, most state laws did not consider married couples in their twenties as being eligible for extended dependent coverage. Furthermore, the subsamples used in the analysis will focus entirely on college graduates who are no longer in school and exclude anyone who is enrolled in any type of educational program.

Three datasets that were discussed and used in earlier chapters will be used again in this analysis, which will include the March CPS, SIPP, and ACS. The main analysis will use ten years of repeated cross-sectional data from the March CPS, which will span the years 2000 through 2009. Time periods after 2009 were excluded as a result of the passage of the Patient Protection and Affordable Care Act of 2010, which included a dependent age extension for all states up to age 26. With the exception of Massachusetts and Hawaii, young adults from all other 48 states and the District of Columbia were used in the samples.[3]

Descriptive statistics for the subsamples of March CPS data used in this analysis can be seen in table 4.2. Separate columns report values for non-student, college graduates and non-student, non-graduates. Eligibility for dependent coverage based on

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[3] The state legislatures in Massachusetts and Hawaii passed comprehensive health care reforms during the time periods of this study. Hence, there were other policies in these states that coincide with the growth of dependent age laws across other states. For this reason, these two states are excluded to avoid biased results. Massachusetts passed a dependent age law while Hawaii did not.

state of residence and time period is measured by the Law variable. Potential eligibility is roughly the same for both groups at 11 percent and 13 percent. Private dependent coverage is slightly higher for college graduates (16 percent vs. 12 percent). However, much larger differences were observed for the other types of insurance coverage. As one might expect, college graduates were much more likely to have private self-owned coverage (64 percent vs. 37 percent) and less likely to be uninsured (18 percent vs. 39 percent) or covered by Medicaid (3 percent vs. 12 percent).

In regards to the main unintended consequences of interest in this chapter (full-time employment, living with parents, and marriage), some important differences can be seen. First, full-time employment is higher among graduates compared to non-graduates by 18 percentage points (78 percent vs. 60 percent). Graduates also have a lower marriage rate (22 percent vs. 31 percent), but the proportion living with parents is roughly the same at around 27 or 28 percent. The other demographic variables also have some large differences between the groups as can be seen by the sample of graduates being more likely to be female, white, have fewer children, and higher values of non-wage income.

4.4. Empirical Methodology

The main interest of this paper is to estimate the relationship between eligibility for private dependent coverage and three choices that young adults make after graduating from college, which include decisions dealing with labor supply, living arrangements, and marriage. The main approach that will be used to estimate these effects will be a linear probability model with fixed effects for state and year, which has the functional form shown in equation (1):

$$(1) \quad Y_{ist} = \beta_0 + \beta_1 Law_{ist} + \beta_2 X_{ist} + \lambda_s + \gamma_t + \varepsilon_{ist}$$

The variable Y_{ist} is a binary outcome variable that could indicate whether or not a young adult has full-time employment, lives with parents, or is married. In order to see if dependent age laws affected insurance coverage in a national sample, an earlier set of regression estimations will use health insurance status as the outcome variable. The variable Law_{ist} is a dummy variable equal to 1 if the individual is eligible for dependent coverage lives in a state with a dependent age law and it is a time period during which the law is in effect. Hence, the main coefficient of interest will be β_1. In addition, the model will include covariates that control for demographic and economic characteristics, such as dummy variables for being female, black, or Hispanic, and other variables measuring the number of own children, the real value of non-wage income in 2009 dollars, and the state-year specific unemployment rate. Fixed effects are included for state and year. The error variable ε_{ist} is assumed to have a mean of zero and follow a normal distribution. Standard errors will be clustered by state and year.

4.5. Results

Before addressing whether other outcomes were impacted by dependent age laws, it is necessary to estimate the impact of health insurance coverage based on the national sample of data. Table 4.3 reports the estimated coefficient on the Law variable for a number of subsamples. Different estimates are provided based on educational attainment, living arrangements, and the type of private coverage. Because it is only possible to observe whether someone is a dependent on a parent's plan if he or she lives with that parent, the samples are limited to those living with parents when estimating the effect on this outcome.

State laws appeared to have increased dependent coverage among 23-to-25-year olds with a bachelor's degree. The estimated rise in any dependent coverage was by a magnitude of 4.1 percentage points (or 25.6 percent). For dependent coverage that can be identified as being on a parent's plan, the increase was by 9.5 percentage points (or 59.4%). A different story can be told for the 23-to-25-year olds who did not have a bachelor's degree. For this group, there was no effect on dependent coverage. This could be due to non-graduates being more insensitive to gaining dependent eligibility compared to graduates, or it could the result of non-graduates being less likely to have parents with employer-provided health insurance.

The additional estimates provided in table 4.3 consider the possibility of disparities in the effects of dependent age laws based on the timing of implementation. It is expected that young adults, who would have needed the state age extension to remain a dependent, would be more likely to have dependent coverage if the extension was enacted into law before they aged-out of eligibility. In other words, a 23-year-old college graduate should be more likely to have dependent coverage if the law change occurred while he or she was still a dependent. This hypothesis can be considered an inertia effect. In order to test whether the timing of the law matters or not, a set of interaction variables will be used. First, the Law variable will be interacted with dummy variables indicating whether the law is in its first year of implementation, second year of implementation, or was implemented more than two years ago. In an alternative estimation approach, the Law variable will be interacted with dummy variables indicating whether the law was enacted before the young adult was 22 years old, or after reaching that age.

For the most part, these results reflect the main findings in which college graduates experienced an expansion in dependent coverage whereas non-graduates did

not. Among college graduates, the effect of the law is larger in the second year of implementation compared to the first year, which is what the inertia effect would predict. However, the coefficient on the interaction of the Law variable and the third year of implementation is much smaller than the coefficient on the second year of implementation. Additionally, it is hard to explain the estimates when the interactions were passed on the age at which the law was implemented. According to the results, a larger expansion occurred for those living in states that passed a law at or after the young adult was age 22. For young adults living in those states, the estimated expansion in dependent coverage on a parent's plan was by 10.9 percentage points (or 62.5 percent).

Table 4.4(a) shows the estimated effects of state dependent age laws on other measures of health insurance status for bachelor's degree graduates. An interesting finding is that the largest drop in the proportion uninsured occurred in the first year of implementation whereas the second year of implementation could be characterized by a large decline in private self-owned coverage. This seems intuitively appealing if young adult's covered under a parent's plan become more likely to continue coverage during the first year of implementation, but those with their own health insurance are unable to switch policies until the end of the year. None of the estimated effects on the proportion uninsured are statistically significant at the 5 percent level. The coefficient on the decline in self-owned coverage during the second year is statistically significant and reflects a similar substitution effect that was found by Monheit et al. (2011). Overall, there did not appear to be any effects on Medicaid coverage.

