
Jianhui Li

Product incompatibility is commonplace in many complementary goods markets. For example, in the market of smartphones and operating systems, IOS can only be installed in IPhones. In the market of game consoles and video games, exclusive contracts between game console manufacturers and game developers make new video games played in specific game consoles. Given the growing prevalence of complementary goods, addressing the effect of product incompatibility on market competition and consumer welfare is crucial for antitrust and intellectual property policies. However, the welfare effect of product incompatibility in complementary goods markets is a source of active debate and an open empirical question.


This paper studies the welfare effect of product incompatibility in complementary goods markets. Complementary goods are often incompatible across brands. Incompatibility imposes a choice constraint and increases consumers’ costs of switching or upgrading. Firms take advantage of incompatibility to lock in consumers. In this paper, I develop a dynamic consumer demand model and an oligopoly pricing game for complementary goods with incompatibility and estimate the model using an individual-level consumer panel data in the U.S. mens shaving market. Estimates are used to quantify the impact of product incompatibility on price competition and consumer welfare. I solve for the counterfactual market equilibriums in which razors and blades are compatible across firms and/or technologies within firms. Results show that compatibility softens price competition. Two effects are presented when razors and blades are compatible: demand expansion effect and intensified competition effect. Razor prices are higher since firms can’t lock in consumers. Blade prices are higher since demand expansion effect dominates intensified competition effect. Consumer welfare is improved overall because the benefit consumers derive from expanded choices outweighs increased product costs. However, the welfare effect varies across consumers.

Product Introduction under Incompatibility in Complementary Goods Markets (in progress)

This paper studies the effect of product incompatibility on consumers’ technology upgrading and firms’ innovation (new product introduction) in complementary goods markets. The key questions to be answered are: How long will consumers upgrade to a newer technology of complementary goods given incompatibility? How often will firms introduce new products in complementary good markets? And whether product incompatibility speeds up or deters consumers’ technology upgrading and firms’ new product introduction? I develop a dynamic oligopoly game of product introduction for complementary goods given incompatibility. I am working on estimating the dynamic game of product introductions using the Nilsen consumer panel data in the U.S. men’s shaving market. Estimates are used to quantify the
impact of product incompatibility on firms’ product introduction frequency and consumers’ welfare. I solve counterfactual market equilibriums where razors and blades are compatible across firms and/or technologies within firms. Incompatibility between razors and blades come from patent protection. In the counterfactual analysis, I assume there is no patent protection and firms can make the horizontal and vertical compatibility decisions. Results will suggest whether or not product incompatibility speeds up new product introduction and hurt consumer welfare in the men’s shaving market. Given counterfactual results, I will discuss the policy implications on patent protection (intellectual property). In particular, I will answer the question that whether patent protection spurs innovation.