Economic contribution of the New Zealand film and television industry

This study highlights the economic contribution of the New Zealand film and television industry in terms of employment, GDP and wider impacts

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pwc

Table of contents

Table of contents	1
Executive summary	2
Background and purpose	2
Results	2
These results in context	3
Changes in the industry	4
Introduction	5
Acknowledgements	5
Purpose and scope of this report	5
Defining the film and television industry	6
Comparisons with other studies	7
Economic impact of the industry	9
The industry as a whole	9
Production subsector	11
Distribution subsector	12
Television broadcasting subsector	13
Film exhibition subsector	14
Home video rental subsector	15
Home video retail subsector	16
Online movie services	17
Appendix 1: Methodology and data sources	18
Defining the film and television industry	18
Measures of Economic Impact	20
Multiplier analysis	22
Reporting of results	25
Glossary	26
Appendix 2: Restrictions	27

Executive summary

Background and purpose

This study examines the contribution of the film and television industry to the New Zealand economy and provides estimates measuring the magnitude of that contribution for 2011. It estimates that the industry's total contribution to the New Zealand economy is 1.4 percent of New Zealand's gross domestic product (GDP).

The analysis takes account of the direct, indirect and induced economic impacts created by the industry to determine the industry's total economic contribution. In other words, it measures not just the spending that occurs by the industry itself, but the subsequent effects of that spending as money, labour and materials impact other industries.

To quantify the economic contribution of the film and television industry, four measures are estimated:

- gross output (or total revenue or total sales) – the combined revenues of all industry participants attributable to film and television activity
- value added – the returns to labour and capital attributable to the industry (which amounts to the industry's contribution to GDP)
- labour income – the contribution made by the industry in wage and salary payments (a subset of value added)
- employment– the number of jobs created as a result of film and television industry activity.

The film and television industry is a changing and evolving industry with new services, products and distribution channels frequently being developed. The system of national accounts that seeks to measure this industry is structured based on industry classifications that are revised relatively infrequently. As is the case with other industries that change with the pace of the technology driving their production, the system cannot separately identify all of the activity of the film and television industry in a manner that reflects current industry structure.

The New Zealand Federation Against Copyright Theft (NZFA©T) has an interest in knowing with greater accuracy the impact of film and television on the economy, as its role is to promote and protect the screen community in New Zealand. Better information about the significance of the industry informs the dialogue between copyright owners and the New Zealand government about protecting the rights upon which the industry relies in order to remain commercial.

Results

The table below outlines the key estimates of the economic impact of the New Zealand film and television sector, across six industry subsectors.

Total economic impact of the NZ film and TV industry

	Value added (GDP)		Labour income		Employment (FTEs)	
Industry segment	Direct ($m)	Total ($m)	Direct ($m)	Total ($m)	Direct	Total
Production	$575	$1,248	$487	$926	4,156	9,309
Distribution	$48	$108	$6	$13	197	365
TV broadcasting	$512	$1,110	$124	$236	2,779	6,225
Film exhibition	$66	$144	$47	$90	1,365	3,058
Home video rental	$58	$123	$46	$79	1,287	1,699
Home video retail	$23	$48	$18	$31	500	660
TOTAL	$1,282	$2,781	$729	$1,376	10,284	21,315

PwC calculations

This study estimates that across the economy in 2011, the New Zealand film and television industry:

- had gross output (ie total sales) of $3,233 million
- contributed total value added of $2,781 million, including total labour income of $1,376 million
- supported 21,315 full-time equivalent jobs
- contributed 1.4 percent of New Zealand's total GDP, which can be compared to the wine industry's total contribution of 0.7 percent of GDP in 2008.

In addition, significant economic benefits may accrue to the New Zealand economy when film and television content enhances awareness and equity in its national brand. This can increase tourist activity, enhance the perception of other New Zealand goods and services and contribute to the sense of national identity. Such impacts are not quantified in this study.

