

Parallel Mixed Mode Surveys on Consumer Attitude towards Fresh Produce

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Abstract

This paper investigates the effect of parallel mixed mode surveys on findings of a study on the Malaysian consumers' attitude towards buying of fresh produce from the large retail stores. Two survey methods were employed, i.e., a face to face interview and an online survey with each required different sampling technique and questioning methods. Statistical tests such as t-test, and chi-square were used to detect mean differences. A factor analysis was run to elucidate the major salient factors that explain the consumers' choice on certain large scale retail stores for fresh produce. The findings suggest that despite the biases of each method and minor differences in results, both are complementary as each rectifies each other's weaknesses.

Keywords: Malaysia, Mixed mode survey, Consumer attitude, Fresh produce, Large scale retailers

1. Introduction

A study has been carried out to examine the Malaysian consumers' attitude towards the large scale retail stores (such as hypermarkets, supermarkets and departmental stores) for fresh produce using face to face interview and internet surveys to collect the necessary primary data. Like in any other developing countries, the advent of large scale multi-national retailers has changed the retail landscape in the country. Despite their late entry into the market (starting in the mid 1990s), they were able to secure about one third of the market share of the retail sales and accounted for about 35% of fruits and vegetable sales in Malaysia in 2002 (FAO, 2005). Hence, it would be useful to examine the factors that push the consumers to purchase from their supplies of fresh produce (fruits and vegetables) from these new retailers despite the availability of many alternatives such as the conventional small shops around their neighborhood, farmers market and mobile market. In order to understand the consumer decision, one must obtain primary data from the consumers or the buyers who are largely females either housewives or professionals and workers. However, in view of their lifestyle, applying the face to face interview technique may not be able to cover those consumers who are at their work premises during the day. Hence a mixed-mode is deemed necessary to reach the two groups – the housewives as well as the workers at either their homes or work premises.

The study has chosen a mixed-mode survey comprised the face to face (FTF) and internet surveys method to solicit consumers' perception on the retailers and factors that affecting their decision to buy from the large retailers. The FTF technique was aimed largely at housewives who either stay at home while the internet was aimed at those who preferred to answer question through the internet. The decision to adopt both techniques was driven by the need to cover as many respondents as possible at an economic cost in accordance with the definition of research design made by Selltitz et al., (1962). Selltitz et al., defined research design as the "arrangement of conditions for collection of and

analysis of data in a combine relevance to the research purpose with economy in procedure". Despite the possible biases of each of the techniques (Nesbary, 2000, Moss and Hendry, 2002), a combination of survey methods is acceptable (Payne, 1964). A combination of survey methods is perceived as complementary parts of a single investigation. In this study, the sampling procedure and the questionnaire design differed while the hypotheses and empirical analyses were similar. However, the medium used by the both method differed in that the FTF involved conversation between the interviewer and the respondent while the internet survey involved the respondent and the computer. Secondly, the times of the survey for the FTF interview were mostly during the day time while for the internet survey were 24/7. In view of these differences and other biases, this paper aims at analysing the effects of the two survey techniques, FTF interview and internet survey on the findings.

2. Literature Review

The comparison between the online survey and the conventional methods yield mixed results. The conventional face to face interview or "pencil and paper survey" has some well established advantages such as flexibility in questioning, low non-response items and higher degree of accuracy (Zikmund, 2003,). Its weaknesses include; falling participation rates, rising costs, labour intensive and limited coverage (Jarvis, 2002).

The evaluation on the online survey received mix viewpoints. A number of claimed advantages were put forward such as lower cost, faster turnaround, bigger coverage of samples, minimum researcher's time and resources, convenient time and location for subjects, anonymity for researchers and subjects, higher response levels, lower respondent error, inexpensive, and possibility of multi media usage on the internet page (Davis, 1999; Dillman 2000; Forrest, 1999; Moss and Hendry, 2002; and Solomon, 2001). In short, online method as a data collection is considered efficient (Weible and Wallace and Kaye and Johnson, 1999).

Critics pointed out that internet-research participants are self-selected group, hardly comprising a random sample (Petit, 1999). A number of studies have evaluated the differential effects of online and traditional surveys on issues such as responses, missing values and internal covariance (Davis, 1999; Smith, 2001; Stanton, 1998 and Walt et al., 2008). With the exception of Smith, the rest of the researchers found that despite differences in environments, the results were comparably equivalent. Other practical concerns include the effects of different browsers on the respondents, variation in computer expertise which may lead to errors and non-response, data security and privacy (Zanutto, 2001).

