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## IKEA Effect vs. Trophy Effect - An Experimental Comparison

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**No. 37-2020**

**Christoph Bühren and Marco Pleßner**

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# **IKEA Effect vs. Trophy Effect - An Experimental Comparison**

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### ABSTRACT

Successful work – either invested to create or to obtain a product – increases the customer's valuation of the product. These phenomena are called the IKEA and the trophy effect. We test both of them separately as well as combined and find that the trophy winner effect looms larger than the IKEA effect for inexpensive items, in our case paper planes. For more expensive products, in our case 3-D-puzzles, we find a trophy loser effect. Positive emotions of trophy winners drive our result for inexpensive products, whereas negative emotions of trophy losers drive our result for more expensive products. We discuss the implications of our findings.

Keywords: effort; labor; competition; achievement; failure; valuation

## INTRODUCTION

The IKEA and the trophy effect describe that successful effort increases the subjective valuation of an object – either by the completion of the object or by winning it in an effortful competition. The IKEA effect is named after the Swedish company whose customers build their furniture on their own. It implies that that “labor leads to love” for the object it has been successfully performed on (Norton et al. 2012, Norton 2009). People tend to overvalue their often poorly made creations and even prefer them over comparable products created by experts. The trophy effect shows that labor leads to love if work has been successfully invested to obtain a certain object. This is enforced by a competition in which the object is the prize (Bühren and Pleßner, 2014). As a result, everyday items can turn into “trophies” which become almost unsalable. In our experiment, we directly compare both effects which has not been done before. Moreover, we test whether they reinforce each other. Understanding the relation and differences of IKEA vs trophy effects yield important managerial implications concerning customer empowerment, i.e. the way how companies interact with their customers.

In what kind of real-life situations do these effects occur and why could it be important to distinguish them? For example, “winning” a job in an exhausting and competitive assessment center has a positive impact on how the hired employee will evaluate the job (trophy effect). And when a customer builds products on his or her own, or when he or she helps to design customized products via an online tool, the evaluation and willingness to pay (WTP) for these products are higher than for pre-built or standardized products (IKEA effect). What if companies try to combine these two effects - for example, in a design competition in which a lot of potential buyers help to create customized products and the best of these products are promoted by the company or the most creative customers win a prize with their products (IKEA+Trophy effect)? Do the trophy and IKEA effects add up? Do they cancel each other out? Which effect looms larger?

The remainder of our paper is structured as follows: The next section comprises literature related to the IKEA and the trophy effect, followed by the section on our experiment: First, we describe our design and procedure followed by the results of Study 1, which tests the IKEA and trophy effect with inexpensive products, in our case paper planes. Then, we report the results of Study 2, which replicates Study 1 with more expensive

products: 3D-puzzles. In our last section, we compare the results of both studies, discuss emotional factors that drive them, and give an outlook on implications and future research.

## LITERATURE OVERVIEW

Bühren and Pleßner (2014) extended a standard endowment effect experiment (Kahneman et al., 1990) where participants had the opportunity to win the endowment in a real effort contest. Those participants who were successful in the effortful competition had a very high willingness to accept (WTA) for the item they received as a prize. They label this phenomenon the “trophy winner effect”. In contrast, subjects who were not successful in the respective competition revealed an extremely low WTP for the same item. The authors label this phenomenon “trophy loser effect”. In combination, these two effects led to complete market failure for the objects that were supposed to be traded, in their case ballpoint pens.

A related phenomenon to the trophy winner effect is the IKEA effect, which describes the overvaluation of own-built products in comparison to ready-made products. The experiments of Norton et al. (2012) show that customers value an object more highly if they built it themselves. An important condition for the IKEA effect is the successful finalization of the project. Norton et al. (2012) show that the effect is not just a result of the time spent on manufacturing: disassembly of a previously built product makes the effect disappear. While the endowment effect indicates that the sole ownership of a product increases its value for the individual, the IKEA effect describes the overvaluation of a product due to the labor invested in it. The authors mention possible explanations for the impact of the IKEA effect: e.g., positive feelings that are associated with successful completion of the work, a focus on the positive characteristics of the product, or the ratio between effort and sympathy (Norton et al., 2012).

A phenomenon similar to the IKEA and trophy winner effect is the ‘I designed it myself’ effect in mass customization which has been described by Franke et al. (2010). They define it as an increase in valuation for a self-designed object which arises from the fact that the customer feels like the creator of the good. The difference between the ‘I designed it myself’ and the trophy winner effect is that the work in the latter is not invested in the good itself (Bühren and Pleßner, 2014). Thus, the ‘I designed it myself’ effect, as well as the IKEA effect, relate to customers’ overvaluation of own creations or creations they have contributed

to. The connecting link between these effects is the association of effort and valuation. This association has been discussed in several studies, and its implications are of great practical importance, for example concerning product development, product design, marketing, and employee motivation.