Table 4.4(b) looks only at college graduates who live with their parents. This group might be more characteristic of the "boomerang child" label. For these individuals, the drop in the proportion uninsured is more pronounced and the decline in

self-owned coverage is more smaller than before. The Law coefficients suggest that the proportion uninsured and the proportion with self-owned coverage both fall by roughly 6 percentage points. The largest drop in the proportion uninsured occurs in the second year of implementation with a 13.2 percentage point decline. The declines in self-owned coverage were somewhat consistent across all interaction years. As before, the estimated effects on Medicaid coverage were negligible in magnitude and not statistically significant.

4.5.1. The Main Findings of the Effects on Full-Time Employment, Living Arrangements, and Marriage Decisions

Considering the changes in health insurance coverage and status that were discussed above, the questions regarding potential unintended consequences become even more relevant. However, most of the results in table 4.5 suggest that, at most, the unintended effects are weak. Conditioning on having a bachelor's degree and not being enrolled in school at the present time, dependent age laws are estimated to have lowered full-time employment by 1 percentage point (or 1.3 percent). This estimated effect is not statistically different from zero. When the interaction terms were included to account for disparities in the effects based on year of implementation, the largest deviation from the main finding was a 6.5 percentage point (or 8.3 percent) decline in the likelihood of having full-time employment during the second year of implementation. This estimated effect also is not statistically different from zero.

The estimated effects on the decision to live with one's parents and the decision to get married were much weaker. The likelihood of living with one's parents rose by 0.1 percentage points (or 0.4 percent) while the likelihood of marriage fell by 0.4 percentage points (or 1.8 percent). Although these estimates had the expected sign, they are not

statistically different from zero. Overall, the initial set of results suggest that state dependent age laws had no significant impact on the transition to adulthood. In other words, the dependent age extensions cannot be blamed for the boomerang child phenomenon.

4.5.2. The Transition into Full-Time Employment Based on Longitudinal Data

A more detailed understanding of the transition out of college can be obtained with longitudinal data. For this analysis, the 2001, 2004, and 2008 releases of the SIPP were used.[4] The subsamples used in the regression analysis consisted of college graduates that were unmarried and were followed in the SIPP for at least 24 consecutive months. Separate linear probability models were estimated based on the duration of time that had passed since the month of graduation. The young adults were studied at the sixth and twelfth months after leaving college. The six-month sample had a total of 1,420 observations and the twelve-month sample had 818 observations. The smaller size of the twelve-month was due to a combination of sample attrition and inability to observe some graduates at month 12 before the SIPP survey period concluded.

Separate linear probability models also were estimated based on two alternative measures of "full-time" employment. It is possible to observe whether someone has at least one job that can be described as a full-time position, which is how the first measure of full-time employment will be defined. The second measure used in the analysis will utilize the ability to observe the number of hours a person works at each of the two jobs reported in the survey. If the combined number of hours is at least as great as 35 hours per week, they will be considered a full-time worker in the second outcome variable.

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[4] The 2001 SIPP covers a time period from October 2000 through December 2003 while the 2004 SIPP covers October 2003 through December 2007. At the time this research was conducted, the 2008 SIPP covered May 2008 through November 2011.

Descriptive statistics for the SIPP data can be found in table 4.6. The proportion of graduates who are potentially eligible for extended dependent coverage is basically the same at the sixth and twelfth month following graduation. Non-negligible differences between the two months arise in the full-time employment variables. At the twelfth month, graduates are more likely to have a full-time job (64 percent vs. 54 percent) and work 35 hours a week or more (66 percent from 57 percent). With the exception of non-wage income being higher in the twelfth month compared to the sixth month, the other variables have somewhat similar values across the two samples.

The estimated effects of dependent age laws on full-time employment decisions can be seen in table 4.7. None of the estimated coefficients are statistically different from zero, but some of the magnitudes are of a considerable size. In the main set of estimates, a dependent age law is estimated to increase the likelihood of having a full-time job by 2 percentage points (3.7 percent) by the sixth month following graduation. The likelihood of working 35 hours or more rises even more by 7.6 percentage points (or 13.3 percent). When including the interaction terms for the year of implementation, the strongest effect appears to occur during the first year of implementation. This could occur if having dependent coverage makes graduates more willing to take lower paying and lower-skilled jobs that could be easier to obtain rather than hold out and search for a better job that could be harder to obtain. However, by the twelfth month, the effects of the law are estimated as being much smaller and still statistically no different from zero. Similar to the analysis based on data from the March CPS, the findings based on the SIPP data suggest that dependent age laws cannot be blamed for contributing to the boomerang child phenomenon.

4.5.3. The Effect on Full-Time Employment based on Age and Gender

In the final robustness check of the validity of the findings presented earlier, the large nature of the American Community Survey (ACS) will be used to get precise estimates on how dependent law changes might have differed by on the exact age and gender of a respondent. As shown in the descriptive analysis of the SIPP data, the likelihood of full-time employment can change substantially within the first year after college graduation. Because of this, it is possible that the effect of dependent coverage on labor supply decisions could differ substantially between 23-, 24-, and 25-year-olds. It also could be the case that men and women react differently to the obtaining dependent health insurance on a parent's plan. For instance, young women expecting to get pregnant could be more prone to maintaining a connection with their parent's insurance plan and less likely to work full time compared to a healthy young man of the same age. Because of these possibilities, separate estimates of the effect of dependent age laws on full-time employment were obtained for each gender-age pair.

Descriptive statistics for the subsamples of ACS data are shown in table 4.8. As in the previous empirical results, the subsamples will include only those who have a bachelor's degree, are not currently enrolled in school, and are not married. The sample sizes vary by age, ranging from 16,736 individuals at age 22 to 25,056 individuals at age 24. Notice how the proportion of the sample that is potentially eligible for extended dependent coverage falls substantially at age 25. Between ages 22 and 24, about 24 to 27 percent of the sample is potentially eligible, but it then falls to 5 percent. This decline at age 25 is due to most states establishing their cutoff age at the 25^{th} birthday, which was shown in table 4.1 earlier in the chapter. As one would expect, full-time employment rises with age. At age 22, forty percent work full time compared to 72 percent at age 25.

Regression results by age and gender are shown in table 4.9. In the samples that include both genders, the only age during which dependent age laws appear to affect full-time employment is age 22. For 22-year-olds, there is an estimated increase in the likelihood of full-time employment by 4.3 percentage points (or 10.8 percent). The size of this effect is stronger than earlier estimates in terms of magnitude. Combined with the absence of significant effects at other ages, this might suggest that dependent eligibility encourages graduates to accept jobs earlier after leaving school rather than discourage work via a boomerang effect. When the effect is allowed to vary based on year of implementation, the effect is concentrated in the states that enacted the laws earlier.

