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The Value of Copyrights in Recorded Music: Terrestrial Radio and Beyond

With copyright regimes everywhere under threat from piracy and wide digital dissemination, conflicts have erupted over the fair market value of copyrights. What should Canadian artists and creators be paid for their work? A lot more than they are at present.

Marcel Boyer

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THE STUDY IN BRIEF

In today's digital age, copyright regimes everywhere face common piracy threats along with wide dissemination. Meanwhile, rights holders and users contest the market value of copyrights in public forums, legislatures and in the courts. Without agreement on value, there can be no fair copyright regime, leaving unprotected the livelihood of artists.

This *Commentary* discusses one battleground of this copyright battle – recorded music. This sector is particularly important for two reasons. First, recorded music is easily and broadly shared through digitization. Second, new technologies used to resell and distribute music such as Internet radio, webcasting and on-demand streaming raise the possibility of large-scale dissemination and customization, while Internet radio also opens markets to less known artists who may be better able to reach an audience for their works.

Whether fought in the media, public policy circles or at regulatory hearings before copyright boards, these conflicts center mainly on the proper compensation for use of copyrighted material. The root of those conflicts is the difficulty of properly valuing the intellectual property rights of authors, composers, performers and makers.

This *Commentary* shows that it is possible to determine the competitive value of recorded music in the terrestrial radio industry from the behaviour and broadcast choices of radio operators. This value can help implement a fair copyright regime. It can also be extended to Internet radio webcasting to assess the payments due to rights holders in this competing sphere.

The author's analysis determines a competitive value of recorded music about 2.5 times greater than the current level of copyright payments. In 2012, this would have meant that royalty payments should have been about \$440 million compared to the estimated \$178 million.

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The world of intellectual property (IP) is in turmoil. In today's digital age, copyright regimes everywhere face common piracy threats along with wide dissemination.

Meanwhile, rights holders and users contest the market value of copyrights in public forums, legislatures and in the courts. Without agreement on value, there can be no fair copyright regime, leaving unprotected the livelihood of artists.

IP rights, including in the music industry, attempt to balance users' and creators' interests. But commerce requires that the products sold have efficiently set prices. In the absence of functioning markets, prices are set through administrative bodies such as copyright boards.

This *Commentary* discusses one battleground of this copyright battle – recorded music. This sector is particularly important for two reasons. First, recorded music is easily and broadly shared through digitization. Second, new technologies used to resell and distribute music such as Internet radio, webcasting and on-demand streaming raise the possibility of large-scale dissemination and customization, while Internet radio also opens markets to less known artists who may be better able to reach an audience for their works.

Among broadcasters using recorded music, commercial music-format¹ terrestrial radio is of particular interest. The commercial radio industry packages recorded music together with other

content, mainly “talk” in different forms, to generate an audience of interest to advertisers. Each radio station finds its niche, by selecting both a music type and a talk type.

The Issues

Costly conflicts between users and creators: Whether fought in the media,² public policy circles or at regulatory hearings before copyright boards, conflicts centre mainly on the proper compensation for use of copyrighted material. The root of those conflicts is the difficulty of properly valuing the intellectual property rights of authors, composers, performers and makers.

In this *Commentary*, I will show that it is possible to determine the competitive value of recorded music in the terrestrial radio industry from the behaviour and broadcast choices of radio operators. This value can help implement a fair copyright regime. It can also be extended to Internet radio webcasting to assess the payments due to rights holders in this competing sphere.

There are three reasons why terrestrial radio is a useful subject for determining royalty rates: (a) it is a well-defined, well-developed and mature

In completing this *Commentary*, I greatly benefited from comments by Benjamin Dachis and anonymous referees. Needless to say, I remain solely responsible for all remaining errors or omissions.

- 1 In music-format radio stations, music represents at least 20 percent of programming content. Talk-format radio stations use music less than 20 percent of the time. I restrict my attention here to music-format radio stations.
- 2 Among numerous recent cases, see the conflict between the webcaster Spotify and singer Taylor Swift at <http://business.financialpost.com/2014/11/05/taylor-swift-takes-on-spotify-but-shell-likely-lose-in-the-end/>. See also <http://www.theguardian.com/music/2013/oct/11/david-byrne-internet-content-world> and <http://flavorwire.com/471802/musicians-drinking-the-spotify-haterade-the-collected-complaints>.

industry with extensive data on revenues and costs; (b) it involves different rights and groups of rights holders; and (c) the observed music royalty rates and payments in that industry are often used as a proxy to determine the music royalty rates and payments in other contexts and industries, including relatively new industries such as Internet radio webcasting, online streaming and/or semi-interactive or interactive webcasting.³

My main findings are:

- The approach followed by the Copyright Board of Canada to determine the competitive value of copyrights in the commercial terrestrial radio industry has deprived rights holders of significant royalty payments;
- Such undercompensation is carried over to Internet radio webcasting since royalty payments in new broadcasting technologies are based in part on the royalty regimes in terrestrial radio broadcasting;⁴ and
- Failing to take into account the major differences between new broadcasting technologies and over-the-air broadcasting is detrimental to rights holders as well as to the Internet radio industry itself.

