

The Music Streaming Industry in the U.S. and EU: The Effects of the 2007 Copyright Royalty Board Decision on Venture Capital Investment

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Beginning in the mid- and late-1990s, the streaming music industry experienced significant growth; this growth was facilitated, in part, by the popular introduction on the Internet and the development of web browsers.³ However, in the 2000s, the streaming music industry's growth declined as a result of both the dot-com crash and regulatory changes and decisions that were seen as being detrimental for the webcasting business model.⁴ One decision that was seen as being particularly damaging to webcasters in the U.S. was a decision made by the Copyright Royalty Board (CRB) in March 2007, which dramatically increased internet royalties for the period from 2006-2010 for U.S. webcasters, and eliminated the distinction of "small" webcasters.⁵ Webcasters found the royalty rates for radio streaming too high for their business to remain profitable, and they began to lobby Congress.

This paper⁶ evaluates the impact of the CRB decision on the music streaming industry. Overall, our results indicate that the CRB decision had a significant and negative effect on private equity venture capital investment received by streaming music companies in the U.S.⁷ In the absence of the detrimental CRB decision, U.S. music streaming companies may have received an additional \$108 million of investment during our analysis period.

To evaluate the impact of the CRB decision, we use data from Thompson One on the frequency and the amount of private equity venture capital funding (referred to as PE investment) raised by music streaming companies. Potentially relevant companies were identified first by using a keyword search for general industry terms in the company description (yielding 1,155 companies),⁸ and second by careful manual categorization of these companies to insure that our sample represented only companies that provided web radio streaming as part of their business model.⁹ The process identified 59 streaming music companies which were used for our analysis.¹⁰ Company status (e.g. defunct, acquired, active private or public) for these companies were also obtained from Thompson One.¹¹ Given the high growth rate of the

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³ Coats, William Sloan, Vicki L. Feeman, John G. Given, and Heather D. Rafter, "Streaming into the Future: Music and Video Online," 20 Loy. L.A. Ent. L. Rev. 285, 2000; Fox, Mark, "E-commerce Business Models for the Music Industry" Popular Music and Society, 27:2, 2004; Searls, Doc, "Why are so Many Internet Radio Stations Still on the Air?" Linux Journal: Industry News, July 17, 2002.

⁴ Bray, Hiawatha, "Royalty hike could mute Internet Radio: Smaller stations say rise will be too much," The Boston Globe, March, 14, 2007; Karif, Olga, "The Last Days of Internet Radio?" Bloomberg BusinessWeek: Technology, March 7, 2007.

⁵ The distinction of "small" webcasters had been established in December 2002 under the Small Webcaster Settlement Act; qualifying small webcasters paid royalties based on a percentage of revenue or expenses rather than on a song per listener basis.

⁶ Funding for this research was provided by CCIA. All opinions contained in this study reflect the independent views and analysis of the authors alone.

⁷ We also analyzed whether the CRB decision affected the survival rates of streaming music companies. However, no discernible patterns were detected within our small sample of companies. This is largely due to the confounding effects of the dot-com crash, which makes the ultimate cause of failure unclear for any specific company.

⁸ Keyword search terms that were used included: "digital music," "digital radio," "internet music," "internet radio," "online music," "online radio," and "streaming music."

⁹ The keyword search alone was insufficient to identify these companies because, for example, many companies only offered links to other sites' web streaming features, or forums for artists to promote their own music, and thus were unlikely to have been affected by the CRB decision.

¹⁰ Thirty-seven of these companies were in the U.S., 20 were in the E.U., and four were in Asia (China, South Korea, and Taiwan). Asia was not included in the final analysis because of the small number of Asian webcasting companies.

¹¹ Companies that were labeled as acquired or defunct were researched to insure that they continued to provide radio streaming services through their acquisition or closure. If not, they were considered "defunct" as of the date they discontinued this service.

entire tech sector at the time, we also included data for all IT companies to normalize the funding rates for streaming music companies.¹² Investment amounts in active webcaster companies within each quarter between the first quarter of 1995 and the third quarter of 2011 were then summed across region (U.S. and EU) and sector (streaming and other music).

To identify the impact of the 2007 CRB decision on the music streaming industry in the U.S., we use a difference-in-difference-in-difference model. In particular, we examine how PE investment in the streaming music industry as a percentage of IT investment changed:

- before and after the CRB decision (the first difference);
- between the U.S. and the EU (the second difference, where we include PE investment in the EU to control for general trends in PE investment in the streaming music industry); and,
- between streaming companies and other music companies (the third difference, where we include PE investment in other music companies to control for general trends in PE investment in the music industry).

