Reading Notes on *Consumption and Habits: Evidence from Panel Data*

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Many researchers have studied intertemporal consumption behavior using the time-separable models in previous studies. However, this method has several limitations, such as the lack of empirical microeconomic evidence and the uncontrolled heterogeneity problem. Therefore, Carrasco et al. (2005) adopted Meghir and Weber's analysis method and studied habit formation in consumption decisions by focusing on three non-durable goods: food at home, transport, and services. They have explained the importance of controlling the time invariant unobserved heterogeneity in studying consumption decisions, and they concluded that habit formation exists after controlling for fixed effects.

Specifically, the authors used the rotating panel data and collect information like consumption and demographic characteristics from the Spanish Continuous Family Expenditure Survey (ECPF) from 1985 to 1995. Compared to the previous data sets, the greatest advantage is that they could analyze the time-invariant unobserved heterogeneity problem and acquire consistent parameters estimates using eight consecutive quarters' consumption information.

In terms of the model and the empirical specification, the authors assumed that the household maximized the present discounted value of a lifetime utility, and the direct translog utility function, which explained the non-separabilities and preference shocks, could represent the preferences for three goods. Then they followed the model from Meghir and Weber (1996) to estimate the intertemporal Euler conditions and the within-period marginal rate of substitution (MRS) between non-durable commodities. Besides, they have included the age and education of the head of the household, family composition variables, seasonal dummies and so on to control the demographic and labor supply variables. Moreover, two sources of stochastic variability which have been rewritten: the expectational errors and the existence of preferences shock can be used as valid instruments. Two models which consist of two equations: food versus services and transport versus services can be estimated using GMM.

By analyzing the consumption estimation of the MRS and Euler equations in levels, the authors found that preferences are intertemporally separable without controlling the time invariant unobserved heterogeneity and therefore the habit formation hypothesis was valid in both the MRS and the Euler equation. Then, the authors considered the situation of controlling the time invariant

unobserved heterogeneity in the preference specification and included several instruments like quantities and nominal expenditures in the regression. The results showed that habit formation exists in food consumption and services, while the Sargan test did not reject the overidentifying restrictions. Besides, Carrasco et al. (2005) also studied the binding problem of liquidity constraints by comparing the coefficients of the MRS and the Euler equations. They found that the equality of the coefficients from the MRS and Euler equations cannot be rejected. Furthermore, by focusing on the groups of individuals younger than 40 that are more likely to be constrained by the liquidity constraints, the authors concluded that they could not reject the null hypothesis of intertemporal separability and the non-separabilities that existed in the Euler equation. More importantly, the hypothesis of equality of the coefficients obtained from the MRS and the Euler equations was failed. The liquidity constraints still bound the young households after controlling labor market variables.

In summary, this paper has shown the importance of controlling the time invariant unobserved heterogeneity in studying intertemporal consumption behavior by using the Spanish household panel data. However, there might exist one limitation in this research. Since the survey data was collected from 1985 to 1995, the results might need to be examined with the recent data support.