

A Study of Sequential Discounting - Individuals Preference for Sequence of Improving Incomes and Declining Payments

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Abstract— The study's objective is to understand the sequence preference of Indian individuals while making payments or receiving returns. Through this study we understand how an Indian investor will be most willing to make a payment with least discomfort and most satisfied while receiving an income even though the overall sum maybe the same. Primary data that was collected through 450 respondents using structured questionnaire form on an online and offline basis. The result shows that Indian individuals are mostly indifferent towards sequence of incomes they receive, they prefer increasing and declining sequence of rewards equally. On the other hand, declining sequence is preferred, while making payments. Most individuals prefer to finish their obligations at an earlier stage. It was identified that few factors like age, gender, character, influence the sequence choice of individuals. Male gender prefer a declining sequence of payments much more in comparison to females. People above age of 35 prefer to declining payments while people below 35 are likely to prefer the opposite. Finally people who are extraverted and open minded prefer decreasing sequence of rewards and payments in comparison to the ones who are not much extraverted & open minded. While annual income and marital status does not influence the behavior of persons while making this choice.

Keywords— Preference, Sequences, Increasing/declining sequence, Monetary-utilitarian benefits, Payments, Influencers.

I. INTRODUCTION

This paper particularly focuses on identifying the sequence pattern of people while they receive an income and make a payment in India. An increasing sequence is one where the amount increases or in other words starts from small moving to larger amounts. Decreasing sequence is the opposite which moves from larger amounts ending up in zero finally .Flat is a sequences one that has equal amounts throughout and it does not change and remains constant

There have been many prior research on the preference priority of consumers mainly done by Lowenstein 1992 and 2008. Those papers have identified a particular preference sequence. This paper also tries to identify what are the factors that influence the decision making of the consumer, making them choose a particular sequence. It being their age group,

personality type, socio-economic status and gender which motives them to behave or choose a particular sequence

There were previously papers published suggesting consumers usually prefer an increasing sequence and would at most times save the best for the last. Likewise most papers have compared certain rewards to receiving cash in liquid form, but in reality most people do not identify gifts and other gains with money itself. They respond very differently to both monetary gains and other utilitarian benefits.

II. LITERATURE REVIEW

A paper by Loewenstein (2002) stated that in any event that has a sequential pattern, most people prefer an increasing sequence. Generally people prefer an improving sequence to one that is declining. For example, Lowenstein and Nachum Sicherman (1991) found that, for an otherwise identical job, most subjects prefer an increasing wage profile to a declining or flat one. Also people strongly preferred a flow of reducing discomfort to streams of increasing discomfort, even when the over- all sum of discomfort over a period of time was otherwise identical.

Similarly Christian Rodriguez, Brandon Turner and Samuel McClure (2010) came to a conclusion that intertemporal utility was concave for gains and convex for losses, this theory was in consensus with the idea already put forward by Loewenstein and Prelec (1992).

Few years later In another paper by Loewenstein (2008) he said ,in their previous paper they had proved that people usually tend to choose an improving sequence due to multiple factors .But in their new paper they conflict with the above statement saying that this might not always be the case in all situations. While researching with pricing and other sequential allocating exercises there was in fact no significant trace of preference for increasing sequences.

A study done by Guyse, Jeffery L ,Keller, L Robin, Eppel, Thomas(2002) said Maximizers,” who showed a desire to take money-up front for economic maximization reasons, were more likely to prefer decreasing sequences of money. Individuals who talked about savoring and dread, local reference points, self-control, or motivation were more likely to prefer increasing

sequences. A major factor that influenced choice for the participants in their study was the subjective “appropriateness” of the sequence, how well it matched the individual’s consumption needs due to time-of-life, personal, and seasonal circumstances.

A paper on psychology by William T. Ross & Itamar (1991) Simonson concluded most people would like to have a happy ending in any event. There is more satisfaction if a more positive event happens towards the end rather than beginning. This sequence and preference is confirmed by three other multiple studies. A preference for happy endings is shown to be most people’s preference in a sequential pattern.

