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The Pattern of Consumption for Food Away From Home (FAFH) of Filipino Households during the Modern Era

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Abstract: Food has traditionally been the top priority item in any household's consumption basket. Whether consumed at home or outside the home, households usually apportion about half of their total budget on food. In the modern times however, because of the shifting consumer preferences and dramatic growth in income, especially in the cities, there has been a remarkable change in household's food consumption patterns. In the Philippines, the proliferation of vast arrays of food service facilities such as conventional full-service and fast food restaurants, coffee shops, food courts, roadside stalls, canteens, delicatessens, etc., together with improved purchasing power, growing time constraints among household members and incessant bombardment of promotional ads across various media collectively create a strong impetus among Filipinos to "eat out". The results of the study point to a steady convergence, over time, of the proportion of food eaten at home (FAH) and the proportion of food eaten away from home (FAFH), with more and more Filipinos increasing their consumption of FAFH, to a point during the modern era, when this major food consumption category becoming a necessity rather than what it was before - a luxury.

Keywords: Food-away-from-home; Sampling design consistent estimation; Tobit analysis; Heckman procedure; Engel curves

1. INTRODUCTION

Despite the economic and commercial importance of food consumption away from home, very limited attempt has been made to investigate the evolution and economics of this type of food consumption among Filipinos over time. This study hopes to set the pace among local researchers in taking advantage of the availability of high quality primary data of nationwide household surveys to generate useful insights on the "eating out" behavior of modern Filipinos. The study will endeavour to establish the linkage between food demand behavior, socioeconomic and demographic characteristics of households, highlighting on the difference between wealthy/not wealthy consumers. To supply the dynamic content of the analysis, public use raw data files of several rounds of the Family Income and Expenditure Survey (FIES) will be used. Relevant state-of-the-art microeconometric

models which address sample selectivity issues and the complex nature of the survey are implemented. Results of the study confirm the significant co-variation of FAFH consumption of Filipino households with its postulated determinants and the establishment of FAFH as a necessity during the modern era.

The issue of the increasing importance of FAFH has not been a priority area among local researchers and policy makers as there is an obvious dearth of research studies, executive and legislative concerns related to it. This apparent oversight induced the researcher to propose a study that will empirically and analytically examine available nationwide household survey data (Family Income and Expenditure Survey (FIES)) undertaken during the period 2003 - 2012, in search for the answer to the following research question:

"*To what extent has the emergence of the modern Filipino society brought about significant changes in the household consumption patterns on food particularly in their behavior in spending on food away from home*?"

1.1 Brief Survey of Literature

Empirical research on consumption of food away from home (FAFH) is widely developed in the international economic literature. Various angles of the phenomenon (e.g., behavioral patterns, fitness and nutrition, visit frequency, role of time constraint, food security, commercialization, type of meals & facilities, etc.) have been scrutinized in different country settings with far ranging policy implications. These studies are mostly concerned with the determination of the various social, demographic, and economic factors that promote dining out that boost away-from-home food spending (in the United States: e.g. Byrne, et al (1998), Binkley (2008), McCraken & Brandt (1987), Guthrie, et al. (2002); in Malaysia: e.g. Tey, et. al (2009), Radam, et al. (2006); in China: e.g. Ma, et al. (2005), Min, et al. (2004), and Fang & Beghin (2002); in Spain: e.g. Molina (1994) and Manrique & Jensen (1998).

Almost all of the published works on FAFH employ large scale household survey data, however, the researcher did not find any study in the literature searched that employed survey-design consistent estimation techniques, as well as the existence of any study which feature the Philippines.

Much of the early literature on FAFH has been descriptive in nature e.g. LeBovit (1967), Manchester (1977); Van Dress (1980). Succeeding researchers recognized the importance of rigorous economic foundation to the analysis of eating out behavior of households. Most of these authors cite the work of Becker (1965) and Prochaska & Schrimper (1973) in justifying their inclusion of the different factors that shape households demand for FAFH.

Using causal research designs, studies on the FAFH almost exclusively employed OLS estimation prior to the study of McCracken & Brandt (1987) who saw the importance of the heavy censoring needed for observations with zero consumption incidence on FAFH (which are rather numerous in varied settings). Insisting on the use of least squares methods will render results to be both biased and inconsistent as shown in other applications and the theoretical literature. Succeeding researchers on FAFH took heed, by using either the Tobit or the Heckman models to address selectivity bias, or other techniques like count and duration models when frequency of FAFH incidence during the reference period is being modeled (e.g. Dong, et. al., 2000). However, estimation biases may still linger when the complexity of the sampling design of the underlying survey is ignored (Deaton, 1997; Heeringa, S., et al., 2010; Haughton and Haughton, 2011) in studies that employ large scale survey data.

