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Abstract: We review a large number of empirical studies on Pay-What-You-Want (PWYW) pricing. We distinguish between laboratory experiments, field experiments, survey experiments and case studies. Based on this survey we identify the following two gaps in the recently flourishing literature on PWYW pricing: (1) studies on PWYW pricing for goods with high cost, and (2) studies on the long-term effects of PWYW pricing.

Keywords: Pay-What-You-Want, PWYW, pricing mechanism, survey, empirical studies

JEL: C90, D12, D49, M21, M30

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1. Introduction

Pay-What-You-Want (PWYW) is a participative pricing mechanism (Chandran and Morwitz 2005, Natter and Kaufmann 2015), which leaves the pricing decision with the buyer. In contrast to other participative pricing mechanisms, like name-your-own-price (NYOP, see Spann, Skiera and Schäfers 2004, Spann and Tellis 2006), a buyer can choose any price (including zero) and the seller has to accept this price.

PWYW can be considered as a special form of voluntary market payments, which have been discussed before (e.g., the literature on tipping, Azar 2004, 2007). What distinguishes PWYW from other forms of voluntary market payments is that PWYW is used for goods and services, which are usually sold employing fixed prices (e.g., music, restaurant meals, drinks, entertainment activities), and that the sellers who use PWYW compete with sellers who use fixed pricing.

PWYW pricing has recently received considerable attention in the management, business, and economics literature. In fact, one of the first articles on PWYW pricing (Kim, Natter and Spann 2010) is the one downloaded most frequently from this journal's website. There have been a considerable number of empirical studies on PWYW pricing, and in this paper, we present a survey of empirical studies on PWYW pricing published between 2009 and 2015. In particular, we review all empirical studies on PWYW pricing which report data generated in laboratory experiments, field experiments, survey experiments and case studies.

We find that (1) PWYW is used almost exclusively for low-cost goods, experience goods, and for bundles of goods and services, and that (2) almost all empirical studies focus on relatively short time periods. Based on our survey, we identify some unanswered questions and suggest directions for further research.

This paper is structured as follows. In section 2, we review the empirical literature on PWYW pricing and summarize our findings in four tables. In section 3 we identify topics which have

not been dealt with in detail but which are relevant for sellers if PWYW is put into practice. In section 4, we conclude.

2. The Empirical Literature on PWYW Pricing

2.1 Categorization of Empirical Studies

The first paper on PWYW pricing, to our knowledge, is Kim, Natter and Spann (2009). Since this publication, the literature on PWYW has received lots of attention. In Tables 1 to 4 we summarize the results of all empirical studies on PWYW pricing between 2009 and July 2015 available in various databases. To avoid publication bias, we include working papers. We decided to look at individual studies (case studies, experiments, etc.) instead of papers. This is because several papers report results from more than one study. We classify the empirical studies into four categories: laboratory experiments (LE), field experiments (FE), survey experiments (SE), and case studies (CS). In LE, FE and SE the researcher has full control over the design of the experiment and makes use of random assignment of individual subjects to one or more treatments.

LE take place in an environment over which the researchers has complete control (a university's laboratory). All LE on PWYW pricing are incentivized, i.e., the subject's compensation depend on her choices. In all LE the subjects are students.

FE are similar to LE, except that they are run in the field. An example is Kim, Kaufmann and Stegemann (2014), who have designed an intervention in the field and run their treatments at two comparable shopping malls. Hence, in FE in contrast to LE, the researcher has less control. A SE embeds the experimental design within a survey (e.g., a factorial survey or a survey based on vignettes). Usually, the survey consists of hypothetical purchase scenarios, and each subject responds to one or more scenarios. SE are easy to administer and, usually, they are internet-based. This allows the researcher to generate a large number of observations

within a short period of time. In contrast to LE and FE, in SE there is no strategic interaction between subjects and the researcher has no control once the experiment has started. Involvement might not be as emotionally intense as it is the case in LE and FE (Collett and Childs 2011), and, usually, there are no financial incentives linked to the subjects' decisions. In most SE, the subjects are undergraduate students who complete the survey for partial or extra course credit.

In a CS, there is no controlled intervention by the researcher since a CS is an observational study. While in FE, the researcher chooses the intervention (i.e., use of PWYW pricing), in CS the seller choose PWYW pricing and allows the researcher to use the data on sales, revenue, prices, etc. Self-selection is an issue because unsuccessful sellers are driven out of the market (see Kim, Natter and Spann 2010, 152) so that only sellers who use PWYW for short periods and sellers who use PWYW successfully over longer periods are observed.

2.2 Main Results from our Survey

Table 1 summarizes the LE. For each LE, we sketch the design and summarize the main findings. In one of the LE (Machado and Sinha 2013), real products were sold to students and the latter had to fill out a questionnaire regarding their payment motivations. We decided to categorize this experiment as LE because the context in which the purchase took place was controlled by the researchers. Although subjects can differ in their valuations for the products, this should not bias the results because subjects are randomly allocated to the different conditions. In the other four LE, subjects trade hypothetical goods, for which the value is induced (see Smith 1976), so that, in contrast to Machado and Sinha's LE, students' true valuations are controlled. The goal of these studies is not to identify the motives that drive payments. Rather, the goal is to investigate the effect of market structure (Krämer et al. 2015, Schmidt, Spann and Zeithammer 2014) and the strategic interaction between multiple buyers

and a seller (Mak et al. 2015).

Table 2 summarizes the FE. For each FE, we present the experimental design, type of product, payments, duration of the PWYW intervention and the main findings. We use the following acronyms for referring to the types of products most frequently investigated: experience goods (EG), digital goods (DG) which always have quasi zero marginal cost, goods with low marginal cost (LMC). If not indicated otherwise, payments refer to mean PWYW payments. What sticks out is that in the FE, PWYW is applied to low-value items and over short periods of time. The highest PWYW payments are payments for a day at a golf resort ($22.95, Machado and Sinha 2013), and payments for a photo portrait (€16.12 ≈ $17.40, Kim, Natter and Spann 2014). In all other FE, average PWYW payments are below $10, and in many cases they are even lower than one dollar.

