The Use of Economics in Copyright Tariff Setting: Where is it Going?

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1. Introduction and Overview

The process of setting Canadian copyright tariffs has increasingly relied on the evidentiary tools of economic theory and analysis. In particular, the Copyright Board of Canada has heard and reviewed a variety of economic evidence submitted over the last decade in proceedings involving setting copyright tariffs for the use of music. It is highly likely that newer and progressively more sophisticated economic tools will be presented in future proceedings.

This paper is organized in the following manner: the use of economics in Copyright Board proceedings to date is briefly summarized and reviewed in Section 2; a review of various developments in theoretical economics, in the development of empirical evidence and in environmental factors is addressed in Section 3; and some concluding observations and a postscript are provided in Section 4.

A few preliminary observations may prove useful in framing the issues to be addressed. A distinction should be made between the use of economic terminology and concepts (such as revenue growth, inflation, profitability and efficiency) and economic analysis (such as estimation or calculation of marginal revenue product, analysis of demand and supply and social benefit analysis). Economic concepts derived from or related to market conditions have long been a staple of the Board proceedings. However, the introduction and consideration of more comprehensive economic analytical tools and evidence is relatively recent.

Moreover, while it is relatively easy to track when and in what areas economists have prepared evidence for copyright proceedings, it is less easy to determine to what extent such economic evidence has been accepted and employed by the Board in its decision making. The Board has been moving steadily towards greater explanation in its decisions and greater clarity regarding relevance of economic analysis should hopefully emerge in the future.

2. The Past Use of Economic Analysis (1992 – 2009)

2.1 A Brief History of Tariffs Set by the Board

The Board certifies tariffs for the public performance of music (musical works for publishers and sound recordings for performers) in radio, TV (musical works only), satellite radio, pay audio, internet radio and various other performance uses. They also approve tariffs for reproduction of musical works, music used in distant TV and radio signals, private copying of music, reproduction and performance of works communicated to the public by telecommunications for educational purposes, and some other relatively minor uses of copyrighted works.

The commercial radio tariff (for communication to the public of musical works) is the longest standing certified tariff overseen by the Copyright Board.[1] It was first certified in 1937 by the Board's predecessor, the Copyright Appeal Board. At the time, the tariff was set on a charge per radio receiver basis. In subsequent years, the tariff evolved from a per receiver fee to a combination of per receiver and lump sum fees and, then, to the current practice of a percentage of gross revenue fee.[2]

In 1959, a single percentage of revenue rate was established at 2.6 per cent which jointly applied to the repertoire covered by the then existing performing rights collectives. The rate was increased to 2.75 per cent in the following year.[3] The Copyright Appeal Board held an extensive hearing in 1978, at which time the rate was further increased to 3.2 per cent, in order to reflect "the growth in the intrinsic value of music". Close to ten years later, in 1987, Copyright Appeal Board held a major proceeding to deal with the radio tariff, which included consideration of music use studies and evidence on U.S. rates. At the time, the collectives had requested an increase, whereas the objectors (the Canadian Association of Broadcasters or CAB) had

1. A brief history of the radio tariff is provided in the Board's October 2005 joint SOCAN-NRCC commercial radio tariff decision: *SOCAN-NRCC Tariff 1.A (Commercial Radio) for the Years 2003 to 2007*, (Copyright Board of Canada, October 14, 2005), online: <http://www.cb-cda.gc.ca/decisions/2005/20051014-m-b.pdf>.
2. A flat fee is set for stations with revenues below a certain threshold.
3. Note that short-lived – and relatively modest – reductions in rates occurred in the early 1960s. These percentage rate reductions appear to have been due to holdover effects of the previous lump sum fee regime – i.e., intended to cap increases in the total dollar amount of the fees collected.

asked that the rate be decreased. The Board determined that they would not change the existing rate of 3.2 per cent.

In 1990, SOCAN was created though the merger of performing rights collectives CAPAC and PROCAN.[4] The following year, the newly established Copyright Board considered for the first time tariffs proposed by SOCAN. The Board maintained the commercial radio tariff rate at 3.2 per cent and established, for the first time, a "low use" rate of 1.4 per cent for radio stations using music less than 20 per cent of their broadcast time. The SOCAN commercial radio tariff rate remained at 3.2 per cent until 2003, when it was increased to 4.4 per cent (on revenues above $1.25 million).

In 1997, amendments to the *Copyright Act* were enacted which extended copyright protection to the public performance of sound recordings, specifically covering producers and performers' performances in eligible sound recordings (i.e., neighbouring rights). Shortly thereafter, the NRCC filed its first tariff application which applied to commercial radio. In 1999, the Board certified a NRCC commercial radio tariff rate of 1.44 per cent, which applied to a station's revenues in excess of $1.25 million and was effective as of 1998. This rate was later increased to 2.1 per cent in the Board's joint SOCAN-NRCC commercial radio decision in 2005 (which was effective as of 2003).

In 2003, the Board certified the first reproduction right tariff applicable to commercial radio in response to a tariff application by CMRRA/SODRAC Inc. (CSI). CSI represents only the reproduction right for authors, composers and publishers. This base rate for this tariff was set at 0.8 per cent for revenues in excess of $1.25 million, while lower tiered rates applied to revenues below this threshold. This tariff was effective between 2001 and 2007. The Board has since increased the base rate to 1.238 per cent.

The Audio-Video Licensing Agency and the *Société de gestion collective des droits des producteurs de phonogrammes et de vidéogrammes du Québec* (AVLA-SOPROQ) filed a proposed tariff (covering years: 2008-2011) relating to the right to make reproductions of sound recordings by commercial radio stations. It represents makers' or producers' rights associated with protected sound recordings. In addition, Artisti has also filed a proposed commercial radio tariff for

4. Composers, Authors and Publishers Association of Canada, created in 1925 and Performing Rights Organization of Canada, created in 1940.

the period 2009-2011 relating to reproduction rights associated with performers' performances in protected sound recordings. As mentioned below, the Board's decision on these proposed tariffs was released in July 2010.

It should also be noted that all existing certified commercial radio tariffs incorporate a "low use" rate for commercial radio stations (i.e., those that use music less than 20 per cent of their broadcast time) which is typically set at roughly 44 per cent of the full certified rate.

2.2 The Use of Economics in Past Tariffs Set by the Board

2.2.1 Commercial Radio

The Board's early commercial radio tariff decisions were largely based on ad hoc considerations although some submissions did refer to industry program expenditures, profit levels and related economic parameters. The Board also set new NRCC and CSI tariff rates using the existing SOCAN tariff as a benchmark reference point.

