



Breakfast, lunch, and dinner expenditures away from home in the United States

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ABSTRACT

This study investigates the differentiated effects of economic and socio-demographic variables on food away from home (FAFH) expenditures by type of meal among different types of households in the United States. Using data from the 2008 and 2009 Consumer Expenditure Surveys, the systems of expenditures on breakfast, lunch, and dinner are estimated with a multivariate sample selection procedure. Statistical significance of error correlations among equations justifies estimation of the sample selection systems. Income, work hours, race, education, geographic region, and household composition are important determinants of FAFH expenditures. Income contributes to FAFH expenditures of all meal types implying that the future of FAFH industry is tied to macroeconomic conditions. More education is associated with increased expenditures for FAFH lunch and dinner. Effects of the Supplemental Nutrition Assistance Program (SNAP) are negligible.

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Introduction

Americans now spend nearly half of their food dollars on food away from home (FAFH). Total spending on FAFH at eating and drinking places amounted to \$433.5 billion in 2010. As a share of total food expenditure, FAFH for all families and individuals rose from 32.0% in 1980 to 41.3% in 2010. In real dollars, however, expenditure reached a peak during 2007 (at \$410.5 billion in 2007 dollars) but has declined since (USDA-ERS, 2011).

The food consumption trends in many other countries are also converging to the pattern in the US, due to rapid income growth, urbanization and globalization. Pingali (2007) summarizes the transformation of Asian diets and food systems and indicates the rising popularity of eating outside the home in many Asian countries. Bai et al. (2012) suggest that rising income and demographic factors have contributed to the tremendous increase in FAFH consumption by households in China. Continuous upward trends in FAFH consumption are also found in many other countries, such as Malaysia (Tan, 2010), Spain (Angulo et al., 2007; Mutlu and Gracia, 2006), Greece (Minhalopoulos and Demoussis, 2001), and Turkey (Gäl et al., 2007).

The literature has identified a variety of economic and socio-demographic factors that are potential determinants of FAFH consumption including household income, household size and structure, and household manager's characteristics such as working

hours, age, education level, race, ethnicity, and region of residence (McCracken and Brandt, 1987; Byrne et al., 1998; Stewart et al., 2004). Food policies implemented by government agencies, such as the Supplemental Nutrition Assistance Program (SNAP), may also have an impact on FAFH.

During the 2007–2009 recession, which encompassed falling incomes, significant increase in unemployment, relatively high food prices, and high participation rates in the federal food and nutrition programs, Americans spent relatively less on eating out in their food expenditures (Kumcu and Kaufman, 2011). A recent study of demographic trends in the US showed that several of the demographic factors triggering FAFH changed remarkably in the 2000s (Cherlin, 2010). For instance, increasing proportions of single parents, Hispanic and Asian immigrants, and the elderly in the population marked significant changes in family and ethnic composition. Continuation of rapid demographic changes may result in a new upward trend in FAFH consumption in the next few years. This possibility escalates the concerns about the public health implications of dining out. Empirical literature has suggested that FAFH is less healthy than food at home (e.g., Mancino et al., 2009), and many policies have been implemented in order to raise the public awareness of the benefits of a healthy diet. Therefore, there remains great interest among economists, academicians, away-from-home foods sector participants, and policy makers in FAFH expenditures.

The effects of economic and demographic factors on FAFH may vary with different types of meals away from home, because certain foods are more likely to be consumed at particular times than others. Jensen and Yen (1996) posit that some food items

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are consumed at certain meals and times of the day but not traditionally at others and, therefore, differences might be expected. A good understanding of the factors that influence FAFH by type of meal is both timely and important, for explaining changes in eating patterns in the US, for creating successful marketing and promotional campaigns, for the design and implementation of policy intervention programs, and for making predictions about the future of the foodservice industry.

We explore the differential impacts of economic and demographic characteristics on household FAFH expenditures by type of meal, viz., breakfast, lunch and dinner, among different household types under current economic conditions.¹ The vehicle of our analysis is the sample selection system (Stewart and Yen, 2004; Yen, 2005) which allows an investigation of the expenditures jointly. We consider the logarithmic transformation in the dependent variables which, as a variance-stabilizing transformation, accommodates potential non-normality and heteroscedasticity in the error terms and facilitates estimation of the system (Yen and Rosinski, 2008).

