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Perceptions of price fairness: An empirical research

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ABSTRACT

This paper researches factors that influence price fairness judgements. The empirical literature suggests several factors: reference prices, the costs of the seller, a self-interest bias and the perceived motive of sellers. Using a Dutch sample, we find empirical evidence that these factors significantly affect perceptions of fair prices. In addition, we find that the perceived fairness of prices is also influenced by other distributional concerns that are independent of the transaction. In particular, price increases are judged to be fairer if they benefit poor people or small organisations rather than benefiting rich people or big organisations.

1. Introduction

Fairness is an increasingly important topic in the economy. Economic transactions are not driven merely by economic motives (See for example Sen, 1996). For many types of organisations it is very important to know when people perceive prices and price changes to be fair. A recent example that clearly illustrates the importance of fairness perceptions is the commotion about the salary of the managing director of the non-profit organisation “De Hartstichting” (the “Heart Foundation”), a foundation that combats heart diseases. In 2004, a newspaper reported that the managing director of “De Hartstichting” received a salary of over € 170,000 annually. Many contributors and collectors were furious, and stopped their donations and their work for the foundation. According to them, the salary of the director was much too high, and therefore unfair. The management of the foundation claimed that an experienced heart specialist was needed in order to lead the research, and that experienced heart specialists often earn a lot more than € 170,000. For many people, this explanation was insufficient. The foundation saw no other option than to discharge the managing director, who was not prepared to lower his salary. Despite this discharge, the reputation of “De Hartstichting” was seriously damaged.

Not only for non-profit organisations, but also for commercial organisations it is very important to know when people perceive prices and price changes to be fair or unfair. Experimental research has shown that concerns about fairness affect choice behaviour of agents (Rabin, 1998). This type of research subjects individuals to self-interested choices and fair choices. It is found that about half of all subjects behave in a way that is significantly inconsistent with pure self-interest. Economic literature gives many examples of this (See for example Bougie, Pieters and Zeelenberg, 2003). For instance, cash posters worked harder than required because of favourable work group attitudes that were dependent upon workers' sense of fair treatment (Akerlof, 1982). Judgments of unfairness lead to dissatisfaction (Oliver and Swan, 1989) and more price consciousness (Sinha and Batra, 1999). It may also lead people to complain or ask for a refund (Xia et al, 2004). In more extreme cases, people might even try to take revenge by not coming back, by spreading negative word-of-mouth or even by using violence (Bougie et al, 2003). Research by Kahneman et al (1986) shows that in some cases people are even willing to disadvantage themselves in order to punish a seller that is perceived to be acting unfairly.

In practice, however, considering fairness judgements is no easy task, because the concept of fairness is highly complex. In literature, many concepts of fairness have been developed representing various different aspects of price fairness (Graafland, 2007; Campbell, 1999; Frey et al, 1993; Kalapurakal et al, 1991, Maxwell, 1995; Maxwell, 2002; Xia et al 2004). In daily practice these different aspects might influence the behaviour of economic agents. The purpose of this paper is to examine the empirical relevance of these aspects for the Netherlands.

For this purpose, we first formulate several hypotheses about price fairness perceptions. Most of them are supported by some main findings of the empirical research in economic and psychological literature into factors that impact on price fairness judgements. We believe, however, that the current literature does not present the complete set of factors that influence price fairness judgments. In particular, we add one new hypothesis, namely that inequalities, which exist before the transaction takes place, may inform price fairness judgements. The hypotheses can be found in section 2. Section 3 describes the methodology

that we have used in our own empirical research in order to validate our hypotheses in the Dutch situation. The outcomes of the empirical research are described in section 4. The conclusion can be found in section 5.

2. Hypotheses on price fairness perception

Investigation into price fairness has evolved from the early work on social exchange (see, for example, Adams, 1965). An important concept of social exchange was *distributive justice* that pertained to the allocation of just outcomes. Later, the focus shifted towards a concern for fair procedures. Applied to prices, *procedural justice* relates to whether the seller has 'played fair' by adhering to the rules of process when setting the price. As is shown by Collie et al (2002), outcome evaluations tend to be influenced by perceptions of procedural justice.