Evidence on the applicability of the Engel's Law on FAFH consumption has also been investigated in the literature, particularly in the United States (see. Byrne et al., 1996; Yen, 1993; McCracken and Brandt, 1987; Holcomb et al., 1995) by showing that FAFH is a necessity, through the estimated magnitudes of the expenditure elasticities using various functional specifications of Engel curves. Most of the studies on Engel curves of FAFH use the Working-Leser form, estimated through Heckman two stage procedure (selection stage and consumption stage) to address selectivity issues in consuming FAFH (see Heien and Wessells, 1990; Tey, et. al, 2009).

2. METHODOLOGY

2.1 Survey Design Consistent Inference

It has been one of the goals of this study to compute parameter estimates of the models together with the necessary descriptive measures and standard errors with full consideration of the complex design of the survey. This is made clear at the onset since the proponent would like to distinguish this study from most statistical investigations that employ survey data. More often than not, statistical inferences in most of these researches are done with the assumption that the data collection is undertaken using simple random sampling (SRS) without replacement (Heeringa, S., et al., 2010 pp. 18), with the elements of the target population having equal chance of being included in the sample. Although computationally convenient and conforming with the i.i.d. requirement of most econometric soft wares, this procedure is theoretically flawed when complex design was used in the survey (Deaton 1997).

The main data source of the study, the Family Income and Expenditure Survey (FIES) in particular, employs a multi-staged stratified sampling design aimed at economizing on the sample size without sacrificing the precision of the sample representation. As a

consequence, each population element has different probabilities of inclusion in the sample. As such, there is a need to take into consideration the use of sampling weights (sometimes called raising factors) which represent the inverse of the selection probabilities for each sample element (Cochran 1977). These sampling weights are needed to correct for differential representation and the effect of the sampling design on the estimates and their respective standard errors (Deaton 1997; Haughton & Haughton, 2011). This will ensure the unbiasedness and consistency of the estimates, resulting in better inference.

2.2 Theoretical Framework

According to the household production theory proposed by Becker (1965), purchases of certain items being consumed by households like food are influenced by traditional factors like prices, income, demographic characteristics of the household, as well as non-traditional influences like time constraints faced by household managers. This extension of the traditional demand theory can be adopted in the analysis of FAFH by representing the associated demand function (either amount consumed or budget share) of FAFH as a function of the usual demand determinants plus other factors in the context of Becker (1965).

2.3 Empirical Models

In this study two alternative empirical microeconometric models are implemented. The first model presumes the household as a utility maximizing entity subject to both budget and time limitation, and makes a one-stage decision in consuming FAFH with the TOBIT maximum likelihood procedure as the basis of parameter estimation. The second is anchored on the theoretical framework that the budget formation process for FAFH is a two stage process which employs the Heckman procedure to estimate the parameters of the associated Engel curve. The first stage uses the Probit model to determine the probability of the household to consume FAFH while the second stage models the budget formation process for FAFH through the Working-Leser specification of the FAFH Engel curve.

2.3.1 The Tobit Model

Prior to McCraken and Brandt (1987), studies involving empirical analyses of FAFH almost exclusively used single equation Ordinary Least Squares (OLS) regression, which has been proven to be both biased and inconsistent because of the large number of households not consuming FAFH. The use of the Tobit Model (also known as censored regression model) in FAFH analysis was pioneered by McCracken and Brandt (1987) to preclude this concern on OLS. The empirical form of the model is the usual regression specification (whose population regression function is supposedly a solution to the first order condition of the household's utility maximization problem subject to budget and time constraints, anchored on The theory of household production, outlined by Becker (1965).

$$FAFH_h = \kappa_1 + \kappa_2 ' D_h + \kappa_3 ' L_h + \kappa_4 ' E_h + u_h \quad (1)$$

where the household h^{th} FAFH consumption is left censored at zero for households who do not "eat out" as determined by D (socio-demographic characteristics vector), L (household location vector) and E (economic attributes vector). To account for this censoring, the Tobin (1958) Maximum Likelihood procedure (whose likelihood function is based on the censored normal distribution) is used in parameter estimation.

