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Price discrimination through transactions bundling: The case of monopsony

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Abstract

This paper shows that for a price setting monopsony, offering to transact in a mixed bundle of goods of uncertain quality is profit enhancing. The magnitude of this enhancement relative to no bundling is greater the smaller the gap in the degree of quality uncertainty between the two goods purchased is. Moreover, contrary to coventional wisdom, the use of mixed purchase bundling by a monopsonist is trade enhancing. There is more room for a dramatic improvement in the volume of trade in a good with a low degree of quality certainty if its purchase is combined with a good of a substantially higher quality certainty.

Keywords: Monopsony; Price discrimination; Mixed bundling; Quality uncertainty; Partner preference; Profit enhancing; Trade enhancing

1. Introduction

The purpose of this paper is the theoretical analysis of price discrimination through the strategy of mixed bundling exercised by a buyer setting prices under conditions of monopsony power. Mixed bundling takes the form of offering either to trade separately in different goods at specific prices, or to trade in a package of goods at an aggregate price which includes a premium.

Mixed bundling is relative to no bundling both profit, for the price setting firm, and trade enhancing.[1] An example of bundling is the case of procurement where contracts are combined by the US government agencies. The result of our analysis is that the US government should ensure that it is of a mixed format.[2] Such an approach is reflected in the recent pieces of legislation concerning defence procurement where it is required that both bundled and unbundled purchasing arrangements have been considered before a decision is reached.[3]

Mixed bundling can also be used to deal with information asymmetries. If the firm is unable to determine the quality of the goods offered by a trading partner, it may find it profitable to bundle its purchases. This feature introduces what we refer to as *partner preference* (e.g. adverse selection). By bundling its purchases and offering a *premium* for doing

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[1] It is also always weakly profit enhancing relative to pure bundling in which only the bundle is offered. We discuss this briefly in footnote 7.

[2] This is argued at some length in Dassiou and Glycopantis (2006).

[3] Analogous, for the case of monopoly, is the decision in 2004 by the European Commission to force Microsoft to also sell a version of its Windows Operating System (WOS) without its Windows Media Player (WMP). This is an imposed switch from pure bundling, which was practised for entry deterrence purposes, to mixed bundling (Ayres and Nalebuff, 2005).

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so, the firm can reduce adverse selection problems by enhancing its ability to successfully identify trading partners and increase profits.

Mixed purchase bundling by the buyer attracts sellers with low costs in either or both goods, leaving out only firms with high costs in both goods. Hence increasing the volume of trade in each good relative to no bundling. As a result, in the case of US government procurement practices trade will *increase*. This is discussed in Dassiou and Glycopantis (2006).

From the point of view of the price setting buyer, under *t* ransactions bundling he offers a bundled price which is *h* igher than the sum of the two separate prices.[4] In our model package purchasing reduces the buyer's problem which arises from the dispersion in the sellers' individual costs.[5] Offering a combined price which is higher than the sum of the individual prices he attracts also sellers with a high cost in one of the goods but a reasonable overall cost for the bundle. On the other hand, the separate prices are set to extract surplus from those producers who might find it more profitable to trade in only one good.

Hence, by offering the opportunity of mixed bundling the firm increases its ability to identify trading partners and thus *both* enhances its profits and increases the trade volume. This reason behind purchase bundling by a monopsonist is minimally, if at all, discussed in the literature.

In our model there are no complementarities between the goods in the bundle. The argument is that it is profitable for a monopsonist to offer a bundled purchase price which is higher by a premium than the sum of the individual prices on offer and this does not rely on the existence of complementarities between the goods. If anything the presence of these would add a strategic incentive for the monopsonist to bundle (Nalebuff, 2004), especially if he is faced with potential entrants.

Section 2 discusses the monopsony model, Section 3 proves that the use of mixed bundling is both profit enhancing for the price setting monopsonist and increases the volume of trade in both goods. Section 4 summarises the conclusions of our analysis.

2. The monopsony case model

Our model is loosely related to the bundling models of Adams and Yellen (1976) and the tying model by Whinston (1990). It is closer to the model by McAfee–McMillan–Whinston (1989)(MMW), that deals with mixed bundling offered by a monopolist, and the Dassiou et al. (2004) model of reciprocal exchange.

There are two goods for potential trade, G1 and G2, between a monopsonistic firm P, and a collection of firms, M, which can be of a number of types. Firms in M attach valuations, equal to the cost of production, θ_i, of Gi and, depending on the prices offered, can decide to sell neither, just one or both goods. The vector $\theta = (\theta_1, \theta_2)$ defines the type of firm as it is endowed by Nature. It is assumed that θ_1 and θ_2 have independent uniform distributions over[6] $[0, 1]$. Every firm in M can supply to P at most one unit of each good.

P, the monopsonist buyer, does not observe the costs; he only knows the probability distribution from which they are drawn. P obtains utility per unit of the good, $S_i^{\mathrm{P}} = \alpha_i + \beta_i\theta_i$ where $\alpha_i, \beta_i \geq 0$, which depends on the cost of the good. S_i^{P} is the valuation of the good bought by the monopsonist. Prices $p = (p_1, p_2)$ and a possible premium $\varepsilon > 0$ for selling both goods as a bundle are set and announced by firm P. Because the goods are bought by P we take $p_i \leq 0$ with $p = (p_1, p_2) \geq (-1, -1)$. The prices are set with the objective of maximising his payoff function which

[4] We have discussed transaction bundling in its textbook format of a price setting monopolist in Dassiou and Glycopantis (2005b), and in its linked exchange form in Dassiou et al. (2004).

[5] For an analogous analysis of the monopoly case, see Pepall et al. (2005, p. 174) and Nalefuff (2003). Also, Bakos and Brynjolfsson (2000) in a more technical approach show that the customers' valuation of a bundle becomes more predictable as more independent items are added. By averaging out high and low valuations for separate goods, the demand curve for the bundle, in relation to those of the individual goods, becomes more elastic. In the limit, as the number of products in the bundle increases, the monopolist can extract 100% of consumer surplus. Finally as our referee pointed out, there has been also research on the use of bundling in selling multiple objects through auctions. Notably Chakraborty (1999) discusses the case of pure bundling in a Vickrey type auction. In this case the auctioneer bundles together two items and the combined price is set by the bidders. The outcome is that the larger the number of bidders, the more likely it becomes that the second highest bundle price at which the items will be sold is lower than the sum of the individual second highest prices if the goods were offered separately.

[6] The case presented can be considered as a limiting case. The unit space is divided into squares of equal area and at every corner there is a firm with valuations given by the coordinates of that point. All valuations are taken to be independent and equally probable. In the limit each square becomes smaller and smaller.