MUSIC ROYALTY RATES FOR DIFFERENT BUSINESS MODELS:

LINDAHL PRICING AND NASH BARGAINING

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Abstract

The current digital era poses challenges and raises pitfalls for the pricing of information goods, most notably musical works and sound recordings. Economic theory and concepts are more than ever useful, even required, to provide the guiding principles underlying the determination of appropriate music royalty rates. The Lindahl Equilibrium and Nash Bargaining Solution serve as useful and complementary analytical tools in this context.

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We discuss the economic concepts of Lindahl equilibrium and Nash Bargaining Solution as useful and complementary analytical tools in the context of the current digital era, which poses challenges and raises pitfalls for the pricing of information goods, most notably musical works and sound recordings. These elements of modern economic theory as well as general economic concepts are more than ever useful, even required, to provide the guiding principles underlying the determination of appropriate music royalty rates.

Introduction

There is a general agreement between rightsholders, copyright users, and tariff-setting organizations that tariffs should be "fair and equitable" to both rightsholders and users and reflect the value or benefits the users derive from copyrighted works.

From an economic perspective, "fair and equitable" is equivalent to the level of compensation that emerges from a competitive market where willing buyers and willing sellers freely negotiate and settle transactions. These willing buyers and sellers are assumed to be price-takers or devoid of market power and would agree on transactions up to the point where the marginal value of an additional transaction for buyers is equal to the marginal cost of that additional transaction for sellers. From that perspective, the tariff to be paid for the use of copyrighted musical works and sound recordings should be based on the amount that users would willingly pay if they were transacting in a well-functioning competitive market.

The Copyright Board of Canada (hereinafter "CB"), the U.S. Copyright Royalty Board, and other tariff-setting institutions represent a surrogate for a competitive market where the price that would prevail for copyrighted works is determined, if such a market existed and operated efficiently. To determine a competitive price for copyrighted works, these institutional bodies typically consider relevant proxies or indicators on buyers, sellers, prices of substitute products and services, industry characteristics, and virtual or simulated competitive processes such as auctions, etc. The challenges encountered in emulating a competitive market are numerous, some of the most salient being the fact that musical works and sound recordings are information goods and that digital technologies are profoundly changing the copyright landscape.

Information Goods and Digitization: Lindahl Pricing

From an economic perspective, musical works and sound recordings are "information goods." An information good is a good whose consumption by one consumer does not prevent its consumption by others, a characteristic of "information" under different forms. In other words, once a musical work or sound recording is created, it can be "consumed" by all, as one person's use of a musical work or sound recording does not prevent its simultaneous or subsequent use or consumption by someone else. See for example, Varian (1999) and Bakos et al. (1999).

Although related, the "information good" nature of musical works and sound recordings and the digitization of music are two different but equally challenging factors in the current copyright setting. The first one relates to the indefinitely long sustainability of a product, as one's consumption does not destroy the consumed unit, which remains fully and unabatedly available for everyone else now and in the future, hence making musical works and sound recordings akin to non-decaying assets. The second one relates to the much-reduced cost of dissemination of that product or asset in a digital context.

Striking in such a context the right balance between creators' rights and users' interests is a difficult and multifaceted endeavor for different reasons: (a) musical as well as other cultural products such as literary works are costly to create and (b) digital technologies have significantly reduced the marginal cost of dissemination of those copyrighted works.

Due to these factors, pricing copyrighted musical works and sound recordings, with the objective of achieving proper compensation for creators, i.e., a creators' right, *and* maximal dissemination of such goods, i.e., a users' right, requires a move away from the usual analysis aimed at setting a product's price equal to its marginal cost. Setting a price equal to marginal cost would clearly not enable the proper, fair or competitive compensation of sellers, producers, and creators. Considering that musical works and sound recordings are permanent assets rather than perishable consumption goods raises questions regarding the proper price concepts to use: the same unit can be sold and resold infinitely many times.

The determination of relevant copyright tariffs rests not so much on the cost of creation, which is underlying the supply function of new musical works and sound recordings, but rather on the value of such goods for the users. The Copyright Board of Canada (2002) acknowledged that "the

important notion in information industries [is that] pricing tends to be based on the value to the buyer, not on cost to produce."

