Networks and piracy of digital products

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We develop a stylized model to investigate the manner in which the pricing, profitability and protection strategies of the seller of a proprietary digital good respond to changing market conditions in the presence of network effects. Specifically, we investigate how the optimal strategy of a seller of proprietary software (such as Microsoft Office) is impacted by product piracy and the presence of free alternatives. Our results, based on an analytical model and an empirical validation, show that the losses incurred by sellers of legitimate goods on account of high quality pirated goods are amplified by the level of network externalities. Therefore, for products characterized by high network externalities (such as software), it is crucial for sellers to try to maintain a large perceived quality gap between their product and illegal copies. We also find that the appearance of free alternative leads the incumbent producer to reduce both the price of the legitimate product as well as the level of piracy control. Further, although high quality pirated goods are detrimental to profits in the absence of free alternatives, they may actually limit seller's losses and the need to adjust prices and protection strategies due to the introduction of these free alternatives. Thus, a firm such as Microsoft may find it easier to compete with free alternatives in the presence of product piracy.

Key words: software piracy, piracy protection, network externalities, Open Source, Microsoft