As noted above, while the Board received various submissions that included economics terminology, the first "economic model" was only proposed in 2005 (Joint SOCAN/NRCC Decision, 2005). In this proceeding, the collectives advanced a formal economic model of the overall value of music to radio broadcasters based on the concept of the "marginal revenue value of music".

The model was presented by P. Audley, M. Boyer and S. Stohn. Another economic model, based on a "hypothetical auction" framework was also suggested by Marcel Boyer (although this model effectively boiled down to a net-profit based approach to setting tariffs). As in the past, changes in music use and profitability were also raised as factors justifying changes to existing rate levels. Broadcasters on the other hand pointed out perceived flaws with the proposed economic models, and argued that declining audiences, market fragmentation, among other factors, warranted a lowering of the existing rates.

In its decision, the Board rejected the collectives' proposed economic models not on theoretical but rather practical grounds – i.e., the Board was concerned that the results of the models were highly sensitive to the underlying assumptions. As a result, the Board simply decided to increase the SOCAN and NRCC rates because (i) it con-

sidered music is worth more (i.e., it had been undervalued for some time), (ii) music use had increased relative to use in the 1980s, and (iii) radio uses music more efficiently (as reflected by the industry's higher profit margins).

The CAB applied for judicial revision of the Board's 2005 decision, which was ultimately sent back to the Board for re-consideration specifically with respect to the calculation of the approved rate increase. The Board then reconsidered the tariff (Joint SOCAN/NRCC Decision Re-determination 2008). The collectives provided various data and information to support the increase approved by the Board, all of which was generally ad hoc in nature. On the other hand, the CAB put forward evidence prepared by economist Steven Globerman that included a comprehensive economic model. The Globerman model provided a means to estimate the trend in the marginal product of music over time (or more specifically radio broadcasters' reservation price or maximum "willingness to pay" for music). In its decision the Board adopted the Globerman valuation model (with several adjustments) to justify the rate increase it had approved in 2005. The Board highlighted the fact that the model involves a global approach to its tariff review (i.e., covering changes in music use, efficiency and music valuation). *This decision represented the first time the Board used a formal economic model to set tariff rates (and the only time to date)*.

In late 2009, the Board held a Consolidated Radio Tariff Proceeding (Decision released in July 2010). This most recent proceeding involved a number of economic models for valuation and other purposes. On behalf of the CAB, Wall Communications Inc. (Wallcom) updated and expanded the Globerman valuation model and provided a framework for setting the value of music as a single input for radio. The Wallcom model represented that the Globerman model was comprehensive in approach except that it only examined the demand side of the market (i.e. the maximum price that radio stations might be willing to pay for the use of music). Consequently, Wallcom expanded the model to include supply side considerations, in particular, the net costs to suppliers of music (or the minimum price that rightsholders would be willing to accept for use of their music).

The Wallcom model also advanced the notion that the purchasing decisions of radio stations were based on the overall perceived marginal product of radio music. Thus, as represented in the original

Globerman model and in the 2009 Wallcom model, calculations of the marginal product over time constituted willingness to pay for *all* music rights (not just for the SOCAN right). This line of reasoning was called the "Music as a Single Input" theory.

It should also be noted that while the CAB presented (and the Wallcom evidence referred to) econometric evidence on the promotional value of radio to rightsholders, (based on an economics study authored by James Dertouzos) the evidence was largely struck from the record because of the confidentiality restrictions applying to the underlying data.

On behalf of AVLA/SOPROQ, Yannos Bakos presented an "economic surplus" model to estimate the overall value of music to radio. He also proposed a variety of proxy-based approaches to share the surplus between music copyright holders and radio stations. Bakos also considered the implications of his proposed copyright payments on net social welfare. In addition, and also on behalf of AVLA/SOPROQ, Nordicity Group attempted to measure the cost savings or efficiency gains realized by commercial radio stations that could specifically be attributed to the practice of making reproductions of sound recordings. Like Bakos, Nordicity also considered various approaches for sharing the estimated benefits between music copyright holders and radio stations. Lastly, on behalf of the NRCC, John McHale also presented a modified version of the Globerman valuation model. The primary intent of his modified model was to critique the Wall Communications Inc. economic model (although several aspects of McHale's modeling evidence were struck from the record by the Board).

In a postscript (Section 6), some observations on the Board's decision, released in July 2010, are provided.

2.2.2 Other Proceedings

Virtually every other communication and reproduction tariff process, including those for television, satellite radio service, digital pay audio, ringtones, online music and private copying, has relied on some form of "benchmarking" – often with the base reference point of

5. Satellite radio used a benchmarking model, with pay audio as the benchmark. The digital pay audio itself did not use benchmarking per se, but rather an "interval setting" exercise. Online music used physical CDs (more precisely the mechanical rate)

the commercial radio tariff (or a previous tariff set by the Board).[5] In the 2009 proceeding on Satellite Radio Service, several economic models were considered including "willingness to pay", Shapely Value and net social benefit – but ultimately rejected.[6] A more complete review of past proceedings is included in an Appendix.

The following Table summarizes some of the strengths and weaknesses of the economic models considered by the Board in past commercial radio proceedings.

2.2.3 Summary Table Comparing Economic Models in Commercial Radio Proceedings

Model	**Strengths**	**Weaknesses**
Audley, Boyer and Stohn (2005)	Introduced the concept of "marginal revenue value of music"	Lack of relevant data and inherent instability of proposed model
Globerman (original, 2008)	Introduced and clarified concepts of marginal revenue product and maximum willingness to pay, provided a means to estimate changes in these factors over time	Looked only at demand side and did not consider supply side role in setting of prices; did not examine issue of overall value of music to broadcasters versus individual tariff approach adopted by the Board
Wallcom (2009)	Expanded Globerman model to include supply side factors; considered the overall value of music in relation to the introduction of various new tariffs	Limited evidence on supply side including the size or potential value of benefit accruing to sellers from radio exposure; did not estimate relative value of individual tariffs through economic methodology – simply adopted relative valuation from past Board decisions

as benchmark (for reproduction) or share of profits (for communication). Finally, private copying relied on the mechanical rate for physical CDs.

6. The Board did note that such models were not warranted at this point in time but "economic models can, in the long run, play a crucial role".

