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Minimum quality standards and market dominance in vertically differentiated duopoly

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Abstract

The paper establishes conditions for low quality dominance within a vertically differentiated duopoly and studies the consequences for minimum quality standard policies. Gross surplus from unit consumption consists of a benefit from quality and a baseline benefit. Consumers are heterogeneous (homogeneous) with regard to the former (latter). Marginal cost increases in quality. The quality-then-price equilibrium exhibits low quality dominance first in market share and then in profit as baseline benefit increases relative to the willingness to pay for quality. The preference structure determines the effect of a minimum quality standard in a way related to the pattern of dominance. The standard reduces (increases) welfare under conditions that lead to low (high) quality dominance.

JEL classification: L13; L15

Keywords: Business strategies; Low quality dominance; Minimum quality standard; Vertical product differentiation

1. Introduction

In many markets high quality firms are not leaders in market share but rather sell at premium prices to a narrow circle of customers. Indeed, there appears to be an inherent asymmetry in many industries. Some firms rely on quality leadership mainly to generate a high mark-up, whereas

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other firms rely on a cost-advantage in order to capture a large share of the market.[1] Whether it is the provider of high or low quality who then dominates the market – in terms of market share, profit or both – depends on the preference and cost structure. At the same time, preferences and technology determine the impact on welfare of policies such as minimum quality standards (MQS).

The conventional model of vertical product differentiation, where consumers derive a benefit from quality alone, is somewhat ill equipped to capture the full range of possible outcomes in terms of dominance. Specifically, the producer of high quality always dominates both in terms of profit and market share (Shaked and Sutton, 1982; Lehmann-Grube, 1997).[2] This is because it could always capture the entire market by matching the low quality producer's price. Using the standard set-up of vertical differentiation, Ronnen (1991) shows that a MQS unambiguously raises consumer surplus, the low quality producer's profit and industry surplus while only harming the high quality producer. This begs the question as to whether the positive welfare impact of the MQS stands up to a setting where preferences are such that the low quality firm dominates.

The present work seeks to clarify these issues by extending the conventional model of vertical differentiation to allow for a richer set of market outcomes in terms of dominance. We consider a vertically differentiated duopoly in a noncovered market, where firms' marginal cost is linear in quality. We deviate from the conventional model by assuming that in addition to the quality-related benefit consumers derive a quality-independent baseline benefit.[3] With this specification, we find that low quality dominance arises for a given cost per unit quality if the baseline benefit is high relative to the willingness to pay for quality. Consumers are then price sensitive, and even a minor cost advantage creates low quality leadership. The switch from high to low quality dominance is sequential. For intermediate values of the baseline benefit the low quality firm acquires leadership in market share but not in profit.[4] If willingness to pay for quality is large relative to the baseline benefit, our model gives the conventional result of high quality leadership.

Furthermore, we characterise the impact on consumer and industry surplus of a MQS. Here, we show that when the baseline benefit is sufficiently large relative to the willingness to pay for quality the MQS reduces industry surplus where both aggregate consumer surplus and profits plummet. The MQS has an ambiguous welfare impact for intermediate levels of the baseline benefit and has the potential to enhance welfare only if the baseline benefit is sufficiently low relative to the willingness to pay. The preference and cost structure determine simultaneously the pattern of dominance and the outcome of the MQS. This allows us to relate in a broad way the policy outcomes to the observed pattern of dominance. Specifically, under low (high) quality dominance a MQS is prone to have a negative (positive) impact on consumer surplus and industry surplus.

[1] The markets for automobiles, consumer electronics, furniture, food or clothing are just a few of many examples, in which the producers of the highest quality do not hold the greatest market share. In many markets products are differentiated in their 'environmental friendliness', where some consumers are willing to pay an eco-premium (e.g. Moraga and Padrón-Fumero, 2002; Kuhn, 2005). In these cases the eco (= high quality) variant usually holds a minor market share.

[2] The business literature recognises the relationship between market structure and the profitability of strategies aiming at cost or quality leadership but does not formalise it (e.g. Porter, 1980; Besanko et al., 2003).

[3] A baseline benefit is sometimes used to justify a covered market setting, where it is assumed to be sufficiently large for all consumers to make a purchase (e.g. Cremer and Thisse, 1994). However, in a covered market the baseline benefit does not have any impact on firms' behaviour, market share, profit or welfare.

[4] As a referee has pointed out, we obtain low quality dominance (in market share) without resorting to the obvious reason: a distribution of WTP that is skewed towards the low end.