The implementation of mixed mode of surveys provides an alternative solution to the problems of traditional survey and online methods (de Leeuw, 2005, Dillman, et al., 2008). It can be done either concurrently or serially depending on the research objectives. It tends to increase response rate and coverage at affordable cost (Meckel et al., 2005), while at the same time it may increase the likelihood of measurement error because the survey question may appear somewhat differently under different mode (Christian and Dillman, 2004 and Lepkowski, 2008).

3. Methodology and Research Design

A survey on consumers was carried out to obtain data on their socio-economic background, attitude and preferences in buying fresh produce (fruits and vegetables) from the large scale retail stores (such as hypermarkets, supermarkets and departmental stores). Two methods were used; a face to face interview (FTF) and an online survey. The FTF interview was carried out in the months of July to November 2007. The study adopted convenience sampling method as a means of data collection procedure mainly from Peninsular Malaysia. A five-point Likert Scale was used to measure the magnitude of the consumers' attitude towards the store's marketing strategies for fresh fruits and vegetables. The consumers interviewed were from major towns in Malaysia, i.e., Kuala Lumpur, Petaling Jaya, Johor Baharu, Ipoh and Penang. The total number of responses was 452.

An online survey was carried out using the same set of questionnaire (with some modification according to the web's requirement) on www.utusan.com.my between 4th until 21st December 2007. This survey managed to obtain responses from Malay respondents from various locations in Malaysia. Another online survey is being carried out at www.thestar.com.my (from 18 February – 25 February 2008). The two web sites represent the most popular online newspapers in Malaysia. The total number of responses was 1,012. The study set to test the following two hypotheses:

H₀1: These is no significance difference in the socio-economic profiles of the two sets of respondents (FTF and internet survey).

H₀2: These is no significance difference in perceptions towards the marketing strategies of the large scale stores between the two types of respondents (FTF and internet survey).

To test the differences in means, the study utilises t, chi-squared and Z tests statistics depending on the types of scales and number of samples. Factor analysis was used to explore and reveal the hidden dimensions of a set of variables used in this study, thereby illustrating the relationships between the underlying factors and the observed variables. Only factors with Eigenvalue greater than one are considered for this methodology, which indicates that the extracted factors explain more variance than a single variable (Hair *et al.*, 1998).

4. Discussion of Findings

4.1 Socio-economic Profile

Table 1 provides the test results of mean differences of the socio-economic variables of the two groups while Table 2 provides their frequency distributions. The t-values and chi-square statistics indicate that with the exception of “gender”, there were significant differences in the means of other variables (age, education, marital status, ethnic, occupation and income). These suggest that the two samples are statistically different in terms of profile. The average age of the online respondents was 31.9 years (with S.D.=7.7) compared to the FTF (mean=35.9, S.D.=12.2). FTF respondents were well distributed among the age groups while more than 90% of the online respondents were below 44 years old. More than two thirds (68.1%) of the online respondents were married compared 35.8% to the FTF’s. Malay respondents were predominant in the online survey (92.9%) compared to FTF (65.7%). Almost half of the internet respondents owned businesses while about 40% of the FTF respondents worked with private companies. In terms of income, a total of 36% of the online respondents earned more than RM3,000 per month compared to 14% in the case of FTF.

4.2 Attitude towards Stores’ Marketing Strategies

Tables 3 – 5 present the respondents’ perception towards the stores’ marketing strategies on fresh fruits and vegetables as well other general services and facilities provided to customers. On pricing policies, the t-tests show significant difference in the means of both groups. The FTF group indicated higher mean scores on all statements on pricing strategies. However, in terms of product policy, there was a significant difference between the two groups with regards to statement such as “The store provides imported produce”, “Good product presentation”, “Minimum searching cost” and “Variety of products that meet my requirements”. The mean scores by the online group were higher compared to FTF’s particularly on the low searching cost (4.0) and variety of products under one roof (4.07). These findings are not surprising in view of the “younger” and IT-savvy characteristics of the online respondents which put higher emphasis on the importance of information and shopping time.

