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NEVER SAY NEVER?
UNCOVERING THE NEVER-UNIONIZED IN THE UNITED STATES

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Abstract

This paper analyzes individuals who never hold a unionized job and are never represented by a union ("never-unionized"). Using 21 waves of NLSY79 data to track individuals starting at age 15/16, we show that by the time workers are 40/41 years old, one-third of them are never-unionized, and a convex never-unionization trajectory suggests that most of them will remain never-unionized. An analysis of the demographic and labour market characteristics of the never-unionized further suggests two types of never-unionized workers—those who lack opportunities for obtaining unionized jobs, and those who lack the desire to obtain unionized jobs.

1. Introduction

Industrial relations scholars and practitioners have long been concerned with questions of union coverage and membership, from explaining union density trends (Bain and Price 1980; Lipset et al. 2004), to predicting who joins unions (Farber and Saks 1980; Gomez et al. 2002), to analyzing the characteristics of unionized workers and union members (Antos et al. 1980; Blanchflower 2007). The focus of these inquiries is typically those who are in or would join a union. Bryson and Gomez (2003, 2005), however, uncover the importance of a previously-unrecognized group—those who are never unionized. More specifically, Bryson and Gomez (2003, 2005) show that the fraction of British workers who are never union members increased from less than 30 percent in the early 1980s to nearly 50 percent in 2001. Schnabel and Wagner (2006) subsequently estimate never-membership rates around 55 percent in Germany in 2002.

In extending the never-unionized concept to the United States, we depart from the approach of Bryson and Gomez (2003, 2005) and Schnabel and Wagner (2006) by focusing on union coverage rather than union membership. We are precluded from analyzing union membership because of a lack of data, but union coverage is important in its own right. In the North American industrial relations system, union coverage is a frequently-analyzed indicator of unionization because covered workers—members and nonmembers alike—are legally-entitled to union-negotiated wages and benefits, and to full union representation in the bargaining and grievance processes. Therefore, whereas Bryson and Gomez (2003, 2005) and Schnabel and Wagner (2006) appropriately use the term "never-member" for their analyses, we use the term "never-unionized" to describe an individual who never holds a unionized job and therefore is never covered by a union contract or represented by a union.

Understanding never-unionization is important for several reasons. Never-unionization

can enrich our understanding of the labour market experience of U.S. workers over the life course by distinguishing between those who have episodic spells of unionization from those who never hold unionized jobs. Never-unionization rates can complement union density rates in creating a better understanding of the true impact and reach of labour unions. At any given time, less than 15 percent of U.S. workers are unionized, but our results reveal a much broader reach in that two-thirds of workers are unionized at some point in their working lives. Also, research at an individual level seeks to understand why individuals join unions or become unionized (Farber and Saks 1980; Gomez et al. 2002); labour movements around the world are also interested in these issues as they try to stem the decline of unionism and revitalize themselves. Analyzing those who are never-unionized can help researchers, union leaders, and policymakers understand why some workers do not become unionized, and thereby help shape future research, union strategies, and public policies. Combining an understanding of the characteristics of the never-unionized with the predicted trends for these characteristics (e.g., educational or occupational trends) can also provide clues about the future of the labour movement (Schnabel and Wagner 2006).

Uncovering never-unionization trends can also help us understand persistent declines in aggregate union density trends. Bryson and Gomez (2003) and Gomez and Gunderson (2004) argue that unionism is an experience good—that is, potential union workers can only fully understand the benefits of unionization by experiencing it firsthand because key aspects like the provision of procedural fairness and voice are difficult for outsiders to observe. This experience good aspect of unionization means that rising rates of never-unionization create a vicious cycle of self-perpetuating declining union density. If fewer workers experience unionism and see the true benefits, then fewer workers support unions and union density declines. This increases the

never-unionization rate and the cycle begins anew. We therefore not only analyze the rate of never-unionization and the characteristics of the never-unionized, but also whether never-unionization is increasing.

To analyze never-unionization in the United States, we track 1,522 individuals through 21 waves of the National Longitudinal Survey of Youth 1979 starting when they are 15 or 16 years old in 1979 and ending when they are 40 or 41 years old in 2004. By assuming that individuals' direct experiences with unions before age 15 or 16 is minimal, we construct a unique series of never-unionized profiles by observing when each individual first becomes employed in a unionized job as they age from 15/16 to 40/41, and then identify those who are still never unionized at age 40/41. This differs from the methodology of the British and German analyses of never-membership that use cross-sectional surveys that specifically asked whether the individual respondent had ever been a member of a union. We instead use longitudinal data to trace each individual's union-nonunion job history for the first half of their working lives. This adds a level of life cycle richness not available in cross-sectional measures of never-union.

2. Theoretical background

Underlying our analyses of never-unionization in the United States is a theoretical foundation in which individual unionization outcomes are a function of opportunity and propensity. This opportunity-propensity model of unionization has been used in various institutional contexts (e.g., Blanden and Machin 2003). For our application, opportunity indicates the extent to which unionized jobs are available to an individual in a certain geographical area who possesses certain qualifications and skills. Propensity captures the extent to which an individual prefers a unionized job over a nonunion one. In this way, never-unionization is theorized to reflect a combination of a lack of opportunities for obtaining a unionized job and a

lack of desire for one. This theoretical approach does not assume that all individuals intentionally choose between unionized and nonunion jobs. Individuals working in areas, industries, and occupations with high unionization rates might have unionized jobs because their opportunities are high, even if their propensities are low.

To analyze differences in never-unionization rates and examine explanatory factors, we therefore focus on measures that capture varying levels of opportunity and propensity for being unionized. U.S. unionization rates are frequently shown to vary by gender, race, and educational attainment (Blanchflower 2007) so these characteristics are central to many of our analyses. Marital status is also explored as a measure of labour market attachment. There are also well-documented differences in union density—and therefore opportunity for having a unionized job—across industries and occupations as well as between the private and public sectors (Curme et al. 1990). Thus, we examine the importance of measures that capture individuals' labour market and job histories across industries, occupations, and sectors. Unions are weaker and union density lower in right-to-work states (Moore 1998), so the fraction of time spent living in non-right-to-work states is another important variable in our analyses. Finally, attitudes toward unions can also be passed from parents to their children (Barling et al. 1991; Blanden and Machin 2003). We therefore analyze indicators for whether the individual has a parent who is a college graduate or a blue collar worker—the former is expected to reduce one's propensity to be unionized, the latter is expected to increase it. We are unable to include other control variables such as employer size or direct measures of attitudes toward unions due to a lack of data availability.

3. Data

The data for this study are taken from the National Longitudinal Survey of Youth 1979 (NLSY79). The NLSY79 is a nationally-representative longitudinal sample of individuals who were between the ages of 14 and 22 when the survey began in 1979, and includes annual (between 1979 and 1994) and biennial (since 1994) surveys of these individuals (Bureau of Labor Statistics 2005). The NLSY79 provides information for up to five different jobs in each survey year and we used the information that was available for all jobs in creating the main variables analyzed in this study. A person's status as being covered by a collective bargaining agreement in any one of these jobs was used as the basis for determining whether or not a person was never-unionized, currently-unionized, or formerly-unionized.

We focus exclusively on the subset of individuals who were 15 and 16 years old in 1979 and follow them through 21 waves of surveys until 2004 when they are 40 or 41 years old.[1] We exclude those who were 14 or 17-22 years old in 1979 to preserve balanced cohort sizes, for comparability with the NLSY97 (which will be used as a comparison group later in this paper), and because it is important for our study to observe individuals when they first enter the labour market.[2] The NLSY79 contains 3,130 individuals who were 15 or 16 years old when the survey began in 1979. However, to confidently construct each individual's union-nonunion job profile history without missing any unionized jobs, we exclude 1,534 of these individuals because they did not participate in the survey for at least one year and another 74 observations because of missing information for which no value could be determined. To preserve the sample size, we imputed some missing values when other pieces of information could be used to confidently make these imputations.[3] The final sample used here therefore contains 1,522 individuals with complete data over 21 time periods. It should be noted that to accurately track individuals as they

age, the sample is not conditioned upon employment. The data should therefore be seen as a sample of all potential workers of a certain age, not all employed workers.[4] Lastly, because the NLSY79 intentionally oversamples minority and low-income individuals, all of the results reported here, except those from the cluster analysis, are weighted using sampling weights.

In the United States, union representation is more closely tied to contract coverage (collective bargaining agreement coverage) than union membership. And the NLSY79 only consistently asks questions about contract coverage, not union membership, across all survey years. We therefore focus our attention on union coverage, not union membership. Specifically, the key variable of interest is whether or not an individual was ever covered by a collective bargaining agreement through the 21 waves of the NLSY, that is, from age 15 or 16 to age 40 or 41. To construct this variable, each person within the sample is considered to be never-unionized until they report being covered by a collective bargaining agreement. For example, 1.85 percent are covered in 1979; the remaining 98.15 percent are designated as never-unionized and continue to be never-unionized during successive years as long as they do not report being covered on a job. In each wave of the survey, then, each individual is in one of three categories: never-unionized, currently-unionized, or formerly-unionized. This last category consists of workers who were once in a unionized job, but do not report being represented by a union in the current survey year.

