



Online Purchase of Food Products in Bangalore City- Preferences and Constraints

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ABSTRACT

Background: Electronic commerce of food products has a very important role to play in creating consistent demand for farmers' products and linking farmers directly to final consumers. The preference of consumers toward online purchases is one of the most important drivers of the e-commerce industry. The objective of the current study is to examine the preference and constraints of online purchase of food products from consumers' perspectives in Bangalore city of India.

Methods: In this study primary cross-section data were collected using a pre-tested schedule between February and May of 2019 from different localities of Bangalore city including Mahadevapura, Sanjaynagar, Jayanagar, etc where most of the online shoppers of food products were located to have a fair demonstration of different socio-economic strata. Descriptive statistics along with principal component analysis were adopted as research methods.

Result: The study revealed that home delivery, wide availability of products and the ability to compare prices of products were among the most influencing factors toward the online purchase of food products online along with convenience and saving time. On the other hand, perishability of products, problematic return policy, limited sensory information and security of information were limitations of online purchase of food products in Bangalore city.

Key words: Constraints, Food products, Online shopping, Preference, Principle component analysis.

INTRODUCTION

Growth in online purchases of food products significantly influences farmers' income since it creates persistent demand for their crops. On the other hand, the seasonality of prices is one the most unpleasant fact for farmers' crops. Online dealers purchase farmers' crops and deliver them to consumers located far from farms even in other states, this indeed makes all products available for consumers in all the seasons and locations. Henceforward, the seasonality of price is ruled out in this process. Preference of consumers toward online purchases is one of the most important drivers of the e-commerce industry therefore, studying the preference and constraints of online purchase of food products from consumers' perspectives is quite handy for stakeholders and researchers to understand the process. Rapid growth and the emerging situation in electronic business have drawn the attention of many researchers to explain the behaviour of consumers toward online purchases and several studies have been carried out worldwide.

Numerous researchers explained effective factors and constraints towards online purchases including Banu *et al.*, (2014) studied key factors that influenced the online purchase behaviour of consumers in Bikaner city of Rajasthan. Saving time, buying at any time of the day, the broad availability of products, best prices, home delivery and reading products rating and comments left by other customers were considered the most effective motives for consumers who opted to purchase online. The future of electronic shopping in India especially in cities observed brightly, offering the best prices, good products and a completely hassle-free shopping experience for their

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customers (Meera *et al.*, 2017). Swapana and Padmavathy (2017) investigated the influence of factors such as motivation, convenience, service quality, website and accessibility for online purchases of different products. Results indicated that convenience, accessibility and service quality were factors that affected consumers to purchase online.

Unfortunately, online purchase is prone to risk and shoppers are concerned about credit and debit card frauds, security concerns, low quality of delivered products compared to the brick-and-mortar store, perishability of food products purchased online and many other concerns that may cause them to avoid the online purchase. Security and privacy issues had drawn much attention in electronic shopping and consumers chose to purchase channels when the environment is relatively secure (Jarvelainen 2007).

Swardt (2008) explained the inability of touching products and the absence of a salesperson as the two main disadvantages of an online purchase from the perspective of South African consumers. Gupta *et al.* (2015) found that delivery charges and no negotiation were two major disadvantages of online shopping in India. Jacobsson (2017) investigated the advantages and disadvantages of online purchases and found that uncertainty, unreliable, risk-taking, page hacking, fraud and identity hijacking were major disadvantages associated with online purchases. Recently, Rasoli *et al.* (2021) investigated socio-economic factors toward the online purchase of food products however, the effects of predetermined motivations and constraints towards the online purchase of food products remained instinctive without rigorous data analysis.

Review of the literature indicated that past studies generally addressed important factors affecting online shopping, not in detail. Additionally, some studies carried out with a limited sample size and no work have covered online purchases of food products. Based on this, the current study focuses on a detailed analysis of consumers' online purchase behaviour along with constraints of this phenomenon from the perspective of consumers concerning the Bangalore city context.