Gautier and van der Klaauw (2012) provide interesting results because they find evidence for self-selection. Guests, who booked a hotel stay under PWYW pricing in advance, pay significantly less in comparison to hotel guests, who have booked the hotel stay at regular conditions, but whom are given the chance to PWYW. A convincing interpretation is that PWYW campaigns of hotels attract buyers who have little concerns to pay small amounts of money. However, Gautier and van der Klaauw (2012) also report that while the campaign is successful in the sense of increasing capacity utilization for unfavorable days, PWYW is not a feasible long-term strategy as the share of those guests who have little concern to pay anything may increase.

Most FE last only for a couple of days. Schons et al. (2013) and Gravert (2014) stick out because they analyze repeated purchases. In Schons et al. (2013), buyers' repeated purchases are observed over 8 weeks, and it is found that, at the individual level, prices decrease over time. Similarly, Gravert (2014) finds that payments decrease from the first to the second purchase.

Table 3 summarizes the SE. For each SE, we summarize data on payments, type of product, experimental design and main findings. In comparison with the FE, it becomes apparent that in SE, PWYW payments for higher-value products are also analyzed. The most expensive product is a mobile phone, with estimated production cost of $472 (according to subjects' estimations).

It should be noted that most SE are based on hypothetical decisions, which might result in subjects overstating the prices they would pay (Harrison and Rutström 2008, Murphy et al. 2005). Such a hypothetical bias might not be a problem if one only looks at treatment differences to see whether a specific variable (like the availability of a suggested price, for example) affects prices that subjects are willing to pay. Exceptions are studies 3 and 4 in Kunter (2015), where subjects are surveyed after they have made a real PWYW purchase.

Most SE identify variables that influence PWYW payments. Variables that positively affect payments are fairness, buyers' satisfaction (product quality, service quality), social norms, information about prices paid by other buyers and information about cost. Variables that negatively affect payments are social distance and anonymity. The effect of external reference prices is ambiguous and seems to depend on whether the reference price is perceived as reasonable or too high.

Another pattern that emerges from Table 3 concerns the types of products. Many products are experience goods, like tickets for sauna, cinema, concert, zoo or museum, or drinks or meals at restaurants, where quality is known only after consuming the product. In line with this is study 1 in Machado and Sinha (2013) in which subjects pay what they want for a dinner in an upscale restaurant. Subjects buy a bundle consisting of (at least) the dinner and the quality of service. Both parts of the bundle are experience goods, and it is found that the quality of the service has the largest effect on payments.

Table 4 summarizes the CS. For each CS, we summarize data on payments, type of product,

duration and main findings. All products investigated are experience goods, and some of them are digital goods (e.g., e-books and music) with almost zero marginal cost. There are three CS which report payments over longer time horizons: The e-book seller in Krawczyk, Kukla-Gryz and Tyrowicz (2015), the seller of music downloads in Regner and Barria (2009), and the restaurant in Riener and Traxler (2012) report results from environments where PWYW has been used for 18 months or more.

The study by León, Noguera and Tena-Sánchez (2012) stands out because in this study holiday packages with regular prices between $40 and $2,938 are offered under PWYW pricing. León, Noguera, and Tena-Sánchez (2012) show that holiday packages with a market value of more than €137,000 earned slightly more than €7,000 under PWYW pricing. For the seller, the use of PWYW was everything but a success because 46.5% of buyers paid nothing, and only 3.3% paid more than 40% of the regular price. Based on the comments in the seller's blog, the authors argue that buyers chose low prices because they perceived reference prices as too high, and because they thought that marginal costs were low. Also, cannibalizing effects might be at work: For example, if subjects buy one part of a bundle (e.g., a flight) under PWYW and buy another part (e.g., dinner) at regular pricing, but have to pay the flight after they have paid the dinner, they might pay less because their budget for the bundle is already depleted.

Table 1: Laboratory Experiments (LE)

	Reference	Experimental Design	Main Findings
1	Krämer et al. (2015)	subjects' risk aversions and social preferences were measured; several treatments in which sellers with various pricing mechanisms competed, focus on sellers' choices of pricing mechanism, resulting market structure, prices and profits	compared to name-your-own-price (NYOP), PWYW achieves higher market penetration but lower profit; sellers choose PWYW if costs are low; PWYW prices depend on buyers social preferences
2	Machado and Sinha (2013) (Study 2)	subjects were told to watch and evaluate a movie, before that they could buy a snack; contextual factors (seller type, payment time, payment appeal, payment visibility) were varied	average payments were $0.30, 60% paid nothing, possibly because subjects felt entitled to consume the snack for free; buyers paid more for local products if payment is made after the snack is consumed, buyers paid more if buyers were satisfied with quality, no evidence for image concerns
3	Mak et al. (2015) (Experiment 1)	PWYW as a threshold public good game; seller was simulated; an infinitely repeated game; 8 buyers with high or low valuation; if revenue falls below a known threshold the seller switches from PWYW to fixed pricing; market information was provided (i.e., buyers' valuations were common knowledge); each period buyers chose prices; full feedback (i.e., after each period buyers are informed about other buyers' prices and the earnings from previous period); treatments different by framing and by communication (no communication, suggested payments, chat)	no effect of framing, average number of periods was around 190, mean number of periods for which PWYW was sustained is 10.50 (no communication), 35.88 (suggestion) and 167.50 (chat); results are driven by buyers with high valuations for the good; these buyers pay significantly more in chat-treatment; in chat-treatment subjects often coordinate on prices resulting in equal earnings
4	Mak et al. (2015) (Experiment 2)	similar to experiment 1 but all treatments with chat, with or without market information and with or without full feedback	the possibility to communicate via chat facilitates the sustainability of PWYW pricing even if buyers have less than full information about other buyers' valuations and prices paid by other buyers; chat helps to establish a "social contract" about appropriate prices
5	Schmidt et al. (2014)	effect of competition is analyzed in two sets of treatments: (i) no competition treatments: repeated game with 1 seller and 3 buyers, seller chooses whether to enter the market or not, seller could invest in quality; (ii) competition treatments: 2 sellers and 6 buyers	buyers are motivated by outcome-based social preferences and strategic concerns (keeping the seller in the market); no evidence for intention-based social preferences; with competition prices are lower; sellers who invest in quality made positive profits on average in all treatments