Table 1 provides summary statistics for the variables used in the analyses. The summary statistics are for the pooled data, so the sample size of 31,962 is comprised of 1,522 individuals over 21 survey waves. These 21 waves span 26 years because the data are collected every other year after 1994, and the results are weighted using sampling weights. In the weighted sample, 49.3 percent are female and 29 percent are non-white. The other variables can change over time

within each individual as they change jobs, move, and continue their education. The summary statistics in Table 1 therefore show the average values in the entire pooled data set. The average rate of never-unionization across the data set is 57.6 percent. The average rate of 13.3 percent for current-unionization (those in unionized jobs at the time of the particular survey wave) is slightly lower than the average U.S. coverage rate of 18 percent for 1979-2004 (Hirsch and Macpherson 2007), but this is to be expected because it is a sample of younger workers. The remaining 29.2 percent of the observations are formerly-unionized individuals working in nonunion jobs. In the remainder of this paper, these data are used to estimate never-unionized rates, trends, and determinants in the U.S. labour force.

4. Never-unionization rates in the United States

The summary statistics in Table 1 are presented for the purpose of describing the data set, not for providing estimates of never-unionized, currently-unionized, and formerly-unionized rates. Because the sample is young relative to the broader U.S. labour force, and because ages less than 30 are more frequent in the sample than ages between 30 and 41 due to the biennial administration of the NLSY79 after 1994, it is better to consider the age-by-age unionization rates that can be derived from this data set. As such, Table 2 reports the never-unionized, currently-unionized, and formerly-unionized rates as the individuals in our sample age from 16 to 40.[5] These estimates essentially control for a cohort effect because these data track the same set of individuals as they age. The currently-unionized rates are predictable based on what is already known about unionization patterns (e.g., Bryson et al. 2005)—union density starts out very low but then stabilizes at age 25 at around 15 percent, and inches up toward 17 percent as individuals approach age 40. We believe that the other two trends presented in Table 2—the never-unionized and formerly-unionized trends in columns 1 and 3—are unique results. The

never-unionized rate starts off close to one and declines until age 40 as individuals become unionized for the first time. The never-unionization rate drops below 50 percent at age 26 which means that from that point forward, a majority of U.S. workers have had firsthand experience with union representation at some point in their working lives.

To see the trends more clearly, the unionization rates from Table 2 are plotted in Figure 1. The never-unionized curve is essentially a Kaplan-Meier survival curve in that it shows the probability that an individual "survives" until a certain age before becoming unionized, similar to how labour economists analyze the duration of unemployment spells (e.g., Hunt 1995). Figure 1 shows that the steepest decline in the never-unionization rate occurs between ages 16 and 25 with an average decline of nearly five percentage points per year. After age 29, the never-unionization rate declines by less than one percentage point each year. The formerly-unionized rate similarly exhibits its fastest gains before age 25 which coincides with the age range in which job tenures are shortest and individuals switch jobs frequently. By age 40, the never-unionized rate is 35.4 percent and the formerly-unionized rate is 48.8 percent. This is a notable result—nearly two-thirds of U.S. workers born in 1963 and 1964 were represented by a union by age 40. Among these workers, the average number of unionized employment spells is 1.96; 43 percent had just one unionized spell, 29 percent had two spells, 16 percent had three, and the remaining 12 percent had four or more unionized jobs. The average unionized employment spell length is 2.4 years, and, as expected, this average is significantly shorter for younger workers (specifically, 37 weeks for teenagers compared to 4.8 years for workers aged 30 and above).[6]

Figure 2 shows the age/never-unionized profiles by gender, race, and educational attainment. These profiles provide the unadjusted differences between the relevant categories (e.g., men and women). As will be shown in Tables 5 and 6, some of these unadjusted

differences can be explained by other observable factors (e.g., men and women having different employment rates and jobs in different industries and occupations). With that said, in panel a of Figure 2 the (unadjusted) never-unionized rate for men is consistently below that for women, and is at least 10 percentage points below after age 20. These male-female average differences are statistically different from each other at conventional levels of significance across the entire range of ages in Figure 2. More than half of the men have been unionized by age 24 while it takes women five years longer to achieve this milestone. The differences are smaller between Caucasians and nonwhite individuals (panel b). While the never-unionized curve is lower for nonwhite individuals—that is, nonwhite individuals exit from never-unionization earlier—the differences are only statistically significant for a few years around age 30.

Panel c shows the age/never-unionized profiles for three educational groups: those who did not complete high school, those who completed high school and may or may not have attended some college, and those who completed at least four years of college, all as of age 40/41. In other words, those who are age 19, for example, are treated as college graduates in panel c if they ultimately graduate from college. In their teens, the different groups exhibit similar trends in never-unionization. But the gap between the high school graduates/some college group and the other two groups widens and becomes statistically significant at age 20. By age 40, there is a 12 percentage point gap between the high school graduates/some college group and the college graduates, and a 15 percentage point gap between the high school graduates/some college group and those who did not complete high school. Interestingly, the high school dropout and the college graduate never-unionized trajectories follow similar trends, and are never statistically different from each other. It takes both of these groups 8 years longer than the high school graduates/some college group to reach 50 percent ever-unionized.

The convex trajectories of the age/never-unionized profiles further suggest that the lack of data past age 40/41 is not a significant problem. More specifically, the never-unionized curves in Figures 1 and 2 all exhibit a distinct exponential shape with individuals exiting from a never-unionized status at a decreasing rate as they approach age 40. In fact, an exponential model of the form never-unionized $= \beta_0 + \beta_1 * \beta_2^{age}$ where β_0, β_1, and β_2 are three parameters estimated via nonlinear least squares fits the data quite well—the adjusted R^2 value from fitting this model to the data in Figure 1 is 0.996 and the p-values for all three coefficients are less than 0.001. Figure 3 plots the never-unionized rates from Figure 1, and the predicted values up to age 65 from this exponential model. Some caution is warranted because of the length of the out-of-sample prediction, and there is a possibility that the actual never-unionized curve changes shape above age 40. But the fit of the statistical model and the tightness of the 95 percent confidence bands suggest that this is not likely. The model predicts that by age 65, the never-unionized rate is 33 percent. In other words, the exponential model implies that the never-unionized rate is predicted to decrease by less than three percentage points from age 40 to 65. Most individuals who leave never-union status during their working life, therefore, do so by the age of 40. Consequently, estimates of never-unionization based on data that end with individuals aged 40/41 appear fairly reliable, though it is worth remembering that a small fraction of individuals are expected to exit never-unionization at older ages.

5. Who are the never-unionized?

The "never-unionized" are defined as those who are still never-unionized in the final wave of the survey (age 40/41). To more fully understand the never-unionized, Table 3 presents a summary snapshot of the demographic, labour market, and job history characteristics of the never-unionized and, for comparison, the currently-unionized and formerly-unionized at age

40/41. The variables that are labelled as "fraction of sample period" indicate what fraction of the years from 1979 to 2004 (the "sample period") the individual exhibits certain characteristics, such as being married, living in an urban area, or working in a blue-collar occupation.[7] Because never-unionization reflects the opportunity and propensity to have a unionized job between age 15/16 and 40/41, these fraction of the sample period are more appropriate than measures that indicate an individual's status only at a certain age. In Table 3, the superscripted Δ's in column 2 indicate which currently-unionized means are statistically different from the analogous mean for the never-unionized sample using a standard *t*-test for the difference of two means; the superscripted Δ's in column 3 are for tests between the never-unionized and formerly-unionized samples. Alternatively, to isolate whether never-unionized workers are unique, one could test the means in column 1 against columns 2 and 3 pooled together. Doing so yields statistically significant differences at the 5 or 10 percent level for every variable except those pertaining to urban residency, non-right-to-work states, the service industry, and log hourly pay.

Turning to the numbers in Table 3, first note that compared to workers who are or were unionized at age 40/41, the never-unionized are significantly more likely to be women. In fact, 57 percent of those who have not been unionized are women, while men outnumber women in the currently-unionized and formerly-unionized categories. Perhaps unsurprisingly, never-unionized individuals, on average, spend less of their time between age 15/16 and 40/41 living in areas and working in sectors and occupations that are traditionally associated with higher unionization rates: urban areas, non-right-to-work states, manufacturing industries, the public sector, and blue-collar occupations. Similarly, the never-unionized spend more time working in industries and occupations that are less unionized—especially agricultural industries and managerial occupations. Relative to formerly-unionized individuals, never-unionized individuals

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are out of the workforce for a greater fraction of time, have had fewer jobs from age 15/16 to 40/41, are less likely to have a parent who had a blue-collar job, and more likely to have a college-educated parent.

Thus far, the statistical portrait of the never-unionized is suggestive of a homogenous group of workers who either choose or happen to live and be employed in sectors in which unionization is less prevalent. But previous research has found that unionized workers are typically found in the middle of the skill distribution (Card 2001), and a closer inspection of the educational profiles of the never-unionized reveals that, relative to workers who are and were unionized, the never-unionized are more likely to be high school dropouts and more likely to be college graduates. This implies that never-unionized workers are diverse and consist of 1) less-educated workers who perhaps do not have enough education to obtain a unionized job (that is, those who lack opportunities for obtaining unionized jobs), and 2) highly-educated workers in white collar, private sector jobs that rarely choose union representation (that is, those who lack the propensity to find unionized jobs). The pattern of wages in the sample reinforces this diverse profile. In Table 3, the average log hourly wage for never-unionized individuals is not statistically different from the averages for the currently-unionized and former-unionized workers, but Figure 4 shows that these means hide more than they reveal.

