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***Abstract:** Pay What You Want (PWYW) pricing has received considerable attention recently. Empirical studies show that if PWYW pricing is implemented, in a number of cases consumers do not behave selfishly and that some producers are able to use PWYW for increasing turnover and profits respectively. In this paper we add information asymmetries to the existing explanations regarding consumer behavior and argue that information asymmetries may account for the results found in empirical studies. Since the success of PWYW pricing depends on the distribution of information, one implication is that optimization strategies with respect to pricing should take information asymmetries into account.*

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1. Introduction

Pay What You Want (PWYW) pricing mechanisms have recently received considerable attention in the literature and in practice. PWYW is a form of participative pricing in which consumers¹ are given the opportunity to determine prices. In contrast to other participative pricing mechanisms, such as reverse auctions, PWYW allows consumers to maximize their own utility by doing monetary harm to a producer. Contrary to the prediction of egoistic materialistic individuals in traditional theory, but in line with the experimental results from dictator games, many consumers of products sold via PWYW pay a price higher than zero. Producers, on the other hand, do not seem to be at risk of falling victim to selfish consumers. They may even use the PWYW pricing mechanism, instead, in order to attract more consumers and enhance revenues as compared to fixed price systems. In recent empirical studies consumers' behavior is interpreted by preferences for fairness, inequity aversion, shame, reciprocal behavior, income level of consumers, or moods. PWYW pricing seems to be not applicable to all products. It is more suitable for products such as meals in a restaurant and less appropriate for goods such as a cinema visit or a holiday package.²

In this paper we take up the question about the types of products PWYW is a suitable pricing mechanism for, as formulated by Kim, Natter, and Spann (2009: 56). Complementary to the behavioral and psychological theories which have been provided to explain consumer behavior in recent studies, we add the aspect of information asymmetries as an additional explanation. This more traditional aspect has been neglected in previous analyses of the empirical findings. We outline how information asymmetries may hamper the effectiveness of PWYW pricing for some commodities, and we show that a reduction of information asymmetries for consumers may make PWYW pricing attractive for producers and can be applied to many consumer products.

In the second section we briefly summarize the recent literature on PWYW pricing. In section three we outline information asymmetries which influence the effectiveness of PWYW pricing and provide a simple model. The final section concludes.

¹ Throughout the text we apply the terms consumer also as a synonym for customer, and producer as a synonym for seller. This does not interfere with the theoretical point we make in this paper.

² For simplicity we speak of goods or products. However, it would be more precise to speak of bundles since all goods dealt with in this paper are in fact offered as part of a bundle (e.g., the meal at a restaurant consists of, at least, the food, the service, and the atmosphere).

2. Review of the Literature

Kim, Natter, and Spann (2009) have pioneered the empirical investigation on PWYW pricing. In three short-term field experiments they test the applicability of a PWYW mechanism to different goods, a lunch buffet at a restaurant, a movie at a cinema, and a hot beverage at a delicatessen (2009: 45). They observe consumers' behavior in a time-span between three days (cinema) and six weeks (delicatessen). Particularly at the cinema PWYW pricing may be rather problematic, while it seems to have positive effects in the restaurant and at the delicatessen (2009: 48). There, producers' advantage of implementing a PWYW pricing mechanism is an *increase* in revenues.

Assuming selfish and materialistic consumers, the predictive payment in PWYW pricing is zero because no minimum threshold price is implemented. However, nearly no consumer pays zero. Such behavior can be explained with behavioral economics, sociology, and psychology. Theories discussed in this context are related to preferences for fairness, reciprocity, inequity aversion, consumers' satisfaction with the quality of the product, consumers' income levels or the availability of reference prices (for a discussion on the relevant literature in experimental economics and psychology cf. Kim, Natter, and Spann 2009: 45-48). Results of the field experiments indicate that consumers' fairness perceptions and satisfaction with the product positively influence prices paid, i.e. prices at which products are sold are higher. Particularly, at the cinema, consumers' perceived fairness of the price seems to have an important influence on prices paid.³ This finding is remarkable for our aim because we show how fairness perception can be influenced by information asymmetries.

