

PIRACY AS STRATEGY?
A REEXAMINATION OF PRODUCT PIRACY*

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Abstract

To explore the impact that piracy has on demand for legal versions of a product and firm performance, we use the literatures of information economics and strategic management to expand the analysis of piracy to markets other than software. Our paper helps clarify the nature of customer demand for legal versions of products, and gain a deeper understanding of the way that piracy can enhance the performance of those firms that own the intellectual property. We contend that although piracy represents unauthorized imitation of a firm's intellectual property, there are some circumstances when piracy can improve the *value* of the intellectual property, such that there is a net increase in demand for the legal versions of the product, a reduction in the firm's expenses in obtaining its sales, and the erection of barriers to producers of (potential) competing legal products.

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INTRODUCTION

The phenomenon of product piracy has received increased attention in recent years from both scholars and practitioners. Product piracy is the misappropriation of intellectual property by a party different from the rightful owner resulting in the making of unauthorized copies of a product (McDonald & Roberts, 1994; Conner & Rumelt, 1991). Product piracy violates copyright or patent law that protects the rights of owners of intellectual property in products such as software, films and books (Burgunder, 1995). The consumer who buys a pirated product is aware that the product is not a legal version of the product but chooses to buy it often because it is less expensive.

One reason for the greater threat of piracy nowadays is the use of digital technologies for software, audio and video content. For example, it has been reported that the software industry loses billions of dollars of revenues each year from pirates who make illegal copies of software. It has been estimated that 5 percent of software used in the U.S. is illegal while in China and Russia the rate of illegal copies approaches 90 percent (Horowitz, 2003; Givon, Mahajan & Muller, 1995). Moreover, copied CD music in a digital format has no reduction in quality due to the ease of reproduction of digitally recorded sound. This was not the case when audio tapes were the technology standard not too long ago (Conner & Rumelt, 1991; McDonald & Roberts, 1994; Globerman, 2001). Technology advancements that make piracy easier and the quality of the pirated products better has forced global public examination and discussion of this phenomenon. Previous research on piracy has focused primarily on its costs (Globerman, 2001; Wagstaff, 2002), especially in terms of direct sales losses (Givon, Mahajan & Mueller, 1995; Lowry, Yang & Edwards, 2003), costs of brand image erosion (Keller, 1993; McDonald & Roberts, 1994), and the costs of enforcement (Rice 2002). For example, loss estimates due to piracy for the software industry alone have been conservatively pegged at \$1.5 billion a year (McDonald & Roberts, 1994; Givon, Mahajan & Mueller, 1995). Illegal music downloads due to piracy were blamed for a \$2.6 billion loss in the worldwide music industry in 2002 according to PriceWaterhouseCoopers (Lowry, Yang & Edwards, 2003). For enforcement, Microsoft maintains a staff of 250 in its intellectual property protection department to operate as a "worldwide police force" (*The Economist*, 2002).

Only recently have researchers begun to examine the possibility that product piracy might improve overall customer demand for legal versions of the product and thus result in benefits to the owners of that intellectual property. For example, Conner and Rumelt (1991) challenge the argument that software piracy harms producers (through reduced sales) by reasoning that piracy could act to increase the customer utility of a software program, thereby increasing demand and firm profits. Furthermore, they contend that "piracy, because it increases the size of the total installed base, may raise the value of the program for all users."¹ Using a diffusion modeling approach on a sample of two types of software in the United Kingdom, Givon, Mahajan and Muller (1995) found that though six out of seven software users utilized pirated copies, the pirated software was responsible for generating more than 80% of new software buyers, therefore greatly influencing the legal diffusion of the software.

¹ Of course they also state that piracy causes direct sales losses. The net effect of piracy depends on balancing piracy's value enhancing effects against the sales that are lost and other costs associated with piracy.

These studies use theory on network effects to examine the sales of software products and have provided a strong starting point for rethinking the costs and benefits of piracy. To further explore the impact that piracy has on demand for the legal version of a product, we use the literatures of information economics and strategic management to expand the analysis of piracy to markets other than software, to clarify the nature of customer demand for legal versions of products, and gain a deeper understanding of the way that piracy can enhance the performance of those firms that own the intellectual property. In doing so, we make a number of important contributions to the literature.

First, whereas previous examinations of this phenomena have primarily focused on the costs to firms of having their products pirated, in this article we argue that there are conditions under which piracy can increase demand for legal versions of the product, i.e., when product piracy generates and/or increases network effects, reduces the costs of search and/or information processing, generates a positive signal to the market, as well as encourages both bandwagon and herding effects.

Second, previous research has primarily attempted to quantify the costs of product piracy for the owner of the intellectual property in one industry (software) and at one point in time (static research designs). In this article, we re-examine the costs of product piracy by accommodating market heterogeneity-heterogeneity in terms of the (1) the extent of overlap between the populations of customers for legal products and that for pirated versions, and (2) the degree to which customers value brands. Without such consideration, the negative impact of product piracy on the demand for legal versions of a product could be substantially over-estimated. Thus, we extend the examination of the effects of product piracy to the firm from the dominion of software and network effects, to the application to all products and include theory of informational economics, branding and signaling effects to the analysis.