The IKEA and trophy effect relate to Bandura's (1977) concept of self-efficacy. Self-efficacy refers to a person's conviction that he or she can cope with difficult situations. Bandura explores how behavior and thinking are influenced by learning and self-confidence. An essential finding is that typically people only start a task if they are convinced that they can execute it successfully. Through the channel of self-efficacy, successfully creating objects (IKEA effect) likely leads more directly to "love" for the built object than winning the object in a competition (trophy winner effect). This psychological mechanism underlying the IKEA effect could loom larger than the trophy winner effect because creators could be more emotionally attached to the object when building it themselves.

A further foundation of the IKEA and trophy effect is Ariely et al.'s (2008) experiment studying the influence of perceived meaning on labor supply with the aid of Lego products (Bionicles). In their setting, participants had to build Bionicles under different conditions: different wages and the manipulations of the perceived meaning of the task. In one treatment, the completely built Bionicles were put on a shelf, and participants received a new one to build, while in another treatment the Bionicles were destroyed and participants were asked to build it anew. The authors find that the more meaningful a task is, the higher is the motivation of the worker.

The IKEA effect and the trophy winner effect can be used to empower customers. In the past years, the role of customers has changed significantly. They can actively participate in a company's product development process and can decide which product is manufactured. Thus, there has been a significant increase in power on the customers' side. The reason for this is the transparency of the market as well as the increase of competition since essential information about the enterprise and the products are available on the internet (see Fuchs et al., 2010). The active inclusion of the customer and the customer's influence on the company are summarized in the concept of customer empowerment (see Ramani and Kumar, 2008; Auh et al., 2019; Fuchs et al., 2010; Wathieu et al., 2002). The research on customer empowerment can be separated into two perspectives – the companies' and the customers'

perspective. Ramani and Kumar (2008, p. 29), e.g., represent the companies' perspective and describe customer empowerment as "[...] the extent to which a firm provides its customers avenues to (1) connect with the firm and actively shape the nature of transactions and (2) connect and collaborate by sharing information; praise; criticism; suggestions; and ideas about its products, services, and policies". The customers' approaches understand customer empowerment as a condition perceived by the customers to be able to influence the processes of a company (Hunter and Garnefeld, 2008; Wathieu et al., 2002). Wathieu et al. (2002, p. 298) state, e.g., that it is about "[...] perceptions on the part of consumers that they have more power than before – and are benefiting from it." Moreover, customer empowerment can be distinguished between a market and a democratic approach. The market approach comprises that customers can choose between options and ultimately determine what is offered on the market. If customers feel that they can determine the companies' product range successfully, the emotions connected with the trophy winner effect might occur and thus strengthen customers' loyalty towards the company. The democratic approach actively involves customers in the development and design of products which can evoke the IKEA effect.

However, customers only feel empowered, if their effort is successful (Bandura, 1977). Customers want to avoid the trophy loser effect: They do not want to be unsuccessful in a competitive task. Thus, companies that start competitions to empower their customers have to find a design that focuses on the trophy winner effect. Concerning the IKEA effect, customers typically buy only those Do-it-yourself products for which they feel competent enough to assemble them. A combination of the trophy winner and IKEA effect seems promising – e.g., product design competitions which may lead to very high customers' valuations for the product.



## EXPERIMENTAL DESIGN, PROCEDURE, AND RESULTS

### Which one looms larger – IKEA vs. Trophy Effect?

#### *Design*

The *IKEA treatment* was inspired by Ariely et al. (2008) and Norton et al. (2012). In our experimental design, the IKEA treatment can be interpreted as a baseline treatment. Potential sellers in our IKEA market had to fold a paper plane<sup>1</sup> (Study 1) or construct a 3-D-puzzle<sup>2</sup> (Study 2) on their own without any time constraints – most of the subjects needed around 5 minutes to build the product. We handed out the instructions to build the paper plane together with colored paper or the 3-D-puzzle pieces and asked the sellers to write down their WTA between 0 and 2 Euros (for paper planes) or 0 and 5 Euros (for 3-D-puzzles) after building the item. Potential buyers in the IKEA market did not have to build a paper plane or a 3-D-puzzle but could buy one built by sellers. Therefore, they had to write down their WTP between 0 and 2 Euros and 0 and 5 Euros, respectively. After collecting the WTA and WTP, we sorted the WTA from lowest to highest and the WTP from highest to lowest to construct a supply and demand curve. The intersection of the curves determined the market-clearing price, that buyers with a higher or equal WTP had to pay to sellers with a smaller or equal WTA. All these transactions took place immediately after showing the market equilibrium (see Appendix A). Sellers and buyers were randomly matched to trade the product.

