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Economic contribution of the New Zealand music industry 2015

A report for the New Zealand music industry

Estimating the direct and indirect economic impacts of the New Zealand music industry

October 2016

pwc

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14 October 2016

Dear Damian

Economic contribution of the New Zealand music industry

We are pleased to provide our report on the economic contribution of the New Zealand music industry. This report contains the analysis of the domestic New Zealand music industry. It does not include the analysis of export and overseas earnings, which will be included in a separate report.

This report is provided in accordance with our terms of engagement dated 28 July 2016, and is subject to the Restrictions set out in Appendix C.

If you require any clarification or further information, please feel free to contact us.

Yours sincerely

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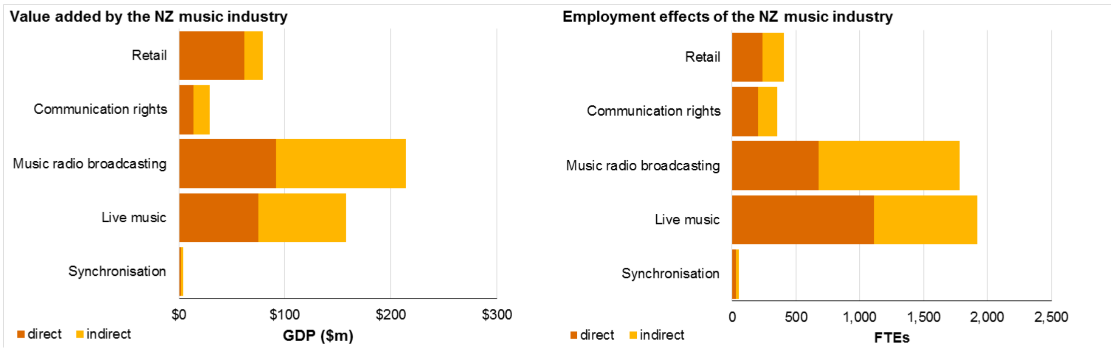
Executive summary

2015 was a year of growth for the New Zealand music industry. Following difficult conditions for many years including in 2014, four out of five market segments grew in 2015. Live music saw significant growth, while notably total retail revenue also grew, facilitated through the doubling of consumption via online streaming.

In 2015, the overall New Zealand music industry directly contributed $245 million to national gross domestic product (GDP) and the equivalent of 2,259 full time equivalent employees (FTEs). After accounting for multiplier effects, the music industry contributed a total of $484 million to national GDP and the equivalent of 4,508 full-time jobs.

Despite the strong performance in 2015, the industry faces a long road to recovery following historical decline. With the changing nature of consumption through digital channels, the industry has found new ways to monetise digital forms of consumption. This will continue to support growth in the industry.

Figure 1 GDP and employment impact of the New Zealand music industry (2015)



Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

Table 1 Direct and total economic impact of the NZ music industry (2015)

		Value added (GDP, $m)		Employment (FTEs)	
Industry sector	**Total sales ($m)**	**Direct impact**	**Total impact**	**Direct impact**	**Total impact**
Physical music	*$31.8m*	*$23.4m*	*$32.5m*	*131*	*224*
Downloads	*$26.0m*	*$16.0m*	*$19.2m*	*44*	*76*
Online streaming	*$36.8m*	*$22.7m*	*$27.3m*	*62*	*107*
Total retail	$94.6m	$62.0m	$78.9m	237	407
Communication rights	$42.7m	$13.8m	$28.9m	204	352
Music radio broadcasting	$227.8m	$92.0m	$214.5m	679	1,782
Live music	$158.0m	$75.3m	$157.8m	1,111	1,919
Synchronisation	$4.0m	$2.0m	$4.1m	29	50
TOTAL	**$527.0m**	**$245.1m**	**$484.3m**	**2,259**	**4,508**

Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

Table 2 Percentage split of impacts in the NZ music industry (2015)

	Total sales ($m)	Value added (GDP, $m)		Employment (FTEs)	
		Direct impact	Total impact	Direct impact	Total impact
Retail	17.9%	25.3%	16.3%	10.5%	9.0%
Communication rights	8.1%	5.6%	6.0%	9.0%	7.8%
Music radio broadcasting	43.2%	37.5%	44.3%	30.1%	39.5%
Live music	30.0%	30.7%	32.6%	49.2%	42.6%
Synchronisation	0.8%	0.8%	0.8%	1.3%	1.1%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

The economic contribution of the New Zealand music industry is spread across five main industry subsectors, as shown in the tables above. The largest two contributors are the **music radio broadcasting subsector** and the **live music subsector,** which together contribute over 77% of total GDP impact and over 82% of total employment. Revenues from radio broadcasting fell between 2014 and 2015 but radio broadcasting remains a substantial component of the industry.

The tables above also highlight the varying effects that spending in different subsectors has on employment. Of note is that **the retail subsector** represents significantly less employment impact than GDP impact, due to its non-labour intensive nature and the shift towards online consumption of music.

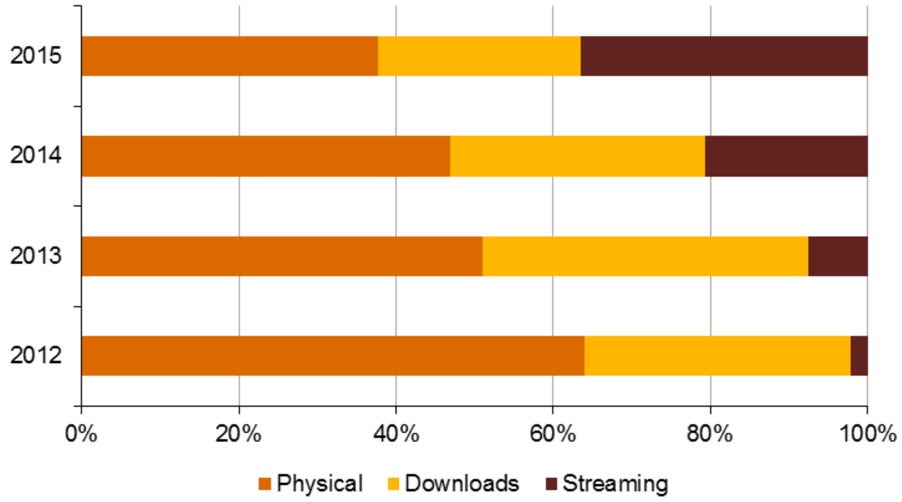
Table 3 Value added and employment trend in NZ music industry (2012 – 2015)

Economic impacts								
	Direct				Total			
Industry segment	2012	2013	2014	2015	2012	2013	2014	2015
Retail								
Value added (GDP)	$63.9m	$61.2m	$55.1m	$62.0m	$84.7m	$81.6m	$71.2m	$78.9m
Employment (FTEs)	304	288	228	237	520	494	390	407
Communication rights								
Value added (GDP)	$11.3m	$12.6m	$13.1m	$13.8m	$23.8m	$26.4m	$27.5m	$28.9m
Employment (FTEs)	171	188	193	204	296	324	334	352
Music radio broadcasting								
Value added (GDP)	$82.6m	$87.5m	$94.3m	$92.0m	$192.5m	$203.9m	$219.9m	$214.5m
Employment (FTEs)	624	651	697	679	1,639	1,708	1,829	1,782
Live music								
Value added (GDP)	$41.3m	$46.2m	$48.8m	$75.3m	$86.5m	$96.8m	$102.2m	$157.8m
Employment (FTEs)	624	687	720	1,111	1,078	1,186	1,244	1,919
Synchronisation								
Value added (GDP)	$2.1m	$2.2m	$1.9m	$2.0m	$4.3m	$4.6m	$4.0m	$4.1m
Employment (FTEs)	31	33	28	29	54	57	49	50
Total								
Value added (GDP)	**$201.1m**	**$209.7m**	**$213.2m**	**$245.1m**	**$391.8m**	**$413.3m**	**$424.9m**	**$484.3m**
Employment (FTEs)	**1,755**	**1,846**	**1,866**	**2,259**	**3,586**	**3,769**	**3,845**	**4,508**

Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

The direct and total impact of the NZ music industry on GDP and employment has increased over the last three years, with a large increase between 2014 and 2015. Further investigation behind the headline figures shows structural change within the industry including an increase in streaming and a reduction in physical music retail. In 2015, there was saw the first annual increase in retail music for 15 years, which was largely driven by streaming. Consumption via online streaming doubled between 2014 and 2015, which means that streaming is now the top source of revenue for record companies and recording artists. The gross output through this consumption channel is now greater than through traditional retail sales of physical product. Once translated from gross output to the direct impact on GDP, the online sales make up 37% of retail's impact while physical retail makes up 38% of retail's impact.

Figure 2 Value added of retail subsector broken down by component (2012-2015)



Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

Live music also experienced a substantial increase between 2014 and 2015. A strong touring year translated to growth in the subsector's contribution to GDP and employment. The increase in activity in the live music subsector contributed 83% of the industry's annual growth in direct GDP impacts and almost all of the industry's annual growth in direct employment.

Introduction

The purpose of this study is to estimate the contribution of the music industry to the New Zealand economy. It provides a snapshot of the industry using data for the 2015 calendar year.

In addition, the report provides some broad insights on the trends occurring in New Zealand's music industry that are affecting the impact of the industry on New Zealand's economy.