In two follow-up studies Kim, Natter and Spann investigate the topic further and find that consumers' reference prices⁴ as well as satisfaction with the product have an influence on the prices paid (2010a). Furthermore, they find that producers should pay attention to personal interaction and the provision of reference prices (2010b).

³ For the cinema they note: "The level of fairness significantly and positively influences prices paid. Although the consumers paid only 66% of their reference price to the seller, they believed that they had behaved fairly; the survey data show that approximately 90% of the consumers considered a price $\leq \text{€}6$ fair." (Kim, Natter, and Spann 2009: 52).

⁴ We use throughout the text the term reference price and do not distinguish between internal and external reference price because for our purpose it is irrelevant whether the reference price has been formed on a consumer's previous experience with the same good or with similar competing goods. We use the definition of reference price as the price that consumers would pay if producers used traditional pricing.

Other recent studies support the finding that the PWYW pricing mechanism may be beneficial for producers. Gneezy *et al.* (2010) show a positive effect of PWYW with respect to charitable giving. Traxler and Riener (2011) are the first who test a PWYW pricing mechanism in the long run. They analyze consumers' payments in a restaurant for the period of two years and find that despite an average decline of payments, total revenues increased. Thus PWYW pricing may offer a long-term business strategy. Traxler and Riener also show that moods account for short-run fluctuations of consumers' payments. Regner and Barria (2009) investigate the payment behavior of consumers in respect of online music and uncover that, on average, consumers pay even more than the price recommended by the producer. Regner and Barria explain their findings through reciprocity, which drives consumers' decisions (cf. additionally Regner 2010). In the last two mentioned cases a positive minimum price and a recommended price are provided.

More recently, León, Noguera, and Tena-Sánchez (2012) conduct a field experiment with PWYW pricing for holiday packages in Spain. In the experiment customers exhibit a much stronger selfish behavior compared to previous studies. Customers pay only 5.1% of the value of the products (2012: 395). León, Noguera, and Tena-Sánchez try to explain the results by hidden customers' preferences and by framing effects. In line with the results of this field experiment we offer a possible alternative explanation. Next, we consider information asymmetries between consumers and producers, an aspect which has not been specifically addressed in the above mentioned literature.

3. Information Asymmetries in PWYW Pricing

As Kim, Natter and Spann (2009) show, PWYW pricing seems to be a pricing strategy which is suitable for some goods but not for others. They outline that fairness perceptions are important for prices paid by consumers. Here we offer a more traditional economic explanation and a model which argues that information asymmetries influence prices paid under PWYW pricing. First, we contend that the '*observability*' of *fixed and marginal costs* may influence consumers' payment decisions. Second, we briefly outline that *ex-ante versus ex-post* PWYW payment schemes can be used in order to overcome asymmetric information as regards the quality of the good and in order to maximize revenues from PWYW pricing mechanisms.

Our first point is related to information asymmetries with respect to costs. Let us assume a not-completely-selfishly motivated consumer who follows individual fairness perceptions when asked to pay for a product which she has consumed or will consume. As a consequence she may pay (within a PWYW pricing mechanism) a price which she *considers fair* according to her set of information. However, if she has incomplete information about the cost function of the producer, the price which she perceives as fair may be too low or too high. Note that information asymmetries *cannot* be solved by reference prices because without information about cost, consumers have no information for judging the fairness of the reference price. And if consumers assume that the reference price is the fair price, the fair price will be distorted unless the reference price accurately reflects the producer's costs.

To provide an example: restaurant visitors have, in most cases, a fairly good experience in how much the price of ingredients are, how much labor is required to prepare a meal and how much approximately the rent for a restaurant in a given area could be. So they may have a reasonable guess about the overall costs of running a restaurant and preparing a meal. Restaurant visitors are able to calculate a price which can cover part of the costs and which they perceive as fair. Quite in contrast to the case of a restaurant visit, a consumer who goes to the cinema is rather unable to calculate the costs which the owner of a cinema faces when showing a movie. Consumers are normally unable to provide an educated guess about the fixed costs for running a cinema, e.g. monthly rent, capital costs, costs for renting movies, etc.. However, consumers are able to observe that the marginal cost for a visitor in a cinema is zero – as long as capacity utilization is below 100%. The general '*observability*' of production costs in one case and the '*unobservability*' of production costs in the other case may lead to different results when consumers are asked to pay in a PWYW mechanism.⁵ In fact, a PWYW mechanism may lead to improve revenues and profits *if* information asymmetries are low on the side of consumers and the same mechanism may lead to contrary results if information asymmetries are high. The latter applies only if the price regarded as fair by a consumer is too low with respect to cost, which is most likely to happen when fixed costs of production are relatively high. If this is not the case and the price considered as fair is higher than the costs, the producer should have an interest in preserving information asymmetries. The problematic case from the perspective of the producer