In the *Trophy treatment*, the setup was very similar to Bühren and Pleßner (2014). Subjects in the Trophy treatment had to complete an elementary mathematics test within 5 minutes (see Appendix B). We pointed out that only 50% of the subjects who scored best would be rewarded with a paper plane (Study 1) or a 3-D-puzzle (Study 2). After having collected the tests, we redistributed them in a random order making sure that nobody got her or his test. Then, we presented the correct answers and asked the participants to correct the tests in front of them. Afterward, we determined the best half of the tests and spot-checked them if they had been corrected properly. We pronounced the pseudonyms of the winners who got the reward from a student helper to avoid that the lecturer learned which of his or her

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<sup>1</sup> We handed out colored paper of high quality together with instructions for a special paper plane. The instructions for the paper plane can be found here:

<https://www.besserbasteln.de/Origami/Papierflieger%20falten/eisvogel.html>.

<sup>2</sup> The 3-D-puzzles were soccer balls with players from the German national soccer team that we bought for 2.80€ each: [https://www.amazon.de/dp/B07BL162JR/ref=dp\\_prsubs\\_1](https://www.amazon.de/dp/B07BL162JR/ref=dp_prsubs_1)

students were good or bad in math. Those who were rewarded with a pre-built paper plane (Study 1) or 3-D-puzzle (Study 2) became sellers, whereas subjects whose results were below the median got the chance to buy the item. From there on, the procedure was the same as in the IKEA treatment.

In the *IKEA+Trophy treatment*, subjects had to fold the same paper plane (Study 1) or the same 3-D-puzzle (Study 2) as in the IKEA treatment, but in a competition: Only the first half of the subjects who managed to build the item became sellers. The other half became buyers in the market. Successfully building the paper plane or the 3-D-puzzle took subjects around 5 minutes. Thus, the time spent for successfully building the product was comparable to the Trophy and the IKEA treatments. The procedure of determining the market price and trades was identical to the IKEA and Trophy treatments.

### ***Procedure***

We ran the sessions of our classroom experiment in lectures at the universities of Kassel and Hamm-Lippstadt from April 2018 until October 2019. We conducted two studies with different products and altogether 310 students (158 female and 152 male) of economics, law and economics, business administration, and industrial engineering who took part in our ‘market experiment’. On average, they were 23.31 years old. As in the study from Bühren and Pleßner (2014), all of them had to have attended an introduction to economics course.<sup>3</sup> We made sure that no student participated twice in our studies and treatments. We called to their attention that the market-clearing price emerges at the intersection between supply and demand and that, in the market, buyers with a WTP higher than the market price have to buy the traded item from sellers with a WTA lower than the market price. They had to pay the market price with their own money. Before we began the experiment, we showed every subject the product (paper planes and 3D-Soccerball-puzzles) so that everybody was familiar with the good that was traded afterward. In our post-experimental questionnaire, we asked the control questions how important it was for our subjects to get or keep the item in our market and if they perceive the item as a symbol for their performance in the experiment.

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<sup>3</sup> Although students of economics might behave differently than other students (e.g., Carter and Irons, 1991), we selected them to have homogeneous samples across treatments and because they are used to deal with the principles of supply and demand.

