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An economic analysis of adult obesity: results from the Behavioral Risk Factor Surveillance System

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Abstract

This paper examines the factors that may be responsible for the 50% increase in the number of obese adults in the US since the late 1970s. We employ the 1984–1999 Behavioral Risk Factor Surveillance System, augmented with state level measures pertaining to the per capita number of fast-food and full-service restaurants, the prices of a meal in each type of restaurant, food consumed at home, cigarettes, and alcohol, and clean indoor air laws. Our main results are that these variables have the expected effects on obesity and explain a substantial amount of its trend.

JEL classification: I12; I18

Keywords: Obesity; Body mass index; Fast-food restaurant

1. Introduction

Since the late 1970s, the number of obese adults in the US has grown by over 50%. This paper examines the factors that may be responsible for this rapidly increasing prevalence rate. We focus on societal forces which may alter the cost of nutritional and leisure time choices made by individuals and specifically consider the effect of changes in relative prices, which are beyond the individual's control, on these choices. The principal hypothesis to be tested is that an increase in the prevalence of obesity is the result of several economic changes that have altered the lifestyle choices of Americans. One important economic change is the

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increase in the value of time, particularly of women, which is reflected by the growth in their labor force participation rates and in their hours of work. The reduction in home time has been associated with an increase in the demand for convenience food (food requiring minimal preparation time) and consumption in fast-food restaurants. Home time also has fallen and the consumption of the two types of food just mentioned has risen because the slow growth in income among certain groups has increased their labor market time.

Another important change is the rise in the real cost of cigarette smoking due to increases in the money price of cigarettes, the diffusion of information concerning the harmful effects of smoking, and the enactment of state statutes that restrict smoking in public places and in the workplace. This relative price change may have reduced smoking, which tends to increase weight. A final set of relative price changes revolves around the increasing availability of fast-food, which reduces search and travel time and changes in the relative costs of meals consumed in fast-food restaurants, full-service restaurants, and meals prepared at home. Some of the changes just mentioned, especially the growth in the availability of fast-food restaurants, may have been stimulated by increases in the value of female time.

To study the determinants of adult obesity and related outcomes, we employ micro-level data from the 1984–1999 Behavioral Risk Factor Surveillance System (BRFSS). These repeated cross sections are augmented with state level measures pertaining to the per capita number of restaurants, the prices of a meal in fast-food and full-service restaurants, the price of food consumed at home, the price of cigarettes, clean indoor air laws, and the price of alcohol (a potential determinant of weight outcomes given the high caloric content of beer, wine, and distilled spirits). Our main results are that these variables have the expected effects on obesity and explain a substantial amount of its trend. These findings control for individual-level measures of age, race, household income, years of formal schooling completed, and marital status.

2. Background

The significance of research on obesity and sedentary lifestyle is highlighted by the adverse health outcomes and costs associated with these behaviors and by the level and growth of obesity rates. According to McGinnis and Foege (1993) and Allison et al. (1999), obesity and sedentary lifestyles result in over 300,000 premature deaths per year in the US. By comparison, the mortality associated with tobacco, alcohol and illicit drugs is about 400,000, 100,000, and 20,000 deaths per year, respectively. Wolf and Colditz (1998) estimate that in 1995 the costs of obesity were US$ 99.2 billion, which was 5.7% of the total costs of illness. Public financing of these costs is considerable since approximately half of all health care is paid by the Federal government and state and local governments.

Until recently, obesity in the US was a fairly rare occurrence. Obesity is measured by the body mass index (BMI), also termed Quetelet's index, and defined as weight in kilograms divided by height in meters squared (kg/m^2). According to the World Health Organization (1997) and National Heart, Lung, and Blood Institute, National Institutes of Health (1998), a BMI value of between 20 and 22 kg/m^2 is "ideal" for adults regardless of gender in the sense that mortality and morbidity risks are minimized in this range. Persons with BMI $\geq$30 kg/m^2 are classified as obese.