⁵ In the case of the restaurant, the price consumers consider to be fair may coincide with the reference price. In the case of the cinema, the price considered as fair is lower than the reference price if consumers underestimate fixed costs (see also footnote 3).

is the first one, where consumers consider a price as fair which is lower than production costs.

To illustrate the importance of information about production costs, assume that a risk neutral representative consumer knows the producer's cost structure, i.e., she is aware of the fixed costs, F , and marginal costs, MC , which are constant. The consumer's willingness to pay (the maximum price she is willing to pay) is given by WTP . For simplicity we assume a consumer whose WTP exceeds the producer's unit costs, UC , which are given by $UC = F/N + MC$ (N is the scale of production).⁶ The gains from trade are given by the difference between WTP and UC , $WTP - UC > 0$. Assume that the consumer who is not completely selfish is willing to split the gains from trade so that her own share is q (with $0 < q < 1$) and the producer's share is $(1-q)$. Then, the price perceived as fair in the full information case is given by

$$p(\text{full information}) = (1 - q)WTP + q UC = (1 - q)WTP + q \left(\frac{F}{N} + MC \right).$$

Now assume that the consumer has only imperfect information about fixed costs, which are low (F_L) with probability r (with $0 < r < 1$) and high (F_H) with probability $(1-r)$. F is replaced by the expected value $E(F) = r F_L + (1-r) F_H$, and the price which the consumer considers a fair price is (in the imperfect information case) given by

$$p(\text{imperfect information}) = (1 - q)WTP + q \left(\frac{rF_L + (1 - r)F_H}{N} + MC \right).$$

Assuming that fixed costs are high ($F = F_H$) the difference between both prices is

$$\Delta_H \equiv p(\text{full information}) - p(\text{imperfect information}) = \frac{qr}{N} (F_H - F_L) > 0,$$

and assuming that fixed costs are low ($F = F_L$), the difference between both prices is

$$\Delta_L \equiv p(\text{full information}) - p(\text{imperfect information}) = \frac{q(1 - r)}{N} (F_L - F_H) < 0.$$

If fixed costs are high (low) but consumers have incomplete information about fixed costs, they underestimate (overestimate) the costs. Hence, with asymmetric information about fixed costs and fixed costs being high, PWYW pricing results in lower revenue and profits (compared to the

⁶ In the text we model the simplest case. For further cases, in which the WTP is smaller than the producer's unit cost, see the Appendix.

situation in which consumers and producers have symmetric information).

For given q and r , the difference in revenue will depend on the scale of production, N , and the difference $F_H - F_L$. The latter can be interpreted as a proxy for uncertainty, which means that with increasing uncertainty, PWYW pricing is less likely to increase revenue. Regarding the scale of production, it follows that if production takes place on a larger scale (higher N), it is more likely to increase revenues, because a larger scale allows for fixed costs to be covered by a larger number of units sold.

Note that the argument above relies solely on the amount of information that consumers have about the producer's cost structure. This does not imply that fairness considerations are unimportant, but it shows that *in addition to* fairness the distribution of information is a crucial variable for explaining the success or failure of PWYW pricing. Indeed, in order to allow consumers to realize their preference for fairness, they need information about production costs.

