

**A BEHAVIOURAL STUDY ON THE PROSPECT THEORY
ANALYSIS OF WORKERS IN THE ONLINE FOOD MARKET;
A CASE STUDY ON THE SAMBALPUR DISTRICT OF
ODISHA WITH A SPECIAL REFERENCE TO ZOMATO
VALET BOYS**

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Abstract

The present study has focuses on the key aspect of labourer behaviour from the prospect theory and the framing effect point of view. By collecting primary data of the Zomato valets or Zomato delivery boys in the studied area, the present article has clearly defined the various reasons for leaving the previous jobs of the respondents as well as the different lucrative aspects of Zomato which pull the labourers from the other unorganised sectors of the city. The Daniel Kahneman and Amos Tversky prospect theory model has been applied in this study. Both the value function graph and mathematical model of the prospect theory model has satisfied the objectives of the study which is to compare the socio-economic conditions of the respondents between the previous and present job as well as to analyse the major aspects of Zomato to make the company attractive for the workers. To describe the framing effect, the present study has also consider the consumer rating platform of Zomato and its importance in attracting the workers from various unorganised sectors of the studied area.

Keywords:prospect theory, framing effect, valet boys, consumer rating

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1. Introduction

1.1 The unorganised labour force in India: - Background

The Indian economy is characterised by the existence of a vast majority of informal or unorganised labour employment. As per the survey carried out by the National Sample Survey Organisation (NSSO) in 2009-10, the total employment in the country was of 46.5 crores comprising around 2.8 crores in the organised and the remaining 43.7 crores workers in the unorganised sector. Out of these workers in the unorganised sector, there are 24.6 crores workers employed in the agricultural sector, about 4.4 crores in construction work and remaining in manufacturing and service. This unorganised sector prevails both in urban and rural sectors of India. The lack of security, high risk, the uncertainty of job and irregularities in wages are the major drawbacks of unorganised sectors. Urban youths are always in search of a settled job having robust security but having a lack of skill, they get stuck in the unstable sectors like small scale industry, construction sites, trade and transport etc. The urban unorganised sector also includes street vendors, head load workers, garment makers, rag pickers, restaurant waiters etc. Workers in these sectors are the victim of overexploitation and differential treatment.

1.2 Zomato in India: - The genesis

The last few years have experienced a shift in the traditional set up of understanding about the nature of employment and what constitutes work. In India, the unorganised sectors have evolved to a tremendous extent as a result of the rapid expansion service sector in both urban and semi-urban area. Keeping pace with these changes and running parallel with the modern concept of employment, a large number of food delivery platforms have been introduced in India. With the cheaper access to information and communication technology many online platforms like Zomato, Swiggy,

Uber eat, Ola, Urban Clap, Airnb have been introduced in India. The nature of the work is purely 'on-demand' and temporary. The participation may be regular or occasional and can be done for primary or supplementary earnings. Zomato is an Indian restaurant aggregator and food delivery start-up founded by Deepinder Goyal in July 2008. It served the countries like Australia, Brazil, Chile, Czech Republic, India, Indonesia, Ireland, USA, UK, UAE, South Africa, and Singapore etc having more than 5000 employees around the world.

1.3 Zomato: ensuring part-time organised work to unorganised labourers

For smooth facilitation of services to its consumers, Zomato is hiring delivery partner/ rider and considered them as Valet Boys. These Valet boys are hired purely on a temporary basis and their earnings depend on the factors such as the number of deliveries completed, the distance they covered and the ratings given by the consumer. The income on this platform is very lucrative and is worker friendly as there is no pre-contractual agreement; people on their will can join and leave the job. As a result of this, the labourers of the unorganised sector which were previously involved in other kinds of part-time job leaving the previous one to join as Zomato Valet. The trend of part-time work in the unskilled sector has dramatically changed after the introduction of Zomato. The absence of casteism, lack of exploitation and nepotism, fair wage, the satisfaction of job are some of the major factors which causes a shift from the traditional concept of urban employment to ICT based job opportunity.

1.4 Prospect theory in labour behaviour analysis- An overview

The prospect theory has been developed by Daniel Kahneman and Amos Tversky in 1979. They opposed the expected utility theory of John von Neumann and Oskar Morgenstern in 1944. This theory describes how individuals predict their gain and loss in an asymmetric manner. According to the expected utility theory, economic agents are rational but the

prospect theory considers the actual behaviour of people. Starting with the concept of loss aversion, prospect theory describes the differences in the reaction of the people reaction in estimating potential losses and potential gains. Based on the specific reference points, people estimate their potential gains and losses. This point is known as the reference point.

The prospect theory describes two kinds of situation as the following: -

- When people confronted with a risky choice leading which leads to gains, at that time individuals act as risk-averse, adopting solution which leads to a lower expected utility but with a higher certainty.
- When people faced with a risky choice leading to losses, at that time individuals act as risk-seeker, adopting solution which leads to a lower expected utility as long as it has the potential to avoid losses.

