



ELSEVIER

Contents lists available at ScienceDirect

Resource and Energy Economics

journal homepage: www.elsevier.com/locate/ree

Mergers in Cournot markets with environmental externality and product differentiation

Mahelet G. Fikru^{a,*}, Luis Gautier^b^a Missouri University of Science and Technology, Department of Economics, 500 W 13th Street, Rolla, MO 65409, USA^b University of Texas at Tyler, Department of Social Sciences, 3900 University Blvd., Tyler, TX 75799, USA

ARTICLE INFO

Article history:

Received 5 May 2015

Received in revised form

10 December 2015

Accepted 3 June 2016

Available online 9 June 2016

JEL classification:

L

Q5

G34

Keywords:

Product differentiation

Cleaner technology

Mergers and acquisitions

Emission tax

ABSTRACT

Due to the extensive work on why mergers take place our understanding of merger incentives has improved. However, there are not many studies examining how differences in pollution parameters between post- and pre-merger markets affect the attractiveness of merger deals. This study examines conditions under which the attractiveness of a merger deal increases in a Cournot market with product differentiation and environmental externality. Our findings suggest that, (i) the attractiveness of a deal increases as products become more differentiated, (ii) merger deals could result in lower optimal emission tax post-merger, (iii) the attractiveness of a deal is more likely to increase if the merged entity is not too pollution-intensive post-merger relative to its pre-merger pollution intensity; and (iv) when merged entities modify products to be greener, they are more likely to benefit more from the deal if they are not too pollution-intensive.

© 2016 Elsevier B.V. All rights reserved.

1. Introduction

Since the seminal work of Salant et al. (1983) on horizontal mergers, studies have examined merger profitability in a framework of homogeneous goods market. For instance, Farrell and Shapiro (1990), Levin (1990) and Fauli-Oller (2002) show that profitable mergers result from the acquisition of a high-cost firm by a low-cost firm. Furthermore, synergies may be possible if the cost of the merged entity is much lower than the sum of the costs of constituent firms (Perry and Porter, 1985; McAfee and Williams, 1992; Horn and Persson, 2001). In addition, in a homogeneous good market profitable mergers are shown to be triggered by foreign competition, uncertainty and information asymmetry (Qiu and Zhou, 2006; Banal-Estanol, 2007; Das and Sengupta, 2001).

Since most of the real world mergers are among firms which produce similar but not identical products, horizontal merger models which explicitly incorporate product differentiation are steadily gaining attention among researchers (Deneckere and Davidson, 1995; McElroy, 1993; Lommerud and Sorgard, 1997; Qiu and Zhou, 2006; Kao and Menezes, 2010). For example, Shapiro (1996) argues that the effect of mergers on market variables depends on the extent of competition between merging brands. Recent studies like Ebina and Shimizu (2009) show that profitable mergers are more likely to occur for firms producing closely related products due to the acquisition of a close rival.

* Corresponding author. Tel.: +1 5733416495.

E-mail addresses: fikruma@mst.edu (M.G. Fikru), lgautier@uttyler.edu (L. Gautier).

Despite the growing interest in merger profitability in markets with product differentiation, there are not many studies extensively examining changes in product types and processes that could occur in post-merger markets. Most studies assume that either pre-merger conditions persist after a merger deal or differences between pre- and post-merger markets are limited to efficiency, output decisions, price, ownership structure and number of firms. For instance, [Baker and Bresnahan \(1985\)](#) rely on pre-merger data to examine a post-merger market in which differentiated firms have merged. [Nevo \(2000\)](#) assumes that the only difference between pre- and post-merger markets is the change in ownership. [Werden and Froeb \(1994\)](#) assume that a merger results in a price change where product characteristics remain the same in the pre- and post-merger markets. [Dagen and Richards \(2006\)](#) use the baby food market to illustrate that the effect of a merger on price and market share significantly depends on post-merger conditions such as whether the merged entity maintains all or some of the brands. Likewise, when cost saving is involved merger profitability may actually depend on post-merger decisions on product types ([Norman et al., 2005](#)).

