Determinants of Malaysian Household Expenditures of Food-Away-From-Home

Helen Lee
Former Graduate Research Assistant
School of Social Sciences
Universiti Sains Malaysia
11800 Minden, Penang
Malaysia
Email: ngandy76@hotmail.com

Andrew Tan
Senior Lecturer
School of Social Sciences
Universiti Sains Malaysia
11800 Minden, Penang
Malaysia
Email: atan@usm.my

Contributed paper prepared for presentation at the International Association of Agricultural Economists Conference, Gold Coast, Australia, August 12-18, 2006

Determinants of Malaysian Household Expenditures of Food-Away-From-Home

Introduction

Malaysians have traditionally apportioned the largest amount of household expenditures on food products. This includes consumption of food-at-home (FAH) and food-away-from-home (FAFH). However, while spending on FAH has declined steadily from a share of 33.7% in 1973 to 22.2% in 1999, spending on FAFH rose from 4.6% in 1973 to 10.9% in 1999 (Department of Statistics Malaysia 2000). This reflects the changing lifestyle of Malaysian households, whereby, having a meal at home is becoming less often while eating out has become more frequent.

As Malaysians eat out more often, this has paved the way for the development of the FAFH industry. From 1999-2003, the Malaysian consumer foodservice market increased by 16% to a total of 20,235 consumer food service units. During the same period, consumer food service transactions and market worth grew by 22% and 39% respectively to 1,026 million and RM16,312 million (US$4,315 million) in current value terms. The home delivery or take-away food sector also grew by 60% in unit terms from 1999-2003 due to the increasingly busy work schedules of Malaysian households. Besides the fast-food sector, cafés and street stalls also registered high growth rates in unit terms over the period of 1999-2003 (Euromoniter International Report, 2004).

Despite its upward growth trend and economic significance, certain aspects of the Malaysian FAFH industry have been neglected over the years. While micro-level demand studies of FAFH in Western cultures have been extensively conducted using household consumption data (Stewart et al., 2004; Capps, Jr., and Park, 1997; Byrne et al., 1996; McCracken and Brandt, 1987; Redman, 1980), an extensive review of the literature

revealed that little or no research attention has been devoted to examining the FAFH consumption patterns of gastronomes in the local region. By simply concluding that demand is on the uptrend and will likely continue to do so in the near future would be impetuous, as little is known about the drivers of the consumer demand function related to changes in the socio-demographic characteristics of the Malaysian population.

As such, this study aims to gain a better understanding of how socio-demographic factors influence the amount of money spent on FAFH in Malaysia. Understanding how these factors affect household expenditure patterns on FAFH is important to food service strategy and consumer insight analysts who are interested in knowing the characteristics that define their industry. In addition, a better understanding of these factors enables the public authorities to be aware of the structure of the food distribution industry and nutritional intake of Malaysian households.

Theoretical Framework

Becker's (1965) theory of household production is often used to model household expenditure analysis. The theory extends to consider how households choose the best combination of commodities to maximize utility, while subject to time, resources, and technology constraints. Following Manrique and Jensen (1998), a household maximizes:

$$U = U(Z_1, Z_2, \ldots, Z_j, \ldots, Z_n) \quad (1)$$

where, U = household utility function; and, Z_j = quantities of home-produced commodity *j*. This function is subject to constraints such as total time available for the household

(opportunity cost of time), total expenditures on market-purchased good being equal to the sum of non-wage income and wage income of household members, and household characteristics (Manrique and Jensen, 1998).

From the solution of (1) using cross-sectional data, Manrique and Jensen (1998) noted that the following expenditure function can be derived:

$$E_i = f_i(T, M, d) \qquad i = 1, 2, \ldots, n \qquad (2)$$

where, E_i = total household expenditures for the i^{th} household; T = the hours of participation in the workforce by the i^{th} household; M = wage and non-wage income for the i^{th} household; and, d = a vector of socio-demographic variables (e.g. age, gender, race, household size) hypothesized to affect the household's expenditures on a particular good.