Table 2: Field Experiments (FE)

	Reference	Experimental Design	Product Type	Payments	Duration	Main Finding
1	Gautier and van der Klaauw (2012)	hotel stays are sold via a promotional campaign in 36 hotels	EG, LMC	involuntary participants: €48 voluntary participants: €24 regular prices are €80, €120, or €150	2 days	promotional campaigns with PWYW attracts customers with few pro-social reputational concerns
2	Gneezy et al. (2010)	photos in amusement park are sold under fixed price or PWYW, in two out of four treatments half the revenue is donated to charity	LMC	merchandise revenue per individual p=$12.95: $0.40 p=$12.95 + charity: $0.40 PWYW: $0.42 PWYW + charity: $0.45	2 days per treatment	merchandise revenue per individual is highest when part of the PWYW price is donated to charity
3	Gneezy et al. (2012)	in three treatments subjects could buy photos in amusement park at different fixed prices ($5 or $15) or under PWYW pricing	LMC	ratio of individuals who bought product / average profit p=$15: 23% / $3.45 p=$5: 64% / $3.20 PWYW: 55% / $3.50	boat tour: data from 20 cruises per treatment	in PWYW fewer individuals buy compared with $5; this opting-out is driven by image-concerns (not knowing the appropriate price)
4	Gravert (2014)	books at charitable bookstore are sold under PWYW, two treatments depend on whether subjects are reminded of their membership status	EG, LMC	$1.50 (pooled over treatments)	2 months	members of the bookstore paid 75 cents more when reminded of their membership; members pay less when they purchase a second book
5	Jang and Chu (2012) (Study 5)	subjects buy canned coffee, information about cost and reference price (i.e., prices paid by previous buyers) are provided	EG, LMC	$0.37 information about cost $0.42 reference price > cost $0.30 reference price = 0	3 days	on average, buyers paid less when informed that 72% of previous buyers paid nothing
6	Kim, Kaufmann and Stegemann (2014) (Field Exp. 1)	restaurant meals in high-priced restaurant (drinks excluded) were sold, external reference price (i.e., information about regular price) and social distance regarding payment (personal interaction with waiter or anonymity) were varied	EG, LMC	€4.20 for products with reg. pr. < €5.00 €7.63 for pr. w. € 5.00 < reg. pr. < €10.00 €10.29 for products with reg. pr. > €10.00	3 weeks	external reference price and reputation of seller (quality of the good) have positive effect on PWYW prices; product value has negative effect
7	Kim, Kaufmann and	sandwiches were sold, external reference price (i.e., information about regular	EG, LMC	€1.19	two days per week at lunchtime, for 4 weeks	see above

	Reference	Experimental Design	Product Type	Payments	Duration	Main Finding
	Stegemann (2014) (Field Exp. 2)	price) and social distance regarding payment (personal interaction with waiter or anonymity) were varied				
8	Kim, Natter and Spann (2009)	buffet lunch cinema ticket (regular) cinema ticket (discount) deli	EG, LMC	€6.44 €4.87 €3.11 €1.94	2 weeks 2 days 1 day 2 weeks	
9	Kim, Natter and Spann (2014) (Exp. 1)	comparison of free sampling and PWYW for Gilette razors; participants were surveyed 5 weeks and 1 year later		€1.41	2 days (promotional campaign)	PWYW yields higher repeat purchases and is more entertaining than free sampling
10	Kim, Natter and Spann (2014) (Exp. 2)	comparison of free sampling, 40% discount and PWYW for photo portraits	LMC	PWYW: €16.12 sampling: €0.00 discount: €26.00	3 weeks (promotional campaign)	compared to the discount treatment, the PWYW treatment attracted more buyers and resulted in higher revenue
11	Kunter (2015) (Study 5)	potential buyers had to fill out a questionnaire before they purchased a zoo ticket; 5 treatments varied textual cues in the questionnaire	EG, LMC	control: €5.75 economic: €5.51 avoid neg. feelings: €5.69 pro-social beh.: €5.98 making excuses: €5.91	10 days	pro-social cues yield sign. higher payments than economic cues; avoiding feelings of guilt is an important factor
12	Machado and Sinha (2013) (Study 3)	payments are made after playing golf	EG, LMC	PWYW: $22.95 fixed price: $31.07	6 Saturdays	with PWYW average payments are lower, in combination with fixed pricing PWYW attracts more buyers and increases revenue
13	Schons et al. (2014)	during the 8 weeks buyers made 1-4 purchases of iced coffee	EG	first purchase: €0.88-0.99 second purchase: €0.62-0.88 third purchase: €0.50-0.76	8 weeks	in aggregate, prices do not decline over time but decline on the individual level until the 4th transaction; buyers have difficulties determining seller's cost
14	Schröder, Lüer and Sadrieh (2015)	in 2 treatments buyers of soft drinks either paid via PWYW or reduced a given price by as much as they want (mark-of-your-own price, MOYOP)	EG	PWYW: €0.90 MOYOP: €0.69	4 x 40 min. per treatment	prices are significantly lower with MOYOP

DG = digital good, EG = experience good, LMC = good with low marginal cost

Table 3: Survey Experiments (SE)