In terms of promotional strategies, the two groups showed differences in opinion towards promotional strategies of the stores. The mean scores for the two groups differed significantly for statements such as “Seasonal promotion”, “The travel cost is low”, “Public transportation is available”, and “Can visit other shops nearby” (Table 4). The two groups also showed significant mean differences in statements such as “Friendly service”, “After sales service”, “Can buy produce in bulk” and “Pleasant shopping environment” (Table 5).

4.3 Factor Analysis

The factor analysis on both samples generated eight major factors for the FTF group compared to six factors for the online respondents (Tables 6-9). The order of the first three factors generated for the two groups were similar, they were: “customer-centric product policy”, “conducive shopping environment” and “customer loyalty programme”. As for the FTF group, the other factors that drove them to buy from the large scale retailers were, “high quality produce”, “location advantage”, “efficient customer services”, “fair and reasonable pricing” and “purchasing advantage”. However as for the internet respondents, two factors were omitted – “high quality produce” and “purchasing advantage”. In the case of FTF, the eight factors accounted for 64.2% of the total variance explained while the six factors accounted for 67.9% for the online results. The reliability test of the online group was marginally higher than the FTF (Table 9). These findings suggest that there appear to be little differences between the two groups of respondents in terms of factors that lead them to buy FFVs from the large scale retailers.

5. Conclusion

The study utilises a parallel mixed mode surveys (face to face interview and an online survey) on a quest to examine the Malaysian consumers’ attitude and preference in buying fresh produce (fruits and vegetables) from the large retail stores. While holding other procedures remain the same (hypotheses testing and empirical analyses), the above findings show that the two samples are different in terms of their socio-economic variables particularly age, education, ethnic, income and occupation. There is a marginal difference in terms of attitudinal attributes of the two groups towards the marketing strategies of the retail stores. The online group seems to value relatively more on the low searching cost of information about the produce and the availability of imported and a variety of produce sold in

the stores. The factor analysis indicates a minor difference in terms of major factors underpinning their attitude towards the large scale stores. This exercise confirms the claim that there exists a sample bias if one utilises online survey. However, the mixed mode of survey proves a useful strategy for the research as it brings a number of advantages mentioned in the literature such as inexpensive, wider coverage and efficiency. The online survey complements the face to face interview as it captures the “younger” market nationwide and bigger coverage of samples, which would have not been possible with the time and resource constraints faced by the researchers.

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Table 1. Mean Comparison

Item	FTF		Online		T-test / Chi- square	Prob.
	Mean	S.D.	Mean	S.D.		
Gender	-	-	-	-	0.837	0.360
Age (years)	35.96	12.201	31.91	7.797	6.475	0.000
Marital status	-	-	-	-	3.242	0.001
Ethnic	-	-	-	-	7.158	0.000
Education	-	-	-	-	3.128	0.001
Occupation	-	-	-	-	17.458	0.000
Income (RM)	1,746	1,375	2,705	1,934	-9.783	0.000

Note: FTF – Face to Face

Table 2. Socio-economic Profile of Respondents

Item	FTF		Online	
	Frequency	%	Frequency	%
Gender				
Male	114	25.2	455	45.0
Female	338	74.8	556	55.0
Total	452	100	1011	100
Age				
<24 years	99	21.9	149	14.8
25-34	118	26.1	547	54.4
35-44	113	25.0	221	22.0
45-54	89	19.7	80	8.0
>55 years	33	7.3	8	0.8
Total	452	100	1005	100
Marital status				
Single	61	61.3	320	31.9
Married	276	35.8	6833	68.1
Divorced/separated	13	2.9	0	0.0
Total	450	100	1003	100
Ethnic				
Malay	297	65.7	934	92.9
Chinese	136	30.1	16	1.6
Indian	15	3.3	28	2.8
Others	4	0.9	27	2.7
Total	452	100	1005	100
Education				
Primary education	44	9.8	223	31.7
Secondary education	232	51.7	292	41.5
Tertiary education	173	38.5	188	26.7
Total	449	100	703	100
Occupation				
Public sector	57	12.9	354	35.2
Own business	51	11.5	497	49.4
Private sector	179	40.4	30	3.0
Student	45	10.2	88	8.7
Not working	89	20.1	16	1.6
Others	22	5.0	21	2.1
Total	443	100	1006	100
Income				
<RM 999	87	27.0	98	9.8
RM 1,000 - RM 1,999	122	37.9	213	21.3
RM 2,000 - RM 2,999	68	21.1	327	32.6
RM 3,000 - RM 3,999	28	8.7	190	19.0
> RM 4,000	17	5.3	174	17.4
Total	322	100	1002	100