In the second concept of this theory focuses on the observation that people give higher weight to events with low probabilities and lower weight to events with high probability. The theory describes the decision process in two stages namely editing and evaluation.

- In the initial phase of editing, decisions are ordered according to certain heuristic and in particular, people set reference point and consider lesser outcomes as losses and greater one as gains. This phase aims to alleviate any kind of framing effect.
- In the evaluation stage, people behave as if they would compute a value (utility), based on their potential outcomes and their respective probabilities, and then choose the alternative having higher utility.

2 Review of related literature

This chapter of an extensive review of literature is highly essential for the present designing of this paper. This section of this paper throws light on

the previous work done by many researchers over the world on the online food marketing and its impact on consumer behaviour as well as on the labour market of different sector. How-ever a few related studies have been conducted so far on the present aspect. Some of the pre-existed works and report has been stated below: -

Gunther Schmid, (2005), points out the key aspect of prospect theory in his analysis of social risk management through transitional labour markets. He presented some stylised facts of new labour market risks and recommended some remarkable structures of opportunities to overcome the problems of different asymmetries in the perceptions of different risks. He also introduced the Sen's approach of capabilities, Rawls' theory and bounded rationality.

Fabio D'Orlando and Francesco Ferrante, (2008), draw some clues like endowment effect, loss aversion and hedonic adaptation from the behavioural economics to study the demand for job protection. They studied the social protection system, explanatory role of education and effect of employment protection legislation from the empirical evidence of OECD countries. They took the 15-year longitudinal data of OECD countries to test the hedonic effect.

Linda Babcock, et al,(2012), emphasized on the behavioural insight of the labour economic theory. In this paper, they review the key implications of behavioural economics and associate these theories relating to procrastination, difficulties in complexity dealing and labour market potential. They also suggested some policy implication regarding unemployment compensation, assistance in job searching procedure and training. They also reflected how the outcomes of labour market policies are the results of behavioural responses.

Varsha Chavan, et al, (2015), in their research "Implementing Customizable Online Food Ordering System Using Web Based Application", point out the convenience and effectiveness of smart phone and wireless communication

technology in fulfilling the consumer demand. This will also help in creating a robust restaurant business in future.

The functioning of e-commerce start-up mainly depends on the home delivery services (Moroz and Polkowski, 2016). As the product bought through online gets delivered only with the help of delivery boys, the delivery boys are the backbone of any e-commercial business.

India consists of the world's biggest working population (Priyadharshini, 2017) between the age of 10 and 24. With the increase in both youth male and female population every day, people are demanding more jobs. The introduction of e-marketing platform had enabled the young job seekers to get earning.

Praveen Yaragatti and Siddharth Nanda (2019) on their paper "Exploratory data analysis and visualisation on Zomato Restaurant Data" stated the importance of online food marketing with special reference to Zomato in India. On their paper, they critically examined the numbers of restaurant registered to the online portal of Zomato and present their research design based on K-means clustering. They studied the impact of Zomato on Indian restaurant market by running mathematical algorithms.

The future viability of the business in the food delivery industry can be an aspect of mergers and acquisitions of different e-platform (S. Selvi, 2019). By studying four companies of the food delivery industry i.e. Swiggy, Zomato, Cure.fit and Kristy's kitchen the paper presented a framework based on the equity-return model. The different factors affecting the business are diversification, market operation, employee operational efficiency, capital requirements, competition, tax benefits and brand image. AsiyaNasreen and Shantanu Kumar Purohit, (2019) work on the blue collar work in the service sectors. They emphasized on the changing perspective of the employment opportunities mainly in the e-commerce platform. They also focus on the last mile delivery platform of the delivery boys.

3. Rationale of the study

Grasping through the details of the above extensive review of literature, it has been observed that a few significant studies have been done on the behavioural aspect of labour employment. Moreover, the present study has been conducted concerning the behavioural factors of Zomato Valet boys in Sambalpur District of Odisha, India which the above literature review is lacking. The present article has analysed different behavioural elements which influenced the workers to adopt new windows of job leaving the traditional one. By applying prospect theory, loss aversion impediment of workers has been presented in this work.

4. Statement of the problem

Loss aversion and reference-dependent utility theories are closely linked with the prospect theory. The reason behind leaving previous jobs of the Zomato Valets is also associated with the behavioural aspect of different versions of prospect theory. The respondents adapt to work as a Valet boy because they are ready to leave the previous one as the previous jobs are risky to some extent and the prospect theory of labour behaviour stated that when labour faced with a risky choice leading to gains, at that time the labourers are always the risk-averse preferring solution that leads to a lower expected utility but with a higher certainty. Higher certainty factor plays an important role to attract workers from different unorganised sectors.