2.3.2 The Heckman Model

In this model, it is presumed that consumption of FAFH is characterized by a two-stage decision process. The first stage is deciding whether or not to consume FAFH – the participation stage. The next decision stage is in determining the budget share for the consumption of FAFH – the expenditure stage. The Heckman model is employed in this study to implement the estimation of the FAFH Engel curve

Stage 1. Let $Y_h = 1$ if household *h* decides to consume FAFH, 0 otherwise. The conditional probability $P(Y_h = 1 | \mathrm{D}_h, \mathrm{L}_h, \mathrm{E}_h) = \Phi(\alpha + \lambda' \mathrm{D}_h + \gamma' \mathrm{L}_h + \delta' \mathrm{E}_h)$ is the participation probability of the household *h* given its demographic, locational and economic attributes. The probit model is used to estimate the intercept α and the parameter vectors λ, γ and δ via MLE with $\phi(.)$ and $\Phi(.)$ are the *pdf* (probability density function) and *CDF* (cumulative distribution function) respectively of the standard normal curve. The inverse Mills ratio $MR_h = \phi(\hat{z}_h)\ \Phi_h^{-1}(\hat{z}_h)$ (with $\hat{z}_h = \alpha + \lambda' D_h + \gamma' L_h + \delta' E_h$ the estimated Probit index function value) is generated for each household to correct for the sample selectivity bias in the expenditure stage.

Stage 2. Estimate the model:

$FAFHShare_h = \kappa_1 + \kappa_2 ' D_h + \kappa_3 ' L_h + \kappa_4 ' E_h + \beta MR_h + u_h$ using GLS for all uncensored observations to come up with the estimated FAFH Engel curve equation using the Working-Leser functional specification.

2.3.3 The Working-Leser Engel Curve Model

The traditional approach in estimating Engel curves using cross section data is based on full system parametric models which simultaneously consider the income expansion paths of all items in a consumption basket. The most common specifications are the Almost Ideal Demand System (AIDS) and the Linear Expenditure System (LES) - favored by researchers because of their representative agent and exact aggregation properties, the main drawback however has been the recurrent problem of model misspecification. Working (1943) proposed the log-linear budget share specification, which eventually became known as the Working-Leser model, since Leser (1963) found that this functional form fits better than most full system and single equation alternatives.

The basic Working-Leser Engel curve presents the budget share of j^{th} consumption item as a function of log of household's income:

$$S_{ij} = \alpha_j + \zeta \log(Y_i) + u_{ij} \quad (2)$$

where S_{ij} is the budget share of the j^{th} item for the i^{th} household, and Y_i is the income of the i^{th} household.

The relationship being represented by an Engel curve is that of consumption and
income. However, households' consumption patterns also respond to socio-demographic and locational characteristics of the households, hence specification (2) can be augmented as:

$$S_{ij} = \alpha_j + \zeta \log(Y_i) + \gamma_j^{'} X_{ij} + u_{ij} \quad (3)$$

with X_{ij} is the vector of socio-demographic and locational characteristics of the i^{th} household influencing the budget share of the j^{th} consumption item, with corresponding parameter column vector γ_j. The Working-Leser curve (3) is the specification implemented in the Stage 2 of the Heckman procedure.

The income elasticity of FAFH consumption is the economic coefficient of interest in this study. Using the specification (3), this elasticity can be shown to be represented by the formula:

$$\varepsilon_{S_{ij}Y} = \frac{\partial S_{ij}}{\partial Y_i}\frac{Y_i}{S_{ij}} = 1 + \frac{\overline{S_j}}{\zeta} \quad (4)$$

The algebraic sign, as well as the magnitude of the income and expenditure elasticity estimates will be the basis of ascertaining whether FAFH consumption by modern Filipinos may show evidence of subscribing to the Engel's law.

2.4 Data

The main database of the study is the public use file of FIES 2012 which is the latest available nationwide household survey from National Statistics Office (NSO) as these primary survey round deems to represent the modern period. Other public use files of earlier rounds of FIES (FIES 2009, 2006, 2003) will also be procured and used to account for the dynamic nature of FAH and FAFH consumption. Sampling design consistent stylized facts on the different eras will be generated to give policy makers unbiased and consistent descriptive scenarios on how the pattern of food consumption away from home among Filipinos evolves.