MATERIALS AND METHODS

In this work, primary cross-sectional data were collected from 95 online shoppers through a pre-tested schedule between February to May 2019 from different localities of Bangalore city and convenience sampling method were employed for that purpose. The study was carried out at the University of Agricultural Sciences. Factors such as; limited access to retail outlets, saving time, convenience, good offers and discounts, good quality of products, ability to compare prices of products, a wide variety of food products available, easy shopping, home delivery and late working in the office were considered as motives of online purchase of food products to study the preferences of consumers using five-point Likert scale (where 1 represented strongly disagree and 5 strongly agree). Additionally, limitations like; security of information, payment method, lack of discount

and negotiating, perishability, higher price, delivery charge, delivery default, limited sensory information, low quality and problematic return policy, were considered as constraints of online purchase of food products on a five-point Likert scale. These factors were obtained from previous studies and piloting of the schedule from online consumers.

Principal component analysis (PCA) was applied to summarize and find out important motives and constraints of the online purchase of food products. The concept of PCA used in this study was adopted from Richardson (2009). The reliability of questions used in the study was tested using Cronbach's Alpha and was 0.7 offering good reliability of the schedule and questionnaire. Descriptive statistics were also used wherever required to describe the basic features of the data. Table 1 displays the sociodemographic and socioeconomic descriptions of 95 respondents who participated in the study.

Principal component analysis

In general terms, PCA uses a vector space transform to reduce the dimensionality of large data sets. Using mathematical projection, the original data set, which may have involved many variables, can often be interpreted in just a few variables (the principal components).

General equation of PCA (1) to compute scores on components extracted (created) in a principal component analysis is given as:

$$C_1 = b_{11}(X_1) + b_{12}(X_2) + \dots b_{1p}(X_p) \quad \dots\dots(1)$$

Where

C_1 = First principal component (the first component extracted).
 b_{1p} = Coefficient (or weight) for observed variable p, as used in creating principal component 1 and takes values between 0 and 1.

X_p = Participant's score on observed variable p.

RESULTS AND DISCUSSION

The appropriateness of PCA was examined by Kaiser-Meyer-Olkin Bartlett's Test of Sphericity which is simplified in Table 2 is 0.686, indicating the adequacy of samples.

Table 1: Sociodemographic and socioeconomic characteristics of the sample.

Variables	Codes	Description	SD±mean
Gender	1 0	Dummy variable which takes the value 1 if the respondent is a man otherwise	0.4561±0.71
Age	-	Continuous variable	7.7984±32.82
Occupation	10	Dummy variable which takes the value 1 if the respondent is professional otherwise	0.4924±0.40
Number of family members earning income	-	Discrete variable	0.8787±1.66
Years of schooling	-	Discrete variable	1.5860±17.36
Income	0, 1, 2, 3 and 4	Dummy variable which takes values of 0, 1, 2, 3 and 4 for low income, low middle, middle, upper-middle and high income respectively	1.2431±1.90

The approximate Chi-square is 92.371 with 36 degrees of freedom, which is significant at a 0.05 level of significance. The p-value is 0.000 (Significant) which is less than 0.05 indicating PCA is valid to proceed. As illustrated in Table 3, four factors have been extracted. Each factor is constituted of all those variables that have factor loadings greater than 0.5 and 9 variables were clubbed into 4 factors. The Scree plot which is furnished in Fig 1, also suggests 4 factors that can be derived from variables included in the study.

Identification of the factors influencing the online purchase of food products in Bangalore city

The rotated factor matrix represents the rotated factor loadings, which are the correlations between the variables and the factors. These are the core factors, which have been

Table 2: Kaiser-meyer-olkin measure and bartlett's test of sphericity result.

Kaiser-meyer-olkin measure of sampling adequacy		0.686
Bartlett's test of sphericity	Approx. Chi-Square	92.371
	Degrees of freedom	36
	Significance at 0.05	0.000

used as the final factor after data reduction. The matrix gives the correlation of the variables with each of the extracted factors. Normally, each of the variables is highly loaded in one factor and less loaded in the other factors. To identify the variables, included in each factor, the variable with the maximum value in each row is selected to be part of the respective factor. The values have been bolded (Table 3) in each of the rows to group the 9 variables into 4 core factors.

As furnished in Table 4, the first factor which included variables like; home delivery, a wide variety of products and the ability to compare prices (service factor) was mostly preferred by consumers in the online purchase of food products. This finding is very similar to the findings of Neger and Uddin (2020) who studied the behaviour of online shoppers during the COVID-19 pandemic. Adnan (2014) stated that product availability is one of the perceived advantages of online shopping in Pakistan, his finding is in line with the variable (wide variety of products) considered in this study.