This report has been commissioned by Recorded Music New Zealand supported with funding from its project partners, the Australasian Performing Right Association/Australasian Mechanical Copyright Owners Society (APRA AMCOS), New Zealand Music Commission, NZ On Air, Te Mangai Paho, Independent Music NZ, the Music Managers' Forum and Creative New Zealand in order to better understand the economic role of the New Zealand music industry.

Purpose and scope of report

This report examines some "bottom-line" measures of the music industry's impact on the national economy. In this respect, it differs from other analyses that focus on the total revenue earned by the industry (eg sales of recorded music or royalties related to communication rights), a "top-line" measure that does not account for factors such as intermediate inputs purchased from other industries or imported from overseas.

By estimating bottom-line measures, this report enables comparisons between the music industry, other industries, and the economy as a whole. It is intended to provide industry participants and policymakers with a robust basis for understanding the importance of the industry to the New Zealand economy.

We have estimated three measures of the New Zealand music industry's economic contribution:

- **total sales** – the gross output of all music industry participants, provided by industry bodies
- **value added** – the industry's contribution to New Zealand's GDP, which is calculated as the total returns to labour and capital in the industry
- **employment** – the number of FTEs employed as a result of music industry activity.

In addition to its **direct** economic impacts, an industry will have **multiplier** effects elsewhere in the economy. In order to do business, firms must purchase inputs from other industries, while the wages and salaries that they pay will subsequently be spent elsewhere in the economy. These effects fall into two categories:

- **Indirect (or upstream) impacts** occur when businesses in the music industry purchase goods and services from other industries in order to record and produce a song, market an album, or put on a concert.
- **Induced impacts** are generated when the wages and salaries paid out by the music industry are spent on goods and services, thereby stimulating further economic activity.

The **total economic impact** of the industry is equal to the sum of its direct, indirect, and induced impacts. In order to estimate the direct and total economic impacts of the New Zealand music industry, we have used multiplier analysis based on national input-output tables[1]. We have described our application of multiplier analysis in Appendix B.

Note that since our 2014 report we have updated our model of the New Zealand economy and inter-industry transactions, as a result of updated input-output tables from Statistics New Zealand. In this report we provide estimates of the economic contribution of the New Zealand music industry in 2015 and also revise our previous estimates for the 2012, 2013 and 2014 years.

Although this report focuses on estimating the contribution of the New Zealand music industry to employment and GDP, we emphasise that the industry has a broader cultural and social role to play. Music contributes to New Zealand in a number of other ways that are not measured in GDP. The enjoyment, or utility, that New Zealanders derive from consuming and producing music is likely to be considerable but is not easily quantified. We have not included these effects in our analysis.

Defining the music industry

This report defines the New Zealand music industry as activities related to the creation, production, distribution, sale, communication, and performance of music in New Zealand, regardless of country of origin.

Industry basis

The music industry incorporates a number of distinct activities and related revenue streams. This report seeks to account for this complexity and report its conclusions in a usable and accessible format.

One way to define the music industry is presented in Figure 3.

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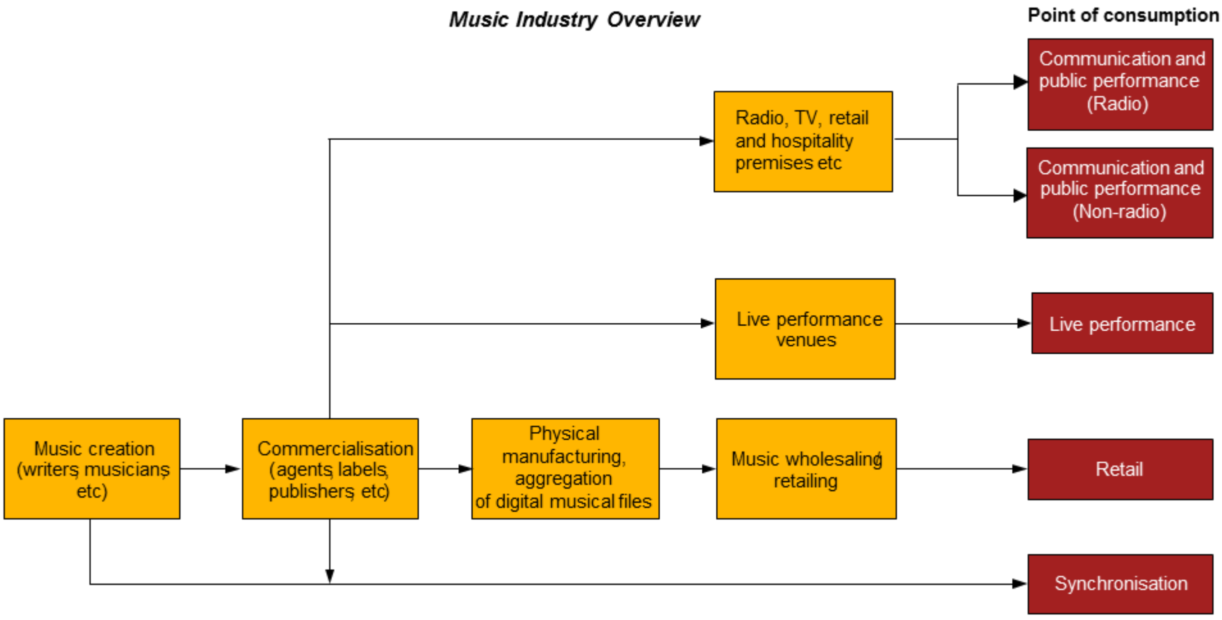
1 Insight Economics (2011), *New Zealand 2011 Input-Output Table and Multipliers*, based on Statistics New Zealand data.

Figure 3 Defining the music industry



This study examines the five main revenue streams accruing to the industry. These include both sales revenue and royalty payments for the use of music[2]:

- Physical and digital retail sales of music, including traditional store-based retailing, online stores, and the recently introduced payments received for access to music via on-demand streaming services. We refer to this subsector as **retail.**
- Revenue from communication of music played on radio, television, and the internet, and for the public performance of music in premises such as but not limited to retailers, hospitality outlets (bars and cafes), educational institutions, and gyms. We refer to this subsector as **communication and public performance**. Given the size of the radio component of communication and public performance we have included that component separately in our reported tables as **music radio**.
- Live performances of music, whether in concerts, festivals, or music venues. We refer to this subsector as **live performance**.
- Royalties earned from licensing music for use in advertisements, games, films, and television programmes. We refer to this subsector as **synchronisation**.

These revenue streams are all associated with the consumption of music in different forms or through different channels. But before music can be brought to the consumer, it must be created, commercialised, manufactured, and distributed. Some of these activities are considered to be part of the core music industry, while others are defined as intermediate inputs purchased from other industries.

The following upstream activities are included in our definition of the music industry:

- music creation, including songwriters, musicians, recording studios, etc
- the activities of record companies and music publishing companies, including the recording and commercialisation of music

[2] There are two royalty streams associated with the commercial exploitation of music. One represents songwriter royalties, stemming from the actual writing of the song. These rights are administered by music publishers and songwriters' collecting societies (eg APRA AMCOS). The second stream relates to sound recordings. These rights are administered by record companies and record company collecting societies (eg Recorded Music New Zealand). Through this report we use data provided by APRA AMCOS and Recorded Music New Zealand.

- the manufacture of physical carriers of music (eg CDs, DVDs) and the aggregation of digital music files for retail
- venue operation for live performances.

Our definition of the core music industry excludes some peripherally-related industries, such as instrument manufacture and retailing as well as music teaching. Where activities in these industries support the production or consumption of music in New Zealand, we are likely to capture the effects in our estimates of the multiplier effects (as discussed below).

Music expenditures also have an economic impact on other industries. As we have described above, businesses in the music industry must purchase inputs from other industries, while the wages and salaries that they pay will subsequently be spent elsewhere in the economy. Consequently, the total impact of the music industry will include:

- purchases of intermediate inputs from sectors that are not directly linked to music, such as advertising and marketing, transport services, plastics manufacturing (such as for CDs), accounting and legal services, sound and lighting, and equipment hire
- additional consumer spending in other industries, such as food and beverage retailing, housing, and recreation, resulting from employment within the music industry and supplier industries.

Geographic location

This report aims to account for all economic impacts that take place in New Zealand. In order to do so, we have adopted an approach that is consistent with the GDP national accounts statistics produced by Statistics New Zealand and overseas statistics bureaus. As we discuss in more detail in Appendix B this approach measures the total value of goods and services produced in New Zealand, rather than the net income of all businesses and individuals located within New Zealand.

In other words, we account for the domestic consumption of music of any origin from New Zealand-based channels. For instance, our measures of economic impact will:

- Include activities related to the physical sale of overseas-originated music to a consumer in New Zealand, but exclude the (relatively minor) cost of importing the physical product.
- Include income earned by overseas musicians touring in New Zealand, as it was earned in New Zealand regardless of whether it is ultimately repatriated elsewhere.
- Exclude payments paid to New Zealand recording artists and songwriters from overseas sources, as they are difficult to quantify due to lack of comprehensive data. While excluded from our calculations, we have separately estimated these payments for completeness.

We have chosen to use a GDP measure, rather than a different measure that accounts for such inclusions and exclusions, for two reasons. First, GDP impact is the most commonly used measure of total economic impact. It is used by Statistics New Zealand when reporting on the size of the New Zealand economy and in many other economic impact studies. Second, while some data on overseas touring revenues and public performance and communication royalties by APRA songwriters earned from overseas does exist, it is not considered comprehensive enough to base robust quantitative analysis of total revenue on.