These results in context

Comparison with the national economy

The New Zealand film and television industry accounts for a small but significant portion of national GDP and employment. It is a high-productivity and high-wage sector compared with the economy as a whole.

Comparison of film and television industry to national economy

	New Zealand	Film & TV industry		Percent of total	
		Direct	Total	Direct	Total
Value added (GDP)	$194,277m	$1,282m	$2,781m	0.7%	1.4%
Employment (FTEs)	1,318,500	10,284	21,315	0.8%	1.6%
Average full-time wage	$51,000	$70,900	$64,500	139.0%	126.5%

Statistics NZ, PwC calculations

Total New Zealand GDP in 2011 was $195 billion[1]. The film and television industry's direct impact of $1,282 million was, therefore, 0.7 percent of GDP, and its total impact of $2,781 million was 1.4 percent of GDP.

In 2011, the average number of full-time equivalent employees working in New Zealand was 1.32 million[2]. With 10,284 direct FTEs, the film and television directly employs 0.8 percent of the national labour force. After accounting for its multiplier effects, film and television has a total impact of 21,315 FTEs, or 1.6 percent of the national labour force.

The average full-time wage for those directly employed in the film and television industry in 2011 is estimated to be $70,900 per annum. This is established by dividing direct labour income by the number of direct employees. The production and post-production sector had a significantly higher average full-time wage of $117,300 per annum. These are both significantly higher than the national average full-time wage of $51,000.

Comparison with the wine industry

To put the magnitude of the film and television industry in context, its economic impact can be compared with the wine industry. Both industries have been growing rapidly over the past decade on the back of expansion into overseas markets.

In 2009, NZIER undertook a study that provides estimates of the economic impact of the wine production industry that are comparable to those in this report[3]. The study is based on data from 2008 and it is likely that

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[1] Statistics NZ, *National Accounts: GDP in current prices (Annual-Mar)*.

[2] Statistics NZ, *Quarterly Employment Survey*. Because Statistics NZ calculates FTEs using a different method to PwC, these employment figures are not entirely comparable.

[3] NZIER, *Economic Impact of the NZ Wine Industry [in 2008]*, April 2009

the wine industry has grown since then. It should also be noted that the wine industry estimates carried out by NZIER are focussed on the wine production sector[4], and exclude for example wine retailing.

With those caveats in mind, we find that the estimated economic impact of the film and television industry in 2011 was **considerably greater** than that of the wine industry in 2008. A comparison is shown in the table below.

Comparison with economic impact of New Zealand wine industry

	Wine industry (2009)		Film and TV industry (2011)	
	Direct	Total	Direct	Total
Gross output (sales)	$1,280m	-	$3,233m	-
Value added (GDP)	$454m	$1,520m	$1,282m	$2,781m
Employment (FTEs)	5,940	16,568	10,284	21,315
Labour income	$168m	-	$729m	$1,376m

NZIER, PwC calculations

Comparison with previous PwC study

PwC conducted a similar study of the New Zealand film and television industry in 2009 based on 2008 data. This study is based on a very similar methodology to the earlier work. However, there are some changes between the two studies, specifically stemming from changes in data availability and underlying multiplier data from the national accounts. These changes are outlined in more detail later in the report. The table below compares the impact of the industry in the two years. The results suggest that, by most measures, the industry has grown slightly in nominal terms since 2008.

Comparison of results with 2009 study

	2008		2011		Growth (%)	
	Direct	Total	Direct	Total	Direct	Total
Gross output (sales)	$3,105m	-	$3,233m	-	4%	
Value added (GDP)	$1,271m	$2,541m	$1,282m	$2,781m	1%	9%
Employment (FTEs)	9,572	21,983	10,284	21,315	7%	-3%
Labour income	$601m	$1,239m	$729m	$1,376m	21%	11%

PwC calculations

Changes in the industry

Since the previous study, online movie services have become more of a factor in New Zealand, as the industry develops new business models. While this part of the industry is still relatively small, services available in New Zealand at the end of 2011 include CASPA OnDemand, iTunes Store, Zune Video, and MUBI. In addition, television broadcasters are expanding online offerings such as iSky and TVNZ Ondemand. Furthermore, the number of online movie services is growing, for example Quickflix entered the New Zealand market in March 2012. New Zealanders' consumption of film and television content through legal internet channels is likely to continue its rapid increase due to greater choice in the market and improving and more affordable broadband services.