## Study 1 – Markets for Paper Planes

### *Results*<sup>4</sup>

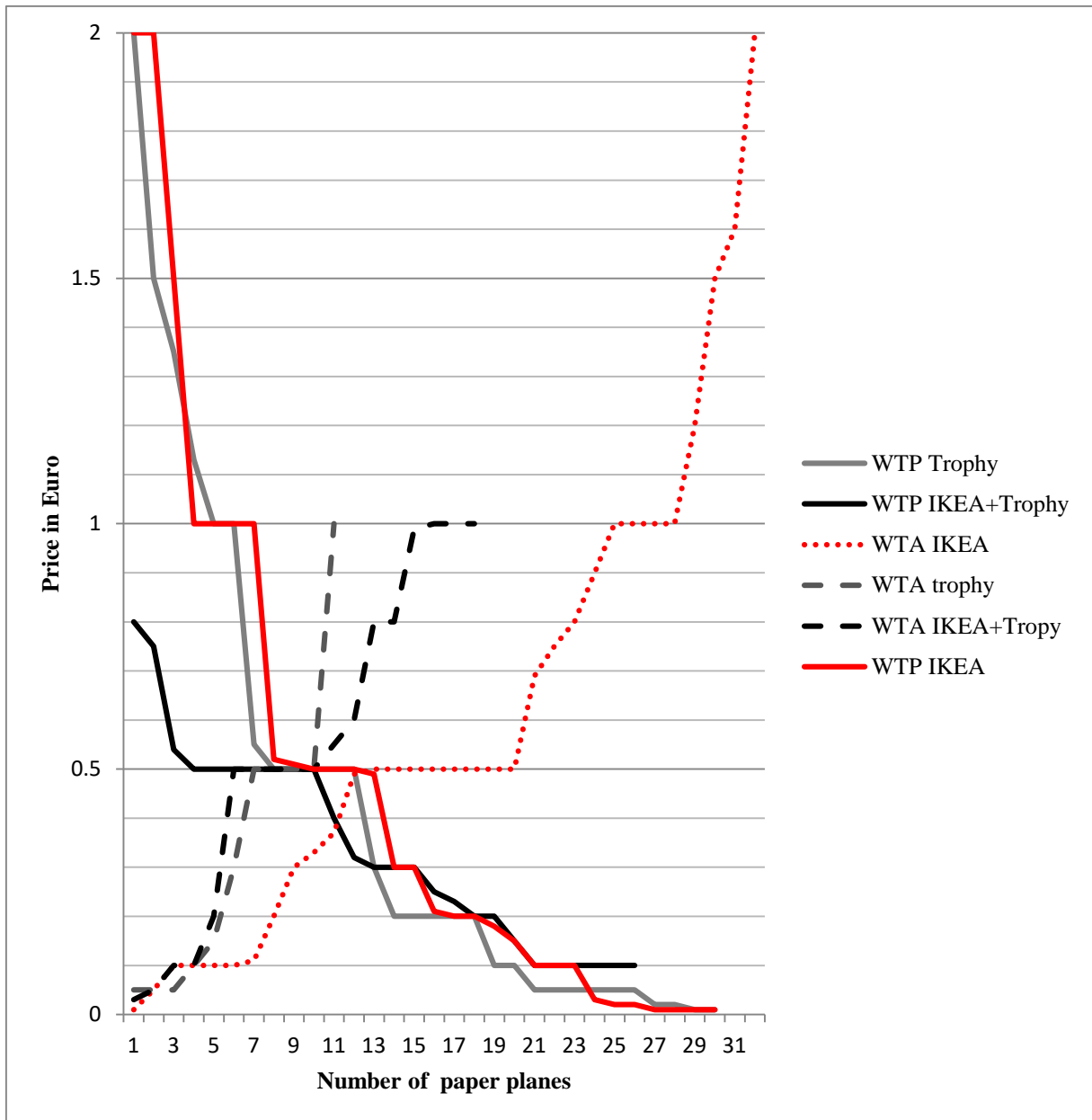
In Study 1, we do not find any significant treatment effects for buyers: The mean WTP in the IKEA+Trophy and Trophy treatments are not significantly smaller than in the baseline (IKEA treatment), the median WTP is identical across treatments. However, sellers who won the paper plane in our math competition valued the item more highly than in our baseline and, thus, had a higher WTA. The median WTA in the Trophy treatment is five times higher than the corresponding median WTP. In IKEA+Trophy it is 4.35 times higher and in IKEA it is 2.38 times higher. Hence, we observe fewer trades than expected in our markets (see Figure 1 and Table 1): In IKEA+Trophy, we observe only 56% of expected trades, in Trophy 65%, and IKEA 71%. The equilibrium price in the markets is 0.50€ in every treatment. The WTA/WTP-ratios in our paper plane study are comparable to typical endowment effect experiments (between 2 and 5, see Kahneman et al., 1990). The median WTA/WTP of the original trophy effect with pens was over 7 (see Bühren and Pleßner, 2014).

Specifications (1) and (2) of Table 3 analyze the treatment effects on the valuation of paper planes with OLS regressions controlling for the perceived importance of getting the paper plane in the market. The perceived importance is positively associated with the price that subjects are willing to accept or pay. Specification (1) confirms the trophy winner effect observed in Table 1: *Ceteris paribus*, potential sellers in the Trophy treatment, who won the math competition, have a 0.47€ higher WTA than in the IKEA treatment ( $p < 0.01$ ). Furthermore, the analysis reveals a positive impact on the valuation of self-made products after winning the competition to accomplish the product before more than half of the subjects do so: *Ceteris paribus*, potential sellers in the IKEA+Trophy treatment have a 0.31€ higher WTA than in the IKEA treatment. Specification (2) confirms the finding of Table 1 that the WTP in the IKEA+Trophy treatment is not significantly smaller than in the IKEA treatment.

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<sup>4</sup> Our dataset and original instructions can be found here <http://dx.doi.org/10.17632/3ddt3x5kxh.1>

Figure 1: Markets for paper planes



**Table 1: Summary of the Treatment Results of Study 1 – Paper planes**

	N	equilibrium			WTA			WTP			WTA/WTP	
	$\sum$ 196	expected trades	trades	price	mean	median	std. dev.	mean	median	std. dev.	means	medians
IKEA	$\sum$ 70	17.5	12	0.50	0.83	0.50	0.68	0.45	0.21	0.56	1.84	2.38
IKEA+Trophy	$\sum$ 64	16	9	0.50	1.06	1.00	0.70	0.28	0.23	0.22	3.79	4.35
Trophy	$\sum$ 62	15.5	10	0.50	1.20*	1.00 <sup>#</sup>	0.80	0.38	0.20	0.50	3.16	5

Notes: Kruskal-Wallis test for sellers:  $p=0.151$ , for buyers:  $p=0.696$ ; ANOVA: F-test for sellers:  $p=0.119$ , for buyers:  $p=0.302$ ; \*: significantly different from IKEA treatment ( $p=0.049$ , two-sided t-test); #: not significantly different from IKEA treatment ( $p=0.084$ , two-sided Mann-Whitney U test).