	Reference	Experimental Design	Product Type	Payment	Main Finding
1	Armstrong and Madrigal (2014) (Study 1)	subjects are presented with a hypothetical online concert ticket purchase scenario; treatments differed as to the level of external reference prices ($10 or $25) and whether they are presented as a descriptive norm ("what others have paid") or injunctive norm ("what you should pay")	EG, LMC	$17.44 low ref. price and descriptive norm $25.06 high ref. price and descriptive nom $21.21 low ref. price and injunctive norm $36.76 high ref. price and injunctive norm	in situations without social pressure payments are influenced by norms and reference prices; when reference prices are high, payments are closer to the reference price when the norm is framed as a descriptive norm .
2	Armstrong and Madrigal (2014) (Study 2)	a pretest was used to determine the expected price for a concert ticket; treatments differed as to the level of external reference prices and as to whether they are presented as a descriptive or injunctive norm	EG, LMC	reference price = $20 < expected price $21.44 descr. / $23.06 inj. ref. pr. = $ 45 = expected price $ 34.18 descr. / $ 42.09 inj. ref. pr. = $70 > expected price $ 52.93 descr. / $ 53.59 inj.	when reference prices are equal to the expected price, payments are closer to the reference price when the norm is framed as injunctive norm (in contrast to the results of study 1)
3	Hilbert and Suessmair (2015)	in a 3 (social interaction: low, medium, high) x 3 (norm compliance: low, medium, high) factorial design subjects indicated their WTP for a travel mug	low cost	€12.80 high social interaction €11.92 medium social interaction €9.15 low social interaction (regular price €17.95)	with high and medium social interaction subjects' WTP are higher as compared to low social interaction; norm compliance is not significant
4	Jang and Chu (2012) (Study 1)	for four products (recording album, mobile phone, cake, DVD), 70 subjects were asked about their WTP and the price they would pay under PWYW	varying	not reported	the distribution of the ratio price-paid/WTP is similar to the distribution of offer/endowment in dictator games
5	Jang and Chu (2012) (Study 2a)	for recording album and mobile phone 60 subjects were asked about their WTP and the price they would pay under PWYW; half of the students had information about cost	varying	not reported	price-paid/WTP ratio is higher in cost provision treatment
6	Jang and Chu (2012) (Study 2b)	in a pretest, subjects estimated the cost of the mobile phone; average estimated cost was $470; in three treatments 120 students were asked about their WTP and the price they would pay under PWYW; treatments differed according to information about cost ($260, $470, $680). Subjects in a control treatment received no information	high cost	price-paid/WTP ratios 40.23% control 73.18% (cost inf. $260) 72.00% (cost inf. $470) 48.48% (cost inf. $680)	the relation between price-paid and cost information is interpreted as buyers signaling fairness; buyers pay less if signaling fairness is more costly

	Reference	Experimental Design	Product Type	Payment	Main Finding
7	Jang and Chu (2012) (Study 3)	in three treatments subjects were asked about their WTP and the price they would pay under PWYW for a mobile phone; treatment variation with respect to information: (i) none, (ii) information about cost, $180, (iii)information about cost together with information that most subjects would pay nothing	high cost	price-paid/WTP ratios 40.00% (i) 60.00% (ii) 34.00% (iii)	when injunctive norm (information about cost) and descriptive norm (most subjects pay would nothing) are in conflict, subjects react stronger to the descriptive norm
8	Jang and Chu (2012) (Study 4)	PWYW for Starbucks coffee; treatments differed according to the information subjects received: (i) fair price is $4.00-4.50, (ii) fair price is $4.00-4.50 but most subjects would pay nothing, (iii) fair price is $4.00-4.50 and most subjects would pay fair price	EG, LMC	price-paid/WTP ratios 72.00% (i) 46.00% (ii) 70.00% (iii)	the influence of a injunctive norm (information about fair price) is not enhanced by the descriptive norm
9	Johnson and Cui (2013) (Study 1)	PWYW for concert tickets in four treatments; treatments differed according to the information subjects received: (i) no reference price, (ii) minimum price = $20, (iii) maximum price = $50, (iv) suggested price $35	EG, LMC	$45.80 (i) $34.45 (ii) $29.67 (iii) $34.31 (iv)	reference price has negative effect and reduces variance
10	Johnson and Cui (2013) (Study 2)	PWYW for concert tickets in a 2 (minimum price present or absent) x 2 (maximum price: present or absent) x 2 (suggested price: present or absent) design	EG, LMC	$43.77 (no information) $49.90 (suggested price only) $47.00 (minimum price only) $35.77 (maximum price only) $32.11 (minimum and maximum) $42.67 (suggested and minimum) $39.53 (suggested and maximum) $34.06 (minimum, maximum, suggested)	external reference prices have negative effect on prices paid; if external reference price is provided, prices paid are closer to the reference price (less variance)
11	Johnson and Cui (2013) (Study 3)	PWYW for concert tickets, in a 2 (minimum price $10 or $20) x 2 (maximum price: $50 or $60) x 2 (suggested price: present or absent) design	EG, LMC	$33.04 minimum price = $10 $38.25 minimum price = $20 $33.30 maximum price = $50 $37.99 maximum price = $60	significant effect of minimum and maximum price but no effect of suggested price; the extremity of anchors influences buyers' chosen prices
12	Johnson and Cui (2013) (Study 4)	PWYW for concert tickets; in all three treatments minimum price = $20 and maximum price = $60; treatments	EG, LMC	$32.62 (i) $33.58 (ii) $37.56 (iii)	suggested price affects prices buyers actually pay

