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CONSTRAINING MINIMUM OFFERS IN ECONOMIC GAMES: WILL THE OFFERS INCREASE?

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Abstract: *In real life situations, one often encounters situations where the offers are constrained as there is a suggestion for a minimum offer. For example, in donation situations there can be a limit on minimum donation, similarly in a negotiation situation there can be a limit on minimum offers. We study the effect of such constraints in the context of economic games, using two experimental studies. We show that constraints that increase the minimum amount that can be offered tend to reduce the average offer size instead of increasing it. We apply the theory of anchoring and adjustment and argue that this is a result of constraints acting as anchors. We also show that constraints on minimum offers have stronger effect on Dictator games than on Ultimatum games. Ultimatum games are more strategic in nature and hence seem to be less vulnerable to anchoring effects. Overall, the results show that constraints on minimum offers can have a significant effect on offers in distribution games and instead of increasing average offers are more likely to reduce them.*

Key words*: Constraints on offers, Dictator game, Ultimatum Game, Anchoring and Adjustment, Behavioural Economics*

JEL Classification Codes: *D00, D01, A10*

"Minimum donations 10 Rs."

"Please offer at least 100 Rs."

Often there are situations where there is a suggestion about the minimum amount that can be offered as a donation (Charness and Cheung, 2013). Similarly, in negotiation situations there can be restrictions imposed on minimum offer size. Ideally, such restrictions on minimum offers should help to increase the offer size by raising the floor of offers. Especially in the context of the two common distribution games in economics, the dictator and the ultimatum game, a limit on minimum offers should help to raise them. Though such constraints are quite common, the effect of such restrictions on the offer sizes has not been examined in the economics literature. The

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objective of this study is to empirically examine the effect of such restrictions on the minimum offers and investigate whether they increase the average offers.

DICTATOR AND ULTIMATUM GAMES

Dictator and Ultimatum games are two common economic distribution games. Kahneman, Knetsch, and Thaler (1986) were the first to use dictator games to study fairness and economic behaviour. In a Dictator game (DG) a proposer gets an endowment and is asked to share a part of that endowment with an anonymous recipient. The recipient has no control over the amount that he/she is offered. Ultimatum Games were first used by Guth et al. (1982) to study economic behaviour. Ultimatum games (UG) are different from dictator games. In a UG, the proposer gets an endowment, a part of which he/she has to share with a responder. For this, the proposer has to make an offer out of the endowment. If the responder accepts the offer, the proposer and responder share the money as per the offer. However, if the responder rejects the offer, neither the proposer not the responder gets any money. As such, in a UG the responders can destroy the endowment by refusing to accept the offer. The settings of economic games like dictator and ultimatum games have been used to investigate fairness, inequity aversion etc (Guth *et al.*, 1982).

THEORETICAL BACKGROUND AND CONCEPTUALIZATION

Imagine a dictator game with an endowment of Rs. 100. The proposer is free to offer any amount. Typically it is observed that offers range from 1% (Rs. 1) to 50% (Rs. 50) of the stake size. Now, suppose that there was a constraint that the proposer needs to make a minimum offer of Rs. 10. Now, this results in the offers with a range of Rs. 10 to Rs. 50. As such, external constraints on minimum offers are likely to result in an increase in average offers. However, there is an alternate possibility that such restrictions on minimum offers may be subject to an anchoring effect and may result in a reduction in offers. Anchoring and adjustment (Tversky and Kahneman, 1974) is used to explain a number of biases such as in bundle pricing (Yadav, 1994) and for property prices (Northcraft and Neale, 1987) etc. Later, Janiszewski and Uy (2008) showed that the amount of adjustment from the anchor was dependent upon the nature of the anchor. The literature review indicates that there is no prior research that has examined how restrictions on minimum offer in economic games impact the size of offers. Further, while anchoring and adjustment is a robust and well established, it has been rarely applied in economic distribution games. This study investigates the effect of constraints on minimum offer by using the theoretical lens of anchoring and adjustment.

STUDY 1 – DICTATOR GAMES

The objective of this study is to understand the effect of constraints on minimum offers in dictator games.

EXPERIMENT DESIGN

The experimental design was a 3 (Low Limit/High Limit/No Limit) between subject design in a dictator game setting. Participants (n = 94) from a management institute in western India participated in a study. The participants volunteered for a participation fee and a chance to make real money in the game. They were randomly assigned to one of the three experimental groups. Participants were given written instructions in which they were explained the rules of the dictator game. For the 'no limit' condition, there were no restrictions on offers. However, for the 'low limit' and the 'high limit' condition, the instruction was that the minimum offers had to be Rs. 10 and Rs. 20 respectively, while the stake size was kept at Rs. 100. The participants were also paired with another 94 anonymous participants who acted as receivers in the dictator game. At the end of the study, payment was made to the participants.