More specifically, Figure 4 presents nonparametric kernel density estimates of the log hourly wage distributions for the three samples of workers aged 40 and 41 years old. Consistent with well-known results showing that unions reduce wage dispersion (e.g., Freeman 1980; Card et al. 2007), the currently-unionized wage distribution is the narrowest. The formerly-unionized distribution largely lies to the left of the currently-unionized distribution which is consistent with a situation in which these workers are no longer enjoying a union wage premium. The never-

unionized distribution, though, is the most dispersed and, consistent with unionized workers typically being located in the middle of the skill distribution, has portions both to the left and right of the currently-unionized wage distribution. These results reinforce what the diverse profile of the never-unionized suggested by the educational attainment results—some of the never-unionized could benefit from unionization (those in the wage distribution to the left of the currently-unionized distribution) while others (those in the wage distribution to the right of the currently-unionized distribution) are earning more than unionized workers.

Cluster analysis provides another tool for considering the heterogeneity of the never-unionized. We undertook a hierarchical, agglomerative, average linkage cluster analysis of the never-unionized using the following measures: female, nonwhite, years of education, and fraction of the sample out of the workforce and in urban areas, non-right-to-work states, agriculture, manufacturing, service industries, the public sector, blue-collar occupations, and managerial occupations. This procedure begins with each of the 515 never-unionized individuals in their own individual 515 groups and then repeatedly joins the closest groups into clusters until all of the clusters become a single group of the entire sample. Because this method starts with individual observations and then clusters them, it is called "agglomerative;" because it creates a hierarchy of clusters by combining similar clusters into larger higher-level clusters, it is called "hierarchical." We use the commonly-used Euclidean distance measure (the sum of squared differences between the values of the relevant variables for two individuals) as the indicator of similarity or dissimilarity of two observations; the average of this measure is used to capture the similarity or dissimilarity of clusters (hence "average linking").

The cluster analysis results indicate that the 515 never-unionized individuals are comprised of two clusters that we label Cluster A and Cluster B. Table 4 shows that Cluster B

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consists of 7 high school dropouts who are frequently out of the workforce and who often work in agriculture but rarely in the public sector or managerial occupations; Cluster A consists of everyone else.[8] The cluster analysis results further show that Cluster A consists of two subsets that we label A1 and A2. The sample means reported in column 3 of Table 4 reveal that Cluster A1 consists of higher-educated workers who are usually employed and are significantly more likely to work in managerial than blue-collar occupations. Cluster A2 includes less-educated workers, on average, who are more likely to be blue-collar workers outside of the public sector. Clusters A1 and A2 are further comprised of A1(a)/A1(b) and A2(a)/A2(b), respectively. Comparing the characteristics of Cluster A1(a) with A1(b), and of A2(a) with A2(b), further reveal the importance of educational level and occupation. One can look at further subdivisions of the clusters, but the clusters reported in Table 4 capture the key results—the never-unionized are a non-trivial segment of the American workforce that consists of two or more educationally- and occupationally- distinct groups.

6. Predicting never-unionization

To assess the correlates of never-unionization at age 40/41 in a multivariate framework, we also estimated probit models in which the dependent variable is the indicator for never-unionization. Three specifications are reported in Table 5. The independent variables are the same as in Table 3, except pay is excluded because of endogeneity concerns. To facilitate interpretation, the entries in Table 5 report the marginal effects, not probit coefficients, calculated in the conventional way (using the probit derivative for continuous variables and the predicted change with a variable on and off for dummy variables with all other variables evaluated at their sample means). The first specification (column 1) focuses on individual demographic characteristics while the specifications reported in columns 2 and 3 add

individuals' labour market and job history information as well as parental background characteristics.

Consistent with the summary statistics presented in Table 3, women are significantly more likely to be never-unionized when only controlling for other demographic measures. But this difference disappears when accounting for each individual's labour market and job history. In this way, male-female differences in never-unionization reflect differences in their labour market experiences with respect to the fraction of time spent employed and the industries and occupations in which men and women are commonly employed. The relationship between educational attainment and the probability of never-unionization, however, is robust across all three specifications. Relative to those whose highest educational attainment is a high school diploma, those who did not complete high school are predicted to be 17-20 percentage points less likely to never be unionized at age 40/41. Relative to the mean never-unionized rate of 0.352, this implies a 50 percent reduction in the probability of never-unionization. College graduates are 12.1 percentage points more likely, on average, to never have a unionized job by age 40/41 compared to high school graduates (column 1), and this difference is robust to accounting for additional factors. No statistical differences are uncovered between high school graduates and those who attended college but did not complete a four-year college degree.

With respect to labour market and job histories, the strongest negative predictors of never-unionization are spending more time working between age 15/16 and 40/41 in urban areas, non-right-to-work states, manufacturing or service industries, the public sector, and blue-collar jobs.[9] Individuals spending more time working in agriculture or in managerial occupations are, on average, significantly more likely to be never-unionized. These findings are consistent with the well-known pattern of U.S. union density rates across industries, occupations and sectors.

Parental education and blue-collar status do not predict never-unionization status, either because parental attitudes toward unionization do not affect never-unionization, or because these measures are inadequate proxies for these attitudes (column 3).

The probit results in Table 5 are one way to estimate the important correlates of never-unionization at age 40/41. An alternative approach is to use the full time-span of the data and to treat exiting from never-unionization as a duration issue analogous to duration models that analyze how long it takes someone to exit from unemployment (Anderson 1992) or how long someone stays in a job (Booth et al. 1999). Specifically, consider how the probability of exiting from never-unionization varies as individuals get older over time. Generically, this can be captured by a hazard function h(t) that measures the probability of exit at time t. To analyze whether exiting from never-unionization is systematically linked to some explanatory variables, this hazard function can be modelled econometrically as a function of these variables. A popular method for doing this is the Cox proportional hazards model in which the independent variables proportionally shift an unspecified baseline hazard.[10]

Table 6 therefore presents the results of a Cox proportional hazard model estimated on the full data set from 1979 to 2004. Relative to the probit models, the proportional hazard estimation method incorporates incomplete or censored spells which is potentially important here because some individuals will exit never-unionization after our data end. A drawback, however, is that the interpretation of the hazard parameters is not as intuitive as that for the probit marginal effects. The parameter estimates allow us to determine the effect of the independent variables on the conditional probability of one becoming ever-unionized from a never-unionized state in the next time period. To facilitate this interpretation, we report the hazard ratios (the exponentiated coefficients β) rather than the coefficients in Table 6. Hazard ratios above one indicate that

increases in the relevant independent variable are associated with an increased likelihood of exiting from never-unionized status in the next time period; ratios below one indicate that increases in the relevant independent variable are predicted, on average, to reduce the probability that an individual exits from the initial never-unionized state.

Turning to the estimates in Table 6, the female and married coefficients are not statistically significant. As such, one cannot reject the null hypothesis that men and women, or single and married individuals, face equal probabilities of exiting from never-unionization. The indicators for nonwhite, high school dropout, and college graduate, in contrast, are statistically significant at the 5 percent level of significance. The nonwhite coefficient is greater than one so nonwhite individuals are predicted to have higher relative probabilities of leaving never-unionization than white individuals. While this variable was not statistically significant in the probit analyses in Table 5, the significant estimate in the duration model is consistent with other research that shows both Hispanics and African-Americans are more likely to be unionized than whites in the United States (Blanchflower 2007). The education coefficients are less than one so relative to individuals with only a high school diploma (i.e., those who did not go onto college), those who did not complete high school and those who graduated from college are significantly less likely to exit from never-unionization. Specifically, the estimated hazard ratio of 0.731 for the high school dropout variable implies that if we consider a high school dropout and a high school graduate who each have not exited from never-unionization by a certain age, then the high school dropout is only 0.731 times as likely to exit by the time they are one year older. Put slightly differently, between a high school dropout and a high school graduate who are still never-unionized, the high school dropout is 42 percent less likely to stop being never-unionized

first.[11] The estimated hazard ratio for the college graduate variable implies that college graduates are 40 percent less likely than high school graduates to become unionized first.

With respect to the labour market and job history characteristics, most of the findings are similar to those in the probit analyses. Individuals living in urban areas and non-right-to-work states and those working in manufacturing, the public sector, or blue-collar occupations are significantly more likely to exit from never-unionized to ever-unionized than the relevant comparison individuals (e.g., non-urban workers for urban workers, or industries besides agriculture, manufacturing, and services for the industry variables). Individuals with managerial occupations, in contrast, are significantly less likely to exit from their initial never-unionized status. Unlike in the probit results, the estimate for total jobs held in the Cox proportional hazard model is statistically significant at the 10 percent level. The hazard ratio above one seems logical given that more job mobility presumably gives one more opportunities to experience a unionized job from a purely probabilistic perspective.

The local unemployment rate has no significant effects on the probability of exiting never-unionized status, but the statistically significant estimates for the two hours variables indicate that average hours of work has a quadratic relationship with the probability of exiting from never-unionization.[12] Higher hours worked are associated with an increased probability of exit, but given the squared term, this effect is largest at around 34.6 hours per week.