Also Schmitt D.R, Kemper. T. D (1996) said preference for increasing /decreasing sequences of rewards is dependent on the magnitude of increase/decrease and on the rate of change with which rewards increase/decrease. In the increasing reward sequences, subjects preferred the step sequence (with its single large increase at the end) prior to experience, but after experience they preferred the exponential, linear, and logarithmic sequences which entailed continuous reward-to-reward improvement throughout the sequence. In the decreasing sequences, subjects were less definite in their preferences. Prior to experience they most preferred the logarithmic sequence with its decelerating decline in magnitude of rewards, while after experience they least preferred the step function, with its huge loss at the end of the sequence.

III. RESEARCH PROBLEM

Most papers done in the field of sequential discounting were done abroad but have not yet been discussed in India. The main papers done in this field were by Lowenstein (1992, 2008). These were done almost 8 years back with only a sample size of 100 which included only students. There were majorly 2 significant published papers and also the second paper published had a conflicting result from the first one. This study is focused on figuring which sequential pattern is preferred in various situations by the Indian investors

Another unique feature in this paper is that none of the other papers have discovered why people tend to choose a particular sequence. This paper attempts to figure out the multiple factors like age, gender, personality type, annual income and marital status that may either individually or combined influence the choice of persons.

IV. OBJECTIVES OF THE STUDY

The paper primarily tries to understand and identify the below

- Sequence preference of people while they receive incomes or rewards
- Difference in preference of persons while choosing between monetary benefits and utilitarian benefits
- Difference while choosing a sequence of gains and losses.
- Main factors that may influence the sequence decision of consumers.

V. METHODOLOGY

I. Sequence preference of people while receiving rewards:

One main question was asked in order to identify how a person may respond to receiving a certain sum of money. The objective was to find if people prefer Increasing or Decreasing sequence.

Question:

Assume you have received 2 free coupons of different amounts in which manner would you like to spend them, choose the order you prefer:

- Spend Rs.500 today and Rs.5000 a month later
- Spend Rs.5000 today and Rs.500 a month later

Result:

As we see in figure 1, more people prefer to follow an increasing sequence where they save the larger amount for the last.

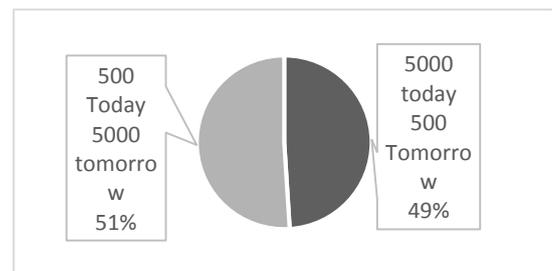


Figure 1 Sequence preference of people on spending - Coupon

Even though there is very less difference between the two categories we say that most people in India would prefer an increasing sequence to a declining one, but there is an almost flat sequence and people are indifferent to either sequences. This was tested through a proportionarity test.

Analysis:

Table 1 Analysis on sequence preference on spending - Coupon

Sample	X	N	Sample p
1	222	438	0.506849
2	216	438	0.493151

Difference = p (1) - p (2)
 Estimate for difference: 0.0136986
 95% CI for difference: (-0.0525162, 0.0799135)
 Test for difference = 0 (vs ≠ 0): Z = 0.41 P-Value = 0.685

Fisher’s exact test: P-Value = 0.735

Ho: p1=p2

The proportion between the two groups of increasing and decreasing sequence is shown in Table 1.

We do not reject the null as its value is 0.685. According to the above analysis. P1=P2. It is not a statistically significant

model. People are indifferent towards increasing and declining sequence i.e. there is no particular preference.