In this *Commentary*, I propose a compensation level that is fair and equitable for both sellers and buyers. First, I ascertain the competitive market value of recorded music based on the behaviour and choices of commercial terrestrial radio operators. I then

apply this competitive value to the Internet radio industry, as both are competing for listeners.

Setting a Value on IP: In a market situation where both sellers and buyers are participating voluntarily, the seller is receiving a price the buyer has agreed to and the buyer is paying a price the seller has agreed to. Buyers and sellers will transact up to the point where marginal value of an additional unit for the buyers (demand) is equal to the marginal cost of that additional unit for the seller (supply), where relevant marginal value and cost concepts may be the short-run or all-inclusive long-run ones, depending on the context.

My core recommendation concerns the Copyright Board of Canada, whose mandate is to establish royalties when copyright is administered by a collective such as the Society of Composers, Authors and Music Publishers. I suggest that the board set royalty rates based on the marginal value, not the total value, of recorded music content. This marginal value can be determined through economic analysis of the behaviour and choices of commercial radio operators and other users.

How would marginal-value compensation work in practice? I calculate the current marginal value of recorded music from the broadcasters' mix of music and other programming, given current royalty rates, and, the compensation paid to on-air talent. I recognize that a change to royalty rates may lead

3 This *Commentary* builds on testimonies I provided over the years as an expert witness before the Copyright Board of Canada and the supporting reports that I co-authored: "The Value of Performers' Performances and Sound Recordings to Commercial Radio Stations" (with Paul Audley and Stephen Stohn) for the 2004 Commercial Radio hearings and "The Value of the Use of the CSI Repertoire by Online Music Services" (with Joël Blit and Paul Audley) for the 2013 Online Music Services hearings. See also Paul Audley and Marcel Boyer, "The 'Competitive' Value of Music to Commercial Radio Stations," *Review of Economic Research on Copyright Issues* 4(2), 2007, 29-50; Marcel Boyer "The Canadian Copyright Board: Economic Concepts and Principles in Decisions and Arguments," pp. 61-99 in Ysolde Gendreau (ed.), *Copyright Board of Canada: Bridging Law and Economics for 20 years*, Carswell, 2011; Marcel Boyer, "The Economics of Fair Use/Dealing: Copyright Protection in a Fair and Efficient Way," *Review of Economic Research on Copyright Issues* 9(1), 2012, 3-46; and Marcel Boyer, Michael Trebilcock, and David Vaver (eds.), *Competition Policy and Intellectual Property*. Irwin Law, April 2009, 494 pages.

4 See, for instance, the recent May 2014 Re: Sound Tariff 8 decision of the Canadian Copyright Board, paragraphs 118, 151, 152.

to music producers altering their production and to radio stations modifying their program mix, depending on the sensitivities (elasticities) of supply and demand of recorded music to the change in royalties.

These modifications would, in turn, affect marginal values, also impacting royalty rates. The Copyright Board's royalty rates should reflect the foreseeable change in behaviour of producers and users that will occur as a result. It must also consider the impact of the competition between terrestrial radio and Internet radio as well as their respective characteristics in setting royalty rates. In the end, the board should set royalties as a percentage of revenues in terrestrial radio and as a per-play rate in Internet radio. This is a way to ensure a fair playing field.

Copyright and Economic Growth

An efficient IP regime encourages the development of quality IP assets while maximizing their use and dissemination, thereby favouring further creativity and innovation.

Core industries whose primary purpose is to create, produce, distribute or exhibit copyrighted materials include sectors such as computer software, videogames, books, newspapers, periodicals and journals, motion pictures, recorded music, and radio and television broadcasting. Many other industries rely on copyright protection in partial, non-dedicated, or interdependent ways. Indeed, copyrights permeate the whole industrial fabric. A recent International Intellectual Property Alliance report estimated that the value of US core copyright industries in 2012 exceeded 6.5 percent of GDP (Siwek 2013). When associated industries were included, the value added reached 11.3 percent of GDP.⁵

IP assets such as copyrights have become increasingly significant factors of growth and social well-being in the contemporary economic landscape. What makes IP assets unique is their nature as an economic good: the use of an IP asset by one individual does not impair its use by someone else. The preferred economic approach to the information-good nature of recorded music is to grant copyrights to the producers or creators to foster the development of market-like processes and institutions aimed at maximizing exchanges between willing buyers and willing sellers of copyrighted goods. However, this information-good characteristic generates a conflict between what economists refer to as static, or short-term, efficiency and dynamic, or long-term, efficiency. Indeed, digitization makes possible relatively costless dissemination of copyrighted material. However, free does not mean costless. Creators must have an incentive to generate new material of good quality.

This short-term versus long-term efficiency conflict is particularly vivid in recorded music. Once produced, recorded music can be used, reproduced and shared at close to zero marginal cost. Short-term efficiency would call for a zero price so that listenership is maximized. Long-term efficiency requires adequate compensation for the resources (that is, capital, time, talent and creativity) used. For example, Italy's adoption of copyrights in the 18th century led to a significant increase in the number of new operas (Giorcelli and Moser 2014).