7. Has U.S. never-unionization increased?

One of the central results of Bryson and Gomez (2005) is that British rates of never-membership have significantly increased since the 1980s. As noted in the introduction, this is a particularly important trend if unionism is an experience good. As shown in Table 2 and Figure 1, the never-unionization trend in the NLSY79 data is downward sloping, but this trend is for one

cohort of individuals as they grow older. To see if never-unionization rates are increasing akin to the Bryson and Gomez (2005) results for never-membership in Britain, we need to compare the NLSY79 trend with another cohort of workers. For this we turn to the National Longitudinal Survey of Youth 1997 (NLSY97) (Bureau of Labor Statistics 2005). The design and administration of the NLSY97 is very similar to that of the NLSY79. It begins with a survey of 12-16 year olds in 1997 and continues with annual survey waves of these same individuals. We therefore repeated the construction of a never-unionized data set tracking individuals who were 15 and 16 years old in 1997 just as we started with 15 and 16 year olds in the NLSY79 in 1979 for our primary sample.

The first eight waves of the NLSY97 up through 2004 allow us to track individuals up to age 22/23. We therefore do not have a comparison data series that spans 26 years like the NLSY79, but we can compare the first eight years of the NLSY79 with the first eight years of the NLSY97 to see if any changes in the never-unionization trajectory are apparent. Figure 5 therefore presents the never-unionized profiles for ages 16 to 23 for the NLSY79 (solid line) and the similarly-aged cohort from the NLSY97 (dashed line) that follows 18 years later. At ages greater than 17 years old, the mean never-unionization rates are statistically different for the two cohorts at conventional levels of significance with the more recent NLSY97 never-unionized rates significantly higher than those in the earlier NLSY79 cohort. By the oldest available age, the gap is 12.5 percentage points. In other words, by age 23 circa the mid 1980s, 58.1 percent of individuals had never been unionized, but roughly 20 years later, 70.6 percent of twenty-three year olds had never been unionized.

One complication, however, is that the demographic composition of the labour force and structural composition of the economy are different in these two eras. For example, among 22/23

year olds in the eighth wave of the NLSY79 in 1986, 16 percent had completed four years of college and 36 percent had held a manufacturing job. In contrast, among 22/23 year olds in the eighth wave of the NLSY97 in 2004, 28 percent had completed four years of college and 27 percent had held a manufacturing job. It is important to see if the rate of never-unionization has increased after adjusting for these shifting demographic and structural characteristics. As such, we construct counterfactuals for the NLSY97 that estimate the NLSY97 rates of never-unionization that would have occurred if the NLSY97 had the same demographic and structural composition as in the NLSY79.

These counterfactuals are constructed by re-weighting the NLSY97 observations to simulate the distribution of demographic and structural characteristics in the NLSY79 data. For example, consider manufacturing. In the eighth wave of the NLSY97, 9 percent of the individuals are working in manufacturing whereas in the eighth wave of the earlier NLSY79, the analogous fraction is 19 percent. The earlier distribution can be replicated in the NLSY97 sample by increasing the weight of each NLSY97 individual working in manufacturing and decreasing the weight of those outside of manufacturing to simulate a sample with 19 percent in manufacturing. By using the methodology of DiNardo et al. (1996), this logic can be extended to gender, race, occupation, education, and other factors by re-weighting each observation by its relative probability of being in the NLSY79 compared to the NLSY97. These relative probabilities are calculated from a logit model where the dependent variable indicates that the observation is from the NSLY79 and the independent variables are years of education and indicators for female, nonwhite, urban, right-to-work state, public sector, employed, and major (1-digit) industry and occupation.

The dotted line in Figure 5 shows the counterfactual never-unionized trajectory produced by this re-weighting algorithm. Accounting for demographic and structural changes between the NLSY79 and NLSY97 cohorts does indeed bring the two trajectories closer together. In other words, 35-40 percent of the increase from the era of the NLSY79 to the era of the NLSY97 in the never-unionization rate can be explained by demographic and structural shifts.[13] But these shifts do not account for the entire change as after age 17 the mean never-unionized rates for the counterfactual and the NLSY79 trends are statistically different with p-values generally less than 0.01. It does indeed appear that never-unionization rates in the United States are increasing as new cohorts enter the labour market, even after adjusting for demographic and structural changes.

8. Conclusions

By assembling a unique data set that tracks U.S. individuals through 21 waves of the NLSY79 from age 15/16 in 1979 to age 40/41 in 2004, we have extended the concept of never-membership to the issue of never-unionization, and uncovered the significance of never-unionization in the U.S. employment relationship. The never-unionization trends documented here reveal both opportunities and risks for U.S. labour unions. The opportunities come from the fact that by age 40/41, nearly two-thirds of U.S. workers in our specific cohort had experienced unionization firsthand, including those who are currently-unionized at age 40/41. U.S. labour unions therefore represent (at some point) many more workers than the 15 percent or so who are unionized at any given time. This provides an opportunity for unions to develop greater support among a larger segment of the U.S. labour force by making sure that workers have positive experiences when they are represented, even as teenagers working at their first job in a grocery store. This can potentially translate into more workers choosing to remain unionized and into

greater socio-political support among the formerly-unionized. But the trends revealed in our analyses also contain risks for U.S. labour unions. If the half of the middle-aged labour force that is formerly-unionized had negative firsthand experiences with labour unions, then broad socio-political support for unions will be harder to generate.

The experience good model of unionism (Bryson and Gomez 2003; Gomez and Gunderson 2004) also presents the U.S. labour movement with a good news/bad news scenario. To the extent that unionism is an experience good, workers can only fully appreciate the benefits of unionization by experiencing it firsthand. The good news for the labour movement in our results is that two-thirds of U.S. workers who are 40/41 years old in 2004 had direct experience with union representation. The bad news for the U.S. labour movement is that never-unionization rates appear to be increasing for more recent cohorts so the opportunity for workers to experience unionization firsthand is likely declining. If there is an experience good element to unionization, increased levels of never-unionization can create a self-reinforcing downward spiral of union density and can perhaps help explain why U.S. union density continues to decline.

The results here are also important for research. The distinct clusters revealed by cluster analysis and the wide never-unionized wage distribution shown by the kernel density estimation suggest that workers are never-unionized for different reasons. While we lack direct information on this issue, the patterns we uncover are consistent with less-educated, lower-wage workers never being unionized because of a lack of opportunities for obtaining better-paying unionized jobs, and with more-educated, higher-wage workers never being unionized because of a lack of propensity for finding unionized jobs.[14] Such possibilities are important for a deeper understanding of never-unionization as well as for the large literature on why workers join unions. Further analyses of these issues with finer data would therefore be a profitable subject for

future research.

Research on the composition of union members also tends to draw one's attention to the largest group of union members who are 40-50 years old (Blanchflower 2007). Our results using longitudinal data suggest a more nuanced reality in which workers' initial experiences with unionization occur before they are 40 years old. U.S. unions, in fact, seem to get very few workers to experience unionism for the first time in their forties, and the convex never-unionization trajectory suggests that the chances are very high that a never-unionized individual in their forties will continue to be never-unionized until they retire. We need to guard against thinking of unionism as a middle-age phenomenon even if this is the age at which workers are the most likely to be unionized.

Bryson and Gomez (2003; 73) also assert that a "key feature of unionization" is that "increasing the flow of members into unions is far more difficult than maintaining the existing stock." This proposition was derived from studying membership rates in British unions, and our results here suggest that this is not a key feature of union coverage in the United States. As shown in Figure 1, as U.S. employees mature from their teens to their early forties, the stock of unionized workers remains fairly stable, but once workers reach age 20, more of them are formerly-unionized than currently-unionized, and by age 40/41, nearly half of the labour force is formerly-unionized. This single largest segment of the workforce represents a large group of workers that unions were unable to maintain in their ranks. More research is needed on the dynamics of flows in and out of unions as workers age across the life cycle.

Notes

[1] Because of different survey months across the waves of the NLSY79, not everyone ages one year in the reported data. We recode everyone to age one year for each survey year based on the age in the initial 1979 survey wave.

[2] The key concern is that we cannot accurately determine if an individual was ever unionized or covered by a collective bargaining agreement if they had any unionized jobs that occurred before they were first surveyed in 1979. We think this is severest for those older than 16 in 1979 as the unionization rate among 14 and 15 year olds is a mere half-percent so missed occurrences of unionized jobs for these individuals is likely to be rare. In comparison, the unionization rate for 17 and 18 year olds is 5-10 percent so the chance of missing pre-survey union jobs for the older age cohorts is significantly higher. We therefore focus on individuals younger than 17 at the start of the survey. By this logic, we could have included 14 year olds, but this cohort is significantly smaller than the others and it is therefore excluded to maintain balanced cohort sizes for the analyses and for comparability with the cohort sizes in the NLSY97.

[3] In particular, a survey error caused 621 of the employed individuals in our final sample to not be asked whether or not they were covered on the job by a collective bargaining agreement in the 1994 wave. We imputed values to this key question by selectively utilizing other variables. Eighty-nine were self-employed and were therefore coded as not covered; 487 were matched by employer id to the same job in the previous or subsequent year in which case we used the covered value from the matching survey year; 26 were similarly matched by industry and occupation codes; and 19 were coded as not covered because of job tenures of a month or less.

