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How does the business cycle affect eating habits?

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ABSTRACT

As economic expansions raise employment and wages, associated shifts in income and time constraints would be expected to also impact individuals' health. This study utilizes information from the US Behavioral Risk Factor Surveillance System (1990–2009) to explore the relationship between the state unemployment rate and the consumption of various healthy and unhealthy foods in the United States. Estimates, based on fixed effects methodologies, indicate that unemployment is associated with reduced consumption of fruits and vegetables and increased consumption of "unhealthy" foods such as snacks and fast food. Heterogeneous responses are also identified through detailed sample stratifications and by isolating the effect for those predicted to be at highest risk of unemployment based on their socioeconomic characteristics. Among individuals predicted to be at highest risk of being unemployed, a one percentage point increase in the resident state's unemployment rate is associated with a 3–6% reduction in the consumption of fruits and vegetables. The impact is somewhat higher among younger, low-educated, and married adults. Supplementary analyses also explore specific mediating pathways, and point to reduced family income and adverse mental health as significant channels underlying the pro-cyclical nature of healthy food consumption.

Introduction

As economic expansions raise employment and yield financial benefits, associated shifts in income and time constraints would be expected to also impact individuals' health. While some studies suggest that health may decline during a recession (Charles & Decicca, 2008; Dee, 2001), the majority of U.S. studies point to health and healthy behaviors being countercyclical. Strengthened economies or income receipt are associated with increases in mortality, acute myocardial infarction, alcohol consumption, smoking, physical inactivity, and other outcomes related to health (Dustmann & Windeijer, 2000; Edwards, 2008a; Ettner, 1997; Evans & Moore, 2011; Gerdtham & Ruhm, 2006; Ruhm, 2000; Ruhm, 2005; Ruhm, 2007). The effects are mainly temporary, and there is some evidence that the adverse effects dissipate in the longer run. Xu and Kaestner (2010), for instance, estimate the structural effect of wages and hours worked on health behaviors among low-educated individuals in the United States, and find that an increase in working hours is associated with higher cigarette smoking, a reduction in physical activity, and fewer visits to the physician. They also find that increases in wages, due to expanded economic activity, are associated with higher levels of cigarette consumption.

Given these broad effects of economic activity on mortality and health, the challenge has been to understand the underlying mechanisms. At the micro level, individuals are adversely affected by unemployment and other negative economic shocks (Sullivan & von Wachter, 2009). However, as Miller, Page, Stevens, and Filipski (2009) note, it seems unlikely that all of the aggregate effects of the business cycle are mediated fully by the individual's own labor force status. Beyond the individual's own employment status, the link between the business cycle and health also reflects other potential pathways that operate individually and ecologically. Prior studies that have related aggregate macroeconomic conditions to health outcomes have generally estimated an average population effect, which can mask considerable heterogeneity and also does not inform the specific pathways that drive observed associations between macroeconomic factors and health. Some prior work has considered health behaviors such as smoking, drinking, physical activity, and preventive healthcare utilization. However, with the exception of Ruhm (2000), who analyzes fruit and vegetable servings in the United States, the literature has not considered how individuals' eating habits respond over the business cycle – a potentially salient factor that may shed light on the mechanisms underlying the connection between the macroeconomy and health.

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This study contributes to the literature by addressing these limitations. Specifically, we utilize micro level data representative of the U.S. population from the Behavioral Risk Factor Surveillance System, spanning 1990 through 2009, to explore the relationship between the economic cycle and food choices and the potential pathways underlying this link. The focus on healthy and unhealthy food consumption is policy-relevant given that caloric intake and nutrition are proximate inputs into obesity and overall population health. If the economic cycle impacts individuals' health-related outcomes, then the effect would also be more easily identifiable in a statistical sense on health behaviors; health outcomes and obesity, on the other hand, tend to be cumulative and may not respond readily or over the short-term. We proxy the business cycle and economic activity with area (state-specific) unemployment rates in the United States to capture the effects on food consumption choices.

Whether unemployment increases or decreases healthy food consumption (and vice versa for unhealthy food consumption) depends on how it affects the marginal benefits and marginal costs of such food consumption. A higher probability of being unemployed or reduction in hours worked raises total available time but reduces income. For instance, Edwards (2008b) notes shifts in leisure time and associated time costs during recessions, and Evans and Moore (2011) point to linkages between income and economic activity and subsequent effects on mortality. This shift in time and income constraints would reduce the direct marginal cost of food consumption that is relatively more intensive in time inputs and less intensive in market inputs. Noting that healthy food consumption is generally more intensive in both market as well as time inputs relative to unhealthy snacks and fast foods, the effect of the macroeconomy on healthy food consumption is ambiguous depending on the relative intensity of market versus time inputs. Greater availability of time tends to raise the demand for home-cooked meals and healthy foods, but lower income tends to raise the demand for cheaper fast food and unhealthy food consumption.

