International Research Journal of MMC (IRJMMC)
ISSN 2717-4999 (Online) | 2717-4980 (Print)
Volume 7, Issue 1 | March 2026

Revisiting Consumer Behavior: Dominant Factors Shaping Consumer Rationality

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To Cite this article: Joshi, U. L., & Bhusal, B. P. (2026). Revisiting consumer behavior: Dominant factors shaping consumer rationality. *International Research Journal of MMC, 7*(1), 146–160. https://doi.org/10.3126/irjmmc.v7i1.93010

Submitted: 4 February 2025 **Accepted:** 25 February 2026 **Published:** 31 March 2026

Abstract

Consumer rationality concerned with the consumer behavior theory plays a significant role in the analysis of economic theories. Since rationality has been mainly influenced by a number of personal and socio-economic factors; age, education, gender, occupation, family size, individual's income and expenditure, there exists a relationship between rationality and among these factors. To examine whether such a linkage between the factors ensue or not in the developing countries' markets is the major focus of this study. If such a linkage exists, what are the dominant factors affecting rationality among them is another concern. To this extent, three dimensions – price, quality and brand were taken as the proxies of consumer rationality and data were collected through survey method by sending questionnaires to the respondents. Under the quantitative research design, the logistic regression model was employed to analyze the data. The results showed that all of the explanatory factors used in the system had more or less significant effect on the concerned rationality factors. The estimated results of the three models showed that the effect of education and occupation in all odd ratios was strong, the effect of age and expenditure hindered and nearly no effect of gender, family size and income. Therefore, among the explanatory variables taken in the estimation, education and occupation are the dominant factors in consumer rationality in Nepal. In the case of developing countries, it may have a significant importance to enhance the consumer's knowledge to the concerned stakeholders, producers, researchers and policy makers in their way of business and living in the present context.

Keywords: consumer behavior, knowledge, price, binary logistic regression

JEL Classification: D11, D83, E31, C35

1. Introduction

Do really the socio-economic and personal factors matter in consumer's rationality in the developing countries' people? This issue concerns with consumers not only at a time but at every time and to every people. However, concerning to this issue, researchers argue that consumer rationality-the degree to which the decision-making process-involves the collection of related information and the trust upon the analysis of that information in the selection of commodity (Dean & Sharfman, 1996). This decision-making process consists of multiple facets: cultural, social, personal and psychological conditions (Soster & Ristanov'c, 2023) and external factors: social ad cultural dimensions. Similarly, Arcidiacono et al. (2011) mention multidisciplinary dimensions: social, economic and psychological dimensions in decision-making. Sometimes there arise controversies in researches relevant to consumer behavior theory. Consumers in some cases are assumed to be rational and, in some cases, cannot be rational in their everyday economic activities. Taking an appropriate decision at right time and the way of selecting 'best action' hence, is termed as rationality in some context and the increasing ability to choose in the other. The issue is to be considering in the consumer behavior theory since the classical period; as a root assumption of both cardinal and ordinal analysis to explain certain phenomenon. The Rational Choice Theory concerns to the decision making and consumer's commodity selection behavior that is often applicable to the marketing decision (Jacoby, 2000).

The theories, laws and studies in economics rest on the assumption of rationality implies the consumer as a quality of being rational. When rationality factors relate to the information, it eases to solve the problems relevant to decision making. Remarkably, Microeconomic theories concern with consumer behavior also assume that rational consumers maximize their utility from all commodity bundles (Redmond, 2000).

Researchers, on the other hand, argue that consumers are not rational and they are biased from rationality due to a number of causes of their nature which implies raising controversies in consumer behavior. Then the assumption of rationality exhausts and possibly it becomes self-contradictory. When these ideal conditions hold constant, it is plausible under most of these conditions (Arrow, 2018). Contrasting conclusions have also perceived regarding rationality of consumer behavior so that they seem to depart from the assumptions of rationality (Redmond, 2000). It is also obvious that consumers' purchasing activities held on the basis of available information are concealed by the sellers. For instance, the cardholders are better informed about profitability of becoming riskier in the future to borrow more they became riskier (Brito & Hartley, 1995) that prevails adverse selection in case of credit cards. Information asymmetry is another cause of the availability of low level of information to the consumers and to be biased from rationality in their daily marketing behavior.

On the other hand, developing countries' people seem less aware on rationality concerns; price, quality and market where the factors like illiteracy and ignorance about the market knowledge make them such. It motivates researchers to be more focused in the study of consumers' behavior to be more conscious on their right to purchase the quality goods at reasonable price. In this regard, it is an attempt to examine consumer's rationality and factors affecting the rationality in the context of Nepal. The result of which can be supportive to consumers for appropriate marketing activities, supportive to producers to know the consumers' behavior at market to promote their sales and supportive to market experts and researchers for market analysis and the research.