Model	Strengths	Weaknesses
Bakos (2009)	Adopted a "net social surplus value" model recognizing in principle both demand and supply factors	Adopted modified Audley, Boyer, Stohn model but did not completely correct for unproven (and arbitrary) assumptions and model volatility; the bargaining model used by Bakos attributed all surplus to sellers without consideration of buyer participation in surplus

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3. The Use of Economics in the Future

It seems clear that the use and acceptance of economic models in Copyright Board proceedings has crossed a threshold – there will be no "going back" – but what about the future?

In contemplating the types of economic evidence that might be presented in the coming decades, a number of areas can be explored. These can be categorized as follow:

Theoretical

– Ongoing developments in neo-classical analysis

– The role of newer theoretical tools (e.g. game theory, signal theory, and decision-making under uncertainty)

– The role of neo-classical approaches versus expanded or alternative approaches (e.g. modified objective functions, definitions of efficiency, and definitions of social welfare)

Empirical

– The collection and use of better data

– The introduction of more sophisticated statistical and econometric techniques

Environmental Changes

– Technology-driven and other changes in the creation, use and communication of music

– Market structure changes (with respect to both producers – including collectives – and consumers)

– Changes in copyright and related laws

Each of these areas is examined below.

3.1 Theoretical

Much of micro-economic analysis is framed around the neo-classical model. Neo-classical economics focuses on the allocation of scarce resources and the role of market forces to efficiently allocate those resources. According to the eminent economist Kenneth Arrow, neo-classical economics is based on two concepts: one is "the notion of the individual economic agent whose behaviour is governed by a criterion of optimization under constraints" and the other concept is the market where "the aggregate of individual decisions is acknowledged and the terms of trade adjusted until the decisions of the individuals are mutually consistent in the aggregate; i.e. supply equals demand".[7] Earlier versions of neo-classical economics tended to have restrictive (i.e. unrealistic) assumptions about human behaviour. However, in recent years many of those assumptions have been relaxed or eliminated, leading to much more realistic depiction of economic behaviour, at least at a theoretical level.[8]

There are a number of areas where more contemporary models (or extensions) of neo-classicalism have emerged. For example, the relatively static (i.e. at a point in time) approach of neo-classical analysis has led to broader temporal – or dynamic – considerations (i.e. maximization over time). In this regard, the role of innovation and

7. Kenneth Arrow, "Limited Knowledge and Economic Analysis", Presidential Address to the American Economic Association, printed in (1974) 64:1 American Economic Review 1.
8. For further discussion see <http://www.economictheories.org/2008/07/comparison-of-neoclassical-and-modern.html>, <http://faculty.lebow.drexel.edu/mccainr/top/prin/txt/Neoch/Eco111s1.html> and Christian Arnsperger and Yanis Varoufakis, "What is Neo-classical Economics? The Three Axioms Responsible for its Oeuvre, Practical Irrelevance and thus, Discursive Power" (2006) 53 *Panoeconomicus* 5-18.

how it impacts efficiency over time has been introduced into some analysis, but much additional refinement and even fundamental discovery remains to be done.

Other topics that have helped to extend neo-classical analysis include less restrictive assumptions on rationality and self-interest,[9] information availability and a singular equilibrium solution. For example, bounded rationality, norm-based rationality and empirically determined rationality offer more realistic underpinnings of human behaviour that still allow the type of constrained maximization required in economics.

Newer theoretical concepts and tools have also been advanced, including developments in the field of mathematics. In particular, "game theory" has slowly been replacing calculus as the primary mathematical tool for advanced economic theory, especially in the field of "industrial organization".[10] Industrial organization is the branch of economics concerned with the structure of markets, the strategic behaviour of firms and their interactions. "Game Theory" has become the *de facto* mathematical concept in the field of Industrial Organization.[11] One contribution of game theory, at least at a theoretical level, has been the demonstration that two parties can both be made better off by not acting in a narrow self-interested manner (see diagram of the Prisoner's Dilemma below). More broadly, game theory incorporates the impact of other parties' actions (or reactions) into market outcomes.

9. Strictly speaking the neo-classical model did not require an assumption that humans are completely rational and self-interested – just that if most people typically act this way, the market will still lead to efficient outcomes.
10. However, in my view, advances in the use of game theory at the theoretical level have not yet translated to widespread real-world problem analysis – the concept of marginality (which stems from calculus) is still the stock tool of the trade.
11. See, for example, Jean Tirole, *The Theory of Industrial Organization* (Cambridge: MIT Press, 1988) and Kyle Bagwell and Asher Wolinsky, "Game Theory and Industrial Organization", Columbia University Department of Economics Discussion Paper, 2002.

The Prisoner's Dilemma: a Single Course of Action Can Lead to Extremely Different Outcomes[12]

	Prisoner B is Silent	Prisoner B Betrays
Prisoner A is Silent	Each prisoner serves 9 months	Prisoner A gets 8 years, prisoner B goes free
Prisoner A Betrays	Prisoner B gets 8 years, prisoner A goes free	Each prisoner serves 4 years

Unfortunately, game theory has its own limitations in applied economic analysis, not the least of which is the difficulty in modeling the potentially large number of outcomes in multi-party and/or multi-stage games – something that occurs frequently in the real world.[13] Moreover, game theory relies heavily on the presumption of rational behaviour. There may also be a need to forecast behaviour without having the necessary data to predict with certainty. In short, game theory has the potential to become a powerful addition to the tool kit of practicing micro-economists, but its application in solving specific pricing problems, such as setting copyright tariffs, generally requires more detailed information and processing capability than is currently readily available.[14]

Another characteristic of neo-classical economics has been the assumption of perfect information – that is, market transacting parties generally have full information available to them. In fact, we know that information is often imperfect and asymmetrical and this can lead to less than fully efficient market outcomes. Signal theory suggests that this market problem can be overcome by one party signalling the other party (i.e. passing on relevant information indirectly). Moreover it may be possible to incorporate signal theory (and other means of overcoming informational weaknesses) into game theory.

12. The Prisoners' Dilemma occurs when two criminals are captured and, under separate questioning, must incriminate the other or stay silent.
13. The use of more-sophisticated algorithms to handle multiple parties and multiple outcomes may ultimately allow greater use of game theory in practice.
14. As noted earlier, the Satellite Radio Service proceeding did include consideration of the Shapley Value approach to allocating gains – a use of game theory – but decided against its use.

