



An economic analysis of platform sharing

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We explore the managerial implications and economic consequences of platform sharing under models of horizontal and vertical product differentiation. By using a common platform across different products, firms can save on fixed costs for platform development. At the same time, platform sharing imposes restrictions on firms' ability to differentiate their products, and this reduces their profitability. It might appear that platform sharing across firms makes consumers worse off because firms cooperate in their product development processes to maximize their joint profit. We find, however, that platform sharing across firms benefits consumers in our framework because it intensifies competition in our horizontal differentiation model, and because it increases the quality of the lower-end product in our vertical differentiation model. We also show new channels through which a merger makes consumers worse off in the presence of platform sharing. *J. Japanese Int. Economies* **22** (2) (2008) 164–186. School of Economics, University of New South Wales, Sydney, NSW 2052, Australia.

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1. Introduction

Product platforms, which are component and subsystem assets shared across a family of products,¹ have recently attracted increasing attention in the product development/design literature (see e.g. Meyer and Lehnerd, 1997; Nobeoka and Cusumano, 1997; Robertson and Ulrich, 1998). Robertson and Ulrich (1998) conceptually articulated the trade-off that firms face when they share a common platform across multiple products. On the one hand, by sharing components and production processes across products, firms can develop differentiated products efficiently. That is, platform sharing reduces product development cost and time because parts and assembly processes developed for one model do not have to be developed and tested for the others. On the other hand, since components and production processes are important factors in determining the nature of products, platform sharing reduces the distinctiveness of products, which is valuable in the marketplace. Given this important trade-off, Robertson and Ulrich proposed the platform-planning process through which firms can achieve an optimal balance of commonality and distinctiveness.

Platform sharing has become common in the automobile industry; an automobile platform means the core framework of cars which includes the floorpan, drive train, and axles. An automobile manufacturer often uses a common platform for different products with similar quality levels. For example, Mitsubishi shares a common platform between its Endeavour and Galant, and Honda shares a common platform between its CR-V and Civic.² A common platform can also be shared across manufacturers. Renault and Nissan have developed a common platform for the Nissan Micra and the Renault Clio, and they plan to reduce the number of platforms they use to 10 in 2010 from the 34 they had in 2000 (see e.g. Tierney et al., 2000; Bremner et al., 2004). See also Szczesny (2003) for platform sharing between Ford Motor and Mazda. These are examples of platform sharing across horizontally differentiated products within a firm and across firms.

An automobile manufacturer can also share a common platform across multiple products with different quality levels. For example, Toyota uses a common platform for its Landcruiser and Lexus LX 470, and Honda uses a common platform for its CR-V and Acura RDX.³ As an example of platform sharing across firms, Porsche and Volkswagen use a common platform for Porsche's Cayenne and Volkswagen's Touareg,⁴ where the former is more luxurious than the latter. These are examples of platform sharing across vertically differentiated products within a firm and across firms.

This paper explores the managerial implications and economic consequences of platform sharing under product differentiation models. Motivated by examples in the automobile industry as mentioned above, we consider platform sharing under horizontal product differentiation and platform sharing under vertical product differentiation, and compare the economic consequences of platform sharing under the two setups.

¹ This definition of product platforms is from Krishnan and Gupta (2001). Several authors have offered different definitions. For example, Robertson and Ulrich (1998) defined a product platform as the collection of assets that are shared by a set of products.

² Mitsubishi's Endeavour and Galant are in a similar price range, where the former is an SUV while the latter is a sedan. Honda CR-V and Civic are also in a similar price range, where the former is an SUV while the latter is a small sedan and hatch-back. See Rechtin and Kranz (2003) and Anonymous (2006).

³ Lexus LX 470 is more luxurious than Toyota Landcruiser, and Acura RDX is more luxurious than Honda CR-V. See Anonymous (2006) and Rechtin and Kranz (2003).

⁴ We have confirmed this by our written inquiry to Volkswagen.

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