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- The purpose of author feedback is to point out technical errors or significant misunderstandings. It is not meant to dispute the opinions of the reviewers, or to explain how criticisms can be addressed!
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- Please do not provide feedback explaining how you can address the referees' concerns or criticisms. It is our assumption already that concerns will be addressed in the final version.
- Feedback should be brief and specific. Feedback is strictly limited in length to 150 words per review, no exceptions.

Paper ID	570
Paper authors	Dengji Zhao, Dongmo Zhang, Laurent Perrussel
Paper title	Multi-unit Double Auction under Group Buying
Paper subtitle	
Track	()
Paper Type	Research Paper (6 pages)
Status	First Ballot
Keywords	Agents & Multi-agent systems::Auctions & Mechanism Design ** Agents & Multi-agent systems::Game-Theoretic and Economic Foundations

Abstract   Group buying is a business model in which a number of buyers join together to make an order of a product in a certain quantity in order to gain a desirable discounted price. Such a business model has just received significant attention from researchers in economics and computer science, mostly because of its successful application in online businesses, such as Groupon. This paper deals with the market situation when multiple sellers sell a product to a number of buyers with discount for group buying. We consider this problem as a multi-unit double auction. We first examines two deterministic mechanisms that are budget balanced, individually rational and only one-sided truthful, i.e. it is truthful for either buyers or sellers. Then we find that, although there exists a ``trivial'' (non-deterministic) mechanism that is (weakly) budget balanced, individually rational and truthful for both buyers and sellers, such a mechanism is not achievable if we further require that both the trading size and the payment are neither seller-independent nor buyer-independent. In addition, we show that there is no budget balanced, individually rational and truthful mechanism that can also guarantee a reasonable trading size.

Average overall recommendation   6.76

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Significance	Originality	Relevance ECAI	Relevance PAIS	Readability	Technical qualit	Evaluation	Confidence	Overall
8	8	8	7	8	9	8	3	8

ReviewerID: 37536

Comments to author(s)

This paper studies the existence of truthful group buying mechanisms. More precisely, it considers the setting in which many buyers want to buy at least 1 unit of a given good, and many sellers are providing multiple units of this good.

In addition to the standard notions of mechanism design such as budget balance, individual rationality, truthfulness, this paper also introduces specific notions for the group buying setting, such as buyer/seller truthfullness, buyer/seller independence, competitiveness.

Although I'm not an expert in this domain, I appreciate the impressive amount of work done by the authors, which give many positive and negative result for group-buying mechanisms.
The paper is clearly written, very well organised. The technical results are correct, as far as I can tell.

details:

- sometimes, reported types are noted v and sometimes $\hat{v}$. Please choose a single notation.

- In the paper, it is assumed that the utility of the buyers are simple thresholded function. Do the results still hold for more complex classes ?

Summary of review

Very nice paper with many interesting results. Clearly written, well organised. The technical results are correct, as far as I can tell.

You may (but need not) reply to the review. Your reply will be visible to the PC members and area chairs that handle your paper.

In the author's opinion, this is   Please select ▾

Please enter your reply here:

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Significance	Originality	Relevance ECAI	Relevance PAIS	Readability	Technical quality	Evaluation	Confidence	Overall
7	7	8	8	7	8	8	7	8

ReviewerID: 37537

Comments to author(s)

This paper models group buying as a multi-unit double auction, where sellers sell an item to buyers with discount for group buying. The authors prove several negative results and also positive results regarding the properties of the auction protocols (mechanism) that can be achieved.

I like this paper. It is nice to see such a work that addresses a popular business model in a game theoretical setting (although with simplifications), which as far as i know is new. The quality of the paper is high. It is a solid work, and it provides new insight (impossibilities and possibilities) to the multi-unit double auction with group buying problem. The paper motivates the research well. I think there will be many interesting future research on this topic, for example, with relaxed assumptions on unlimited supply as the paper suggests, auction design for group buying, or bidding strategies in different auctions for group buying.

The paper is well written, and it reads well. The only typo I noticed:

gaol -> goal in section 6.

Summary of review

A nice paper. It models group buying as a multi-unit double auction, where sellers sell an item to buyers with discount for group buying. The authors prove several negative results and also positive results regarding the properties of the auction protocols (mechanism) that can be achieved. The problem is new. The quality of this work is high, and it is well written.

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In the author's opinion, this is   Please select ▾

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Significance	Originality	Relevance ECAI	Relevance PAIS	Readability	Technical qualit	Evaluation	Confidence	Overall
5	5	8	3	6	6	5	7	5

ReviewerID: 38232

Comments to author(s)

SUMMARY

This paper investigates the concept of group buying: buyers join together, promising to buy a certain quantity of product, in exchange for group discount. This business model is becoming more popular with the advent of organizations such as Groupon. The authors prove that there does not exist a multi-unit double auction that is budget-balanced, individually rational and truthful while at the same time requiring that both trading size and payment are neither seller- not buyer-independent.

ORIGINALITY

This work is a first attempt to formalize multi-unit double auctions, and as such it appears to be original. However, it is not made explicit how this work differs from the related work mentioned in section 6, and as such the originality is hard to judge.

RELEVANCE

It is very hard to judge the relevance of this work, as no reference to this aspect is provided by the authors. To a reader not familiar with the intricacies of auction mechanisms, it is unclear whether the example auctions shown are arbitrary or related to real-world situations. No arguments are given that indicate why these results are of importance, or what the influence of the findings will be for the field. E.g. the example of Groupon is mentioned as motivation for this research, but there is no link back on how the results might be of relevance for such organizations.

CONTENT

The paper is well-written and the findings are concisely formulated. However, some additional explanations might help make it more self-contained and easier to follow. E.g.:
- End Section 1: "even under the predetermination constraint", explain what is meant by this constraint, or why it is important
- Formula 1, and the following discussion: although there are multiple sellers, only one is selected by the auction to sell the product. Given infinite supplies this makes sense, however this appear to be a rather strong assumption that will not be met in many real-world scenarios. Give some arguments why this choice is made and what the consequence is on the findings.
- Definition 3: why this choice to define trading size? It seems arbitrary. Provide a reference if this is a know method, or provide some argumentation for this choice.
- Algorithm M2nd: if there is only one seller, $p(k) = \inf$, so $k^* = 0$. This means this mechanism only works if there are multiple sellers? Also, the symbol $k+$ is used but not explained.
- Algorithm M+2nd: very dense, textual explanation would help
- The mechanisms of sections 3 and 4 promote either buyer- or seller-truthfulness. Do these map to specific scenarios, how do they differ in market liquidity?

SPELLING
- Abstract: We first examines...
- Section 1: the focus of this model is [on] group buying...
- Section 1: Individual rationality incentivises traders to participant...
- Section 1: However, if we allow either the trading size or the payment to [be] seller-independent...

Summary of review

This paper investigates the concept of group buying: buyers join together, promising to buy a certain quantity of product, in exchange for group discount. This business model is becoming more popular with the advent of organizations such as Groupon. The authors prove that there does not exist a multi-unit double auction that is budget-balanced, individually rational and truthful while at the same time requiring that both trading size and payment are neither seller- not buyer-independent.

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