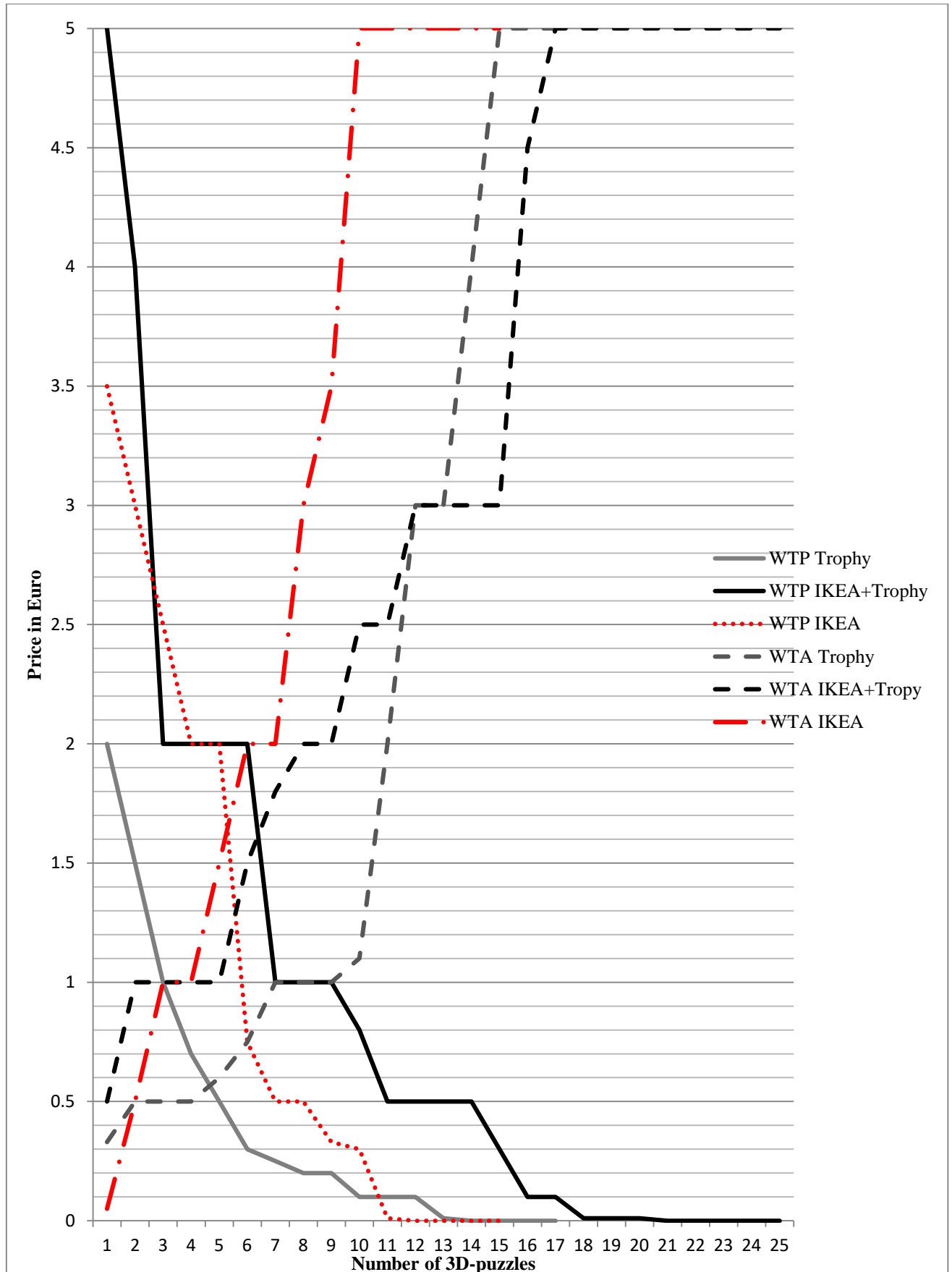
## Study 2: Markets for 3-D Puzzles

### *Results*

In all three markets in Study 2, we observe imperfect markets due to amplified endowment effects (see Figure 2 and Table 2): Whereas in the IKEA treatment, two-thirds of the expected trades were realized, less than half of the expected trades took place in the Trophy and IKEA+Trophy treatments. The market price was highest in the IKEA treatment (1.65€) and lowest in the Trophy treatment (0.56€). On average, sellers in the IKEA+Trophy treatment had the highest WTA (3.13€), whereas buyers in the Trophy treatment had the lowest WTP (just 0.41€). The ratio of median WTA and median WTP was 5 in Trophy and 6 in IKEA and IKEA+Trophy. We do not find significantly different WTA or WTP of the Trophy and IKEA+Trophy treatments compared to the IKEA treatment. However, the WTA in the Trophy treatment is lower than the WTA in the IKEA+Trophy treatment ( $p < 0.05$ ). This result indicates that the product or building the product in Study 2 (the 3-D puzzle) is more in the subjects' focus compared to Study 1, in which winning the math competition is more valuable for our subjects than accomplishing to build a paper plane.

Specification (3) of Table 3 is in line with the finding of Table 1 that the WTA of 3D-puzzles in Trophy and IKEA+Trophy are not significantly different from the WTA in IKEA. Having a look at the WTP in these markets, we can replicate the trophy loser effect found by Bühren and Pleßner (2014) after controlling for how important subjects perceived the puzzles (specification (4)). The potential buyers' WTP is *ceteris paribus* 0.85€ smaller after losing the math competition compared to the IKEA treatment. In the combination of IKEA and Trophy treatment (IKEA+Trophy), we do not observe such a trophy loser effect.

Figure 2: Markets for 3D-puzzles



**Table 2: Summary of the Treatment Results of Study 2 – 3D-puzzles**

	N	equilibrium			WTA			WTP			WTA/WTP	
	$\sum$ 114	expected trades	trades	price	mean	median	std. dev.	mean	median	std. dev.	means	medians
IKEA	$\sum$ 30	7.5	5	1.65	2.97	3.00	1.92	1.03	0.50	1.22	2.88	6.00
IKEA+Trophy	$\sum$ 50	12.5	6	1.61	3.13	3.00	1.66	0.93	0.50	1.29	3.37	6.00
Trophy	$\sum$ 34	8.5	4	0.56	2.02 <sup>a</sup>	1.00 <sup>b</sup>	1.77	0.41	0.20	0.58	4.93	5.00