Empirical Model

In this study, the dependent variable (Y_i) measures the total monthly household expenditures by the i^{th} respondent on FAFH. Given the nature of disaggregated cross-sectional data, it is conceivable that households not recording any FAFH expenditures during the specified survey period but otherwise having complete records of socio-demographic characteristics are included in the sample. Total expenditures containing zero as well as positive amounts are consequently distributed over a limited range[1]. In such instances, the censored Tobit model (Tobin, 1958) is appropriate given that its

[1] However, altering or disposing of such zero observations results in the loss of valuable information on users and non-users (Heckman, 1979). The use of ordinary least squares regression, on the other hand, results in biased, inconsistent, and inefficient parameter estimates (Greene, 2003).

specifications allow for the presence of zero observations attributable to corner solutions. The standard censored or Tobit model for the research study is written as:

$$\begin{aligned} Y_i^* &= X_i'\beta + u_i, \qquad i = 1, 2, \ldots, n \\ Y_i &= Y_i^* \qquad \text{if } Y_i^* > 0, \\ Y_i &= 0 \qquad \text{if } Y_i^* \leq 0, \end{aligned} \tag{3}$$

where, Y_i = observed dependent variable (total monthly household FAFH expenditures); Y_i^* = latent variable (the optimal amount of expenditures of the respondent or the solution to a utility maximization problem); X_i' = k-dimensional vector of socio-demographic regressors as listed in Table 1; β = k-dimensional vector of unknown parameters; u_i = stochastic disturbance term assumed to be $N(0,\sigma^2)$.

The maximum likelihood method is used to estimate the β coefficients. Since this method assures the consistency of large sample and the asymptotic normality of the estimated coefficients, conventional tests of significance are applicable. The likelihood function for the Tobit model is given by:

$$L(\theta) = \prod_0 \left[1 - \Phi\left(\frac{X_i'\beta}{\sigma}\right)\right] \prod_1 \sigma^{-1}\phi\left[\frac{(Y_i - X_i'\beta)}{\sigma}\right], \tag{4}$$

where, $\prod_0$ = the product over values of i where $y_i^* \leq 0$; $\prod_1$ = the product over values of i where $y_i^* > 0$; $\theta = (\beta', \sigma^2)$; and Φ and ϕ = cumulative distribution function and probability density function, respectively, of the standard normal variable (Greene, 2003).

Model Regressors

The selection of variables likely to influence Malaysian household expenditures on FAFH relies on the previous studies by Stewart et al. (2004), Capps, Jr., and Park (1997), Byrne et al. (1996), Capps, Jr. et al. (1985), McCracken and Brandt (1987), and Redman (1980). The following socio-demographic characteristics are therefore hypothesized to influence the amount of money spent on FAFH in the current study: (1) age of household head or meal planner, (2) location, (3) ethnicity/race, (4) gender, (5) education level, (6) total monthly household income, and (7) household size (Table 1).

INSERT TABLE 1

Age of household head (in years) is selected as an explanatory variable in the current study as Capps, Jr., and Park, (1997) and McCracken and Brandt (1987) have shown that both younger and older people are assumed to have differences in tastes and preferences for food, eating habits, lifestyles, and opportunities to socialize. In addition, given the fast paced routines and tight schedules rising from rapid structural transformation and urbanization process that Malaysia is currently undergoing, households may find it hard to break the eating out cycle as consumers demand fast and easy meal solutions to fit their busy lifestyles. Hence, the convenience of FAFH serves as an attractive option to most urban households that face production time constraints. (Mihalopoulos and Demoussis, 2001; Nayga, Jr. and Capps, Jr., 1993).

McCracken and Brandt (1990) suggest that a dummy variable based on ethnicity be included in household food expenditure studies to allow for the possibility of cultural

and ethnic differences to influence purchase decisions. Therefore, ethnicity is grouped under Malay (Race1), Chinese (Race2), and Indian/others (Race3) (base group) in the present study given the unique Malaysian scenario of three distinct races amongst its multi-ethnic population (i.e. Malay, Chinese, Indian and a small proportion consisting those of various other races). At the same time, gender of household head is selected as one of the dummy explanatory variables in the current study as participation rates of women in the Malaysian workforce have been steadily increasing from 44.8% in 2000 to 46.7% in 2004 (Ministry of Finance Malaysia, 2004). This emerging trend may lead to an increase in demand for FAFH amongst women and households who have less time to cook at home (Binkley, 2005; Byrne, et al. 1996; Nayga, Jr. and Capps, Jr. 1993).

