



## Obesity and labor market outcomes in Denmark

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### ABSTRACT

This paper analyzes the relationship between body mass index (BMI) and employment status and wages. The analysis uses a unique data set from a Danish panel survey from 1995 and 2000, combined with administrative registers, covering 8000 individuals. Results show a negative effect of BMI on employment for women and an inverted u-shaped effect for men. Results further indicate that in the private sector BMI has a negative effect on wages for women but an inverted u-shaped effect on wages for men, whereas results from the public sector show that BMI has no influence on wages for either men or women.

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### 1. Introduction

The relationship between obesity and labor market outcomes has recently come into focus in the U.S. The prevalence of obesity in the U.S., around 30% in 2003–2004 (Ogden et al., 2006), is the highest in the developed world, and its impact on wages is significantly negative, especially for White women (Cawley, 2004). Obesity is likewise a growing health problem in Europe. Sanz-de-Galdeano (2005) finds for a selected sample of European countries that the obesity levels on average rose 8.5% from 1998 to 2001 for both men and women. Yet data on obesity rates in Europe are scant and inadequate.

Existing literature has explored the impact of obesity both on wages (Cawley, 2004; Morris, 2006; Brunello and D'Hombres, 2007; Johansson et al., 2007; Shimokawa, 2008) and employment (Garcia and Quintana-Domeque, 2007; Morris, 2007; Lundborg et al., 2007; Johansson et al., 2007; Burkhauser and Cawley, 2008). The labor markets in the Northern European welfare state economies are characterized by a high-labor market participation rate, a compact wage distribution, and a considerable share of the labor force employed in the public sector, with fixed wage structures. Thus, larger effects are expected on employment than on wages and larger effects are expected in the private sector than in the public sector. Therefore, by analyzing the impact of obesity on both employment status and wages in the private and the public sector, this paper broadens the perspective on obesity and labor market outcomes.

Obesity is defined as a physical condition that results from excessive storage of fat in the body, with consequences for the individual's health (Svendson et al., 2001). The precise percentages of body fat that lead to negative health consequences remain controversial. In practice, obesity is usually defined by a body mass index (BMI, measured as weight in kilos over height in meters squared,  $\text{kg}/\text{m}^2$ ), above 30.

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Obesity affects labor market outcomes through several channels. Obesity is related to a number of serious diseases such as hypertension, Type 2 diabetes, coronary heart disease, and sleep apnea.<sup>1</sup> Obesity may also lead to psychological problems arising from stigmatization, social rejection, humiliation, and dissatisfaction with oneself, particularly among women.<sup>2</sup> This stigmatization may also depend on the prevalence of obesity, so that obesity becomes more stigmatizing in countries like Denmark, where the prevalence of obesity is less than half of the U.S. level.

Problems at the personal level may also affect the individual's relationship to the labor market. Obesity may be a real parameter of productivity, e.g., in occupations with physical labor or customer contact. Obesity may also reduce work ability through the health channel, thereby reducing the individual's productivity. Although results from the [Burkhauser and Cawley study \(2004\)](#) are mixed, they nonetheless present evidence that weight increases the probability of health-related work limitations and the probability of receiving disability-related benefit payments. While obesity is related to several diseases not all obese people are sick and have more sick days than healthy weight people. In the case of statistical discrimination of obese people, obesity, as generally related to several health problems that do imply costs for the employer, becomes a motive for employers not to employ the obese in order to maximize profit.

Discrimination against obese people in the labor market can be a consequence of prejudice or preferences (for non-obese workers) on the part of employers, employees, or customers ([Becker, 1973](#)). Determining when differences in employment are due to discrimination is not easy as they are often justified as productivity differences or additional costs associated with employing a specific individual. A recent experimental study from Sweden ([Rooth, 2007](#)) finds evidence of discrimination against obese people in the hiring process and finds that employers in occupations with more customer contact discriminate more than those with less customer contact.

The sociological literature supports the hypothesis that obese people meet discrimination in the labor market. Research into the hiring process shows that some of the most important values an employer looks for are non-measurable characteristics such as engagement, commitment, and social qualifications ([Csonka, 1995](#); [Behrenz and Delander, 1996](#)). These values may work against obese people in the hiring process as obesity may be a signal of certain qualities such as lack of self-control and laziness ([Sobal and Stunkard, 1989](#); [Puhl and Latner, 2007](#)) which employers may not like. However, discrimination for esthetical reasons accompanies rational choice by the employer as obesity is also a signalling device.

This paper offers a new approach to the subject of obesity and labor market outcomes using Danish data. The paper presents estimates of the impact of body weight on both employment and wages for both men and women using body weight measures all based on BMI or BMI corrected for measurement error through use of a Danish medical study's predictions on the relationship between the reported and true BMI ([Bendixen et al., 2004](#)). The paper uses a unique dataset consisting of information from both a Danish panel survey from 1995 and 2000 and the administrative registers. This dataset on about 8000 individuals includes a long list of variables recording employment, employment history, body weight, and medical prescription records which allows us to deal with methodological problems – such as measurement error, endogeneity, and selection – that arise in studies of the relationship between obesity and labor market outcomes.

## 2. Methods and the empirical strategy

As body weight is partly an effect of individual lifestyle, the impact of body weight on employment is difficult to analyze, as employment simultaneously may affect weight and thereby impose endogeneity.

Employment may affect weight if the unemployed and low-wage earners live in poorer areas in which nutritious food is harder to find and where fattening fast food is cheap and easily available. Yet the reverse causality – that poor labor market outcomes promote obesity – is less likely to obfuscate the issue in Denmark, where taxes on fast food are relatively high and eating out is relatively expensive ([Lipsej and Swedenborg, 1996](#)). Nonetheless, employment may affect obesity for other reasons. A study on healthcare in Europe ([Alber and Köhler, 2004](#)) shows that a considerably higher share of the working population feel more stressed than those who are not employed. Furthermore, stress is related to body weight ([Hannerz et al., 2004](#)). Hence, those working may lose weight on account of the stress they experience.

However, when independent factors are correlated with both weight and labor market outcomes, a third factor may also explain the relationship between obesity and employment. This factor could reflect problems of self-control or preferences for current as opposed to future consumption, or reflect the possibility that those people who do not overeat are also those who invest more in skills and work harder than other people. A number of studies have analyzed the relationship between BMI and time preferences ([Komlos et al., 2004](#); [Borghans and Golsteyn, 2006](#); [Cutler and Glaeser, 2005](#); [Smith et al., 2005](#)), finding some evidence of the relationship between BMI and the ways in which people discount the future. Yet the results on the relationship between BMI and time preferences depend on both the proxy for the discount rate and vary between sub-groups in the population.

<sup>1</sup> Higher body weight is also associated with an increase in all-cause mortality and lower fertility ([NHLBI, 1998](#)).

<sup>2</sup> Several studies have shown that obesity has a considerably more stigmatizing effect on women and that women appear to internalize this stigma more than men ([Sobal and Stunkard, 1989](#); [Peralta, 2003](#)).

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