5 Objectives

The study aims is to assess the behaviours of the labourers of the unorganised sector by analysing the prospect theory model. The study also focuses on the various reasons for opting as a valet by leaving the previous one. Further, the study also wants to show the framing effect by introducing consumer rating platform of Zomato.

6 Scope of the study

The present study has been conducted on the Sambalpur district of Odisha, India considering a total number of 30 respondents working as Zomato delivery boys or Zomato Valets in the year 2020.

8 Methodology

The present study has been done on the behavioural aspect of labour theory by selecting the convenient sampling method. The data collection mechanism is purely primary. A total number of 30 respondents have been chosen for the study. By considering different reasons and previous income of previous jobs of valets the present study has analysed the prospect theory model of behavioural economics with the help of value function and mathematical model. Further, the consumer rating platform of Zomato has been introduced to show the framing effect analysis. By running the Kolmogorov-Smirnov test of normality and Pearson correlation test on SPSS, IBM; the study has concluded to its final result.

9 Data Set

Table-1

Information about the respondent's w.r.t. their nature of the previous job and Daily income of the previous and present job

(Daily income in rupees)

No. of Respondents	Areas of previously engaged job	Nature of the previous job	Daily income of the previous job	Daily income as a Valet boys
1	Garage mechanic	Part-time	500	800
2	Fruit Vendor	Full-time	400	1000
3	Vegetable Vendor	Full-time	450	1000
4	Electrician	Part-time	500	950
5	Barber	Part-time	300	1000
6	Auto Driver	Part-time	300	1000
7	Waiter	Part-time	350	700

8	Construction Worker	Full-time	300	800
9	Factory worker	Full-time	300	800
10	Mines worker	Full-time	250	800
11	Carpenter	Part-time	300	900
12	Weaver	Part-time	300	950
13	Artisan	Full-time	300	800
14	Garage mechanic	Part-time	500	800
15	Auto driver	Part-time	300	1000
16	Mines worker	Full-time	250	800
17	Barber	Part-time	300	1000
18	Electrician	Part-time	500	800
19	Factory workers	Full-time	300	800
20	Waiter	Part-time	350	900
21	Waiter	Part-time	350	750
22	Fruit Vendor	Full-time	400	1000
23	Vegetable Vendor	Full-time	450	1000
24	Waiter	Part-time	350	850
25	Weaver	Part-time	300	1000
26	Artisan	Full-time	300	700
27	Auto driver	Part-time	300	1000
28	Garage mechanic	Part-time	500	800
29	Construction worker	Full-time	300	800
30	Factory worker	Full-time	300	800

Source: Collected through Primary Survey on the studied area

Table-2

Information about the respondent's w.r.t. to their reasons for leaving the previous job and reason for opting as Valet boys

Areas of respondents previously engaged job	Frequency	Reason for leaving the previous job	Reason for joining as Valet
Garage mechanic	3	Hard Work and Risky	Safe & less workload
Fruit Vendor	2	Lower Wage	Higher wage

Vegetable Vendor	2	Lower Wage	Higher wage
Electrician	2	Hard work	Less workload
Barber	2	Lower Wage	Higher wage
Auto Driver	3	Lower Wage	Higher wage
Waiter	4	Hard Work	Less workload
Construction worker	2	Hard Work and Risky	Safe & less workload
Factory worker	3	Hard Work and Risky	Safe & less workload
Mines worker	2	Hard Work and Risky	Safe & less workload
Carpenter	1	Lower demand of product	On demand job
Weaver	2	Lower demand of product	On demand job
Artisan	2	Lower demand of product	On demand job