Due to the "weightless" nature of the delivery of these services, and the fact that most are based offshore, their economic impact in New Zealand is likely to be negligible, or captured within other sectors (eg production companies). Consequently we have not explicitly attributed any economic impact to this part of the industry, but anticipate this will need to be considered carefully in future reports, as online penetration grows.

[4] Specifically grape growing, wine production and cellar door sales and hospitality

Introduction

The purpose of this study is to estimate the contribution of the film and television industry to the New Zealand economy. It provides a snapshot of the industry using 2011 data. It updates a 2009 PwC report for the New Zealand Federation Against Copyright Theft (NZFA©T), an industry body[5].

This report has been commissioned by NZFA©T, and supported with funding from the Home Entertainment Association of New Zealand, the Motion Picture Distributors Association of New Zealand, ThinkTV and the National Association of Cinema Operators. This report should be read in conjunction with the Restrictions in Appendix 2.

Acknowledgements

This report required gathering data from several different sources. In particular the data sources for the rental and retail subsectors used in 2008 were no longer available. We would like to thank the Video Dealers Association of New Zealand for their help in providing data on the rental subsector, and GfK Group (www.gfk.com) who provided data on retail sales. Without up-to-date information on these fast changing segments of the industry the robustness of our estimates for these subsectors would be undermined.

Purpose and scope of this report

This report examines some "bottom-line" measures of the film and television industry's impact on the national economy. Some other studies, such as Statistics New Zealand's annual *Screen Industry Survey* (SIS), focus on the total revenue earned by the industry, a "top-line" measure that does not account for factors such as intermediate inputs purchased from other sectors or imported from overseas.

By estimating bottom-line measures, this report enables comparisons between the film and television 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 film industry's economic contribution:

- **gross output** – the total sales of all film and television industry participants gathered from the SIS and industry sources

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[5] PwC (2009), *Economic Contribution of the New Zealand film and television industry*, report for NZFA©T.

- **value added** – the industry's contribution to New Zealand's gross domestic product (GDP), which is calculated as the total returns to labour and capital in the industry
- **employment** – the number of full-time equivalent workers (FTEs) employed as a result of film and television activity.

In addition to its **direct** economic impacts, an industry will have **spillover** effects elsewhere in the economy. In order to do business, firms must purchase inputs from other industries, while the wages, salaries, and profits 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 film and TV industry purchase goods and services from other sectors in order to produce a movie, broadcast a television show, or rent a movie to a customer.
- **Induced (or downstream) impacts** are generated when the wages, salaries, and profits paid out by the film and TV 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 film and television industry, we have used multiplier analysis based on national input-output tables[6]. We have described our application of multiplier analysis in Appendix 1: Methodology and data sources.

Defining the film and television industry

This report defines the "New Zealand film and television industry" as the group of businesses located in New Zealand whose chief aim is the creation, distribution, or sale to consumers of film and television content. We have examined the economic contribution of seven subsectors of the industry throughout the entire value chain – from the conception of an idea through to the viewing of its finished product. These subsectors are:

- screen production
- film and television distribution
- television broadcasting[7]
- film exhibition
- home video rental
- home video retail sale
- online movie services.

We have used the Statistics New Zealand definitions of the production, distribution, broadcasting and exhibition subsectors. **Figure 1** summarises the position that these subsectors occupy in the overall industry value chain. The subsectors highlighted in red are in the business of supplying consumers with film and television content through different media and venues (eg television, movie cinemas, rental shops). The subsectors in orange and yellow are responsible for making film and television content and distributing it to various sales channels, respectively.