3. RESULTS AND DISCUSSION

3.1 Descriptive Analysis

Based on the 2012 FIES survey round, 89.61% of Filipino households registered positive consumption of food away from home (FAFH), a big jump from the figure of 75.43% during the previous round 2009. This pattern of consumption has been monotonically increasing (67.03% in 2003 and 71.66% in 2006), which unmistakably represent a behavioral change in the manner modern Filipino families are consuming food. Using survey design consistent estimation, the evolution of this behavioral pattern is summarized graphically in Figure 1 below; showing the budget shares of the total expenditures devoted to food consumption, food

consumption at home (FAH) and food consumption away from home (FAFH).

The figure shows the relatively slow convergence of the shares FAH and FAFH of the household budget during the earlier FIES survey rounds, with FAH going down and FAFH going up: 40.96% in 2009, 40.67% in 2006 and 42.88% in 2003 for FAH and 4.93%, 4.57% and 4.24% respectively for 2009, 2006 and 2003. In 2012 however, the percent gap of these food consumption categories reached its narrowest at 37.95%. This narrowing difference in the propensities of families to consume FAH and FAFH is replicated in most regions of the country, particularly those with highly urbanized locales, namely Region 13 (Metro Manila), Region 41 (Calabarzon), and Region 3 (Central Luzon).

To analyze the dynamic shift in food consumption behavior of Filipinos over the 9 years span covering the survey rounds, annual growth rates for the per capita total household expenditure, total food expenditure, FAH and FAFH, as well as the per household average expenditures on food, FAH and FAFH are computed. These rates are presented in Table 1 where FAFH per capita registered the highest continuously compounded* annual growth at 9.19% over the period 2003-2012, followed by FAFH per household at 8.59% per year. FAH per household is growing at the slowest pace at 4.20% per year, followed by FAH per capita at 4.41% per annum. The extraordinary growth in FAFH consumption and the slower rate of increase in FAH consumption by Filipino households suggest convergence in the consumption incidence of these food categories, implying a remarkable shift in the eating behavior of Filipino households

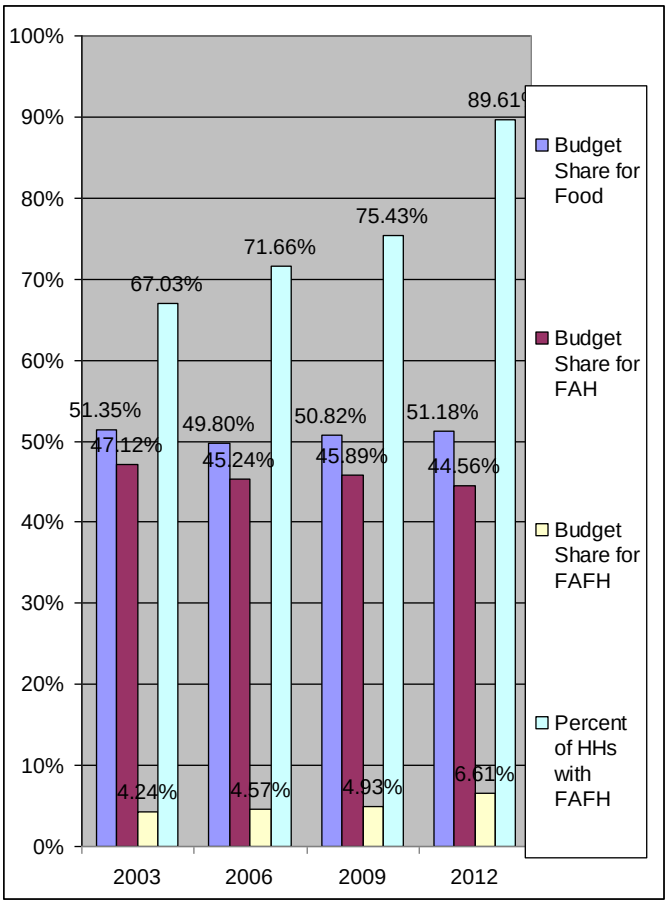

Figure 1. Evolution of Budget Shares of FOOD, FAH, FAFH and Proportion of HH with FAFH Philippines: 2003, 2006, 2009 and 2012

Table 1. Continuously Compounded Annual Growth Rates for per capita and per Household - Total Expenditure, Food Expenditure, Food Taken at Home (FAH) and Food Away From Home (FAFH)