From one perspective, this conflict between two efficiency objectives is a struggle between copyright as a necessary instrument to ensure creators are adequately compensated and copyright as a means of conferring market power on rights holders. The exercise of such market power will typically constrain the use of copyrighted works and therefore make society as a whole worse off.

5 Canadian data have not been updated for more than a decade.

Economists have studied this dilemma for many years. Two possible solutions are: implement a lower-than-optimal production under a close-to-zero price or a lower-than-optimal dissemination under a positive price.⁶

Copyright in Canada

In Canada, original artistic, music and literary works (including computer programs and photographs) are automatically protected by copyright. Ideas are not protected unless and until they are expressed in text, composition, recording, picture or drawing.

Copyright provides the creator with the exclusive right to produce or reproduce a work or a substantial part of it in any form, including the right to perform the work or to publish it. Those who want to use the work must get the copyright holder's permission. Copyright protection also extends to artists' performances, sound recordings and communication signals, but under the more limited form of a right to fair and equitable compensation.

The copyright owner is usually the author of the work, or any other person (individual or legal entity) to whom copyright is transferred. In general, copyright extends to 50 years after the creator's death or the original creation date. After that, the work becomes part of the public domain and anyone can use it freely.

Creators and users, generally through intermediaries, representatives, associations or collectives, routinely negotiate the use of copyrighted works and reach agreements specifying the scope and duration as well as compensation

for such use. When the administration of such copyright has been entrusted to a collective-administration society, the Copyright Board of Canada, an independent quasi-judicial tribunal created under the *Copyright Act*, steps in. In the case of recorded music protected by copyright, the board intervenes to establish, either through its legal mandate or at the request of an interested party, the compensation level or structure of royalty rates (see Box 1). The board may also supervise agreements between users and licensing bodies and issue licences when a copyright owner cannot be located.

As well, the board ascertains the competitive value of copyright in particular contexts after hearing arguments from the disputing parties. In so doing, it may also rely on proxies and benchmarks, as well as agreements between related or similar parties. In a sense, the board acts as a surrogate for competitive markets in striking an equilibrium between the interests of rights holders as willing sellers and the interests of users as willing buyers without market power being exercised on either side.

The *Copyright Act* contains some exceptions intended to favour dissemination of some copyrighted works, to curb excessive market power by rights holders, to recognize freedom of expression and to recognize that original works always build on previous works. One exception is known as fair dealing. It says that using copyrighted works for the purposes of research, private study, education, parody or satire, as well as criticism and review and news reporting, may not infringe copyright if certain conditions are satisfied.⁷ Such admissible uses of authors' or creators' intellectual property do not require authorization and do not give a right to royalty compensation.

6 For a more complete discussion of necessary distortions in the context of welfare economics, see Marcel Boyer (2012).

7 Those conditions have been established by the Supreme Court of Canada in decisions such as: *CCH Canadian Ltd. v. Law Society of Upper Canada*, 2004 SCC 13, [2004] 1 S.C.R. 339; *Alberta (Education) v. Canadian Copyright Licensing Agency (Access Copyright)*, 2012 SCC 37; *Society of Composers, Authors and Music Publishers of Canada v. Bell Canada*, 2012 SCC 36, [2012] 2 S.C.R. 326.

Box 1: The Actors: How Copyright Works in Canada

Canada's *Copyright Act* is jointly administered by two federal departments – Industry Canada and Canadian Heritage. The Act was proclaimed in 1921 and substantially amended in 1988 and 1997. Several attempts were made between 2005 and 2011 to further amend the Act, but failed to pass due to political opposition. In 2011, with a majority in the House of Commons, the Harper Government introduced Bill C-11, the *Copyright Modernization Act*. It passed and received Royal Assent on June 29, 2012.

Copyright compensation for recorded music is mainly determined by the Copyright Board of Canada, which is asked by stakeholders such as rights holders and broadcasters to set royalty rates for blanket licences to broadcast copyrighted music. Blanket licences significantly lower negotiation or transaction costs.

The communication rights of authors and composers (music publishers) are managed by SOCAN, the Society of Composers, Authors and Music Publishers of Canada. The communication rights of performers and makers (record labels) are managed by Re:Sound (formerly known as the Neighbouring Rights Collective of Canada). The reproduction rights of authors and composers (music publishers) are managed by CSI Music Services, a joint venture of CMRRA, the Canadian Musical Reproduction Rights Agency, and SODRAC, the Society for Reproduction Rights of Authors, Composers and Publishers in Canada. Finally, the reproduction rights of performers and makers (record labels) are managed by CONNECT Music Licensing (formerly known as Audio-Video Licensing Agency) and the *Société de gestion collective des droits des producteurs de phonogrammes et vidéogrammes du Québec*.

To avoid unintended harm and to foster efficient means of exchange between users and creators of copyrighted works, while respecting the rights of both, fair dealing must involve a balanced approach in accordance with the conditions and factors of use stipulated by the Supreme Court of Canada.⁸

The Competitive Value of Music Copyrights in Radio

It is not easy to identify the competitive value of copyrights in recorded music; that is, the

appropriate compensation for transactions between willing buyers and willing sellers. Music copyrights come in many forms or categories, which are managed under different contractual arrangements. They involve creators (authors and composers) of musical works, performers and makers (producers of sound recordings), intermediaries (music publishers, record labels, collective societies) and end users (individuals, organizations such as restaurants, hotels and movie studios) and resellers (such as terrestrial and Internet radio, TV stations and online music services).