Third, previous product piracy research has focused on the effect of piracy on demand (or the dollar equivalent of diminished demand). Although we follow this lead, we also use the strategy literature to link changes in demand to firm performance, acknowledge the impact that the costs of defending against pirates has on firm performance, and explore the role that product piracy has in building barriers to entry, which in turn enhances the sustainability of a firm's performance advantage.

Fourth, piracy provides an interesting context to explore the inter-relationship between the sources of a firm's sustainable competitive advantage. Resource-based theories of strategy (RBV) have argued that firms that possess resources that are valuable, rare, inimitable, and non-substitutable have the potential of achieving superior performance (e.g. Barney, 1991; Wernerfelt, 1984). A branded product can be a source of competitive advantage if the organizational and strategic processes of firms facilitate the manipulation of resources into value-creating strategies (Eisenhardt & Martin, 2000). When all else is held constant, less imitability means a more sustainable competitive advantage and it is therefore not surprising that resource-based scholars have placed considerable importance on a firm's ability to maintain the inimitability of its intellectual property.

However, using the information economics literature we argue that the sources of a firm's competitive advantage are inter-related such that there are circumstances when less inimitability may have a positive impact on a firm's sustainable competitive advantage because it enhances other sources of sustainable competitive advantage. Specifically, piracy represents unauthorized imitation of a firm's intellectual property but, we argue that in some circumstances piracy can improve the *value* of the intellectual property such that the firm's sustainable competitive advantage is enhanced. In this context, value is represented by a net increase in demand for the legal versions of the product and possibly a reduction in the firm's expenses in obtaining its sales. The context of piracy also highlights two populations of (potential) competitors- those that produce pirated products and those that produce competing legal products. Although piracy reflects imitation by one population, we argue that there are circumstances when piracy can reduce the level of imitation by the other population by creating barriers to entry for potential competing legal products.

We believe that this paper helps address inconsistencies between theory and observed phenomena in the area of intellectual property misappropriation. For example, in the case of software, the pirating of Windows operating system software and Microsoft office products has helped cement Microsoft's dominance in the PC software industry in developing countries in Asia and Latin America, bringing customers into the fold that could not afford legal versions of the products. In a recent example, Microsoft declared an amnesty to software pirates in Russian cyber cafés because it has recognized that (1) under the present economic conditions in Russia, these businesses could not afford to pay the "legal" price for the software, (2) the power of Russian police to prosecute these crimes is limited and (3) most importantly, they recognize that users of these pirated products might in the future buy legal upgrades of the software that they are most familiar with (Meredith, 2003).

The case of prestige goods is also illustrative. The Louis Vuitton brand is the single most pirated leather goods brand in the world, yet is the largest contributor in sales (30%) and profits (50%) to parent LVMH as indicated in its 2001 annual report. Traditional theory on branded goods would argue that the signaling effect would not occur because the referent group (affluent buyers of upscale leather goods) in this case would be in fact repulsed by the fact that non-elite consumers are wearing a similar product acquired at a much lower price. Thus, piracy should result in brand erosion and lower sales and profitability for the product. However, net sales of these prestige goods have increased 37% in the last two years. Moreover, in Hong Kong, one of the largest markets for upscale goods in the world coexists with one of the largest pirated product markets in the world. Significant sales of inexpensive, fake Rolex watches are sold in close proximity to upscale jewelry stores selling price legitimate Rolex products. Apparently, the market for pirated watches can operate symbiotically with the legitimate market and is therefore tolerated. We believe our theoretical arguments help make sense of these apparently contradictory phenomena.

The article proceeds as follows: First, the construct of product piracy is introduced and distinguished from other forms of intellectual property infringement. Second, we challenge an existing assumption in the literature to re-examine the costs of product piracy. Third, we utilize the literature on information economics to extend previous work on network effects and propose other situations when piracy can enhance demand for legal versions of the product.

Fourth, we utilize the literature on strategic management to explore the relationship between product piracy and firm performance. Finally, we discuss the implications of our model and offer a number of concluding remarks.

PRODUCT PIRACY

McDonald and Roberts have defined piracy as “when products have been copied and sold without the permission of the rightful manufacturer” (1994: 55). They further differentiate between counterfeiting, piracy and knock offs. They argue both counterfeiting and piracy result in illicit products, but that a counterfeit product is one which the manufacturer produces with the intention of deceiving the consumer, while in the case of piracy, the consumer is aware that the product is fake, and that in this case it constitutes a conscious act of the consumer to purchase a fake product. MacDonald and Roberts argue that the consumer is aware that he or she is buying a fake because of the price, purchase location, or obvious differences in design, quality and features. Knock -offs they define as a similar product that is designed to ride the brand or trade dress of the leading product in this category.