Treatment of the economic effects of illegal and user generated music use

The illegal use of music is beyond the scope of this report. Discussions with industry stakeholders have indicated that it is a significant on-going challenge facing the industry. It has had a significant economic effect, depressing physical music sales and catalysing rapid growth in legal options for the digital sale and access of recorded music.

This report is intended to provide a snapshot of the industry's actual economic impact at a point in time and as a result does not discuss revenue foregone due to the illegal use of music. However, a natural extension of this work would be to estimate the net economic losses to the music industry as a result of illegal use. This could be based on an analysis of trends in sales volumes pre- and post-illegal use of music. In order to do so, it would be necessary to specify a robust counterfactual scenario for sales volume growth in the absence of the illegal use of music.

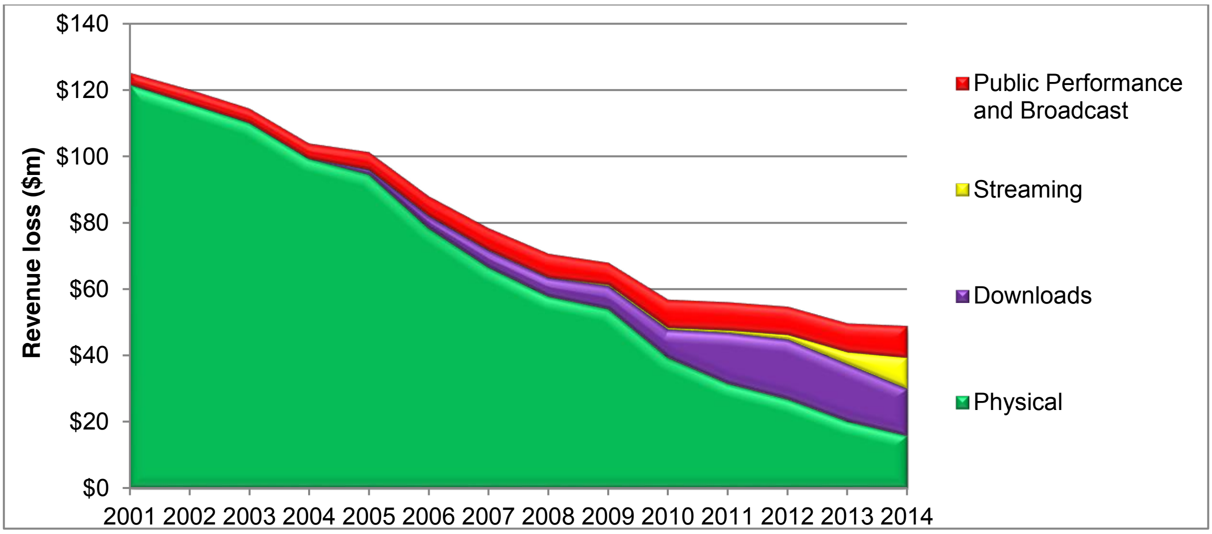
Furthermore, it may also be necessary to consider the extent to which the illegal use of music represents an economic loss and the extent to which it reflects a redistribution of surplus from music producers to music consumers or online platforms like YouTube (and potentially an associated reallocation of consumer expenditures from music to other cultural goods).

However, stakeholders, especially Recorded Music NZ, point out that music is still accessed, streamed and downloaded illegally. These activities continue even though global brands are investing in and developing on-line and on-demand products. Examples include Spotify and Apple Music, as well as internet discovery radio like Pandora and iHeart and other similar offerings. These products provide music at low prices, or even free to the consumer with advertising-based models.

Access by users to cyber lockers and stream ripping services represents an on-going problem and has resulted in a rise in piracy over last year.[3] According to Recorded Music NZ, participation in such activities represents a disconnect by consumers as to the harm done to the New Zealand music industry. The global music industry operates in the digital market and provides a variety of products to consumers to meet changing demand. Despite the platforms and products offered, the industry still faces challenges from illegal music use. In their view, users will continue to access illegal sources until there are robust regulatory setting and copyright laws in place that are readily and cost-effectively enforceable.

While visiting New Zealand in 2016, Dr George Barker obtained data on the New Zealand recorded music industry for 2001 to 2014 (15 consecutive years). Analysing total sales revenues and adjusting them for inflation and broader GDP growth, he concluded that the recorded music industry had lost up to $1.5 billion of revenue over that timeframe. The figures focused on total revenue, rather than GDP impacts.

Figure 4 Annual New Zealand revenue lost from illegal use and non-fully licensed music



Source: via Recorded Music New Zealand

The results are not just from illegal use (ie downloading and file sharing) but include the impact of platforms like YouTube that have user-generated content uploaded to them, which is not fully licensed. While there are some efforts to monetise user-generated content via Google's Content ID system (due to

3 Based on two datasets purchased or commissioned by Recorded Music NZ (comScore, Inc., Piracy Report for IFPI by country and Horizon Research Limited, Tracking Report to June 2016.)

surround advertisements), revenue is below the level that full licensing would provide to the industry. Services like Spotify, Pandora, iHeart, Apple Music and others are required to negotiate full licensing arrangements with the industry. In Recorded Music NZ's view, this loss arises from out-of-date regulatory settings. These regulations have not been changed since the passing of legislation in the US in 1999. Their view is that the legal framework governing the internet then was appropriate for that time but it is inappropriate in 2016.

Economic impact of the New Zealand music industry

This section summarises the direct and total economic impact of the New Zealand music industry. It estimates the industry's overall contribution to New Zealand's GDP and employment and allocates economic impacts between the five main subsectors of the industry: retail, communication and public performance, music radio broadcasting, live performance, and synchronisation.

The industry as a whole

Table 4 summarises estimates of the overall economic impact of the music industry.

Table 4 Overall economic impact of the New Zealand music industry (2015)

		Value added (GDP, $m)		Employment (FTEs)	
Industry sector	Total sales ($m)	Direct impact	Total impact	Direct impact	Total impact
Physical music	*$31.8m*	*$23.4m*	*$32.5m*	*131*	*224*
Downloads	*$26.0m*	*$16.0m*	*$19.2m*	*44*	*76*
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Total retail	$94.6m	$62.0m	$78.9m	237	407
Communication rights	$42.7m	$13.8m	$28.9m	204	352
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TOTAL	**$527.0m**	**$245.1m**	**$484.3m**	**2,259**	**4,508**

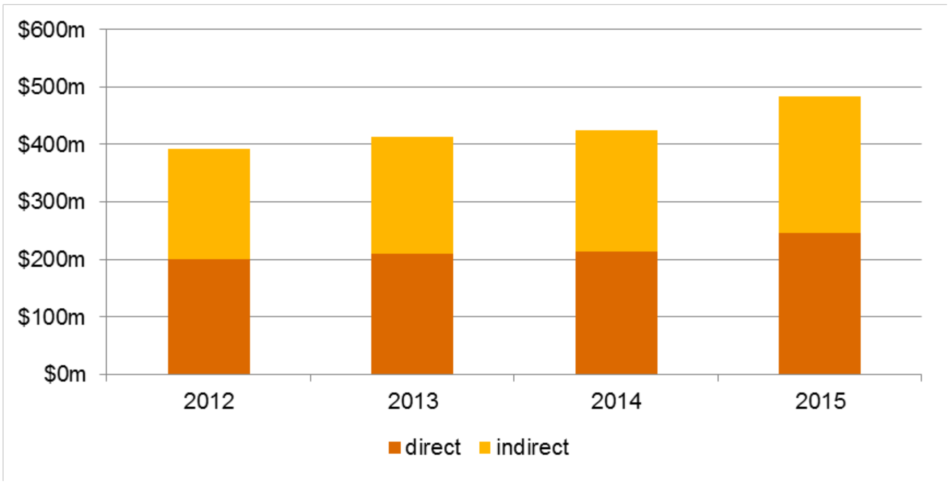
Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

The main findings of the study are that in 2015:

- The New Zealand music industry **directly** added $245.1 million to national GDP and provided the equivalent of approximately 2,259 FTEs.
- The total economic impact of the New Zealand music industry included **direct**, **indirect**, and **induced** (ie spending supported by the wages paid by the music industry) impacts. In total, the New Zealand music industry contributed or supported $484.3 million in national GDP and 4,508 FTEs.
- Approximately 20% of sales is attributed to NZ music content, approximately 24% of total GDP, and approximately 28% of total employment.

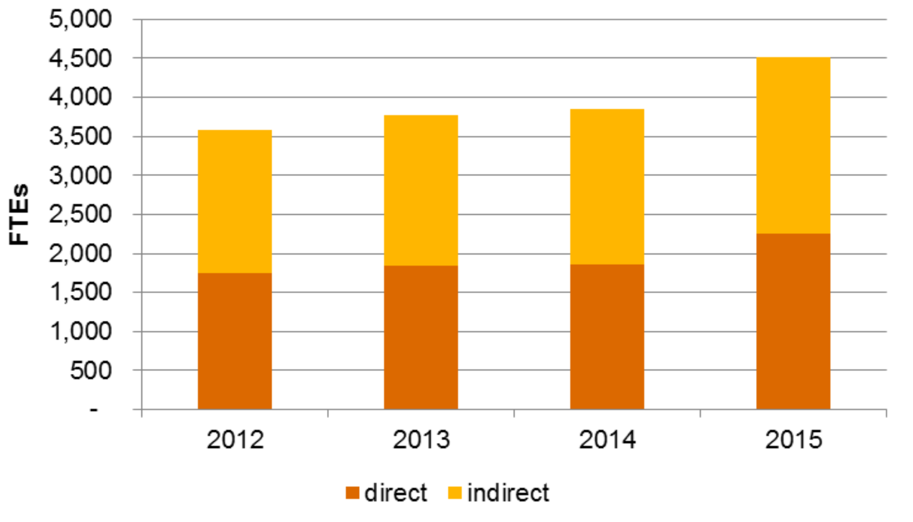
Figures 4 and 5 summarise trends in total GDP and employment impacts in the NZ music industry. Over the 2012 to 2014 period the industry's GDP was fairly constant despite structural changes within the subsector components, and the impact of music piracy. The industry exhibited significant growth in 2015, driven by strong growth in live music. Despite the on-going decline in traditional consumption methods (ie retail physical sales), there has been significant growth in online streaming, which is now the main retail channel for record companies and recording artists.