The attempts to examine the linkage between consumer rationality and its determining factors are rare in the knowledge of the researchers in one hand. On the other hand, the factors affecting consumer rationality is an ongoing issue and seems essential to study the reality of consumer behavior in the current context of Nepal. In this scenario

research questions; what are the determinants of consumer rationality in the context of Nepal, how consumer rationality and its determining factors are related could be crucial to be researched by testing the hypotheses: H1: Factors affecting rationality have a significant effect on price, H2: Factors affecting rationality have a significant effect on quality and H3: Factors affecting rationality have a significant effect on brand.

In this regard, this study aims at examining the factors affecting the consumer rationality in the present context of Nepal and to examine the relationship between consumer rationality and the factors affecting it. And aims to examine which are the dominant one among those affecting factors? Some statistical tools including logistic model are utilized to test whether there exist any linkages between rationality, i.e., price, quality and brand of the commodity and their determinants or not.

2. Literature Review

The classical economists introduced rationality as an assumption of cardinal utility approach in the consumer's behavior theories. Beyond it, this assumption widely used by the Ordinalists followed by modern economists. Modern economists widely presume this assumption providing as a strong implication of the complexity of individual's decision-making process (Arrow, 1986). Absence of persistent behavior in purchasing activities of consumer arises controversies in research. To dig out the gap and the hidden behavior of the consumers, we reviewed a few relevant researches published in journals, international conferences papers and books.

Rationality becomes a common assumption to explain certain phenomenon comfortably, nonetheless economics and law cannot exist without theory of rationality (Hovencamp, 1991). Individual's behavior could be explained on the basis of rationality assumption with the goal of maximizing their expected utility. The rationality maximizers are those who try to apply the basic assumption of economics (Jacoby, 2000).

Empiricists verified that consumers are rational to purchase goods and services. Balakrishnan et al. (2000) model to examine the rationality of the consumer's by calculating the efficiency of individual consumer choice using EDA model. Their findings conclude consumers are rational in the sense of choosing the economically most efficient brand and the predictions are dependent of economic efficiency. Anckar (2003) explores the consumer rationality in terms of electronic market and he says that electronic market activities are primary drivers to adopt or reject internet and e-commerce relating to the behavior of rational consumer from the proposed value perspective.

Despite the evidence supporting the consumer behavior, there are literatures to show the consumer's biasedness from the concept of rationality, for instance, Brito and Hartley (1995) explore the behavior pattern of the modern consumers in which they behave irrationally when they borrow on credit cards at high interest rates. In such cases, cost effectiveness in market activities takes place because low transaction costs can make credit cards more attractive relative to bank loan. In the vast and emerging consumer contexts, consumer behavior is not always guided by rationality.

Sometimes the assumption of consumer's effective pursuance of interest predicts important social benefits of the market system that shows the deviation of rationality. For instance, in US, high consumption expenditure lowers the level of savings (Redmond, 2000). In such a context, consumers seem to deviate from the assumption of rationality. The purchasing decision could present consumer rationality in terms of economic, social and psychological aspects which supports the need for multidisciplinary perspective (Arcidiacono et al., 2011) to analyze the purchasing decision. Arcidiacono et al. further ascertain the hypothesis of a critical consumer that appears to blur with a strong sensitivity to price from the decision-making process. It reveals the persistence of traditional attitudes

and the emergence of new cohorts of stimulation on customers, as shown by the focus on quality.

The factors affecting to rationality have been tested under the assumption of consumer rationality as a major assumption in consumer behavior theory. The past studies predicted that the factors affecting the rationality had certain influence on rationality and different consumer's behavior pattern were explained in specific situation. The consumer rationality could have been affected by price and quality that a consumer can use the strategies of price aversion, best value and price-seeking (Tellis & Gaeth, 1990). Tellis and Gaeth found that price seeking behavior due to inference is strictly rational and it can lead to positive response to price in the case of low-quality information.

Hartman et al. (1991) found that consumer rationality is affected by status quo and the consumers present the bias behavior and conclude that consumers attach with "undue" importance to the commodity presenting the "irrational" behavior and reluctant to switch bundle of alternatives. So, consumers' decisions sometimes are guided by their innocent and emotional feelings instead of rationality. Some of the studies like Bazerman (2001) points out that most of the existing literature are implicitly biased towards marketing perspective and are focused on the development of knowledge that influence the consumer's purchase. In the consumer's behavior analysis, the studies need to be concentrated on their actions and decisions on market activities rather to find their biases.