⁸ For a theoretical economic discussion of those factors in light of the principles of balance and respect for the rights of all concerned, along with the principles of efficiency as put forward by the Supreme Court of Canada, see Boyer (2012).

There are two main ways to determine the competitive value of copyrights. It can be done through direct negotiations between creators and users or their representatives, or through the Copyright Board of Canada or similar bodies elsewhere. This *Commentary* deals primarily with the Copyright Board of Canada's determination of recorded music copyright values in commercial music format radio.

The competitive market value of music copyrights differs significantly from the total value of recorded music for end users. The market compensation of an input is based on its marginal value, not on its total value in the production process. In terrestrial and Internet radio, for example, the copyright royalties to be paid to rights holders as competitive compensation will differ significantly from the total value of recorded music for broadcasters. There is typically no clear relation between marginal and total values. I will show that the confusion between marginal and total values may have deprived rights holders of significant revenues in recent decades.

Copyrights in recorded music fall into four different baskets. First there are two rights: the communication right and the reproduction right. Second, there are two groups of rights holders, the authors and composers (music publishers), and the performers and makers (record labels). In each of these four baskets, one finds a right and one of the rights holders' groups. The sharing of total royalty payments is an important issue by itself, but my concern here is the determination of the aggregate competitive value, not its distribution across the different baskets.

The transaction costs incurred in negotiating compensation with each author, composer, performer and maker for each sound recording would be astronomical relative to the value of the traded music. The result is that parties prefer to deal with each other under a broad and encompassing blanket licence, priced if necessary by an impartial independent body. In such a context, the role of institutions such as the Canadian Copyright Board or the US Copyright Royalty Board is to act as surrogates for competitive markets by determining, based on the best evidence possible, what the competitive price or compensation formula would be.

The royalty levied on different users of recorded music as copyrighted goods must be assessed by determining what such users would willingly pay in a competitive negotiation or market environment. The compensation structure should allow users to demand quantities and qualities of recorded music as close as feasible to what efficiency would suggest considering the information-good nature of recorded music.

The determination of a competitive market value or compensation for rights in recorded music must satisfy one basic principle: it should correspond to what willing buyers and willing sellers would agree on if an efficient competitive negotiation for music copyrights existed.

On the demand side, the buyer (in this case a terrestrial radio station) will want to use a quantity of recorded music such that its marginal value product⁹ is equal to its price, or marginal cost, or to its marginal opportunity cost.¹⁰ The marginal value product of recorded music corresponds to the

9 Economists use the terms marginal value product, value of marginal product and marginal revenue product interchangeably. For my part, I use "marginal value product."

10 The difference between marginal cost and marginal opportunity cost becomes particularly relevant when an additional constraint exists. For instance, the total time devoted to music and talk cannot be more than the available program time.

additional (advertising) revenue an operator can obtain from using one additional unit (minute) of music. This additional revenue is determined by multiplying the selling price, or advertising rates of the terrestrial radio product, by the marginal product or productivity of music in attracting listeners of the desired type. A similar process applies to the purchase of other inputs such as talk content.

On the supply side, the seller is the music producing industry, comprising authors/composers, performers and makers of sound recordings. They may use two marginal cost concepts, sometimes creating confusion. These are (i) the marginal cost of creation and production – the direct material cost, the opportunity value of time spent or invested, the opportunity value of the creation/innovation effort in writing/composition, performance/interpretation and fixation in a sound recording; and (ii) the marginal cost of reusing the work or reproducing the sound recording. The first cost may be significant for high-quality works, while the second will typically be low, even near zero. Both marginal cost concepts are relevant depending on the context. In any case, all inputs or factors of production used in generating advertising revenues in the commercial terrestrial radio industry will be typically compensated at their respective competitive market value or “price” level.

Terrestrial radio station operators aiming to maximize profits will use recorded music and any other program content, such as talk, in such quantities and proportions that their respective marginal contribution to station profitability is the same; i.e., the last unit, play or minute of recorded music content and the last unit, play-equivalent or minute of any other program content such as “talk”

must generate or contribute the same net marginal profit (marginal revenue minus marginal cost). Otherwise, profitability would not be maximized and the operator would reduce its use of one input and increase the other given the total program time available.¹¹

For example, a broadcaster will devote one additional minute to music and, consequently, one less minute to talk, if the additional advertising revenue associated with the additional minute of music more than offsets any loss of advertising revenue due to the reduction of one minute of talk content. The opportunity cost of the additional music minute is the loss of advertising revenue due to the reduced minute of talk. The same applies for talk versus music. In responding to the market forces in the advertising and content markets, a radio broadcaster will allocate music and talk so that there is no opportunity to increase profits by reallocating minutes between music and talk. This implies that the marginal value of the last minute of talk must be equal to the marginal value of the last minute of music.

This equality of marginal values reveals a common competitive per-minute value or “price” for music and talk. In other words, if the station operator had to pay for music and talk on a per-minute basis and the same per-minute price were in effect for both, the operator would choose a program time allocation for which marginal values of music and talk would be the same, satisfying the basic condition for profit maximization.