II. Difference between monetary benefits and utilitarian benefits:

Most people do not look at utilitarian benefits such as a free gift coupon or a free trip in the same sense as that of liquid cash itself. Though many prior studies have compared gifts to liquid cash itself and also used it as a proxy but it is seen at multiple occasions that people do not respond in a similar way to both products. Thus the paper asked 2 very similar questions one using liquid cash and another using a utilitarian proxy to compare the responses of persons.

The previous question was regarding a cash coupon and the responses were almost linear or more inclined towards an increasing sequence. Another similar question was asked using a gift proxy

Question:

You have to make a choice between the below options. Choose the sequence you would prefer

- Dinner at a Five Star restaurant today and Dinner at an Average Restaurant next month
- Dinner at an Average restaurant today and Dinner at an Five Star Restaurant next month

Result:

From figure 2, though the sequence is still the same as the previous one and people prefer an increasing sequence, but there is a drastic difference in the number of person from the previous question to this. This was tested through a proportionarity test

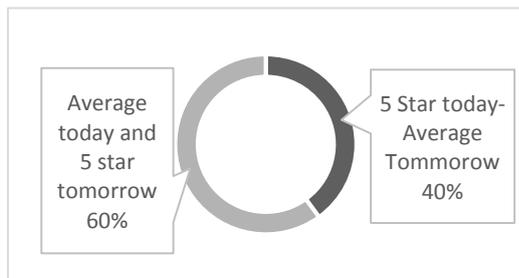


Figure 2 Sequence preference of people on spending - Hotel

Analysis:

Ho: $p_1 = p_2$

From Table 2, we see that the p-value is below 0.05 and is a statistically significant model.

This analysis proves that $p_1 \neq p_2$ and that utilitarian benefits are not the same as liquid cash in the mind of an investor. This shows that people prefer an increasing sequence of returns. They prefer to save best for last.

Table 2 Analysis on Sequence preference of people on spending - Hotel

Sample	X	N	Sample p
1	179	437	0.409611
2	258	437	0.590389

Difference = $p(1) - p(2)$

Estimate for difference: -0.180778

95% CI for difference: (-0.245982, -0.115574)

Test for difference = 0 (vs $\neq 0$): $Z = -5.43$ P-Value = 0.000

Fisher's exact test: P-Value = 0.000

III. Sequence of preference of people while making payments :

Multiple questions of various types were asked to understand how the people would like do their payments.

Question:

Suppose you have to make payment of the following bills within the next one month, choose the manner in which you will pay them,

- Pay Electricity bill today (1000) and Phone bill end of the month (500).(p1)
- Pay both bills today 1500.(p2)
- Phone bill today (500), and electricity bill end of the month (1000).(p3)
- Pay both bills end of the month 1500 (p4).

Result:

From figure 3, we see that more than half of the sample (50.1%) would like to finish off all the payments initially and would not like to postpone the payments to a future date.

Also in case of the other majority would still like to make a larger payment initially and keep smaller sums for later. This proves that people in India strongly prefer decreasing sequences when it comes to the matter of payments or losses and would prefer to make it initially rather than to push it.

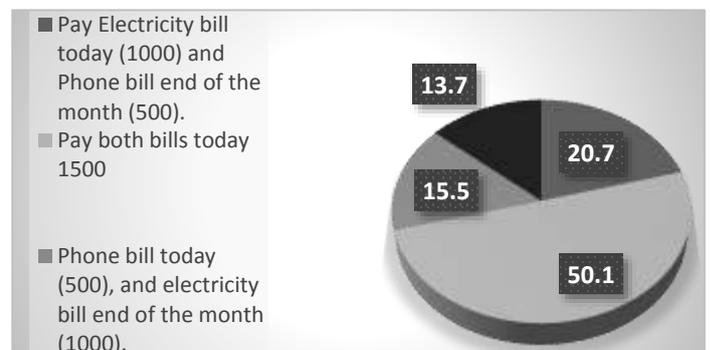


Figure 3 Sequence preference of people on spending - Bill Payments

Analysis:

A relationship between the payment preference and the gender of the person's was tested. A chi square test of association was performed and is shown in Table 3.