Rationality is also assumed to be highly influenced by the market information. the extent at which the consumers are familiar with the information regarding the commodity and market conditions, they know, matter in the purchasing activities. At the same time, information asymmetry prevails in the market that consumers have less information about products than sellers or producers in the market. Likewise, the educated consumers search more about the commodity than the less educated consumer (Menon et al., 2007). However, parents do not utilize all available information in assessing the quality of goods as Mocan (2007) considers asymmetric information and adverse selection factors in testing consumer's rationality by adjusting the scale effect to test consumer's rationality in presence of asymmetric information and adverse selection (Mocan, 2007).

At the same time, some consumers exactly do not know what they want due to lack of information asymmetry that they are inconsistent about rationality (Dhar et al., 2008). Therefore, in absence of such prior subsistence information consumer's preferences can be constructed.

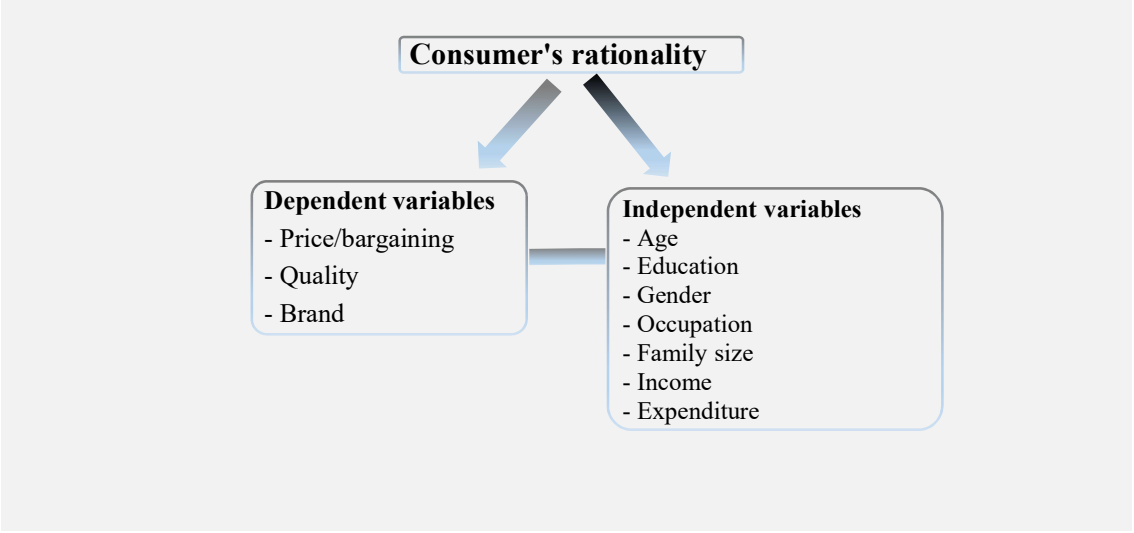
In the previous studies, the consumer rationality researched with related different factors but the study of examining the linkages between consumer rationality and the factors affecting it, especially, in the case of developing countries like Nepal are rare in researcher's view. In this regard, here, we conducted this study to examine the relationship between consumer rationality and the factors affecting it in the context of Nepal.

2.1 Conceptual Framework

The concept of rationality suggests in economic aspect that consumers are conscious in price, brand and quality in marketing activities. Consumers are mostly affected by the price of commodity. In consumer behavior analysis, price is an important aspect of rationality (McFadden, 1996). Their preference for a brand depends on their cognitive beliefs (Bass & Talarzyk, 1972) so that brand preference can be measured to use in the algebraic model (Bagozzi,1982) in the consumer rationality analysis. Likewise, in the consumer rationality, quality of durable goods is a fundamental factor on the basis of which there is high probability of buying goods in the market (Tellis & Gaeth, 1990) because consumers select the quality goods (Friedman, 1967). Therefore, in this study, consumer rationality is proxied by the factors; price, quality and brand of goods. How

consumers behave in the marketing activities and how they respond to price and commodity related factors is the major focus in this study. In this regard, to analyze the data collected from Hetauda sub-metropolitan city-Nepal, are categorized into two forms: one as dependent variable (price/bargaining, quality and brand) and others the independent variables limiting into personal and socio-economic variables (age, education, income, family size and expenditure) as presented in the Figure no. 1.

Figure 1: *Conceptual framework*



3. Research Methodology

The process of data collection was based on the quantitative way especially survey method applying the interview tool. The interview was taken through structured questionnaire in the year 2022 at shopping centers of Hetauda MC, Nepal. The questionnaire was evaluated by a panel of expert academics for the face validity which judged the quality in terms of wording, structure and content. The major focus of the panel was whether the questionnaire fulfills the objectives or not? The study area was selected on the basis of convenience method of sampling technique to be seemed appropriate to interview the people through questionnaire because interviewing people at shopping centres is convenient where people come together (Suwal, 2020; p. 62). The methodology completed in the stages; sample units' selection, questionnaire formation followed by pilot test, reform of questionnaires after pilot test, data collection through questionnaires, data entry and analysis and report the results and discussion on the results.

