Asymmetric Price Increase in Critical Loss Analysis:

A Reply to Langenfeld and Li

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Abstract:

Langenfeld and Li claim that Daljord, Sørgard and Thomassen's market delineating criterion for an asymmetric SSNIP is logically inconsistent and tends to define too broad antitrust markets. We show that these claims are false.

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1. Introduction

In an earlier issue of this journal we propose a criterion for an asymmetric SSNIP test, where the price is increased for one product only and where the Lerner condition of profit maximising price setting is explicitly imposed.[4] Langenfeld and Li claim that our criterion is incorrect, and that it is likely to lead to antitrust markets that are too broad.[5] They offer what they claim to be a different and correct criterion.

In response to Langenfeld and Li we would like to make three points:

(a) Our criterion is correct.

(b) Langenfeld and Li's formulation is equivalent to ours under the Lerner condition.

(c) Langenfeld and Li fail to see (b) and, by extension, (a).

2. Background

Critical Loss is a framework used to operationalise the SSNIP-test for market delineation. The Critical Loss is the relative change in demand that keeps the profits of the hypothetical monopolist unchanged following a Small, but Significant and Non-transitory Increase in Price. The critical loss is then compared to the Actual Loss, the relative change in demand that would occur following a SSNIP. If the Actual Loss is less than the Critical loss, the SSNIP is profitable and the market is delineated. Whereas the Critical Loss is determined by the margins of the products, the Actual Loss is determined by the price sensitivity.

Katz & Shapiro and O'Brien & Wickelgren point out that margins and price sensitivity are in general related through firms price setting behaviour, and consequently, so are the actual and the critical loss.[6] Both make the point that while high margins tend to give a low Critical Loss, high margins also tend to give a low Actual Loss. The reason is that firms will find it profitable to set high margins on products with low price sensitivity. Both papers therefore caution against drawing conclusions on market delineation from evidence on Critical Loss alone. They suggest imposing a restriction of profit maximisation to ensure consistency between the profitability measures that determines Critical Loss and the price sensitivity that determines Actual Loss.

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[4] Øystein Daljord, Lars Sørgard and Øyvind Thomassen, The SSNIP Test and Market Definition with Aggregate Diversion Ratio: A Reply to Katz and Shapiro, 4 J. COMPETITION L & ECON. 263-270 (2008).

[5] See James Langenfeld and Wenqing Li, Asymmetric Price Increase in Critical Loss Analysis: A Reply to Daljord, Sørgard and Thomassen, 10 J. COMPETITION L & ECON., 495-503 (2014).

[6] See Michael L. Katz and Carl Shapiro, Critical Loss: Let's Tell the Whole Story, ANTITRUST MAGAZINE, spring 2003 and Daniel O' Brien and Abraham L. Wickelgren, A Critical Analysis of Critical Loss Analysis, 71, ANTITRUST L.J. (2003).

The relation between profitability and price sensitivity is captured by the Lerner condition for profit maximisation

$$m = \frac{1}{\varepsilon}$$

where m is the margin and ε is the demand elasticity. Our paper follows the approach of Katz & Shapiro and O'Brien & Wickelgren. Our contribution is a market delineating criterion that uses a SSNIP for one product only, is consistent with the Lerner condition and allows firms to be asymmetric with respect to prices and marginal cost. Langenfeld and Li claim that our criterion is logically inconsistent, but fail to see the role of the Lerner condition in our criterion. We now show that their claim therefore is incorrect.

3. An asymmetric SSNIP test with the Lerner condition

While we impose the Lerner condition to ensure the delineating criterion is consistent with profit maximising behaviour of firms, Langenfeld and Li do not. Langenfeld and Lie compare our Critical Loss expression, where we have already explicitly imposed the Lerner condition, to their own, which is derived without that assumption. They then conclude that since the two expressions differs, our market delineation must be logically inconsistent. However, we now show that our criterion follows directly from their premises once we impose the Lerner condition.