Period	Total Expen. per capita	Total Food per capita	FAH per capita	FAFH per capita	Food Per HH	FAH Per HH	FAFH per HH
2003	29,610	12,305	10,749	1,556	53,290	46,598	6,691
2012	47,752	19,550	15,992	3,558	82,500	68,001	14,499
Annual Growth	5.31%	5.14%	4.41%	9.19%	4.86%	4.20%	8.59%

* Annual growth is determined by the formula

$$g = (1/9)[\ln(figure_{2012}) - \ln(figure_{2003})]$$

3.2 Results of Tobit Modeling

Survey design consistent estimates of the Tobit models for FAFH consumption using the raw data files of the four rounds of FIES yielded four censored regression equations. Looking at Table 2, which presents the estimated Tobit model of FAFH consumption using the most recently available FIES raw data, the estimated demand equation for food away from home (FAFH) for the modern Filipino households takes shape. The same sets of regressors are applied in each model to assess the dynamic impact of the variables on households' consumption of FAFH.

Table 2. Design Consistent Tobit Censored Regression of FAFH Consumption, 2012

FAFH	Coefficient	Linearized Standard Error	t-value	p-value
Family Size	1,265.2300	153.7054	8.2300	0.0000
Sex (Male=1)	32.3844	417.1206	0.0800	0.9380
Age of HHH	-42.5935	45.6556	-0.9300	0.3510
Age Squared	-0.4479	0.4486	-1.0000	0.3180
Single HHH	1,094.5960	570.0172	1.9200	0.0550
Married HHH	-1,910.1060	479.5258	-3.9800	0.0000
College Grad HHH	2,228.2270	363.2000	6.1300	0.0000
Employed Members	992.1206	146.1351	6.7900	0.0000
Wife Employed	866.0623	299.2714	2.8900	0.0040
Middle Income HH	4,472.1590	652.3210	6.8600	0.0000
One Member HH	1,366.7040	502.9226	2.7200	0.0070
Number of Children	384.0957	121.2075	3.1700	0.0020
Ilocos Region	4,047.2410	689.3270	5.8700	0.0000
Cagayan Valley	2,561.7050	764.7166	3.3500	0.0010
Central Luzon	9,087.1060	756.2521	12.0200	0.0000
Bicol Region	5,253.5790	659.5368	7.9700	0.0000
Western Visayas	900.1818	786.0743	1.1500	0.2520
Central Visayas	4,522.1290	718.9115	6.2900	0.0000
Zamboanga	905.0703	668.1206	1.3500	0.1760
Northern Mindanao	-117.6918	665.2091	-0.1800	0.8600
Davao Region	3,517.7100	759.5009	4.6300	0.0000
Socksargen	4,247.9510	662.4926	6.4100	0.0000
Metro Manila	21,028.5600	847.9085	24.8000	0.0000
CAR	-2,300.3100	901.9050	-2.5500	0.0110
ARMM	-2,957.9820	1,229.5960	-2.4100	0.0160
Caraga	-1,003.1770	694.4416	-1.4400	0.1490
CALABARZON	15,169.2400	762.1959	19.9000	0.0000
MIMAROPA	684.0354	625.6325	1.0900	0.2740
Intercept	-10,843.0100	1,407.3950	-7.7000	0.0000

Some interesting significant co-variations can be noted, other than those provided by the usual demand determinants like household's income level and size of the family. For one, locational attributes of the households appear to be the most significant predictors. The dummy variables for the highly urbanized regions of Metro Manila, Calabarzon and Central Luzon deemed to provide the highest explanatory contribution to the level of FAFH consumption of the average Filipino household with respective marginal contributions of P21,029, P15,169 and P9,087 (all at $p<0.0001$). When interpreted, FAFH consumption by the typical Metro Manila household is on the average P21,029 higher than that of Eastern Visayas (the benchmark region). Remarkably, some household demographics failed to produce significant explanatory impact; for instance, gender ($p>0.90$) and age ($p>0.35$) of the household head.

The most important feature of the main FAFH demand equation (Table 2) is the apparent empirical validity of the household production and consumption theory (Becker 1965; Prochaska & Schrimper 1973) adopted in the study. The variables that proxy for the value of household members' time posted highly significant coefficient estimates: wife employed ($p<0.005$), number of employed members ($p<0.0001$) and one member household dummy ($p<0.01$).