For the purpose of this paper we will concentrate on piracy. That means that the intent in this case is not to deceive the consumer as would be the case with counterfeiting, and that the consumer is a willing participant in the transaction. This definition is important because mounting evidence, in particular in the case of technological content, that consumers do not perceive the acquisition of pirated products to be a crime or that they perceive it to be a “victimless crime”. Furthermore, we assert that pirating occurs when the final price of the legal version of the product includes a component of the cost of creating the intellectual property. Two classic examples are first software and pharmaceutical products, where the price of the final product reflects the investment in research and development, and second prestige goods, where the final price reflects branding costs and snob appeal.

PIRACY AND LOSS OF DEMAND

Pirated products as substitutes for legal products

A key theme of earlier studies of piracy consisted of attempts to analyze the costs for firms in terms of lost sales (Globerman, 2001). A critical assumption that was made in these earlier piracy studies was that the sales of pirated products directly reduce the sales of legal copies of the product. However this zero sum assumption can only be made if both buyers of pirated and legal products come from the same population of likely buyers and users of the product. If the buyers of legal and pirated products come from different populations then we can not consider all pirated copies as lost sales. Therefore, we will look at the implications of holding two different assumptions about the populations of legal and pirated products and the corresponding affects on piracy costs to firms.

First we will assume that buyers of legal and pirated products come from the same population. This means that the buyer of a pirated product could have paid the price for the legal product but chose to purchase the less costly pirated version of the product. The loss to the company

from product piracy would be directly in proportion to the loss of sales attributable to the substitution of pirated products for legal products. Therefore, when buyers of legal and pirated products come from the same population, the sale of each pirated product represents a loss to the firm that is the victim of piracy, and so the accounting for such losses can often amount to a substantial cost to the firm.

Now we relax our first assumption and assume that buyers of legal and pirated products come from different populations. This is often the case in the situation where a product is marketed on a global basis and one set of the buyers come from developed countries with high levels of disposable income, and other potential buyers come from third world countries with low levels of income. There could be income barriers that keep buyers from pirated products distinct from buyers of legal products. For example, a student in China may be able to pay one dollar for a pirated software program but does not have the resources to pay the legal price of one hundred dollars for the software from the company that owns the intellectual property rights to market and distribute it. When legal and pirated product buyers are distinct should all sales of a pirated product be considered a loss of sales to the company that has the legal rights to market this product? The answer is that with distinct buyer populations fewer buyers of pirated products would be in a position to buy the legal product. Therefore the cost of piracy in terms of lost sales to the owner of the intellectual property could be overstated if we do not consider the extent of overlap between the population of buyers of legal products and the population of buyers of pirated products. Thus,

Proposition 1: The relationship between piracy and demand for legal versions of the product is moderated by the extent to which buyers of legal and pirated products come from different populations. The more independent the population of (potential) buyers of legal versions of the product is from the population of (potential) buyers of pirated versions of the product, the less negative the impact that piracy has on demand for legal versions of the product.

Pirated products and the erosion of brand equity

Brand equity can be a significant contributor to increased demand for a product and enhance firm profitability (Aaker, 1992), but it can be adversely affected by product piracy. Brand equity refers to “the marketing effects uniquely attributable to the brand --for example, when certain outcomes result from the marketing of a product or service because of its brand name that would not occur if the same product or service did not have that name” (Keller, 1993:1). McDonald and Roberts have argued that the “existence of pirated versions of a brand detracts from the intangible assets placed on the brand by the consumers” (1994: 57).

McDonald and Roberts (1994) raise a number of interesting points with regards to the deterioration of brand image that can occur due to product piracy. First, there is the erosion caused by the loss in terms of the intangible assets that the customer places on the brand. A consumer of Louis Vuitton bags is also paying for the exclusivity attached to the fact that only a few people can afford the brand. This allure and exclusivity is eroded by the presence of pirated copies of the product at a reduced price. Second, the presence of pirated products of lesser quality than the originals, in particular in industries such as the pharmaceutical industry, can obviously create harm to possible consumers and can lead to negative attributions to the

original brand.² Finally, although piracy can operate as a form of vertical extension of the brand into a different market segment (Aaker, 1972), downward stretches in brands can also result in brand dilution (Kirmani, Sood, & Bridges, 1999). Thus,

Proposition 2: The relationship between piracy and demand for legal versions of the product is moderated by the extent to which buyers value branding. The less value placed on branding, the less negative the impact that piracy has on demand for legal versions of the product.

PIRACY AND ENHANCED DEMAND

Traditionally, researchers have concentrated on the cost of piracy (Wagstaff, 2002; Nascimento & Vanhonacker, 1988). Only recently have researchers begun to examine the possibility that pirating might improve overall customer demand for legal versions of the product and thus result in benefits to the owners of that intellectual property. Advancements in our knowledge of the benefits of piracy for the firm that owns the intellectual property have come primarily from a “network effects” investigation of the software industry (e.g., Conner & Rumelt, 1991; Givon, Mahajan & Muller, 1995). In the sections that follow, we extend the “network effects” perspective to explore the potential benefits of piracy more generally (beyond the software industry), we complement this perspective by using the broader literature on information economics to gain a deeper understanding of the relationship between piracy and customer demand for legal versions of the product, and we use the strategic management literature to better understand piracy in terms of its implications on the performance of the firm that owns the intellectual property.