Perhaps a more fundamental problem lies with the inherent uncertainty that characterizes the real world. Early neo-classical analysis did not directly address issues of risk and uncertainty. Frank Knight, in 1921, first attempted to define the terms: "*risk*" refers to situations where the decision-maker can assign mathematical probabilities to the randomness with which he is faced; in contrast, "*uncertainty*" refers to situations when this randomness cannot be expressed in terms of specific mathematical probabilities.[15]

The debate concerning distinctions between risk and uncertainty – and how these concepts are best incorporated into economic analysis – is longstanding and far from resolved. In the real world, the consequences of a consumer (or producer) choice cannot be fully known prior to the choice being made; hence, uncertainty and risk are non-avoidable. Efficient markets are often presumed to deal effectively with uncertainty but we are constantly reminded (e.g. the recent global financial crisis) that this notion is over simplified.[16]

Modern theoretical advances have developed various means of accepting and incorporating notions of uncertainty and accounting for risk such that efficient market outcomes, at least at a theoretical level, are achievable. In fact, a whole field has developed that addresses the concepts of risk and uncertainty in the decision-making of economic agents.[17] It should also come as no surprise that game theory – which deals with the potential for multiple outcomes stemming from a single action – provides one treatment of uncertainty. Moving farther afield, the question of uncertainty has led to the development of "economic sociology" – a joining of two previously separate fields of research.[18] The notion of moving beyond conventional

15. Frank Hyneman Knight, *Risk, Uncertainty and Profit* (Boston, Mass.: Houghton Mifflin, 1921) ch. 7.
16. See for example Paul Davidson (Editor, Journal of Post Keynesian Economics) "Risk And Uncertainty In Economics", Paper presented at the conference on "The Economic Recession and the State of Economics", Westminster, London, February 6, 2009.
17. There is even a journal dedicated to the field – *The Journal of Risk and Uncertainty*, published by Springer US. It is worth noting that the field of psychology intersects with the study of these concepts.
18. See Jens Beckert, "What Is Sociological about Economic Sociology? Uncertainty and the Embeddedness of Economic Action" (1996) 25:6 *Theory and Society* 803 at 830-1: "If agents cannot anticipate the benefits of an investment, optimizing decisions become impossible, and the question opens up how intentionally rational actors reach decisions under this condition of uncertainty. This provides a systematic starting point for economic sociology. Studies in economic sociology that argue from different theoretical perspectives point to the significance of uncertainty and

concepts of economic optimization and societal well-being are discussed below.

Many of the questions posed above invite reconsideration of what, exactly, a society is trying to (or should be trying to) achieve and how best to measure how well we are achieving those goals. The mathematical properties of economics – to quantify costs and benefits, to estimate efficient prices and to ultimately gauge how well-off society is – are highly reliant on the acceptance of the many assumptions of neo-classical economics. At a basic level, economics relies on being able to measure well-being – whether in dollars or some unit of "utility".[19] Economic analysis assumes that people want more utility – or to be better off – and behave accordingly. Yet utility is impossible to measure and the use of dollars as a measuring stick falls short of capturing what is essentially the concept of "happiness".[20]

Some economists – and academics from other fields such as psychology, medicine, sociology and philosophy – have tried to define broader (or more complete) understandings of well-being. No doubt this quest is eternal and our ongoing investigations will continue to provide better formulated models of human behaviour and what motivates us. But for all its imperfections, the use of economics still provides a powerful tool that is successful at predicting a significant part of behaviour.

For now, neo-classical economics, and its modern incarnations, provides the most appropriate tool for assisting regulated price-setting decisions such as the setting of tariffs by the Copyright Board. Economics may be an imperfect tool, but it gets the job done reasonably well, most of the time.

3.2 Empirical

Perhaps the greatest opportunity for near-term improvement in the analysis underlying tariff setting is represented by the collection and utilization of better information or data.

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goal ambiguity. ... It becomes understandable why culture, power, institutions, social structures, and cognitive processes are important in modern market economies."

19. The term "utility" refers to a measure of satisfaction – either at the individual level or aggregated across all society (social welfare).
20. See for further discussion of utility and social choice theory Amartya Sen's Nobel Prize lecture, *The Possibility of Social Choice* (December 8, 1998), online: <http://nobelprize.org/nobel_prizes/economics/laureates/1998/sen-lecture.pdf>.

As noted earlier, the basic framework of supply and demand can be used to get a big picture view of the factors that influence price (or would be influential if a market existed). Thus, demand for a good or service is influenced by conditions such as the availability and price of substitutes, the number of buyers, the quality of a good, tastes, expectations of the future and income level (or ability to purchase).[21] When considering a factor input (such as the use of music as an input into the production of radio or in other services), demand will be determined at the margin by the additional revenue that is gained from using the factor so that the demand and supply conditions of the final good market (e.g. radio) will also impact the demand for a factor input (e.g. music).

On the supply side, the cost of the inputs that go into producing a good tends to form a floor below which a supplier will refuse to supply a good.[22] Other considerations impacting the supply of a good include the available production and related technologies (and any changes or improvements over time), the number of suppliers, the durability of a good and expectations of the future.[23]

A good starting point when assessing whether prices for a copyright work(s) should be moving higher or lower is to assess the factors that influence demand and supply for that work or works. Put simply, gathering information on the factors that shift demand and supply can provide a useful "first order" sense of price direction.

Parties before the Board should strive for ever-more accurate information at the most granular level. For example, users of music should provide data on how much music is being used and the ways it is being used. Collecting this information over several years allows a tracking of trends. Moving up the data chain, evidence and data on how much additional revenue is expected from the use (at the margin) of music can help provide an indication of the users' "willingness to pay".[24] Typically, there is no direct means of determining how

21. These are factors that can "shift" a demand curve. Changes in the price of the product will cause movements up or down along the demand curve.
22. It should be noted that it is really the "net" cost of inputs that is relevant. For example, if external benefits accrue to a producer from the sale of its goods, then those benefits will lower the net cost to the producer.
23. These factors can cause a "shift" in the supply curve. Changes in product price will cause a movement up or down along the supply curve.
24. "Willingness to pay" is really just another term for demand. It describes what a user (or consumer) is willing to pay for any given quantity of a product or service.

much additional revenue comes solely from the use of more music so it will have to be estimated,[25] perhaps by reference to the market factors that will influence demand.

Similarly on the supply side, the most basic information provided by collective agencies would include accurate measures of use of the specific music that is covered by their agency (i.e. repertoire). A different type of data is needed to gauge the supply of music – or the price at which a rights holder would be willing to sell their music. Data on the costs of creating the work, the impact of production technologies and other elements of supply must be measured and accounted for.

Another device that can provide indirect but useful indications of demand and supply is survey research. For example, on the demand side, surveys of listener habits and preferences can provide insight into what attracts people to a music broadcast service, which in turn is helpful in determining the willingness of advertisers to make ad placements with the music service. On the supply side, surveys of music creators can assist in understanding the financial terms under which they are willing to supply their works.

