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Behavior-based price discrimination with retention offers [☆]

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ABSTRACT

This paper is a first step in investigating the competitive and welfare effects of behavior-based price discrimination (BBPD) in markets where firms have information to employ retention strategies as an attempt to avoid the switching of their clientele to a competitor. We focus on retention activity in the form of a discount offered to a consumer expressing an intention to switch. When retention strategies are allowed, forward looking firms anticipate the effect of first period market share on second period profits and price more aggressively in the first-period. Thus, first period equilibrium price under BBPD with retention strategies is below its non-discrimination counterpart. This contrasts with first period price above the non-discrimination level if BBPD is used and retention activity is forbidden. Regarding second period prices, the use of retention offers increase the price offered to those consumers who do not signal an intention to switch; the reverse happens to those consumers who decide to switch after being exposed to retention offers. As in other models where consumers have stable exogenous brand preferences, the instrument of BBPD is bad for profits and welfare but good for consumers. BBPD with the additional tool of retention activity boosts consumer surplus and overall welfare but decreases industry profit.

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1. Introduction

In markets with repeated purchases firms frequently use the consumers' purchase history to quote different prices to their own previous customers and to those who bought from a rival before. When price discrimination is permitted and trade among consumers is not feasible,

firms may want to price low to poach their rival's customers and price high to their own customers. This form of price discrimination, termed behavior-based price discrimination (henceforth BBPD), sometimes also called price discrimination based on purchase history or dynamic pricing, is widely observed in many markets. In the communications markets, for instance, firms frequently offer a lower price to a customer who has been using a competitor's service. Similar pricing strategies are employed in other markets such as supermarkets, web retailers, credit cards, banking services and electricity and gas.¹

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¹ A recent report by the Office of Gas and Electricity Markets (Ofgem, 2008), the regulator for Britain's gas and electricity industries, has revealed that, in this industry: (i) a substantial fraction of consumers are 'switchers' in the sense that they constantly seek out for the best deal in the market and (ii) suppliers are well aware of these consumers' dynamics and do take them into account in their pricing decisions. In particular, "companies charge more to existing ("sticky") customers whilst maintaining competitiveness in more price sensitive segments of the market.

Although this type of competitive price discrimination has received much attention in the economics literature in recent years,² the literature has hitherto focused on the assumption that firms do not react to the rivals' poaching offers. Interestingly, in some of the markets where firms often discriminate between their own and the rivals' consumers, the use of retention offers as an attempt to avoid customer poaching and switching has become a widespread business practice. A recent report by the regulator and competition authority for the UK communications industries ([Ofcom, 2010](#)) refers that retention offers have been increasingly used by firms operating in markets in which the switching process is the Losing Provider Led (LPL). The LPL regime is currently in place in the UK for switching mobile telephony or broadband services and operates as follows. Consumers wishing to switch their mobile telephony services must contact their existing provider and request a Porting Authorization Code (PAC) which they must communicate to their new provider in order to complete the switch.³ The same procedure also applies for switching broadband services, in which case the required code is the Migrations Authorization Code (MAC).

Therefore, apart from being able to know whether or not a consumer purchased from a rival before, firms can have the tools to price discriminate between different types of old customers – those disclosing a desire to switch (called active consumers) and those showing no intention to switch (called passive consumers). Empowered with this additional information firms can have the last word over their competitors' poaching offers. The consumer's request of a code discloses information about his willingness to switch and gives firms an incentive to use retention offers targeted to customers who are at a risk of switching. Theoretically firms can use diverse forms of retention offers – price discounts, price matching, upgrade of services – as a way to make it less attractive for a customer to switch to a competing firm. However, according to the [Ofcom report \(2010, p. 82\)](#) retention activity in the UK communications industry is generally in the form of a price discount.

The ability of firms to employ retention strategies will make it more difficult for firms to attract the rivals' customers and will potentially raise welfare and antitrust concerns. Some interesting issues are the following. What is the likely impact of retention on competition and consumers? Do firms charge "excessive prices" to passive consumers? Does BBPD with retention offers enhance the dominance of the firm with a higher customer base? Who benefits and who loses when firms engage in BBPD with retention offers? Should these business practices be banned?

Despite the crucial importance of these issues, the answer to these and other related questions is not yet known. This paper takes a first step in investigating the competitive and welfare effects of retention offers in markets where firms engage in BBPD. The paper considers a

two-period model with two horizontally differentiated firms competing for consumers with stable exogenous brand preferences across the two periods. These preferences are specified in the Hotelling-style linear market of unit length with firms positioned at the endpoints. Firms cannot commit to future prices. In the first-period firms charge a uniform price. In the second-period there are two stages. In the first stage, firms use the consumers' first period purchase history to draw inferences about their preferences and price accordingly. Each firm simultaneously chooses a price to its old customers and to the rival's previous customers. In the second stage, it is assumed that a retention discount is targeted at consumers expressing an intention to leave and is enabled by a switching process in which a provider is made aware of a customer's intention to switch before the switching takes place (LPL process).

In order to investigate effects of retention offers when firms also employ BBPD, I first present the benchmark case where BBPD is permitted but retention offers are not allowed, either because they are not permitted or because firms cannot recognize the customers who are at risk of switching. This benchmark is useful to understand the competitive and welfare implications of BBPD in markets operating under different switching regimes. With regard to the communications sector, the Ofcom report states that an alternative to the LPL switching regime, also in place in the UK, is the Gaining Provider Led (GPL) process which applies, for instance, to switching fixed telephony lines. Under the GPL regime, the consumer agrees a deal with the new provider before the losing provider is informed that the switch is in process. In contrast to the LPL regime, the GPL switching process does not allow firms to target counter-offers to consumers willing to switch because by the time the existing provider becomes aware of the consumer's intention to switch, the consumer has already signed the contract with a competitor.

The second-period static analysis sheds some light on the price effects of BBPD with retention counter-offers given an inherit market share. I show that firms will only engage in BBPD with retention offers when their customer base is above a threshold, i.e., when it is higher than 33%. The analysis also sheds light on whether or not BBPD with retention strategies can help a dominant firm (with a market share above 50%) to maintain its dominance. The model predicts that when BBPD is permitted but retention offers are not allowed, the dominant firm will lose its dominance under BBPD. A similar result is obtained in [Gehrig et al. \(2012\)](#). In contrast, if BBPD and retention offers are both permitted the model predicts that when the dominant firm is big enough, i.e., with a market share above 75%, although BBPD with retention activity reduces its dominance the firm can still maintain the dominant position (i.e., a market share above 50%).

While the static analysis is a useful tool, the dynamic analysis is the most appropriate to advise competition authorities. The paper shows that BBPD with retention offers gives rise to new dynamic effects. While under BBPD with no retention, the first-period equilibrium price is above the non-discrimination level, the reverse happens under BBPD with retention discounts. Regarding the

² [Chen \(2005\)](#), [Fudenberg and Villas-Boas \(2007\)](#) and [Esteves \(2009b\)](#) present updated literature surveys on BBPD.

³ For mobile services a PAC code is required only when the consumer wants to keep his existing telephone number when switching to the new provider.

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