The marginal cost of food consumption is further impacted by any changes in the relative monetary costs of food over the economic cycle. Hastings and Washington (2010) indicate, for instance, that prices for foods purchased by low-income households tend to vary positively with demand. Data from the Bureau of Labor Statistics (BLS) on the overall food price index, adjusted for inflation, reveal that food prices are generally mildly procyclical. De-trended and standardized real fruit and vegetable prices (1959Q1-2011Q1) are also weakly procyclical, as expected, decreasing during economic downturns and increasing during expansions (correlation with unemployment rate = −0.13). Interestingly, the relative price of healthy versus "unhealthy" food consumption (proxied by the price index for fruits and vegetables relative to the price of purchased meals and price of limited service restaurants, which includes fast food establishments) is similarly procyclical (correlation with unemployment rate = −0.4). Procyclical relative prices of healthy food consumption may temper any potential procyclicality of healthy food consumption and countercyclicality of unhealthy food consumption.

The marginal benefits of unhealthy food consumption may also increase during economic downturns. It is well-documented in the literature that unemployment leads to higher levels of stress, depression, and psychological distress (Dooley, Catalano, & Wilson, 1994), and depressed individuals tend to consume more calories and greater amounts of junk food (Wurtman, 1993). Loss of health insurance, as a result of job loss, may also have opposing effects on eating habits due to ex ante moral hazard and reduced contact with physicians (Dave & Kaestner, 2009).

The upshot of this discussion is that while there may be good reason to believe that individuals respond to the economic cycle by varying their food consumption due to shifts in the marginal costs and benefits, the direction of the impact is a priori ambiguous depending on the relative intensity of time and market inputs in the production process and the importance of these other potential channels of effect. There may also be considerable heterogeneity across different segments of the affected population. In this study, we assess the extent to which the economic cycle impacts healthy and unhealthy food consumption, investigate heterogeneous responses, and undertake an analysis of the potential mediators driving the connection between the macroeconomy and eating habits.

Methodology

Consider the following reduced-form demand function linking measures of food consumption (HC) to the unemployment rate, a proxy for economic activity, multiple macroeconomic factors, and the overall business cycle[1]:

$$\mathrm{HC}_{\mathrm{ismt}} = B_0 + B_1\mathrm{UNEMP}_{\mathrm{smt}} + X_{\mathrm{ismt}}\Pi + \mu_{\mathrm{s}} + \lambda_{\mathrm{m}} + \nu_{\mathrm{t}} + \varepsilon_{\mathrm{ismt}}$$

Specifically, the above model denotes that food consumption for the ith individual, residing in geographic area s in month m and year t, is a function of the unemployment rate (UNEMP) and other observable exogenous characteristics such as age, gender, race, education, and marital status (X), with ε representing an individual-level disturbance term.

Rather than the individual's actual unemployment status, it is the area-specific unemployment rate that is the relevant and appropriate determinant in the demand for food consumption. First, actual unemployment only partially captures potential pathways through which the economic cycle may affect food choices. Even if an individual is not actually unemployed, the economic downturn affects the probability of becoming unemployed and would be expected to alter the marginal costs and benefits of caloric intake. For instance, psychological distress due to a higher probability of being laid-off or due to the unemployment of a spouse or family member may lead to a lower (higher) demand for healthy (unhealthy) food consumption. The decline in household wages or labor supply, even if the individual remains employed, would also be expected to shift the marginal cost of food consumption. Second, the use of area unemployment rates more proximally captures the effect of the economic cycle since within-area changes in the unemployment rate are strongly countercyclical. While the unemployment rate reflects the risk of unemployment, it is also reflective of other macroeconomic factors such as economic activity, income, and hours worked. Thus, the parameter of interest is B_1, which is the reduced-form net impact of the unemployment rate on the individual's food choices operating through all (and potentially competing) individual and ecological channels of effect.

While the area-specific unemployment rate is plausibly exogenous to the individual's food consumption, the possibility of other confounding area-specific factors remains. To account for this "statistical endogeneity," specifications control for area fixed effects (μ_s), which capture all unobservable time-invariant area-specific factors, and month and year fixed effects to capture unobserved seasonal factors and general trends. In addition, alternate specifications also control for state-specific linear trends to account for systematically-varying unobserved factors within a given state over time.

The estimation strategy proceeds in four parts. First, we estimate the impact of unemployment on healthy and unhealthy food

[1] Our methodology is based on the theoretical model outlined in detail in Dave and Kelly (2010). 18