Note: USD1=RM3.2

Table 3. Consumer Attitude towards Pricing and Product Strategies

No	Statement	FTF		Online		Difference		T test	Prob.
		Mean	SD	Mean	SD	Mean	SD		
Pricing									
1	Prices are cheap	3.25	0.851	3.15	0.966	0.10	-0.115	2.107	0.035
2	Prices are transparent	3.92	0.767	3.67	1.069	0.25	-0.302	4.953	0.000
3	Prices available from catalogue	3.32	0.960	3.08	1.197	0.24	-0.237	3.980	0.000
4	Prices are reasonable	3.49	0.830	3.33	0.908	0.16	-0.078	3.339	0.000
Product									
5	Produce are fresh	3.66	0.864	3.56	0.888	0.10	-0.024	2.097	0.036
6	Produce are consistently of high quality	3.28	0.899	3.36	0.880	-0.08	0.019	-1.615	0.107
7	Variety of produce	3.84	0.788	3.90	0.864	-0.06	-0.076	-1.217	0.224
8	Imported produce	3.58	0.900	3.90	0.803	-0.32	0.097	-6.408	0.000
9	Pre-packed, ready for cooking vegetables	3.64	0.848	3.82	0.802	-0.18	0.046	-3.801	0.000
10	Good product presentation	3.80	0.774	3.82	0.817	-0.02	-0.043	-0.505	0.613
11	Variety of products under one roof	4.00	0.712	4.07	0.833	-0.07	-0.121	-1.702	0.089
12	Minimum searching cost	3.80	0.873	4.00	0.852	-0.20	0.021	-4.113	0.000
13	Various grades to meet my requirements	3.67	0.826	3.77	0.886	-0.10	-0.06	-2.061	0.04

Note: SD is Standard Deviation

Table 4. Consumer Attitude towards Promotion and Location Strategies

No	Statement	FTF		Online		Difference		T test	Prob.
		Mean	SD	Mean	SD	Mean	SD		
Promotion									
14	Promotional benefits	3.65	0.876	3.56	0.976	0.09	-0.1	1.829	0.068
15	Seasonal promotion	3.92	0.686	3.79	0.684	0.13	-0.178	3.255	0.001
16	Brochure	3.73	0.811	3.72	0.942	0.01	-0.131	0.061	0.951
17	Consumers' loyalty programme	3.72	0.872	3.76	1.002	-0.04	-0.13	-0.671	0.503
Location									
18	The travel cost is low	3.49	0.912	3.61	1.034	-0.12	-0.122	-2.35	0.019
19	The retail premise located near my place	3.56	0.944	3.67	1.042	-0.11	-0.098	-1.973	0.049
20	Public transportation is available	3.24	0.982	3.03	1.257	0.21	-0.275	3.305	0.001
21	Can visit other shops nearby	3.56	0.855	3.67	0.971	-0.11	-0.116	-2.343	0.019

Table 5. Consumer Attitude towards Services, Facilities and Shopping Environment

No.	Statement	FTF		Online		Difference		T test	Prob.
		Mean	SD	Mean	SD	Mean	SD		
Services									
22	Friendly service	3.51	0.846	3.37	0.868	0.14	-0.022	3.065	0.002
23	Fast transaction	3.36	0.869	3.31	0.909	0.05	-0.04	0.982	0.326
24	After sales service	2.85	1.080	2.73	1.091	0.12	-0.011	2.012	0.045
25	Can buy produce in bulk	3.44	0.827	3.54	0.863	-0.10	-0.036	-2.085	0.037
26	Can pay using credit cards	3.91	0.949	3.93	0.974	-0.02	-0.025	-0.343	0.732
Facilities and Shopping Environment									
27	Facilities for consumers' convenience	4.07	0.734	4.10	0.873	-0.03	-0.139	-0.669	0.504
28	Air-conditional environment	4.17	0.716	4.21	0.823	-0.04	-0.107	-0.804	0.422
29	Good hygiene condition	3.96	0.809	3.98	0.874	-0.02	-0.065	-0.437	0.662
30	Spacious	3.99	0.812	3.92	0.848	0.07	-0.036	1.44	0.150
31	Pleasant shopping environment	4.17	0.795	4.07	0.893	0.10	-0.098	2.001	0.046