Theoretical framework

Our empirical model is derived by extending the discrete random utility theory (Pudney, 1989). Each individual is assumed to maximize the random utility subject to a fixed budget m :

$$\max_{q,c} \{U(Dq, c; h) | p'q + c = m\} \quad (1)$$

where $q = [q_1, \dots, q_n]'$ is the quantity vector with positive prices $p = [p_1, \dots, p_n]'$, c is a composite commodity for other goods with price normalized at unity, h is a vector of demographic variables, and $D = \text{diag}(d_1, \dots, d_n)$ is a diagonal matrix with each binary variable d_i indicating if an individual is a potential consumer of q_i . Assume the utility function $U(Dq, c; h)$ is regular strictly quasi-concave and has positive first partial derivatives with respect to positive elements of Dq and c . Then, solving Eq. (1) yields the notional demand q^* for FAFH, which is optimal demand without a non-negativity constraint. This constrained utility maximization problem motivates specifications for the demand functions. When an individual can be a potential non-consumer of q_i , optimum q_i occurs in the interior of the choice set that corresponds to $d_i = 1$ and $q_i = 0$ when $d_i = 0$ since price p_i is assumed positive. In this case, censoring in q_i is governed by a sample selection mechanism. Express the notional demand with a latent consumption equation, and denote as x the vector of income and demographic variables (with corresponding parameter vector β) affecting quantity demanded. Since prices do not vary in the sample used so they are absorbed in the constant term and, further, we also consider the demand equations in expenditure forms. Let random errors v_i reflect the unobservable. Then, the first-order (linear) approximation to latent expenditures y_i^* are expressed by the latent equations

$$y_i^* = x' \beta_i + v_i, \quad i = 1, \dots, n. \quad (2)$$

Income is a key determinant affecting FAFH consumption positively for all groups, since households with higher incomes face looser budget constraints. Demographic variables include age, race, education, and working hours, household composition, home ownership,² season, geographical regions, and participation status in SNAP.

¹ Snacks are not included in breakfast, lunch, or dinner. Information on snack expenditures is collected separately. With the growing importance of snacks in American diet (Piernas and Popkin, 2010; Sebastian et al., 2011), snacks could have been included in the analysis as an additional type of meal. However, given the complexity of the econometric framework, we focus on a smaller system of the three major meal types.

² Individual characteristics are those of the reference person for a single-person household and of the husband for a husband-wife household. Working hours for husband and wife are both included for a husband-wife household.

Since time value plays an important role in food consumption decisions (Becker, 1965), work hours of both husband and wife (or of the only person in single-person households) are included. For parameter identification, we use work hours as a unique variable(s) in the selection equation. Byrne et al. (1998) argue that market labor hours are assumed to have a varying and positive effect on the decision to consume FAFH, due to the limited time available for household production. However, once a decision is made to consume, the number of hours worked plays little role in determining expenditure level.

A dummy variable for SNAP participation status is included to reflect the impact of the program on FAFH. Many state agencies provide nutrition education as a part of the SNAP to assist recipients in making healthy food and active lifestyles choices. Thus, SNAP participation might decrease consumption of FAFH as participants opt for healthier diets. Also, since SNAP benefits cannot be used for the purchase of FAFH and further, since children from SNAP-eligible households would qualify for free school meals, participation in the program may reduce consumption of FAFH for the recipients. On the other hand, food benefits may free up resources to spend on FAFH as well as other goods. The net effect of SNAP on FAFH is thus unclear.

Household composition variables are important determinants in demand analysis, the effects of which vary with different types of meals (Jensen and Yen, 1996). Urban residency can also play a role, because urban families have been found to consume more FAFH (e.g., McCracken and Brandt, 1987; Yen, 1993), due to the metropolitan life style and better access to dining facilities. Home-owners, on the one hand, may consume more food away from home because of greater financial stability. On the other hand, they may have less cash flow which diminishes FAFH expenditure (Soberon-Ferrer and Dardis, 1991; Yen, 1993). Tastes and eating habits may differ by race. Because food preferences and other unobserved characteristics may differ across geographical regions and seasons, dummy variables indicating regions and seasons will be included to account for these differences (e.g., Jensen and Yen, 1996; Stewart and Yen, 2004). Due to the absence of prices in a single cross section, these regional and seasonal dummy variables will also accommodate regional and seasonal price variations. Gender and age are expected to influence FAFH expenditures to different extents by meal. Finally, education is expected to affect FAFH expenditures, as it is correlated with labor market participation, income and likely different preferences for location of eating.

Data and sample

Data are drawn from the 2008 and 2009 Consumer Expenditure Surveys (CES) (US BLS, 2009, 2010), which provide consecutive 2-week information on FAFH expenditures. We focus on a system of three main meals – breakfast, lunch, and dinner, each of which includes expenditures by sources, viz., at fast food, full service, vending machine, employer, board, and catered affairs. Also included in the survey are economic and demographic characteristics of the households. After removing households with missing values for important information such as household type, the full sample consists of 11,674 observations.

In order to address the fact that household expenditure reflects spending by any member of the household and not just one member, the full sample is segmented into three sub-samples by household types: (i) 4592 households with a single person or a single parent with children; (ii) 3950 husband-wife households without children (at home); and (iii) 3132 husband-wife households with children. All other households such as single parents with all children older than 17 and families of unrelated adults are excluded. Among the first group, there are 728 households with a single parent, for which a dummy variable is included to capture the

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