Survey research, while helpful, suffers from the fact that it only provides "opinion" evidence – i.e. what a person thinks they did or would do – as opposed to evidence from market behaviour such as actual amount listened to or actual amount of music supplied under specific conditions. Such opinion data is also highly dependent on the exact wording of the survey questions and the context in which they are asked. Ongoing improvements in survey methodology and question construction can be expected as a natural consequence of the adversarial nature of the processes conducted before the Copyright Board.

It is our expectation that the direct estimation of demand curves using econometric or statistical techniques is unlikely to show up in the near term. Econometrics works best when there is sufficient variation in the dependent variable (e.g. quantity demanded) and the independent variables (chief of which is price) to confidently determine statistical relationships. There have been many recent

25. It will also be difficult to isolate the specific role of music use in generating revenues since services (such as commercial radio, SRS, pay audio, television) are often a bundle of several services and there are many inter-related inputs that are used.

advances in econometric methods but without a good and relevant set of data even the most sophisticated techniques cannot yield good results.

However, econometric and statistical techniques can be useful in estimating the relationship between various elements of the music business (e.g. radio airplay and record sales) which in turn can provide insight into supply (or demand) conditions.

3.3 Environmental Changes

For lack of a better term we will use "environmental change" as a catch-all to describe large structural changes or shifts that will ultimately impact the market conditions in which price is set. Most if not all of these environmental changes would eventually be captured by factors affecting demand or supply but because they may occur at a very broad level, they may not be immediately recognized for their specific or immediate relevance.

For example, technological change impacts the conditions of demand and supply in numerous ways, near term and longer term, direct and indirect. Technological change has not only changed the processes by which music is created, recorded, distributed and "broadcast", but also the manner in which it is consumed (e.g. the use of personal music devices – including cell-phones!).[26] But technological change has also helped create new activities (time spent on internet social media sites, use of console and computer games) that compete with conventional activities like listening to radio or TV stations. While some "new" activities clearly incorporate the use of music, others do not. A key question is the extent to which activities which involve music are losing or gaining ground to activities which do not involve music.

There has been much debate about the impact of new technologies (such as file-sharing) on the consumption and the monetization of music. While the debate has tended to center on whether unauthorized music downloads have reduced the sales of CDs, an equally important question concerns the expansion of listening choices and its impact on music business models. For example, 40 years ago listening to recorded music generally took place in one of two ways:

26. Technological change is often identified as helping to reduce the costs of music supply but it can also spur new types of demand.

through the programming on the radio or on a home audio system. Today, programmed music can be heard in many more ways: conventional radio, satellite radio, digital pay audio (on cable and DTH systems), pay and free streamed internet radio stations, downloaded or streamed podcasts, algorithmic and/or personal-taste internet music services (such as Pandora or Spotify). As for self-programmed (including random or shuffle selections from a library of music), music can be stored in and played on numerous devices such as personal dedicated MP3 players, personal media players, MP3 docking stations, cell-phones, personal computers, net-books, CDs and players, and DVDs and players.

As technology evolves so does market structure, sometimes as a direct response to technological change and sometimes more as a consequence of financial or other factors. In this respect, consolidation – or even ownership changes generally – in the broadcasting industry or the emergence of new competitors can lead to different initiatives and priorities regarding the use of music. Likewise the market structure of music creators and rights holders will evolve – new types of collective agencies, the growth of independent (and non-conventional) music creators and their representatives, and the diminishment of traditional players (e.g. major music labels). The key for an agency like the Copyright Board is to get a handle on how these market structure changes might affect the demand for, and supply of, music.

We also need to constantly remind ourselves that tastes change. This is another way of saying that the value of goods and services (including music) changes over time. Getting an appreciation for how technology and other factors affects tastes can help identify possible changes in demand.

Structural change also occurs when the underlying rules change. New copyright legislation and new court interpretations of old rules or principles are obvious ways in which the underpinnings of recorded music-use commerce can be affected. But even without those types of institutional change, the ground can shift. Public perception and changes in what is considered “acceptable” behaviour regarding the consumption of music can have a material impact on business outcomes and may even lead to changes in the rules.

4. Final Thoughts and PostScript

As this article was nearing completion, the Board released its Decision on the Consolidated Radio Tariff. This major proceeding involved one of the most extensive uses of economics-related evidence and argument in a Copyright Board proceeding to this point in time.

In brief, the Board rejected virtually every party's economic evidence. Yet the Board also noted that they believed economic modelling was central to determining appropriate tariffs:

> We have examined the methodologies proposed by the parties to set the rates and have decided not to use any of them. We will however analyze some of their underlying assumptions to explain why we have rejected them. We do so because we believe that economic modeling should remain central to the Board's tariff determination. (Para. 182)

The statement by the Board seems paradoxical. Moreover, the reasons provided by the Board for rejecting each economic model put forward by each of the parties are not based on economic reasoning; rather, they tend to reference past Decisions or matters of law. Fundamental economic questions (such as how demand and supply factors have impacted the market for music or whether the overall value of music to a radio broadcaster or to music sellers has changed – regardless of how each individual tariff might or should be set) have not directly been addressed by the Board. As a consequence, there is very little guidance provided as to what economic framework, if any, the Board is using to determine tariffs.[27]

The setting of tariffs by the Copyright Board is by any measure a challenging exercise. However, when the tools for assisting in the rate setting exercise are evaluated, economics provides the most relevant tool-set for the setting of prices. The adoption of the Board in some recent proceedings of evidence based on economic analysis seemed to indicate the growing acceptance of this tool – at least until the most recent Decision of the Board was released. At this point, it is unclear whether or not the Board is prepared to adopt economic reasoning as a key element of its decision-making process.

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27. In a Decision that is 335 paragraphs long, only 23 paragraphs address "economic analysis". Moreover, very little in the 23 paragraphs deals explicitly with economic concepts or arguments.

To reiterate, examination of basic supply and demand conditions provides a useful starting point for analysis. These conditions change over time such that each tariff proceeding can gain useful information by considering the factors that have recently had an impact on basic supply and demand in recent years – or are expected to impact market conditions in the near term. A review of changes in basic demand and supply conditions can provide, at a minimum, broad guidance as to which direction tariffs should be moving.