We can interpret this common marginal value of the last minute of music and the last minute of talk as the implicit competitive per-minute “price” of both talk and music.¹² Compensating both

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- 11 It is important to stress here that the user or buyer of copyrighted recorded music is the radio station, not the final consumers or listeners. Hence, I do not use the “club good” value concept corresponding to the (vertical) sum of individual values.
- 12 I use the expression “implicit competitive per-minute price of talk and music” because it is not really a price in the usual sense, although it is akin to a market price.

inputs at that implicit competitive per-minute price implies that payments for music and talk must be proportional to their respective program time allocation. See the Appendix for a graphical representation of this reasoning.

Valuing Music versus Talk: Different data sources point to a relatively stable 75 percent share for music in terrestrial radio programming.¹³ Audley and Boyer (2007) disaggregated the typical radio programming day into different parts – music as a percentage of program time, advertising rates and revenues, and payments for on-air talent vary by time of day – and derived a conservative weighted music content percentage of 60 percent, with the complementary 40 percent being talk content.

Accounting data for terrestrial radio stations indicate that the level of payments for talk content or on-air talent amounts to 18.3 percent of revenues.¹⁴ As such, one can compute the competitive market value of recorded music as 18.3 percent multiplied by 1.5, the mathematical value of the 60/40 music/talk ratio.

The result, my most important conclusion, is that the estimated music competitive market value is 27.5 percent of revenues. Again, this is not an opinion, but rather the implication of the observed behaviour and choices of terrestrial radio station operators.

The total contribution, or total value, of each type of content – that is, its respective capacity to generate advertising revenues – is arguably much larger than the competitive market payments to be made since the latter are based on marginal values. In fact, there is only a weak link between

total value and marginal or competitive value; i.e., music and talk may have the same marginal value per minute or per-play and at the same time have very different total contributions to the profitability of the terrestrial radio industry. But competitive markets base compensation on marginal values not on total values. Therefore, even if talk content contributed more to the profitability of radio stations than recorded music, it does not follow that the competitive market compensation (based on marginal contribution) of talk should be larger – or vice-versa, if recorded music contributed more to profitability than talk.

Given that the Canadian music-format terrestrial radio industry generated revenues of about \$1.6 billion in 2012, the competitive market value of recorded music on which royalty payments should be based, as revealed by the observed behaviour and choices of terrestrial radio operators, would amount to slightly more than \$440 million (27.5 percent of \$1.6 billion).

This amount is about 2.5 times higher than the current total royalty payments before adjustments (11.2 percent of revenues).

Given that the total available play-equivalent program time in the Canadian terrestrial radio industry is about 232 billion plays,¹⁵ the 60/40 split translates into some 139.2 billion recorded music plays. The royalty compensation, therefore, should be 0.316 cents per play based on the total competitive value of \$440 million from above; i.e., \$440 million divided by 139.2 billion. (Talk content represents 92.8 billion play-equivalents. And with a \$293 million [18.3 percent of \$1.6

13 In its May 2014 decision (Re:Sound Tariff 8, paragraph 170), the Copyright Board uses a 2011 programming time share for music of 80.6 percent.

14 The data come from a sample of 27 stations and was presented to the Canadian Copyright Board by Erin Research. See Audley and Boyer (2007).

15 A play is one piece of recorded music, typically just under four minutes, broadcast to one listener. The data on the total hours of commercial-music-format radio broadcasting and total listenership are for the year 2007.

billion] competitive value, it translates into the same compensation of 0.316 cents per equivalent-play [\$293 million divided by 92.8 billion].)

Two issues are worth raising at this point. First, the above analysis does not mean that the pricing of recorded music on terrestrial radio should be done on a per-minute or per-play basis. It is not and should not. Since the short-run marginal cost of using additional minutes of recorded music is indeed zero, the marginal price should also be zero. This is achieved if royalties are paid as a percentage of revenues, as they are paid now, not as a function of the exact quantity of recorded music used. Nevertheless, the implicit competitive price, corresponding to the common marginal opportunity cost of recorded music and talk, remains positive.

Second, if an input such as recorded music were priced below its competitive market-equilibrium level, then other input providers such as talk, direct labour and capital, as well as advertisers, would benefit from partially capturing the market value of recorded music. The recognition and correction of such anomalies would trigger adjustments in related input markets as well as in advertising rates. This illustrates the potential pitfalls in using historical values to assess the competitive market value of copyrights when the pricing of copyrights may have been distorted for many decades. The competitive market-pricing model developed here does not rely on historical values. As for overall effects, it is sufficient to mention that competitive pricing and compensation are always a positive factor for social efficiency and welfare.

Although my results indicate that the competitive market value of recorded music is about 50 percent higher than the compensation received by on-air talent, they do not mean that recorded music is more important in generating advertising revenues. Competitive market values of inputs are based on their respective marginal value products or marginal contributions, not on their total contributions.

An important caveat is that such an evidence-based recalibration of royalty payments for recorded music would modify in a significant way the structure of terrestrial radio operations, expenses and revenues. Therefore, any analysis by the Copyright Board of the appropriate royalties should take into account any responses by music producers and broadcasters to the new rates.