Notes: Kruskal-Wallis-test:  $p=0.085$  for sellers and  $p=0.421$  for buyers, ANOVA: F-test for sellers:  $p=0.123$ , for buyers:  $p=0.222$ ; <sup>a</sup>: significantly different from IKEA+Trophy ( $p=0.044$ , two-sided t-test) <sup>b</sup>: significantly different from IKEA+Trophy ( $p=0.028$ , two-sided Mann-Whitney U test).

**Table 3: OLS regressions analyzing the treatment effects for sellers and buyers in our paper plane and 3-D-puzzle markets**

	(1) Paper planes: sellers		(2) Paper planes: buyers		(3) 3D-puzzles: sellers		(4) 3D-puzzles: buyers	
	coef.	std. err.	coef.	std. err.	coef.	std. err.	coef.	std. err.
IKEA+Trophy	0.3093*	0.1602	-0.1649	0.1096	0.3870	0.5414	-0.2448	0.3314
Trophy	0.4702**	0.1530	-0.3541	0.1104	-0.4312	0.6067	-0.8512*	0.3625
Importance	0.1233***	0.2238	0.0369*	0.0156	0.2960**	0.9784	0.3166**	0.0894
cons	0.0517	0.1451	0.3282**	0.0942	1.7860**	0.5770	0.6461*	0.28103
N	96		98		57		57	
R <sup>2</sup>	0.2774		0.0794		0.2109		0.2353	
Adjusted R <sup>2</sup>	0.2539		0.0500		0.1663		0.1920	
F, Prob>F	11.77, <0.0001		2.70, 0.0500		4.72, 0.0054		5.44, 0.0025	

Notes: \*:  $p<0.05$ , \*\*:  $p<0.01$ , \*\*\*:  $p<0.001$ ; Treatment: Reference category: IKEA; Importance: Control variable in the post-experimental questionnaire asking subjects how important it is for them to keep (sellers) or to buy (buyers) the product in the market experiment on a 10-point Likert-scale.



## CONCLUSION AND DISCUSSION

The results of Study 1 and 2 reveal that the size (and direction) of the IKEA and the trophy winner effect is determined by the product that subjects build on their own or that subjects receive as a reward. The value of winning a competition (in the Trophy and IKEA+Trophy treatments) is especially incorporated in the valuation of inexpensive products which, nevertheless, symbolize a trophy for the winners (paper planes in our study or pens in Bühren and Pleßner, 2014). As soon as the won product has a specific value itself, the trophy winner effect is less pronounced and the IKEA effect, which is more directly connected to the product, plays a larger role. For 3-D-puzzles, however, we did not find a significant difference between the IKEA and Trophy treatment, only a larger effect of the combination IKEA+Trophy compared to Trophy.