	Reference	Experimental Design	Product Type	Payment	Main Finding
		differed according to the suggested price: (i) $30, (ii) $40, (iii) $50			
13	Kim, Kaufmann and Stegemann (2014)	PWYW for several products (cinema tickets, DVD, digital album, flight tickets, hotel, rental car, opera, wine), online survey which varied social distance, product value, external reference price, seller's reputation and sales promotion; subjects were asked for the price they would pay under PWYW, their WTP and the regular price	different	subjects paid 65.85% of the regular price and 77% of their WTP with respect to all products	PWYW prices increase with lower social distance, low value products and external reference prices; seller's reputation and sales promotions had no significant effect
14	Kunter (2015) (Study 1)	PWYW for tickets to animal park (sold in lecture); real payments but subjects received €11.50 show-up fee; study explores "motivation-related payment factors"	EG, LMC	PWYW prices not reported; regular price € 4.00	three most frequent answers: fairness (58%), reference prices (46%), customer satisfaction (31%)
15	Kunter (2015) (Study 2)	PWYW for day ticket for wellness and sauna, survey and interview with 91 subjects	EG, LMC	PWYW prices not reported; regular price € 20-25	most frequent answers: reference prices (71%), customer satisfaction (47%), fairness (37%)
16	Kunter (2015) (Studies 3 and 4)	survey with 153 and 205 subjects; survey with paired comparisons took place in museum or zoo after subjects purchased tickets, in contrast to other surveys prices paid are not hypothetical; prices are not recorded	EG, LMC	not applicable regular prices: €4.50 museum €14.00 zoo	most important motives for making positive payments: customer satisfaction, fairness, income
17	Machado and Sinha (2013) (Study 1)*	PWYW for dinner in an upscale restaurant, in a conjoint analysis, 258 subjects ranked 12 different profiles; profiles differed in characteristics of the meal, quality of service, pricing (fixed or PWYW) and price paid	EG, LMC	not applicable	quality of service and fairness have significant effect; reciprocity is not significant; the effect of quality of service is largest
18	Marett, Pearson and Moore (2012)	buyers downloaded projects for an app (iProduct) from iTunes App Store, made their PWYW payments and completed a survey	DG, LMC	$0.43	structural equation modeling is used; loyalty influences buyers' WTP; price consciousness and usage affect the price actually paid
19	Santana and Morwitz	PWYW for 16-ounce cup of fresh-squeezed lemonade, online survey with	EG, LMC	$2.81 (i) $1.52 (ii)	subjects pay more when profits go to charity; effect of social norm depends on SVO: with

	Reference	Experimental Design	Product Type	Payment	Main Finding
	(2013) (Study 2)*	205 M-Turk subjects; social value orientation (SVO) was measured and the survey primed the norm: (i) communal norm in which all profits go to charity, and (ii) exchange norm			exchange norm pro-socials pay more than pro-selves, with communal norm pro-socials and pro-selves pay the same
20	Santana and Morwitz (2013) (Study 3)*	PWYW for 16-ounce cup of coffee, online survey with 546 M-Turk subjects; social value orientation (SVO) was measured and the survey primed the norm: (i) communal relationship norm, the description focuses on social aspects (e.g., "very warm interaction"), and (ii) exchange relationship norm focusing on economic aspects	EG, LMC	$2.71 (i) $2.22 (ii)	situational relationship norms leads to higher prices, even if profits do not go to charity (cf. Study 2); pro-socials ($2.62) pay more than pro-selves ($2.31)
21	Santana and Morwitz (2013) (Study 4)*	PWYW for coffee plus bagel, online survey with 339 M-Turk subjects; social value orientation (SVO) was measured and the survey primed the norm: (i) communal norm, and (ii) exchange norm; priming took place in an unrelated task	EG, LMC	$3.37 (i) $3.04 (ii) (suggested price $3.00)	subjects primed with communal norm paid significantly more than subjects primed with exchange norm; priming effect carries over; pro-selves react stronger to priming
22	Thomas and Gierl (2014)	WTP for pizza and hotel room is elicited, 2 (perspective) × 3 (reference-price information) × 3 (profit orientation) between subjects × 2 (service category) within subjects design	EG, LMC	€ 11.03 pizza € 62.13 hotel room	reference prices (inform. about what others paid before or minimum prices) have negative effects, no sign. difference between profit and nonprofit sellers

DG = digital good, EG = experience good, LMC = good with low marginal cost

Table 4: Case Studies (CS)

	Reference	Description	Product Type	Payments	Duration	Main Findings
1	Krawczyk, Kukla-Gryz and Tyrowicz* (2015)	PWYW for bundles of about 5 e-books, each bundle is sold in a 7 or 14 days campaign, the mean price and the eight buyers who paid the highest prices are listed on the seller's website	DG, EG, LMC	€5.00	about two years	buyers try to match the mean price; due to information about payments of others a social norm may drive payment behavior
2	León, Noguera and Tena-Sánchez (2012)	holiday packages and services (flights, hotel stays) of different price categories	EG, high cost	total payment €7,011, i.e., 5.1% of total value, €137,066	2 weeks	overall very low contributions with 46% of customers who paid zero; explanations for low payment are a framing effect and a cannibalizing effect caused by complementary goods
3	Regner and Barria (2009)	music downloads or CDs are sold, buyers can choose any price between $5 and $18, CD costs additional $4.97 for physical costs	DG, EG, LMC	$8.20 ($8.00 recommended price)	18 months (September 2003 – January 2005)	on average payments are considerably higher than the minimum price of $5 and higher than a recommended price of $8; reciprocity as the driver for voluntary payments is not confirmed; instead warm glow and guilt seem to be motives that drive behavior
4	Regner and Riener* (2012)	as above, but for two weeks, the seller changed its policy so that the artist was informed about buyers' names and prices paid;	DG, EG, LMC	$7.99 with anonymity $8.05 without anonymity	4 months (September — December 2005)	reduced privacy increases payments, but effect is not significant; reduced privacy decreases buyers by 20% per day and decreases revenues by 25% per day
5	Riener and Traxler (2012)	lunch or dinner at a restaurant	EG, LMC	€5.26	2 years	average payments modestly declined since the start of the restaurant but PWYW payments stabilized at about 5€ per meal on average; revenues increased due to more customers; restaurant has been operating for two years in a competitive market with PWYW pricing
6	Santana and Morwitz* (2013) (Study 1)	adoption fee at animal shelter	EG	$110.38 (reference adoption fee is $150)	1 month	buyers consider transaction in PWYW as socially interdependent; outcomes of sellers are considered; communal or exchange norms drive payment decisions

DG = digital good, EG = experience good, LMC = good with low marginal cost
* Working paper

3. Gaps in Current Research

In this section we address two gaps in the recent studies on PWYW pricing. The first gap is that studies are confined to low-price goods and the second one is that studies are confined to short-term observations. Both gaps are apparent from the survey above and are related to one of the following unanswered questions: (1) What conditions are required so that a seller applies PWYW pricing to high-cost goods without making a loss? (2) What are the conditions under which sellers can apply PWYW pricing in the long run?

