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Fast food prices, obesity, and the minimum wage

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ABSTRACT

Recent proposals argue that a fast food tax may be an effective policy lever for reducing population weight. Although there is growing evidence for a negative association between fast food prices and weight among adolescents, less is known about adults. That any measured relationship to date is causal is unclear because there has been no attempt to separate variation in prices on the demand side from that on the supply side. We argue that the minimum wage is an exogenous source of variation in fast food prices, conditional on income and employment. In two-stage least-squares analyses, we find little evidence that fast food price changes affect adult BMI or obesity prevalence. Results are robust to including controls for area and time fixed effects, area time trends, demographic characteristics, substitute prices, numbers of establishments and employment in related industries, and other potentially related factors.

1. Introduction

The rise in obesity rates at the end of the twentieth and the beginning of the twenty-first centuries remains one of the major public health issues in the developed world today. Although the trend is a continuation of earlier increases in population weight (Komlos and Brabec, 2011), new challenges have emerged. Obesity is a concern to both health care professionals and policy makers because of its long term health consequences, including diabetes, cardiovascular disease, and cancer (National Task Force on the Prevention and Treatment of Obesity, 2000). Finkelstein et al. (2009) found that medical costs associated with obesity may have been $147 billion in 2008, or almost 10% of all U.S. medical expenditures. As a result of both the pecuniary and health costs associated with obesity, a large body of research has attempted to isolate the many contributing determinants of obesity in the United States.

Recently fast food consumption has received considerable attention in terms of its contribution to the rising prevalence of obesity. Cutler et al. (2003) characterize changes in weight as determined by changes in the balance of calorie intake and output. They conclude that caloric intake has increased by enough since the 1970s to explain the rising trend while caloric output has remained essentially unchanged, so consumption rather than output may be an appropriate policy target. For example, research conducted by Chou et al. (2004), Chen et al. (2009), Dunn et al. (2012), and Lhila (2011) suggest that *access* to fast food restaurants may have a small to moderate influence on the prevalence of obesity.[1] However, other evidence exploiting exogenous variation in the supply of restaurants

[1] Notably, Chen et al. (2009) and Dunn et al. (2012) both account for endogeneity when estimating the impact of fast-food *access* on obesity. The former utilizes a spatial autoregressive framework, while the latter employs an instrumental variables approach.

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(through the placement of Interstate Highways) casts doubt on this suggestion by finding either effects limited to a few population subgroups (Dunn, 2010) or no effects at all (Anderson and Matsa, 2011). In a similar vein, we focus attention on fast food prices as a potential policy lever. Specifically, several policy makers and some in the media have proposed taxes and restrictions on the fast food industry as a means of curbing fast food consumption (e.g. Lazarus, 2011; Lim, 2011). These articles suggest that the implementation of taxation on high calorie fast foods will reduce obesity rates by creating incentives to avoid fast foods.

Although it is intuitive that increasing the price of calorie dense foods would lead to healthier eating and weight outcomes, many factors contributing to overeating and obesity must be accounted for in order to isolate price effects. For example, Fig. 1 depicts annual deflated, normalized national food price indexes and the estimated median obesity rate among the states and Washington, DC between 1998 and 2010 (the restaurant series were first made available in 1998). The relationship between the Limited Service Restaurants and Snacks price index (LSRPI), which includes fast food restaurant prices, and obesity prevalence is unclear. Taking a close look, it appears that larger percent increases in the LSRPI tend to be accompanied by smaller percentage point increases in obesity prevalence. However, a broader perspective reveals that both the Food at Home and the Full Service Restaurants and Snacks series end up at a relatively *lower* level than the LSRPI across the time period, suggesting that an increase in the price of fast food relative to other foods – as would presumably be the case if fast food were taxed effectively – is associated with rising obesity. Neither of these interpretations tells a complete story, so careful research efforts are warranted to more clearly identify the relationship. In addition, theoretical models of consumption and weight accumulation do not yield definitive conclusions on the response of weight to price changes. For example, Anderson and Matsa (2011) show that a rational agent who consumes more restaurant calories may reduce other calorie consumption, and the inverse would also hold. Schroeter et al. (2008) develop a model demonstrating that, under certain conditions, a tax on high calorie foods can lead to an *increase* in body weight.

While some research on the effects of fast food prices on weight report a negative association between obesity and fast food prices among adolescents (e.g. Chou et al., 2005; Powell, 2009), other studies find that estimated fast food price coefficients are not statistically significant for other age groups (e.g. Chou et al., 2004, 2005). In light of research that leverages exogenous variation in the accessibility of restaurants to study its effect on obesity, we find it surprising that fast food *price* effects have not been studied in a similar way. Therefore, our goal is to contribute to the literature examining fast food prices and obesity by (1) exploiting an exogenous change in fast food prices such as what might arise from the taxation of fast food and (2) adding to existing knowledge about the relationship between fast food prices and obesity among adults.

In this study, we use two-stage least-squares (2SLS) methods that leverage variation in federal and state minimum wage mandates to address the possibility that ordinary least squares (OLS) estimates of fast food price effects yield biased estimates. Since fast food prices are equilibrium outcomes, it is likely that the observed relationship between prices and obesity prevalence across time and place does not simply reflect the response of weight to fast food price changes. Factors that mediate the

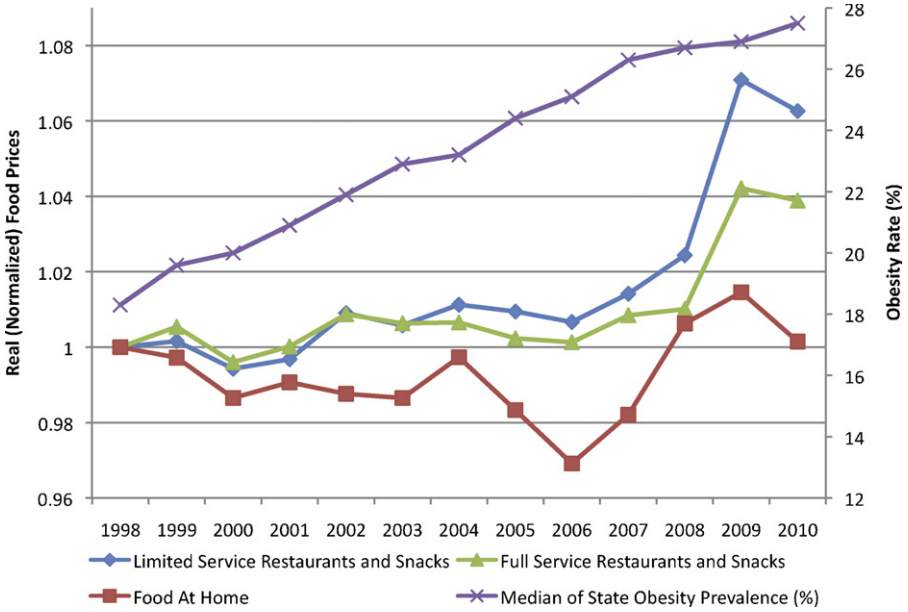

Fig. 1. Real (normalized) food prices and obesity prevalence in the United States, 1998–2010. *Notes*: The left axis measures three normalized food price indexes, deflated by the consumer price index. The price index series were obtained from the U.S. Department of Labor, Bureau of Labor Statistics. The right axis measures the median state-level prevalence of obesity estimated from the Behavioral Risk Factor Surveillance System, provided by the Office of Surveillance, Epidemiology, and Laboratory Services at the Centers for Disease Control and Prevention.