[4] Among the 1,522 individuals, 10 did not report any employment in any of the 21 waves, 28 were employed in 1-5 of the waves, 87 in 6-10 of the waves, 220 in 11-15 of the waves, 941 in 16-20 of the waves, and 236 in all 21 waves.

[5] Ages 15 and 41 are excluded from Table 2 and Figure 1 because only half of the sample is observed for these two ages. Moreover, because the NLSY79 is administered biennially after 1994, we only observe half of the sample for each age from age 31 to 40. The numbers in Table 2 and Figure 1 are therefore smoothed by interpolating the missing values as the average of the previous and subsequent values within each age cohort.

[6] These figures include all spells, including 199 right-censored spells from individuals who were in unionized jobs still in progress in 2004.

[7] In other words, these variables are essentially the within-individual means of annual dummy variables for each of these categories. Recall, however, that the NLSY79 is administered biennially rather than annually after 1994. The strict mean of the survey waves, therefore, underweights later ages. To compensate, we multiply each value in each survey wave after 1994 by two and then re-normalize the average to reflect a sample period of 26 years rather than 21 survey administrations. Note further that individuals can have multiple jobs in one period. The measures in Table 3 are generally for their primary job. The results are qualitatively similar if we use indicators for whether an individual was ever married, in a non-right-to-work state, blue-collar occupation, and the like.

[8] The superscripted Δ's in Table 4 denote that the sample means are statistically different from each other in a pairwise *t*-test within these relevant comparisons (e.g., A versus B, or A1 versus A2).

[9] The results are similar if we use indicators for ever living in a non-right-to-work state, manufacturing, a blue-collar occupation, and other analogous measures to those reported in Table 5.

[10] The Cox proportional hazards model assumes the following functional form of the hazard function: $h(t) = h_0(t) \cdot e^{x\beta}$ where $h_0(t)$ is an unspecified baseline hazard, x denotes the independent variables, and β represents the parameters to be estimated. The baseline hazard is not estimated. It can be any shape, but it is assumed to be the same for all individuals. The parameters β indicate how much the independent variables shift this baseline hazard. For example, the estimate for the coefficient on a female dummy variable indicates the extent to which the hazard function differs between men and women. For more details, see Kalbfleisch and Prentice (2002).

[11] Because the hazard ratio HR = 1/(1-p) where p is the probability of exiting first, then p = HR/(1+HR) (Spruance et al. 2004).

[12] These three variables in the Cox proportional hazard model were not included in the probit model because the probit model focuses on summarizing 25 years of labour market and job history rather than period-specific characteristics.

[13] Using linear probability models to calculate a Oaxaca-type decomposition in which the change in never-unionization at age 23 between the two cohorts is decomposed into the portion attributed to changing characteristics and the portion attributed to changing coefficients or propensities indicates that 19 percent of the change can be explained by changing characteristics. This reinforces the finding that changing demographic and structural changes can explain only a fraction of the total change.

[14] Consistent with this conjecture, in the U.S. Worker Representation and Participation Survey conducted by Freeman and Rogers (1999), the percentage of nonunion workers who reported that they would vote in favour of union representation in their workplace was 51 percent for high school dropouts compared to only 23 percent for college graduates (authors' calculations from data available at http://www.nber.org/~freeman/wrps.html).

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Figure 1
U.S. Unionization Rates as Individuals Age from 16 to 40
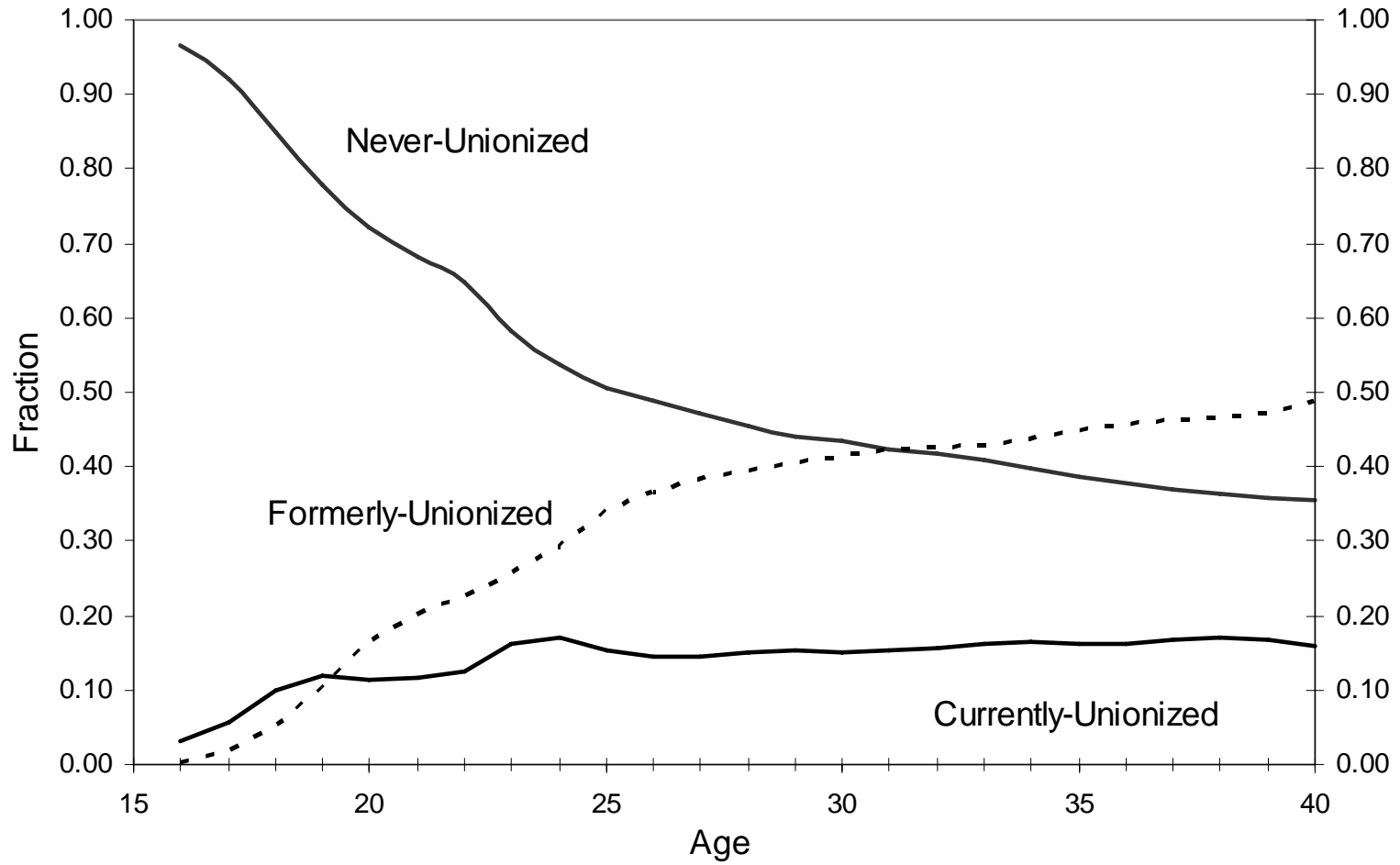
Source: NLSY79 data for 1979-2004 of individuals who were 15 or 16 years old in 1979.

Figure 2
The Never-Unionized Trajectory, Age 16 to 40

a)
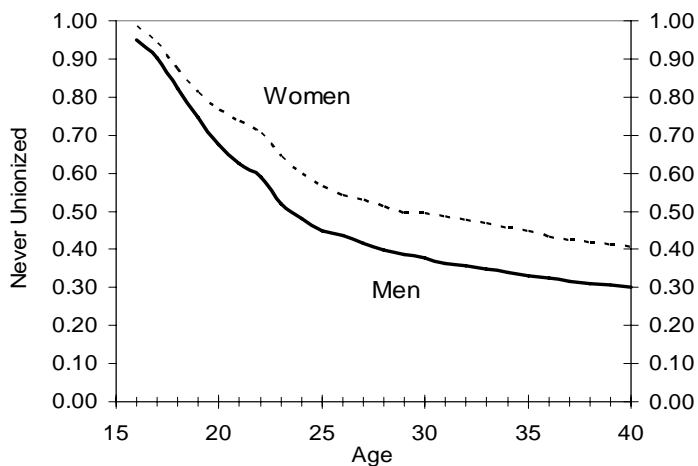
b)

c)
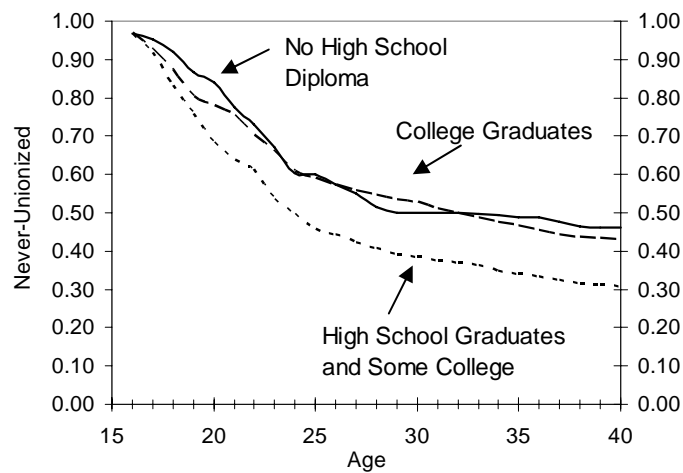
Source: NLSY79 data for 1979-2004 of individuals who were 15 or 16 years old in 1979.