Formal education of the household head (in number of years) is another explanatory variable selected in this study due to its effect on lifestyles and health-related behaviours. Individuals with different levels of education may have different knowledge and perception about diet and health, and consequently may perceive FAFH in different manners. This variable also acts as a proxy for the opportunity cost of time since the data does not have information on the number of hours worked. In essence, higher educated respondents have higher opportunity cost of time and may prefer to eat out more often.

Similarly, total gross monthly household income (in RM) is used as an explanatory variable in the current study. While wealthier households are assumed to spend more on products and services (including leisure and other dining amenities such as full service and ambience), consuming FAFH may be considered as a form of leisure as well (Binkley, 2005; Stewart et al., 2004; Mihalopoulos and Demoussis, 2001). Finally, household size may influence FAFH expenditures as larger households have a

higher household burden and would be less able to afford the higher cost of eating-out. In general, food prepared at home may be more economical for larger households. Furthermore, larger size families with pre-school children may spend less on FAFH due to the inherent characteristics of small children themselves, such as possible behavior problems in restaurants and smaller stomach capacities (Redman, 1980).

Data

The data in this study is from the Malaysian Household Expenditure Survey 1998/1999 (MHES), conducted from July 1998 and continued through June 1999 by the Department of Statistics Malaysia. This secondary data set is the most recent available of the national household food expenditure survey. The sample was designed using a stratified multi-stage, area probability sampling method, thus ensuring that socio-demographic and geographical considerations are taken into account to reflect the Malaysian population. Household heads in the survey were asked to record their monthly expenditures on FAFH, in addition to information on their socio-demographic characteristics[2]. From the total number of 9198 households, only 9184 were retained for this study after discarding those with suspect or incomplete information.

Characteristics of Survey Respondents

The descriptive statistics of variables in the statistical models are presented in Tables 2. For the total sample, the average age of the household head is 44.8 years, with the youngest being 16 years old and the oldest 98 years old. About 57% of the total

[2] Respondents not recording purchases during the specified period but having otherwise complete records of socioeconomic and demographic characteristics are included in the sample. Monthly expenditures containing zero as well as positive (RM) amounts are thus consequently distributed over a limited range.

sample resides in urban areas while 43% reside in rural areas. In terms of ethnicity, 50% of the entire sample household heads are Malay; 29% Chinese; and 21% Indian/other races. The whole sample consists of about 83% male and 17% female household heads, with an average household size of approximately 4 persons, consisting of a single person to 23 persons in a household (Table 2). From the sub-sample, whereby respondents are categorized under FAFH purchasers or non-purchasers, 6608 (72%) respondents reported that they purchased FAFH, while 2576 (28%) respondents reported that they did not purchase any FAFH at all during the survey period (Table 2)[3].

INSERT TABLE 2

Estimation Results

Summary statistics of the Tobit model are reported in Table 3, with the estimated coefficients (β) and the probability for z-statistic presented in the first and the second columns, respectively. Based on McDonald and Moffitt (1980), the marginal effect of each of the explanatory variables on the expected value of the dependent variable (amount of expenses evaluated at the means) for all observations (third column) and for observations above the limit (fourth column) are also presented. The fifth column depicts the marginal effect on changes in the probability for those who did not spend on FAFH, but might, thus referring to those observations at the limit[4].

[3] In this study, respondents reporting FAFH expenditures of RM30.00 (US$8) and below were also classified as non-purchasers. This amount was derived based on a nominal amount of spending of RM1.00 (US$0.26) per day for subsistence spending away from home.

[4] A more comprehensive discussion of the results of the Tobit analysis can be obtained from the authors upon request.

Out of the total of nine explanatory variables, only *location, Race2 (Chinese)* and *household income* are statistically significant in explaining household expenditures on FAFH. In contrast, the variables that are statistically insignificant are *age, Race1 (Malay), Race3 (Indian), gender, education level,* and *household size*. The Log Likelihood Ratio (LR) and Wald statistics are 1924.852 and 246.518, with probability values of almost zero. Hence, the model is concluded as having a good fit.