Among the first to explore the concept of price fairness were Huppertz et al (1978). In their study, people were asked to judge the fairness of scenarios containing inequitable levels of price and service. Although this research had several limitations, it has induced many researchers to further explore the concept of price fairness judgments.

Various hypotheses can be formulated on the underlying mechanisms which regulate the price fairness perception. In this section five hypotheses will be formulated and, where relevant, supported with literature. In our view these hypotheses may not be a full set¹, but they quite well cover the most relevant aspects.

Hypothesis 1: Reference prices play a role in price judgements

One of the most important findings in the literature is that fair prices are related to reference prices (Kahneman, Knetsch and Thaler, 1986). The primary rule is that the actual price should be equal to the price that a consumer expects. This price is the 'reference price'. Both market prices and prices from previous transactions can serve as reference prices. Consumers feel that they are entitled to this reference price, because consumers at other stores or in the recent past can buy or have bought the commodity for the same price. More specifically, the results indicate that buyers perceive they have an entitlement to the terms of a reference transaction and sellers perceive they have an entitlement to the profit resulting from this reference transaction. This concept is referred to as the 'dual entitlement' (DE) principle. According to the DE principle, it is unfair for firms to exploit excess demand because this violates the customer's entitlement to the reference price. The most intriguing aspect of this principle is that entitlements are not symmetrical: in the case of increased costs, sellers are allowed to increase prices in order to protect their reference profit. However, when costs decline, sellers do not have an obligation to lower prices because the reference terms of the buyers are not threatened.

Hypothesis 2: Options to pass-on production costs are perceived to be fair

In the literature several cost-based pricing rules have been developed. Kalapurakal et al (1991) test the fairness of the DE principle against two alternative cost based rules: a 'cost-

¹ For example, one of the mechanisms not tested in our research is that of Frey and Pommerehne (1993) who find that procedural fairness rules, such as 'first come, first served' and a lottery mechanism, are perceived to be the fairest.

plus rule', which implies that prices are positively related to costs, and a *'buffer rule*', which says that small cost increases and decreases are absorbed by the seller. The authors conclude that the case for the DE principle may not be as strong as argued by Kahneman et al (1986). Both a buffer rule and a cost-plus rule applied consistently to cost increases and decreases are considered to be more fair than the dual-entitlement principle.

Three years later Dickson and Kalapurakal (1994) repeated this research, including a fourth cost-based rule: 'average costs', which states that the price is set in such a way that the buyer and the seller both pay for half of the extra costs in the case of a cost increase, and also both benefit equally when a cost decrease occurs. The findings do not change the results significantly, and therefore represent a further challenge to the DE principle.

Clients often lack an accurate understanding of the costs that are associated with a product and the profits a firm makes. Bolton et al (2003) show that people strongly overestimate the profits that are being made by a firm. For example, the profit margin of grocery stores is normally about 1-2%, whereas people's estimate was 27.5%. Several explanations are given. One is that people underestimate the effects of inflation, causing people to overestimate profits made by firms. Another explanation is that people do not spontaneously consider all cost categories. When different cost categories are explicitly mentioned to the respondents, perceived profits go down, but are still much higher than the actual profits.²

Hypothesis 3: Pursuing social goals is considered more fair than increasing profits

Many of the studies mentioned so far have used questionnaires in which people were given a lot of information about the transaction. In reality, people do not have so much information. They therefore often base their fairness judgment on assumptions they hold about firms and their products. If people think that firms are making a large profit, feelings of unfairness are more likely to arise in the case of a price increase.