Network effects and piracy

Katz and Shapiro (1985, 1992, 1994) and Farrell and Saloner (1985) have provided the basis for discussion of network externalities in the context of product piracy. Katz and Shapiro have described a product with network externalities as one “in which the utility the user derives from consumption of the good increases with the number of other agents consuming the good” (2001: 424). In the case of products with network externalities, the fact that other individuals are consumers of the product increases product utility. These authors give three main cases of network externalities for products which can be generated by: (1) direct effects of the number of purchasers on the quality of the product; (2) indirect network effects, when the number of customers of the primary product increases the number of customers for complementary products; and (3) when the quality and availability of the post purchase service is related to the size of the service network, which in turn is related to the number of unit sales. An example of the direct effect of network externalities is when the number of mobile phone users increases

² For example, the consumer of a pirated version of Viagra, a drug for male impotence, may experience harmful side effects that do not occur when using the legal version of this drug. This problem, however would be more salient in the case of counterfeiting, in which the consumer does not know that the product is a fake, than in the case of piracy, when the consumer does know that the product is a fake and yet chooses to acquire it. One can, however, imagine situations in which either in developing countries, or when customers with low acquisition power decide to knowingly acquire a cheaper and unauthorized pirated version of a pharmaceutical, and in doing so take risks to their health.

the value of the phone network to each additional customer as the number of users gets larger. An indirect effect of network externalities occurs when consumers of a Britanny Spears music CD also purchase a music video made by the same artist. A post-purchase service example of a network externality occurs when a software user also purchases a technical service manual for the software in order to better understand how to operate all the software functions.

Both Conner and Rumelt (1991) and Givon, et al. (1995) have utilized the notion of network effects to argue that piracy might result in benefits to the manufacturer of software that ends up being pirated. Conner and Rumelt in their study argue that piracy could increase firm profits due to increased sales. The justification is that piracy supports the formation of network externalities and consequently increases the real number of product users who are attracted to a more valuable product. Network externalities occur for software products because consumers have an incentive to economize on post-purchase learning and customization costs.

Givon, et al. (1995) contend that pirates play an important role in helping convert potential users into actual users of the software, and that many of those users of pirated software eventually acquire legal copies of the product. Using a diffusion modeling approach, they found that this shadow diffusion has a significant impact on the legal distribution of the software. In their study of spreadsheets and word processors in the United Kingdom, they found that even though six out of each seven units were pirated, pirates influenced the potential users to adopt this software, and contributed to generate more than 80% of unit sales for these types of software. The authors attribute this diffusion to word of mouth interactions that influence the potential buyers of the products. Thus,

Proposition 3: The relationship between piracy and demand for legal versions of the product is moderated by the extent to which product piracy generates and/or increases network effects. The more that product piracy generates and/or increases network effects, the more positive its impact on demand for legal versions of the product.

Even though Givon, et al. (1995) do not directly discuss the issue of search and information cost to new buyers, we can infer that one of the benefits to potential consumers is a significant reduction of their costs in the gathering information. Diamond (1985) differentiates between information gathering for opportunities, which makes the consumer aware of the possible choices available, and information gathering for the arrangement of individual trades, which centers on the acquisition products. Piracy could help in both accounts, by making prospective customers aware of the product, and by making them aware of the base price for the product. For example, Merlo and Schottner (1994) found that as complexity of the decision increases, subjects employ simpler learning rules, and that individuals learn better in low cost learning environments. They argue that this is a result of how much individuals process the information they generate and not of the type of information they generate. Piracy results in simpler learning rules that indicate which products are favored by others, and the information generated by piracy tends to be low cost. In a similar way, piracy could also affect significantly the learning costs of prospective buyers and thereby influence the acquisition of legal products. Thus,

Proposition 4: The relationship between piracy and demand for legal versions of the product is moderated by the extent to which product piracy reduces the costs of search and/or information processing for potential users. The more that product piracy reduces the costs of search and/or information processing, the more positive its impact on demand for legal versions of the product.

Signaling and piracy

Piracy can play a beneficial role for the demand of legal versions of the product through signaling. Based on signaling theory from information economics, Erdem and Swait (1998) analyzed brand equity from a signaling perspective and found that brands are important to consumers because they can signal product positions credibly, inform consumers about product attributes, and increase customer confidence on brand claims. Contrary to the cognitive behavior approach on signaling, Erdem and Swait (1998) argue that an informational economics based perspective, in particular, addresses the imperfect and asymmetrical information structure in markets.