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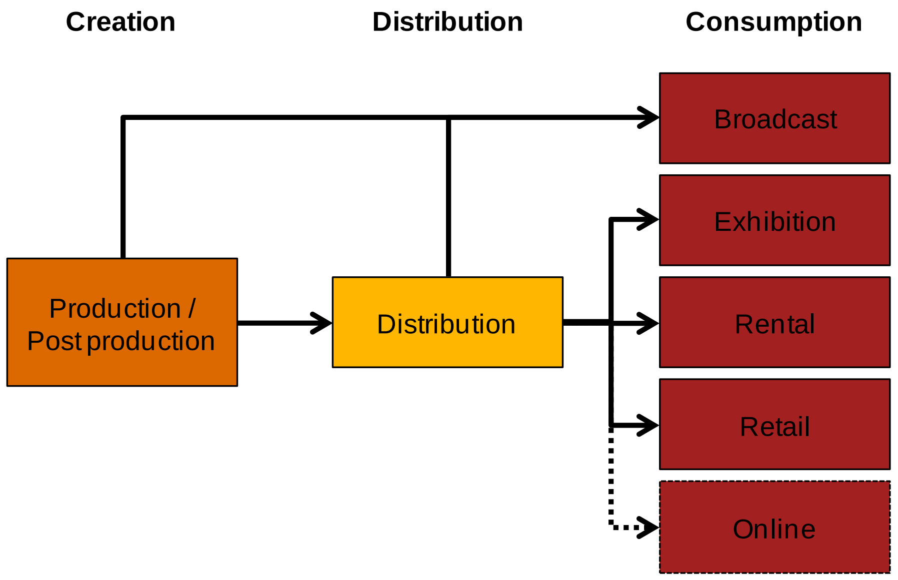
[6] Butcher Partners Ltd (2012), *New Zealand 2006-07 Input-Output Table and Multipliers*, based on Statistics New Zealand data.

[7] Which includes free to air and subscription based services.

Figure 1: Film and TV industry value chain



Source: PwC

Comparisons with other studies

This report is intended to provide comparable measures of the film and television industry's impact on the New Zealand economy. The economic impact measures we have chosen and the analysis we have undertaken mean that our results can be compared with:

- Results from the 2009 PwC report, *Economic Contribution of the New Zealand film and television industry*
- Economic impact studies of other New Zealand industries
- National-level GDP and employment statistics.

However, our report differs from Statistics New Zealand's *Screen Industry Survey*. The SIS reports top-line data on total industry sales and employee counts in the first four industry subsectors. We have used this data to estimate GDP and FTEs, which are bottom-line impact measures, in each subsector.

Here, we summarise the similarities and differences between this report and other recent reports on the New Zealand film and television industries.

Statistics New Zealand, *Screen Industry Survey* (2011)

The most detailed current source of official information about economic activity is provided by the 2011 SIS. The SIS provides comprehensive and accurate figures on several top-line measures of the screen industry.

The core information collected relates to revenue earned by firms in the industry, as well as the industry's rolling mean employment (RME), or average number of employees over the course of a year. As a result, the SIS allows for some analysis of trends in total industry sales and employment counts. However, these measures do not provide a full picture of the industry's contribution to the New Zealand economy, as they do not account for factors such as intermediate inputs purchased from other industries or imported from overseas.

Our report complements the SIS by estimating several bottom-line measures of the industry's contribution to the New Zealand economy, including (direct and total) GDP impact and a measure of employment that accounts for the role of independent contractors and working proprietors.

In addition, we estimate the economic impact of the home video rental and retail subsectors in addition to the four industry subsectors measured by the SIS.

Ministry of Economic Development, *Growth and Dynamics of the New Zealand Screen Industry* (2012)
The MED study is based primarily upon the SIS, supplemented with other official statistics and industry data. While it provides a range of useful contextual information on the industry, it does not provide any additional estimates of the industry's bottom-line impact on the New Zealand economy.