Beyond Terrestrial Radio: Internet Radio and Webcasting

The economic characteristics of the new technologies for reselling and distributing music, known as Internet radio (Web radio, net radio, streaming radio, e-radio, online radio and webcasting) are significantly different from those of terrestrial radio. Terrestrial radio is largely regulated, with important barriers to entry, and has little scope for customization. Internet radio is almost unregulated, has low entry costs, and offers the potential of large-scale customization.

The supply of terrestrial radio services is limited by the availability of licences, itself constrained by the availability of appropriate spectrum bands. Supply of Internet radio services is not similarly constrained. While Internet radio offers low entry costs, its operating costs grow quasi-linearly with the number of listeners. In contrast, terrestrial radio's entry cost is high but operating costs are somewhat independent of the number of listeners. Those characteristics pose significant challenges to the radio industry and, in turn, to rights holders in recorded music.

Commercial terrestrial music format radio is an ad-based, subscription-free service that reaches all listeners within range of the emitting station at the same cost. Internet radio uses bandwidth whose cost increases with the number of listeners. Two business models exist for Internet radio or webcasting – an ad-supported, subscription-free model and an ad-free, subscription-based model.

For example, US-based Pandora Internet Radio offers the two systems: it gets about 88 percent of its revenue from an ad-supported, subscription-free service and 12 percent from its ad-free, subscription-based service. Pandora has some 200 million customers, mostly in the United States, and streamed 17 billion hours of radio in 2013 while generating about US\$650 million in revenues.¹⁶ This revenue level is 10 times more than that of the largest US terrestrial station.¹⁷ Over the last five years, Pandora's customers have created or defined some five billion customized radio stations. As a point of comparison, the number of US commercial terrestrial radio stations was 11,357 as of December 2014.¹⁸

The technological differences between Internet and terrestrial radio give rise to potential economies of scope; that is, to a joint and integrated use to generate increased value. For example, terrestrial radio is more cost efficient in reaching large audiences. As noted, since Internet radio bandwidth costs increase almost linearly with the number of listeners, it is therefore better suited for niche audiences, although bandwidth costs may be dropping. Internet radio allows for individualized advertising, that is, targeted to the individual listener as well as behavioural advertising linked

to the listener's location or activity at the time of listening.¹⁹

Some media companies already provide both Internet and terrestrial radio.²⁰ Although about 90 percent of all radio is currently terrestrial, it is clear that Internet radio is already a significant competitor. As Pandora puts it:

We compete for listeners with broadcast radio providers, including terrestrial radio providers ... and satellite radio providers ... Many broadcast radio companies own large numbers of radio stations or other media properties. Many terrestrial radio stations have begun broadcasting digital signals, which provide high quality audio transmission. In addition, unlike participants in the emerging Internet radio market, terrestrial and satellite radio providers, as aggregate entities of their subsidiary providers, generally enjoy larger established audiences and longer operating histories (FY2013 10-K SEC Filing).

Since Pandora and most webcasters are direct competitors with terrestrial over-the-air radio, it is important that a level copyright playing field be established for the two broadcasting technologies.

Avoiding the destructive competitive trap: The Internet radio industry is bound to experience a fall in prices toward marginal delivery costs, a situation

16 The data on Pandora are adjusted to a 12-month period, based on Pandora 10-K SEC filings of 31 January 2013 and 31 December 2013. The adjustment is due to a change of fiscal year, from February/January to January/December.

17 According to James Cridland (managing director, MediaUK), the largest terrestrial stations are WTOP (Washington, D.C.) with US\$64.6 million in revenues, KIIS (Los Angeles) with US\$56.8 million, and Z100 (New York) with US\$48.2 million. Presentation available online at: https://www.youtube.com/watch?v=xKwg1bA-FVI&feature=player_embedded.

18 Data from the U.S. Federal Communication Commission at http://transition.fcc.gov/Daily_Releases/Daily_Business/2015/db0107/DOC-331381A1.pdf.

19 See footnote 20 and also Franc Kozamernik and Michael Mullane (2005), "An Introduction to Internet Radio," *European Broadcasting Union Technical Review*, October, 15 pages.

20 For example, RadioDNS defines itself as hybrid radio since it is both terrestrial and Internet based. It claims that: "RadioDNS provides the link between what you're broadcasting over FM, DAB, HD Radio (or other broadcast platforms) and what you can also provide over an Internet connection. This lets you combine the power of broadcasting to reach many people, in many places very cost effectively and the power of the Internet to deliver enhanced or personalised content. Put simply, it makes better radio (<http://radiodns.org/>)."

which can be postponed only if differentiation strategies and brand name recognition are successful. Pandora, Apple iRadio, Spotify, Songza, Deeze and the like are similar but with a twist. For example, Pandora's music genome project makes it the leader in customized Internet radio with a 70 percent US market share.²¹

Insofar as the cost of entry in Internet radio is relatively low, the intensity of competition will be high in this sector with the resulting effect of dragging prices to marginal costs, hence making it difficult to cover fixed costs. If that is so, many music webcasters not only will continue to lose money but also will be unable to pay market-based fair and equitable compensation to rights holders. In cases of this type, competition may be too intense, even destructive of value.

