



## Pay-what-you-want pricing: Can it be profitable?



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### ABSTRACT

Using a game theoretic framework, we show that not only can pay-what-you-want pricing generate positive profits, but it can also be more profitable than charging a fixed price to all consumers. Further, whenever it is more profitable, it is also Pareto-improving. We derive conditions in terms of two cost parameters, namely the marginal cost parameter for the seller, and the social preference parameter of a consumer to incorporate behavioral considerations for paying too little compared to her reference price.

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### 1. Introduction

Several field experiments using pay-what-you-want (PWYW) pricing, for example, by musicians (Radiohead band), coffee houses (Mosaic Coffee House in Seattle, Washington), restaurants (Just around the Corner in London and Mon Cheri in Fukuoka, Japan), a movie theatre (near Frankfurt Germany (Kim et al., 2009)), and an on-line magazine (Paste), have attracted attention in both economics and marketing literature. Under PWYW pricing, the seller does not set the price. Consumers may choose any price to pay including zero.<sup>1</sup> Those who practice this form of pricing may not receive enough revenue to cover their costs. This problem is exacerbated when either a large fraction of consumers free ride or the voluntary payments they receive are below the marginal cost of production, thus potentially making it an unprofitable pricing practice compared to charging a fixed price.

This paper considers if PWYW pricing can generate positive profits and also earn profits in excess of those earned by using a fixed price. The paper makes the following contributions to the existing literature. First, we endogenize the choice of pricing strategies – PWYW price vs. fixed price. Thus rather than solely focusing on the profitability of PWYW pricing, we evaluate its profitability vis-a-vis uniform pricing. To the best of our knowledge this has not been done so far theoretically. Second, we specify consumer utility to account for both economic and behavioral considerations. We show that when marginal cost is low and behavioral considerations are strong, then PWYW pricing can exploit the deadweight loss present under the uniform price to gain additional profit at the cost of serving some free riders. Therefore, PWYW pricing can be more profitable than charging a fixed price especially when the marginal cost is low and the deadweight loss is high. Third, we demonstrate PWYW pricing is more attractive when the cost of price setting is considerable or the market size is small.

The empirical evidence examining PWYW pricing comes mainly from field experiments. Kim et al. (2009) conducted field experiments in a medium-sized town near Frankfurt, Germany, in which three firms used PWYW pricing. All three sellers (a lunch buffet in a middle-priced restaurant, a delicatessen serving twelve different types of hot beverages and a multiplex cinema consisting of eight different movie theaters) reported receiving payments from all customers (no free riders). To explain such payment patterns, the authors posit that behavioral factors play an important role and

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<sup>1</sup> The significant difference between PWYW and name-your-own-price strategy is that, unlike under PWYW pricing, in the name-your-own-price strategy, the seller can always refuse a buyer's final offer even when the buyer is willing to pay the required minimum price.

how consumers react to a pricing practice may not be solely rational. Based on the experimental data they conclude that when buyers and sellers interact face-to-face, buyers will not free ride and will pay a positive price. Unlike the online offering by Radiohead, in all their experiments the interactions were face-to-face.<sup>2</sup> Behavioral considerations such as fairness, altruism, satisfaction and loyalty affect a consumer's reference price and that in turn influences the payment made by the consumer. These concerns become more significant when the interaction is face-to-face such that the consumer will not free ride.<sup>3</sup>

Gneezy et al. (2012) introduce two additional factors that also play an important role in assessing the viability of PWYW pricing. Based on the results from three field experiments, they show that consumers would avoid free riding under PWYW pricing, in part, because consumers want to maintain their self-image of being fair. Since both free riding and not paying a "fair" price create a negative self-image, to protect self-image, buyers rather prefer to forego purchasing from the firm using PWYW pricing in favor of the firm who uses a declared fixed-price. This no-purchase outside option, although helping to maintain the self-image, also results in fewer purchases under PWYW pricing. The authors conclude that "...choosing whether to purchase a product or service, and how much to pay for it, has a self signaling value. People feel bad when violating the norm and thus would avoid the situation by choosing not to buy the product or service. If they do choose to purchase the product or service, they often choose to pay a "fair" price that does not have a negative effect on their self-image (p.7240)." Using online laboratory experiments, Schmidt et al. (forthcoming) also reach the same conclusion when firms compete and consumers have an outside option.