Table 6. Comparison of Factors Identified

Factor	FTF	Factor	Online
1	Customer-centric product policy	1	Customer-centric driven policy
2	Conducive shopping environment	2	Conducive shopping environment
3	Customer loyalty programme	3	Customer loyalty programme
4	High produce quality	4	Location advantage
5	Location advantage	5	Fair and reasonable pricing
6	Efficient customer services	6	Efficient customer services
7	Fair and reasonable pricing		
8	Purchasing advantage		

Table 7. Factor Analysis on FTF Respondents

Item	Factor loading							
	F1	F2	F3	F4	F5	F6	F7	F8
Imported produce	0.765	Customer-centric product policy						
Variety of products under one roof	0.695							
Minimum cost of searching	0.693							
Various grades that meet my requirements	0.615							
Good product presentation	0.602							
Variety of produce	0.580							
Spacious	0.807	Conducive shopping environment						
Air-conditional environment	0.776							
Good hygiene condition	0.734							
Good facilities for consumers' convenience	0.713							
Consumers' loyalty programme	0.729	Customer loyalty programme						
Brochures	0.728							
Seasonal promotion	0.665							
Promotional benefits (discounts, rebates and rewards)	0.614							
Produce are consistently of high quality	0.755	High produce quality						
Produce are fresh	0.746							
The retail premise located near my place	0.800	Location advantage						
The travel cost is low	0.793							
Can visit other shops nearby	0.648							
After sale service	0.775	Efficient customer services						
Fast transaction	0.612							
Prices are reasonable	0.738	Fair & reasonable pricing						
Prices available from catalogue	0.725							
Prices are cheap	0.659							
Pre-packed, ready for cooking vegetables	0.667	Purchasing advantage						
Pay with credit cards	0.643							
Can buy produce in bulk	0.590							

Bartlett's Test of Sphericity: Approx. Chi-Square=4.925E3, df=435, Sig=0.0001

Kaiser-Meyer-Olkin Measure of Sampling Adequacy=.886

Table 8. Factor Analysis on Online Respondents

Item	Factor Loading					
	F1	F2	F3	F4	F5	F6
Imported produce	0.757					
Variety of vegetables and fruits	0.747					
Pre-packed, ready for cooking vegetables	0.728					
Variety of products under one roof	0.726	Customer-centric driven policy				
Good product presentation	0.707					
Minimum searching cost	0.703					
Various grades that meet my requirements	0.670					
Air-conditional environment		0.800				
Good hygiene condition		0.798				
Spacious		0.755				
Good facilities for consumers' convenience		0.716				
Brochures			0.775			
Seasonal promotion			0.728			
Promotional benefits (discounts, rebates and rewards)			0.721			
Consumers' loyalty programme			0.681			
The retail premise located near my place				0.851		
Travel cost is low				0.813		
Prices are cheap					0.831	
Prices are reasonable			Fair & reasonable pricing		0.794	
Produce are consistently of high quality					0.610	
Produce are fresh					0.584	
Friendly service						0.746
Fast transaction						0.738
After sale service						0.712

Bartlett's Test of Sphericity: Approx. Chi-Square=1.512E4, df=351, Sig=0.0001

Kaiser-Meyer-Olkin Measure of Sampling Adequacy=0.929

Table 9. Comparison of Statistics of Factor Analysis

Factor	FTF				Online			
	Eigenvalue	% of variance	Cumulative %	Reliability Test	Eigenvalue	% of variance	Cumulative %	Reliability Test
1	8.561	28.538	28.538	0.830	10.564	39.127	39.127	0.905
2	2.140	7.133	35.671	0.852	2.170	8.039	47.166	0.903
3	1.867	6.223	41.894	0.787	1.776	6.579	53.745	0.857
4	1.850	6.166	48.060	0.756	1.428	5.288	59.033	0.875
5	1.492	4.972	53.032	0.704	1.293	4.790	63.822	0.825
6	1.255	4.183	57.215	0.611	1.123	4.159	67.981	0.789
7	1.103	3.678	60.893	0.691				
8	1.007	3.355	64.249	0.565				