Convenience and time-saving variables loaded higher in the second factor which could be named as easiness factor and was preferred by consumers after the service factor. This finding is comparable with the findings of Hasan

Table 3: Total variance explained using varimax rotation.

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings	
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	% of variance	Cumulative %
1.	2.40	26.68	26.68	2.40	26.68	26.68	18.11	18.11
2.	1.15	12.83	39.51	1.15	12.83	39.51	16.76	34.88
3.	1.11	12.38	51.90	1.11	12.38	51.90	15.70	50.58
4.	1.06	11.83	63.73	1.06	11.83	63.73	13.16	63.74
5.	0.85	9.53	73.27					
6.	0.68	7.55	80.82					
7.	0.63	7.03	87.85					
8.	0.60	6.71	94.56					
9.	0.48	5.43	100.00					

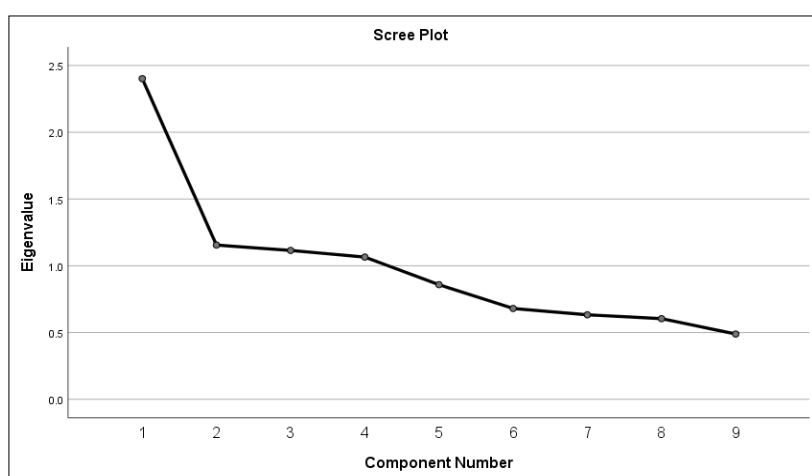


Fig 1: Scree plot for factors influencing the online purchase of food products.

and Rahim, (2008) and Wai *et al.* (2019) which indicated convenience as a positive factor in the behaviour of online shoppers.

Lower prices along with offers, discounts and lack of bargaining (pricing factor) were variables loaded higher in the third factor and hence preferred by consumers after the easiness factor. Bucko *et al.* (2018) also detailed the price as a leading factor in the online purchase behaviour of consumers.

Late working hours and limited access to B&M stores were variables loaded higher in the fourth or last factor we called it accessibility factor, which is preferred less by consumers towards online purchase of food products. We conclude that limited access to B&M stores and heavy working hours were not among the important motives for the online purchase of food products.

Identification of the constraints of online purchase of food products in Bangalore city

Principal component analysis was also used to study the limitation of online purchases of food products by consumers. As is clear in Table 5, the first four variables (perishability, problematic return policy, limited sensory information and security of information) loaded higher in the first factor. Thus, we conclude these variables as leading constraints of online purchase of food products. Similarly, Adnan (2014) examined the security of information under

the perceived risk of online shopping that affected negatively the process.

Delivery default and delay in delivery (variables) loaded higher in the second factor and are the second important factor limiting the online purchase of food products by consumers in Bangalore city. Delivery default and delivery delay were also found by Rani *et al.* (2019) as constraints of online shopping in Meghalaya, India. Further, Anthonysamy and Ignatius (2020) also illustrated delivery default and delays as leading constraints towards online shopping which is comparable with our findings.

Quality and price variables along with discounts were loaded higher in the third factor and lastly, payment method was a negligible limitation for consumers as it loaded last. Quality issues related to products purchased online were one of the leading constraints found by Rani *et al.* (2019) which is correspondent to our findings.

Sources of online purchase of food products used by consumers in Bangalore city

This study also examined platforms used by consumers for doing an online purchases in Bangalore city as furnished in Fig 2. Five major online platforms were taken for the study. We found that 47.37 per cent of consumers preferred to purchase food products from BigBasket followed by Amazon pantry (23.3%), Flipkart Supermart (16.54%), Nature Basket (7.52%) and Grofers (5.26%).