A critique of our argument could be the question: Why should fix costs matter at all? According to the standard views in microeconomic theory, fix costs are sunk costs and should not matter. The profit-maximizing producer should set her price equal to marginal costs. The profit-maximizing price is determined by the intersection of the upward-sloping marginal cost curve and the downward-sloping demand curve. Contrary to this theoretical prediction, a large number of producers employ full cost pricing (Govindarajan and Anthony 1983; Shim and Sudit 1995). Full cost pricing is also related to loss aversion and the sunk cost paradox, for which there is experimental evidence (Kachelmeier 1996; Buchheit and Feltovich 2011; Feltovich 2011).

If producers use full cost pricing, the reference price equals unit costs and thus reflects fix costs.⁷ Consumers who are fair (in the sense that they are willing to share the surplus from the transaction) are willing to pay a price which depends on their information. In general, this price will be higher if consumers have information about the producer's fixed costs.

Moreover, information about producer's costs may affect entitlements and self-image concerns. With more information the producer's claim to a share of the surplus becomes more salient. Since consumers are not obliged to pay a positive price, producer's entitlement is not a legal but a

⁷ This does not imply that consumers have information about fix costs. However, consumers' information about fix costs can influence the perception of the reference price as fair or not.

morally perceived right (Gächter and Riedl 2005).

Kahneman, Knetsch, and Thaler (1986) show that consumers perceive a price increase as fair if higher prices reflect higher costs but perceive higher prices as unfair if they reflect excess demand. Put bluntly, the perception is that producers are entitled to a higher price and consumers have a moral obligation to pay a higher price *if* costs are high. The effect of information about costs on entitlements is comparable to the notion that consumers pay a positive price in order to maintain a positive self-image (Gneezy et al. 2012). Viewed from this perspective, one can argue that the loss in a consumer's utility from paying too little increases with the strength of the producer's entitlement. In other words, the more information consumers have about producers' costs, the stronger the producers' entitlements are and the larger consumers' losses in utility are from violating fairness and acting selfishly. Empirical evidence derives from Jang and Chu (2012) and Schmidt, Spann and Zeithammer (2012), who investigate PWYW pricing using laboratory experiments. Jang and Chu (2012, experiment 2a) show that more information about costs increases PWYW prices and argue that the rationale behind this is that consumers do not want to hurt producers because doing it would result in a bad feeling. Schmidt, Spann and Zeithammer (2012) show that consumers are willing to pay higher prices if higher production costs lead to an increase of consumers' valuations for the good.

Our second – much shorter point – refers to information asymmetry with respect to the quality of the product. While in most restaurants the payment is made after the product has been served (respectively consumed), at a cinema payment is usually made before consumption. Consumers pay for a product which they consume after making the payment and they are at risk of falling victim to moral hazard. If we assume a risk averse consumer, then, in a PWYW pricing mechanism, she should pay ex-ante a price below the price estimated as fair by her. This may explain decreasing revenues for cinemas when compared with a fixed price system. At the cinema, as at the restaurant, a PWYW pricing may be particularly promising ex-post consumption. However, producers may also provide the option to pay before *and* after consumption, thus having PWYW pricing mechanism with two payments at the same time. Particularly those consumers who are willing to pay more than the sum initially given, have the chance to pay an additional sum after consumption, i.e. after information asymmetries about the product have ceased (however cf. León, Noguera, and Tena-Sánchez 2012: 398 for a cannibalization effect in ex-post consumption PWYW). The argument can be drawn one step

further if moods are considered. If the consumption of a product influences consumers' moods and if moods influence the willingness to pay (Capra, Lanier, and Meer 2010), then ex-post PWYW pricing or a combination of ex-ante and ex-post is a recommendable option for a producer.

4. Conclusion

In this paper, we have added the argument of information asymmetries as an explanation for which products the PWYW pricing mechanism may be a viable alternative to traditional fixed pricing. We referred to two examples discussed in the empirical literature, a visit to the restaurant and a visit to the cinema. Both goods are representative for a large group of similar goods, particularly services.

What implications can be drawn for the success of PWYW pricing? First, if fixed costs are high PWYW is more likely to be successful if consumers have information about producer's fixed costs because if they have such information, the price that they will pay reflects costs. This implies that for producers with high fixed costs PWYW can only be a success if the information asymmetry is low, i.e., if consumers have information about fixed costs. Second, these information asymmetries are less important if the scale of production is large (e.g., buying hot beverages at the delicatessen) or if there is no capacity constraint at all (e.g., online music). And third, consumers' expectations about fixed costs (i.e., the parameters F_H , F_L , and r , or more generally, the distribution of fixed costs) matters for what they perceive as a fair price. The larger the range of the distribution of fixed costs ($F_H - F_L$) or the larger the probability that fixed costs are low (r), the lower the price which a consumer is willing to pay.