3.3 Results of the Heckman Estimation of Working-Leser Engel Curves

Because of the inherent sample selection problem surrounding the specification of the FAFH Engel curve, which may not be present in FAH, the systems approach in simultaneously estimating both the FAH and the FAFH Engel curves using the Heckman procedure is precluded in the analysis. Instead, the single equation approach is used, and only for FAFH. As a result, four Working-Leser Engel curves are estimated independently for each FIES survey round. The focus of attention is on the FAFH Engel curve presented in Table 3, representing the most

Probit (Participation) Stage	Coeff.	Std. Err	t-value	p-value
Log(Total Income)	0.48277	0.02261	21.35000	0.00000
Family Size	0.08500	0.00983	8.65000	0.00000
Age of HHH	-0.00834	0.00444	-1.88000	0.06000
Age Squared	-0.00001	0.00004	-0.30000	0.76300
Sex (Male=1)	-0.04021	0.03528	-1.14000	0.25400
Single HHH	-0.07750	0.05326	-1.46000	0.14600
Married HHH	-0.26221	0.03765	-6.96000	0.00000
Wife Employed	0.17178	0.02690	6.39000	0.00000
College Undergrad HHH	0.10246	0.02830	3.62000	0.00000
College Grad HHH	0.21200	0.06892	3.08000	0.00200
Number of Employed Members	-0.06910	0.01288	-5.36000	0.00000
Metro Manila	0.56027	0.04786	11.71000	0.00000
constant	-4.43544	0.26299	-16.87000	0.00000

contemporary FAFH budget formation process of Filipino households.

The upper panel of Table 3 presents the outcome of the second (consumption) stage of the Heckman procedure, while the lower panel shows the result of the first (participation) stage. The participation stage is implemented through probit estimation of the conditional probability that the household will consume FAFH given its attributes, while the consumption stage features the estimated Engel curve for FAFH corrected for selectivity bias through the inclusion of the Inverse Mills ratio derived from the results of the participation stage as additional regressor (Heckman 1979). The fit of the models in both stages of appear to be excellent with nearly all coefficients estimated with extreme statistical significance and conforming to theoretical a-priori expectations, except for a few variables which are insignificant.

Table 3. Weighted Heckman Estimation of Working-Leser FAFH Engle Curve, 2012

Engel Curve (Budget Formation Stage)	Coeff.	Std. Error	t-value	p-value
Log(Total Income)	-0.00246	0.00085	-2.90000	0.00400
Family Size	0.00012	0.00024	0.51000	0.61000
Age of HHH	-0.00070	0.00022	-3.13000	0.00200
Age Squared	0.00000	0.00000	1.85000	0.06400
Sex (Male=1)	0.00626	0.00147	4.27000	0.00000
Single HHH	0.01474	0.00302	4.89000	0.00000
Married HHH	-0.01880	0.00165	-11.4000	0.00000
Wife Employed	0.00434	0.00094	4.60000	0.00000
Col Undergrad HHH	0.00276	0.00104	2.65000	0.00800
College Grad HHH	0.00132	0.00318	0.41000	0.67800
Employed Members	0.00207	0.00045	4.59000	0.00000
Ilocos Region	0.03792	0.00293	12.95000	0.00000
Cagayan Valley	0.04238	0.00299	14.15000	0.00000
Central Luzon	0.05319	0.00269	19.77000	0.00000
Bicol Region	0.02674	0.00324	8.25000	0.00000
Western Visayas	0.01947	0.00284	6.87000	0.00000
Central Visayas	0.03185	0.00314	10.14000	0.00000
Zamboanga	0.01044	0.00269	3.87000	0.00000
Northern Mindanao	0.00479	0.00242	1.98000	0.04800
Davao Region	0.02723	0.00326	8.36000	0.00000
Soccksargen	0.01992	0.00269	7.40000	0.00000
Metro Manila	0.07899	0.00272	29.09000	0.00000
CAR	0.00667	0.00265	2.52000	0.01200
ARMM	0.01333	0.00331	4.02000	0.00000
Caraga	0.00590	0.00246	2.40000	0.01600
CALABARZON	0.06917	0.00259	26.72000	0.00000
MIMAROPA	0.01377	0.00262	5.25000	0.00000
Inverse Mills Ratio	-2.71105	0.01260	-215.200	0.00000
constant	0.08730	0.01180	7.40000	0.00000

The upper panel of Table 3 presents the outcome of the first (participation) stage of the Heckman procedure,

while the lower panel shows the result of the second (consumption or budget formation) stage. The participation stage is implemented through probit estimation of the conditional probability that the household will consume FAFH given its attributes, while the consumption stage features the estimated Engel curve for FAFH corrected for selectivity bias through the inclusion of the Inverse Mills ratio derived from the results of the participation stage as additional regressor (Heckman 1979). The fit of the models in both stages appear to be excellent with nearly all coefficients estimated with extreme statistical significance and conforming to theoretical a-priori expectations, except for a few variables which are insignificant.