Ho: Sequence of payments is independent of gender

Here the p-value being 0.03 there is a significant difference between pattern of payment and the gender. Most People choose declining sequence of payments.

And the gender of the person influences the choice of payment sequence of a person.

Table 3 Analysis on the relationship between Payment preference and Gender

PAYMENTS AND GENDER					
Rows: Worksheet rows Columns: Worksheet columns					
	PBEOM	PBT	PBTPBEOM	PPBTEBEO	All
1	17	72	22	12	123
	17.23	60.44	25.08	20.25	
2	40	128	61	55	284
	39.77	139.56	57.92	46.75	
All	57	200	83	67	407
Cell Contents:	Count Expected count				

Pearson Chi-Square = 8.530, DF = 3, P-Value = 0.036
Likelihood Ratio Chi-Square = 8.944, DF = 3, P-Value = 0.030

IV. Main factors influencing the sequence decision of consumers:

The idea here was to identify “why” exactly a person tends to choose the particular pattern and what influence him to do so. So a few factors were identified that may affect a person's choice pattern and behavior mainly being, gender, age group, personality type, marital status, economic status(annual income).

The personality of a person was tested by a “Big 5” test mainly checking the behavior under 5 main features being:- Openness, Agreeableness ,Thinking, Neuroticism and Extraversion.

A hypothesis testing or a Chi Square of Association was carried out on each one of these independent variables to discover if any one of them had any effect on the sequence preference of people.

A) Does gender of a person affect sequence choice?

Ho: Sequence of rewards is independent of gender.

Ho: Sequence of payments is independent of gender.

Table 4 Analysis on Sequence preference [Gender – Rewards]

GENDER-REWARDS			
Rows: Worksheet rows Columns: Worksheet columns			
	Inc seq	Decseq	All
1	147	136	283
	145.68	137.32	
2	62	61	123
	63.32	59.68	
All	209	197	406
Cell Contents:	Count Expected count		

Pearson Chi-Square = 0.081, DF = 1, P-Value = 0.776
Likelihood Ratio Chi-Square = 0.081, DF = 1, P-Value = 0.776

Table 5 Analysis on Sequence preference [Gender – Payments]

GENDER-PAYMENTS			
Rows: Worksheet rows Columns: Worksheet columns			
	Inc seq	Decseq	All
1	95	190	285
	87.10	197.90	
2	30	94	124
	37.90	86.10	
All	125	284	409
Cell Contents:	Count Expected count		

Pearson Chi-Square = 3.401, DF = 1, P-Value = 0.065
Likelihood Ratio Chi-Square = 3.492, DF = 1, P-Value = 0.062

From the Table 4, we can conclude that with regard to rewards received gender has no significance as p-value is 0.776. We do not reject the null.

From the Table 5, while in case of payments there is a p value of 0.065 which is significant at 10% level of significance .This proves that gender of a person may influence them to make payments in a specific sequence. We reject the null hypothesis. Male gender prefers a declining sequence of payments much more in comparison to females.

B) Does marital status of a person affect sequence choice?

Ho: Sequence of rewards is independent of marital status.

Ho: Sequence of payments is independent of marital status.

From Table 6 and Table 7, we do not reject the null in both cases as the p-value is very high. We can conclude that the marital status of a person does not influence the person's choice of sequence

Table 6 Analysis on Sequence preference [Marital status – Rewards]

MARITAL STATUS -REWARDS

Rows: Worksheet rows Columns: Worksheet columns

	Inc seq reward_1	Dec seq reward_1	All
1	179 180.69	172 170.31	351
2	30 28.31	25 26.69	55
All	209	197	406
Cell Contents:	Count	Count	Expected count

Pearson Chi-Square = 0.240, DF = 1, P-Value = 0.624
Likelihood Ratio Chi-Square = 0.240, DF = 1, P-Value = 0.624