In our post-experimental questionnaire, we asked our subjects if they perceive the product as a symbol for winning the competition (in the Trophy and IKEA+Trophy treatments). Controlling for the WTA, sellers of paper planes perceive the item on a 10-point Likert-scale on average 2 points more as a symbol than sellers of 3-D-puzzles. The trophy loser effect is more pronounced for more expensive products: While we do not observe any significant effects on buyers of paper planes, we find that subjects who lose the math competition have *ceteris paribus* a lower WTP for 3-D-puzzles than subjects of our baseline (IKEA) treatment. Interestingly, potential buyers in the Trophy markets perceived the 3-D-puzzle, compared to paper planes, as a bigger symbol for their defeat in the math test (after controlling for the price and the importance of the product 1.82 more points on a 10-point Likert-scale). Thus, positive emotions attached to an inexpensive product are driving our finding that the trophy winner effect looms larger than the IKEA effect in Study 1. And negative emotions attached to a more expensive product are responsible for the trophy loser effect in Study 2. Similarly, the endowment effect is mediated by emotions: Positive emotions activate the endowment effect, whereas negative emotions impede it (Lin et al., 2006, see also Biel et al., 2011).

Having a look on marketing implications, it is of great value for companies to know which effect they should try to make use of in their product development and their marketing campaigns, or whether a combination could be promising. Our findings suggest that the relevance of the IKEA and trophy effect is determined by the product category. The labor of customers invested in the product itself seems to be of greater importance the more expensive

the product is. However, as soon as customers interpret certain tasks - related or unrelated to the product development process - as a competition, the effect on their subjective valuation can be substantial even for inexpensive products. An example of a competition not directly connected to building the product can be answering survey questions on the company or the product better than other customers. The risk of a trophy loser effect in case of a lost competition is more relevant if the trophy for the competition is a more important product. It is less relevant in competitions in which effort is directly invested in designing or building the product (IKEA+Trophy).

Companies that allow their customers to individualize products ought to be careful in creating customers' tasks. To prevent frustration, companies should balance out the relationship between customers' effort and their extra utility associated with the performed labor to obtain the product (Dellaert and Stremersch, 2005; Bühren and Pleßner, 2014). Concerning self-efficacy (Bandura, 1977), companies need to create tasks in a way that customers can fulfill them (performance accomplishment). Furthermore, if customers successfully contribute to the production process, it would be helpful if other customers were made aware of this performance (vicarious experience), for example via social media (e.g., the "build your own burger" competition by McDonald's) which can have positive effects on brand loyalty.

Our findings can also be seen in the context of employee productivity. Hossain and List (2012) find in their natural field experiment with employees of a Chinese high-tech manufacturing facility that both negative and positive framings of bonuses can have a positive influence on employees' productivity. Their negative frame has a greater impact than their positive frame. If the bonuses are granted beforehand and employees can lose them in case of underperformance (negative "Punishment" frame), employees' productivity is roughly 1% higher than in a positively framed setting ("Reward"), where employees strive for a bonus in the future based on their per-hour production. However, the "Reward" frame also leads to higher productivity. Furthermore, they find that the effect is stronger for groups than for individuals. The positive effect of the "Reward" setting is in line with the IKEA-effect as well as the trophy winner effect: The hard work employees invest in or to receive their bonuses leads to a higher valuation of the bonus and can thus evoke higher productivity. Yet, the fear of losing an already granted bonus seems to loom larger than the joy of a prospective bonus in the future and has thus a greater effect on productivity. This can be regarded as a manifestation of loss aversion (Kahneman and Tversky, 1979) and is in line with the trophy

loser effect: To avoid the “pain” of having worked for nothing, employees work even harder to obtain results that reach or surpass the threshold defined beforehand.

Our results can also be interpreted in the light of customer empowerment. Fuchs et al. (2010) present the psychological implications of customer empowerment. They find that customers who were entitled to decide on the products to be marketed showed significantly more interest and a higher WTP for these products. The reason for the higher WTP is the psychological feeling of property, as the customers themselves were allowed to participate in product development. Nevertheless, Fuchs et al. (2010) identified two important limitations of the "empowerment product demand". They emphasize that the demand decreases if the product to be marketed does not represent the customer's personal preferences and if customers are not convinced that they can make well-founded decisions.