Moving to a more detailed level of analysis, examination of purchasers' maximum willingness to pay and of suppliers' minimum acceptable selling price can offer deeper insight to market conditions. While advancements in our conceptualization of market forces and the introduction of newer theoretical tools (such as Game Theory and alternative measures of well-being) will gradually support improvement in copyright tariff setting, perhaps the most useful near term advancement will come from better data. This will include not only more exact price and cost information but also survey research data that can better capture market agent behaviour.

Appendix: A Review of the Copyright Board's Reliance on Economic Valuation Models for the Purpose of Setting Copyright Tariffs[28]

In what follows, a brief summary is provided of the various valuation methods the Copyright Board has adopted since its inception in setting tariff rates for commercial radio, television and online music services, among others. A summary of current tariff rates is provided as an attachment.

1. COMMERCIAL RADIO (covering first SOCAN then, later, NRCC and CSI, with proposed AVLA/SOPROQ and Artisti tariffs pending)

A commercial radio performance/communications rights tariff rate was first set in Canada in 1937 and until the end of the 1980s was overseen by the Board's predecessor (the Copyright Appeal Board).

The Board's first decision regarding this tariff was issued in 1991. At the time, the Board inherited the then existing tariff rate of 3.2 per cent. It decided not to change the rate.

When asked to revise the SOCAN tariff rate in the 1990s, the Board was presented evidence on (i) music use by radio, (ii) the ratio of royalties payments to program expenses, (iii) industry profit levels, (iv) comparable U.S. rate levels and (v) contributions made to radio to the music industry. As the existing rate level (3.2 per cent) was maintained by the Board it is difficult to know what impact this evidence had.

NRCC Decision, 1999: In this case, evidence on the "overall" value of music was presented by NRCC to the Board based on what amounted to "benchmark" estimates of program expense to revenue ratios in other sectors of the communications industry (i.e., broadcast TV and PPV). On the other hand, broadcasters proposed that the new NRCC rate be set in relation to the existing SOCAN rate, but at a low level reflecting what they considered to be the low intrinsic value of neighbouring rights as well as the fact that performers/makers benefit from radio airplay. The Board did use the SOCAN rate as its "starting point" or benchmark – but rejected arguments to reduce the

28. The author notes that the Appendix was prepared in large part by Bernie Lefebvre.

relative value of neighbouring rights based on considerations such as the promotional value of radio airplay. The Board set the value of NRCC's rights equal to those represented by SOCAN (i.e., 1 to 1, before repertoire adjustments).

CSI Decision, 2003: In this case, CSI suggested there were benefits to radio as a result of reproduction (e.g., efficiency gains and quality improvements) and suggested that existing reproduction rights agreements with TVA and TQS be used as benchmarks. Broadcasters on the other hand argued that any benefits from copying music are minimal and that the CSI rate should be set at a nominal value relative to the existing SOCAN rate. The Board once again used the existing SOCAN rate as its starting point or benchmark, but rejected the notion that the rate should be set at a nominal value. It also decided that reproduction rightsholders should share in the "efficiencies" gained from the ability to reproduce music (despite the fact that these efficiencies were not quantified at the time, but were rather assumed to exist). The Board also noted that they took into account the concern that setting the rate too high could discourage innovation. As well it looked to foreign experience on the ratio of communications and reproduction right royalty rates in the commercial radio industry. Effectively the Board set the rate in relation to the exiting SOCAN tariff rate after taking into account the above noted considerations. The base CSI rate was set at roughly 1/3 the SOCAN rate (before repertoire adjustments).

Joint SOCAN/NRCC Decision, 2005: In this proceeding, the collectives advanced a formal economic model of the overall value of music to radio broadcasters based on the concept of the "marginal revenue value of music". The model was presented by Audley, Boyer and Stohn. Another economic model, based on a "hypothetical auction" framework was also suggested by Boyer (although this model effectively boiled down to a net-profit based approach to setting tariffs). As in the past, changes in music use and profitability were also raised as factors justifying changes to existing rate levels. Broadcasters on the other hand pointed out flaws with the proposed economic models, and argued that declining audiences, market fragmentation, among other factors, warranted a lowering of the existing rates. In its decision, the Board rejected the collectives' proposed economic models not on theoretical but rather practical grounds – i.e., the Board was concerned that the results of the models were highly sensitive to the underlying assumptions. As a result, the Board simply decided

to increase the SCOCAN and NRCC rates because (i) it considered music is worth more (i.e., it had been undervalued for some time), (ii) music use had increased relative to the 1980s, and (iii) radio uses music more efficiently (as reflected by the industry's higher profit margins).

Joint SOCAN/NRCC Decision Re-determination 2008: The CAB applied for judicial revision of the Board's 2005 decision, which was ultimately sent back to the Board for re-consideration specifically with respect to the calculation of the approved rate increase. The collectives provided various data and information to support the increase approved by the Board, all of which was generally ad hoc in nature (i.e. not supported by a comprehensive economic model). On the other hand, the CAB put forward evidence prepared by Steven Globerman that included a comprehensive economic model which provided a means to estimate the trend in the marginal product of music over time (or more specifically radio broadcasters' reservation price for music). In its decision the Board adopted the Globerman valuation model (with several adjustments) to justify the rate increase it approved in 2005. The Board highlighted the fact that the model involves a global approach to its tariff review (i.e., covering changes in music use, efficiency and music valuation). *This decision represented the first time the Board used a formal economic model to set tariff rates (and, indeed, the only time to date)*.

Consolidated Radio Tariff Proceeding (Decision Pending): This most recent proceeding involved a number of economic models for valuation and other purposes. On behalf of the CAB, Wall Communications Inc. updated and expanded the Globerman valuation model (e.g., taking into account both the buyers' and sellers' reservation prices), and provided a framework for setting the value of music as a single input for radio. It should also be noted that while the CAB presented econometric evidence on the promotional value of radio to rightsholders, which was authored by Dertouzos; however, this evidence was largely struck from the record because of the confidentiality restrictions on the underlying data.

On the other hand, on behalf of AVLA/SOPROQ, Bakos presented an "economic surplus" based model to estimate the overall value of music to radio. He also proposed a variety of proxy-based approaches to share the surplus between music copyright holders and radio stations. Bakos also considered the implications of his pro-

posed copyright payments on social welfare. In addition, and also on behalf of AVLA/SOPROQ, Nordicity attempted to measure the cost savings or efficiency gains realized by commercial radio stations that could specifically be attributed to the practice of making reproductions of sound recordings. Like Bakos, Nordicity also considered various approaches for sharing the estimated benefits between music copyright holders and radio stations. Lastly, on behalf of the NRCC, McHale also presented a modified version of the Globerman valuation model. The intent of his modified model was primarily to critique the Wallcom model (several aspects of McHale's modeling evidence were struck from the record by the Board).