PwC, *Economic Contribution of the New Zealand film and television industry* (2009)
Our report updates PwC's previous report on the economic impact of the New Zealand film and television industry, which provided a snapshot of the industry in the 2008 financial year. We have taken care to ensure consistency between the two reports. Inevitably however, there are some changes between the two studies, specifically stemming from changes in data availability, and underlying multiplier data from the national accounts. These changes are outlined in more detail below.

Both reports provide the same core measures of the industry's bottom-line economic impact: direct and total GDP contribution and employment impact.

The calculations and assumptions underlying these figures are also comparable. Both reports apply multiplier analysis to estimate the economic impact of total spending in industry subsectors. They are based on underlying data from the SIS and industry sources.

However, we have refined the methodology in two main areas. First, we have applied a similar but slightly more robust method to adjust multipliers to avoid double-counting of within-industry purchases. We discussed these calculations with Butcher Partners, who provided multipliers for the last report, to ensure that they are accurate and appropriate for this study.

Second, we have used Statistics New Zealand industry-level statistics on full- and part-time employment and working proprietors to convert the SIS employee count figures into FTEs. This has enabled us to make a better estimate of total labour input in the industry.

Finally, the sources of data for the retail and rental sectors that were used in the previous study are no longer available. Consequently we have estimated total video rental revenue based on data provided by the NZ Video Dealers Association. Retail sales are based on data provided to us by GfK.

Economic impact of the industry

The industry as a whole

In 2011, the New Zealand film and television industry as a whole had total gross output of $3,233 million. This is estimated to have directly generated $1,282 million in GDP and 10,284 full-time equivalent jobs. After accounting for multiplier effects, the industry had a total economic impact of $2,781 million in GDP and 21,315 FTEs. Based on estimates of labour income, average wages across the industry were $70,900 per annum.

Table 1: Total economic impact of the NZ film and TV industry

	Economic impacts	
NZ screen industry	Direct	Total
Gross output (sales)	$3,233m	-
Value Added (GDP)	$1,282m	$2,781m
Employment (FTEs)	10,284	21,315
Labour income	$729m	$1,376m

PwC calculations

This impact was spread across six main subsectors of the industry, as shown in **Table 2** below. The **production** and **TV broadcasting** subsectors had the largest impact on New Zealand's GDP and overall employment. **Film exhibition**, **home video rental** and **retail** had a significantly smaller GDP impact but nonetheless accounted for a significant portion of industry employment due to their labour-intensive nature.

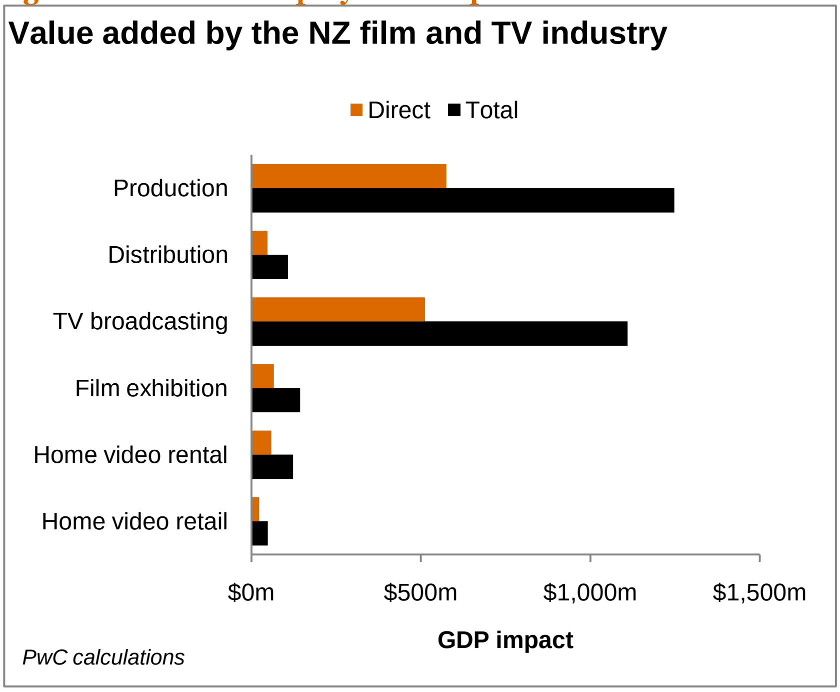
Table 2: Economic impact of the NZ film and TV industry, by subsector