Source: Collected through Primary Survey on the studied area

10. Prospect theory model

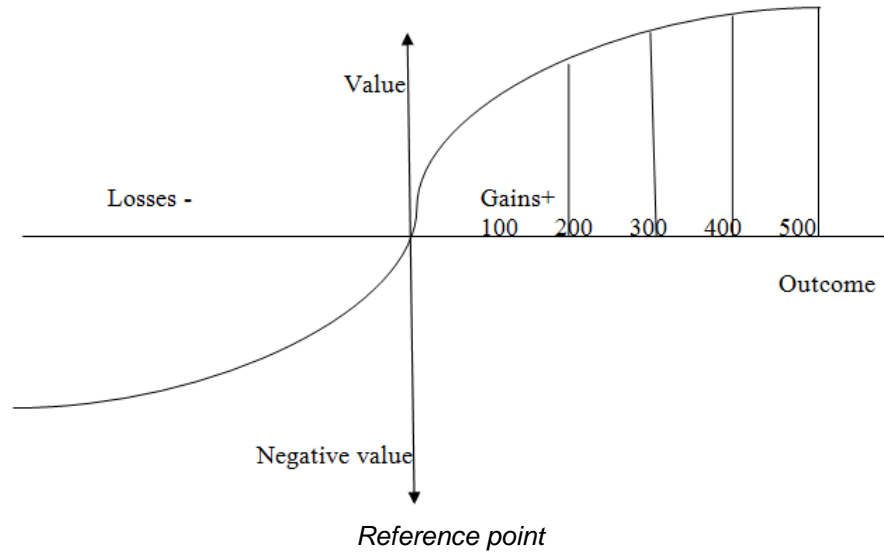
Table-3

Reference points of the respondents for opting as a Valet boy

Reference points w.r.t. to daily income on an average to join as Valet (Quantitative aspect)	Value function after joining as Valet	Deviation of value function from reference points (Gain/Loss)
500/-	1000/-	Gain 500
500/-	900/-	Gain 400
500/-	800/-	Gain 300
500/-	700/-	Gain 200

9.1 Value function

Figure-1



The above figure represents the gains outcome and their value function of the respondents after joining as valet boys. The study has taken the reference point as rupees 500/- (daily income) which is purely based on the psychological mindset of the respondents. It has been observed respondents are ready to work as Zomato delivery boys if their daily income would cross the rupees 500/- and according to that, we can calculate their value function. Based on the primary data, the study has categorized the daily income of valet boys into four categories i.e. 700/-, 800/-, 900/- and 1000/-. As the reference point is rupees 500/-, we can predict the outcome as gain and according to that, the above value function figure is plotted. The figure indicates the gain as 200/-, 300/-, 400/- and 500/- in which all the outcomes have positive values.

9.2 The mathematical model

Kahneman and Tversky have presented the following formula for the evaluation phase. This formula shows how individuals value their different

outcomes in different magnitude. The present study has also used the following formula for evaluating the outcomes of respondents:-

$$V = \sum_{i=1}^n \pi(p_i) v(x_i)$$

Here,

v = overall/expected utility of the outcomes that the valet boys are making

x_i = it represents potential outcomes like x₁, x₂, x₃, x₄

x₁ = higher wage

x₃ = less workload

x₂ = safe and less workload

x₄ = on-demand job

p_i = it represent the probabilities of the potential outcomes x₁, x₂, x₃, x₄ as p₁, p₂, p₃, p₄ respectively.

p₁ = probabilities of choosing outcome x₁
outcome x₃

p₃ = probabilities of choosing outcome x₃

p₂ = probabilities of choosing outcome x₂

p₄ = probabilities of choosing outcome x₄

Out of 30 respondents the probabilities of choosing the alternatives x₁, x₂, x₃, x₄ are: -

$$p_1 = 09/30 \quad p_3 = 06/30$$

$$p_2 = 10/30 \quad p_4 = 05/30$$

We can write the prospect as (x₁, p₁, x₂, p₂ ; x₃, p₃, x₄, p₄) which represent a prospect with outcome x₁ with probability p₁, outcome x₂ with probability p₂, outcome x₃ with probability p₃ and outcome x₄ with probability p₄.

$$p_1 + p_2 = 0.5 < 1$$

Here (x₁, p₁) = (x₁, 0.5) is not equivalent to (x₂, p₁p₂) = (x₂, 0.6)

Then (x₁, p₁r) is preferred to (x₂, p₁p₂r) here 'r' is reference point =500

So, (x₁, 250) is preferred to (x₂, 300).....(1)

$$\text{Similarly } p_3 + p_4 = 0.5 < 1$$

Here $(x_3, p_3) = (x_3, 0.33)$ is not equivalent to $(x_4, p_3p_4) = (x_4, 0.056)$

Then (x_3, p_3r) is preferred to (x_4, p_3p_4r) here 'r' is reference point =500

So, $(x_3, 165)$ is preferred to $(x_4, 28)$(2)

From the above mathematical model of prospect theory analysis, we can observe from the equation-1 that the valet boys are preferring outcome or attributing excessive weightage to the events with lower probabilities and undervaluing the events with higher probabilities. That means they are ready to give of the satisfaction of safe and less workload (x_2) in to achieve the higher wage (x_1) even if the probabilities of getting safe and less workload is higher than probabilities of getting a higher wage.

But the equation-2 of the evaluating stage has shown different result as the respondents are weighting more to the events with higher probabilities than the events with lower probabilities. Here the result is contradictory as a result of the framing effect. Respondents are choosing less workload (x_3) to on-demand job (x_4) only because of the advertisement and the way of framing the usefulness of the job to the respondents. The less work load is greatly influenced by the rating platform of the Zomato application. The respondents who have opted less workload over the on-demand job are mainly waiters and electrician.