At most, the biggest effect on the male sample was a 2.6 percentage point (or 9.6 percent) increase in the proportion with full-time employment among 22-year-olds. However, this estimate is not statistically different from zero. When the interaction terms were included, negative effects were estimated for 23-year-olds after two years of implementation and 25-year-olds in the second year. This would suggest that the hypothesis of a disincentive to work due to dependent eligibility is more characteristic of older graduates who are male.

The effect on women was similar to the effect on the full sample. Again, the largest effect is an increase in full-time employment among 22-year-olds. It is estimated that dependent age laws increased full-time employment at age 22 by 5.6 percentage points (or 14 percent). The only negative effect estimated for women was at age 24 and during the second year of implementation, which was 5.2 percentage point (7.8 percent) drop in full-time employment. For the most part, it seems that neither gender is being discouraged from working full time as a result of the dependent age laws passed at the state level.

4.6. Conclusion

Considering the recent attention given to boomerang children and the growing literature on dependent age laws, this essay makes a few contributions. Primarily, the results of this essay indicate that the transition to adulthood among college graduates has not been significantly affected by state dependent age laws. While college graduates were the main beneficiaries of the laws based on estimated expansions in health insurance coverage, they did not appear to alter other behaviors. Decisions regarding living arrangements and marriage remain unchanged. Most of the results regarding full-time employment suggested that dependent age laws played no role in this decision either. At most, there was weak evidence to suggest that college graduates were more likely to work full time immediately following college graduation as a result of being eligible for dependent coverage.

The findings of this essay present additional questions that future literature should address. In the descriptive summary of the March CPS data, there were substantial differences in health insurance status between college graduates and non-graduates within the age group of 23-to-25-year olds. For instance, it was shown that college graduates were less likely to be uninsured or covered by Medicaid and more likely to have their own employer-provided coverage. Future research could address how long these disparities persist or whether they grow further apart of longer time horizons. However, it is possible that asking this question simply about health insurance coverage only would understate the true disparities in outcomes and well-being. Larger differences also could exist between the groups in regards to cost sharing of medical expenses and other non-wage benefits, such as retirement plans and life insurance.

If dependent age laws did encourage new graduates to become more willing to accept lower paying jobs following graduation, there could be long-term effects worth studying based on the discussion in the paragraph above. Suppose dependent eligibility encourages college graduates to settle for lower quality jobs following graduation, then it is possible that they also are sacrificing other valuable benefits. Whether focusing on health insurance coverage while forgoing other benefits is the most efficient decision could be a topic for future research. Following the Patient Protection and Affordable Care Act of 2010, more young adults will obtain dependent eligibility and be faced with these types of decisions. Cohort studies based on those graduating before and after the federal reform could address the longer term questions.

An additional question of interest arose from the descriptive analysis of the SIPP data, which illustrated that full-time employment after college graduation has declined while full-time employment before graduation has risen over the years. The opposite directions of these values seem to be somewhat of a paradox. It seems unlikely that college graduation, by itself, would reduce an individual's attachment to the labor force. Two factors that could explain this phenomenon could be (1) a correlation with geographic location and (2) a causal effect. It is possible that colleges and universities are located in areas that have developed stronger labor markets over time compared to the geographic areas in which graduates are originally from or have moved to following graduation. Alternatively, rising tuition costs may have encouraged an increase in student labor supply while in college, but a corresponding incentive has not changed for those outside of college. These hypotheses should be addressed with future research.

The final idea to consider is the finding that college graduates were more affected than non-graduates when it came to changes in health insurance status following the

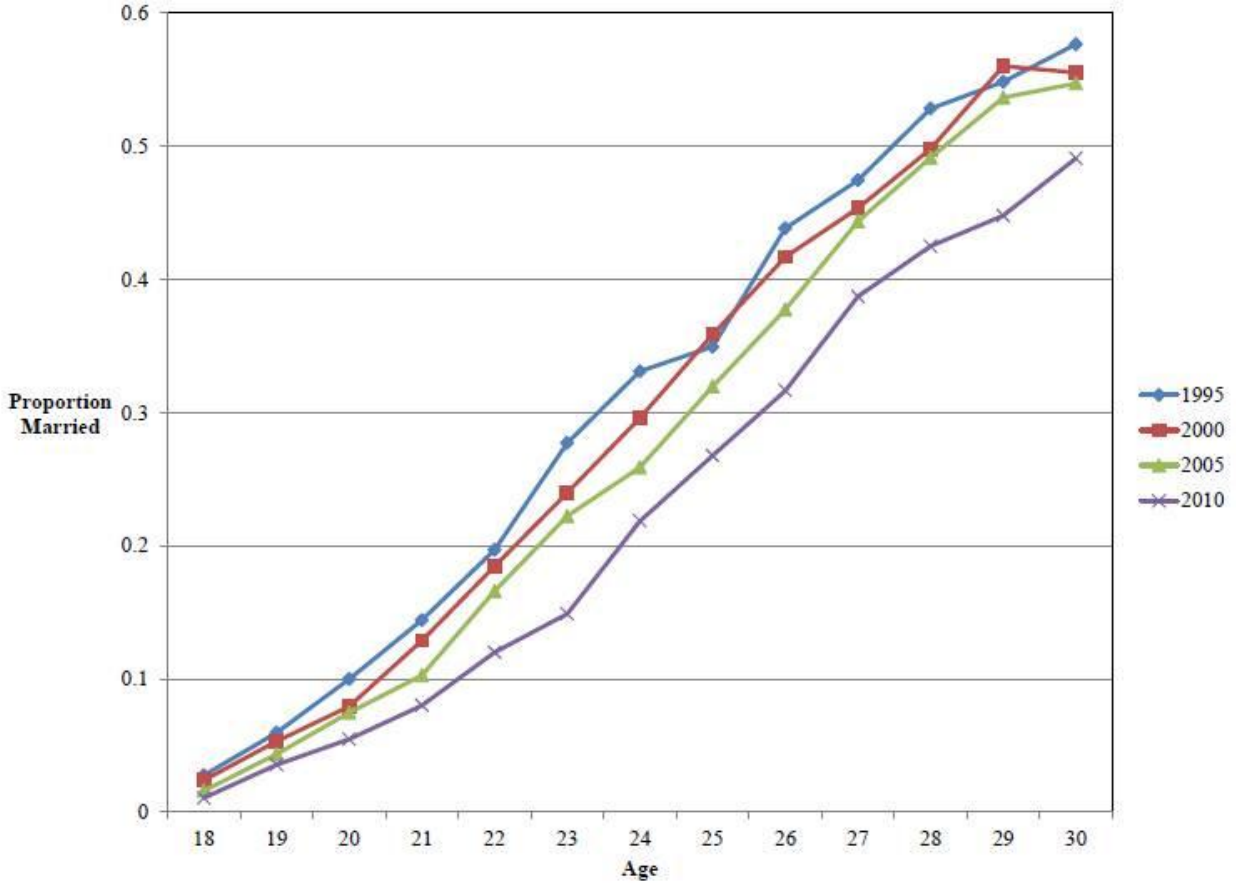
implementation of a dependent age law. As mentioned earlier, this could be due to college graduates having wealthier parents who are more likely to have employer-provided health insurance. Alternatively, there could be behavioral differences based on education level. Future research could address the question of whether higher-educated individuals are more sensitive to incentives and policy changes than lower-educated individuals. An interesting question is how much does parental income matter and to what extent do non-graduates appear more insensitive to incentives. Since most datasets do not allow parental income to be observed unless a young adult actually lives with the parent, this analysis will require additional data that is different from the sources used in this essay.