Figure 5 GDP impact of the New Zealand music industry, 2012-2015



Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

Figure 6 Employment impact of the New Zealand music industry 2012-2015



Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

The methodology that underpins these estimates is outlined in Appendix B. The following sections examine the 2015 and four year trend impact of the sub components of the New Zealand music industry, which are all based on the same underlying methodology.

Music retail

In 2015, the New Zealand music industry earned $94.6 million in retail revenues, with the subsector posting its first annual growth in 15 years. We estimate that these gross revenues resulted in a net, direct impact on the New Zealand economy of $62 million in GDP and 237 FTEs within the music industry. After accounting for multiplier effects, the retail subsector had a total economic impact of $78.9 million and 407 FTEs. New Zealand music contributed a small but significant share of total value within the retail subsector accounting for approximately 10% of gross output.

Table 5 Direct and total economic impact of retail 2015

		Value added (GDP, $m)		Employment (FTEs)	
Industry sector	Total sales ($m)	Direct impact	Total impact	Direct impact	Total impact
Physical music	$31.8m	$23.4m	$32.5m	131	224
Downloads	$26.0m	$16.0m	$19.2m	44	76
Online streaming	$36.8m	$22.7m	$27.3m	62	107
Total retail	$94.6m	$62.0m	$78.9m	237	407

Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

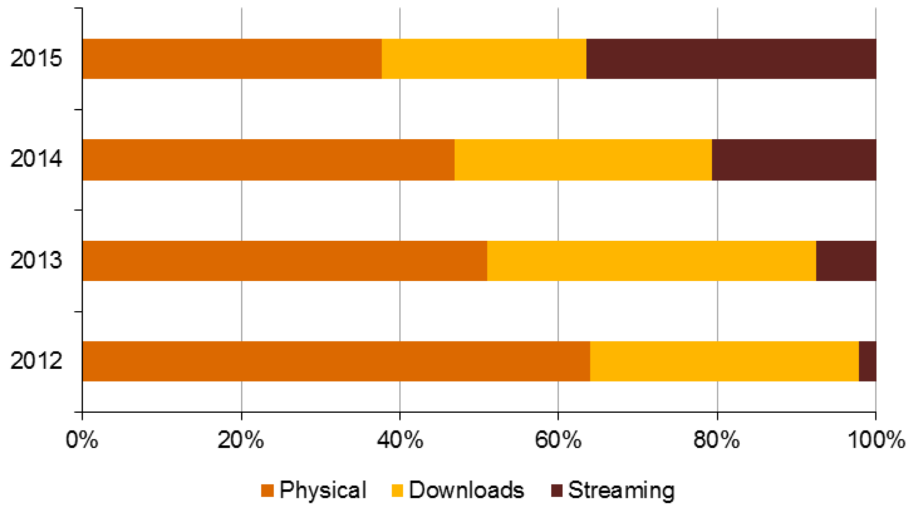
Table 6 Direct and total economic impact of retail 2014

		Value added (GDP, $m)		Employment (FTEs)	
Industry sector	Total sales ($m)	Direct impact	Total impact	Direct impact	Total impact
Physical music	$35.1m	$25.8m	$35.9m	145	248
Downloads	$29.0m	$17.8m	$21.6m	50	87
Online streaming	$18.6m	$11.4m	$13.8m	32	56
Total retail	$82.6m	$55.1m	$71.2m	228	390

Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

Historically the majority of these economic impacts were related to physical music retail. However, physical music retail has reduced significantly and now makes up approximately 38% of total retail gross output compared to 64% in 2012. The physical sales reduction has been offset by the growth of online streaming, which has grown rapidly over the past two years even after allowing for music piracy and now accounts for 37% of retail output. The gross output from online streaming doubled between 2014 and 2015, indicating that consumers have moved towards an on-demand consumption preference. Consumer preferences changing towards more on-demand consumption has been made possible by improvements to broadband internet, 3G and 4G mobile networks, greater uptake of mobile data accessible devices and more competitive prices for mobile data.

Figure 7 Breakdown of retail subsector economic impacts by consumption channel



Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

Definition of the retail subsector

This subsector includes all activities related to music retail, whether they take place in a physical or digital format. This category encompasses a range of different consumption points, ranging from physical retailers to online music stores to new business models such as on-demand streaming. In all cases these represent the industries' channel to market for the sale or personal use of recorded content.

Physical retail includes activities directly related to the sale of albums, concert DVDs, and other forms of recorded music in stores. There are two major retail chains involved in music retail: The Warehouse, which accounts for roughly half of total physical sales, and specialised retailer JB Hi Fi. In addition, there are independent music stores such as Real Groovy and Slow Boat Records. There has been some resurgence in sales of vinyl records, comprising 9% of all physical sales but the growth in the sales of vinyl records has not been enough to offset a falling physical product market. Over the last twenty years, the number of specialty music stores in New Zealand has fallen from roughly 300 to about 30.[4]

Digital retail, by contrast, is growing rapidly and also undergoing considerable innovation with the development of new online consumption channels for music. It includes all revenues generated by the legal consumption of music through online and mobile channels, including:

- digital retail services such as iTunes
- on-demand and streaming services such as Spotify, Youtube, Apple Music and Pandora.

*Starting from a small base of $2.2m in 2012, total sales from **online streaming** has grown significantly and was $36.8m in 2015.*

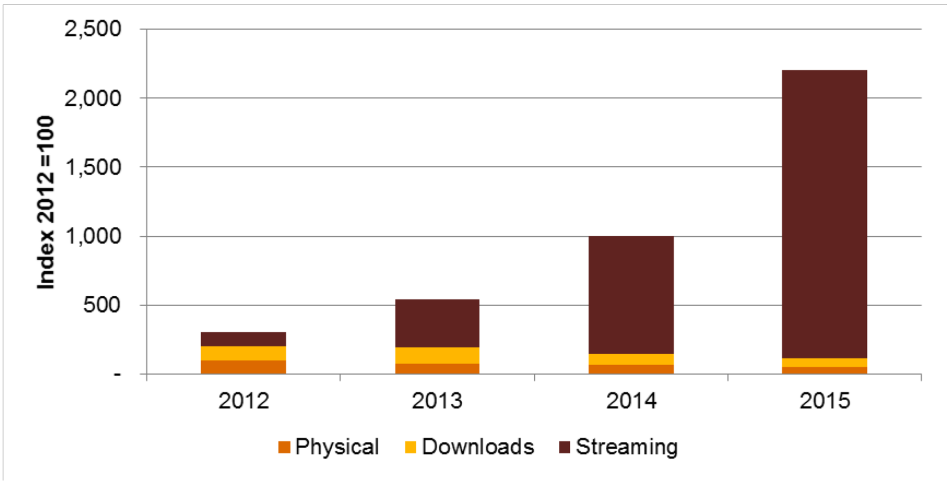
New Zealand music retail has been heavily affected by the emergence of new internet distribution channels for music. These distribution channels are in competition with traditional physical retail. On the one hand, illegal use has provided consumers with an effectively free source of music, which has led to a drop in sales and is likely to have reduced the price point at which consumers are willing to purchase music. On the other hand, new services for digital music purchasing or consumption, from iTunes to on-demand services such as Spotify or internet radio such as Pandora or iHeart, have emerged as rapidly-growing alternatives to physical retail. In addition, the internet has given musicians more and better channels to reach new audiences and communicate directly with their fans.

4 Interview with Chris Caddick, Managing Director, Recording Industry Association of New Zealand Inc, 16 June 2012. Cited in the New Zealand entertainment and media publication 2012-2016, PwC

Figure 8 below suggests that the New Zealand music industry is beginning to effectively monetise online music as shown through the increase in streaming revenues. New technologies, such as the rise of Apple Music and Spotify, have had a large impact on channels of legal music consumption. Digital consumption, combined with the effects of illegal use of music, has drastically altered the revenue landscape in the music industry.

The breakdown of physical and digital revenue has changed over the past four years as well as the overall decline in music sales. Given what can be observed over the past several years it seems likely that this trend will continue and that digital and streaming will further increase market share.