Pirating may act as a signaling mechanism that could serve to increase the credibility of the branded product (legal versions) in markets with asymmetric and imperfect information. We extend their arguments on brand equity to the realm of piracy, and argue that pirating also reduces imperfect and asymmetric information to the consumer, by giving the consumer a clear indication of what other consumers in the market value. Piracy would then work to reduce uncertainty, and to reduce information gathering and processing costs for prospective customers of non-pirated products. Thus, when shopping for an upscale leather good, out of all possible choices, by examining the brand that is the most pirated, the customer could easily determine which brand is most valued by other customers.

Thus in the same manner that advertising would provide a credible signal about the product, Erdem and Swait (1998) would argue that the presence of product piracy would increase the credibility of the branded product and signal to the prospective users of non-pirated versions of the product that this is the "most credible brand". Furthermore, piracy would signal to prospective consumers that out of all possible alternatives to the product, the one that gets pirated the most is the one that produces the most utility to the customer. That customer utility is such that individuals pirating the product are willing to run significant legal and financial risks in order to capture some of that utility.

In addition, pirating, by providing market information as to which products are valuable to consumers, would decrease the information costs and perceived adoption risk of the consumer, thus increasing the product utility for the consumer. Finally, the presence of pirated products that users can compare might enhance the credibility of quality claims about the product and might increase the "snob" appeal by highlighting the difference in price between legal and pirated product. Thus,

Proposition 5: The relationship between piracy and demand for legal versions of the product is moderated by the extent to which product piracy provides a positive signal to the market. The

more that product piracy generates a positive signal, the more positive its impact on demand for legal versions of the product.

A different perspective on external effects on consumer utility involves “bandwagon effects” and piracy. Leibenstein (1950) defined bandwagon effects as

The extent to which the demand for a commodity is increased by the fact that others are consuming the same commodity... It represents the desire of people to get in the swing of things; in order to conform to the people they are associated with; in order to be fashionable or stylish; or in order to appear to be one of the boys (1950:189).

Leibenstein’s perspective countered traditional economic theory and arguments that the consumption by one individual is independent of the consumption of others. At the center of our piracy argument is that since an individual’s consumption is not independent of the consumption of others, the phenomena of piracy can help alter consumption patterns of individuals in such a way that the result could be the increase of consumption of legal versions of the product.

Bandwagon effects in the context of piracy would serve to inform prospective buyers of legal versions of the product about the appropriate product choice made by other consumers from their referent group, given that these are the ones that pirates perceive to be the referent products. For example a pirated video game may signal to a customer that the game is “cool” and should be selected over other games. In the context of bandwagon effects, by acquiring a product outside of what pirates signal are the appropriate ones, a customer risks acquiring a product that is inappropriate (outside of referent groups choices of products). Thus,

Proposition 6: The relationship between piracy and demand for legal versions of the product is moderated by the extent to which product piracy hastens bandwagon effects. The more that product piracy hastens bandwagon effects, the more positive its impact on demand for legal versions of the product.

Herding effects and piracy

Banerjee (1992) has defined herd behavior as “social and economic situations in which our behavior is influenced by the behavior of others” (p. 797). In herd behavior, individuals make product choices to mirror or emulate the choices and behaviors of others. Herding is related to, but distinguishable from signaling, in that herding relates to individuals willingness to conform to social or group norms, and unwillingness to depart from the herd, even in situations when it would be advantageous to do so. The main difference between the two is that signaling is associated with information arising from the pirated product whereas herding is linked to the behavior of those that acquire it. Choi (1997) has examined herd behavior in the context of new product introductions in the technology arena and asserts that the interaction of informational externalities and payoff effects could produce herd behavior on consumers of new technology, who would want to avoid choosing technologies alternative to the leader because they would not want to be left out. As he states:

I demonstrate that in the presence of network externalities, once a technology is adopted and its true value is revealed, it has a significant advantage over another technology whose value is uncertain in the subsequent technology-adoption process. More specifically, the proven technology can be sequentially chosen by everybody even when it is common knowledge that the unproven one has a higher expected value. Thus the consequence of handicapping the adoption of the other technology is the prevalence of herd behavior in the technology adoption process. (1997: 408)

Piracy can be an important driver of herd behavior, both in the case of digital products as in the case of other consumer products. When a product has a first mover advantage and is pirated, the herd effects can be deployed which act to raise barriers for other technologies or products to enter the market, even if the technology or product is suboptimal. The herd effects discussed by Choi (1997) could be accelerated if the product is pirated, which would in turn intensify the network effects, and the perceived product value for prospective consumers of the legal products.

Piracy could also provide herding effects for prestige goods by providing information to prospective buyers as to which prestige good is more desirable and appreciated by others. Sales of legal goods would drive up the rate of piracy, which would also drive up sales of legal products through herding, creating a virtuous circle between legal and pirated copies of the products. This effect would help explain phenomena such as markets in Hong Kong, where vast numbers of sellers of pirated copies coexist with a great number of stores selling legal copies of the same consumer products, such as Gucci handbags or Rolex watches. Thus,

Proposition 7: The relationship between piracy and demand for legal versions of the product is moderated by the extent to which product piracy provides hastens herding effects. The more that product piracy hastens herding effects, the more positive its impact on demand for legal versions of the product.

