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Obesity and the labor market: A fresh look at the weight penalty☆

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ABSTRACT

This paper applies semiparametric regression models to shed light on the relationship between body weight and labor market outcomes in Germany. We find conclusive evidence that these relationships are poorly described by linear or quadratic OLS specifications. Women's wages and employment probabilities do not follow a linear relationship and are highest at a body weight far below the clinical threshold of obesity. This indicates that looks, rather than health, is the driving force behind the adverse labor market outcomes to which overweight women are subject. Further support is lent to this notion by the fact that wage penalties for overweight and obese women are only observable in white-collar occupations. On the other hand, bigger appears to be better in the case of men, for whom employment prospects increase with weight, albeit with diminishing returns. However, underweight men in blue-collar jobs earn lower wages because they lack the muscular strength required in such occupations.

1. Introduction

Obesity is a major public health issue that has caused billions of dollars in medical expenditures and contributes to hundreds of thousands of deaths every year (Mokdad et al., 1999). The obesity epidemic has also spilled over into the labor market. A negative association between body weight and wages is well established in the labor economics literature. It has been observed in the United States (Averett and Korenman, 1996; Cawley, 2004; Conley and Glauber, 2006, among others), as well as in European countries such as Denmark (Greve, 2008), England (Morris, 2006), Finland (Johansson et al., 2009), France (Paraponaris et al., 2009), Germany (Cawley et al., 2005), Sweden (Lundborg et al., 2014), and even in Taiwan (Tao, 2008).

Higher weight is not only associated with drawbacks for those in employment, but also for those searching for a job. Chubby job seekers have considerably lower chances of initially finding a job than their slimmer, equally qualified peers (Lindeboom et al., 2010; Garcia and Quintana-Domeque, 2006, among others) and certain jobs are not even open to overweight applicants (Cawley and Maclean, 2012). Obese unemployed are forced to spend more time on welfare (Cawley and Danziger, 2005). In addition, being overweight has adverse effects on those who already face obstacles in the job market. For instance, heavy women tend to be more prone to adverse labor market outcomes than overweight men (Mocan and

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Tekin, 2011). There is also evidence that they have less success in their transition back to employment, despite putting in more effort and having lower reservation wages (Caliendo and Lee, 2013).

While previous research has consistently uncovered a negative relationship between body weight and labor market outcomes, non-linearities in the relationship and heterogeneous effects remain under-explored. Most studies merely apply linear or dummy variable regressions of wages on body weight. Recent studies by Gregory and Ruhm (2011) for the US and a European cross-country analysis by Hildebrand and Van Kerm (2010) indicate that these functional forms might fail to capture important details in the association between wages and body weight; moreover, few studies account for heterogeneity across different occupational categories. Based on data from the German Socio-Economic Panel, our study fills these gaps in the literature. First, we apply a semiparametric model that allows for a flexible functional form. Second, we divide our sample into blue-collar and white-collar workers, and distinguish between occupations in which physical attractiveness is productivity-enhancing and those where it is not. To the best of our knowledge, we are also the first to apply a semiparametric model to gain insights on the relationship between employment and body weight.

Our results indicate looks-based discrimination against women in terms of lower wages, albeit only in white-collar jobs. Even women of normal weight are subject to wage penalties, and thus it might be misleading to refer to this effect as an "obesity penalty". Our analysis also suggests that what at first glance appears to be looks-based discrimination against underweight men more likely results from a lack of fitness and strength, which tend to be of particular importance in blue-collar jobs. Our results are robust to the inclusion of controls for muscle strength and also hold up when we further stratify our sample by job type and age. Altogether, we find a level of heterogeneity, which partly confirms the findings of previous studies, but also shows them in a different complexion.

We also find that the employment probability peaks for women way before the clinical threshold of obesity is reached. On the other hand, a parametric probit model would have suggested continuously declining employment probabilities in body weight. For men, we find that the propensity for employment peaks at a body weight that is actually quite close to the obesity threshold. While our semiparametric approach addresses functional form issues in an innovative way, it is no remedy for the endogeneity issues plaguing the literature. After all, obesity is not randomly assigned and likely to be correlated with omitted unobservables that also affect labor market outcomes. As a result our estimates do not have a causal interpretation, although they shed additional light on the relationship between obesity labor market outcomes.

The remainder of the paper is organized as follows. Section 2 describes the data used and presents first descriptive evidence on the outcomes of interest. In Section 3 we discuss our methodological approach before presenting the results in Section 4. Finally, Section 5 concludes and provides an outlook for further research.

2. Data and descriptives

2.1. Estimation sample

For our analysis we use data from the German Socio-Economic Panel (SOEP) which is an annual representative household panel study that collects detailed information about the socio-economic circumstances of approximately 30,000 individuals across in Germany (see Wagner et al., 2007, for details). We focus on the waves 2002, 2004, 2006, and 2008 of the survey, during which information on both body weight and height was obtained from all participants. We pool data from different waves, but only use the most recent observation for each respondent.[1] From this information, we construct each respondent's body mass index (BMI) as the main explanatory variable of our study. BMI is the most commonly used measure of obesity (see Burkhauser and Cawley, 2008, for a discussion of the merits and demerits of using this measure). It is defined as an adult's weight in kilograms divided by the square of his or her height in meters. The World Health Organization (WHO) deems individuals with a BMI between 20 and 25 as having a healthy "normal" weight. Individuals with a BMI higher than 30 are classified as obese, while those with a BMI between 25 and 30 are rated as overweight (WHO, 2000). Obesity and, to a lesser degree, being overweight, is significantly associated with poor health and higher mortality in general (Allison et al., 1999), and diabetes, high cholesterol, and high blood pressure in particular (Mokdad et al., 2003). Obesity is also one of the main causes for rising health care costs (Cawley and Meyerhoefer, 2012).

Height and weight are self-reported in the SOEP. There is a tendency to underreport weight and overreport height due to reasons of social desirability and age. For example, Strauss (1999) shows that adolescent girls tend to underreport their weight. This might slightly bias our results towards zero. Previous studies, e.g. Cawley (2004), tried to correct potential reporting error by applying a method developed by Bound et al. (2001), which relies on measured weight and height of participants of the National Health and Nutrition Examination Survey (NHANES III). We refrain from adjusting our BMI measure since we have no such benchmark study available for Germany, and the merits of this method are not beyond doubt (Han et al., 2009).

The dependent variable in our wage specification is the (log) hourly wage rate, which is constructed from the reported weekly earnings and hours of work. We also adjust wages from different waves for inflation. Respondents who claim to have hourly wages that exceed € 300 or

[1] While panel attrition might be a concern in this context, there is little evidence for differential attrition with respect to either the main outcome or the main explanatory variable. A related concern is sample selectivity. For that reason, we re-run our analysis without selecting observations from the 2008 wave where possible and obtained virtually identical results. We also re-run our analysis by randomly selecting a wave for each individual in our sample, again the results were similar. The results of these robustness checks are available online in a supplementary appendix. For more information on attrition and re-participation rates (which are generally at around 90%) in the SOEP see Kroh (2011).