Figure 3
Predicting the Never-Unionized Rate Past Age 40
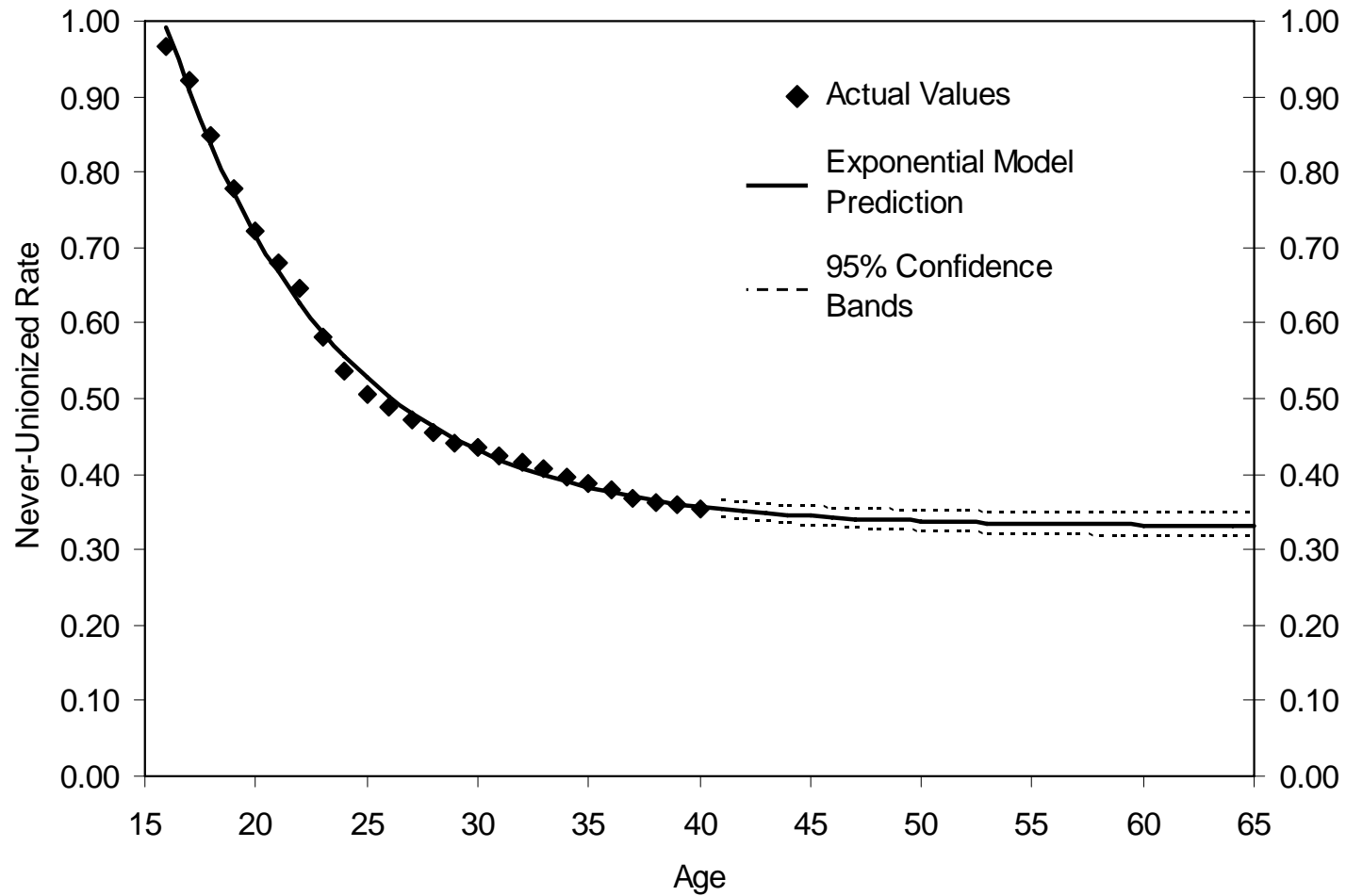
Source: NLSY79 data for 1979-2004 of individuals who were 15 or 16 years old in 1979.
Note: Actual values (diamonds) are the never-unionized rates from Table 1. Predicted values (solid line) are from a nonlinear exponential regression of the form never-unionized = $\beta_0 + \beta_1 * \beta_2^{age}$ (n=25).

Figure 4
The Distribution of (Log) Hourly Pay Rates by Union Status, 2004

Currently-Unionized

Formerly-Unionized

Never-Unionized

Density

-0.5   0.5   1.5   2.5   3.5   4.5   5.5

Log Wage
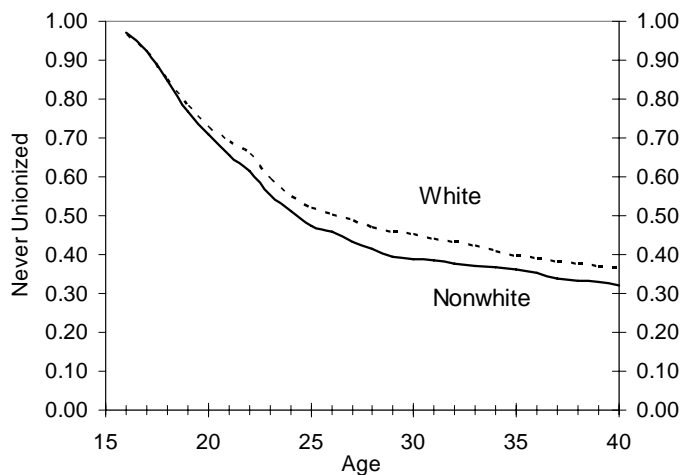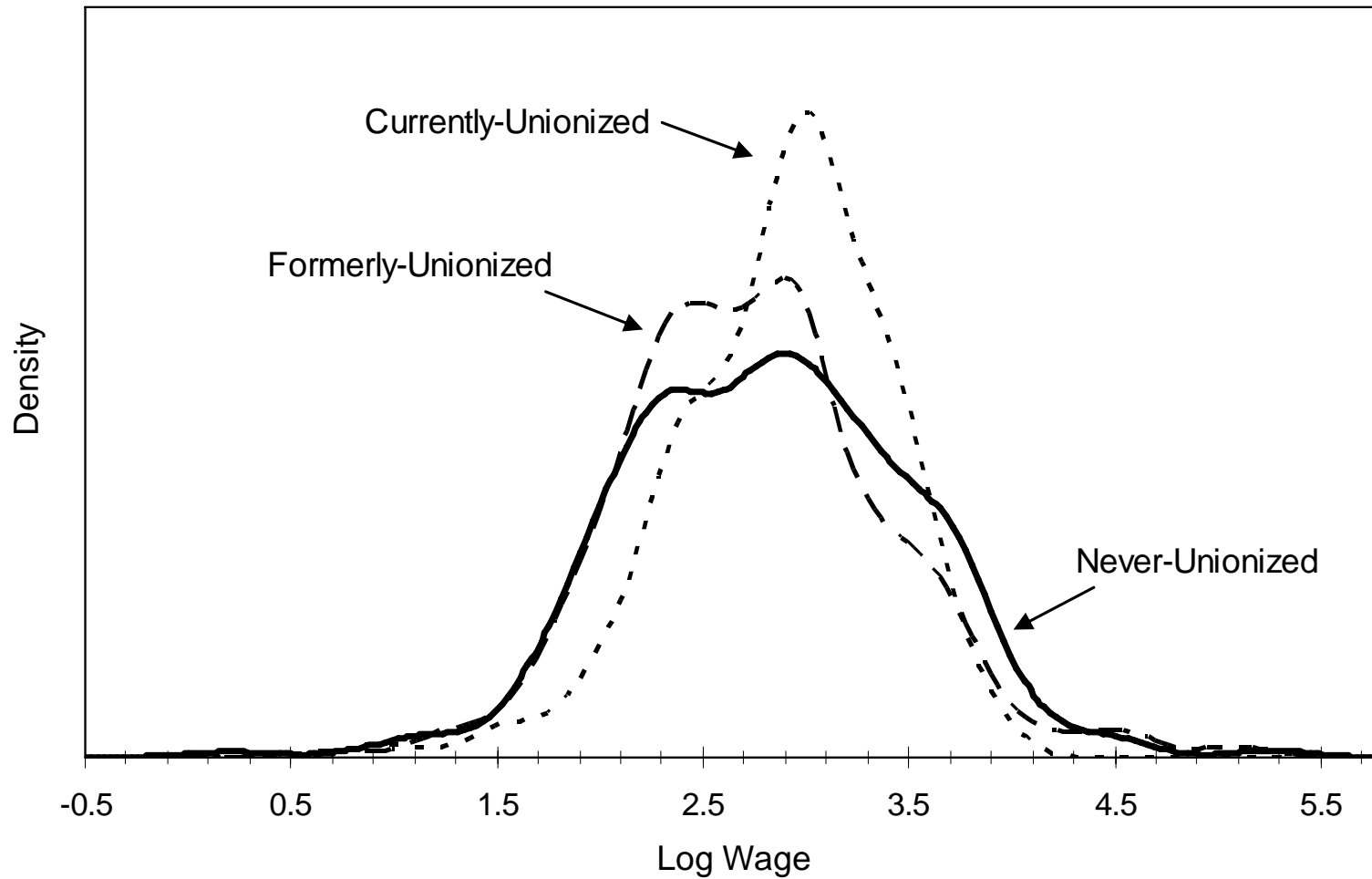
Source: NLSY79 data for 2004 of individuals who were 15 or 16 years old in 1979.
Note: Distributions are estimated using nonparametric kernel density estimation.