11. Consumer rating platform of Zoamato application

In addition to the daily income fixed by the company, the valet boys can earn more through the rating provided by the consumer. The rating is done by the customer based on on-time delivery, behaviour with the customer and the quality of food delivery to the customer. As from the above previous study we observed that waiters and electrician are mainly influenced by the online rating system and hence due to framing effect they preferred less workload to on demand job, so we are now going to study the effect of online rating system on the four waiters and 2 electrician to join as Valet boys as well as the two weavers, two artisan and one carpenter who have

joined as a valet on the basis of on-demand job. In Zomato apps there is a feature of rating and the valet boys can earn extra income over their numbers of delivery. In cities like Sambalpur from where the respondents are taken, the company did give any incentives to the valets for one star, two star and three-star ratings.

Incentives in according to ratings for Sambalpur city are given below: -

- 1 star = no incentives
- 2 star = no incentives
- 3 star = no incentives
- 4 star = rupees 5/-
- 5 star = rupees 10/-

Now, we have to make an inter comparison between the “on-demand job seeker” and “less workload seeker” on the basis of their earning from per delivery and from rating platform. The “on-demand job seekers” are mainly waiters and electrician and safe and the “less workload seekers” are artisan, carpenter and weaver.

Table-4

Earning of the “on demand job seekers” from delivery (in rupees)

No. of Respondents on the basis previous job	Earning from delivery	Earning from ratings	Overall earning(per delivery earning+ rating earning)
Waiter	500	200	700
Waiter	600	300	900
Waiter	400	350	750
Waiter	450	400	850
Electrician	550	400	950
Electrician	350	450	800
No of respondent=6	Total=2850	Total=2100	

Source: Collected through Primary Survey on the studied area

Table-5: Earning of Stars of the “on-demand job seekers” in terms of rating (in unit)

No. of Respondents on the basis previous job	No of four-star ratings	No of five-star rating
Waiter	0	20
Waiter	0	30
Waiter	0	35
Waiter	0	40
Electrician	0	40
Electrician	0	45

Source: Collected through Primary Survey on the studied area

11.1 Statistical analysis of “On-demand job seeker”

X= Earning from delivery

Y= Earning from ratings

Z= Overall earning (per delivery earning+ rating earning)

Table-6:
Tests of Normality

	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
X	.122	6	.200*	.982	6	.961
Y	.212	6	.200*	.933	6	.607
Z	.122	6	.200*	.982	6	.961