Primarily, to conduct survey, the people of shopping centres at Hetauda MC were considered as population and the minimum numbers of sample units were determined by using Cochran's (1977) sample units selection criterion recommended by Kothari (2011) and Suwal (2020); $n = \frac{z^2pq}{e^2}$, where, n = sample size, z = Z score = 1.96 at 95% confidence level, p = proportion of population = 0.5, q = 1-p = 0.5 and e = margin of error = 0.05 . Therefore, following this method minimum number of sample units required for the analysis is 385. Each unit of the determined samples was selected under simple random sampling method that provides representativeness of the population and can help to avoid sampling bias. The results obtained from it will increase precision that can be generalized (Soster & Ristanovi´c, 2023).

The constructed questionnaire which was validated by the expert's group was sent to 40 respondents, i.e., about 10% of the total sample units (as prescribed by Cocks, and

Torgerson, 2013) for piloting to test the reliability of the questionnaires. After receiving the answers of 10% respondents, the reliability test was performed by employing the Cronbach alpha test, where, $\alpha = \frac{N*\bar{c}}{\bar{v}+(N-1)*\bar{c}}$ defining; N = number of samples, $\bar{c}$ = mean covariance between items, $\bar{v}$ = mean item variance. Then, the calculated Cronbach's alpha values are reported in Table no. 1.

Table 1: *Values of Cronbach's alpha*

Dependent variables	α-value
Price	0.829
Quality	0.812
Brand	0.804
Total numbers of sample units taken for pilot test	40

Source: *calculated by authors using the data obtained from the survey.*

Cronbach's alphas in all three dimensions of consumer rationality were more than 0.7 predicts the reliable state of the questionnaire to be eligible for data collection process. Then, the collected data through structured questionnaire were entered into the computer and constructed variables are presented in Table no. 2.

Table 2: *Description of the variables*

Variables	Descriptions
RATYp	rationality on price (ask price; yes = 1, no = 0)
BARG	Bargaining (bargain for price; yes = 1, no = 0)
RATYq	Rationality on quality (consider quality; yes = 1, no = 0)
RATYb	Rationality on brand (consider brand; yes = 1, no = 0)
AGE	Age (based on the income earners group ranges from 20 to 72 years)
GEN	Gender (male = 0 or female = 1)
EDU	Education level (illiterate =1, literate = 2, primary = 3, secondary = 4, bachelor = 5, above bachelors = 6)
OCC	Occupation (agriculture = 1, business = 2, service = 3, labor = 4, household = 5, others = 6)
FS	Family size (number of family members)
INC	Log of Income (monthly money income in Rs.)
EXP	Log of Expenditure (monthly expenditure in Rs.)

The variables as explained and summarized in the Table 2 were utilized in the model test.

3.1 Theoretical background and econometric model setup

Among the consumer behavior theories, Duesenberry (1949) profound a theory based on consumer behavior which explains the consumption level depends on the relative income but not on the absolute income of the consumer which implies a person's consumption does not depend on his current income but depends on a the previous level of income. He further clarifies consumers imitate their neighbours, peers, friends so that consumption is guided by imitation not by rationality. therefore, this theory can be interpreted in two grounds; Demonstration effect and Ratchet effect which affect consumption behavior.

On the other hand, Rational Expectation Model hypothesize that economic agents such as workers and firms do not know the future with certainty so they take their decisions on their future what they expect. Therefore, the economic man can make rational expectation if he has full information forecasting to the future. However, his forecast may not always be correct to form expectation and can be surprised by monetary surprises.

Similarly, the modern `Consumer Culture Theory' based on 20 years of research shows that many consumers lives are constructed by the multiple realities of their lives and they use consumption pattern to those realities. The theory more explores multiple meaning of the society's cultural groups within the frame of globalized context and market capitalism (Arnould et al., 2005). .

Some of these consumer behavior theories indicate consumers are rational in their marketing activities responding with different socio-economic and personal factors and consumer behavior is affected by multiple realities.

