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Intellectual property clearinghouses: The effects of reduced transaction costs in licensing

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ABSTRACT

We focus on downstream uses of intellectual property (IP) that combine multiple rights and examine the effects of introducing an IP clearinghouse. We identify the two sometimes conflicting functions of clearinghouses: transaction cost reductions and coordination. We show that reduced transaction costs cause licensors to raise royalties in some cases, which makes them worse off due to the 'tragedy of the anticommons'. Downstream welfare effects may also be positive or negative and we characterize the effects on downstream manufacturers and final consumers. We also show that total welfare is most likely to increase following a transaction cost reduction when the number of intellectual property rights per downstream use is small, or if rights are relatively substitutable in downstream use, but it is also possible for welfare to decrease.

1. Introduction

A clear trend in intellectual property (IP) is the growth of licensing for downstream use, as shown by various studies and surveys such as Razgaitis (2005) and Athreye and Cantwell (2007). The implication is that 'markets for technology' where innovations are licensed (Arora et al., 2001) are becoming increasingly important in the use and development of IP. This paper examines the effects of introducing a 'clearinghouse' that reduces transaction costs in IP licensing on market efficiency in both the market for technology and downstream markets.

A proliferation of IP rights may result in a 'thicket' (Shapiro, 2001) that can increase costs for development of downstream products that require the use of multiple existing innovations. This issue can arise in high-technology industries such as information technology and biomedicine, as well as content aggregation industries such as radio and television broadcasting and online news providers. For example, Verbeure et al. (2006) describe how genetic diagnostic tests are based on detecting mutations in candidate genes. A single genetic disease can be associated with mutations in many different genes, and an accurate test must check most or all of these. Since gene sequences as well as technologies for amplifying, labelling and detecting sequences can be patented, a new genetic diagnostic test potentially requires licenses to many existing IP rights owned by many different parties.

There are well-known transaction costs associated with licensing (see, for example Teece, 1977), and these costs are likely to increase with the number of licensing agreements required. In addition, if multiple IP rights are complementary in downstream use, the 'tragedy of the

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anticommons' (Heller and Eisenberg, 1998; Buchanan and Yoon, 2000) may result in license fees that are inefficiently high. Both the costs of the licensing process and this 'tragedy' may result in lower utilization of IP. Due to these issues, a number of 'collective rights' institutions (Merges, 1996) aim to improve efficiency in licensing. For example, patent pools may help to solve the coordination problem among IP owners that leads to the tragedy of the anticommons. Similarly, copyright collectives such as the American Society of Composers and Performers (ASCAP) provide licenses to a bundle of works using standardized contracts and exploit economies of scale in the licensing and monitoring process.

A number of authors have also promoted the idea of IP 'clearinghouses' that act as intermediaries in the licensing process.[1] These clearinghouses can provide a range of services in markets for technology, from simple searchable databases of available IP through to packaging and licensing IP on behalf of owners. In Aoki and Schiff (2008) we identify 15 existing third-party clearinghouses (not including copyright collectives). These range from straightforward patent search engines like the Google patent search,[2] to more sophisticated exchange platforms for licensable technologies such as BirchBob[3] and Yet2.com.

However, there has been little economic analysis of such clearinghouses. In this paper we concentrate on the effects that a clearinghouse might have on license fees and welfare as a result of reduced transaction costs. We use a simple licensing model in which there is a range of potential uses of some existing IP rights. Each downstream use requires licenses to a number of IP rights, and these rights may be substitutes or complements in downstream production. We assume negotiating licenses requires incurring fixed transaction costs, and a downstream use will be exploited if it is profitable for a monopolist to do so. Royalties are set independently by IP owners, so the tragedy of the anticommons occurs when IP rights are complements.

An important observation from this model is the role played by transaction costs in the determination of royalties. Since a manufacturer will not produce anything unless its variable profit can at least cover these costs, the transaction costs can act like a disciplining device on the royalties set by IP owners, and help to offset the tragedy of the anticommons if it occurs. With complementary IP rights, a reduction in transaction costs by a clearinghouse has three potentially offsetting welfare effects: New products will be produced, and real resource costs of licensing are reduced, but higher royalties flow through into downstream retail prices, which reduces consumption and welfare.

We show that in small markets (with low levels of demand), transaction cost reductions are Pareto-improving, as previously inactive markets are opened due to the lower costs. In markets with intermediate levels of demand, transaction cost reductions benefit IP owners and lead to higher downstream prices when technologies are relatively substitutable, but are Pareto-worsening when technologies are complementary as the disciplining effect of transaction costs is important. In markets with high levels of demand, production is not constrained by transaction costs, and therefore a transaction cost reduction has no effect on equilibrium royalties and is only welfare improving, but all the benefit is captured by downstream manufacturers in our model.

Under a uniform distribution assumption about the demand intercept, we show that the overall effect on total welfare is ambiguous, with a reduction in licensing costs possibly causing a reduction in equilibrium welfare if substitutability of IP rights is low, if the number of IP rights per downstream product is high, or if the licensing cost reduction is small.

There is an extensive existing literature on the incentives of innovators to license their IP and optimal licensing contracts.[4] In this paper we take the licensing decision as given and focus on the outcome of the licensing process. Within the licensing literature, Arora and Fosfuri (2003) show, as we do, that reducing transaction costs leads to more licensing, but they do not examine the welfare implications of this. There is also a small economic literature on copyright collectives, which focuses on the effects of these collectives on incentives to create copyrighted works, and the level of royalties set by the collectives.[5] Similarly, the literature on patent pools examines the centralized royalties set by a pool and the incentives for pool formation.[6] In contrast, we focus on the effects of transaction costs on decentralized licensing. Finally, AokiI (2009) considers IP clearinghouses as network providers and examines the demand for and stability of these systems in contrast with patent pools, while in this paper we focus on general effects of transaction cost reductions in a market for technology.

The organization of the rest of this paper is as follows. The next section briefly describes IP clearinghouses and their role in the licensing process.[7] Section 3 presents a simple licensing model and Section 4 characterizes the equilibrium of the model. Then Section 5 examines what happens in equilibrium when transaction costs are reduced. Section 6 offers concluding comments and suggestions for future work.

2. Intellectual property clearinghouses

Clearinghouses act as intermediaries in the licensing process. For example, van Zimmeren et al. (2006) promote the idea of establishing a clearinghouse of biotechnology IP, to assist the development of new genetic diagnostic tests and other advances that require licenses to multiple existing IP rights. A concrete example of a third-party clearinghouse is Yet2.com. It was founded in 1999 with joint investment from Siemens, Bayer, Honeywell, Dupont, Procter and Gamble, Caterpillar, and NTT Leasing. It describes itself as a 'technology marketplace' and provides

[1] See van Zimmeren et al. (2006), Van Overwalle et al. (2006), OECD (2002) and Graff and Zilberman (2001).

[2] www.google.com/patents.

[3] www.birchbob.com.

[4] For example, Gallini and Wright (1990) and Katz and Shapiro (1985).

[5] Besen et al. (1992), Kleit (2000) and Hollander (1984).

[6] See, for example, Lerner and Tirole (2004) and Aoki and Nagaoka (2005).

[7] More detailed descriptions and discussion are contained in Aoki and Schiff (2008).