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

done through SPSS, IBM

Figure-2

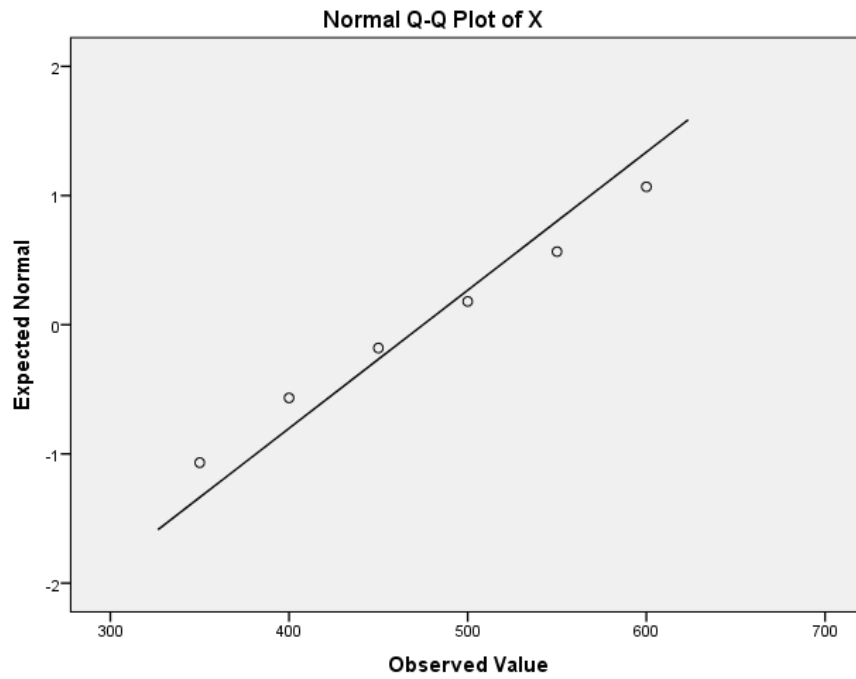


Figure-3

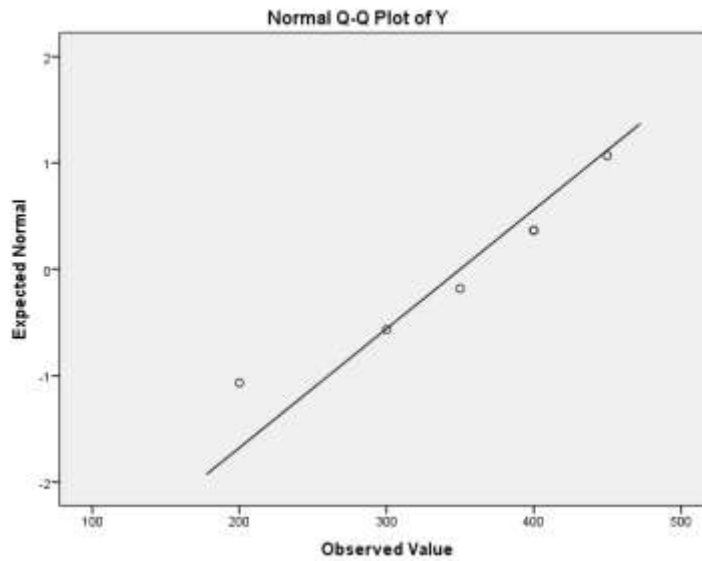
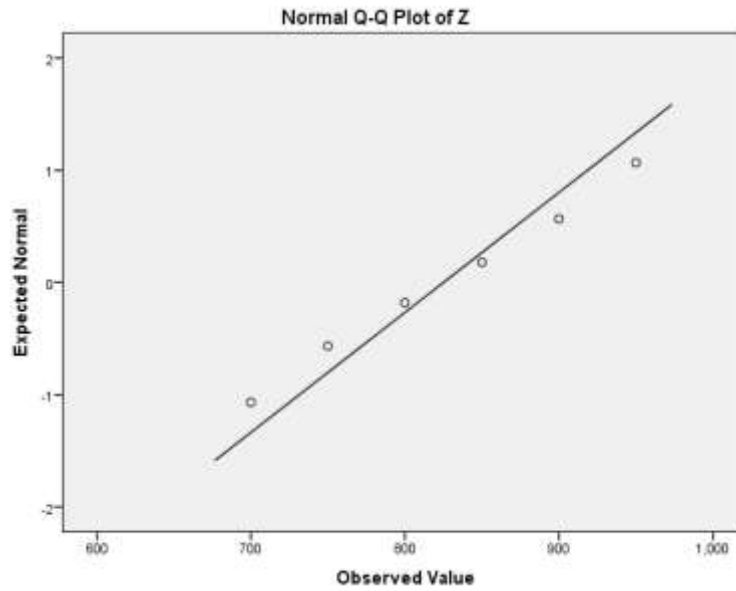


Figure-4



done through by SPSS, IBM

11.1.1 Multiple correlation analysis

Table-7

Correlations^a

		Z	Y	X
Z	Pearson Correlation	1	.478	.543
	Sig. (2-tailed)		.338	.266
Y	Pearson Correlation	.478	1	-.478
	Sig. (2-tailed)	.338		.338
X	Pearson Correlation	.543	-.478	1
	Sig. (2-tailed)	.266	.338	

a. Listwise N=6
done through SPSS, IBM

Table-8

Earning of the “less workload seekers” in terms of per delivery (in rupees)

No. Respondents on the basis of previous job	Of	Earning from delivery	Earning from rating	Overall earning(per delivery earning+ rating earning)
Carpenter		700	200	900
Artisan		550	250	800
Artisan		400	300	700
Weaver		650	300	950
Weaver		600	400	1000
No of respondent=5		Total=2900	Total=1450	

*Source: Collected through Primary Survey on the studied area***Table-9**

Earning of stars of the “less workload seekers” in terms of rating (in unit)

No. of Respondents on the basis of previous job	No of four-star ratings	No of five-star rating
1. Carpenter	10	15
2. Artisan	20	15
3. Artisan	40	10
4. Weaver	60	0
5. Weaver	50	15

*Source: Collected through Primary Survey on the studied area***11.2 Statistical analysis of “less workload seeker”**

X= Earning from delivery

Y= Earning from ratings

Z=. Overall earning (per delivery earning+ rating earning)

Table-10

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
X	.197	5	.200 [*]	.943	5	.685
Y	.246	5	.200 [*]	.956	5	.777
Z	.198	5	.200 [*]	.957	5	.787

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction done through SPSS, IBM