Our model takes the following form:

$$\begin{aligned} & \frac{PE\ Streaming_t}{Total\ IT\ Investment_t} \\ &= \beta_0 + \beta_1(US\ Dummy) + \beta_2(Streaming\ Dummy) + \beta_3(CRB\ Dummy) \\ &+ \beta_4(US)(Streaming) + \beta_5(Streaming)(CRB) + \beta_6(US)(CRB) \\ &+ \beta_7(US)(CRB)(Streaming) + \beta_8(Macro\ Controls)_t + \varepsilon_t \end{aligned}$$

Our dependent variable in this model is the percentage of private equity venture capital that was invested in music streaming companies relative to all private equity venture capital investment in IT in each quarter. Normalizing our dependent variable in this way allows us to control for the general increase in IT funding that occurred over this period. Dummy variables are used to identify all U.S. companies, all music streaming companies, and each quarter following the CRB decision. The coefficients β_4 , β_5 , β_6 , β_7 are the effects of interacting these dummy variables. These coefficients allow us to observe the differential effects of combinations of region, sector, and time frame of the investment percentage in streaming music. The coefficient β_7 is our primary interaction term of interest as it isolates the effect of the CRB decision on U.S. streaming music companies only. *Macro Controls* includes two control variables, GDP and broadband penetration (as a percent of population); these measures allow us to isolate the effects of the general macroeconomic conditions in each region and the technology status of the region on the investment percentage going into streaming music companies.¹³

The base model is run initially without the additional controls, and uses a three year event window around the CRB decision (to limit the impact of other time varying factors for which we do not control). Results from this model are presented in the first column of Table 1, and indicate that across all streaming companies (EU and U.S.), the PE investment percentage increased significantly after the CRB decision. This is consistent with the general growth trend that has been noted in this sector. Importantly, however, when the effect is limited to only U.S. streaming companies, our analysis shows that the CRB decision had a significantly negative effect on the amount of private equity invested in the music streaming industry (-0.00103%). Although this percentage may appear small, the implied losses are not insubstantial. Applying this percentage to the total IT investment in the U.S. after the CRB decision implies a loss of approximately \$108 million through the third quarter of 2011. In fact, this reduction in investment exactly offsets the gains that were experienced industry-wide after the CRB decision.

The results of our analysis are robust to widening the event window to four or five years prior to, and post, CRB decision, as shown in columns 2 and 3 of Table 1. Furthermore, our results are robust to the inclusion of GDP and broadband penetration as controls for the macroeconomic conditions and

¹² IT companies were identified using Thompson One's sector code for "IT."

¹³ Both GDP and broadband penetration measures for the EU are aggregated across all EU countries and weighted by population.

technology status of these regions over time (columns 4-6 of Table 1). Finally, considering the possibility that binding contracts may have slowed the industry response to the CRB decision, we also run the model using a lagged CRB dummy where the effect of the decision is lagged one, two, or three quarters. Our results also prove robust to this scenario.¹⁴

Thus, we find evidence that indicates that the CRB decision had a significant negative effect on the percentage of funding received by streaming companies in the U.S. In the absence of the detrimental CRB decision, U.S. music streaming companies may have received an additional \$108 million of investment.

Table 1
The Effect of the CRB Decision on Private Equity Investment in US Streaming Companies

Event Window	(1) CRB +/-3	(2) CRB +/-4	(3) CRB +/-5	(4) CRB +/-3	(5) CRB +/-4	(6) CRB +/-5
US Dummy	-7.78e-05 (0.000104)	-5.41e-05 (7.90e-05)	-3.56e-05 (6.37e-05)	-0.000305* (0.000158)	-0.000173* (0.000102)	-0.000138 (8.42e-05)
Streaming Co. Dummy	-8.13e-05 (0.000117)	-6.09e-05 (8.87e-05)	-4.88e-05 (7.14e-05)	-8.13e-05 (0.000117)	-6.09e-05 (8.18e-05)	-5.13e-05 (6.93e-05)
CRB Decision Dummy	0.000218 (0.000240)	0.000169 (0.000186)	0.000167 (0.000164)	-0.000458 (0.000333)	-0.000244 (0.000244)	-0.000179 (0.000228)
US*Streaming Co.	0.000179 (0.000147)	0.000130 (0.000112)	9.71e-05 (9.07e-05)	0.000179 (0.000173)	0.000130 (0.000113)	0.000107 (9.48e-05)
Streaming*CRB Decision	0.00103* (0.000598)	0.000864* (0.000470)	0.00100** (0.000461)	0.00103* (0.000578)	0.000914* (0.000489)	0.000904* (0.000487)
US*CRB Decision	-0.000194 (0.000243)	-0.000151 (0.000188)	-0.000153 (0.000166)	-9.14e-05 (0.000231)	-0.000102 (0.000191)	-0.000126 (0.000188)
US*Streaming*CRB	-0.00103* (0.000611)	-0.000770 (0.000482)	-0.000848* (0.000471)	-0.00103* (0.000602)	-0.000863* (0.000503)	-0.000839* (0.000498)
GDP				7.66e-05 (0.000106)	1.48e-05 (8.33e-05)	8.66e-06 (8.10e-05)
Broadband				0.00650** (0.00279)	0.00322** (0.00136)	0.00263** (0.00103)
Constant	0.000141 (0.000101)	0.000106 (7.67e-05)	8.45e-05 (6.18e-05)	-0.000630* (0.000338)	-0.000204 (0.000140)	-0.000133 (9.53e-05)
Observations	100	132	156	100	128	140
R-squared	0.217	0.184	0.213	0.259	0.219	0.223
Adjusted R-squared	0.157	0.138	0.176	0.185	0.159	0.169

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

¹⁴ These results are not shown here, but are available upon request.