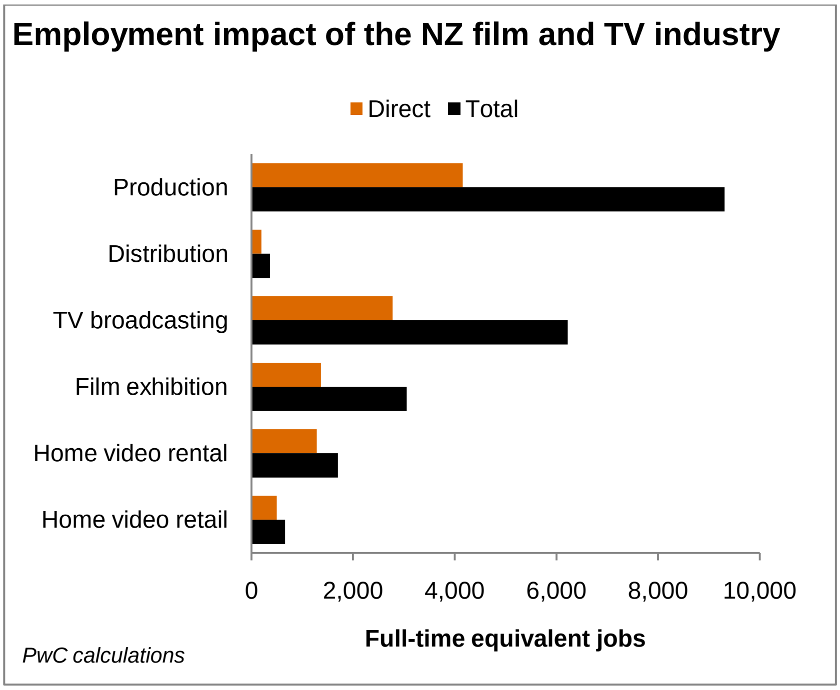
	Value added (GDP)		Labour income		Employment (FTEs)	
Industry segment	Direct ($m)	Total ($m)	Direct ($m)	Total ($m)	Direct	Total
Production	$575	$1,248	$487	$926	4,156	9,309
Distribution	$48	$108	$6	$13	197	365
TV broadcasting	$512	$1,110	$124	$236	2,779	6,225
Film exhibition	$66	$144	$47	$90	1,365	3,058
Home video rental	$58	$123	$46	$79	1,287	1,699
Home video retail	$23	$48	$18	$31	500	660
TOTAL	$1,282	$2,781	$729	$1,376	10,284	21,315

PwC calculations

Figure 2 provides a visual representation of the distribution of value throughout the industry in terms of both GDP and employment.

Figure 2: GDP and employment impact of the NZ film and TV industry, by subsector





Production subsector

In 2011, businesses in the film and television production subsector earned $1,403 million in gross output. This is estimated to have directly generated $575 million in GDP and 4,156 full-time-equivalent jobs. After accounting for multiplier effects, this subsector had a total economic impact of $1,248 million in GDP and 9,309 FTEs.

Table 3: Direct and total economic impact of the production subsector

	Economic impacts	
Production	**Direct**	**Total**
Value Added (GDP)	$575m	$1,248m
Employment (FTEs)	4,156	9,309
Labour income	$487m	$926m

PwC calculations

Definition of the production subsector

The screen production subsector encompasses both *production* and *post-production* activities. Production refers to all work leading up to and including filming, such as development, pre-production, and principal photography. Post-production includes all activity that takes place after filming in order to complete a screen production, such as editing, visual effects, computer graphics, animation and special effects, developing, printing and processing, captioning and sub-titling, film and video transfers or reproduction, and audio and duplication.