Furthermore, a high profitability is perceived as fairer if the buyer thinks that the seller has the intention of serving some social goals rather than making a high profit. The relevance of the inferred motive for fairness judgments can be illustrated by an example that is used by Campbell (1999): A price rise for bottles of water after an earthquake is unfair if the supplier wants to take advantage of the situation. It is, however, perceived as more fair when the supplier is trying to prevent a shortage by rationing the use of bottles of water. Kantian ethics can be used to explain this assumption. If the supplier wants to take advantage of the situation, he uses other people as means to an end (profit), and not as an end in themselves (Velasquez, 1998). If he is trying to prevent a shortage, he treats the consumer as an end (his goal is that there will be enough water for everyone). The importance of social components (such as inferred motive) of fairness judgements in addition to the economic

² Kahneman et al (1986) and Xia et al (2004) also find that people do not always act completely rationally. For instance, people are more sensitive to out-of-pocket cost than to opportunity costs and more sensitive to losses than to foregone gains. Judgements of fairness are also susceptible to framing effects (that is, the way a situation or transaction is presented). Kahneman et al (1986) show that a nominal wage cut of 7% in a situation with no inflation is perceived to be unfair, while an increase in nominal wage by 5% in a situation with 12% inflation is not. Thaler (1985) also provides several examples of situations in which people do not act rationally, as would be predicted by standard economic theory.

components is also demonstrated by Maxwell (1995). He finds that people attach value to prices being affordable by everyone.³

Hypothesis 4: Self-interest affects the notion of fairness

Another outcome of Kahneman et al (1986) is that fairness judgments are biased by self-interest. This implies that someone who is being disadvantaged, be it as a seller or as a buyer, perceives more unfairness than someone who is advantaged. This self-interest bias is also observed by Dickson and Kalapurakal (1994), Maxwell (2002) and Xia et al (2004).

Hypothesis 5: The notion of fairness is biased towards poorer and smaller parties

This hypothesis has to our knowledge not been elaborated in literature, but in our view it is as relevant as the other ones mentioned before. Protests against low prices paid by Western companies to companies in developing countries, like in the coffee sector or textile sector, suggest that distributional factors not directly linked to the transaction itself (i.e. the producer or consumer surplus from the transaction), such as the total income, wealth or economic power of the buyers and seller, also influence perceptions of fairness. We therefore hypothesise that price increases are considered to be fairer if they benefit poor agents rather than rich agents. More generally, also other types of inequalities may inform price fairness judgements. We have therefore added one alternative measure of inequality, namely inequality in scale and hypothesise that price increases are considered to be fairer if they benefit small organisations rather than large organisations. Scale may be an indication of income, but also of other factors, such as power.

3. Methodology

In order to validate the hypotheses which we have formulated in section 2, we used a questionnaire. This questionnaire can be found in appendix 1. Each hypothesis has been tested by one or more pairs of questions. A pair of questions consists of two questions that were similar, except for one factor. By comparing the answers to the two questions, we checked whether the factor that was changed influences the fairness judgment. Of course, the questions were in random order, so that one question from a pair was never asked immediately after the other one. Moreover, we randomly inserted ten other (unpaired) questions to reduce the visibility of the paired questions (these questions are not in the appendix)

The questionnaire consists of questions that sketch practical situations. Two questions asked people which price they would consider to be fair under certain conditions. For the other questions there were four possible answers: 'completely fair', 'acceptable', 'unfair' and 'very unfair', which is similar to the method used by Kahneman et al (1986). Note that the rating scale is 'unbalanced'. This implies that there is no neutral point. In this way, respondents are forced to choose between an opinion that is more fair or less fair than "neutral". To apply statistical tests to the answers, the data had to be transformed into

³ Sometimes also the social relationship between buyer and seller is considered in fairness judgments. For example, both the studies of Huppertz et al (1978) and Bolton et al (2003) show that price increases are perceived to be extra unfair when they harm regular customers.

numerical data. This was done by assigning “fairness points” to the answers that were given (completely fair: 4 points; acceptable: 3 points; unfair: 2 points; very unfair: 1 point). In the last part of the questionnaire we posed questions about sex, age and income.

The sample of the questionnaire

The questionnaire was put on a website. For a period of three weeks people were able to fill out the questionnaire and to submit it on-line. We asked as many people as possible to fill out the questionnaire. This form of data collecting is called ‘convenience sampling’, which means that the data has been collected from members of the population who were conveniently available to provide it (Sekaran, 2003). In total, 307 people filled out the questionnaire. According to the central limit theory, a sampling distribution will be approximately normal if a sample size is sufficiently large. For most sampled populations, sample sizes greater than 30 will suffice for the normal approximation to be reasonable (McClave et al, 1998). Since our sample size is much larger, we can use normal approximation.