We think that these questions provide fruitful guidance in research because the answers are of central importance for theoretical as well as applied studies on PWYW. On a theoretical level, the answers will contribute to the literature on behavioral pricing. On an applied level, the answers to question (1) are of interest for sellers who want to use PWYW pricing as a short- or long-term strategy, and the answers to question (2) are of interest for sellers who want to use PWYW pricing in the long run.

3.1 PWYW and High-Cost Goods

If we consider the perspective of a seller, PWYW can, firstly, be considered as a marketing strategy with the goal of creating awareness for a new product. Long term considerations, such as future market penetration, can be reasons for choosing PWYW pricing in the short run. Secondly, in the long term, PWYW can be a viable profit-enhancing pricing strategy for experience goods with low marginal costs, such as services, music downloads or e-books.

As a marketing strategy, PWYW can be successful in the short run because it attracts new buyers and increases sales. Many buyers might be attracted by the innovative character of PWYW pricing (Kim, Natter and Spann 2014), or by the option of making a ‘good’ bargain (Shampanier, Mazar and Ariely 2007). Another reason why buyers might be attracted by

PWYW pricing is the reduced risk of paying too much for a low quality product. This holds especially true for experience goods whose quality is only known after consumption (Nelson 1970). A buyer, who pays before consumption, is at risk to pay a price she would not pay if she knew the quality of the goods in advance. This may lead to abstaining from purchasing the good at a fixed price. Egbert, Greiff and Xhangolli (2015) point out that PWYW-ex-post-consumption can be a viable strategy to reduce information asymmetries and to increase sales. This is confirmed in several FE and SE, showing that PWYW payments increase in quality (Kim, Kaufmann and Stegemann 2014, Kim, Natter and Spann 2014, Kunter 2015 and Study 1 in Machado and Sinha 2013).

Only a small number of studies examine goods which have relatively high cost and which are normally sold at higher fixed prices. Exceptions are the sales of holiday packages reported by León, Noguera and Tena-Sánchez (2012), with sales between €40 (hotel room for two persons, one night) and €2,938 (a seven-night holiday for two persons in Egypt) and the hotel stays reported by Gautier and van der Klaauw (2012), with regular sales between €80 and €160.

To see the relation between PWYW pricing and profits, consider the ratio of average PYWW payment, $\bar{p}$, to average cost, $\bar{c}$, $r = \frac{\bar{p}}{\bar{c}}$. If r>1, a seller makes positive profits, and if r<1, a seller makes a loss. Based on the results summarized in the previous section, it seems that r is smaller for goods that have higher costs.

If applied to goods with a low average cost, PWYW pricing can, in the worst case, lead to minimal losses because $\bar{c}$ is small. For goods with a higher average cost, the risk of making a loss is larger, because buyers have a stronger incentive to free-ride by paying a low price. Although the empirical results show that buyers are sensitive to reference prices and cost information, and that buyers are willing to pay higher prices for goods that come with higher costs, it is unclear from the reviewed studies whether sellers can apply PWYW to high-cost

goods without making losses. The results from León, Noguera and Tena-Sánchez (2012) and Gautier and van der Klaauw (2012) provide a pessimistic outlook, but it appears premature to draw any generalized conclusion based on two studies only. Firstly, in both studies, social distance between buyers and seller is rather high and this might lead to reduced payments. Secondly, it is possible that buyers make small payments because they underestimate production costs (Greiff, Egbert and Xhangolli 2014). And, thirdly, buyers might perceive the use of PWYW as a marketing campaign in which they are entitled to make payments below cost.

For the FE by Gautier and van der Klaauw (2012), the third explanation seems plausible because PWYW was used as part of a promotional campaign. If buyers know that a seller does not use PWYW as a short-run marketing strategy, buyers might recognize that the seller will stay in business only if payments are high enough, and hence, they might be willing to pay higher prices in order to keep the seller in business.

Although common sense might suggest that PWYW cannot be successful for high cost goods because buyers will take advantage of the opportunity to pay low prices, there is no clear evidence for this. Many studies on PWYW pricing suggest that positive payments are driven by social preferences, in particular by fairness and reciprocity. Results from laboratory experiments show that fairness considerations and reciprocity (List and Cherry 2008; Fehr, Fischbacher and Tougareva 2002) are not weakened by higher stakes, suggesting that sellers do not necessarily make losses when offering high cost products at PWYW pricing.

3.2 PWYW in the Long-Run

Our survey reveals that most FE rely on data that covers comparatively short periods of time – at best several months but mostly only a few days. This is different as with CS. Three CS (Krawczyk, Kukla-Gryz and Tyrowicz 2015, Regner and Barria 2009, Riener and Traxler

2012) are based on data about PWYW transaction collected over a period of more than a year.

In these CS, goods with low marginal costs are sold. It is plausible that for these goods average payments exceed marginal cost. It seems that for goods with a low marginal cost, PWYW can increase profitability by attracting buyers at times when production operates below full capacity utilization. With regard to profitability this makes sense if there are economies of scale (e.g., due to high fix cost) so that average cost decreases with a higher capacity utilization. Digital goods are a specific case because marginal costs are zero and a capacity constraint does not exist. For these goods any additional unit sold at an arbitrary small but positive price increases profit.