Input values

In order to estimate the direct and total economic impact of the screen production subsector we applied the methodology and assumptions as described in Appendix 1: Methodology and data sources in **Figure 4**. These imply the following input data and multipliers:

Table 4: Input figures for the production subsector

Variable	Value
Gross output (sales)	$1,403m
Employment (RMEs)	1,540
Number of businesses	2,616

Source: Statistics NZ

Table 5: Ratios and multipliers for the production subsector

Ratio or multiplier	Value
Direct impacts	
Ratio of value added to gross output	0.41
Ratio of FTEs to RMEs	1.00
Ratio of labour income to value added	0.85
Indirect multipliers	
Value added	0.53
Employment	0.64
Labour income	0.45
Induced multipliers	
Value added	0.64
Employment	0.60
Labour income	0.45

Source: Butcher Partners, PwC calculations

Distribution subsector

In 2011, the distribution subsector had total gross output of $186 million. This is estimated to have directly generated $48 million in GDP and 197 full-time equivalent jobs. After accounting for multiplier effects, this subsector had a total economic impact of $108 million in GDP and 365 FTEs. The estimated average wage in the distribution subsector was $32,900.

Table 6: Direct and total economic impact of the distribution subsector

	Economic impacts	
Distribution	Direct	Total
Value Added (GDP)	$48m	$108m
Employment (FTEs)	197	365
Labour income	$6m	$13m

PwC calculations

Definition of the distribution subsector

Film and television distribution is the process of distributing the completed work for display to the market (eg film, TV or software distribution; film library operation, and film leasing). This process includes marketing of the completed work but excludes retail distribution. It is analogous to other wholesale trade activities.

Distribution provides a key link between the creation and consumption of entertainment products. Most of the participants in the subsector are foreign-owned subsidiaries of Hollywood studios. Their main activity is to provide foreign-owned content to New Zealand businesses. The leakage likely to occur as revenues are returned offshore has been taken into account by adopting a subsector-specific ratio of value-added to gross revenue from a comparable Australian study.

Input values

In order to estimate the direct and total economic impact of the distribution subsector we applied the methodology and assumptions as described in Appendix 1: Methodology and data sources in **Figure 4**. These imply the following input data and multipliers:

Table 7: Input figures for the distribution subsector

Variable	Value
Gross output (sales)	$186m
Employment (RMEs)	180

Source: Statistics NZ

Table 8: Ratios and multipliers for the distribution subsector

Ratio or multiplier	Value
Direct impacts	
Ratio of value added to gross output	0.26
Ratio of FTEs to RMEs	1.10
Ratio of labour income to value added	0.14
Indirect multipliers	
Value added	0.61
Employment	0.44
Labour income	0.55
Induced multipliers	
Value added	0.65
Employment	0.41
Labour income	0.48

Source: Butcher Partners, PwC calculations

Television broadcasting subsector

In 2011, the television broadcasting subsector had total gross output of $1,248 million. This is estimated to have directly generated $512 million in GDP and 2,779 full-time equivalent jobs. After accounting for multiplier effects, this subsector had a total economic impact of $1,110 million in GDP and 6,225 FTEs. The estimated average wage in TV broadcasting was $44,700.

Table 9: Direct and total economic impact of the broadcasting subsector

	Economic impacts	
TV broadcasting	Direct	Total
Value Added (GDP)	$512m	$1,110m
Employment (FTEs)	2,779	6,225
Labour income	$124m	$236m

PwC calculations

Definition of the television broadcasting subsector

The television broadcasting subsector includes firms that distribute movies and television content to consumers through media such as television or the internet. Television broadcasting in New Zealand is dominated by a small number of firms providing free-to-air or subscription offerings to consumers.