Figure 8 Breakdown of gross output by retail category from 2012-2015 (Indexed growth from 2012)



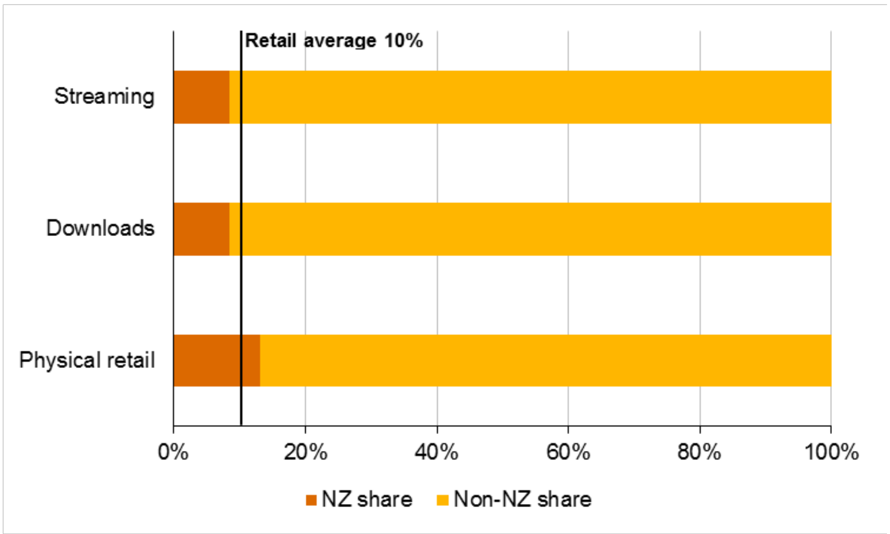
Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

Figure 8 also indicates that in New Zealand there was a lag between retail music revenue falling and digital music capturing a significant share of the market. Over the past three years companies have found solutions to monetising digital music, and growth in that sector has accelerated.

The role of New Zealand-originated music

Figure 9 shows the share of wholesale revenues from retail music earned by New Zealand musicians in 2015. It indicates that out of every $100 of music purchased at retail outlets, $13 was spent on New Zealand music. Across all retail consumption channels, 10% was spent on New Zealand music.

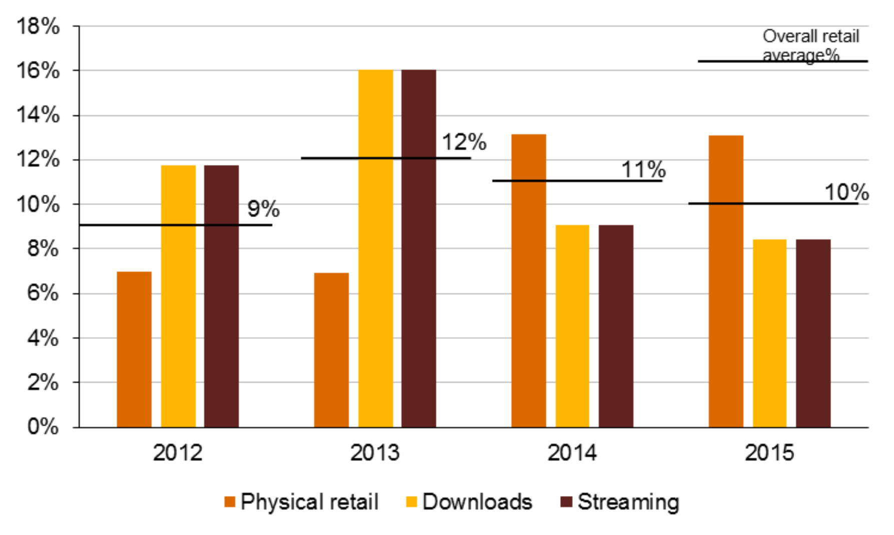
Figure 9 NZ artist share of retail sales by consumption channel (2015)



Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

The share of New Zealand music by subsector has changed over the last four years but the percentage of New Zealand music contribution to total retail has essentially remained constant as shown in Figure 10. There are indications that the switch from physical to streaming has been more prevalent for overseas artists, but less so for New Zealand artists.

Figure 10 NZ artist share of retail sales by consumption channel (2012 – 2015)



Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

Communication and public performance

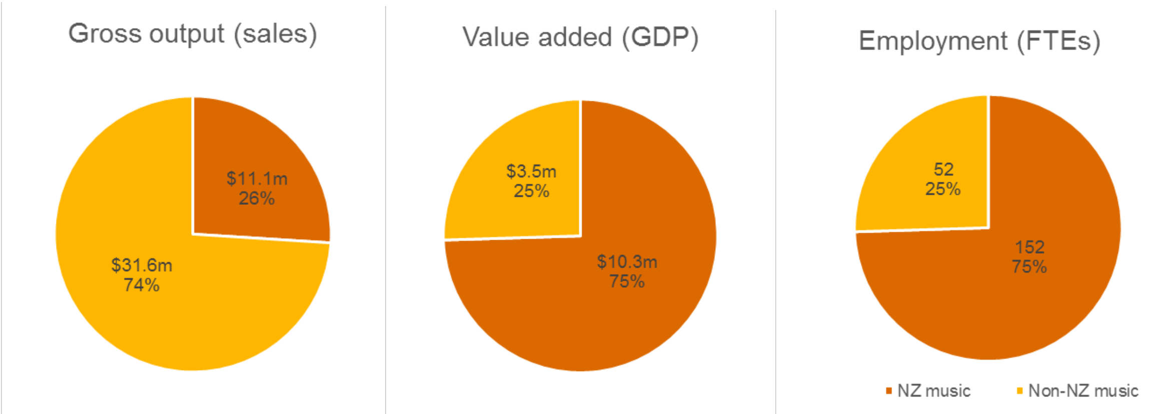
In 2015, the New Zealand music industry earned $42.7 million in royalties for non-radio communication and public performance. We estimate that these gross revenues resulted in a net, direct impact on the New Zealand economy of $13.8 million in GDP and 204 FTEs within the music industry. After accounting for multiplier effects, non-radio communication and public performance had a total economic impact of $28.9 million in GDP and 352 FTEs. New Zealand music was responsible for a large share of that total economic impact due to the significant role of royalties earned for New Zealand music.

Table 7 Direct and total impact of non-radio communication and public performance (2015)

2015 Communication and public performance	Direct economic impacts		Total economic impacts	
	All music	NZ music only	All music	NZ music only
Gross output (sales)	$42.7m	$11.1m		
Value Added (GDP)	$13.8m	$10.3m	$28.9m	$21.6m
Employment (FTEs)	204	152	352	262

Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

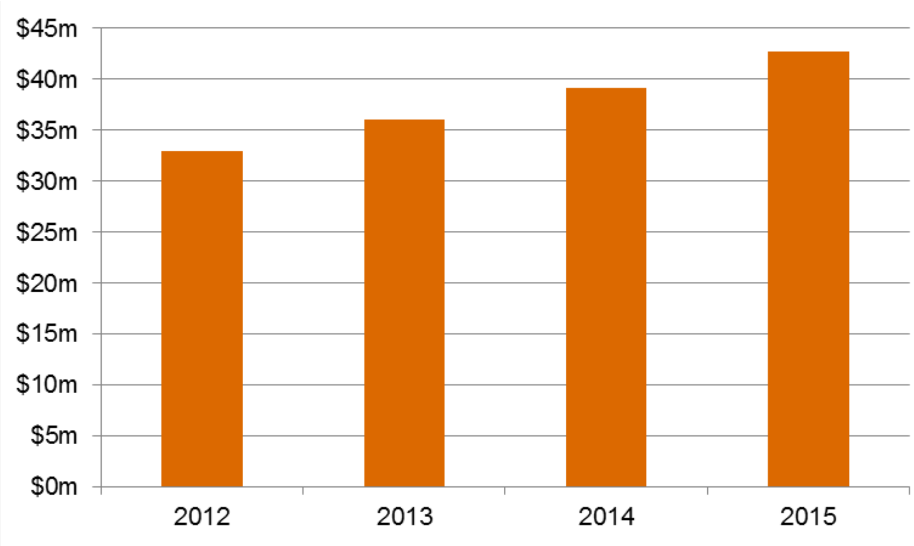
Figure 11 Direct impact of non-radio communication and public performance (2015)



Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

The non-radio communication and public performance subsector has been growing. Figure 12 shows the upward trend in royalties earned from this sector. The subsector experienced growth in revenue, supported by the successful migration to a new licensing process and collaborative effort between APRA AMCOS and Recorded Music via OneMusic.

Figure 12 Total sales from non-radio communication rights



Source: Recorded Music New Zealand, APRA AMCOS, PwC calculations

Definition of the communication and public performance subsector

The communication and public performance subsector of the music industry includes all instances in which music is communicated to the public or played in a public venue. It includes:

- Communication via radio, television, pay TV, and internet channels
- Public performance in premises such as but not limited to retailers, hospitality outlets (bars and cafes), educational institutions, and gyms.

In our analysis, we have split the communication and public performance subsector into radio (**music radio**) and non-radio (**communication and public performance**) which includes television, pay TV, internet channels, hospitality premises etc. The analysis in Table 7 and Figure 12 relate to non-radio channels.

When music is publicly performed, recording artists, record companies, songwriters, and music publishers earn money from royalties paid for this use. These royalties are calculated on a blanket basis and distributed mostly on a per-use basis. Data is obtained from Recorded Music NZ and APRA AMCOS.

Music radio broadcasting

In addition to the above definition of the communication and public performance sector is music radio broadcasting which we present as a separate category because of its size and impact. In 2015 the music radio broadcasting sector earned $227.8 million. We estimate that these gross revenues resulted in a net, direct impact on the New Zealand economy of $92.0 million in GDP and 679 FTEs within the music industry. After accounting for multiplier effects, music radio broadcasting had a total economic impact of $214.5 million in GDP and 1,782 FTEs.