PIRACY, DEMAND, AND FIRM PERFORMANCE

Piracy, demand, and firm profitability

Above we have proposed that under specific circumstances the loss of demand for legal products from the presence of pirated products is diminished and piracy can enhance the demand for legal versions of the product. When piracy increases net demand for the legal version of a product, the firm that owns that intellectual property can benefit through improved firm performance. Increased demand for a product can enhance firm performance in three ways: the firm can charge higher prices for the legal version of the product and sell the same quantity (improved profit margin and absolute profit), the firm can charge the same price and sell a greater quantity of the legal version of the product (increase market share and absolute profit), or some combination of the two.

While piracy can improve performance through increased net demand for the legal version of the product, firm performance can also be improved by reducing current expenditure on direct costs in enforcing property rights and defending brands against piracy. Firms employ

international law firms, private investigative organizations and lobbying firms to activate public action and force customs and police organizations in many different countries to act against the piracy of their products. McDonald and Roberts (1994) have argued that under those circumstances there are higher probabilities of a case of alleged infringement being identified and acted upon. Yet, the cost of legal and political action can be significant, and persecution and prosecution can be time consuming. For example, Cartier declared that they spend in excess of \$3 million dollars a year protecting the intellectual property rights of their products in over 125 countries (McDonald & Roberts, 1994). Microsoft maintains a staff of 250 in its intellectual property protection department, which operates as a “worldwide police force” (The Economist, 2002).

In digital media, technological advances have further increased the costs of enforcement while reducing the likelihood of persecution and prosecution. Cameron has stated that:

a significant essential economic problem of digital crime is that the impact of technological progress has made transactions costs of enforcement potentially too high, partly because of the low costs of copyright infringement due to technological advances for there to be substantial amounts of deterrence from punishment. (2002:15).

Furthermore, in developing countries the courts may indeed be more sympathetic to nationals who create local jobs by pirating the intellectual property of organizations situated in wealthy countries.

Therefore, reducing resources allocated to fighting pirates can have a positive impact on demand for the legal version of the product and reduce the firm's costs, both of which enhance firm performance. Thus,

Proposition 8: The relationship between piracy and firm profitability is moderated by the extent to which product piracy enhances net demand for the legal version of the product. The more that product piracy increases net demand, the more positive its impact on the performance of the firm that owns the intellectual property.

Piracy, barriers to entry, and firm profitability

Above we have argued that although piracy represents unauthorized imitation of a firm's intellectual property, there are some circumstances when piracy can improve the value of the intellectual property such that there is a net increase in demand for the legal versions of the product and possibly a reduction in the firm's expenses in obtaining its sales. In these situations the reduction in one source of competitive advantage - inimitability - is more than compensated by a gain in another source of competitive advantage - value - such that the firm may be able to increase its sustainable competitive advantage.

However, piracy also highlights the need for a more fine-grained assessment of inimitability. In this context, there are two populations of (potential) competitors - those that produce pirated products and those that produce competing legal products. Although piracy reflects imitation for one population, we argue that there are circumstances when piracy can reduce the level of

imitation by the other population by creating barriers to entry for potential competing legal products. Specifically, piracy can help generate barriers to entry through standard setting and market size.

Farrell and Saloner (1987) have shown the benefits of technology standards for competition within an industry. The presence of technology standards commits producers to compete on price or service, protecting adopters from being orphaned by a losing technology, allowing them to reduce uncertainty and information gathering costs and thus encourage potential adopters to buy earlier. Farrell and Soloner contend that standardization can replace regulation and accelerates network effects by contributing to the increase in the number of adopters in the market.

This view is consistent with research by Gandal and Greenstein (1999) who have argued that firms can facilitate setting the standard by extending the market, and looking for ways to create network externalities. Piracy goes beyond extending the market by having adopters experience sunk and learning costs as part of an installed base of a product (Shapiro, 1999). Later all adopters can be converted into legal users of new generations of the product due to the penalty from experiencing switching costs. Furthermore, piracy provides a signal to potential adopters of the likelihood that a technology will become the standard so they can avoid the costs of adopting the wrong technology which may end up being abandoned, a costly mistake. Having one's technology as the standard could represent a substantial barrier to entry (Farrell & Saloner, 1987; Church & Gandal, 1992).

Givon, et al. (1995) also suggest that the size of the pirated market could serve as a barrier to entry to potential competitors, who might delay and even cancel the introduction of new products because of the presence of piracy, and the implications it could have for its own firm's profitability and ability to conquer the market. Thus,

Proposition 9: The relationship between piracy and firm profitability is moderated by the extent to which product piracy builds barriers to entry. The more that product piracy builds barriers to entry, the more positive its impact on the performance of the firm that owns the intellectual property.