The theories of consumer behavior guide to diagnose a linkage among consumer rationality and socio-economic and personal factors affecting rationality as conceptualize in Figure 1. To set up an appropriate econometric model to examine the effect of factors affecting the rationality, the logistic regression model-an extension of multiple regression model where dependent variable takes the value either 1 or 0. Since the dependent variables originated due to qualitative nature and take value binary or dichotomously the logistic model is appropriate (Madnani, 2015). The mathematical form of logit model is expressed as; Li $=ln\left(\frac{Pi}{1-Pi}\right)$, or, Zi $=\beta_0+\sum_{i=1}^{7}\beta i$Xi

Consumer rationality as dependent variables quantified to the dichotomously as either 1 or 0 are regressed with independent variables. To estimate the relationship among the variables, the empirical model takes the form; Y = $f(\beta 0+\sum_{i=1}^{7}\beta i$Xi+Ɛi) and Y = $\begin{cases} 1 \; shows\ consumer\ is\ rational \\ 0 \; otherwise \end{cases}$

Elaborating the Xis in actual variables to be utilized in the analysis the econometric model will be as; Y = $\alpha_i + \beta_1$AGE + β_2EDU + β_3GEN + β_4OCC + β_5 FS + β_6 INC + β_7EXP + Ɛi, where, Ɛi is the error term and the symbols of the variables are as described in the Table 2.

For the simplicity of analysis and to reduce the heteroskedasticity income and expenditure are transferred into log form in the model. Since there is high probability of presence of strong correlation between income and expenditure, the final form of the econometric model is divided into the following two types; one with income and without expenditure and another without income and with expenditure.

$RATY_{(p, q, b)} = \alpha_i + \beta_1$AGE + β_2EDU + β_3GEN + β_4OCC + β_5FS + β_6 INC + Ɛi ……. (i)

$RATY_{(p, q, b)} = \alpha_i + \beta_1$AGE + β_2EDU + β_3GEN + β_4OCC + β_5FS + β_6 EXP + Ɛi ……. (ii)

The consumer's rationality on price, quality and brand of the commodity are represented by RATYs which take the value in binary form or the rationality indicates its value either 1 and 0 otherwise. Finally, the equations (i) and (ii) are the final form of econometric models to be utilized in the estimation process.

4. Results and Discussion

4.1 Summary description of the factors

We specify the general profile of the total sample units i.e., 385 respondents taken in the survey before estimating the relationship. The ages of respondents were between the group 20 to 72 years. The education levels as a personal characteristic of the respondents shows higher percentage, i.e., 48.1% in secondary level in the survey. Looking through gender perspective, among the total units 71.4% were male and 28.6% were female with different occupation holders where 33.5% were of business categories and 41.0% are engaged in service sector. We also considered a variable; family size where 34.5 per cent respondents were of 4 members in their family or less in number and 1.1 percent have 12 to 14 members.

Table 3: *Summary of the data*

	Age	Education	Occupation	Family Size	Income	Expenditure
Mean	38.23	4.30	2.73	5.19	4.42	4.18
Median	37.00	4.00	3.00	5.00	4.40	4.18
Maximum	72.00	6.00	6.00	14.00	5.18	5.10
Minimum	20.00	1.00	1.00	2.00	3.90	3.60
Std. Dev	9.46	0.94	1.05	1.57	0.19	0.22
Skewness	0.72	-0.58	0.66	1.54	0.21	-0.20
Kurtosis	3.29	4.77	3.50	8.39	3.87	3.52
Jarque-Bera	34.65	72.00	32.27	619.30	14.92	6.97
Probability	0.000	0.000	0.000	0.000	0.000	0.030
Observations	385	385	385	385	385	385

As aforementioned, consumer rationality is measured in three dimensions - price, quality and brand. Rationality in terms of price, yes/no type questions like 'Do you purchase goods looking at the pricelist? was asked at the beginning. In this question, 95.1% answered in 'Yes' and 4.9% replied in 'No' and that shows majority of the respondents are in favor of pricelist.

Quality as a second dimension of rationality, six questions were asked in this issue. Quality dimension is the most frequently selected priority among other dimensions in the rationality research (Arcidiacono et al., 2011). In this concern, the question was, 'Do you purchase higher priced quality goods?'. Out of total respondents 66.2% answered in 'Yes' and 33.8% of them answered in 'No' to answer this question.

Brand as the third dimension of rationality and five questions were set for this dimension. Among these questions, one of the questions was related to 'Five brand names of the products.' Among the respondents, 27% answers were in 'No' and 76% responses were of 'Yes' in this context.

4.2 Inferential analysis

To examine the effect of independent variables on the dependent variables whose values are of dichotomous type, logistic regression estimation method is appropriate (Liu, 2018). Therefore, in this analysis to examine the effect of the regressants: age, education, gender, occupation, family size, income and expenditure of the consumer on dichotomous variables: price/bargaining, brand and quality this model is employed. The survey data collected from valid questionnaire were entered into SPSS and are analysed by using software STATA. Strongly correlated variables; log of income and expenditure are prevented to use in same model in the analysis, i.e., two separate models were run separately to estimate the coefficients.