Table 4.1: State laws extending dependent eligibility to non-students.

State	Effective Date	Age Limit	Eligible if married	Must live with parents
Colorado	January 2006	25		Yes
Connecticut	January 2009	26		
Delaware	June 2007	24		
Florida[1]	October 1992	25		Yes
Idaho	July 2007	21		
Illinois	June 2009	26		
Indiana	July 2007	24		
Iowa	July 2008	25		
Kentucky	July 2008	25		
Maine	September 2007	25		
Maryland	January 2008	25		Yes
Massachusetts	January 2006	26	Yes	
Minnesota	January 2008	25		
Missouri	January 2008	26		
Montana	January 2008	25		
New Hampshire	September 2007	26		
New Jersey[2]	May 2006	30		
New Mexico	July 2003	25		
New York	September 2009	30		
Ohio	July 2010	28		
Pennsylvania	January 2010	30		
Tennessee	August 1986	24		
Texas	January 2003	25		
Utah	January 1994	26		
Virginia	July 2007	25	Yes	Yes
Washington	January 2009	25		
West Virginia	July 2007	25		
Wisconsin	January 2010	27		

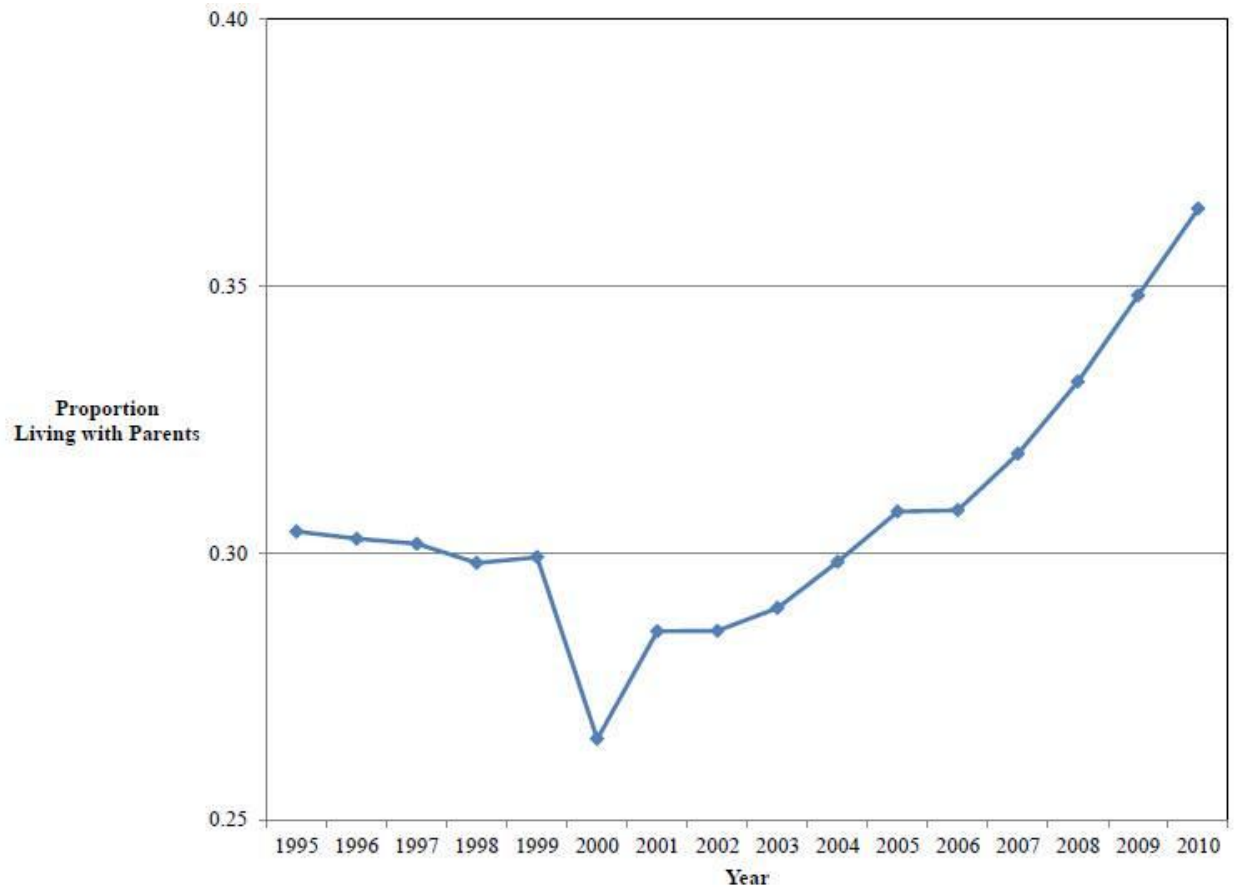
[1] Florida extended the age limit to 30 in October 2008. The 2008 law change also waived the requirement of living with the parent who was the policyholder.
[2] New Jersey extended the age limit to 31 in January 2009.
Sources: The National Conference of State Legislators, The Kaiser Family Foundation, and the author's own reading of state laws.

Figure 4.1: Proportion married by age.