Figure 5
The Shifting Never-Unionized Curve
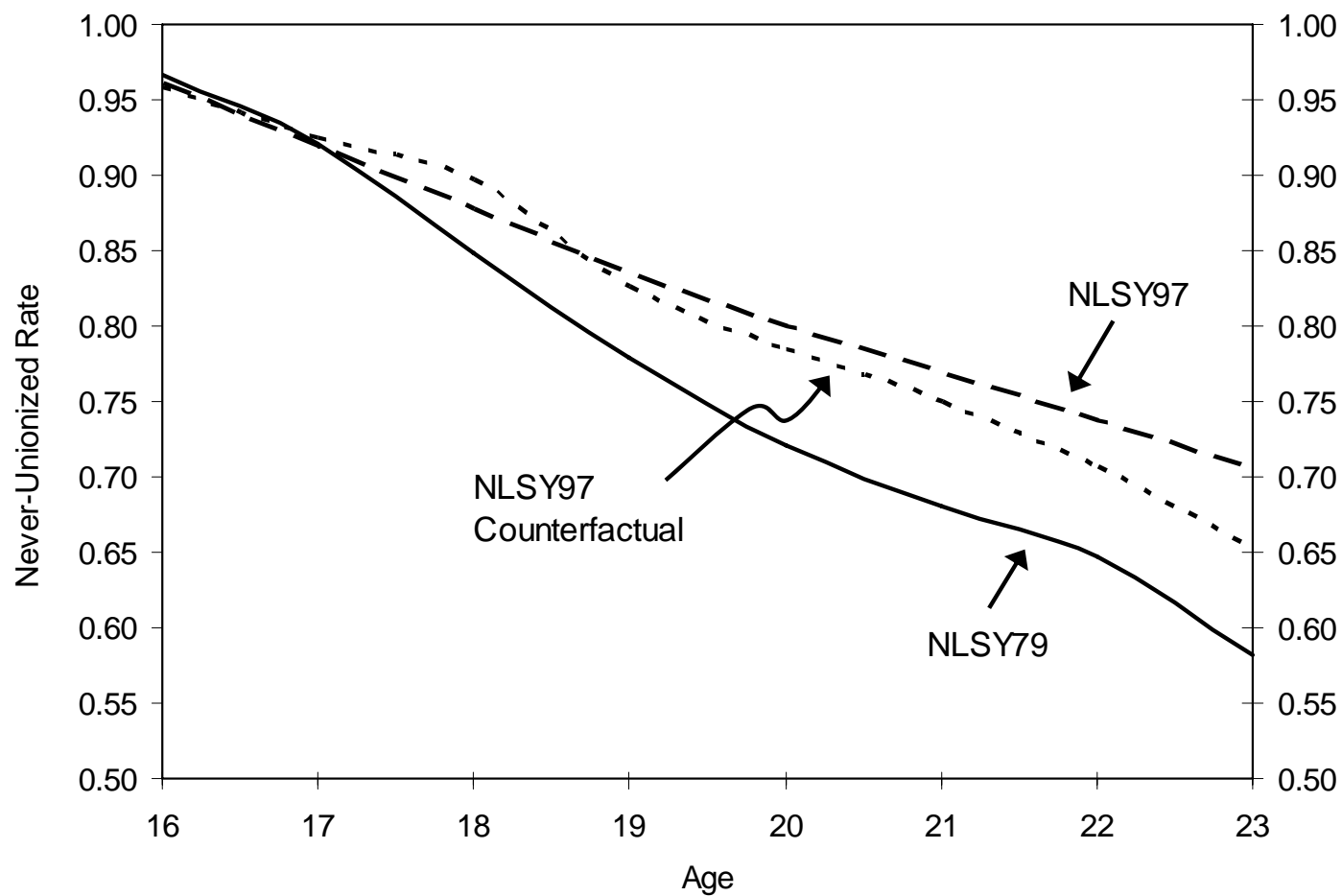
Source: NLSY79 (NLSY97) data of individuals who were 15 or 16 years old in 1979 (1997).
Note: The NLSY97 counterfactual re-weights the NLSY97 values to reflect the distribution of demographic and job characteristics in the NLSY79 for each age group. See the text for details.

Table 1
National Longitudinal Survey of Youth 1979 (NLSY79) Data, 1979 to 2004:
Summary Statistics

	Mean (1)	Standard Deviation (2)
1 if Never-Unionized	0.576	0.495
1 if Currently-Unionized	0.133	0.345
1 if Formerly-Unionized	0.292	0.456
1 if Female	0.493	0.498
1 if Nonwhite	0.290	0.500
1 if Married	0.407	0.485
1 if Did Not Graduate from High School	0.226	0.427
1 if is a High School Graduate	0.404	0.492
1 if has Some College	0.200	0.405
1 if is at Least a Four-Year College Graduate	0.170	0.349
1 if Out of the Workforce	0.150	0.384
1 if Lives in an Urban Area	0.758	0.417
1 if Lives in a Non-Right-to-Work State	0.688	0.475
1 if Works in Agriculture	0.023	0.150
1 if Works in a Manufacturing Industry	0.141	0.339
1 if Works in a Service Industry	0.286	0.452
1 if Works in the Public Sector	0.094	0.309
1 if Works in a Blue-Collar Occupation	0.236	0.417
1 if Works in a Managerial Occupation	0.078	0.252
Total Jobs Held	7.124	5.368
Average Hours Worked Per Week	30.782	18.204
Local Unemployment Rate	7.182	3.196
Sample Size	31,962	

Source: NLSY79 data for 1979-2004 of individuals who were 15 or 16 years old in 1979.
Note: The sample mean is weighted using individual sampling weights.

Table 2
Unionization Over the Life Cycle

Age	Never-Unionized (1)	Currently-Unionized (2)	Formerly-Unionized (3)
16	0.966	0.031	0.002
17	0.921	0.058	0.021
18	0.848	0.099	0.052
19	0.779	0.119	0.103
20	0.721	0.115	0.164
21	0.681	0.117	0.202
22	0.647	0.126	0.227
23	0.581	0.162	0.257
24	0.538	0.170	0.292
25	0.507	0.153	0.341
26	0.490	0.144	0.366
27	0.472	0.146	0.383
28	0.455	0.149	0.395
29	0.441	0.154	0.405
30	0.435	0.150	0.415
31	0.424	0.154	0.422
32	0.416	0.157	0.427
33	0.408	0.163	0.429
34	0.397	0.165	0.438
35	0.388	0.162	0.450
36	0.379	0.163	0.458
37	0.369	0.168	0.462
38	0.363	0.171	0.466
39	0.358	0.169	0.473
40	0.354	0.158	0.488

Source: NLSY79 data for 1979-2004 of individuals who were 15 or 16 years old in 1979.
Note: Rows do not add to one due to rounding.

Table 3
Who Are the Never-Unionized at Age 40/41?[a]

	Never-Unionized (1)	Currently-Unionized (2)	Formerly-Unionized (3)
Female	0.569 (0.486)	0.400$^\Delta$ (0.501)	0.467$^\Delta$ (0.500)
Nonwhite	0.259 (0.497)	0.357$^\Delta$ (0.491)	0.292 (0.500)
Fraction of Sample Period Married	0.477 (0.291)	0.491 (0.279)	0.426 (0.290)
Not a High School Graduate	0.085 (0.321)	0.055 (0.212)	0.053$^\Delta$ (0.237)
High School Graduate	0.364 (0.488)	0.429 (0.494)	0.456$^\Delta$ (0.500)
Some College	0.195 (0.407)	0.215 (0.434)	0.245 (0.436)
Four-Year College Graduate	0.356 (0.452)	0.300 (0.452)	0.245$^\Delta$ (0.411)
Fraction of Sample Period Out of the Workforce	0.166 (0.238)	0.107$^\Delta$ (0.131)	0.128$^\Delta$ (0.162)
Fraction of Sample Period Living in an Urban Area	0.727 (0.319)	0.755 (0.285)	0.756 (0.309)
Fraction of Sample Period Living in a Non-Right-to-Work State	0.650 (0.421)	0.737$^\Delta$ (0.399)	0.677 (0.425)
Fraction of Sample Period Working in Agriculture	0.031 (0.119)	0.012$^\Delta$ (0.033)	0.020 (0.065)
Fraction of Sample Period Working in a Manufacturing Industry	0.121 (0.185)	0.162$^\Delta$ (0.224)	0.155$^\Delta$ (0.217)
Fraction of Sample Period Working in a Service Industry	0.288 (0.257)	0.328 (0.297)	0.286 (0.259)
Fraction of Sample Period Working in the Public Sector	0.055 (0.118)	0.244$^\Delta$ (0.269)	0.091$^\Delta$ (0.184)
Fraction of Sample Period Working in a Blue-Collar Occupation	0.165 (0.250)	0.301$^\Delta$ (0.298)	0.266$^\Delta$ (0.293)

Table 3 (continued)

Fraction of Sample Period Working in a Managerial Occupation	0.178 (0.355)	0.040$^\Delta$ (0.212)	0.112$^\Delta$ (0.304)
Total Jobs Held	11.307 (6.222)	11.156 (5.379)	12.639$^\Delta$ (6.296)
Log Hourly Pay in 2004[b]	2.817 (0.683)	2.891 (0.510)	2.756 (0.664)
At Least One Parent was a Blue-Collar Worker	0.367 (0.488)	0.402 (0.491)	0.443$^\Delta$ (0.498)
At Least One Parent is a College Graduate	0.221 (0.380)	0.210 (0.375)	0.160$^\Delta$ (0.341)
Sample Size	515	256	751

Source: NLSY79 data for 1979-2004 of individuals who were 15 or 16 years old in 1979.