IN SUM: The Board's early commercial radio tariff decisions were based largely on ad hoc considerations, and it has set new NRCC and CSI tariff rates using the existing SOCAN tariff as a benchmark. However, more recently, the Board has been presented a variety of comprehensive economic valuation models for rate setting purposes in the case of commercial radio. Indeed, it relied on the Globerman valuation model in its SOCAN/NRCC re-determination decision.

2. DIGITAL PAY AUDIO (DPA)

SOCAN/NRCC DPA Decision, 2002: In this proceeding, the collectives focused largely on suitable proxies or benchmarks to set SOCAN's and NRCC's proposed DPA tariff rates. This involved consideration of program expenditure to revenue levels in the case of pay, PPV and/or specialty TV services. The DPA services on the other hand argued that commercial radio is a more appropriate proxy. In its decision, the Board used an entirely ad hoc approach to setting the DPA tariff rates, involving the establishment of what it referred to as a "comfort zone" for the rates. It ultimately settled on the mid-point of the zone to set the rates.

CSI DPA Tariff Rate, 2004: No proceeding was ultimately held in this case since the DPA services reached an agreement with CSI on reproduction right fees. It appears that the same communications to reproduction right ratio used for commercial radio was agreed to in this case.

IN SUM: The basis for SOCAN and NRCC DPA rates set by the Board was effectively ad hoc in nature, although it did take into considerations the level and relationship between the SOCAN and

NRCC rates in effect for commercial radio at the time. There was no apparent reliance on economic theory or modelling in this case.

3. SATELLITE RADIO SERVICES (SRS)

SOCAN, NRCC & CSI SRS Tariffs, 2009: The Board's SRS decision was issued in May of this year. In the proceeding leading to the decision, the collectives presented several novel economic theory based approaches to setting SRS copyright fees. The primary evidence in this respect was authored by Agrawal and, in reply, Agrawal and McHale. Four approaches were proposed:

i) A "willingness-to-pay" approach based on existing agreements between SRS services and specific car manufacturers. This approach depends on the order of deal-making for key inputs.
ii) A "Shapley Value" or theoretical cooperative game theory approach which was used to calculate the average marginal contribution to revenues of key inputs used by the SRS services. Again, this approach depends the ordering of the deal-making among parties or the acquisition of key inputs can be assessed.[29] The potential effects of "cannibalization" (i.e., harm arising from the introduction of SRS to other music revenue streams such as CD and download sales) was also considered.
iii) A "net social benefit" of music model which was empirically implemented by the estimating the difference between the value Canadians place on the service (the maximum willingness to pay) and the cost of providing the service (measured by marginal cost).[30]
iv) A benchmarking approach using the existing DPA tariff as the starting point. Under this approach, a series of adjustments are made to account for differences between DPA and satellite radio services, such as relative music and repertoire use.

Evidence filed by the SRS Services (authored by Reitman, CRAI) mostly focused on attacking the reliability of the collectives' economic models. The SRS Services otherwise supported use of a benchmarking approach using DPA as the starting point.

> In its decision, the Board stated that while it found that Agrawal/ McHale's proposed economic valuation models to be interesting and

29. This approach depends on the results of a SRS subscriber survey in which subscribers are asked to value different types of SRS content.
30. Note that this approach relies on a complex underlying theoretical model which is very challenging to implement empirically

> potentially useful, it was not "persuaded to use them at the present time." The Board provided the reasons why it chose not to rely on these models and added that it was doing so:
>
> > ... in the hope that they will provide guidance for the parties in developing new economic models in the future. In our opinion the development and presentation to the Board of such alternative economic models can, in the long term, play a crucial role in the determination of fair and equitable tariffs.

IN SUM: This proceeding marks a case in which the Board was presented with several economic models to set tariffs, yet decided not to use any of them due to concerns over the difficulties implementing the models and, ultimately, concerns over the reliability and stability of the results of the models. Thus it once again chose to rely on a benchmarking approach to setting the rates for SRS.

4. CONVENTIONAL AND PAY & SPECIALTY TELEVISION SERVICES

Like commercial radio, the Board inherited the existing SOCAN communications royalty fee from its predecessor. The fee was initially set in 1951. While it fluctuated somewhat over time, it was 2.1 per cent when the Board came into existence.

Conventional Television (SOCAN 2.A): The SOCAN commercial television tariff rate was revisited by the Board in 1993 and 1998. No formal economic models were relied on by the Board, but rather general considerations were taken into account such as: (i) changes in music use, (ii) US rate levels, (iii) environmental factors (competition from specialty services), and (iv) changes in profitability.[31] It is worth noting that the Board also permitted the introduction of a Modified Blanket Licence or MBL provision in 1993 which allowed broadcasters to clear the performance rights for music used in specific programs (this provision was extended to pay/specialty services in 2004).

Pay & Specialty Television, SOCAN 17.A: First set by the Board in 1996 (with an effective date of 1990), the SOCAN non-broadcast television tariff rate was set in direct relationship to the existing SOCAN 2A rate (with various adjustments to account for differences between the two classes of services).

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31. This factor was used in large part to reduce the rate from 2.1 per cent to 1.8 per cent in 1998.

SOCAN 2.A and 17.A Decision, 2004: The Board dealt with the two tariffs on a consolidated basis for the first time in 2004. In this case, SOCAN provided evidence, authored by Liebowitz, on what was referred to as the "theory of derived demand". This theory basically boiled down to proposition that royalty fees should track growth in programming expenses. The Board rejected this approach, concluding that there was no supporting evidence of the theory. Instead, it harmonized the two tariff rates and relied on generally ad hoc considerations to adjust the level of the rates to 1.9 per cent.

IN SUM: The Board's approach to setting SOCAN tariffs for television services has consistently been ad hoc in nature. In this case, no formal economic valuation models have been proposed by either SOCAN or the broadcasters.

5. RINGTONES

SOCAN Tariff 24 Decision, 2006: In this case, much of the debate around setting level of SOCAN's proposed tariff for the communications right for ringtones revolved around the appropriate relative valuation of the communications and reproduction rights associated with the musical works included ringtones. Market information was already available on the level of reproduction copyright fees paid by ringtone suppliers. Thus the Board's decision ultimately focussed on setting SOCAN's rate relative to existing reproduction copyright fees for ringtones. Since the communications right was considered "ancillary" to the reproduction right in this instance, the Board set the SOCAN rate below the average existing reproduction copyright fees for ringtones. Consideration of foreign rates was taken into account to set the communications fee at roughly half the value of the reproduction fee.