The sample of the questionnaire on the Internet consists of 183 males (59,6%) and 124 females (40,4%). People were also asked to indicate whether their family income was ‘below average’ (18%), ‘average’ (35%) or ‘above average’ (43%). Relatively many respondents are younger than 30 years. This can be explained by the fact that, like in other empirical studies ethics, (e.g. Angelidis & Ibrahim, 2004) we asked students to fill in the questionnaire. However, since the response of students may not be representative for the Dutch population, we also did substantial effort to include other groups in the sample. As a result of our efforts, more than 60% of the sample consists of non-students aged 30 years or older. This allows us to test the possible bias resulting from using students in the sample. Furthermore, since the sample consists of relatively many males and people with a family income that is above average, we have also tested for statistical differences between different gender and income groups. The test statistics show, however, that there are no significant differences between any of these subgroups (see Appendix 3). This implies a more representative sample of the Dutch population will not produce results that differ from our estimates.

4. Results

In the following paragraphs the validation of the various hypotheses, as obtained from the questionnaires, will be shown. Each of the five hypotheses will be dealt with in turn, showing the questions as well as the answers given, whereby we show the difference between the mean answers that were given to the two questions that form a pair. The last columns give the standard error of the mean differences for every pair of questions and the T-value with a probability of 95%. If the T-value exceeds 2.0, the factor that was changed has a significant influence on price fairness perception.

Hypothesis 1. Reference prices play a role in price judgments

This hypothesis was tested with two pairs of questions. In the first set actual prices in different stores were used as a reference, while in the other set historic prices were

compared to current prices. In both pairs, the respondents were asked to judge the fairness of the price for a particular product, whereby in one of the questions the reference price was equal to the price that had to be judged, while in the other the reference price was lower. As can be seen from Table 1, the difference is significant for both pairs. Prices that match prices of competitors or prices in the past are considered to be much fairer than prices that strongly deviate from these reference prices.

Table 1 Reference prices play a major role in price judgments: Test results

Reference price taken as:	Pair of questions ^a	Mean difference in fairness points ^b	Standard error	T-value
Actual price	Set I	0.901	0.064	13.982
Historical price	Set II	0.671	0.080	8.351

^a See appendix 1 for the questions

^b Difference in average fairness points of the two questions. For each question the options are: completely fair: 4 points; acceptable: 3 points; unfair: 2 point; very unfair: 1 point.

The mean difference was biggest for the pair of questions in which actual prices were compared. However, also the historic price comparison shows a significant difference.

Hypothesis 2: Options to pass-on production costs are perceived to be fair

In order to test the second hypothesis we asked respondents to judge the fairness of a price increase for snow shovels after a blizzard compared to a price increase after an increase in the wholesale price of snow shovels. A price increase after a rise in the costs of the seller is considered to be much fairer than a price increase in response to the rise in demand. Again, the difference between the mean answers given is quite large and significant.

Table 2 Options to pass-on production costs are seen as fair: Test results

Pair of questions ^a	Mean difference in fairness points ^b	Standard error	T-value
Set III	1.086	0.048	22.417

^a See appendix 1 for the questions

^b See Table 1

Hypothesis 3: Pursuing social goals is considered more fair than increasing profits

This hypothesis concerns the ‘inferred motive’ of the seller. This hypothesis was tested with one pair of questions. We used the same case as mentioned by Campbell (1999) of a shop owner who increases the price of a bottle of water after an earthquake in a remote village, which has caused the delivery of water to be delayed. In the first question, his motive is to make some extra money. In the other question, his motive is to make sure that people do not use more water than they need, so that there will be enough for everybody. Table 3 shows that this difference in motive indeed makes quite a big difference in perceived fairness. The mean difference is over 0.5 ‘fairness points’, and is significant.