Table 4: Factors influencing the online purchase of food products in Bangalore city.

Attributes	Component			
	Service factor	Easiness factor	Pricing factor	Accessibility factor
Home delivery	0.784	0.187	-0.067	0.034
Wide variety of products	0.700	0.136	0.054	0.093
Ability to compare prices	0.591	-0.147	0.542	-0.102
Convenience	0.026	0.830	0.117	-0.14
Time saving	0.282	0.670	0.098	0.252
Lower price	-0.094	0.152	0.854	0.023
Offers and discounts	0.264	0.416	0.520	0.144
Late working hours in office	-0.033	-0.178	0.235	0.808
Limited access to B&M stores	0.127	0.261	-0.183	0.638

Table 5: Constraints of online purchase of food products in Bangalore city.

Limitations of online purchase	Components			
	1	2	3	4
Perishability	0.743	0.074	-0.118	-0.047
Problematic return policy	0.627	0.125	0.102	0.111
Limited sensory information	0.612	-0.026	-0.160	0.305
Security of information	0.575	0.154	0.351	-0.184
Delivery default	-0.095	0.521	-0.241	-0.045
Delivery charge	0.306	0.727	-0.029	-0.206
Low quality	-0.283	-0.218	0.670	0.139
Higher price	0.177	0.444	0.626	0.203
Lack of discount	-0.211	-0.108	0.863	-0.012
Payment method	0.059	0.041	0.015	0.931

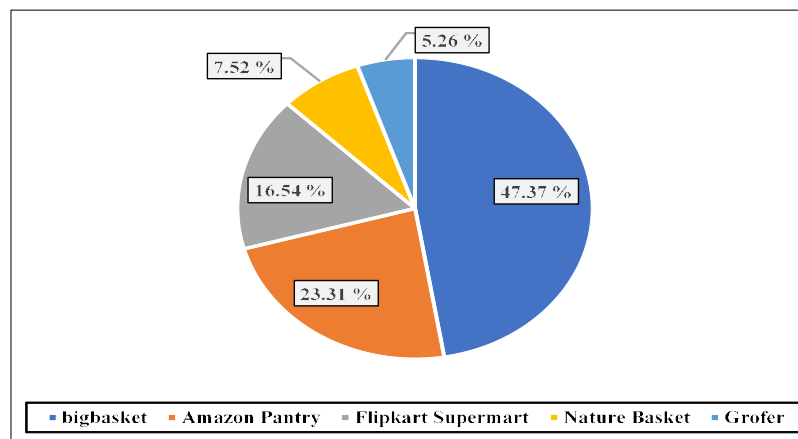


Fig 2: Sources of online purchase of food products used by consumers in Bangalore city.

Table 6: Comparison prices by consumers when doing online purchases of food products.

Comparison of price	No. of consumers	Percentage to the total
Yes	84	88.42
No	11	11.58
Total	95	100

Price comparison and payment in online purchase of food products

One of the advantages associated with online purchases is the ability of consumers to compare the price of products before placing an order or making a purchase on different online platforms. Henceforth, we also acquired this Information in Table 6 and found that the majority of consumers (88.42%) compare the price of products before placing an order. Contrary, 11.58 per cent of consumers mentioned that they do not compare prices at all. We concluded that online consumers are price sensitive and consider the price as an important factor when making online purchases.

CONCLUSION

The majority of consumers do look closely at the prices of products on different online platforms before ordering a product online, which indicates consumers are price sensitive toward online purchases and increase the nature of price competitiveness among online sellers. For this reason, online sellers are required to be efficient in their business process to deliver products at the minimum possible cost to maintain customer reputation. Customer services factors like home delivery, a wide variety of products and the ability to compare prices was the most preferred factor by consumers toward the online purchase of food products, calling online retailers to improve their home delivery services, include more product mix to their online platforms and make their product specifications visible to consumers (e.g., in Google search). Perishability, problematic return policy and security of information were

the major constraints of online purchase of food products. Henceforth, products (fruits, vegetables and meats) are required to be delivered freshly to consumers to bring business and customer reputation. Delivery default should be minimized to avoid customer complaints which would significantly reduce product returns by consumers. Furthermore, the security of information should be included in marketing efforts to make consumers understand their privacy is secured and build trusted relationships with consumers.

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