The supply function of musical works and sound recordings in the rightsholders' collective repertoire (stock) is horizontally constant at a price p just above 0 (infinite price elasticity at $p = \varepsilon$). That is because the marginal cost, which underlies the supply function, is quasi-zero for the rightsholders: zero marginal cost of reproduction and dissemination and zero marginal opportunity cost, those musical works and sound recordings being resalable an indefinite number of times. Setting the tariff equal to this marginal cost would generate no revenue for the seller, here the rightsholders, thereby failing to meet a central objective of the institution of copyright itself. Insofar as the compensation of rightsholders must come through transactions, not from public subsidies or grants, the setting of tariffs is cast in a second best economic framework.

In such a context, the proper price equilibrium is the Lindahl equilibrium. The Lindahl equilibrium is a generalization of the competitive equilibrium for public or information goods, according to which, given a stock of musical works and sound recordings, different users pay for access to a relevant repertoire, prices equal or proportional to their respective derived marginal values.

The notion of Lindahl (1919) pricing was developed to characterize both the optimal or efficient quantity of a public good and a way to finance its production cost. It requires that the price paid by a given buyer or user of a public (or information) good be positively linked to the value or the amount of satisfaction derived from the consumption of that public good, as everyone is assumed to consume, at least virtually, the whole good . The user deriving a greater (marginal) value from the same marginal unit would pay a higher price. As long as the sum of those prices is above the marginal cost, additional units should be produced. The efficient quantity and quality level are reached when the sum of users' marginal values (prices) is equal to the marginal cost. The Supreme Court of Canada has asked the CB to consider such analytic framework in setting tariffs.

Technological neutrality

The Supreme Court of Canada, in its 2015 landmark decision introducing the principles of technological neutrality, and balance, stated:

"One element of just compensation is an appropriate share of the benefit that the user obtains by using reproductions of their copyright-protected work in the operation of the user's technology. That just compensation must be valued, however, in accordance with the principle of technological neutrality. While highly unlikely, where users are deriving the same value from the use of reproductions of copyright-protected works using different technologies, technological neutrality implies that it would be improper to impose higher copyright-licensing costs on the user of one technology than would be imposed on the user of a different technology. To do so would privilege the interests of the rights holder to a greater degree in one technology over the other where there is no difference between the two in terms of the value each user derives from the reproductions.

The converse is also true. Where the user of one technology derives greater value from the use of reproductions of copyright-protected work than another user using reproductions of the copyright-protected work in a different technology, tech-nological neutrality will imply that the copyright holder should be entitled to a larger royalty from the user who obtains such greater value. Simply put, it would not be technologically neutral to treat these two technologies as if they were deriving the same value from the reproductions" (Supreme Court of Canada 2015, paragraphs 70, 71).

The Supreme Court asked the CB to consider that if a user with a given technology derives more value from a product, say a repertoire of musical works and/or sound recordings assets, than another user with a different technology, the former user should pay more than the latter, even if both use the same repertoire. The two users would access the same asset at different prices.

The Supreme Court thus recognized that, for efficiency and fairness reasons, users with different business models may be subject to different tariffs for access to the same stock of musical works and sound recordings. This is a direct application of Lindahl principles for pricing information goods.

Applying Lindahl principles is arduous and full of potential pitfalls especially in the context of copyright royalties. Many tariffs are expressed as a proportion of an accounting base due to the

challenging factors involved in pricing copyrighted works. Expressing royalties as a percentage of an accounting base, such as the user's revenues, serves different purposes. It allows (a) for savings in transaction costs, including assessing and verifying payments; (b) for immunity to accounting manipulations if the rate base is well chosen and valid; and (c) for risk-sharing between rightsholders and users as a whole as it may be difficult or impossible to know ex ante which user will be successful in turning profitable access to a stock of musical works and sound recordings. However, expressing royalty payments as a percentage of a rate base does not provide any indication about the price of copyrighted work. This follows because a percentage is not a price.

A percentage is not a price

A major source of confusion in royalty rate setting is the trap of "considering a percentage as a price". There is no reason to believe that the proper price to be paid for the same inputs, namely the right to access a stock of musical works and sound recordings, would correspond to the same percentage of revenues irrespective of the characteristics of the underlying industries under consideration. In fact, using the same percentage will usually lead to subsidizing one industry at the expense of another because, under the economic law of one price, the same price for the same inputs used in two different industries will, in general, represent quite different percentages of the value of the industry outputs (or revenues). Moreover, Lindahl equilibrium calls for different prices for different users or consumers of the same good.