Table 3 Pursuing social goals is more fair than increasing profits: Test results

Pair of questions ^a	Mean difference in fairness points ^b	Standard error	T-value
Set IV	0.517	0.047	11.078

^a See appendix 1 for the questions

^b See Table 1

Hypothesis 4: Self-interest affects the notion of fairness

For the hypothesis that people have a ‘self-interest bias’ in judging price fairness we have chosen two perspectives. The first perspective relates to that of the buyer. We compare the judgment in a situation in which the price (of snow shovels) is increased when demand is high with that in which the price of snow shovels is decreased when demand is low. Assuming that most people from our sample will identify with the buyer of a snow shovel rather than with a seller of a snow shovel, greater unfairness should be perceived in the first question. In Table 4 it is shown that there is indeed a very large and significant difference in the perceived fairness.

Table 4 Self-interest affects the notion of fairness: Test results

Perspective of transaction	Pair of questions ^a	Mean difference in fairness points ^b	Standard error	T-value
Buyer’s perspective	set V	0.908	0.316	2.873
Seller’s perspective	set VI	1.378	0.054	25.671

^a See appendix 1 for the questions

^b For set V: see Table 1. For set VI, we report the difference in average fair price

The second perspective relates to the seller’s perspective. Both questions were exactly the same: “a farmer needs to receive 15 cents per kilo of potatoes to be able to continue his business. The market price is 12 cents per kilo. What is a fair price?” However, in the first question, we wrote: “Suppose a farmer...” and in the second question we wrote: “Suppose you are a farmer...”. Table 4 shows that there is a significant mean difference of 0.908 eurocent per kilo, despite the fact that the two questions were very similar.

Hypothesis 5: The notion of fairness is biased towards poorer and smaller parties

Hypotheses 5a and 5b relate respectively to influences of income or scale inequality between buyer and seller on price fairness judgments. These perspectives have to our knowledge not been tested before. We therefore used five sets of questions to test this hypothesis.

One set of questions concerns poor coffee producers in developing countries that sell coffee to rich Western coffee buyers. On the coffee market, fairness is a big issue. Coffee prices that roasters pay to coffee farmers have been the subject of discussion for a long time. In the first question, there are two poor coffee farmers and one rich buyer. The buyer uses his market power to get the lowest possible price. In the second question, there is only one poor coffee farmer, but there are two rich buyers. Now the coffee farmer has market power, and uses this to get the highest possible price. The principle on which action is taken is the same in both questions. Only the wealth of the parties that are involved in the transaction differs. As can be seen from Table 5, the mean difference is very large and significant. The price increase that the small farmer can get because of the favourable market circumstances

is considered to be fair (the average score is 3.0, see appendix 2), whereas the price reduction that the small farmer must accept in the case of unfavourable market circumstances is considered to be unfair (the average score is 1.87, see appendix 2). This result therefore makes a strong case for hypothesis 5a.

In the next set of questions, a clothing store moves production to a country where wages are low (also by the standards of that country), in order to increase profits. In one question, the clothing store was already making large profits before the shift, while in the other question the clothing store was incurring losses. NGOs and anti-globalists often criticise Western retailers for paying wages well below the living wage. Amirul Haque Amin, for example, criticises C&A for buying merchandise from a factory in Bangladesh that pays wages well below the official minimum wage (Graafland, 2002). Another example is Klein (2002) who criticises Adidas for paying wages of 13 dollar cents per hour, whereas the living wage that is required to sustain a minimum subsistence level of welfare is 87 dollar cents per hour in China (Klein, 2002). The results from our data indicate, however, that it makes a significant difference when the Western retailer is more or less forced to shift its orders to low wage countries in order to secure its continuity.