Indeed, rights holders are often residual payees in commercial radio and will be properly compensated only if the firms, which package and resell recorded music, can make a competitive profit. Otherwise, they will likely be compensated at a level much below the competitive market value of their recorded music. This is what seems to be happening in Internet radio.

One way out of this situation is to require Internet radio services to pay for copyrights in recorded music on a per-play basis rather than as a percentage of revenues since numerous webcasters generate very little revenue while using a large

amount of music. In fact, the US Copyright Royalty Board has favoured a per-play compensation for rights holders in Internet radio. The Canadian Copyright Board has moved in that direction in its May 2014 decision on Re:Sound Tariff 8: "We opt for a per-play tariff because it is better correlated with usage, because it monetizes music given for free, because usage is more readily and reliably measurable, because it is technologically possible and because it is a transactional price" (par. 115).

A per-play royalty payment formula may raise costs for Internet radio providers, thereby limiting entry to providers capable of developing a profitable business model based on differentiation.²² The reduced competition makes it likely that the Internet radio industry will develop and prosper by offering value-added radio services while ensuring proper compensation of rights holders, as well as for direct labour, innovation efforts and invested capital.²³

In this regime, the per-play rate should be compatible with that observed in commercial terrestrial radio, again to ensure a level playing field in radio competition. In Pandora's case, it paid some US\$345 million, or 53 percent of its 2013 revenues, to rights holders. Its royalty payments that year represented 2.05 cents per listener-hour or 0.134 cents per-play.²⁴ I showed above that a fair per-play rate should be in the order of 0.316 cents in terrestrial radio (Canada), a significantly higher

21 This proportion is based on the top 20 US stations and networks.

22 One interesting case is that of AccuRadio which, according to *Business Week* (Olga Kharif, "The Last Days of Internet Radio," *Business Week*, 2007-03-07), offered 300 channels of music and lured over one million visitors a month, employed six full-time staff, recorded US\$500,000 in sales and paid some US\$50,000 in royalties. The 2007 decision of the Copyright Royalty Board to switch from royalties as a percentage of revenues to royalties as a per-play rate would raise royalty fees tenfold. It would increase AccuRadio's royalties payout to about \$600,000, as the per-play rate is expected to reach 0.14 cents (two cents per listener-hour for 14 songs per hour). Joe Kennedy, CEO of Pandora, is quoted as saying, "[Those] rates are disastrous."

23 Webcasting firms could be expected to realize normal returns in what would become a relatively stable monopolistically competitive industry.

24 For more on Pandora's finances, risks and relations with rightsholders, see Pandora's SEC 10-K filing.

rate than Pandora pays, even when accounting for exchange rate differences.²⁵

A move from 0.134 cents to 0.316 cents per-play will have significant impacts on the industry, in particular through the reduced intensity of competition in Internet radio. However, 0.316 cents per-play is indicative only of the direction royalty payments should take, as adjustments in the structure and financial operations of radio stations will clearly take place over time and affect that number.

CONCLUSION

The observed behaviour of Canadian terrestrial radio station operators reveals a competitive value of recorded music about 2.5 times greater than the current level of copyright payments. In 2012, this would have meant that royalty payments should

have been about \$440 million compared to the estimated \$178 million, before adjustments for repertoire, exemptions, concessions, legal provisions, tiering, etc.

Translated into Internet radio per-play rates, this means an increase from the 0.134 cents per-play rate being paid by Pandora and the 0.21 cents per-play set by the US Copyright Royalty Board toward a 0.316 cents per-play rate. Equal royalty rates, although with a different formula, will ensure a level playing field of competition between terrestrial and Internet radio.

These estimated competitive market royalty rates will trigger adjustments in the terrestrial and Internet radio industries. It is important to anticipate and take into account those adjustments. The resulting royalties will in the end depend on them.

25 The Canadian and US dollars were on average almost at par during those periods.

APPENDIX:

MODELLING THE COMPETITIVE VALUE OF RECORDED MUSIC IN TERRESTRIAL RADIO

Economic theory allows us to establish the link between the relative use of inputs, recorded music and talk, in the production of an audience to be sold to advertisers and the relative competitive market value of those inputs.

Let us consider a simple model with the following simplifying assumptions, which are made to facilitate the narrative but are not essential to the key results: terrestrial radio operators choose different program contents to maximize profit; all station revenues come from advertising; program content is of two types, namely “music” and “talk”; the program time available per period or day segment is given; different program contents are used in one-minute increments (the analysis could similarly be conducted on the basis of per-play or per-play equivalent increments); the additional or marginal cost to the radio operator of one-minute increments in music and talk content are both zero, since the payment for music copyrights is typically set as a percentage of station revenues and the payment for talk content is typically set on a contract basis with a zero marginal cost over a relevant time range.²⁶

If a terrestrial radio operator chooses (see Figure 1) an (M, T) allocation of program time between music M and talk T , it must be because this allocation is expected to maximize the profits of the station. Given an available F minutes of

program content, the marginal value product (mvp) of music content measured in minutes from left to right in Figure 1 is decreasing and the marginal value product of talk content measured in minutes from right to left is also decreasing. The profit maximizing program time allocation is reached at the intersecting point where $mvp(M) = mvp(T)$, with $M + T = F$. The last minute of each type of content generates the same marginal advertising revenue.