Table 7 Analysis on Sequence preference [Marital status – Payments]

MARITAL STATUS PAYMENTS:

Rows: Worksheet rows Columns: Worksheet columns

	Inc seq pymt_1	Decseq pymt_1	All
1	114 113.21	240 240.79	354
2	20 20.79	45 44.21	65
All	134	285	419
Cell Contents:	Count	Count	Expected count

Pearson Chi-Square = 0.052, DF = 1, P-Value = 0.820
Likelihood Ratio Chi-Square = 0.052, DF = 1, P-Value = 0.819

Table 8 Analysis on Sequence preference [Age – Payments]

AGE-PAYMENTS

Rows: Worksheet rows Columns: Worksheet columns

	Inc seq pymt_1_1	Dec seq pymt_1_1	All
1	118 139.77	250 228.23	368
2	40 18.23	8 29.77	48
All	158	258	416
Cell Contents:	Count	Count	Expected count

Pearson Chi-Square = 47.381, DF = 1, P-Value = 0.000
Likelihood Ratio Chi-Square = 47.432, DF = 1, P-Value = 0.000

Table 9 Analysis on Sequence preference [Age – Rewards]

AGE-REWARDS

Rows: Worksheet rows Columns: Worksheet columns

	Inc seq reward_1_1	Dec seq reward_1_1	All
1	189 188.14	150 150.86	339
2	23 23.86	20 19.14	43
All	212	170	382
Cell Contents:	Count	Count	Expected count

Pearson Chi-Square = 0.079, DF = 1, P-Value = 0.778
Likelihood Ratio Chi-Square = 0.079, DF = 1, P-Value = 0.779

C) Does age of a person affect sequence choice?

Ho: Sequence of rewards is independent of age.

Ho: Sequence of payments is independent of age.

[Here age is categorized into 2 parts i.e. Above 35 years of age and Below 35 years of age.]

From Table 9, we see that with regard to rewards received by a person's age has no significance as p-value is 0.779. We do not reject the null.

From Table 8, while in case of payments there is a p value of 0.00 which is significant. This proves that age of a person influences them to make payments in a specific sequence. We reject the null hypothesis. We conclude that people above age of 35 prefer to declining payment sequence while people below 35 prefer the opposite.

D) Does Annual Income of a person affect sequence choice?

Ho: Sequence of rewards is independent of annual income.

Ho: Sequence of payments is independent of annual income

[Here income is categorized into 2 parts i.e. above 7 lakh p.a. and Below 7 lakh p.a.]

From Table 10 and Table 11, we do not reject the null in both cases as the p-value is very high. We can conclude that the annual income of a person does not influence the person's choice of sequence.

Table 10 Analysis on Sequence preference [Annual Income – Rewards]

ANNUAL INCOME AND REWARDS

Rows: Worksheet rows Columns: Worksheet columns

	Inc seq reward_1_1_1	Dec seq reward_1_1_1	All
1	187 186.68	164 164.32	351
2	30 30.32	27 26.68	57
All	217	191	408
Cell Contents:	Count	Count	Expected count

Pearson Chi-Square = 0.008, DF = 1, P-Value = 0.928
Likelihood Ratio Chi-Square = 0.008, DF = 1, P-Value = 0.928

Table 11 Analysis on Sequence preference [Annual Income – Payments]

ANNUAL INCOME AND PAYMENTS:

Rows: Worksheet rows Columns: Worksheet columns

	Inc seq pymt_1_1_1	Dec seq pymt_1_1_1	All
1	114 114.70	244 243.30	358
2	18 17.30	36 36.70	54
All	132	280	412

Cell Contents: Count
Expected count

Pearson Chi-Square = 0.048, DF = 1, P-Value = 0.827
Likelihood Ratio Chi-Square = 0.048, DF = 1, P-Value = 0.827

E) Does Personality of a person affect sequence choice?