Table 5 Fairness is biased towards poorer and smaller parties: Test results

Fairness criterion	Pair of questions ^a	Mean difference in fairness points ^b	Standard error	T-value
5a income	Coffee, set IX	1.145	0.060	19.010
	Clothes, set VIII	0.230	0.076	3.043
	Software, set VII	0.626	0.083	7.546
5b size of operation	Salary, set X	0.264	0.079	3.354
	Energy supply, set XI	0.225	0.043	5.188

^a See appendix 1 for the questions

^b see Table 1

This is confirmed by the results from the third set of questions. In these questions, there is a high demand for a certain software program, because it appears to be the only program that can detect and destroy some new computer virus. The seller of the program increases the price in response to this market situation. In the first question, this seller is a small firm facing bankruptcy. In the second question, the seller is Microsoft, which is assumed to be a very rich company. Again the price increase by the company facing financial problems is considered to be much fairer than the price increase by the highly profitable Microsoft. The difference is found to be quite large and significant.

In the last two sets of questions, we explored the impact of the size of an operation on the perceived fairness. The first pair of questions relates to the case which we described in our introduction. In the first question, one large company funds the non-profit foundation that researches heart diseases. In the second question, many small private contributors fund it. In both questions, the managing director of the firm earns an annual salary of € 140,000. Respondents were asked to judge the fairness of this salary in both cases. The director's salary is found to be significantly more acceptable in the case where one large company finances the foundation than in the case where many small private contributors do so.

Another case that recently caused a public outcry in the Netherlands concerns the salaries of directors of electricity companies. The managing director earns a salary of € 600,000 annually. In the first question, the buyers are private households. In the second

question, the buyers are large industrial companies. Again, respondents were asked to judge the fairness of this salary in both cases. Also for both of these pairs of questions, a small but significant difference could be observed between the mean answers. These results seem to support the validity of our hypothesis.

5. Conclusion

The goal of this paper is to identify factors that influence price fairness judgments. The empirical literature suggests that there are several factors that drive perceptions of fair prices: reference prices, the costs of the seller, a self-interest bias and the perceived motive of the seller. In this paper we add one new element, namely equality in income or scale. In particular, we hypothesise that price increases are perceived to be fairer if they benefit poor or small-scale organisations than if they benefit rich or large-scale organisations. Obviously, the scale can be an indicator of income: small-scale buyers or sellers may be perceived as relatively poor in comparison to large-scale buyers or sellers when no further information is given.

We tested these hypotheses on a Dutch sample of 307 respondents to our questionnaire. The results indicate that the factors that are identified by empirical literature are also valid for our Dutch sample today. First, the test results confirm the finding that prices equal to prices of competitors or prices in the recent past are considered to be fairer than prices that strongly deviate from these reference prices. This is coherent with the basic notion of fairness, that equals should be treated equally: similar goods should be priced similarly.

We also find evidence confirming the second hypothesis that price setting using cost-based rules is perceived to be fairer than price setting based on demand-supply ratios. Apparently, the well-known notion of fair price of Thomas Aquinas that a trader may not benefit from local scarcity is still alive. According to Aquinas, it is in most cases unlawful to sell something for a higher price than was paid for it (Stackhouse et al, 1995).

Also the third hypothesis that someone who is being disadvantaged perceives more unfairness than someone who is advantaged is significantly confirmed by our sample. Apparently, price fairness is a mental notion, which differs for an outsider, observing a transaction without any direct material interest, and an insider who is personally involved in a transaction. If a person is involved in a transaction (either as seller or as buyer), the price fairness is determined by the way in which that person benefits from it. The more he takes advantage, the more the price is considered as fair. The result is particularly convincing since the people that filled out the questionnaire have probably never been involved in the transactions that we described. Therefore, their self-interest probably influenced the judgments to a smaller extent than if they had been involved in the transactions as buyers or sellers.

Also the fourth hypothesis that price increases are more legitimate if the seller is driven by a social motive rather than the profit motive is confirmed. This finding is also coherent with Aquinas' theory of just prices. Although Aquinas rejected profit as an end in itself, he considered it lawful to sell something for more than was paid for it if the profit is used as a means to some virtuous goal. Also in the case where a man buys something not for sale but for possession, and afterwards, for some reason wishes to sell, it is not a sin if he

sells at a profit. He may do so, either because he has improved the item or because its value has changed with the change in place or time, according to Aquinas.