The above literature survey finds that PWYW can be successfully applied over long periods of time if products have low marginal cost, as in the mentioned CS. However, based on our survey, it is an open question whether PWYW can be successfully applied over longer periods for goods which have positive marginal costs.

Another important factor which could influence the success of PWYW in the long run is the degree of substitutability, which depends on market structure. For instance, if buyers prefer the good a seller offers under PWYW and if substitutes are available, buyers have an incentive to free-ride under PWYW pricing by buying the good at a low price. The seller makes a loss and, eventually, is driven out of business. This is not a problem for buyers because substitutes are available. However, if no perfect substitutes are available, the incentive to free-ride under PWYW is weaker since driving the seller out of the market cannot be in the interest of the buyer.

An example for this situation can be lunch or dinner at a restaurant. Riener and Traxler find that 81% of the customers of the restaurant studied are regular customers who eat there are least once a month, and 50% of customers eat there at least twice per month (Riener and Traxler 2012, 477). These regular customers might be an important factor driving the success

of PWYW at this particular restaurant because they are willing to pay prices that cover costs in order to keep the restaurant in business. Arguably, this would be different if there were an exact replica of the restaurant which sells at fixed prices (i.e., a restaurant where customers could eat exactly the same meals in exactly the same atmosphere). Hence, we postulate that over longer time spans, the success of PWYW pricing will depend on the availability of substitutes and, therefore, on market structure. This is a hypothesis right now and further research into this direction is needed. For example, one could design a LE (similar to Mak et al. 2015) in which buyers choose between two goods, one being sold under PWYW pricing and the other one being sold under fixed pricing. Across treatments one could vary the degree of substitutability between the two goods in order to explore how this affects PWYW payments.

Closely related to the discussion of the long run is the question of how buyers' payments develop over time in repeated purchases. Schons et al. (2013) and Gravert (2014) show that prices decrease when purchases are repeated. Decreasing prices do not imply that the seller will eventually realize losses. In fact, Riener and Traxler (2012) find that a slow decrease in average PWYW payments goes hand in hand with an increase in buyers so that revenue increases in total.

4. Conclusion

In this paper, we provide a thorough survey of the fast growing literature on PWYW pricing. Our survey reviews all empirical studies on PWYW pricing which report data generated in laboratory experiments (LE), field experiments (FE), survey experiments (SE) and case studies (CS). We find that PWYW pricing is almost exclusively used in very small segments of consumer goods, mostly for low-cost goods, experience goods, or for bundles of goods and services. Moreover, almost all empirical studies focus on relatively short time periods.

Despite the current fashion to investigate PWYW, there are still several unanswered questions. In particular, it is not clear if sellers can successfully apply PWYW to high cost goods, or over longer time periods. To address these issues, we provided some tentative answers in the previous section. However, so far, the amount of goods sold via PWYW pricing in comparison to other pricing mechanisms is nothing more than marginal, and further research should investigate PWYW pricing in longitudinal studies in order to identify opportunities for sellers.

References

Armstrong Soule, Catherine A. and Robert Madrigal (2014). "Anchors and norms in anonymous pay-what-you-want pricing contexts." *Journal of Behavioral and Experimental Economics* 57, 167-175.

Azar, Ofer H., (2004). "The history of tipping – from sixteenth-century England to United States in the 1910s." *Journal of Socio-Economics* 33(6), 745-764.

Azar, Ofer H., (2007). "Why pay extra? Tipping and the importance of social norms and feelings in economic theory." *Journal of Socio-Economics* 36(2), 250-265.

Chandran, Sucharita, and Vicki G. Morwitz (2005). "Effects of participative pricing on consumers' cognitions and actions: A goal theoretic perspective." *Journal of Consumer Research* 32(2), 249-259.

Collett, Jessica L. and Ellen Childs (2011). "Minding the gap: Meaning, affect, and the potential shortcomings of vignettes." *Social Science Research* 40(2), 513-522.

Egbert, Henrik, Matthias Greiff and Kreshnik Xhangolli (2015). "Pay what you want (PWYW) pricing ex-post consumption: A sales strategy for experience goods." *Journal of Innovation Economics & Management* 16(1), 249-264.

Fehr, Ernst, Urs Fischbacher and Elena Tougareva (2002). "Do high stakes and competition undermine fairness? Evidence from Russia." Working Paper No. 120, Institute for Empirical Research in Economics, University Zurich.

Gautier, Pieter A. and Bas van der Klaauw (2012). "Selection in a field experiment with voluntary participation." *Journal of Applied Econometrics* 27, 63-84.

Gneezy, Ayelet, Uri Gneezy, Leif D. Nelson and Amber Brown (2010). "Shared social responsibility: A field experiment in pay-what-you-want pricing and charitable giving." *Science* 329(5989), 325-327.

Gneezy, Ayelet, Uri Gneezy, Gerhard Riener and Leif D. Nelson (2012). "Pay-what-you-want, identity, and self-signaling in markets." *Proceedings of the Royal Academy of Sciences* 109(19), 7236-7240.

Gravert, Christina (2014). "Pride and patronage: The effect of identity on pay-what-you-want prices at a charitable bookstore." Economics Working Papers 2014-04, School of Economics and Management, University of Aarhus.

Greiff, Matthias, Henrik Egbert and Kreshnik Xhangolli (2014). "Pay what you want – but pay enough! Information asymmetries and PWYW pricing." *Management & Marketing* 9(2), 193-204.

Harrison, Glenn W. and Elisabet Rutström (2008). "Experimental evidence on the existence of hypothetical bias in value elicitation methods." Chapter 81 in: Charles R. Plott and Vernon L. Smith (eds.), *Handbook of Experimental Economics Results, Volume 1*, 2008, 752-767.