One of the most interesting results noted in Table 3 is the apparent validity of the Engel's Law on the budget setting process for FAFH by modern Filipino households. This assertion is demonstrated by the highly significant ($p<0.005$) and negative coefficient estimate of the income variable, which when interpreted would mean that poorer households devote higher share of income to FAFH than richer families. Furthermore, income elasticities are computed (using equation (4)) for the various FIES rounds and are tabulated in Table 4 below.

Table 4. Working-Leser Income Elasticities for FAFH Consumption 2003-2012 FIES Rounds

FIES Survey Round	Average FAFH Share	Engel Curve Coeff. of ln(Income)	Working-Leser Income Elasticity	Commodity Classification of FAFH
2003	0.03631	0.00079	1.02176	Luxury
2006	0.04156	0.00153	1.03682	Luxury
2009	0.04458	0.00270	1.06056	Luxury
2012	0.05953	-0.00246	0.95867	Necessity

By classifying FAFH as a necessity consumption item, even households situated in the lower rung of income distribution are predisposed to consume food away from home during the modern era. This phenomenon is not seen in the earlier survey rounds as FAFH had been consistently categorized as luxury item.

The highly significant and positive coefficient estimates for the variables related to the value of time of household members justify these variables as the non-traditional budget shares predictors, echoing the results noted in the Tobit estimated FAFH demand equation. This result implies the validity of the household production theory (Becker 1965; Prochaska & Schrimper. 1973) in specifying Engel curves of FAFH.

4. CONCLUDING REMARKS

Consumption incidence of food away from home (FAFH) among Filipino households has been increasing monotonically over the years, reaching an all-time high of 89.61% of all households in 2012. Per capita consumption of FAFH is also on the uptrend at an annual clip of 9.91%, compared to the increase of just 4.41% per year on per capita expenditure of food consumed at home (FAH). These statistics are testament to the phenomenon of changing consumer preferences resulting in a remarkable shift in food consumption patterns, particularly in the cities and highly urbanized locales. Despite the economic and commercial importance of food consumption away from home, very limited effort has been made to investigate the evolution and economics of this type of food consumption among Filipinos over time. This study attempts to bridge this gap in the literature by doing a comprehensive analysis of this emerging consumption trend using the four most recent public use files of the FIES, aiming to establish the stylized facts and the significant drivers of this phenomenon. A value added feature of the study is the use of survey design compliant procedures in all estimation and inferences conducted to avoid misleading inferences.

The outcomes of the study confirm the significant co-variation of FAFH consumption in the most recent period (2012) with the traditional food demand determinants like household income, family size, age composition; household head's demographics like education and marital status. Usual demand predictors, however, like age and gender are insignificant determinants. Interestingly, non-traditional factors like employment status of homemaker (wife), single member status of the household and number of employed members contribute significant explanatory influence on FAFH consumption. This empirical result confirms the validity of the household production and consumption theory due to Becker (1965). Over-all, the most powerful drivers of the phenomenon proved to be the locational characteristics of the household captured by the regional dummy variables, with the indicator variables for Metro Manila, Calabarzon and Central Luzon appear to be the strongest drivers.

The empirical verification by the study that FAFH is a necessity item in the food basket of modern Filipino household also confirms the validity of the Engel's law to FAFH, with an income elasticity of -0.9587. The results of the study may be used as the basis of predicting the increasing role of FAFH in shaping the consumption

behavior of the modern Filipino families, thus offering important insights with valuable commercial and economic implications shift in food consumption.

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6. REFERENCES

Becker G. (1965). A Theory of allocation of time. Economic journal 75: 493-517.

Binkley, J. (2008). Calorie and gram differences between meals at fast food and table service restaurants. Review of Agricultural Economics 30 (4), 750–763.

Byrne, P. J., O. Capps, , & A. Saha (1996). Analysis of food-away-from-home expenditure patterns for U.S. households, 1982–89. American Journal of Agriculture Economics, 78, 614– 627.