We outlined that the (un)observability of production costs⁸ and of quality can influence the price a consumer is willing to pay for a good. The (un)observability of production costs as well as of quality are problems which may cause market failure or moral hazard, both being suboptimal for producers. Thus, they deserve attention in the currently evolving debate on PWYW pricing mechanism. According to these insights one may find an answer to the important question about

⁸ Since production costs of holiday packages are difficult to observe, the rather selfishly oriented behavior of customers reported by León, Noguera, and Tena-Sánchez (2012) fits into our explanation.

the types of products, which PWYW is a suitable pricing mechanism for.

Appendix

Section 3 shows the effect of consumers' information asymmetries on prices, revenues and profits under a PWYW pricing mechanism. With asymmetric information and fixed costs being high, the price regarded as fair by consumers is too low with respect to production costs. In this situation it is the producer's interest to inform consumers about costs. In the opposite case, in which fixed costs are low and fair prices are too high compared to costs, preserving the information asymmetry is in the producer's interest. In both of these two situations it has been assumed that consumers' WTP (maximum willingness to pay) exceeds product's unit costs (UC) so there can be a positive gain from trade ($WTP - UC > 0$), which is split between the producer and the non-selfish consumer.

The assumption of WTP exceeding unit costs restricts the analysis to two cases. In this section we relax this assumption and consider all possible cases. Denoting the producer's real unit cost by UC_r and the unit cost as perceived by the consumer by $UC_p = \left(\frac{rF_L + (1-r)F_H}{N} + MC \right)$, the six possible cases are:

- | | |
|------------------------|------------------------|
| 1. $UC_p < UC_r < WTP$ | 4. $UC_p < WTP < UC_r$ |
| 2. $UC_r < UC_p < WTP$ | 5. $WTP < UC_p < UC_r$ |
| 3. $UC_r < WTP < UC_p$ | 6. $WTP < UC_r < UC_p$ |

In cases 1 and 2, which are discussed above, the consumer buys the good and pays $(1 - q)WTP + qUC_p$.

In case 3, perceived unit costs by consumers are higher than average WTP, which in turn is higher than product's real unit costs. If consumers knew the real unit costs they would pay a perceived fair price of $(1-q)WTP + qUC_r$, which is lower than the WTP but higher than real unit costs, thus increasing revenue and profit. With asymmetric information, however, the increase in revenue and profit would be even larger since consumers overestimate unit costs and pay a higher price. In this case, it is in the producer's interest to preserve information asymmetries.

In case 4, the products' real unit costs are higher than WTP, despite the fact that the consumers think that the costs are lower than the maximum price they are willing to pay. In this case, with asymmetric information, the price consumers will pay lies between the WTP and the perceived unit cost but below real unit cost so that the producer will make a loss. And if the producer informs consumers about the products' real unit costs, PWYW pricing makes no sense. Consumers who are concerned about fairness would not be willing to pay the fair price $(1-q)WTP + q UC_r$, because if they would, the producer would incur losses. They would refrain from buying since the fair price exceeds their WTP. Consumers who have no concern for fairness would pay a price less or equal to their WTP, i.e., a price that is below costs. Thus, with asymmetric information and with symmetric information the price paid by consumers who buy the good is below the producer's unit cost, resulting in losses. In this case, PWYW pricing mechanism is not advisable since generated revenues will not exceed production costs.

In cases 5 and 6 average consumers' WTP is lower than both real and perceived unit costs. In these cases the price consumers consider as fair is smaller than the cost of production, UC_r . As in case 4 with symmetric information, fair consumers would not buy the good and selfish consumers would buy at a price below cost. This holds regardless of the consumers' information about fixed costs. PWYW pricing mechanism should not be used in these cases since revenues will be lower than costs, resulting in a loss for the producer.

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