Figure-5

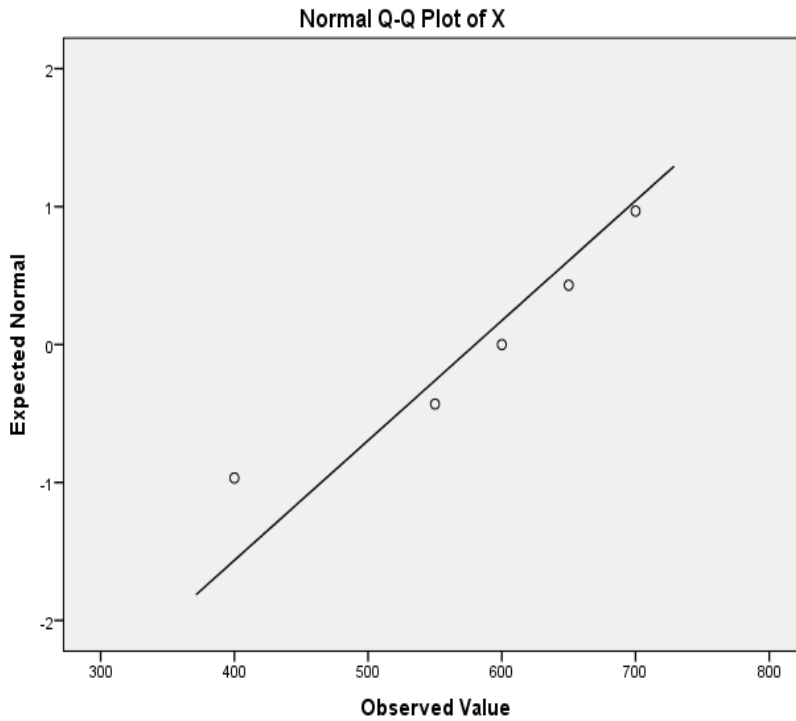


Figure-6

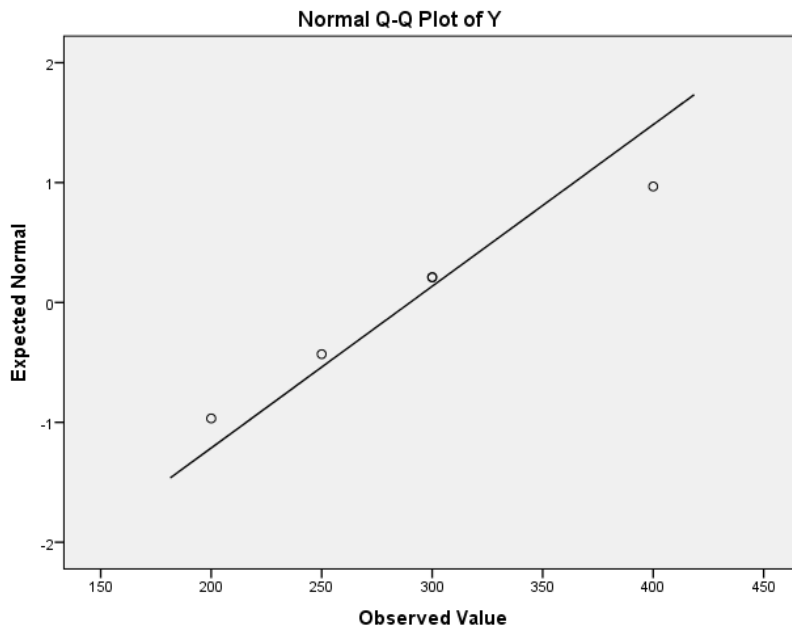
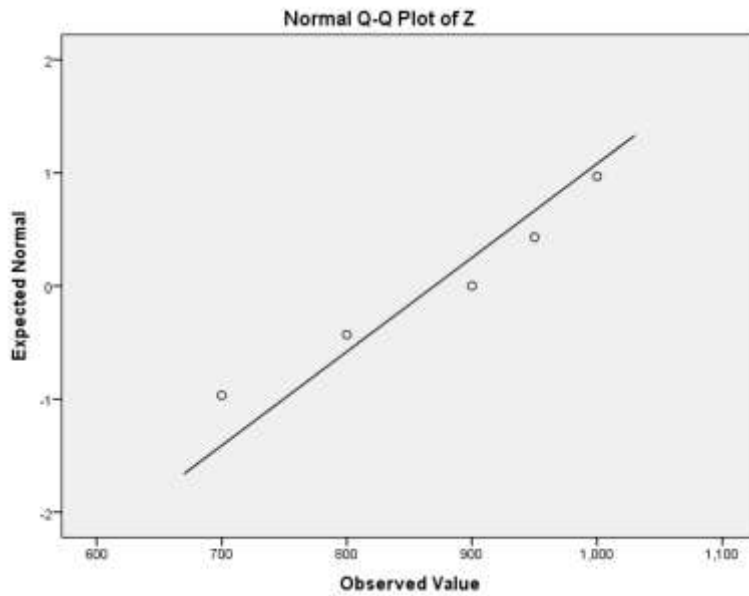