The following example can help illustrate why a percentage is not a price. Suppose an apartment in a low income housing project is valued at $100,000. Suppose also an apartment of the same size and configuration in a high income housing project is valued at $1,000,000, i.e., ten times more. Suppose that the same quantity and quality of paint is used for both apartments. As expected, the cost of painting the two apartments would be the same as the law of one price applies to the input market (i.e., paint). In economics, the law of one price states that similar products in the same market should sell at similar prices Let us suppose that the actual cost of paint for the high value apartment is $1,000, i.e., 0.1 per cent of the value of the apartment. If one takes the 0.1 per cent as the "price" of the paint to be paid for the low value apartment, one would get a price in dollar terms of 0.1 per cent x $100,000 = $100, or one-tenth of the cost of the same amount and quality of paint used for painting the high value apartment. In fact, the cost of paint expressed as a percentage of the value of the two apartments would be quite different: 1.0 per cent for the low value apartment

and 0.1 per cent for the high value apartment, a difference by a factor of ten for the same quantity and quality of paint.

As we further discuss below, regulatory bodies responsible for the setting of royalties for the use of copyrighted works tend to avoid transferring percentages from one industry to another without proper adjustments. In doing so, they aim to ensure that percentages reflect similar prices for the same rights.

Making those different percentages correspond to Lindahl prices and percentages requires additional adjustments.

Balance between rightsholders and users

The Supreme Court of Canada stated that achieving balance between the rights of creators and users requires that the CB take both rights expressly into account in the determination of royalty rates by considering "respective contributions of, on the one hand, the risks taken by the user and the investment made by the user, and on the other hand, the reproductions of the copyright-protected works to the value enjoyed by the user" (Supreme Court of Canada 2015, paragraph 75). The principle of balance is related to the economic concepts of a bargaining game, which in turn is related to the concepts of competitive equilibrium and negotiated price.

A bargaining game is an analytical framework of game theory that seeks to model a situation in which there is a conflict of interest between different agents who have the opportunity to reach a mutually beneficial agreement but may nevertheless veto any agreement. When "there is more than one course of action more desirable than disagreement for all individuals but conflicting views over which course of action to pursue, then negotiations to resolve the conflict will take place" (Osborne and Rubinstein 1994, page 117).

In this context, the framework of a bargaining game appears as a tool to model the negotiation process and to determine how different agents who contribute to the creation of a given surplus or value added can share that value among them. A solution to the bargaining game is a sharing formula that specifies, for instance, what percentage of the total value each agent receives at the end of the bargaining game. The total value to be shared, the agents' outside options (i.e.,

alternative options in case they do not reach an agreement), as well as their bargaining power all play a role in the determination of the solution.

John F. Nash Jr., the 1994 laureate of the Nobel Memorial Prize in Economic Sciences, proposed a solution to such a bargaining problem, known as the Nash Bargaining Solution (NBS). The NBS is derived from four axioms defined as desired or reasonable properties. Namely, the solution should be (Pareto) efficient, symmetric, immune to equivalent reformulations of players' objectives, and immune to irrelevant alternatives. The efficiency property simply states that the solution should leave no money on the table. The symmetry property states that if two agents are in similar positions or have similar capacities to negotiate, they should be treated equally, that is, obtain "similar" shares of the pie. Given that each party is rational, well advised, and controls an essential input, each holds similar power to negotiate and veto any solution and therefore can be considered to be equally capable of negotiating and affecting the solution. The other two axioms are more technical and not developed here.

Nash shows that there is only one solution to the above bargaining problem (Osborne and Rubinstein 1994, page 307). In other words, there is a unique sharing formula that satisfies the four axioms: once each agent is properly compensated for the cost it incurs to sit at the negotiation table, the residual monetary value should be shared 50-50 between the agents. Given the reasonableness of its axioms, the NBS is a powerful and stunning result. It says that whatever the negotiation conduct and/or process, *i.e.*, no matter how the negotiation is conducted, the ultimate end-point or result can only be the NBS. As mentioned above, the NBS is closely related to the concepts of competitive equilibrium (willing buyer, willing seller) and negotiated price, two concepts regularly referred to in hearings before tariff-setting organizations.