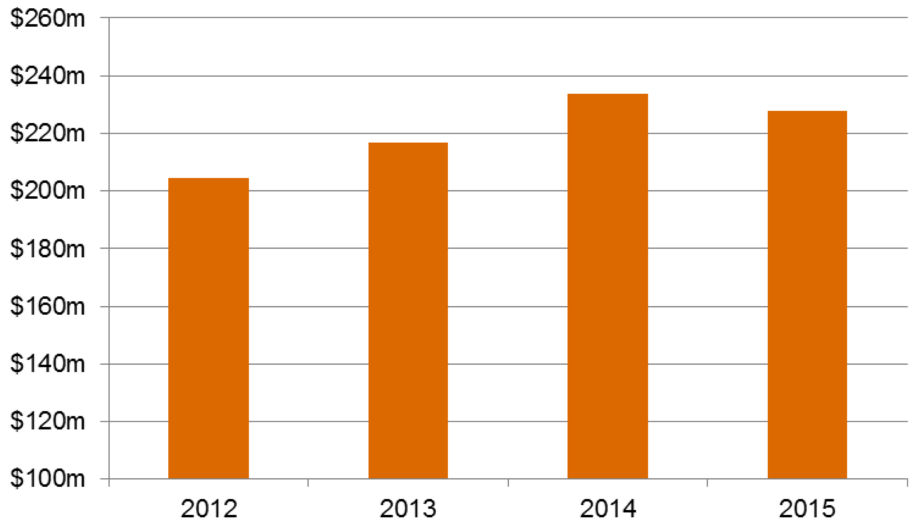
Table 8 Direct and total impact of music radio broadcasting (2015)

2015 music radio broadcasting	Direct economic impacts		Total economic impacts	
	All music	NZ music only	All music	NZ music only
Gross output (sales)	$227.8m	$40.8m		
Value Added (GDP)	$92.0m	$16.5m	$214.5m	$38.4m
Employment (FTEs)	679	122	1,782	319

Source: Recorded Music, APRA AMCOS, PwC analysis

The music radio subsector contracted between 2014 and 2015. Figure 13 demonstrates the trend over the past four years. The trading conditions in commercial radio have been tough in New Zealand, consistent with global trends, as advertisers are spreading and diversifying their investment across various media as well as changing consumption patterns towards on-demand and mobile streaming services. There are challenges in sustaining momentum in this subsector.

Figure 13 Total sales from music radio

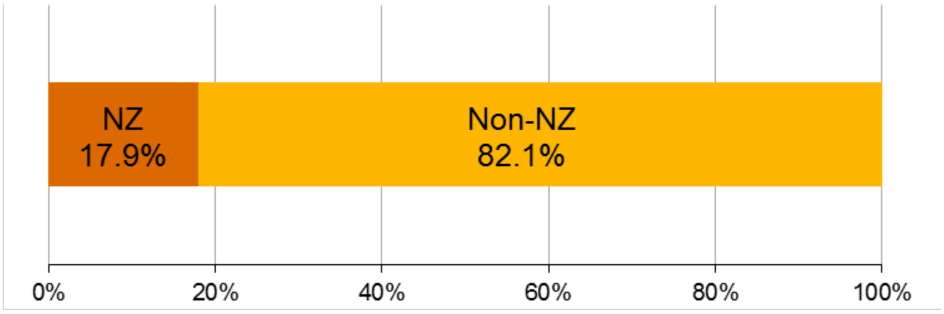


Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

The role of New Zealand-originated music

Figure 14 shows that 17.9% of total radio plays are New Zealand music. This figure is based on Recorded Music figures for all radio, including commercial radio, student radio, Iwi radio and Pacific Community radio, but does not include Radio New Zealand.

Figure 14 New Zealand share of total radio plays (2015)



Source: Recorded Music NZ.

Live performance

In 2015, the New Zealand music industry earned an estimated $158.0 million in live performance revenues. We estimate that these gross revenues resulted in a net, direct impact on the New Zealand economy of $75.3 million in GDP and 1,111 FTEs within the music industry. After accounting for multiplier effects, the live performance subsector had a total economic impact of $157.8 million and 1,919 FTEs.

Table 9 Direct and total impact of the live performance subsector (2015)

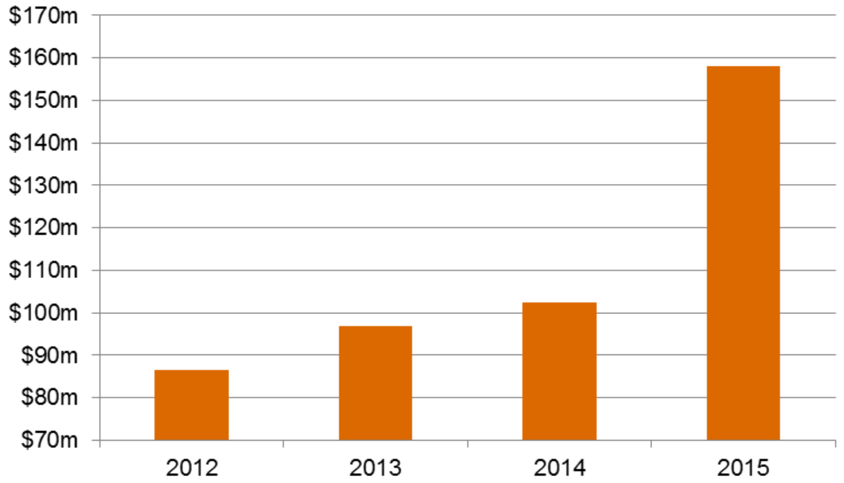
2015	Direct economic impacts		Total economic impacts	
Live performance	All music	NZ music only	All music	NZ music only
Gross output (sales)	$158.0m	$44.3m		
Value added (GDP)	$75.3m	$21.1m	$157.8m	$44.2m
Employment (FTEs)	1111	311	1919	537

Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

In the 2015 calendar year, total ticket sales revenue from concerts, music festivals, and other live music was estimated at $158.0 million, based on public performance royalties collected by APRA AMCOS. This figure is equivalent to the gross output, or total sales, of the live performance subsector.

There was significant growth in the live performance subsector between 2014 and 2015, attributed to strong performances from New Zealand and overseas touring artists. This reflects the longer trend of positive growth in the live performance subsector as shown in Figure 15.

Figure 15 Total sales in live performance subsector



Source: Recorded Music New Zealand, APRA AMCOS, PwC calculations

One notable feature of the live performance subsector is that it accounts for a greater share of the sector's direct and total employment than of its GDP impact. This suggests that it is more labour-intensive and lower in labour productivity than other parts of the sector.

Definition of the live performance subsector

The live performance subsector of the New Zealand music industry includes all types of live music played in New Zealand by local and overseas artists. These include:

- concerts and music festivals
- live music at music venues (ie door sales)
- orchestras
- music in theatre (excluding grand right musical plays).

Synchronisation

In 2015, the New Zealand music industry earned an estimated $4.0 million in annual synchronisation fee revenue. We estimate that these gross revenues resulted in a net, direct impact on the New Zealand economy of $2.0 million in GDP and 29 FTEs. After accounting for multiplier effects, synchronisation had a total economic impact of $4.1 million and 50 FTEs. New Zealand music is estimated to account for roughly three quarters of the overall economic impact of this subsector.

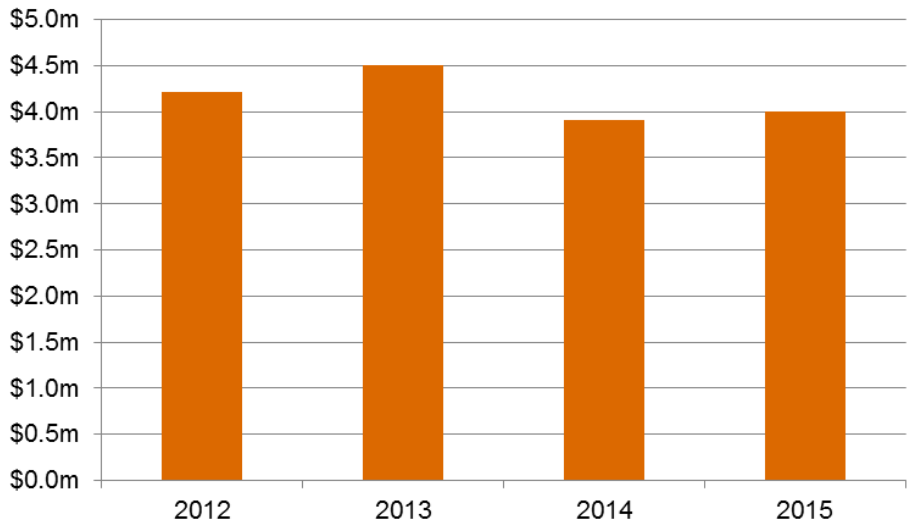
Figure 16 demonstrates that the contribution of this sector has been broadly constant in the past four years with gross output at approximately $4 million each year.

Table 10 Direct and total impact of the synchronisation subsector

2015	Direct economic impacts		Total economic impacts	
Synchronisation	**All music**	***NZ music only***	**All music**	***NZ music only***
Gross output (sales)	$4.0m	$2.0m		
Value added (GDP)	$2.0m	$1.5m	$4.1m	$3.1m
Employment (FTEs)	29	22	50	38

Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

Figure 16 Total sales in the synchronisation sector



Source: Recorded Music New Zealand, APRA AMCOS, PwC analysis

Appendix A: Glossary

The table below provides a glossary of music industry terms, industry associations, and commonly used acronyms.