IN SUM: Here again, the Board did not rely on any formal economic valuation model, but rather a largely ad hoc relative valuation exercise. This decision also set the tone for the Board's subsequent online services tariffs, which involved setting tariffs for both communications and reproductions rights.

6. ONLINE MUSIC SERVICES

CSI, 2007: The Board's first online services decision covered CSI's proposed reproduction rights tariffs for (i) permanent down-

loads, (ii) limited downloads and (iii) on-demand streaming. In this case, tariff valuation reduced largely to the choice of an appropriate benchmark or starting point. While CSI preferred the ringtone market, the objectors advocated the use of the prerecorded CD market. The Board adopted the latter. Thus rates were set in this case using a purely benchmarking exercise.

SOCAN 22 – Part I, 2007: SOCAN's Tariff 22 had been tied up in legal appeals since 1999. The Board's first decision dealing with SOCAN's Tariff 22 was finally issued 8 years later and covered rates applicable to the communication rights associated with (i) permanent downloads, (ii) limited downloads and (iii) on-demand streaming (i.e., the same categories covered in the earlier CSI decision). In this case, the Board focused on first setting a total value for the "bundle" of reproduction and communications rights for internet downloads. Based on evidence filed by both SOCAN (Liebowitz) and the objectors (Brander), the Board used the market for prerecorded CDs as its benchmark once again in this case. However, it also adopted a (partial) economic theory advanced by Liebowitz that rights holders should share (proportionately) in the increased profits that record companies were claimed to enjoy in the case of sound recordings distributed as digital downloads compared to physical CDs. On this basis the Board found the total value of the bundle of rights to be 12.2 per cent (which is higher than otherwise would have been the case absent acceptance of the profitability sharing assumption). The Board then simply backed out the already certified CSI rates in order to establish the three corresponding SOCAN tariff rate elements.

SOCAN 22 – Part II, 2008: In this decision, the Board set the remaining elements of SOCAN's proposed Tariff 22 rate elements – i.e., those dealing with audio webcasts and simulcasts, audiovisual webcasts and simulcasts and online game sites. On behalf of SOCAN, Liebowitz suggested that the costs of the commercial radio and TV broadcasts are effectively "sunk" and, on this basis, he argued that the profitability of broadcasters' online operations is much higher than their traditional operations and, therefore, tariff rates should be higher for online compared to traditional operations (much like the situation for digital downloads). However, the Board rejected this proposal (it did not agree that the program costs were sunk in this instance). Instead, the Board decided to simply extend existing commercial radio, TV, DPA and SRS and TV tariff rates to internet-

related revenues (discounted considerably for the fact that many visits to websites are to access non-audio or non-audiovisual content). Thus, in this case, it decided not to so much set new tariffs, but to expand the applicable rate base for existing SOCAN tariffs.

IN SUM: In the case of online music services, once again, the Board has not been presented with any comprehensive economic valuation model evidence. To set rates, the Board has relied primarily on a benchmarking approach, along with various ad hoc considerations relating to the relative value of communications and reproduction rights in each case in hand.

7. PRIVATE COPYING

Private copying rates came into effect in 1999 and have subsequently been reset several times over by the Board. The rates per eligible blank recording medium established by the Board have been set by using the pre-recorded CD market as a benchmark. Numerous adjustments were required to account for different rightsholders, eligible repertoire coverage, consumer purchase and copying behaviour and average capacity used by eligible medium, among other factors. Account was also taken of the "secondary" or "ancillary" nature of a copy of a sound recording (when the original is owned by the copier). In more recent decision, an adjustment was also introduced to account for paid internet downloads. While an extensive amount of survey and statistical data is required to set private copying rates, it is essentially a benchmarking exercise, albeit it a complex one.

Attachment
Summary of Certified Copyright Tariff Rates as of Year-end 2009

Use	SOCAN	NRCC	CSI	Communications to Reproduction Rights Ratio
Commercial Radio	3.2 % ≤ $1.25M 4.4 % > $1.25M Low-use = 1.5 %	$100 ≤ $1.25M 2.1 % > $1.25M Low-use = 0.75 %	0.27 % < $0.625M 0.53 %: $0.625-1.25M 0.80 % > $1.25M Low-use rates apply on each tier	**3.2 to 1**
Digital Pay Audio (DPA)	12.35 %	5.85 %	Confidential Agreement	NA (assumed to be same as commercial radio)
Satellite Radio Services (SRS)	4.26 %	1.18 %	0.1 – 2.9 % (depends on type of SRS receiver)[32]	Same as comm. radio, adjusted as most copies made in U.S.
Commercial Television	1.9 % w/MBL regime	Denied	Several SODRAC rates in effect[33]	NA
Pay/ Specialty TV	1.9 % w/MBL regime	Denied	SODRAC rate in effect[34]	NA
Ringtones[35]	6 %	NA	Confidential (assumed to be 12 %)	***1 to 2***

Wall Communications Inc. 2010

NOTE 1: in the case of audio and audiovisual websites a rate base discount of at least 50 % applies to reflect non-audio or non-AV content website page impressions.

32. The CSI rate is 0.10 % for SRS subscribers with basic play functionality; 1.87 % for SRS subscribers with extended buffer and replay capability; and 2.90 % for SRS subscribers able to store songs and programs.
33. Negotiated SODRAC rates in effect for CBC and TVA & TQS rates.
34. The Board certified SODRAC rate for MusiquePlus & Musimax (0.87 %) based on pre-existing negotiated TVA & TQS rates, adjusted for repertoire use.
35. A minimum penny rate of 6 cents a ringtone applies.

Use	SOCAN	NRCC	CSI	Communications to Reproduction Rights Ratio
Online Music[36]				
Perm. Download Limited download On-demand stream	3.4 % 6.3 % 7.6 %		8.8 % 5.9 % 4.6 %	1 to 2.5 1 to 1.0 1 to 0.6
Audio Simulcast: Commercial Radio DPA SRS	**NOTE 1** 4.2 % (low use 1.5 %) DPA rate SRS Rate			
Audio Websites: Low use (< 20 %) Medium Use High Use (>80 %)	1.5 % 4.2 % 5.3 %			
AV Simulcast[37]	Same as SOCAN 2 & 17			
Game Sites	0.8 %			

36. A minimum penny rate charges apply in the case of downloads and on demand streaming.
37. Separate rates apply in the case of public broadcasters, CBC, TVO and TQ.