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Direct and indirect effects of body weight on adult wages

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ABSTRACT

Previous estimates of the association between body weight and wages in the literature have been conditional on education and occupation. In addition to the effect of current body weight status (body mass index (BMI) or obesity) on wages, this paper examines the indirect effect of body weight status in the late-teenage years on wages operating through education and occupation choice. Using the National Longitudinal Survey of Youth 1979 data, for women, we find that a one-unit increase in BMI is directly associated with 1.83% lower hourly wages whereas the indirect BMI wage penalty is not statistically significant. Neither a direct nor an indirect BMI wage penalty is found for men. However, results based on clinical weight classification reveal that the indirect wage penalty occurs to a larger extent at the upper tail of the BMI distribution for both men and women via the pathways of education and occupation outcomes. Late-teen obesity is indirectly associated with 3.5% lower hourly wages for both women and men. These results are important because they imply that the total effect of obesity on wages is significantly larger than has been estimated in previous cross-sectional studies.

1. Introduction

Over the past few decades, the prevalence of obesity has risen dramatically in the United States. One-third of American adults were reported to be obese in 2007–2008 (Flegal et al., 2010). Given these trends, there is great interest in the economic consequences of obesity. Many economic studies have recently reported finding a negative effect of body mass index (BMI) or obesity on labor market outcomes, such as hourly wages, particularly for women (Averett and Korenman, 1996; Pagan and Davila, 1997; Cawley, 2004; Baum and Ford, 2004; Conley and Glauber, 2005; Norton and Han, 2008; Han et al., 2009) and the probability of employment (Sarlio-Lahteenkorva and Lahelma, 1999; Cawley, 2000; Paraponaris et al., 2005; Tunceli et al., 2006; Garcia and Quintana-Domeque, 2007; Lundborg et al., 2007; Morris, 2007; Norton and Han, 2008; Han et al., 2009).

Economists are especially interested in understanding why BMI or obesity may affect labor market outcomes. Most explanations are conditional on having a job, and may explain differences either in initial wages or in wage growth. In addition to the relationship between current weight status and wages conditional on education and occupation, in this study, we provide empirical evidence on the wage penalty stemming from weight status in the late-teen years operating through two indirect pathways – education and occupation outcomes. Many important decisions that affect future employment and wages are made during the late teens and a large number of economic and vocational studies have explored whether behavioral

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choice and the environment of teenagers affect their education or occupational outcomes in adulthood (Blau et al., 1956; Heckman et al., 2006; Holland, 1985; Schoon, 2001; Schoon and Parsons, 2002).

Our study builds on the previous literature and empirically tests whether in addition to the direct weight-related wage penalty, late-teen body weight status prior to the job search is associated with wages indirectly through two major determinants of wages, education and occupation (Mincer, 1974), the formation of which occurs in early adulthood in the life trajectory. Several previous studies that explore the association of choices in the late-teen years with occupation outcomes focus on young adulthood (see for example, Borghans et al., 2007; Heckman et al., 2006). Examining the relationship between body weight status in the early part of the life-cycle (i.e., the late teenage years) and future education, employment, and occupation outcomes in young adulthood, we are able to identify whether different levels in the stock of education or sorting into different occupations are potential mediating paths that contribute to the BMI wage penalty. Evidence on this indirect effect would substantially add to the debate about the relationship between weight and wages, highlighting the potential persistent negative externalities from obesity prevalence in the teenage years. Such evidence would also imply that the total effect of obesity on wages is significantly larger than has been estimated in previous cross-sectional studies.

We examine the extent to which individuals with different body weight status have different labor market outcomes, particularly, hourly wages in their early thirties, and whether such differences may be attributable to education and occupation outcomes among service, sales, managerial or professional specialty, administrative support or clerical, or blue-collar jobs. That is, our study helps to understand the potential of an indirect effect of weight status in the late-teenage years on wages operating through education and occupation in addition to assessing the direct association of weight status on wages.

We also build on a hypothesis from the psychology literature about the importance of social interactions (Frieze et al., 1990; Martel and Biller, 1987). Personal traits such as interactive skills have been explored as a source of individual heterogeneity that is related to economic behaviors in the economics literature as well (Borghans et al., 2008; Heckman et al., 2006; Mueller and Plug, 2006; Krueger and Schkade, 2005). In occupation outcomes, such traits are reported to affect both the productive capabilities and the individual preferences for occupations (Ham et al., 2009; Borghans et al., 2007). The lack of accumulation of some forms of human capital – such as interpersonal skills – may be due to stigma or lack of self-image during the teenage years. Obese children are reported to have social and psychological problems such as stigma and poor-self esteem (Daniels, 2005). The correlation of physical attractiveness (for which BMI or height may be an objective proxy measure) and less human capital accumulation during high school years also has been reported in economics literature. For example, Moan and Tekin (2009) show that less attractive high school students accumulate less human capital, particularly for female students, which is correlated with their labor market outcomes in later years. Persico et al. (2004) show that taller people earn higher wages stemming from higher human capital such as good social skills built from more sport or club participation in high school compared to their shorter counterparts. Mobius and Rosenblat (2006) report physically attractive workers show more self-confidence. Han and colleagues (2009) also report larger negative relationships between adult contemporaneous BMI and wages in occupations requiring interpersonal skills based on the nature of relationship to people.

Therefore, we categorize occupations by the amount of social interactions required using the Dictionary of Occupational Titles (DOT) in addition to Census occupation codes. The aggregate Census occupational codes generate occupation categories based on overall characteristics of each occupation (Pagan and Davila, 1997; Baum and Ford, 2004). Given that occupations in the same Census classification can have different requirements for social interaction with customers or colleagues, this additional control may partly explain the BMI wage penalty.

The results from this study show that a one-unit change in BMI is associated with 1.8% direct wage penalty for women. No direct BMI or obesity wage penalty is found for men. It is notable that the indirect BMI wage penalty occurs at the upper tail of the late-teen BMI distribution given that we estimate a 3.5% wage penalty of obesity via the indirect pathways of education and occupation outcome for both women and men.

2. Previous literature

Several studies have linked body weight status to labor market outcomes, mostly wages. Most of those studies find a negative contemporaneous effect of body weight status (either BMI or obesity) on hourly wages for women, but no significant effect for men (Cawley, 2004; Averett and Korenman, 1996; Conley and Glauber, 2005; Baum and Ford, 2004; Han et al., 2009). For women, the wage penalty for a one-unit increase in BMI is found not only for their own earnings and occupational prestige, but also their spouses' earnings and occupational prestige (Conley and Glauber, 2005). The direction and the magnitude of the effects are different by race within each gender (Cawley, 2004). Also, the often-reported negative relationship between BMI and wages is larger in occupations requiring interpersonal skills with presumably more social interactions (Han et al., 2009).

Body weight status is also estimated to affect labor market outcomes on the extensive margin, such as employment or occupation outcomes. Morris (2007) estimates a negative relationship between obesity and the probability of employment for British people for both genders. Increasing BMI also is estimated to raise the percentage of time spent unemployed during the working years and lowers the probability of employment after a period of unemployment for both genders for French people (Paraponaris et al., 2005). Both obese men and women are less likely to sort into managerial, professional and technical occupations (Pagan and Davila, 1997). However, the effect of obesity is not statistically significant