DISCUSSION OF PIRACY AS STRATEGY

Piracy and diminished demand for legal versions of the product

Previous research on the costs of product piracy has made a substantial contribution to the literature. It was not their purpose to provide a generalized theory of piracy; rather they were focused on explaining the costs of piracy in a particular industry (software) at a particular point in time. We were interested in developing a more generalized theory of product piracy and therefore considered market heterogeneity.

First, we proposed that markets (across industries and over time) differ to the extent that the population of (potential) customers for legal versions of the product overlap with the population of (potential) customers for pirated versions of the product, and that these

differences matter in understanding the negative impact of piracy on demand for legal versions of the product. For example, the results from early studies on the impact of piracy on demand for software would likely differ to the results of later studies of software (when the product/market was more mature). We speculate that in the early days of software, the population of legal users of the product was highly independent of the population of (potential) customers of pirated products, although as the product/market for software matured there is an increasing overlap between the two populations. In such a situation, we propose that the costs of piracy in terms of diminished customer demand are greater when the product/market is more mature.

Stated differently, if we assume that there is considerable overlap between the populations of (potential) customers of legal versions of the product and pirated products, when in fact there is little such overlap, it is likely that there will be an over-estimation of the negative impact of product piracy on customer demand for legal versions of the product. This approach of accounting for pirated sales as lost sales at the regular sales price of the product would only be appropriate if in the absence of pirated products those customers would be likely acquirers of the legal versions. This is not the case for a significant number of customers in developing countries, and a number of customers in developed countries. In fact the vast majority of cases of pirating occur in developing countries such as India, China and Latin America. As the populations in developing countries become wealthier, consumers will then be in a financial position to purchase legal versions of a product. Thus the consumers of pirated goods in a developing country may be perceived as a latent market for legal product versions for the future waiting to be tapped once an economic threshold of wealth has been achieved by this population.

Second, we proposed that markets (across industries and over time) differ to the extent customers value brands, and that these differences matter in understanding the negative impact of piracy on demand for legal versions of the product. If market differences in the value customers place on brand are not taken into consideration, then there could be a significant over- or under-estimation of the negative impact that piracy has on the demand for the legal version of a product. After re-examining the costs of piracy to the firm that owns the intellectual property, we acknowledge that costs are only on one side of the equation- next we discuss the implications of our propositions regarding the positive impact that piracy can have on demand for the legal version of the product.

Piracy and enhanced demand for legal versions of the product

In this article we proposed that there will be situations where the benefits of piracy outweigh its costs. Specifically, the more that product piracy generates and/or increases network effects, reduces the costs of search and/or information processing, generates a positive signal to the market, hastens bandwagon effects and hastens herding effects, the more it can overcome its costs and enhance demand for the legal versions of the product. These proposed relationships make an important contribution to the literature. By offering situations when piracy can have a positive impact on demand for legal versions of a product, we offer an important counterweight to the dominant perspective in the literature that has focused exclusively on the costs of piracy.

We are not the first to offer such a counterweight. There have been a few studies that have begun to investigate the positive impact that piracy can have on the demand for legal versions of the product (e.g., Conner and Rumelt, 1991; Givon et al., 1995) and these studies have made an important contribution to the literature. In this article, we extend their contribution of network effects in the context of product piracy of software products, to provide a model that is generalizable beyond the software industry by exploring other aspects of network externalities and to accommodate other important constructs consistent with an information economics perspective. In this article, we proposed that markets differ (across industries and over time) and these differences matter in determining the extent that piracy has a positive impact on the demand for legal versions of the product. For example, the network effects in the software industry might be stronger than in other industries and therefore to generalize the relationship between product piracy and its positive impact on the demand for legal versions of the product found in Conner and Rumelt (1991) and Givon et al. (1995) to other industries would likely over-state the positive aspects of product piracy. The same challenges likely arise in generalizing results of the software industry in the late eighties and early nineties to the early twenty-first century.

Based on our model, we argue that reliance solely on the network effects arising from product piracy will likely understate the positive impact that piracy has on the demand for legal versions of the product because it does not sufficiently capture other information benefits, such as reducing the costs of information gathering, providing positive market signals, hastening bandwagon effects, and hastening herding effects.

Piracy and its strategic implications

Should management *always* enforce its intellectual property rights and actively fight piracy or should it sometimes be passive? Using an information economics and a resource-based perspective the short answer is no. In this article we have argued that the sources of a firm's competitive advantage are inter-related such that when a product is pirated (imitated), there are circumstances when the firm's sustainable competitive advantage can be improved because piracy has a positive impact on the value of the legal version of the product and/or piracy can erect barriers to entry for potential producers of competing legal products.

Therefore, we contend that rather than the "defend at all costs" strategies proposed in the received literature, product piracy and intellectual property misappropriation should be managed by the firm. That is, through careful calibration of enforcement, legal action, lobbying, and the use of anti-piracy technologies, firms should be able to extract some of the benefits of network externalities, herding effects, and signaling, while keeping within reasonable parameters lost sales and brand erosion.