INSERT TABLE 3

Conclusions and Policy Implications

Results of this study may have important implications for the food industry in Malaysia as it indicates that *household income, race,* or *location of residence* of households significantly affect total monthly expenditures on FAFH, *ceteris paribus*. Specifically, as household income increases, total monthly expenditures on FAFH are expected to increase. At the same time, Chinese households or urban residents have significantly higher FAFH expenditures than their non-Chinese or rural counterparts.

Several notable implications can be culled from these results. First, similar to the trend in other countries, it is expected that the shift in Malaysian food expenditure patterns toward FAFH will continue to transpire with increased income and urbanization arising from economic growth. As such, this provides great business opportunities for the development of the away-from-home foodservice industry in Malaysia. Second, when considering the viability of future business locations, the foodservice industry may target markets consisting of ethnic Chinese households, urban locales, or those with high disposable incomes. These socio-demographic characteristics are found to define those

who are willing and able to spend on FAFH to satisfy their lifestyle and nutritional needs. Third, since FAFH is typically high in fat, sodium, and calories content, public health policies aimed at ensuring optimal nutrient intake should target Chinese households and those in the urban settings to be more selective of their dietary intake. Fourth, more food review columns in popular Malay and Indian language-based news-media, or even regional radio advertisement programmes should also be considered in order to promote FAFH outlets amongst these ethnic groups. At present, such promotional strategies are still lacking. Lastly, advertising and promotional efforts focusing on age groups, gender, or even education may have limited effects on FAFH expenditure patterns.

Finally, while this study acts as a catalyst to further research on Malaysian household expenditure patterns of FAFH, several limitations exists due to the secondary nature of the data. First, since only information on the value of total monthly household expenditures is available, the dependent variable is assumed to implicitly capture the interaction between prices and quantities (demand) in the FAFH market. Second, while additional information such as marital status, number of working adults, age and number of children, purchasing outlet (fastfood, hawker, restaurants), working hours, and reasons for consumption or non-consumption may provide a more comprehensive indication of socio-demographic effects, these information were not readily available.

References

Becker, G. S. 1965. "A Theory of Allocation of Time". *Economics Journal*, 75: 493-508.

Binkley, J.K., 2005. The Effect of Demographic, Economic, and Nutrition Factors on the Frequency of Food Away from Home. Selected paper presented at the *American Agricultural Economics Association Annual Meetings*, Providence, Rhode Island, July 24-27, 2005.

Byrne, P.J., O. Capps, Jr. and A. Saha. 1996. Analysis of Food-Away-From-Home Expenditure Patterns for U.S. Households, 1982-89. *American Journal of Agricultural Economics*, 78, pp. 614-627.

Capps, Jr., O. and L.J. Park. 1997. Demand for Prepared Meals by U.S. Households. *American Journal of Agricultural Economics*, 79, pp. 814-824.

Capps, Jr., O., J.R. Tedford and J. Havlicek, Jr. 1985. Household Demand for Convenience and Nonconvenience Foods. *American Journal of Agricultural Economics*, 67, pp. 862-869.

Department of Statistics Malaysia. 2000. Report on Household Expenditure Survey, Malaysia (1998/99). Department of Statistics Malaysia, Putrajaya, Malaysia.

Euromonitor International Report. 2004. *Executive Summary, April*. [Internet] Available from: <http://www.euromonitor.com/Consumer_Foodservice_in Malaysia> [Accessed 14 May 2005].

Greene, W.H. 2003. *Econometric Analysis*. 5th Edition. United States of America: Prentice Hall, New Jersey.

Heckman, J.J. 1979. Sample Selection Bias as a Specification Error. *Econometrica*, 47, pp. 153-161.

Manrique, J. and H.H. Jensen. 2001. Spanish Household Demand for Seafood Products. *Journal of Agricultural Economics*. 52:23-37.

Ministry of Finance Malaysia. 2004. *Economic Report 2004/2005*. Kuala Lumpur, Malaysia.

McCracken, V.A. and J.A. Brandt. 1987. Household Consumption of Food Away From Home: Total expenditure and by type of food facility. *American Journal of Agricultural Economics*, 69, pp. 274-284.

McDonald, J.F. and R.A. Moffitt. 1980. The Uses of Tobit Analysis. *Review of Economics and Statistics,* 60, pp. 318-321.