Table 4: *Results from the data analysis*

	Model 1				Model 2		Model 3	
Variables	Price		Bargaining		Quality		Brand	
	1a	1b	1a'	1b'	2a	2b	3a	3b
Constant	1.27**	-0.19	1.084*	1.45***	1.08*	-0.29	1.49***	0.489
	(0.03)	(0.69)	(0.064)	(0.003)	(0.071)	(0.565)	(0.007)	(0.301)
Age	-0.001	-0.004	-0.005*	-0.004*	-0.0002	-0.002	0.005**	0.004
	(0.553)	(0.139)	(0.056)	(0.099)	(0.943)	(0.374)	(0.038)	(0.13)
Education	0.07***	0.04	-0.06**	-0.04*	0.08***	0.049*	0.119***	0.097***

	(0.007)	(0.153)	(0.038)	(0.084)	(0.005)	(0.093)	(0.000)	(0.000)
Gender	0.003	0.03	0.09	0.08	0.02	0.059	-0.09*	-0.072
	(0.946)	(0.473)	(0.098)	(0.13)	(0.644)	(0.289)	(0.067)	(0.17)
Occupation	-0.16***	-0.15***	0.05**	0.05**	-0.14***	-0.14***	-0.047**	-0.046**
	(0.000)	(0.000)	(0.013)	(0.018)	(0.000)	(0.000)	(0.029)	(0.034)
Family size	-0.013	-0.01	0.01	0.014	-0.01	-0.016	-0.023*	-0.023*
	(0.324)	(0.366)	(0.272)	(0.285)	(0.208)	(0.236)	(0.065)	(0.072)
Income	-0.14	------	-0.04	------	-0.12	------	-0.27**	------
	(0.297)	------	(0.771)	------	(0.38)	------	(0.043)	-------
Expenditure	------	0.24**	------	-0.14	------	0.244*	------	-0.016
	-------	(0.05)	------	(0.245)	------	(0.06)	------	(0.892)
R-squared	0.130	0.12	0.056	0.044	0.09	0.097	0.0709	0.06
F (6, 378)	9.45	9.98	3.78	4.00	7.41	7.93	4.81	4.09
P-values	0.000	0.000	0.0011	0.0007	0.0000	0.0000	0.0001	0.0006
No. of obs.	385	385	385	385	385	385	385	385

Note: **,** and *** show significant at 0.1, 0.05 and 0.01 level respectively. Values in the parenthesis represent the p-values.*

The estimated coefficients of the variables using logit regression model with all six regressors including income and expenditure in separate models are reported in Table no. 4.

4.3 Interpretation of the results

H1: Factors affecting rationality have significant effect on price of the commodity: Price rationality and bargaining in price

Model 1 has tested the effect of independent variables on price and bargaining activities or this model is guided by hypothesis 1. The inclusion of age in the model was to test whether age matter to ask the price of commodity or not. Age with bargaining is significant at 10% level with negative coefficient (i.e., β_1 = -0.005 and p=0.056 in 1a' and β_1 = -0.004 and p=0.088 in 1b'), education with price is positively associated (i.e., β_2 = 0.07 and p=0.007 in 1a and β_2 = -0.004 and p=0.088 in 1b') and with bargaining negatively linked at 1% to 10%, occupation with both dependent variables at 1% to 5% and expenditure only with price at 5% level with positively and significantly associated.

In this way, the factors education, occupation and expenditure are strongly associated with the dependent variables in this model. The significance of F-statistics (6, 378) with values 7.41 and 7.93 in the model indicates the model is best fit. the rejection of null and the acceptance of alternative hypothesis implies there is significant relationship between factors affecting the rationality and price of the commodity.

H2: Factors affecting rationality have significant effect on quality of the commodity: Quality rationality

Rationality on quality (model 2) is estimated with the same variables as in model 1. In this model, the independent variables; education, occupation and expenditure including constant term are significant to explain the dependent variables but other variables age, gender, income and family size are not significant to explain the rationality on quality. Selection of quality may associate with the income level of the people because wealthy or sophisticated people may value quality highly (Tellis & Gaeth, 1990). Nepal as low PCI country, such a character may be reflected in marketing activities. The probability of F-statistics (6, 378) with values 7.41 and 7.93 respectively in income and expenditure model with p-value = 0.000<0.01 indicates the model is best fit.

H3: Factors affecting rationality have significant effect on brand of the commodity: Brand rationality

Model 3 estimates the level of effect of independent variables on rationality on brand. Similar process as in former models is applied here, i.e., model 3a consists of the independent variables with income and without expenditure and 3b consists of the independent variables with expenditure instead of income. In model 3a, all the independent variables used in the estimation are significant at different level of significance. In this case, age at 5% level with positive coefficient (0.038), education at 1% ($p = 0.000$) with positive value 0.119, gender at 10% ($p = 0.067$) level with negative value -0.09, occupation at 5% ($p = 0.029$) with negative coefficient (-0.047), family size at 10% ($p = 0.065<0.1$) with negative coefficient (-0.023) and income at 5% ($p = 0.043$) with negative coefficient (-0.27) are significant.