The last hypothesis that we test is that price increases are judged to be fairer if they benefit poor or small agents than if they benefit rich or large agents. As far as we know these hypotheses have not been tested before by social economic research. All test results point in the same direction. In pairs of questions where only the income (or profit) of the buyer and seller was altered, we found significant differences in perceived fairness of the price increase. Similarly, we find that high director salaries paid by non-profit or commercial organisations are more acceptable if the burden of the costs rests on the shoulders of large contributors rather than small contributors.

Finally, all outcomes are found to be consistent if we redo the test for various subgroups. The factors that are under investigation are remarkably consistent for groups with different levels of income, young and old respondents and males and females.

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Appendix 1 The questionnaire⁴

Set of questions relating to hypothesis a. Reference prices play a major role in price judgments

Set I

2. In most supermarkets the price of a packet of coffee is € 1.99. Also in Albert Heijn the price is € 1.99. How do you perceive the price that Albert Heijn demands for a packet of coffee?

9. In most supermarkets the price of a packet of coffee is € 1.59. Now you discover that Albert Heijn sells packets of coffee for € 1.99. How do you perceive the price that Albert Heijn demands for a packet of coffee?

Set II

⁴ The numbers refer to the number in the questionnaire.

4. Two years ago the price of a certain popular book was € 10 in a bookstore. Nowadays this popular book costs € 15. How do you perceive the price that one currently has to pay for this popular book?

17. The price of a certain popular book has not risen during the last two years. Two years ago the price of this popular book was € 15 and now it is still € 15. How do you perceive the price that one currently has to pay for this popular book?

Set of questions relating to hypothesis b. Options to pass-on production costs are seen as fair

Set III

6. Gamma sells snow shovels for € 15. The day after a huge snowstorm Gamma raises the price of snow shovels to € 20. This new price is:

7. There has been no snowstorm, but the wholesale price of snow shovels increases by € 5. For this reason, Gamma raises the consumer price of snow shovels from € 15 to € 20. This is:

Set of questions relating to hypothesis c. Pursuing social goals is considered more fair than increasing profits

Set IV

10. There is an earthquake in a remote village. The supply of bottles of water is temporarily not possible any more. A local store has still a number of crates with bottles of water in stock. The salesman raises the price of bottles of water from € 10 to € 11. In this way he hopes to earn a nice amount of money for his own holiday. This is:

12. There is an earthquake in a remote village. The supply of bottles of water is temporarily not possible anymore. A local store has still a number of crates with bottles of water in stock. The salesman raises the price of bottles of water from € 10 to € 11. In this way he hopes that the people in the village will be use the available supply of water more efficiently, so that there be enough for all. This is:

Set of questions relating to hypothesis d. Self-interest affects the notion of fairness to a large degree

Set V

6. Gamma sells snow shovels for € 15. The day after a huge snowstorm Gamma raises the price of snow shovels to € 20. This new price is:

11. Gamma sells snow shovels for € 15. During the whole winter it has not snowed and it seems that this will not happen any more. Gamma wants to get rid of the snow shovels and lowers its price to € 10. The new price is:

Set VI

5. A potato farmer knows that he needs at least 15 cents per kilo of potatoes in order to make ends meet. However, the common market price is currently 12 cents per kilo. McCain (a large producer of chips) buys potatoes from the farmer. What would be a fair price?

19. Suppose you are a potato farmer. You know that you need at least 15 cents per kilo of potatoes in order to make ends meet. However, the common market price is currently 12 cents per kilo. McCain (a large producer of chips) buys potatoes from the farmer. What would be a fair price?

Set of questions relating to hypothesis e. The notion of fairness is biased towards poorer and smaller parties

Set VII

1. A new computer virus causes great harm to the computer of private persons and companies. After opening an e-mail, the hard disc of the computer becomes useless within a couple of hours. A new

anti-virus program of a small software company, that is about to go bankrupt, appears to be the only program that can destroy the virus. When the virus becomes known, this small company increases the price of the anti-virus program from €100 to €150. This is:

15. A new computer virus causes great harm to the computer of private persons and companies. After opening an e-mail, the hard disc of the computer becomes useless within a couple of hours. A new anti-virus program of Microsoft appears to be the only program that can destroy the virus. When the virus becomes known, Microsoft increases the price of the anti-virus program from €100 to €150. This is:

Set VIII

3. C&A makes large losses. The board decides to move part of the merchandise from Germany to China. This reduces the costs, because the wages for unskilled labour (required for producing apparel) are much lower in China. Also in the context of China the wages that suppliers of C&A pay to their employees are very low. This policy of C&A is:

16. C&A earns a high profit. In order to increase its profits further, the board decides to move part of the merchandise from Germany to China. This reduces the costs, because the wages for unskilled labour (required for producing apparel) are much lower in China. Also in the context of China the wages that suppliers of C&A pay to their employees are very low. This policy of C&A is:

Set IX

13. A rich coffee trader goes to a poor coffee farmer and says: "On the other side of the mountain I have to pay a coffee farmer less than you for a bag of coffee. I will only buy your coffee if you ask for a lower price than the coffee farmer on the other side of the mountain. The coffee farmer mentions a lower price. Subsequently, the rich trader goes to the other side of the mountain and tells the other coffee farmer the same story. He continues to do so until he pays the lowest possible price for the coffee. This is:

18. A poor coffee farmer can sell his coffee to two different rich coffee traders. He says to the first trader: "How much do you pay for my coffee?". The coffee trader mentions a price. Subsequently, the poor coffee farmer goes to the other coffee trader and says: "I can sell coffee for this price. If you want to buy coffee from me, you will have to pay more". The coffee trader mentions a higher price. Next, the poor coffee farmer goes again to the first trader and demands a higher price. He continues to do so until he gets the highest possible price. This is:

Set X

8. Philips wants to do something for society and establishes a foundation that researches heart diseases. Philips provides all financial means for this foundation. The director of this foundation earns an annual salary of € 140,000. This salary is:

20. The heart foundation combats heart diseases. The main source of income of the Heart foundation is donations from private persons. The Director of the Heart foundation earns an annual salary of € 140,000. This salary is:

Set XI

14. Essent delivers gas, water and electricity to private persons. The director of Essent earns an annual salary of € 600,000. This salary is:

21. IntraSupply delivers gas, water and electricity to large industrial companies. The director of Intrasupply earns an annual salary of € 600,000. This salary is:

Appendix 2 Descriptive statistics per question

Question	N	Mean	St. dev	Question	N	Mean	St. dev
1	307	2.84	.821	11	307	3.63	.524
2	305	3.48	.654	12	306	2.07	.827
3	306	2.29	.827	13	307	1.87	.883
4	306	2.44	.749	14	306	1.91	.875
5	307	14.23	2.279	15	307	2.14	.783
6	307	2.24	.784	16	307	1.99	.846
7	307	3.34	.673	17	305	3.05	.632
8	305	2.46	.866	18	305	3.00	.763
9	304	2.54	.824	19	304	14.98	5.764
10	307	1.55	.723	20	306	2.13	.823
				21	304	2.11	.884

Appendix 3 Differences in fairness points: Outcomes per group^a

H	Set of questions	income			age		Sex	
		high	average	low	>29	≤ 29	male	female
a	I	.8	1.0	1.0	.9	1.0	.8	1.2
	II	.6	.6	.5	.6	.6	.6	.7
b	III	1.1	1.2	1.1	1.0	1.2	1.1	1.1
c	IV	.6	1.8	1.5	.4	1.3	.9	1.0
d	V	1.3	1.5	1.5	1.3	1.4	1.4	1.4
	VI	.4	.5	.7	.3	.8	.5	.6
e.1	VII	.6	.8	.9	.7	.7	.7	.7
	VIII	.3	.2	.4	.3	.3	.3	.3
e.2	IX	1.2	1.2	1.0	1.2	1.1	1.0	1.2
	X	.3	.4	.3	.3	.4	.4	.3
	XI	.2	.1	.3	.2	.2	.2	.2

^a All differences are statistically significant at the 95% level.

This Table shows that the differences in fairness judgments are very similar for various subgroups. All differences are statistically significant at the 95% level.