Mergers cause an immediate change in ownership and a subsequent change in operations and practices ([Rhodes, 2004](#)). For example, the merged entity may introduce a new brand after the merger deal ([Hoberg and Phillips, 2010](#)) or it may invest more on environmentally friendly products and/or processes. Certain choices may be better than others in facilitating integration, aligning different corporate cultures and leading to the success of the organization. Thus when product differentiation is present using pre-merger parameters to evaluate post-merger markets does not provide reliable predictions. The contribution of this study is to examine some conditions under which mergers are more profitable in industries that produce differentiated goods. We extend the discussion to firms producing goods with a negative environmental externality and facing an emission tax.

We explicitly control for pollution parameters and resulting regulation in our model because of two reasons. First, the majority of merger deals take place among firms which contribute to greenhouse gas emissions and pollution. For instance, the value of mergers in pollution-intensive industries identified by [Hettige et al. \(1995\)](#) accounted for about 80% of the value of deals and 81% of the volume of deals in the European manufacturing sector in 2009/2010 ([Fikru and Lahiri, 2013](#); [Fikru and Lahiri, 2014](#); [Fikru, 2013](#)). Second, due to changing environmental regulation firms are becoming wearier of environmental liability when they choose merger partners. According to [Gillston and Meyer \(2013\)](#) considering environmental liabilities such as contamination, toxic chemicals in water and pollution should be a vital element of any merger deal. Likewise, [Gehsmann and McCeney \(2009\)](#) argue that companies planning to make a merger deal should assess the effect of environmental policy on those businesses they wish to partner with.

In a Cournot oligopoly model we consider the case where a merged entity, (1) has a different pollution intensity post-merger due to an exogenously imposed change in production technology, and (2) modifies its product (hence contributing to the industry's product differentiation) to be more environmentally-friendly after the merger. For instance, among a sample of food processors which engaged in a merger and acquisition deal during 2001–2012, there was a 17.6% increase in the average number of process modifications targeting reduction of toxic pollutant releases a year after the deal was announced. Similarly, among the same sample there was a 63.1% increase in average number of product modifications two years after the deal with the purpose of reducing release of toxic chemicals (authors' calculation based on Toxic Release Inventory and Thomson Reuter's Analytical data). Another specific example is Land O'Lakes Inc. one of the largest dairy producers in the USA with significant merger and acquisition deals during 2001–2003 (it purchased Farmland Industries Inc. in 2002, Purina Mills Inc. and Philips Morris Inc. in 2001; it also merged with Bongards Creameries in 2003). Starting from 2004 onwards the company reports adoption of some process modification activities to reduce emission of toxic chemicals. In addition, immediately after its merger with Purina Mills Inc. in 2001 it introduced several new brands of butter.¹

Using these two cases, we study under what conditions the attractiveness of a merger deal increases as products get more and more (or less and less) differentiated. The specific research questions addressed are: (1) What is the effect of mergers on the optimally determined emission tax rate, if any? (2) How does the attractiveness of a merger deal change when the industry's product differentiation changes? (3) How does the effect of product differentiation on the attractiveness of a deal depend on whether the merged entity has modified its technology or product? (4) What is the role of the abatement induced by the emission tax on the attractiveness of a merger deal?

Our general finding indicates that a merger deal is more attractive if the merged entity is not too pollution intensive post-merger and if the merged entity differentiates its products to be environmentally conscious post-merger. Some of the specific findings of this study suggest that (i) mergers in a differentiated market with environmental externality result in lower optimal emission tax post-merger unless both the pre-merger pollution intensity and abatement induced by tax are relatively very small, (ii) the attractiveness of a merger deal among polluting firms increases as products become more differentiated, (iii) in the case where the post-merger market's pollution intensity changes due to a change in technology, the attractiveness of a merger deal is more likely to increase with product differentiation when the merged entity's pollution intensity is relatively small, (iv) in the case where the merged entity modifies products to be greener, the attractiveness of a merger deal is more likely to increase with product differentiation when the merged entity's pollution intensity is small, and (v) abatement induced by emission tax affects merger profitability in such a way that pre- (post-) merger abatement

¹ Source: <https://www.landolakesinc.com/company/MemberOwnedIdeaDriven/Timeline/default.aspx>.

Download English Version:

<https://daneshyari.com/en/article/985509>

Download Persian Version:

<https://daneshyari.com/article/985509>

[Daneshyari.com](https://daneshyari.com)