Mihalopoulos, V.G. and M.P. Demoussis. 2001. Greek Household Consumption of Food Away from Home: A Microeconometric Approach. *European Review of Agricultural Economics*, 28, pp. 421-432.

Nayga, Jr., R.M. and O. Capps, Jr. 1993. Analysis of Socio-Economic and Demographic Factors Affecting Food Away from Home Consumption. *Journal of Food Distribution Research*, 24, pp. 69-86.

Redman, B.J. 1980. The Impact of Women's Time Allocation on Expenditure for Meals Away From Home and Prepared Foods. *American Journal of Agricultural Economics*, 62, pp. 234-237.

Stewart, H., N. Blisard, S. Bhuyan, and R. Nayga, Jr. 2004. *The Demand for Food Away From Home: Full-Service or Fast Food?* [Internet] Available from: <http://www.ers.usda.gov/publications/AER829/> [Accessed 15 November 2004]

Tobin, J. 1958. Estimation of Relationships for Limited Dependent Variables. *Econometrica*, 26, pp. 24-36.

Table 1
Description of Explanatory Variables in the Statistical Model

Variable	Description
Age	Age of household head (in years)
Race1	1 if Malay household head; 0 if non-Malay
Race2	1 if Chinese household head; 0 if non-Chinese
Race3	1 if Indian/other household head; 0 if non-Indian/other
Education	Formal education of the household head (in years)
Gender	1 if male household head; 0 if female
Household Size	Total number of family members in the household
Household Income	Total gross monthly household income (in Ringgit)
Location	1 if household resides in urban area; 0 if rural

Table 2
Descriptive Statistics of Variables in the Statistical Models

Variables	Those who purchased FAFH (n_1 = 6608)			Those who DID NOT purchase FAFH (n_2 = 2576)			Total Sample (N = 9184)			Population Average
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	
Tot. Expenditures (RM)	*197.63*	*30*	*5311.9*	-	-	-	*142.20*	*0*	*5311.9*	*1621.00*
Age (years)	43.66	16	91	47.70	16	98	44.80	16	98	26.3
Race1 (dummy)	0.49	0	1	0.52	0	1	0.50	0	1	54%
Race2 (dummy)	0.35	0	1	0.12	0	1	0.29	0	1	26%
Race3 (dummy)*	0.16	0	1	0.36	0	1	0.21	0	1	20%
Education (years)	8.74	0	17	5.75	0	17	7.90	0	17	-n/a-
Gender (dummy)	0.85	0	1	0.79	0	1	0.83	0	1	50.4%
Household Size (no. occup)	4.43	1	23	4.26	1	17	4.40	1	23	4.6
Household Income (RM)	2776.14	1	56638	1197.56	64	55000	2333.36	1	56638	2472.00
Location (dummy)	0.65	0	1	0.36	0	1	0.57	0	1	62%

* Refers to the omitted category in the analysis

Table 4
Summary Statistics for Tobit Analysis of Household Expenditures on FAFH

	1	2	3	4	5
Explanatory Variables	**Coefficients (b)**	**Z-statist.**	$\frac{\partial E(Y)}{\partial X_i}$	$\frac{\partial E(Y \mid Y > 0)}{\partial X_i}$	$\frac{\partial P(Y > 0)}{\partial X_i}$
Constant	-1.4387	-0.0384	-0.9161	-0.6398	-0.0014
Age	-0.5833	-1.0689	-0.3714	-0.2594	-0.0006
Race1	13.8761	0.8096	8.8363	6.1706	0.0134
Race2	122.9893	6.6376*	78.3196	54.6930	0.1186
Education	2.0601	1.1748	1.3119	0.9161	0.0020
Gender	19.8454	1.0392	12.6376	8.8252	0.0191
Household Size	-3.2764	-1.1026	-2.0864	-1.4570	-0.0032
Household Income	0.0357	36.3021*	0.0227	0.0159	0.00003
Location	36.9724	2.4913*	23.5440	16.4415	0.0356

Note: The unconditional expected value of y (at mean x) = 233.593; the conditional expected value of y (at mean x) = 366.82317; the standard error around the Tobit model index = 389.2126; the predicted probability that y>0 (at the mean x) = 0.6368; z = 0.35; f(z) = 0.3752.
* at 5% level of significance
Source: Columns 3-5 computed by authors