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Journal of Forest Economics

journal homepage: www.elsevier.de/jfe



Asymmetric transmission between factory and wholesale prices in fiberboard market in Korea

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ARTICLE INFO

Article history:

Received 12 January 2012

Accepted 13 June 2012

JEL classification:

D49

L73

Keywords:

Price relationships

Asymmetric transmission

Fiberboard

Causality

Co-integration

Marketing chain

ABSTRACT

This paper extends the estimation of price relationships in wood processing and empirical assessment of asymmetric price transmission by incorporating time lags in both explanatory and dependent variables. Each of the models developed and estimated in this article reveals the existence of asymmetric price transmission between factory and wholesale prices of fiberboard in Korea. Estimation results indicate that wholesalers earn additional profits by exploiting price fluctuations in the markets. The empirical findings in this study suggest the potential for lower wholesale prices of fiberboard with more competition in wholesale marketing.

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Introduction

Price transmission has drawn widespread interest from economists in the past few decades. Previous studies analyzed price relationships in input and output markets, different links along the supply chain, and across spatial markets. A variety of products – from agricultural commodities to petroleum products – have been the subject of empirical work. Several studies have studied pricing relationships among forest products. Zhou and Buongiorno (2005) explored price transmission between stumpage and forest products at different stages of manufacturing. Hänninen et al. (2007) analyzed the pass-through of sawnwood prices to supplier countries' national roundwood prices, and

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Koutroumanidis et al. (2009) investigated price transmission between the producer and consumer prices in the round-wood markets.

The common assumption used in previous studies of forest products, except for Koutroumanidis et al. (2009), is symmetric price transmission. That is, the magnitude of price transmission does not depend on the direction of the initial price shock. Koutroumanidis et al. (2009) investigated asymmetric price transmission at the consumer and producer levels of the Greek round wood market where imports constitute the dominant share of consumption. Studies applied to other commodities have attempted to investigate empirically this assumption using a more general framework that separates the regimes by the direction of initial price shock and allows the possibility of non-symmetric transmission (Karrenbrock, 1991; Azzam, 1999; Meyer and von Cramon-Taubadel, 2004; Kaufmann and Laskowski, 2005; Ahn and Kim, 2008). Following this line of literature, commonly referred to as asymmetric price transmission, the present study adds significantly to the price transmission literature on forest products by investigating the structure of price transmission in the context of the vertical layers of fiberboard markets in Korea.¹ Focusing on the factory and wholesale levels of the marketing chain, we examine short-term as well as long-term price responses of wholesale prices to changes in factory prices.

In addition to providing empirical evidence related to asymmetry, previous studies on asymmetric price transmission explored the interpretation of asymmetric price transmission. If the markets were efficient, a price shock in one market affects the price of the related market in a symmetric fashion. This suggests that the test of asymmetry could be used to investigate market efficiency, and the evidence of asymmetry would be consistent with a market with asymmetric transaction costs, market power or some other structure (Meyer and von Cramon-Taubadel, 2004; Carman and Sexton, 2005; Koutroumanidis et al., 2009).

A number of studies of agricultural commodities suggested that the main driver of the asymmetric price transmission in a vertical marketing chain is market power (McCorriston et al., 1998; Azzam and Schroeter, 1995; Chen and Lent, 1992; Bunte and Peerlings, 2003; Carman and Sexton, 2005). The party with market power can influence the price to increase profits. Under such a situation, market participants with market power exploit the situation differentially depending on the direction of the initial price shock. We also explore the implications of our test results for the underlying market structure of the Korean fiberboard industry. The Korean fiberboard industry is large and growing rapidly, with annual sales value close to \$1 billion in 2010.² Lee et al. (2008) suggest that wholesalers of fiberboard in Korea exercise market power over the fiberboard producers. While there are many producers in the upstream market, the downstream market is dominated by three major distributors (wholesalers) of fiberboard in Korea.³ Of course, evidence of asymmetry does not necessarily indicate market power. Carlton (1989) suggests that unless the change in marginal cost (the procuring price from upstream marketing chain) is sufficiently large, retailers do not implement a price change due to a menu or re-pricing cost. Bettendorf and Verboven (2000) supported this claim empirically in the context of vertical markets for coffee. Other explanations include Ball and Mankiw (1994) who focused on asymmetric adjustment of nominal prices during the time of inflation, and Reagan and Weitzman (1982) who showed how the competitive industry results in asymmetric price transmission through their inventory holding behavior. Finally, Bailey and Brorsen (1989) pointed out that asymmetric (or imperfect) information about costs may cause asymmetric price transmission.⁴

¹ The Korean board industry is represented by two types of boards, particle board and fiber board. This study considers only fiberboard because of the dominance of fiberboard in consumption and production in Korea. About 60% of board consumption in Korea is in fiberboard, and almost 90% of this consumption is supplied domestically, while about half of particle board consumption is supplied from foreign sources (Korea Forest Service, 2011).

² Fiberboard production in Korea increased more than 100 times between 1986 and 2010. Total annual production of 11,000 m³ of fiberboard in 1986 increased to 1,751,000 m³ in 2010 (Korea Forest Service, 2011).

³ According to a survey in 2003 conducted by the Korea Forest Service, there existed 719 manufacturers in Korea who produced a wide range of wood and timber products (Korea Forest Service, 2004). Three major wholesale distributors of fiberboard in Korea are Gunwoo Housing, Csk, and M3rd International Co (IHB, the timber network).

⁴ For more discussion, see Peltzman (2000) who investigated various plausible causes for price asymmetries such as market concentration, inventories, inflation-related asymmetric "menu costs" of price changes, or the fragmentation of the marketing chain. His study supports none of these causes, except for the level of fragmentation of the marketing chain.

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