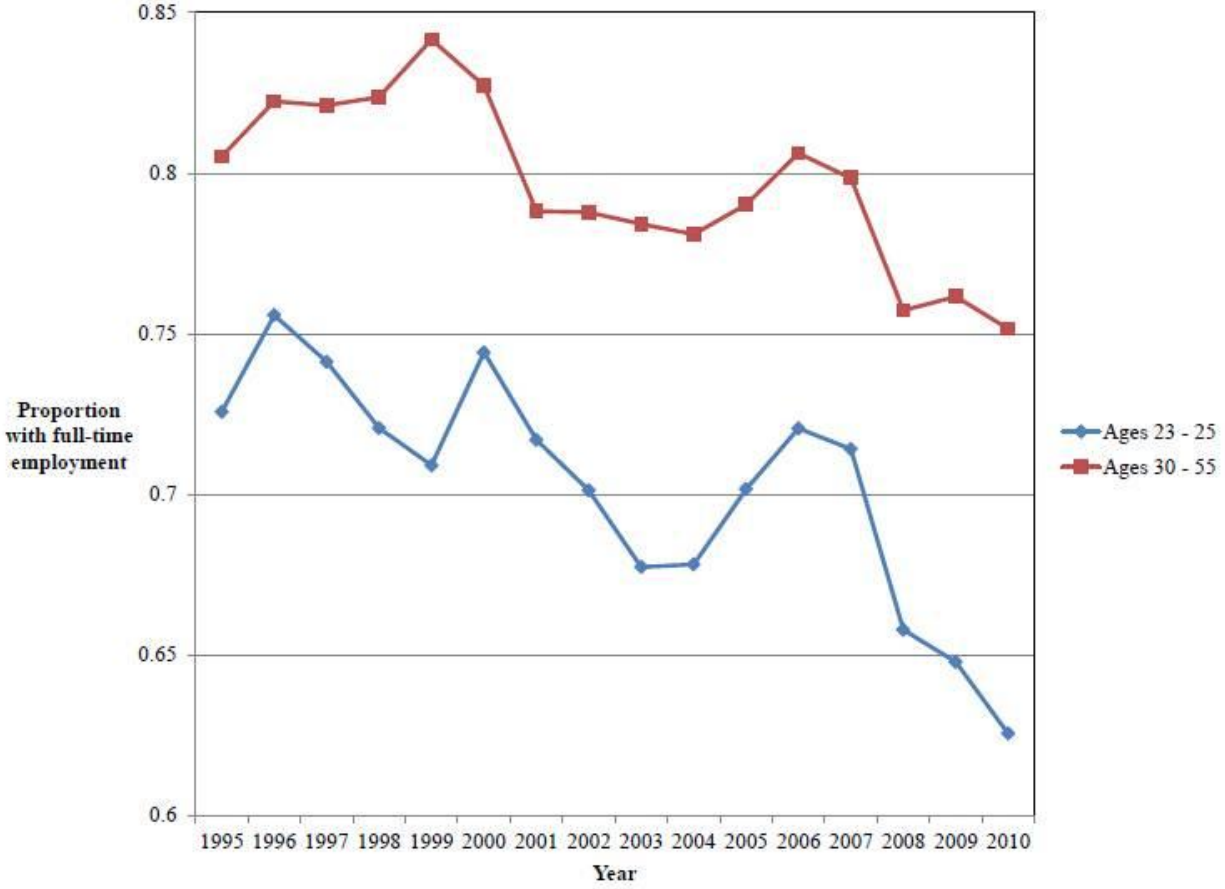
Source: March CPS (1996 – 2011)

Figure 4.2: Proportion of 23-to-25-year-olds living with their parents.



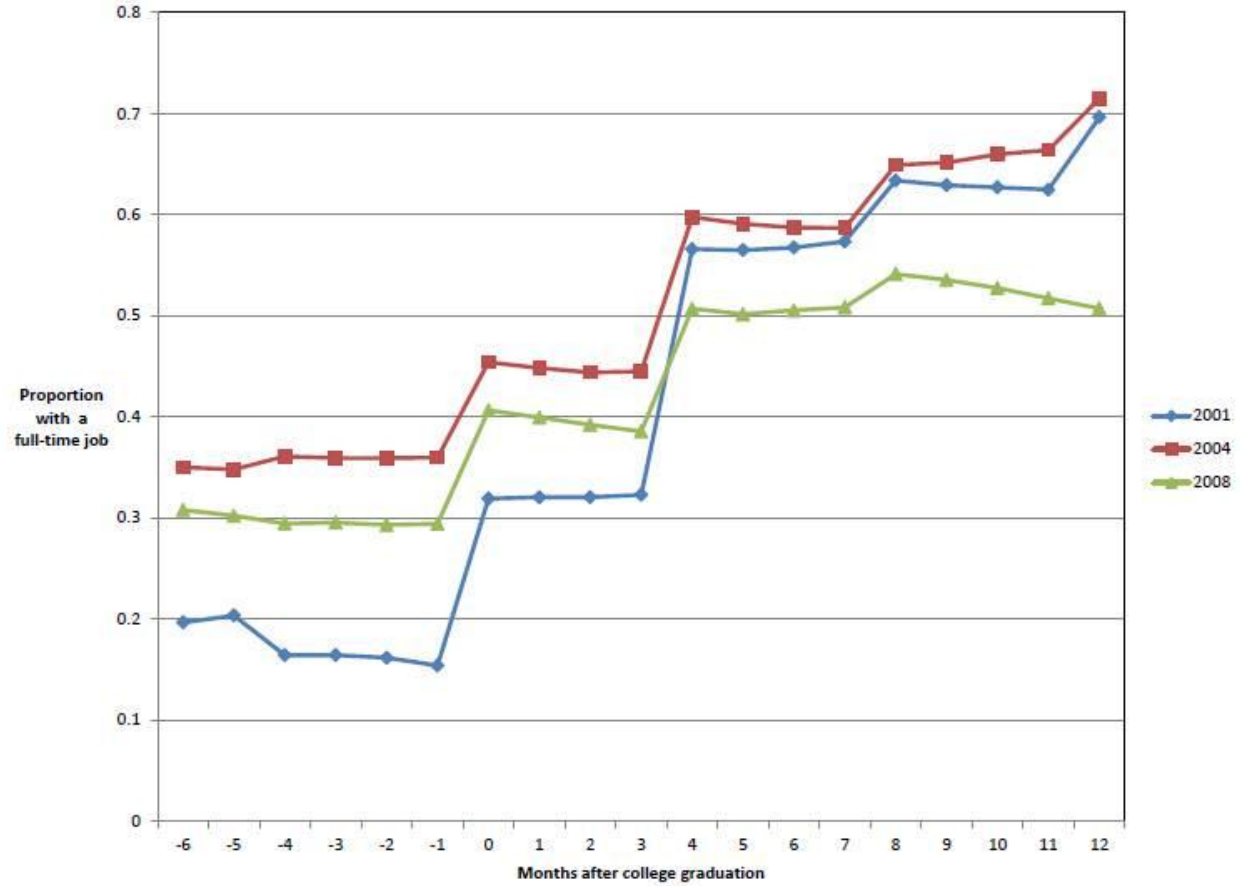
Source: March CPS (1996 – 2011)

Figure 4.3: Proportion of unmarried college graduates with full-time employment.