Capps, O., Jr., J. Telford and J. Havlicek, Jr. (1985). Household Demand for Convenience and Nonconvenience Foods. Amer. J. Agr. Econ. 67: 862-69

Cochran, W. (1977). Sampling Techniques, 3rd Ed. John Wiley and Sons, New York.

Deaton, A. (1997). The Analysis of Household Surveys – A Microeconometric Approach to Development Policy. World Bank Press.

Deaton, A. and J. Muellbauer (1980). Economics and Consumer Behavior. Cambridge: Cambridge University Press, 1980.

Dong D., P. J. Byrne, A. Saha and O. Capps, Jr. (2000) Determinants of Food-Away-From-Home (FAFH) Visit Frequency: A Count-Data Approach. Journal of Restaurant & Foodservice Marketing, Vol. 4(1) 2000

Fang, C., & J. Beghin, (2002). Urban demand for edible oils and fats in China: Evidence from household survey data. Journal of Comparative Economics, 30, 732–753.

Guthrie, J., Lin, Biing-Hwan, E. Frazao, (2002). Role of food prepared away from home in the American diet, 1977–78 versus 1994–96: changes and consequences. Journal of Nutrition Education and Behavior 34 (3), 140–150.

Haughton, D. and J. Haughton (2011). Living Standards Analytics: Development through the Lens of Household Survey Data. Springer, New York

Kinsey, J. (1983). Working Wives and the Marginal Propensity to Consume Food Away from Home. Amer. J. Agr. Econ. 65: 10-19

Leser, C. (1963). Forms for Engel curves. Econometrica 31:694-703

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

Heeringa, S., B. West, and P. Berglund. (2010). Applied Survey Data Analysis. Chapman and Hall Book, Taylor & Francis Group, LLC, Ann Arbor, Michigan.

Holcomb, R., J. Park, and O. Capps, Jr. (1995). Examining Expenditure Patterns for Food at Home and Food Away from Home. Journal of Food Distribution Research. 26: 1-8.

LeBovit, C. (1967). Expenditures for Food Away From Home. Nat. Food Situation 152:36-38.

Leser, C. (1963). Forms of Engel Functions. Econometrica 31(4): 694-703.

McCracken, V., and J. Brandt (1987). Household consumption of food away from home: Total expenditure and by type of food facility. American Journal of Agricultural Economics, 69: 274– 284.

Ma, H., J. Huang, F. Fuller and S. Rozelle (2006). Getting Rich and Eating Out: Consumption of Food Away from Home in Urban China. Canadian Journal of Agricultural Economics 54: 101-119.

Manchester, A. (1977). Eating Out. Nat. Food Situation 161:25.

Manrique J, and H. Jensen. (1998). Working women and expenditures on food away-from-home and at-home in Spain. Journal of Agricultural Economics 49(3): 321-333.

Molina J. (1994). Food demand in Spain: An application of the Almost Ideal System. Journal of Agricultural Economics 45(2): 252-258.

Nayga, R. and O. Capps, Jr. (1992). Determinants of food away from home consumption: Update. Agribusiness 8: 549-59.

Prochaska, F. and R. Schrimper. (1973). Opportunity Cost of Time and Other Socioeconomic Effects on Away-From-Home Food Consumption. Amer.J. Agr. Econ. 55, 595-603.

Redman, B. (1980). The Impact of Women's Time Allocation on Expenditure for Meals Away from Home and Prepared Foods. Amer. J. Agr. Econ. 62: 234-37

Rufino, C. (2013). Consumption Pattern of the Poor Households in Metro Manila - A Microeconometric Evaluation. DLSU Business & Economics Review 23(1): 10-24

Shonkwiler, J. and S. Yen (1999). Two-Step Estimation of a Censored System of Equations. Amer. J. of Agr. Econ. 81: 972-982

Stone, R. (1954). Linear Expenditure Systems and Demand Analysis: An Application to the Pattern of British Demand. The Economic Journal 64(155): 511-527

Tobin, J. (1958). Estimation of Relationships for Limited Dependent Variables. Econometrica, 26: 24- 36.

Van Dress, M. (1980). Fast Food Industry Growth. Nat. Food Rev.9, pp. 35-37.

Working, H. (1943). Statistical laws and family expenditure. Journal of the American Statistical Association 38:43-56.