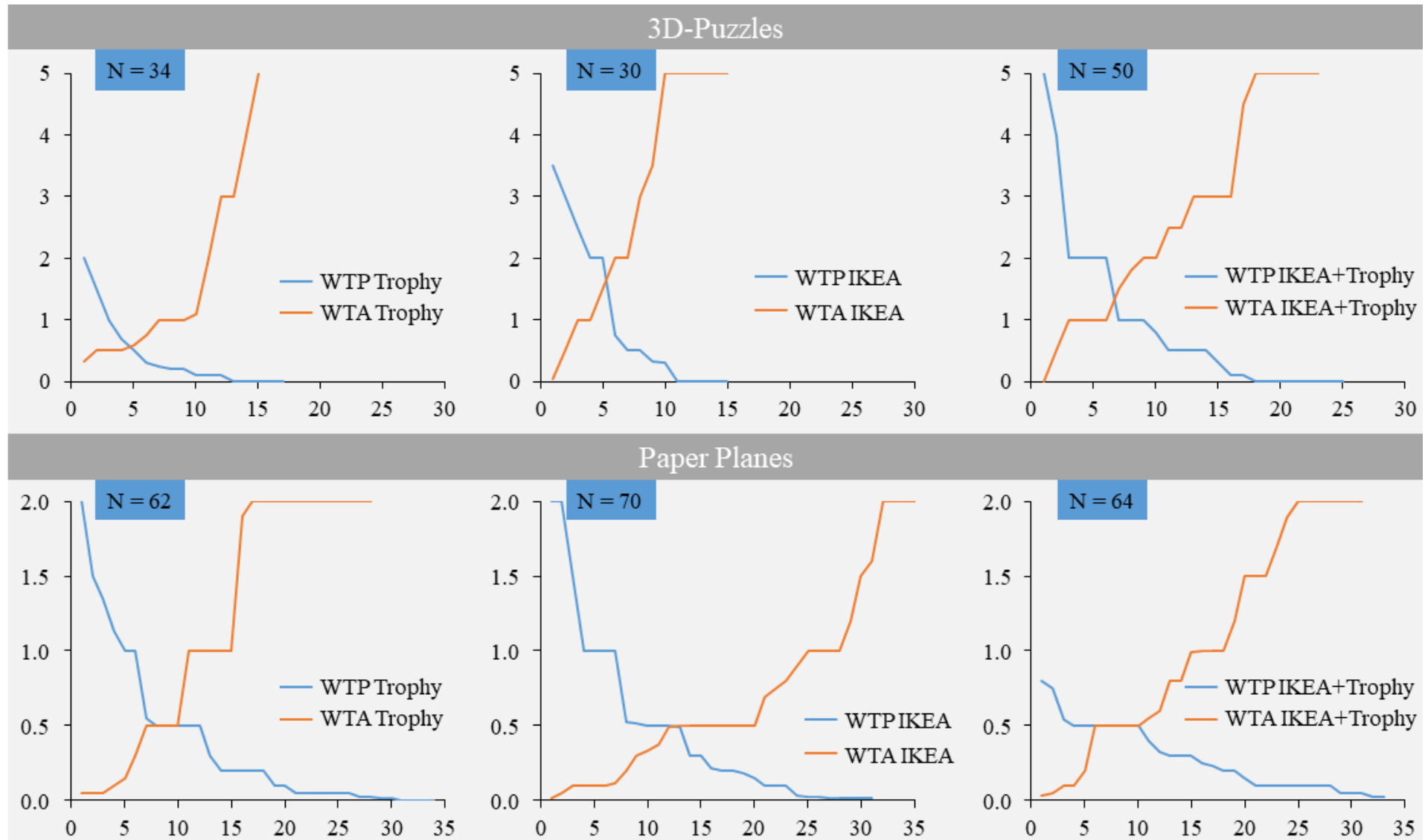
Future research could investigate the prediction bias (Loewenstein and Adler, 1995), which holds for the endowment effect, for these two effects. This could be analyzed by handing out the object and the respective instructions and elicit the subjective valuation before participants assemble the products. Whether subjects can predict the significant increase or decrease in subjective valuation due to the labor they (un)successfully invest in getting or building the product is a further important aspect for companies for their marketing campaigns and pricing decisions. If customers do not anticipate the increase in subjective valuation due to successful labor, companies will need to start with higher marketing budgets and relatively modest prices to convince customers of their products. In case this prediction bias does not hold for the IKEA and the trophy winner effect, companies do not have to be overcautious in their pricing decisions and marketing budgets could be lower. Future research can also try to investigate further the impact of product importance on the IKEA and trophy effect. It would be desirable to test the effects further with different product categories – from everyday items to expensive products.

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**Appendix A: Overview of markets for 3D-puzzles and paper planes**



**APPENDIX B****Mathematics test (5 minutes without a calculator, translated from German)**

1.) (two points each)

A biro and a paper block together cost 1.10 €. The biro is 1 € more expensive than the paper block. How much does the paper block cost?

5 bricklayers need 5 days to construct 5 walls. How long do 100 bricklayers need for 100 walls?

The trousers cost 60 € including a discount of 20%. How much do the trousers cost before the discount?

2.) (one point each)

$$x - (x + 1) + 2 =$$

$$z^3 + xy + z^3 =$$

$$\frac{b - b^2}{b} =$$

$$\frac{1 - y^2}{y + 1} =$$