Using the notation of Langenfeld and Li, the market delineating criterion in equation (13) in Daljord, Sørgard and Thomassen states that the market is delineated if and only if

$$\frac{t_1}{m_1} < \left(\frac{p_2 - c_2}{p_1 - c_1} \right) D_{12}$$

where p_i is the price and c_i is the marginal cost of products i=1,2, D_{12} is the diversion ratio from product 1 to product 2, t_1 is the SSNIP of product 1 and m_1=((p_1-c_1)/(p_1)) is the margin of product 1.

Langenfeld and Li define their critical loss as

$$CL = \frac{t_1}{t_1 + m_1 - m_2 \frac{p_2}{p_1} D_{12}}$$

From their equation (4), the market is delineated if and only if Actual Loss is less than Critical Loss

$$AL = t_1 \varepsilon_{11} < \frac{t_1}{t_1 + m_1 - m_2 \frac{p_2}{p_1} D_{12}} = CL$$

where ε_{11} is the own-price elasticity of demand for product 1.[7] However, the Lerner condition $m_1=1/\varepsilon_{11}$ has not yet been used. When it is imposed, Actual Loss can be rewritten as AL=t_1/m_1. Inserting into Langenfeld and Li's equation (4) and rearranging, we find that the market is delineated if and only if

$$\frac{t_1}{m_1} < \frac{t_1}{t_1 + m_1 - m_2 \frac{p_2}{p_1} D_{12}}$$

$$t_1 + m_1 - m_2 \frac{p_2}{p_1} D_{12} < m_1$$

$$\frac{t_1}{m_1} < \frac{m_2}{m_1} \frac{p_2}{p_1} D_{12} = \frac{p_2 - c_2}{p_1 - c_1} D_{12}$$

which is the Daljord, Sørgard and Thomassen criterion in their equation (13).[8] Since the criterion is a necessary and sufficient condition, there is no logical inconsistency in our criterion.

4. Concluding remarks

Market delineation requires comparing the Actual Loss to the Critical Loss. Langenfeld and Li's Critical Loss formulation fails to take into account that that the term m_1 in their equation (4) also will affect the Actual Loss. When their Critical Loss is small, so is the associated Actual Loss, and that affects the market delineation. That point is not captured in Langenfeld and Li when attention is focused on Critical Loss alone. In fact, Langenfeld and Li's approach of making inference about the relevant market from Critical Loss alone is the target of the criticism made in Katz & Shapiro and O'Brien & Wickelgren. Both papers suggest imposing the Lerner condition as a solution to avoid erroneous market delineations.

Furthermore, our criterion is a necessary and a sufficient condition. That implies that when Langenfeld and Li reach different delineations than we do, it is because they are effectively imposing alternative assumptions on firm's price setting. Whatever those implicit assumptions are, they are inconsistent with the Lerner condition of profit maximising price setting. That is precisely what our criterion is constructed to prevent.

The last part of Langenfeld and Li's paper consists of a set of simulations that are meant to demonstrate the supposed logical error in our criterion. We have shown above that the

[7] Linear demand is implicitly assumed by Langenfeld and Li as well as the rest of the literature, to be able to infer the effects of "significant" (5%) price changes from the marginal effects as given by elasticities and diversion ratios.

[8] The price change, t_1, and Critical Loss, CL are strictly positive, so that $t_1+m_1-m_2(p_2/p_1)D_{12}=t_1/\text{CL}>0$.

criteria are equivalent under the Lerner condition. The simulations therefore bear no evidence of logical inconsistencies on our part. Quite the opposite, they show that when Langenfeld and Li make alternative assumptions about price setting, they reach different conclusions, as would be expected.

Although we imposed the Lerner condition, we are not arguing that this condition always holds. It is fair to discuss when the Lerner condition is a valid assumption and when it is not.[9] However, this would be another discussion than the present one.

[9] There is a literature that does just that. See for example David Scheffman, The State of Critical Loss Analysis: Let's Make Sure We Understand the Whole Story, ANTITRUST MAGAZINE, November 2003.