Likewise, in the same model, i.e., model with dependent variable brand, 3b is constructed without income but with expenditure shows few variables are associated with brand. Here only a few independent variables used in the estimation were significant at different level of significance with brand. In this case, education at 1% ($p = 0.000$) with positive value (0.097), occupation at 5% ($p = 0.034$) with negative coefficient (-0.046) and family size at 10% ($p = 0.072$) with negative coefficient (-0.023) were significant. The model in this model 3 seems best-fit because F-statistics (6, 378) with values 4.81 and 4.09 respectively in income and expenditure model with p-values = $0.0001<0.01$ and = $0.0006<0.01$ respectively indicate the models were best fit.

4.4 Discussion on findings

To explore the effects of factors affecting the consumer rationality, we turn to logistic regression analysis using some socio-economic and personal variables. The three models of odd ratios price/bargaining, quality and brand are tested with particular variables; age, gender, education, occupation, family size, income and expenditure. Some of the key factors are linked to proxies of rationality providing strong evidence of their association with rationality in marketing activities in Nepal.

Among the factors affecting rationality, age is significantly and negatively associated with bargaining, i.e., $\beta_1 = -0.005$ and $p = 0.056<0.1$ in 1a' and $\beta_1 = -0.004$ and $p = 0.099<0.1$ in 1b' implies aged people are not likely to bargain for price and age is positively associated with brand, i.e., $\beta_1 = 0.005$ and $p = 0.038<0.05$ in 3a indicates probability of choosing brand increases by 0.03 if there is one unit increase in age of people implies they are more concern about the brand. However, age factor is not significant in all cases.

Another variable education revealed positively and significantly (i.e., $\beta_2 = 0.07$ and $p = 0.007<0.01$ in 1a) with price implies increase in the level of education has probabilities of asking the price it is because the educated consumers search more information including price about the commodity (Menon, et al. 2007). But this factor is negatively and significantly associated with bargaining (i.e., $\beta_2 = -0.06$ and $p = 0.038<0.05$ in 1a' and (i.e., $\beta_2 = -0.04$ and $p = 0.084<0.1$ in 1b'). The psychological factor like educated people are unlikely to bargain on price may associate with this case.

The significant and positive coefficients of education in model 2 (i.e., $\beta_2 = 0.08$ and $p = 0.005<0.01$ in 2a and $\beta_2 = 0.049$ and $p = 0.093<0.1$ in 2b) implies an increase in education level leads to increase in the probability of selecting the quality of commodity. Since the more educated and conscious people search for durable goods (Tellis & Gaeth, 1990) and one of the criteria to choose commodity is also quality. Likewise, the positive coefficient of education in model 3 (i.e., $\beta_2 = 0.119$ and $p = 0.000<0.01$ in 3a and $\beta_2 =$

0.097 and p = 0.000<0.1 in 3b) indicates an increase in education level increases the probability of selecting the brand.

In the same way, gender is negative and significant (i.e., β_3 = -0.09 and p = 0.067<0.1 only in 3a) with brand implies one unit change in gender leads to 0.09 units change in brand selection in the opposite direction, i.e., females are unlikely to choose brand rather than male. However, this factor does not have significant effect on other dependent variables.

Occupation, in all cases, is significantly correlated with rationality proxies. In model 1a, it is negatively associated with price (i.e., β_4 = -0.16 and p = 0.000<0.01 in 1a and β_4 = -0.15 and p = 0.000<0.01 in 1b) and positively associated with bargaining (β_4 = 0.05 and p = 0.013<0.05 in 1a' and β_4 = 0.05 and p = 0.018<0.05 in 1b'). As the occupation of the people shifts from agriculture to other sectors, they are likely to bargain rather than asking price. Inversely, people engaged in agriculture are likely to ask price of the commodity. In the first model with price, the coefficient of occupation negative and significant implies people are unlikely to ask price as there is probability of changing occupation from agriculture to other sectors and the positive coefficient of bargaining imply there is higher probability of bargaining on the price. On the other hand, in model 2, the negative and significant coefficient (β_4 = -0.14 and p = 0.000<0.01 in 2a and β_4 = -0.14 and p = 0.000<0.01 in 2b) of occupation implies as the occupation of people shifts from agriculture to other sectors the probability of selecting quality is unlikely to increase by 14%. Similarly, same negative pattern of occupation (β_4 = -0.047 and p = 0.029<0.05 in 3a and β_4 = -0.046 and p = 0.034<0.05 in 3b) indicates shifting occupation towards from agriculture to other sectors discourages in brand selection. When the occupation of people of developing countries shifts from agriculture to other sectors (mainly non-business sectors to money earning sectors) their habit shifts to savings because commodities with brand and quality cost higher in comparison to low quality commodity. High spending people may search for high quality product in the market. But the average income of Nepalese people is very low so that they may not be more sensitive to the quality and brand of the commodity.