Notes: [a] Sample means (weighted using individual sampling weights) and standard deviations.

[b] The log hourly pay variable excludes individuals with reported hourly wages less than $1 and greater than $200; the number of usable observations are 424, 228, and 636, respectively.

$^\Delta$ Differences in means are statistically different from column 1 at the 0.05 level.

	Two Clusters		Three Clusters (inc. Cluster B)		Five Clusters (including Cluster B)			
	A (1)	B (2)	A1 (3)	A2 (4)	A1(a) (5)	A1(b) (6)	A2(a) (7)	A2(b) (8)
Female	0.618	0.714	0.539^Δ	0.657^Δ	0.591	0.473	0.671	0.577
Nonwhite	0.443	0.571	0.317^Δ	0.504^Δ	0.366	0.257	0.481^Δ	0.635^Δ
Fraction of Sample Period Married	0.443	0.484	0.453	0.437	0.479	0.420	0.445	0.394
Not a High School Graduate	0.104^Δ	1.000^Δ	0.000^Δ	0.155^Δ	0.000	0.000	0.003^Δ	1.000^Δ
High School Graduate	0.394^Δ	0.000^Δ	0.000^Δ	0.587^Δ	0.000	0.000	0.692^Δ	0.000^Δ
Some College	0.213^Δ	0.000^Δ	0.120^Δ	0.258^Δ	0.215^Δ	0.000^Δ	0.305^Δ	0.000^Δ
Four-Year College Graduate	0.289^Δ	0.000^Δ	0.880^Δ	0.000^Δ	0.785^Δ	1.000^Δ	0.000	0.000
Fraction of Sample Period								
Out of the Workforce	0.204	0.385	0.141^Δ	0.235^Δ	0.174^Δ	0.101^Δ	0.213^Δ	0.357^Δ
Living in an Urban Area	0.749	0.714	0.801^Δ	0.724^Δ	0.790	0.815	0.724	0.723
Living in a Non-Right-to-Work State	0.632	0.659	0.663	0.617	0.682	0.638	0.621	0.595
Working in Agriculture	0.028	0.242	0.014^Δ	0.035^Δ	0.007	0.020	0.034	0.038
Working in a Manufacturing Industry	0.115	0.143	0.123	0.110	0.098	0.155	0.106	0.132
Working in a Service Industry	0.284	0.143	0.332^Δ	0.261^Δ	0.282^Δ	0.393^Δ	0.265	0.241
Working in the Public Sector	0.058^Δ	0.005^Δ	0.094^Δ	0.040^Δ	0.066^Δ	0.128^Δ	0.040	0.041
Working in a Blue-Collar Occupation	0.161	0.302	0.062^Δ	0.209^Δ	0.064	0.060	0.194^Δ	0.290^Δ

Table 4 (continued)

Working in a Managerial Occupation	0.096^{Δ}	0.011^{Δ}	0.156^{Δ}	0.067^{Δ}	0.155	0.157	0.075^{Δ}	0.032^{Δ}
Log Hourly Pay in 2004[b]	2.738	1.709	3.196^{Δ}	2.492^{Δ}	3.050^{Δ}	3.373^{Δ}	2.533	2.205
Total Jobs Held	10.756	8.143	11.413	10.434	11.301	11.554	10.291	11.231
Cluster Size	508	7	167	341	93	74	289	52

Source: NLSY79 data for 1979-2004 of individuals who were 15 or 16 years old in 1979 and were never-unionized at age 40 or 41 in 2004.

Notes: [a] The calculations in this table are not weighted.

[b] The log hourly pay variable excludes 91 individuals with reported hourly wages less than $1 and greater than $200

$^{\Delta}$ Differences in means are statistically significant at the 0.05 level. The tests of statistical significance are between Clusters A and B; between A1 and A2; between A1(a) and A1(b); or between A2(a) and A2(b).

Table 5
Probit Analyses of the Never-Unionized at Age 40/41[a]

	(1)	(2)	(3)
Female	0.110**	0.042	0.048
	(0.028)	(0.036)	(0.036)
Nonwhite	-0.036	-0.012	-0.010
	(0.029)	(0.031)	(0.031)
Fraction of Sample Period Married	0.074	0.083	0.085
	(0.051)	(0.054)	(0.054)
High School Dropout (relative to High School Graduate)	0.170**	0.201**	0.201**
	(0.060)	(0.066)	(0.067)
Some College (relative to High School Graduate)	-0.005	-0.033	-0.039
	(0.037)	(0.038)	(0.038)
College Graduate (relative to High School Graduate)	0.121**	0.125**	0.105**
	(0.036)	(0.043)	(0.046)
Fraction of Sample Period Out of the Workforce	---	0.175*	0.169*
		(0.097)	(0.097)
Fraction of Sample Period Living in an Urban Area	---	-0.099**	-0.105**
		(0.050)	(0.050)
Fraction of Sample Period Living in a Non-Right-to-Work State	---	-0.082**	-0.083**
		(0.036)	(0.036)
Fraction of Sample Period Working in Agriculture	---	0.375**	0.360**
		(0.167)	(0.167)
Fraction of Sample Period Working in Manufacturing	---	-0.138*	-0.137*
		(0.082)	(0.081)
Fraction of Sample Period Working in a Service Industry	---	-0.096	-0.099
		(0.067)	(0.067)
Fraction of Sample Period Working in the Public Sector	---	-0.719**	-0.726**
		(0.101)	(0.100)
Fraction of Sample Period Working in a Blue-Collar Occupation	---	-0.282**	-0.274**
		(0.082)	(0.082)
Fraction of Sample Period Working in a Managerial Occupation	---	0.286**	0.277**
		(0.116)	(0.116)

Table 5 (continued)

Total Jobs Held	---	-0.003 (0.003)	-0.003 (0.003)
Parent is a College Graduate	---	---	0.032 (0.044)
Parent is a Blue-Collar Worker	---	---	-0.042 (0.031)
Model χ^2 p-value	< 0.001	< 0.001	< 0.001

Source: NLSY79 data for 1979-2004 of individuals who were 15 or 16 years old in 1979.

Notes: [a] Each entry contains the marginal effect and standard error (in parentheses) from a weighted probit model with a dichotomous dependent variable equal to 1 if never-unionized in 2004 (age 40 or 41). The mean of the dependent variable is 0.352 and the sample size is 1,522.

** Statistically significant at the 0.05 level, *0.10 level.

Table 6
Hazard Analysis of the Odds of Switching from Never-Unionized to Unionized[a]

	(1)
Female	0.892
	(0.073)
Nonwhite	1.197**
	(0.088)
Married	0.898
	(0.081)
High School Dropout (relative to High School Graduate)	0.731**
	(0.087)
Some College (relative to High School Graduate)	0.831*
	(0.087)
College Graduate (relative to High School Graduate)	0.672**
	(0.092)
Urban	1.248**
	(0.119)
Non-Right-to-Work State	1.163*
	(0.104)
Agriculture	0.759
	(0.204)
Manufacturing	1.471**
	(0.155)
Service Industry	1.078
	(0.092)
Public Sector	2.639**
	(0.257)
Blue-Collar Occupation	1.411**
	(0.134)
Managerial Occupation	0.612**
	(0.129)

Table 6 (continued)

Total Jobs Held	1.108**
	(0.014)
Average Hours Worked per Week	1.110**
	(0.014)
Average Hours Worked per Week – Squared	0.999**
	(0.000)
Local Unemployment Rate	1.004
	(0.012)
Model χ^2 p-value	< 0.001

Source: NLSY79 data for 1979-2004 of individuals who were 15 or 16 years old in 1979.

Notes: [a] Each entry contains the exponentiated hazard coefficient and standard error (in parentheses) from a weighted Cox proportional hazard model where the initial state is never-unionized, and exit is defined to occur when an individual becomes unionized. The sample consists of 1,500 individuals and 17,610 observations.

** Statistically significant at the 0.05 level, *0.10 level.