This strategic approach to piracy management should result in higher long term profits for the firm. Management of the misappropriation of intellectual property should not be a knee jerk reaction against all types because product piracy might be helpful to the firm. Too much piracy obviously could result in brand erosion, (which is detrimental when customers value brand) and in reduced sales (when the acquirers of pirated products and of legal products are part of the same population). Firms should be able to determine, given the unique characteristics of its

products, the optimal space where pirating can lead to network effects, reduced costs of gathering information, positive market signals, hastened bandwagon and herding effects and, the generation of barriers to entry such that firm performance can sometimes be enhanced by a strategy of “tolerating” rather than “fighting” pirates.

It is interesting to note that Microsoft, has slowed down on anti-piracy initiatives in Russia and China (Meredith, 2003). This action appears to be the result of both the difficulty of persecuting piracy crimes in those markets, but also because they understand that piracy can improve firm performance through increasing demand for legal versions of the product (possibly at a later date) and generating barriers for others considering entry into these markets. Apparently they are taking a long-term view that customers of pirated versions of current products may in the future turn into users of upgrades of legal software products.

Givon, et al. (1995) also suggest that whether to fight pirates or not is a strategic decision. They suggest that the protective devices be introduced later in the product life cycle stage. At a later life cycle stage customers (both paying customers and those who received pirated version of the software) would be familiar with the software, product piracy would have already helped establish a standard for the product, and customer switching costs would be higher, so they would be more inclined to buy the software.

However, it is not our intention in this paper to promote product piracy. We understand that even though intellectual property regimes differ from country to country, piracy is an illegal activity in many countries. Our analysis only deals with the reality of piracy and a better understanding of the role it can play in crafting the strategy of the affected firm.

A comment on unit of analysis

Even though in this article we have only examined the problem of piracy from the perspective of the firm, it is important also to recognize that there are a number of societal issues surrounding piracy with strong implications for both firm and public policy. Direct effects on society from piracy include a reduction of tax receipts that can contribute to a reduction in public funds to pay for services that benefit the society. Indirect effects from piracy include providing a context for higher incidences of criminal behavior such as in the way that “broken windows” theory would predict (Wilson & Kelling, 1982). Consistent with this argument, an increase in piracy and its lax enforcement would result in societal costs in terms of increases in other types of crimes. For example, lack of enforcement on piracy could lead to greater frequencies of other white collar crimes such as embezzlement, insider securities trading and fraudulent financial reporting to shareholders, leading to economic losses to the society because financial markets could lose their credibility with investors.

Therefore, and on the one hand, the fight against piracy from this societal perspective would entail mobilizing government resources to enforce the intellectual property rights of firms. While our paper has focused at the level of a firm that is acting in its own economic interests to deal with piracy, we recognize that fighting piracy may be perceived as a social goal and that government resources may be spent to enforce the rights of firms who are victims of piracy. Furthermore, this social perception should also be taken into account when formulating firm piracy strategy. A firm using piracy as a strategic tool should be careful to not be tarred as “soft

on crime” and or socially perceived as encouraging piracy. The advantages gained by strategic use of piracy could be lost due to changes in the public perception of the firm.

On the other hand, not all governments are going to view piracy as a serious infraction worthy of using government resources and staff to prosecute the perpetrators. In Italy and Spain, for example, local and federal governments are less interested in persecuting and prosecuting piracy, which they perceive as a minor crime, for fear that strong persecution and prosecution of misappropriation of intellectual property would result in higher incidence of violent crimes such as robbery and assault, which are perceived to be more dangerous to society. In this context piracy is seen as the lesser of two evils, and it is less likely that government resources will be used to fight piracy leaving the burden of piracy enforcement to be left to firms who decide on their own to fight it.

CONCLUSION

While the literature on product piracy has emphasized its disadvantages, the potential benefits of piracy have by and large been overlooked. This paper applied the lens of information economics and strategic management to provide a balanced perspective of both the costs and benefits of product piracy to the firm which has had its products copied by pirates. After examining product piracy in terms of network effects, signaling, bandwagons, and herding behavior we find that piracy in some specific situations is likely to be less costly and/or more beneficial to the firm than in others. In other words, we suggest that there will be situations where the costs of piracy outweigh the benefits and other situations where the benefits outweigh the costs.

Two important additions to received theory should be addressed at this point. We argue that product piracy and intellectual property misappropriation should be managed by the firm. That is, through careful calibration of enforcement, legal action, lobbying, and the use of anti-piracy technologies, firms should be able to extract some of the benefits of network externalities, herding effects, and signaling, while keeping within reasonable parameters lost sales, and brand erosion.

Second, even though prior researchers had argued the benefits of network externalities in the context of product piracy of software products, our model introduces the analysis of signaling and herding effects to the examination of piracy, and more importantly, extends the discussion to all pirated products. Within our analysis, all firms, not only software firms can examine the costs and benefits of piracy for their products and development strategies.

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