Ho: Sequence of rewards is independent of personality.

Ho: Sequence of payments is independent of personality.

Table 12 Analysis on Sequence preference [Extravert – Payments]

EXTRAVERT AND PAYMENTS:

Rows: Worksheet rows Columns: Worksheet columns

	Inc seq pymt_1_1_1_1_1	Dec seq pymt_1_1_1_1_1	All
1	43 69.95	194 167.05	237
2	60 33.05	52 78.95	112
All	103	246	349

Cell Contents: Count
Expected count

Pearson Chi-Square = 45.889, DF = 1, P-Value = 0.000
Likelihood Ratio Chi-Square = 44.302, DF = 1, P-Value = 0.000

Table 13 Analysis on Sequence preference [Extravert – Rewards]

EXTRAVERT AND REWARDS

Rows: Worksheet rows Columns: Worksheet columns

	Inc seq reward_1_1_1_1_1	Dec seq reward_1_1_1_1_1	All
1	68 85.12	139 121.88	207
2	64 46.88	50 67.12	114
All	132	189	321

Cell Contents: Count
Expected count

Pearson Chi-Square = 16.470, DF = 1, P-Value = 0.000
Likelihood Ratio Chi-Square = 16.402, DF = 1, P-Value = 0.000

Personality of a person was measured by 4 standards namely Openness, Extraverted, Thinking, Neuroticism. From the above specified the most important factor that stood out which was extraverted. An analysis was conducted further on it.

From Table 12 and Table 13, we find that both have a p-value less than 0.05 and the models are significant in nature. The personality type of extraverted nature has a major effect on the sequence choice of a person both rewards and payments

People who are extraverted and open minded prefer decreasing sequence of both rewards and payments in comparison to the ones who are not much extraverted & open minded.

VI. FINDINGS & DISCUSSION

- More than 50% of the sample chose a combination of increasing returns and declining payments.
- In case of incomes in form of money most people prefer a flat sequence where Indians don't find much diff between an increasing or decreasing returns sequence.
- Utilitarian benefits are not the same as liquid cash in the mind of an investor. More than 60% of the sample prefer an increasing sequence.
- In case of payments most individuals like to have a declining sequence and like to finish of their obligations initially rather than to delay it.
- Factors like age, gender, personality type (extravert) influence the sequence preference of persons.
- Male gender prefers a declining sequence of payments much more in comparison to females.
- People above age of 35 prefer a declining sequence of payments while people below 35 prefer the opposite.
- People who are extraverted and open minded prefer decreasing sequence of rewards and payments in comparison to the ones who are not much extraverted & open minded.
- Factors like annual status and marital status do not affect the sequence preference of a person in any way.

CONCLUSION

As we found that most people prefer increasing sequence while receiving incomes. So what we can conclude from this is when an individual's receives certain benefits like dividends or other incomes then he will receive more satisfaction if he receives a smaller amount initially and it gradually increases over a period of time to larger amounts even though the overall income got amount remains same. An investor is more likely to invest in such areas that give him an increasing return over a period of time rather than a decreasing one.

Likewise when a person has to make payments like interest or has any other obligations then he would be more willing to do it in initial stages rather than latter. Decreasing sequence is a normally preferred among Indians as they like to pay off their obligations in initial stages and remain debt or payment free thereafter.

LIMITATIONS

Like any other study this study has few limitations. The study was done only in metropolitan cities with an urban sample.

This only holds true only for those Indians that come from an urban populated area. None of the rural population or tier 2 and 3 cities were included in this study.

This study had use the format of a questionnaire another method to get a good response would be to hold experiments and group discussions and to ask people how they prefer their sequences and what influences them to do so. Through this we can get a detailed reply to each of the asked questions which are now somewhat objective in nature.

This study had found only few factors like gender, age, income, marital status or the character of the person affects the choice of the people. In future studies more factors can be discovered that affect the decision making of a human while choosing their sequences.

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