Term	Definition
APRA AMCOS	The Australasian Performing Right Association The Australasian Mechanical Copyright Owners Society The New Zealand branch licenses music users, on behalf of its members, and collects fees where music is used for communication or public performance. APRA licenses premises such as (but not limited to) retailers, hospitality, education, and gyms, and venues for live music performance. These fees are then distributed directly to songwriters or to music publishers to whom songwriters have assigned their rights. APRA also now licenses public performance rights for both Recorded Music NZ and itself via the new joint venture licensing brand Onemusic. (www.onemusic.com)
Communication	The performance of recorded music via mediums including radio, television and the internet.
Music Publisher	While music publishers historically made money by reproducing and selling sheet music, today they invest in, promote and represent songwriters (or song catalogues) and are responsible for ensuring payments are made when their songwriters compositions are reproduced.
On-demand	On-demand music services are businesses that provide access to music as opposed to selling digital music files. Examples include Spotify, Deezer, Rdio, Google Play and Groove. These services generally have several tiers of revenue collection: ad-supported, where the customer has free access but is subjected to audio advertising; subscription which provides ad-free access via a computer; and premium subscription which provides ad-free access via both computes and mobile devices such as handsets and tablets.
Public Performance	Public performance refers to two uses of music. First, the playing of music in premises such as retailers, hospitality outlets (bars and cafes), educational institutions, and gyms. Second, the live performance of music in venues. Rights associations representing songwriters and recording artists licence the public performance of recorded and live music.
Record Company	A business that invests in, promotes, and represents recorded music made by recording artists. Record Companies typically represent a mixture of recorded music in which they own the copyright outright and recorded music in which they hold the copyright under exclusive licence from the owner. Often called a "record label".
Recorded Music New Zealand	Recorded Music New Zealand was formed from the merger of RIANZ and PPNZ. The organisation represents the rights of member Record Companies and undertakes collective functions on their behalf. Activities include the production of The New Zealand Music Awards, the weekly compiling and publishing of the Official New Zealand Music Chart and anti-piracy activities. Additionally Recorded Music New Zealand is a music service company working on behalf of recording artists and record

	company members. It licences sound recordings for use in communication and public performance. The fees are then distributed to recording artists or to record companies to whom recording artists have assigned their rights.
Royalty	Royalties are fees paid to songwriters and recording artists accruing from various uses including sale of recordings and public performance.
Synchronisation Right	A music synchronisation licence is required where a piece of recorded music is reproduced with a visual image, for example in a film, game, TV programme or advertisement. Often abbreviated as “synch right”.

Appendix B: Approach and methodology

This section provides a detailed overview of our approach and methodology, including definitions of our main economic impact measures, a discussion of our main data sources, and an explanation of how we calculated direct and total economic impacts. Finally, it discusses some opportunities for improving music industry data collection or undertaking future analysis.

Measures of economic impact

This report uses three main indicators of economic impact: gross output, value added, and employment. It relies on input-output (multiplier) analysis to estimate the indirect and induced impacts of the music industry.

Gross output

The gross output of an industry is equal to its total sales revenue. This figure incorporates both value created within that industry and the value of intermediate goods (eg raw materials, real estate, equipment and machinery) purchased by the industry from other industries.

Although gross output or sales revenue is commonly used as a measure of the value of an industry, it is an imperfect measure due to its inclusion of inputs purchased from other industries.

Value added

The value added of an industry is equal to the total value created within that industry. It can also be described as the GDP impact of an industry. It measures the contributions of labour (through wages and salaries) and capital (through profits and depreciation) to the output produced by the industry, and the taxes paid by the industry. As a result, it is equivalent to the gross output of an industry, less the value of all inputs purchased from other industries.

When using our value-added estimates, it is important to understand what they do and do not include. GDP measures, including those reported in Statistics New Zealand's national accounts and in most economic impact studies, measure the total value of goods and services produced in New Zealand, rather than the net income of all businesses and individuals located within New Zealand. As a consequence, we will:

- include income earned by overseas musicians touring in New Zealand, as it was earned in New Zealand regardless of whether it is ultimately repatriated elsewhere.
- exclude royalty payments paid to New Zealand musicians by overseas sources, as they resemble investment income accruing from ownership of an asset more than they do exports of goods physically produced in New Zealand.

These inclusions and exclusions should be taken into consideration when using our estimates. The New Zealand music industry is relatively globalised – New Zealand consumers purchase a great deal of overseas-originated music, and New Zealand musicians tour and earn royalties overseas. We have excluded most music imports from our analysis by:

- measuring only economic benefits from New Zealand-originated music in digital retail and broadcasting
- including both New Zealand and overseas music in gross output figures for physical retail in the expectation that output multipliers will correct for any imported content.

However, our analysis does not account for New Zealand musicians' overseas income earned through touring and royalties from overseas retail sales and music broadcasts. As a result, it will underestimate the total income earned by the New Zealand music industry.

There were two main reasons to measure value added in terms of GDP. First, GDP impact is the most commonly-used measure of total economic impact. It is used by Statistics New Zealand when reporting on the size of the New Zealand economy and in many other economic impact studies. Although GDP does have some weaknesses, they are not unique to the New Zealand music industry. Across the whole economy, there is a significant gap between GDP and gross national income (GNI) figures due to the large role of foreign investment and lending in the New Zealand economy. According to World Bank figures, New Zealand's GNI has been three to seven percent lower than GDP in recent years. The same is true for specific industries as well – for example, measures of the GDP impact of the wine industry will exclude both profits paid out to overseas owners of New Zealand wineries and income earned from New Zealand wineries' overseas investments, which may be considerable.

Second, we found in discussions with stakeholders (eg APRA AMCOS, NZMC) that no comprehensive data on overseas income from music sales, royalties and touring exists. We investigated whether it would be possible to compile this information from industry participants. While some data on overseas touring revenues and royalties earned from overseas does exist, it is neither comprehensive enough nor accessible enough to base robust quantitative analysis on.

The New Zealand Music Commission (NZMC) administers some overseas development grants to New Zealand musicians. They require grant applicants to submit information about their overseas earnings (from sales, touring, and licensing) in the last financial year. Because NZMC receives applications from roughly 60-100 artists a year, their figures would allow us to estimate overseas income for a large portion of the music industry. However, as NZMC does not audit artists' reported income, we cannot be sure that they are accurate. Nor can we be certain what share of overseas income is counted in their data.

APRA AMCOS collects songwriter royalties for all music played within New Zealand and Australia. It repatriates royalties earned by overseas artists to their national royalty-collection body, which then distributes it to publishers and artists. In return, other royalty-collection bodies (eg PRS for Music in the UK, ASCAP in the US) collect royalties for Australian and New Zealand music played in those countries, and remit it to APRA AMCOS. However, it may not be possible to obtain information for New Zealand artists only. The largest music publishers operate out of Australia, and as a result most overseas royalty income earned by New Zealand artists will go to Australia in the first instance. Discussions with APRA AMCOS have indicated that it will be time-consuming, if not impossible, to obtain comprehensive New Zealand-specific information on overseas royalties.

Employment

We measure employment on the basis of FTEs, rather than total (full-time and part-time) jobs or headcount. Under this measure, part-time jobs are counted as a proportion of a full-time job – so, for example, a job that involved working 15 hours a week would be counted as 0.5 of an FTE. This provides us with the most comparable measure of employment in an industry, as rates of part-time employment can vary between different industries.

Values are reported in New Zealand dollars of the day unless otherwise stated

All figures in this report refer to New Zealand dollars in nominal terms.

Data sources

Main quantitative data sources

Our estimates of the economic impact of the New Zealand music industry are based primarily upon three sources of data:

- Recorded Music NZ figures on physical and digital sales wholesale revenue
- APRA AMCOS data on songwriter royalties and Recorded Music NZ data on recording royalties
- Statistics New Zealand and other industry-level estimates of economic activity and input-output tables for New Zealand industries.

Where possible, other data was used to provide a sense check on estimates derived from these sources.

The calendar years (year ended December quarter) have been selected as the basis for the economic impact calculations and these are the most recent full set of annual data available. All amounts in this report relate to impacts that occur in this period.

Avoiding double counting

In several cases, Recorded Music NZ and APRA AMCOS figures measured different components of the same market subsector. For example, Recorded Music NZ provided data on total physical and digital music sales, while APRA AMCOS provided data on mechanical royalties (ie royalties paid each time a piece of recorded music is reproduced) paid from physical and digital music sales. As royalties are paid as a proportion of retail sales, including both of these figures in our analysis would mean double-counting activity in this market subsector.

In order to avoid double-counting, we have examined the definitions of each measure of the market and discussed with data providers where necessary.

Multiplier analysis

Direct, indirect and induced impacts

Like any industry, the music industry has spillover effects on other parts of the New Zealand economy. For our purposes here, these impacts can be divided into two categories:

- Indirect (or upstream) impacts
- Induced impacts.

Indirect impacts occur as a result of purchases of goods and services from other industries. When a record is made or a concert is put on, businesses within the music industry purchases a range of inputs: advertising and marketing, transportation services, machinery and instruments, rented real estate, etc.

Induced impacts occur as a result of the wages and salaries paid out by the music industry. When a musician collects a royalty check, he or she will then spend some of that money on a range of goods and services, thereby stimulating further economic impact.