Machado and Sinha (2013) specify a utility function to explicitly control for three behavioral factors, namely fairness, reciprocity and consumers' bias toward a fixed-price strategy. Employing both laboratory and field experiments they explore when these three behavioral factors could make PWYW a viable pricing option. The utility function under PWYW pricing includes disutility from not paying a "fair" price, and a positive utility because of reciprocity consideration. In the absence of any posted or anchor price, a consumer's internal reference price plays the main role in determining the "fair" price. They conclude that PWYW pricing has the potential to expand the market size because all buyers participate and thus it could serve as an effective mechanism to price discriminate. In their model specification, not only could PWYW pricing increase the market size, but because of reciprocity concerns it may lead to an unusual result of consumers paying *more* than their reference prices.

Regner and Barria (2009) analyze consumers' payment patterns at the online music label Magnatune, where consumers can pay what they wish within a *specified* price range of \$5–\$18. They find that, on average, customers paid \$8.20, far more than the suggested minimum price of \$5, and even higher than the recommended price of \$8. The authors conclude that PWYW pricing *could* serve as a viable alternate pricing option because such open contracts encourage customers to

make voluntary payments. They argue that voluntary payments can be due to reciprocity, "warm glow" – acts of kindness, or experiencing a large enough guilt from not paying a "fair" price. Repeated interactions or loyalty is another plausible explanation. Since the focus of their analysis is mainly on payment patterns of consumers, no definitive conclusions can be drawn about the profitability of PWYW pricing.

Regner (2010) uses the Magnatune data to find which behavioral determinants have the strongest affect on consumer payments. Consumers are categorized into three groups: Low payers who paid near the minimum price of \$5 (15%), average payers who paid near the recommended price of \$8 (60%), and generous payers who paid substantially more than the recommended price (25%). The author identifies reciprocity and fairness/guilt considerations as the primary drivers for generous payments and social norms as the driver for payments made around the recommended price.

The extensive literature in behavioral economics, marketing and psychology studying PWYW pricing strongly suggests that many behavioral considerations play a significant role. For the profitability of PWYW pricing, it may not be possible to identify the single most significant determinant of both how much consumers would like to pay and how the profits are affected. Experimental studies also show that, in spite of the option to free ride, not *all* consumers free ride. However, in the case of Radiohead's online experiment about 68 percent did not pay at all. We argue that regardless of which behavioral factor is a dominant factor in deciding whether to pay or not and how much to pay, a theoretical analysis should not, a priori, rule out free riding by focussing on specific behavioral factors. Further, one cannot conclude that positive revenue under PWYW pricing implies higher profits compared to charging a fixed price without considering the magnitude of marginal cost and what fraction of buyers paid above or below the marginal cost. Even when free riding is ruled out and one focuses primarily on the payments, marginal cost still remains a relevant factor.

The main motivation for the paper is to provide a plausible theoretical explanation incorporating both the economic and the behavioral considerations to two important questions. Not ruling out free-riding a priori based on some specific behavioral factors, when would some consumers pay and some free ride? Under what conditions could PWYW pricing generate higher profits than charging a fixed price to all consumers? We provide answers to both these questions based on two parameters, namely the marginal cost of production for the seller and a "catch-all" social preference parameter that serves as a proxy for all relevant behavioral factors.

We use a stylized game theoretical model based on profit maximization to endogenize the choice of pricing strategies between PWYW pricing and uniform pricing. Our basic framework relies upon the growing body of literature related to social preferences in experimental and behavioral economics. Fair-minded consumers are modeled to maximize *net* utility, where the utility function is comprised of two parts: (1) consumers wish to maximize consumer surplus (defined as the difference between consumers' private values for the good and the amount paid); and (2) consumers also wish to minimize transaction utility. Transaction utility incorporates the effects of social preferences that are typically ignored in standard models of utility maximization but quite relevant under PWYW pricing. For tractability reasons, it is impossible to explicitly incorporate every single social preference factor, (e.g., fairness, warm glow, self-image, reciprocity etc.), into a consumer's utility function. Such a specification will make a closed form solution for the demand functions highly complex, perhaps even impossible, as shown in Machado and Sinha (2013). However, by including a single "catch-all" social preference parameter for the consumer that

<sup>2</sup> The British band Radiohead offered their album *In Rainbows* to consumers online, where the interaction was *anonymous*. The PWYW experiment resulted in both paying customers (38 percent worldwide and 40 percent in the U.S. *willingly* paid) and free riders, who were as prevalent in the U.S. as in the rest of the world. From October 10 to 29, 2007, 1.2 million people worldwide downloaded the album from Radiohead's Website. The average paying consumer in the US paid considerably more, \$8.05 compared to \$4.64, than her international counterpart. The band did require a 45 pence minimum payment as a transaction fee. See <http://www.inrainbows.com>; and <http://comscore.com/press/release.asp?press=1883>; and the Wall Street Journal, October 3, 2007, p.C14.

<sup>3</sup> Kim et al. (2009) provide an extensive literature review that provides reasons why consumers might pay when they have an option not to pay.

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