Source: March CPS (1996 – 2011)

Figure 4.4: Proportion of unmarried college graduates with full-time employment within a year of graduation.



Source: SIPP 2001, 2004, and 2008

Table 4.2: Descriptive statistics for the sample of March CPS data.

	Has a bachelor's degree	Does not have a bachelor's degree
Law	0.11	0.13
	(0.31)	(0.33)
Private dependent coverage	0.16	0.12
	(0.37)	(0.33)
Self-owned private coverage	0.64	0.37
	(0.48)	(0.48)
Uninsured	0.18	0.39
	(0.38)	(0.49)
Medicaid coverage	0.03	0.12
	(0.16)	(0.33)
Full-time employee	0.78	0.60
	(0.42)	(0.49)
Lives with parent	0.27	0.28
	(0.44)	(0.45)
Married	0.22	0.31
	(0.44)	(0.46)
Female	0.57	0.47
	(0.50)	(0.50)
Black	0.08	0.16
	(0.34)	(0.36)
Hispanic	0.07	0.24
	(0.25)	(0.43)
Real value of non-wage income (in thousands of 2009 dollars)	2.166	1.230
	(7.393)	(4.350)
State unemployment rate	5.6	5.6
	(1.7)	(1.7)
Sample size	11,456	47,027

Note: Frequency weights were used in all calculations. All summary statistics reported in the table were based on data from the 2001 through 2010 releases of the March CPS, which covered calendar years 2000 through 2009. The respondents in the subsamples reported above include all civilians who were between the ages of 23 and 25.

Table 4.3: Effect of dependent age laws on dependent health insurance coverage.

	Bachelor's degree			Bachelor's degree and lives with parent			No bachelor's degree			No bachelor's degree and lives with parent		
Variable	Private Dependent Plan			Parent's Private Plan			Private Dependent Plan			Parent's Private Plan		
Law	0.041*			0.095*			0.002			0.020		
	(0.019)			(0.031)			(0.008)			(0.016)		
Law x 1st year		0.052			0.095*			-0.012			0.018	
		(0.027)			(0.043)			(0.011)			(0.023)	
Law x 2nd year		0.130*			0.143*			-0.001			-0.017	
		(0.043)			(0.042)			(0.017)			(0.023)	
Law x 3rd year		-0.011			0.065			0.009			0.030	
		(0.024)			(0.051)			(0.010)			(0.020)	
Law x Before Age 22			-0.014			0.068			0.009			0.030
			(0.026)			(0.058)			(0.010)			(0.019)
Law x At or After Age 22			0.078*			0.109*			-0.006			0.010
			(0.026)			(0.033)			(0.010)			(0.020)
R^2	0.051	0.053	0.053	0.104	0.104	0.104	0.017	0.017	0.017	0.030	0.030	0.030
Sample size	8,695	8,695	8,695	2,931	2,931	2,931	31,042	31,042	31,042	11,473	11,473	11,473

Note: All estimations were derived with the use of analytical weights. Each estimate is the coefficient from a linear probability model based on March CPS data. Other covariates used in the model were the state unemployment rate, the real value of non-wage income, the number of own children, and dummy variables indicating gender, racial background, state of residence, age, and year. Standard errors are in parentheses and are clustered by state and year. All subsamples exclude young adults who were married, enrolled in school, or on active duty.

* denotes statistically significant at the 5 percent level.

Table 4.4(a): Effect of dependent age laws on health insurance coverage.

	Has a bachelor's degree								
Variable	Uninsured			Medicaid			Self-Owned Private		
Law	0.003			0.001			-0.046		
	(0.025)			(0.007)			(0.025)		
Law x First year of implementation		-0.056			0.010			-0.008	
		(0.032)			(0.013)			(0.026)	
Law x Second year of implementation		-0.036			0.012			-0.107*	
		(0.024)			(0.011)			(0.039)	
Law x Third year of implementation		0.063			-0.010			-0.044	
		(0.038)			(0.008)			(0.038)	
Law x Implemented Before Age 22			0.066			-0.009			-0.045
			(0.043)			(0.009)			(0.042)
Law x Implemented At or After Age 22			-0.040			0.008			-0.047
			(0.023)			(0.009)			(0.026)
R^2	0.026	0.027	0.027	0.022	0.022	0.022	0.047	0.047	0.047
Sample size	8,695	8,695	8,695	8,695	8,695	8,695	8,695	8,695	8,695

Note: All estimations were derived with the use of analytical weights. Each estimate is the coefficient from a linear probability model based on March CPS data. Other covariates used in the model were the state unemployment rate, the real value of non-wage income, the number of own children, and dummy variables indicating gender, racial background, state of residence, age, and year. Standard errors are in parentheses and are clustered by state and year. All subsamples exclude young adults who were married, enrolled in school, or on active duty.

* denotes statistically significant at the 5 percent level.

Table 4.4(b): Effect of dependent age laws on health insurance coverage.

	Has a bachelor's degree and lives with parents								
Variable	Uninsured			Medicaid			Self-Owned Private		
Law	-0.066 (0.038)			0.006 (0.011)			-0.059 (0.034)		
Law x First year of implementation		-0.057 (0.056)			0.028 (0.021)			-0.057 (0.048)	
Law x Second year of implementation		-0.132* (0.043)			0.006 (0.012)			-0.060 (0.048)	
Law x Third year of implementation		-0.032 (0.059)			-0.013 (0.013)			-0.060 (0.047)	
Law x Implemented Before Age 22			-0.015 (0.062)			-0.010 (0.015)			-0.085 (0.049)
Law x Implemented At or After Age 22			-0.092* (0.042)			0.015 (0.013)			-0.046 (0.036)
R^2	0.050	0.051	0.051	0.043	0.044	0.044	0.081	0.081	0.082
Sample size	2,931	2,931	2,931	2,931	2,931	2,931	2,931	2,931	2,931

Note: All estimations were derived with the use of analytical weights. Each estimate is the coefficient from a linear probability model based on March CPS data. Other covariates used in the model were the state unemployment rate, the real value of non-wage income, the number of own children, and dummy variables indicating gender, racial background, state of residence, age, and year. Standard errors are in parentheses and are clustered by state and year. All subsamples exclude young adults who were married, enrolled in school, or on active duty.

* denotes statistically significant at the 5 percent level.