Figure-7



done through by SPSS, IBM

11.2.1 Multiple correlation analysis

Table-11

Correlations^a

		X	Y	Z
X	Pearson Correlation	1	-.249	.803
	Sig. (2-tailed)		.686	.102
Y	Pearson Correlation	-.249	1	.378
	Sig. (2-tailed)	.686		.531
Z	Pearson Correlation	.803	.378	1
	Sig. (2-tailed)	.102	.531	

a. Listwise N=5

done through by SPSS, IBM

From the above analysis of both “on-demand job seeker” and “less workload seeker” it is cleared from the table-4 and table-8 that the “on-demand job seeker” earns rupees 2100/- daily from consumer ratings and the “less workload seeker” earns rupees 1450/- daily from consumer ratings. From statistical point of view it has been observed that the data taken for multiple correlations is normal. The normality of data has been proved by running Kolmogorov-Smirnov test on SPSS, IBM. The K-S significant value is more than 0.05 which means that the data is normal which can be shown by table-6 and table-10. The figure-2, 3 and 4 are the QQ-plots for the variable X,Y and Z respectively of “on-demand job seeker”. Similarly, the figure-5, 6 and 7 are the QQ plots for the variable X, Y and Z respectively of “less workload seeker”. This QQ-plot indicates the normality of variables X, Y and Z i.e. earning from delivery, earning from ratings and overall earning (per delivery earning+ rating earning). Further, the multiple correlations test shows that for “on-demand job seeker” the correlation between “earning from rating” and “overall earning” is higher and for the “less workload seeker”, the correlation between “earning from rating” and “overall earning” is lower. From the table-7 and table-11, it can be seen that the pearson correlation value for Y and Z is 0.478 in case of “on demand job seeker” and the pearson correlation value for Y and Z is 0.378 in case of “less workload seekers”.

12 Conclusion

The whole study has been carried out to present the behavioural aspect of the prospect theory in case of Zomato valet boys. By preparing the mathematical model and value function of prospect theory analysis, it has been observed that the people who are previously engaged in the different unorganised sector of Sambalpur city are preparing to leave the previous work due to various reasons and want to join as Valet boys. The gains after joining the Zomato as valets have been reflected in the value function figure. Moreover, the contradictory result arises from the prospect theory analysis is only because of the framing effect in consumer behaviour which leads to the consumer rating platform of Zomato and it has been proved that the rating platform leads to the framing effect in valet behaviour.

The behaviour of people to adopt new windows of employment opportunity has drastically improved in the modern era. Labourers are now very much conscious about the information and communication technology based jobs. The information revolution around the world has brought a remarkable change in unorganised sectors of the world. It has created a virtual “unorganisingly organised market” and labourers have shifted their choice from text book unskilful job to the modern one.

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A Appendix

A.1 Prospect Theory Model of Daniel Kahneman and Amos Tversky (Evaluation Phase)

$$V = \sum_{i=1}^n \pi(p_i) v(x_i)$$

$$I=1$$

Here,

v = overall/expected utility of the outcomes that the valet boys are making the decisions $x_1, x_2, x_3, \dots, x_n$
 x_i = it represents potential outcomes like $x_1, x_2, x_3, \dots, x_n$

π is a weighting function of probabilities which shows the idea that people tend to overreact to events with small probabilities and they underreact the events with large probabilities.

Let $(x, p; y, q)$ represents a prospect having outcomes like x with p probability and outcome y with q probability and outcome nothing with probability $1-p-q$.

- If a regular prospect like $(x, p; y, q)$ is there (either $p+q < 1$ or $x \geq 0 \geq y$, or $x \leq 0 \leq y$), then: $V(x, p; y, q) = \pi(p)v(x) + \pi(q)v(y)$(1)
- If $p+q=1$ (either $x > y > 0$ or $x < y < 0$), then: $V(x, p; y, q) = v(y) + v(p) [v(x) - v(y)]$ (2)

From the equation (1), it can be deduced that

- $v(y) + v(-y) > v(x) + v(-x)$ and
- $v(-y) + v(-x) > v(x) + v(-x)$

From the above proofs the value function is defined as the deviations from the reference point, which indicates that in case of gains, value function is concave and in case of losses value function is convex and this convex function is steeper for losses than for gains.

If $(x,p) \neq (y,pq)$, then (x,pr) is not preferred to (y,pqr)

But the equation (1) follows that

$$\pi(p)v(x) + \pi(pq)v(y) = \pi(pq)v(y) \text{ leads to } \pi(pr)v(x) \leq \pi(pqr)v(y),$$

Thus:

$$\pi(pq) / \pi(p) \leq \pi(pqr) / \pi(pr)$$

It proved that for a fixed ratio of probabilities the decision weights are closer to 1 when probabilities are low than when they are high. So, π is never linear in prospect theory.

When $x > y > 0$, $p > p'$ and $p+q=p'+q' < 1$ then prospect $(x,p';y,q')$ dominates prospect $(x,p;y,q)$, means that $\pi(p)v(x) + \pi(q)v(y) > \pi(p')(x) + \pi(q')v(y)$,

Therefore:

$$\pi(p) - \pi(p') / \pi(q') - \pi(q) \leq v(y) / v(x)$$

As $y \rightarrow x$, $\pi(p) - \pi(p') \rightarrow \pi(q') - \pi(q)$, but since $p-p' = q'-q$, which would imply that π must be linear.