Whether the family members matter or not in the rationality on marketing was one of our enquiries. The coefficient of family size is negatively significant (β_5 = -0.023 and p = 0.065<0.1 in 3a) implies that if the family member increases by one unit the odd ratio decreases by 0.023 units indicating family size is also sensitive to brand so that increase in family size discourages the brand selection. So, people search for non-branded commodities and the consumers minimize expenses (Tellis & Gaeth, 1990) as the family size increases which can be seen in the people of developing countries in these days.

The negative relationship between income and brand (β_6 = -0.27 and p = 0.043<0.05 in 3a) matches with the view of Modigliani (1970) later confirmed by Carrol and Weil (1994) who explains people tend to save money by cutting the level of expenditure as their income increases, i.e., income and saving are positively correlated such that people cut their expenditure to save money. Or higher income growth leads to higher saving rather than spending on branded goods. Similarly, the consumer's monthly expenditure is correlated with price and quality (β_7 = 0.24 and p = 0.05=0.05 in 1a and β_7 = 0.244 and p = 0.06<0.1 in 2b) implies as the household expenditure increases it tends to ask for price for the intention of low price and durable goods or quality product.

The results from the estimation of three models show that effect of education and occupation is strong, hinders the effect of age and expenditure and nearly no effect of gender, family size and income. Therefore, education and occupation are the dominant factors in consumer rationality in Nepal.

A major problem in the analysis could be the presence of multicollinearity in the estimation. To test whether there is presence of such problem or not, Variance Inflation Factor (VIF) test is performed.

Table 5: *VIF values*

Variables	Model 1a	Model 1b	Model 2a	Model 2b	Model 3a	Model 3b
Constant	NA	NA	NA	NA	NA	NA
Age	1.32	1.24	1.31	1.32	1.32	1.32
Education	1.36	1.32	1.36	1.34	1.36	1.34
Gender	1.18	1.21	1.18	1.15	1.18	1.15
Occupation	1.06	1.30	1.06	1.06	1.06	1.06
Family size	1.02	1.01	1.02	1.02	1.02	1.02
Income	1.42	------	1.42	------	1.42	------
Expenditure	--------	1.31	------	1.38	------	1.38

Source: *author's calculations*

The results from the VIF evaluation values presented in Table 5 depicts the values of VIF in all models are less than 5 and it implies models are free of multicollinearity problems to run the regression.

5. Conclusion

This study delved into the consumer's rationality on marketing activities with the objective of examining the factors affecting rationality in the Nepalese context. Three dimensions of binary dependent rationality variables (i.e., rationality = 1 and 0 otherwise); price, quality and brand were tested by the socio-economic and demographic factors; age, education, gender, occupation, family size, income and expenditure. The logistic regression model was selected as the best fit model to explain the probability of odds ratio of consumer rationality on independent variables. The results provide the figures to predict the effect of rationality and the determinants of rationality in the context of Nepal.

A number of factors influence the consumer rationality and a significant relationship is observed between the proxies of rationality and the factors affecting it, i.e., the variables taken in the sample; age, education, gender, occupation, family size, income and expenditure are the determining factors of rationality. Regarding the rationality factors, all factors are sensitive to brand of the commodity. Senior and more educated people's behavior with this dependent odd associate positively, but females seem not to care about brand. A change in the people's occupation from agriculture to other sectors, increase in the size of family and increase in the income of people are seemed to negatively reacting with brand. Regarding the factors affecting to rationality, on the other hand, the externality effect of education and occupation on rationality of developing countries' people is observed. Education and occupation are strongly correlating factors to rationality proxies. Whereas the factors; age and expenditure moderately, and gender, family size and income are weakly affecting factors. It provides some evidence of personal and socio-economic factors affecting to rationality. However, due to low and subsistence level of income they cannot express their rationality on marketing or due to limited income they buy the cheaper commodities whatever they find without concerning brand and quality, but it remains an issue to be researched. This research may have a significant importance to enhance knowledge about the consumer behavior to the concerned stakeholders, consumers, producers, experts, researchers and policy makers in their way of business and living in the present context.

However, relatively inelastic and inconsistent effects of determinants on rationality creates a gap for further research to establish a consistent and stable relationship in this field for the case of developing economies.

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