Table 4.5: Effect of dependent age laws on full-time employment, living arrangements, and marriage

	Has a bachelor's degree								
Variable	Full-time employment			Living with parents			Marriage		
Law	-0.010			0.001			-0.004		
	(0.022)			(0.023)			(0.020)		
Law x First year of implementation		-0.001			0.007			0.004	
		(0.035)			(0.027)			(0.031)	
Law x Second year of implementation		-0.065			0.032			-0.007	
		(0.038)			(0.062)			(0.040)	
Law x Third year of implementation		0.014			-0.019			-0.008	
		(0.025)			(0.027)			(0.025)	
Law x Implemented Before Age 22			0.008			-0.013			-0.025
			(0.026)			(0.029)			(0.027)
Law x Implemented At or After Age 22			-0.020			0.010			0.011
			(0.028)			(0.031)			(0.025)
R^2	0.053	0.053	0.053	0.133	0.133	0.133	0.131	0.131	0.131
Sample size	8,695	8,695	8,695	8,695	8,695	8,695	11,456	11,456	11,456

Note: All estimations were derived with the use of analytical weights. Each estimate is the coefficient from a linear probability model based on March CPS data. Other covariates used in the model were the state unemployment rate, the real value of non-wage income, the number of own children, and dummy variables indicating gender, racial background, state of residence, age, and year. Standard errors are in parentheses and are clustered by state and year. All subsamples exclude young adults who were enrolled in school or on active duty.

* denotes statistically significant at the 5 percent level.

Table 4.6: Descriptive statistics for the sample of SIPP data.

	Six months after graduation	Twelve months after graduation
Law	0.24 (0.43)	0.25 (0.43)
Full-time job	0.54 (0.50)	0.64 (0.48)
Works at least 35 hours a week	0.57 (0.50)	0.66 (0.47)
Female	0.54 (0.50)	0.56 (0.50)
Black	0.09 (0.28)	0.09 (0.29)
Hispanic	0.06 (0.24)	0.06 (0.23)
Number of own children	0.18 (0.48)	0.15 (0.43)
Real value of non-wage income (in thousands 2010 dollars)	1.899 (2.622)	2.183 (2.150)
State unemployment rate	6.6 (2.3)	6.5 (2.3)
Sample size	1,420	818

Note: Frequency weights were used in all calculations. All summary statistics were based on data from the 2001, 2004, and 2008 releases of the SIPP. The respondents included in the subsamples reported above were unmarried individuals between ages 21 and 25.

Table 4.7: Effect of dependent age laws on full-time employment after college graduation.

	Six months after graduation				Twelve months after graduation			
Variable	Has a full-time		Works 35 hours		Has a full-time		Works 35 hours	
Law	0.020		0.076		0.005		-0.013	
	(0.060)		(0.057)		(0.059)		(0.063)	
Law x First year of implementation		0.102		0.116		0.002		-0.028
		(0.084)		(0.078)		(0.077)		(0.077)
Law x Second year of implementation		-0.008		0.066		-0.070		-0.044
		(0.072)		(0.069)		(0.099)		(0.107)
Law x Third year of implementation		-0.003		0.062		0.031		0.005
		(0.070)		(0.070)		(0.070)		(0.077)
R^2	0.194	0.196	0.197	0.197	0.322	0.323	0.313	0.314
Sample size	1,420	1,420	1,420	1,420	818	818	818	818

Note: All estimations were derived with the use of analytical weights. Each estimate is the coefficient from a linear probability model based on SIPP data. Other covariates used in the model were the state unemployment rate, the real value of non-wage income, the number of own children, and dummy variables indicating gender, racial background, state of residence, age, and year. Standard errors are in parentheses and are clustered by state and month. All subsamples exclude young adults who were married.

* denotes statistically significant at the 5 percent level.

Table 4.8: Descriptive statistics for ACS data.

	Age 22	Age 23	Age 24	Age 25
Law	0.27	0.27	0.24	0.05
	(0.44)	(0.45)	(0.43)	(0.22)
Employed full-time	0.40	0.57	0.66	0.72
	(0.49)	(0.50)	(0.47)	(0.45)
Female	0.61	0.57	0.54	0.53
	(0.49)	(0.50)	(0.50)	(0.50)
Black	0.08	0.08	0.09	0.10
	(0.28)	(0.27)	(0.28)	(0.30)
Hispanic	0.07	0.07	0.07	0.08
	(0.26)	(0.25)	(0.25)	(0.27)
Number of own children	0.19	0.15	0.11	0.11
	(0.20)	(0.47)	(0.42)	(0.41)
Real value of non-wage income (in thousands of 2009 dollars)	0.261	0.270	0.278	0.298
	(2.274)	(2.554)	(2.594)	(2.485)
State unemployment rate	6.1	6.1	6.2	6.2
	(2.2)	(2.2)	(2.2)	(2.3)
Sample size	16,736	24,920	25,056	22,804

Note: Frequency weights were used in all calculations. All summary statistics were based on data from the 2006 through 2009 releases of the ACS. The respondents included in the subsamples reported above were unmarried civilians who had obtained a bachelor's degree.

Table 4.9(a): Effect of dependent age laws on full-time employment.

	Age 22		Age 23		Age 24		Age 25	
(a) Full sample								
Law	0.043*		0.009		-0.004		0.007	
	(0.020)		(0.017)		(0.017)		(0.014)	
Law x First year of implementation		0.040		0.025		0.007		0.031*
		(0.023)		(0.018)		(0.017)		(0.013)
Law x Second year of implementation		0.049*		-0.020		-0.024		-0.016
		(0.022)		(0.021)		(0.024)		(0.013)
Law x Third year of implementation		0.067*		-0.040		-0.026		-0.020
		(0.025)		(0.038)		(0.028)		(0.014)
R^2	0.026	0.026	0.026	0.026	0.025	0.026	0.030	0.030
Sample size	10,470	10,470	14,609	14,609	13,990	13,990	12,398	12,398

Note: All estimations were derived with the use of analytical weights. Each estimate is the coefficient from a linear probability model based on ACS data. Other covariates used in the model were the state unemployment rate, the real value of non-wage income, the number of own children, and dummy variables indicating gender, racial background, state of residence, age, and year. Standard errors are in parentheses and are clustered by state and year. All subsamples exclude young adults who were married or had not obtained a bachelor's degree.

* denotes statistically significant at the 5 percent level.

Table 4.9(b): Effect of dependent age laws on full-time employment.

