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Do legal school leaving rules still affect schooling and earnings? [☆]



Mevlude Akbulut-Yuksel

Dalhousie University, IZA and HICN, Department of Economics, 6214 University Avenue, Halifax, NS, B3H 4R2, Canada

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ABSTRACT

This paper quantifies whether compulsory schooling laws are still effective in the 21st century and if so, to what extent the school compulsion continues to influence individuals' educational achievement and labor market earnings. Using American Community Survey, I find that compulsory schooling laws were effective for the white men and women born in the 1930s and 1940s in the U.S.; however, they no longer produce the same seasonality effects on the educational attainment of the white cohorts who completed their educational attainment in the 2000s. I also find that the school compulsion was not binding for the older African American cohorts; however, they were effective in keeping the younger African American men at school longer.

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1. Introduction

In the today's global economy, knowledge and innovation are the main engines of the economic progress. The OECD and developing countries invest a sizable fraction of their GDP in human capital to be able to compete in the global sphere. The United States spent more than \$11,000 per elementary school student and more than \$12,000 per high school student in the 2010 fiscal year. This figure increases to \$29,910 per student when the spending on tertiary education is included (OECD, 2012). The majority of the OECD countries aim to provide every child with a high standard of education through 12 years of compulsory schooling. Over the last two decades, many developing countries have also been reforming their education system by extending the compulsory schooling years. Given the resources put in high school and college education, the effectiveness of the compulsory schooling laws in promoting high school completion, transition into college and more importantly individuals' success at the labor market still remains in the center of public policy and requires further scrutiny.

This paper investigates whether the compulsory schooling laws are still effective in enhancing individuals' educational attainment and labor market earnings in the first decade of 21st century. I exploit the legal school dropout age imposed by the compulsory schooling laws to estimate the returns to compulsory school legislations among the most recent cohorts of white and African American men and women in the United States. Students typically start first grade in the autumn of the calendar year in which they turn six and are required to stay in school by law until they attain the minimum legal dropout age. Hence,

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E-mail address: mevlude@dal.ca.

children born in the earlier months of the year reach the minimum dropout age at the beginning of the calendar year, the compulsory schooling laws mandate them to stay in school until the middle of the school year. On the other hand, their classmates who were born in the later months of the same year reach the minimum dropout age after the school term ends; therefore, they are forced to stay in school longer. If individuals' birth dates are randomly distributed, the quarter of birth generates a plausibly exogenous variation in individuals' educational achievement and potentially in labor market earnings later in life.

Angrist and Krueger (1991) first proposed that compulsory schooling laws provide a natural experiment to estimate the returns to education. Their study focuses on white and black men born between 1920 and 1949 and utilizes the 1960, 1970, and 1980 U.S. Censuses. Following Angrist and Krueger (1991), I explore the difference in educational attainment across birth quarters generated by compulsory schooling legislations and employ quarter of birth as the instrument of educational achievement. More specifically, I estimate the labor market returns to compulsory schooling for 31–55 year-old men and women born in the United States using the 2005 American Community Survey (ACS). The 2005 ACS is the first U.S. Census to report individuals' quarter of birth after the 1980 Census Public Use Microdata Samples (PUMS, Ruggles et al., 2004). Therefore, this new dataset enables us to investigate the returns to education for the more recent cohorts by exploiting possible seasonal differences in years of schooling generated by the compulsory schooling legislations. Another attractive feature of the 2005 ACS is its massive sample size allowing us to gauge association between (log) earnings and years of schooling over time using OLS and instrumental variables strategies.

I find that the seasonality pattern shows that school compulsion yields a sizable increase in educational achievement of the white men and women born between 1930 and 1949. However, the educational attainment of African American men born during the same time period does not show the same pattern. Similarly, the analysis of the younger cohorts suggests that compulsory attendance laws are no longer effective in increasing whites' and African American women's educational attainment. In contrast, I find that the laws still compel the younger African American men to stay in school longer.

The analysis of earnings also reveals that among the cohorts born in 1950s, the first quarter births earn less than the later quarter births. However, these cohorts exhibit a weaker or no seasonality in years of schooling. Since the association between quarter of birth and earnings persists despite the weakening association between quarter of birth and years of schooling for these cohorts, this suggests the quarter of birth may not be a valid instrument of educational attainment. For instance, quarter of birth can also affect individuals' earnings through differential parental characteristics, exposure to illness at birth, the incidence of behavioral difficulties and the need for mental health services which vary by the quarter of birth (Boland et al., 2015; Buckles and Hungerman, 2013; Almond, 2006; Bound and Jaeger, 1996). These seasonal patterns in other potentially contributing factors would therefore make it challenging to causally identify the returns to education using quarter of birth as an instrument among more recent cohorts.

This paper makes several contributions. First, it contributes to the literature exploring the returns to compulsory schooling and increasing income inequality in the United States and other developed economies. Since the 1970s, the earnings of high school dropouts have been declining and income inequality has been soaring in the United States (Saez, 2015; Boustan et al., 2013). According to the U.S. Census Bureau, the average high school dropout earns an annual income of \$20,241 in 2010, while a typical high school graduate earns \$30,627 and someone with a bachelor's degree earns \$56,665. The returns to education and skills are higher for the more recent cohorts on average than the older cohorts (Acemoglu and Autor, 2011; Autor et al., 2003; Acemoglu, 2002). These findings have spurred a global move towards compulsory schooling. Analyses presented in this paper add to the debate on the efficacy of the compulsory schooling laws in enhancing educational attainment and labor market outcomes of the more recent cohorts. Moreover, in contrast to previous studies, I separately analyze the effects of the school compulsion on the educational achievement and the labor market success of white and African American men to assess potential racial differences in school compulsion and earnings. In addition, in contrast to previous studies which only focus on men, I also estimate the effects of school compulsion on the educational attainment and labor market outcomes of women as well.

This paper also contributes to the debate on the validity of quarter of birth as an instrument, building on the research of Bound et al. (1995) and Bound and Jaeger (1996), who argue that the association between quarter of birth and both educational attainment and earnings are too strong to reflect the compulsory schooling laws alone. In this paper, I formally test their criticisms by separately analyzing the seasonality patterns in educational outcomes and labor market earnings among more recent white and African American cohorts of men and women.

The remainder of the paper is organized as follows. Section 2 briefly reviews the relevant literature. Section 3 describes the data in detail. Section 4 discusses whether the compulsory schooling laws increase educational attainment of the old and the young birth cohorts. Section 5 presents the OLS and Wald estimates of returns to education. Section 6 concludes.

2. Literature review

Angrist and Krueger (1991), the first researchers to exploit the timing of compulsory schooling laws as a natural experiment to estimate the causal association between individuals' schooling and earnings, focus on white and black men born between 1920 and 1949 and utilize the 1960, 1970, and 1980 U.S. Censuses. They show that those born in later quarter stayed in school longer and consequently attained higher levels of education and earned more in the labor market. Margo and Finegan (1996) provide similar evidence using more detailed information on month of birth available in the 1900 U.S.

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