The balance required by the Canadian Supreme Court to be considered in rate-setting must be reached in a context where standard perfectly competitive conditions do not prevail. Regarding copyrighted musical works and sound recordings, a standard competitive market with individual buyers and sellers with no market power and symmetric information does not generally exist. However, negotiations can take place between representatives of the parties before a rate-setting body emulating a competitive framework and solution. A negotiated price would then be considered the solution of the bargaining game involving the different parties. Such negotiated

prices are grounded in economics as accounting for (and therefore balancing) the relative contributions and alternate options of the parties involved in the negotiations.

The Case of Digital Pay Audio and Commercial Radio in Canada

In Canada, payments for communication rights of musical works and sound recordings in the digital pay audio industry (DPA) as well as in the commercial radio industry (CR) are measured as percentages of a rate base (the total revenue of the user). In fact, the CB has at numerous times compared and used as proxies royalty rates expressed as percentages of revenues by carefully applying relevant adjustments to account for differences among the industries considered.

Applying the above reasoning to the CR and DPA industries, similar prices for the same access rights to the same repertoire of musical works and sound recordings, when expressed in percentage terms, will represent a higher percentage in the lower value added DPA industry, where the main input is music, than in the higher value added CR industry, where musical works and sound recordings are one input among many including news, weather, or traffic reports and on-air personalities. In other words, similar prices would yield different percentages.

In its decision, the Supreme Court of Canada instructs the Board to consider that if a user, such as DPA services, derives more value from the product, say the repertoire of SOCAN Collective of authors and composers (musical works) and Re:Sound Collective of performers and makers (sound recordings) than another user, such as a CR operator, the former user should be asked "to pay more" than the latter.

In Canada, the commercial radio royalty rates for musical works and sound recordings are both 4.2 per cent (before adjustments for repertoire) of the user's revenues. Suggesting to increase the combined CR royalty rate of 8.4 per cent to 10.6 per cent for DPA on the basis that the latter uses 25 per cent more music per given period, would clearly not satisfy the technological neutrality principle insofar as the DPA industry derives greater value from musical works and sound recordings relative to CR, which generates revenues from other programs.

One possibility would be first to derive the level of royalties generated by the 8.4 per cent rule and second to express it as a percentage of revenues generated by music only. On average, music format radio stations broadcast music content during 80 per cent of programming time and other

content (news, survival programming, on-air personalities or talk) during the remaining 20 per cent, while DPA services play music 100 per cent of the time, that is, 25 per cent more. However, the CB has repeatedly expressed the view that on-air talent is more important than music to radio stations. In its 2002 DPA decision, it stated: "Radio may be designed around the use of music and musical genres but as a cost, and (probably) as a drawing card, on-air talent is far more important" (Copyright Board of Canada 2002, page 8). If so, one may estimate that on-air talent generates at least between 50 and 60 per cent of revenues and music less than 40 to 50 percent of revenues.

As such, the resulting percentage rate of music royalties expressed on the basis of revenue generation by music would be 21.0 (= 8.4 / 0.4) per cent. Increasing that percentage rate by 25 per cent to account for the larger use of music in DPA would yield an equivalent rate for DPA, i.e., 26.3 per cent.

Hence, the Lindahl percentages, which would satisfy both the Supreme Court principles of technological neutrality and balance, assuming that the CR rates have been and remain properly set, would be, before any adjustments for repertoire or other reasons, 8.4 per cent of revenues for Commercial Radio and 26.3 per cent of revenues for Digital Pay Audio services.

References

Varian, Hal R. *Markets for information goods*. Institute for Monetary and Economic Studies, Vol. 99, Bank of Japan, 1999

Bakos, Yannis, Erik Brynjolfsson, and Douglas Lichtman. "Shared Information Goods." *The Journal of Law and Economics* 42, no. 1 (1999): 117-156.

Copyright Board of Canada (2002), Pay Audio Decision. http://www.cb-cda.gc.ca/decisions/2002/20020315-m-b.pdf

Erik Lindahl, "Just taxation – a positive solution." In Richard Musgrave and Alan Peacock, eds., *Classics in the Theory of Public Finance*, Macmillan, London, 1958: 98–123 (the original appeared as Chap. 4 Part I of *Die Gerechtigkeit der Besteuerung*, Lund 1919; translated by Elizabeth Henderson).

Supreme Court of Canada (2015), *Canadian Broadcasting Corp. v. SODRAC 2003 Inc.*, 2015 SCC 57, File No. 35918.

Osborne, Martin J. and Ariel Rubinstein, *A Course in Game Theory*, Cambridge: MIT Press, 1994.