RESULTS

A between subjects ANOVA suggests that the mean offers across the three conditions differs ($F(2,91) = 9.68$, $p < 0.01$). Next, pairwise comparisons across the three groups were done. A t test indicates that there was a significant difference in the offer sizes across the two constraint conditions that imposed a low and a high limit on minimum offers. The mean offer size for the 'high limit' condition ($M_{\text{High Limit}} = 35.00$, $SD = 10.19$) was significantly higher than the 'low limit' condition ($M_{\text{Low Limit}} = 28.55$,$SD = 13.80$), $t(61) = 2.09$, $p < 0.05$). This result is on the expected lines and indicates that raising the constraint on minimum limit raises the offer size. Next, a t test was done to compare the offer size across the 'no limit' and 'high limit' condition. The mean offer size for the 'no limit' condition ($M_{\text{No Limit}} = 41.63$, $SD = 11.12$) was significantly higher than the 'high limit' condition ($M_{\text{High Limit}} = 35.00$, $SD = 10.19$), $t(62) = 2.47$, $p < 0.05$).

DISCUSSION

The results indicate that raising the minimum limit of offers results in an increase in the size of offers. A high limit of Rs. 20, results in higher average offers than the minimum limit of Rs. 10. However, the results also show that the average offers reduced when restrictions on lower offers were imposed. The DGs where there were no constraints on offers resulted in a larger offer size than DGs where there were constraints on minimum offers. This supports that the restrictions on lower offers act as anchors and tend to reduce the average offer size. This is consistent with the theory of anchoring and adjustment.

STUDY 2 – ULTIMATUM GAMES

UG offers tend to be more strategic in nature (reference) and the offers are thought through and not impulsive. The objective of this study was to test the robustness of the anchoring and adjustment effect in the context of UG game where the offers are more strategic. We expected that the extent of anchoring would be low when the

minimum limits are too low since they carry risk of rejection. However, if these are relatively high, the anchoring and adjustment would have a stronger effect, since the risk is lower. In other words, participants are more likely to anchor when there are high limits on minimum offers than on low limits. This is in line with anchoring and adjustment theory which suggest that subjects are likely to ignore anchors which are not perceived relevant (Mussweiler and Strack, 1999).

EXPERIMENT DESIGN

The experimental design was 3 (Low Limit/High Limit/No Limit) between subject design in a ultimatum game setting. Participants (n = 92) from a management institute in western India participated in a study. The participants volunteered for a participation fee and a chance to make real money in the game. They were randomly assigned to one of the three experimental groups. As in study 1, the low and high limits were Rs. 10 and Rs. 20 respectively with the stake size of Rs. 100. Participants were given written instructions in which they were explained the rules of the ultimatum game. The participants were also paired with another 92 anonymous participants who acted as responders in the ultimatum game. The proposers were randomly paired with the responders and payments were made as per the outcome of the game, the same day.

RESULTS

A between subjects ANOVA suggests that the mean offers across the three conditions differs ($F(1, 89) = 8.71$, $p < 0.01$). Next, pairwise comparisons across the three groups were done. A t test indicates that there was a significant difference in the offer sizes across the two constraint conditions that imposed a low and a high limit on offers. The mean offer size for the low limit condition ($M_{\text{High Limit}} = 33.94$, $SD = 10.62$) was significantly lower than the high limit condition ($M_{\text{Low Limit}} = 39.67$, $SD = 10.66$), $t(60) = 2.1$, $p < 0.05$. We also compared the means between no limit and low limit condition. The mean offer size for the no limit condition ($M_{\text{No Limit}} = 45.23$, $SD = 10.66$) was significantly check what we want to say here higher than the low limit condition ($M_{\text{Low Limit}} = 39.67$, $SD = 10.66$), $t(60) = 2.03$, $p<0.05$).

DISCUSSION

The offer sizes were larger when the suggestions for minimum offers were low than when they were high. This is a reversal of the effect seen for dictator games. In UGs, low offers face a risk of rejection, and it seems that the restrictions on lower limits had a much weaker effect when they were low because of the risk of rejection associated with low offers. However, when the minimum offer restrictions were relatively high they provided a valid anchor and the effect was relatively stronger. Interestingly, comparison between 'no limit' and 'low limit' condition indicates that there is anchoring effect associated with 'low limit' though this is relatively weaker than 'high limit' condition. The findings are in line with anchoring and adjustment theory. These also illustrate the difference in the nature of the two types of distribution games.

CONCLUSION

This research through two studies establishes that restricting minimum offers in distribution games can have an adverse impact on offers. Intuitively, restricting minimum offers should result in raising the floor of offers and help in increasing the offers, however, the results suggest that imposing restrictions on minimum offers also acts as a suggestion and provides an anchor to the proposers. Study 1 shows that in a dictator game, though higher limits on minimum offers resulted in larger offers, overall imposing a restriction is still a worse strategy than giving no suggestions. This provides support that to the effect of anchoring and adjustment on offer sizes. Study 2 examined the effect of such restrictions in the context of UGs. The results show that since UG is more strategic, low limits on minimum offers are not potent anchors and more adjustment happens from such anchors. However, high limits on minimum offers tend to act as good anchors. This shows that anchoring and adjustment process is egocentric and stickiness with anchors which are beneficial is much more than that with anchors that are not beneficial.

Overall, the results provide a conclusive support for anchoring and adjustment effect in distribution games. Moreover, they show that it is not just the priming effect of anchoring and adjustment but there is a conscious anchoring and adjustment process that works. When the anchors are in an acceptable range, they have greater efficacy, however, when they are outside this range, the anchoring effect is weaker.

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