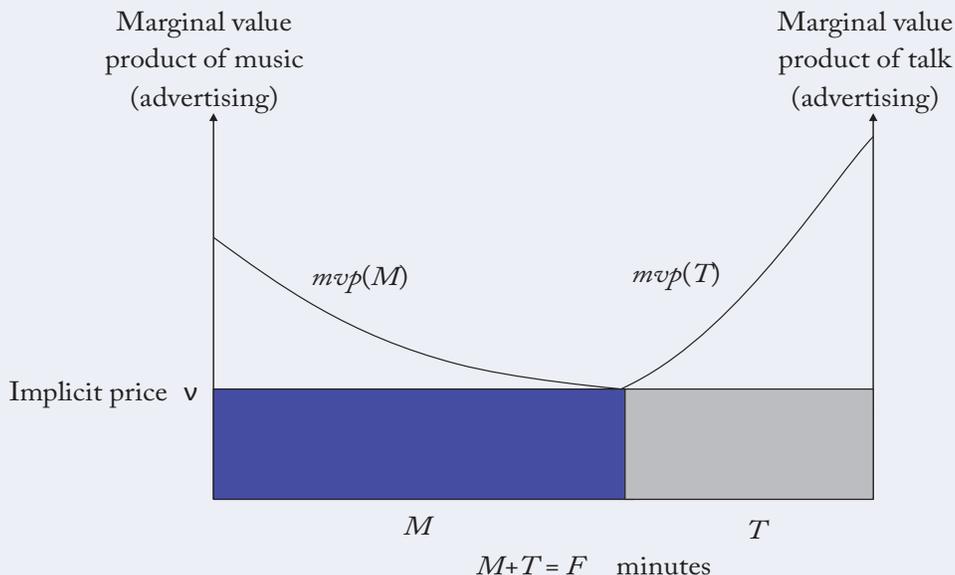
The closest proxy to the marginal values of music content and talk content is the marginal, not the total, contribution of each to advertising revenues: the equal marginal contribution at the intersection of the two mvp curves is the implicit competitive per-minute market price of both music and talk. Indeed, confronted with that single and common per-minute price of music and talk, the profit maximizing terrestrial radio operator would choose the amount of music M and the amount of talk T which equate their respective marginal value product.

The competitive market payments for music and talk, based on their common marginal contribution, are proportional to their respective program time. Those payments appear as the blue or dark-shaded rectangle and the grey or light-shaded rectangle in Figure 1. This proportionality is not an assumption made or an opinion expressed by outside analysts or experts – technologists, lawyers, judges, or economists – but a direct implication of the profit maximizing choices and decisions of the terrestrial radio operators themselves.

It is important to stress at this point that the (M, T) allocation is chosen by the terrestrial radio

26 The assumption of a zero marginal cost of music content is more a fact than an assumption. For the purpose of music royalty payments, music stations, those with more than 20 percent of the broadcast day accounted for by music, pay royalties for sound recordings as a percentage of advertising revenues, irrespective of the precise use of music in program content. A zero marginal cost of talk content is also reasonable since hosts are typically hired per on-air segments rather than on a per minute basis.

Figure 1: Profit-maximizing Time Allocation



Source: Audley and Boyer (2007).

operator on the basis of his/her knowledge of the $mvp(M)$ and $mvp(T)$ curves. Outside observers, such as economists, lawyers or judges, can observe the (M, T) allocation but not the curves themselves. Although we can affirm that the chosen (M, T) allocation must be profit maximizing, we cannot say how much music and talk do in fact contribute to the station's profits either absolutely or relatively.

To determine the competitive market royalty payments for music (the dark-shaded rectangle), one can use two available pieces of information: the relative use of music and talk, that is the (M, T) allocation, and the payment made for talk content (the size in \$ of the light-shaded rectangle). The relative program time devoted to music and talk in terrestrial radio is known from Canadian Radio-television and Telecommunications Commission and Statistics Canada sources, and the total

payments made for talk content can be obtained from commercial terrestrial radio operators.

Suppose a radio operator uses a variable quantity of some input, say talk, to produce an audience for advertisers. There is typically a competitive market for talk services. Radio operators express a downward sloping demand function for talk services; that is, a derived demand based on marginal value product of talk services. Individuals with proper talent express an upward sloping supply function of talk services; that is, a function of their personal marginal cost or opportunity cost. The market equilibrium price and quantity of talk services is determined by the intersection of supply and demand, say a price P and a quantity Q . When a radio operator buys q units of talk services, he pays Pq or P per unit. Is P an average value or a marginal value? It is an average price for the radio



operator as he pays P for each unit of talk services bought. But P is also equal to the common personal marginal cost of all providers of talk services. And P is also equal to the common marginal value product of talk services (itself equal to the common marginal opportunity cost) for all radio operators.

So P is both a marginal value and an average value, as usual. As far as efficiency or profit maximization conditions are concerned, it is the marginal value product and marginal opportunity cost (marginal value product = marginal opportunity cost) that are relevant.

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