	Age 22		Age 23		Age 24		Age 25	
Males								
Law	0.026		-0.006		0.016		-0.013	
	(0.031)		(0.028)		(0.026)		(0.024)	
Law x First year of implementation		0.020		-0.002		0.022		0.024
		(0.036)		(0.032)		(0.024)		(0.017)
Law x Second year of implementation		0.038		-0.009		0.005		-0.061*
		(0.034)		(0.039)		(0.041)		(0.020)
Law x Third year of implementation		0.048		-0.117*		-0.007		-0.028
		(0.039)		(0.047)		(0.036)		(0.019)
R^2	0.029	0.029	0.024	0.025	0.032	0.032	0.037	0.038
Sample size	6,266	6,266	10,311	10,311	11,066	11,066	10,406	10,406
Females								
Law	0.056*		0.023		-0.022		0.024	
	(0.022)		(0.018)		(0.019)		(0.023)	
Law x First year of implementation		0.055*		0.049*		-0.007		0.034
		(0.023)		(0.018)		(0.022)		(0.031)
Law x Second year of implementation		0.057*		-0.024		-0.052*		0.027
		(0.026)		(0.022)		(0.025)		(0.023)
Law x Third year of implementation		0.089*		0.026		-0.045		-0.016
		(0.032)		(0.041)		(0.031)		(0.028)
R^2	0.026	0.026	0.026	0.026	0.025	0.026	0.030	0.030
Sample size	10,470	10,470	14,609	14,609	13,990	13,990	12,398	12,398

Note: All estimations were derived with the use of analytical weights. Each estimate is the coefficient from a linear probability model based on ACS data. Other covariates used in the model were the state unemployment rate, the real value of non-wage income, the number of own children, and dummy variables indicating gender, racial background, state of residence, age, and year. Standard errors are in parentheses and are clustered by state and year. All subsamples exclude young adults who were married or had not obtained a bachelor's degree.

* denotes statistically significant at the 5 percent level.

Chapter 5: Conclusion

The first essay examined how health insurance coverage differed across age groups in the United States. Using repeated cross-sections from the March CPS, I find that the increase in the proportion uninsured around age 19 has become steeper in magnitude since 1990 by about 6.5 percentage points. I also show that a similar change in the proportion covered by Medicaid occurred over the same time frame. The drop in Medicaid coverage around age 19 became steeper in magnitude by about the same amount. When longitudinal data from the SIPP was used to estimate health insurance status for those older than age 19 based on their status before turning 19, I found that initial status matters tremendously. Those who were uninsured prior to age 19 are more likely to be uninsured after age 19 by about 10 percentage points. For those initially on Medicaid, they are more likely to become uninsured by 10 to 15 percentage points compared to those who were not on Medicaid initially. These findings were consistent with a theory of state dependence in which prior health insurance status has a great impact on insurance status in future time periods.

It is also shown that health insurance status can change substantially within the months following college graduation. Using panel data from the SIPP and NLSY97, I found that there was an upward spike in the proportion uninsured by about 5 percentage points (from 12 percent to 17 percent) following graduation from a four-year program. However, this upward spike mostly disappeared after the first year following graduation. Interestingly, both the SIPP and the NLSY97 provided near identical descriptions of this transition process. One implication of this finding is that dependent age laws may be a

more important policy for expanding health insurance coverage among non-students instead of college graduates.

The second essay focused on the two-state study of New Jersey and Pennsylvania in order to test the validity of the college lock hypothesis. I found that the dependent age law in New Jersey increased insurance coverage among 19-to-22-year olds in the state relative to those in Pennsylvania. Although there was some degree of substitution between dependent coverage and private self-owned insurance, the overall proportion uninsured did fall in New Jersey relative to Pennsylvania. Considering the focus on the college lock hypothesis, it was interesting to observe that the largest expansions in insurance coverage were primarily among non-students, who experienced reductions in the likelihood of being uninsured by about 22 to 24 percent.

The main findings of the second essay suggested that college lock exists and dependent age laws can reverse it. I estimated a decline in college enrollment among 19-to-22-year olds in New Jersey relative to those of the same age in Pennsylvania. The magnitude of the college lock effect ranged between 15 and 24 percent. This effect was primarily found among those with household incomes above 300 percent of the federal poverty line and had a parent working for a small employer with fewer than 100 employees. Since low-income families are less likely to have employer-provided insurance coverage and large employers were typically exempt from state dependent age laws, these findings are consistent with the predictions made earlier in the dissertation. Robustness checks tended to support the argument that the relative decline in college enrollment in New Jersey was due to a reversal of college lock. Further analysis showed that the effect on college enrollment in New Jersey was due to changes in the decision to

attend college or not rather than a shift between full-time and part-time enrollment. Additionally, the reduction in enrollment was more profound on private college enrollment and not significant on public college enrollment.

An analysis on institution-level data gave further support to the college lock hypothesis. I showed that public college enrollment grew faster in New Jersey compared to Pennsylvania, especially for two-year programs. Furthermore, I find that the age distribution of students at two-year programs became younger. Relative to Pennsylvania, there was a 5 percentage point rise in the proportion of New Jersey students who were age 19 or younger. If dependent eligibility for non-students encouraged students to finish college earlier, these findings would be consistent with the college lock hypothesis as well.

While the New Jersey versus Pennsylvania comparison suggested that dependent age laws discourage college enrollment, there was little evidence to suggest that other decisions were effected. The main research in the third essay extends the analysis to 48 states and the District of Columbia and does not find a correlation between the timing of dependent age laws and changes in the decisions to move out of a parent's home, get married, or work full time. Using repeated cross-sectional data from the March CPS, I find that health insurance coverage does increase among college graduates between ages 23 and 25, but marriage decisions and living arrangements are unchanged. Most of the findings regarding full-time employment suggested it was not affected by the laws. Estimates using panel data from the SIPP suggested that dependent age laws might encourage graduates to find and accept full-time employment within six months of

graduation, but this higher tendency to work full time mostly disappeared by the twelfth month following graduation.

Altogether, the research presented in this dissertation has several implications for what to expect following the federal law requiring dependent eligibility up to age 26. Like New Jersey's law, the federal law does include non-students in the definition, which makes the possibility of college lock reversals relevant to other states. Also, if state dependent age laws were effective in reducing the proportion uninsured, the age profiles describing insurance status in the first essay are likely to change. In other words, the proportion uninsured between ages 19 and 23 should decline. Earlier findings also would suggest that a decline in the proportion with self-owned private plans could be expected. Future work could analyze if this has any effects on the premium costs for individual and family insurance plans. In addition, the overall effect on the transition to adulthood could be re-examined based on the federal law. The third essay of this dissertation suggested that the transition to adulthood was mostly unchanged following state dependent age laws. Since the federal law is not affected by ERISA and will affect more young adults compared to the state laws, it will provide another opportunity to analyze how responsive young adults are to health insurance policies.

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