Hilbert, Leon Paul and Augustin Suessmair (2015). "The effects of social interaction and social norm compliance in pay-what-you-want situations." *American Journal of Industrial and Business Management* 5, 548-556.

Jang, H, and W. Chu (2012). "Are consumers acting fairly toward companies? An examination of pay-what-you-want pricing." *Journal of Macromarketing* 32(4), 348-360.

Johnson, Jennifer Wiggins and Annie Peng Cui (2013). "To influence or not to influence: external reference price strategies in pay-what-you-want pricing." *Journal of Business Research* 66(2), 275-281.

Kim, Ju-Young, Martin Natter, and Martin Spann (2009). "Pay what you want: A new participative pricing mechanism." *Journal of Marketing* 73(1), 44-58.

Kim, Ju-Young, Martin Natter and Martin Spann (2010). "Pay what you want: relevance and consumer behavior." *Zeitschrift Für Betriebswirtschaft* 80(2), 147-169.

Kim, Ju-Young, Martin Natter and Martin Spann (2014). "Sampling, discounts or pay-what-you-want: Two field experiments." *International Journal of Research in Marketing* 31(3), 327-334.

Kim, Ju-Young, Katharina Kaufmann and Manuel Stegemann (2014). "The impact of buyer-seller relationships and reference prices on the effectiveness of the pay what you want pricing mechanism." *Marketing Letters* 25, 409-423.

Krawczyk, Michal, Anna Kukla-Gryz and Joanna Tyrowicz. (2015). "Pushed by the crowd or pulled by the leaders." Working Paper No. 25/2015 (173), Faculty of Economic Sciences, University of Warsaw.

Krämer, Florentin, Klaus M. Schmidt, Martin Spann and Lucas Stich (2015). "Delegating pricing power to customers: Pay what you want or name your own price?" Munich Discussion Paper No. 2015-5, Department of Economics, University of Munich.

Kunter, Marcus (2015). "Exploring the pay-what-you-want payment motivation." *Journal of Business Research* 68(1), 2347-2357.

Léon, Francisco J., José A. Noguera and Jordi Tena-Sánchez (2012). "How much would you like to pay? Trust, reciprocity and prosocial motivations in El trato." *Social Science Information* 51(3), 389-417.

List, John A. and Todd L. Cherry (2008). "Examining the role of fairness in high stakes allocation decisions." *Journal of Economic Behavior & Organization* 65(1), 1-8.

Machado, Fernando and Rajiv K. Sinha (2013). "The viability of pay what you want pricing." Working Paper.

Mak, Vincent, Rami Zwick, Akshay Rao and Jake A. Pattaratanakun (2015). "'Pay what you want' as threshold public good provision." *Organizational Behavior and Human Decision Processes* 127, 30-43.

Marett, Kent, Rodney Pearson and Robert S. Moore (2012). "Pay what you want: An exploratory study of social exchange and buyer-determined prices of iProducts." *Communications of the Association for Information Systems* 30, Article 10.

Murphy, James J., P. Geoffrey Allen, Thomas H. Stevens and Darryl Weatherhead (2005). "A meta-analysis of hypothetical bias in stated preference valuation." *Environmental and Resource Economics* 30, 313-325.

Natter, Martin and Katharina Kaufmann (2015). "Voluntary market payments: Underlying motives, success drivers and success potentials." *Journal of Behavioral and Experimental Economics* 57, 149-157.

Nelson, Phillip (1970). "Information and consumer behavior." *The Journal of Political Economy* 78(2), 311-329.

Regner, Tobias and Javier A. Barria (2009). "Do consumers pay voluntarily? The case of online music." *Journal of Economic Behavior and Organization* 71(2), 395-406.

Regner, Tobias and Gerhard Riener (2012). "Voluntary payments, privacy and social pressure on the internet: A natural field experiment." DICE Discussion Paper, No. 82, Düsseldorf Institute for Competition Economics (DICE).

Riener, Gerhard and Christian Traxler (2012). "Norms, moods, and free lunch: Longitudinal evidence on payments from a pay-what-you-want restaurant." *Journal of Socio-Economics* 41(4), 476-483.

Santana, Shellene and Vicki G. Morwitz (2013). "We're in this together: How sellers, social values, and relationship norms influence consumer payments in pay-what-you-want contexts." Working Paper.

Schmidt, Klaus M., Martin Spann and Robert Zeithammer (2015). "Pay what you want as a marketing strategy in monopolistic and competitive markets." *Management Science* 61(6), 1217-1236.

Schons, Laura Marie, Mario Rese, Jan Wieseke, Wiebke Rasmussen, Daniel Weber and Wolf-Christian Strotmann (2013). "There is nothing permanent except change: Analyzing individual price dynamics in 'pay-what-you-want' situations." *Marketing Letters* 25(1), 25-36.

Schröder, Marina, Annemarie Lüer and Abdolkarim Sadrieh (2015). "Pay-what-you-want or mark-off-your-own-price: A framing effect in customer-selected pricing." *Journal of Behavioral and Experimental Economics* 57, 200-204.

Shampanier, Kristina, Mazar, Nina and Dan Ariely (2007). "Zero as a special price: The true value of free products." *Marketing Science*, 26(6), 742-757.

Spann, Martin, Bernd Skiera and Björn Schäfers (2004). "Measuring individual frictional costs and willingness-to-pay via name-your-own-price mechanisms." *Journal of Interactive Marketing* 18(4), 22-36.

Spann, Martin and Gerard J. Tellis (2006). “Does the internet promote better consumer decisions? The case of name-your-own-price auctions.” *Journal of Marketing* 70(1), 65-78.

Smith, Vernon (1976). “Experimental economics: Induced value theory.” *The American Economic Review* 66(2), 274-279.

Thomas, Stefan and Heribert Gierl. (2014). “Pay what you want: How to affect the price consumers are willing to pay.” In: Proceedings of the 13th ICORIA: International Conference on Research in Advertising, June 26-28 2014, Amsterdam.