Estimating direct economic impacts

We estimate the direct impact of the music industry in terms of its contribution to gross output, value added, and employment as follows:

- For each market subsector, we start with figures on either gross output (eg total digital music sales, total estimated ticket sales) or value added (eg broadcasting royalties).
- We then choose a representative ANZSIC[5] industry (eg Entertainment Media Retailing, Creative Artists, Musicians, Writers, and Performers) for each market subsector.

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5 Australian and New Zealand Standard Industrial Classification a nomenclature for classifying industries used by Australia and New Zealand.

- We use data from Statistics New Zealand to estimate the ratios of value added (VA) to gross output (GO) and VA (or GO) to employment in these industries. These ratios were then used to estimate direct GO/VA and employment in each market subsector.

Estimating total economic impacts

Spending in the music industry has multiplier effects in other industries as a result of the way in which that spending flows through the economy. Every dollar that is spent directly on music will also stimulate or support other types of economic activity indirect and induced from the industry.

In order to estimate flow-on effects, we applied multipliers calculated using 2006/07 input-output tables for all New Zealand industries, which are the latest available. Multipliers were available for gross output, value added, and employment in these industries.

- Indirect impacts were estimated using Type 1 multipliers, which account for the first-round and indirect effect of purchases of goods and services by each industry.
- Induced impacts were estimated using Type 2 multipliers, which account for induced effects from wages and salaries paid by each industry.

Approaches followed for individual subsectors

Table 11 summarises the activities in each subsector of the music industry that are included in our GDP calculations.

Table 11 What is included and excluded from GDP calculations?

Industry subsector	Revenue earned in NZ		Revenue earned overseas
	From NZ artists	From overseas artists	
Retail	Included in GDP	Accounted for in GDP	Excluded
Communication rights and radio	Included in GDP	Songwriter royalties not included, as they are earned offshore Recording artist royalties retained by record companies are accounted for in GDP	Excluded
Live performance	Included in GDP	Included in GDP, as performance occurred here	Excluded
Synchronised music	Included in GDP	Synchronisation fee revenues paid out to overseas artists are not included, as they are earned offshore Synchronisation fee revenue accruing to local agents (eg record companies, music supervision companies) are accounted for in GDP	Excluded

Table 12 below summarises the methodology and assumptions used to calculate the economic contribution of individual subsectors of the music industry.

Table 12 Methodology and assumptions for the different subsectors of the music industry

Subsector	Information base	Direct value added	Direct FTEs	Total value added and FTEs
Retail – physical music	Wholesale physical sales data provided by Recorded Music NZ	Estimated total retail sales revenue using Statistics NZ Annual Enterprises Survey (AES) data. Estimated split between retailer margin, wholesale (record label) margin, value of rights embodied in physical product, and manufacturing cost using AES data. Estimated value added from the retail margin using the average ratio of value added to gross margin in the "wholesale trade" and "other store-based retailing and non-store retailing" industries. Estimated value added within record companies by applying the ratio of value added to gross output in the "arts and recreation services" industry and adding the total value of rights embodied in the physical product. Estimated value added from manufacturing using the ratio of value added to gross output in the "arts and recreation services" industry.	Based on ratios of employment to value added as follows: • retailer margin – the average of the "wholesale trade", and "other store-based retailing and non-store retailing" • record company margin - "arts and recreation services" • manufacturing - "arts and recreation services". No additional employment impact calculated for the value of rights embodied in the physical product, as this is likely to be repatriated overseas as profit. (Employment in record label activities is captured elsewhere.)	Based on total (direct, indirect, induced) multipliers as follows: • retailer margin – the average of the "wholesale trade", and "other store-based retailing and non-store retailing" • record company margin - "arts and recreation services" • manufacturing - "arts and recreation services". No spillover impacts calculated for the value of rights embodied in the physical product, as this is likely to be repatriated overseas as profit.
Retail – digital music	Wholesale digital sales figures provided by Recorded Music NZ, plus data on songwriter royalties for digital sales provided by	Estimated total retail sales revenue using information provided by APRA AMCOS. Estimated split between retailer margin, record label revenue, and royalty revenue using information provided by APRA AMCOS. Used AES data to estimate	Based on ratios of employment to value added for the "arts and recreational services" industries.	Based on total (direct, indirect, induced) multipliers for the "arts and recreational services" industries.

Subsector	Information base	Direct value added	Direct FTEs	Total value added and FTEs
	APRA AMCOS.	the value of the rights embodied in the digital product. Because online retailers primarily based overseas, the retailer margin was assumed to have no value added impact. Estimated value added within record companies by applying the ratio of value added to gross output in the "arts and recreational services" industry and adding the total value of rights embodied in the physical product.	No additional employment impact calculated for the value of rights embodied in the digital product, as this is likely to be repatriated overseas as profit. (Employment in record label activities is captured elsewhere.)	No additional employment impact calculated for the value of rights embodied in the digital product, as this is likely to be repatriated overseas as profit.
Communication rights	Data on songwriter royalties provided by APRA AMCOS and performer royalties provided by PPNZ for radio and TV broadcasts and public performance of music.	Estimated the share of royalties paid out to New Zealand songwriters and recording artists using Radioscope data on the New Zealand music share of total radio plays. All (songwriter and recording artist) royalties paid for New Zealand artists converted directly to value added as they represent direct income earned locally. Estimated that 50% of recording artist royalties paid for overseas-originated music would be retained by record companies as profits and funding for their New Zealand-based marketing activities, while the remaining 50% would be paid directly to overseas recording artists or repertoire owners. Estimated an economic impact related to the recording artist royalties retained locally by record companies using the ratio of value added to gross output in the "arts and recreational services" industry. Songwriter royalties paid for overseas-originated music does not generate any value added in New Zealand.	Based on ratio of employment to value added for the "arts and recreational services" industry.	Based on total (direct, indirect, induced) multipliers for the "arts and recreational services" industry.
Music radio broadcasting	Data on total radio licensing fees and licensing fee rate	Estimated the total radio output that is related to the music industry based on the licensing fees as being the	Based on ratio of employment to value added for the "arts and	Based on total (direct, indirect, induced) multipliers for the

Subsector	Information base	Direct value added	Direct FTEs	Total value added and FTEs
	provided by APRA AMCOS	proportion of the total evidenced by the licensing rate. Output = Licensing fees/licensing rate	recreational services" industry.	"arts and recreational services" industries.
Live performance	Data on songwriter royalties provided by APRA AMCOS for live performance of music and APRA AMCOS information on the royalty rate.	Gross output (ie ticket sales) estimated by dividing the value of songwriter royalties by the royalty rate applied to ticket sales. Value added in live performance estimated by applying the ratio of value added to gross output in the "arts and recreational services" industry to estimated gross output.	Based on ratio of employment to value added for the "arts and recreational services" industry.	Based on total (direct, indirect, induced) multipliers for the "arts and recreational services" industries.
Synchronisation rights	Estimated total songwriter and recording artist royalties earned from synchronisation deals in New Zealand provided by Recorded Music NZ.	Estimated the share of royalties paid out to New Zealand songwriters and recording artists using Recorded Music NZ estimate of the New Zealand music share of total synchronization revenues. All (songwriter and recording artist) royalties paid for New Zealand artists converted directly to value added as they represent direct income earned locally. Estimated that 50% of (songwriter and recording artist) royalties paid for overseas-originated music would be retained by negotiating agents as profits and funding for their New Zealand-based activities, while the remaining 50% would be paid directly to overseas rights-holders. Estimated an economic impact related to the recording artist royalties retained locally by record companies using the ratio of value added to gross output in the "arts and recreational services" industry.	Based on ratio of employment to value added for the "arts and recreational services" industry.	Based on total (direct, indirect, induced) multipliers for the "arts and recreational services" industries.

Appendix C: Restrictions

This economic impact assessment has been prepared for Recorded Music New Zealand Limited (Recorded Music NZ), the Australasian Performing Rights Association and the Australasian Mechanical Copyright Owners Society (APRA AMCOS) and the New Zealand Music Commission. This report has been prepared solely for this purpose and should not be relied upon for any other purpose.

To the fullest extent permitted by law, PwC accepts no duty of care to any third party in connection with the provision of this Report and/or any related information or explanation (together, the "Information"). Accordingly, regardless of the form of action, whether in contract, tort (including without limitation, negligence) or otherwise, and to the extent permitted by applicable law, PwC accepts no liability of any kind to any third party and disclaims all responsibility for the consequences of any third party acting or refraining to act in reliance on the Information.

Our report has been prepared with care and diligence and the statements and opinions in the report are given in good faith and in the belief on reasonable grounds that such statements and opinions are not false or misleading. In preparing our report, we have relied on the data and information provided by members of the sponsor group as being complete and accurate at the time it was given. The views expressed in this report represent our independent consideration and assessment of the information provided.

No responsibility arising in any way for errors or omissions (including responsibility to any person for negligence) is assumed by us or any of our partners or employees for the preparation of the report to the extent that such errors or omissions result from our reasonable reliance on information provided by others or assumptions disclosed in the report or assumptions reasonably taken as implicit.

We reserve the right, but are under no obligation, to revise or amend our report if any additional information (particularly as regards the assumptions we have relied upon) which exists at the date of our report, but was not drawn to our attention during its preparation, subsequently comes to light.

This report is issued pursuant to the terms and conditions set out in our engagement letter dated 28 July 2016.