Free-to-air television broadcasters derive revenue from advertisers who pay for airtime during regular programming; it is available via both analogue and digital transmission. Subscription television earns revenue from regular subscriber payments and advertising and is available via satellite[8].

Input values

In order to estimate the direct and total economic impact of the television broadcasting subsector we applied the methodology and assumptions as described in Appendix 1: Methodology and data sources in **Figure 4**. These imply the following input data and multipliers:

Table 10: Input figures for the broadcasting subsector

Variable	Value
Gross output (sales)	$1,248m
Employment (RMEs)	2,700

Source: Statistics NZ

Table 11: Ratios and multipliers for the broadcasting subsector

Ratio or multiplier	Value
Direct impacts	
Ratio of value added to gross output	0.41
Ratio of FTEs to RMEs	1.03
Ratio of labour income to value added	0.24
Indirect multipliers	
Value added	0.53
Employment	0.64
Labour income	0.45
Induced multipliers	
Value added	0.64
Employment	0.60
Labour income	0.45

Source: Butcher Partners, PwC calculations

[8] Since March 2011, New Zealand has begun the process of switching away from analogue to digital television transmission.

Film exhibition subsector

In 2011, the film exhibition subsector had total gross output of $162 million. This is estimated to have directly generated $66 million in GDP and 1,365 full-time equivalent jobs. After accounting for multiplier effects, this subsector had a total economic impact of $144 million in GDP and 3,058 FTEs. The estimated average wage in the exhibition subsector was $34,800.

Table 12: Direct and total economic impact of the exhibition subsector

	Economic impacts	
Film exhibition	Direct	Total
Value Added (GDP)	$66m	$144m
Employment (FTEs)	1,365	3,058
Labour income	$47m	$90m

PwC calculations

Definition of film exhibition subsector

Film exhibition is defined as the display of a completed work to the public at a pre-set location, such as a cinema, open air movie screening, film festival, or as part of a museum display.

There are three identified major players in the exhibition subsector: Readings Cinemas, Hoyts and Sky City. Together with the smaller chains, such as Rialto, and various independent operators, film exhibition had total gross revenue of $162 million in 2011.

Input values

In order to estimate the direct and total economic impact of the film exhibition subsector we applied the methodology and assumptions as described in Appendix 1: Methodology and data sources in **Figure 4**. These imply the following input data and multipliers:

Table 13: Input figures for the exhibition subsector

Variable	Value
Gross output (sales)	$162m
Employment (RMEs)	2,100

Source: Statistics NZ

Table 14: Ratios and multipliers for the exhibition subsector

Ratio or multiplier	Value
Direct impacts	
Ratio of value added to gross output	0.41
Ratio of FTEs to RMEs	0.65
Ratio of labour income to value added	0.71
Indirect multipliers	
Value added	0.53
Employment	0.64
Labour income	0.45
Induced multipliers	
Value added	0.64
Employment	0.60
Labour income	0.45

Source: Butcher Partners, PwC calculations

Home video rental subsector

In 2011, the home video rental subsector had total gross output of $121 million. This is estimated to have directly generated $58 million in GDP and 1,287 full-time equivalent jobs. After accounting for multiplier effects, this subsector had a total economic impact of $123 million in GDP and 1,699 FTEs. The estimated average wage in the rental subsector was $35,700.

Table 15: Direct and total economic impact of the rental subsector

	Economic impacts	
Home video rental	**Direct**	**Total**
Value Added (GDP)	$58m	$123m
Employment (FTEs)	1,287	1,699
Labour income	$46m	$79m

PwC calculations

Definition of the home video rental subsector

The home video rental subsector encompasses all businesses that rent film or television content on any format (eg DVD, Blu-ray, obsolete formats such as videocassette) to be viewed by the consumer in private.

The rental subsector is made up of three major video rental chains – VideoEzy, Civic Video, and United Video – as well as a number of independent operators and Fatso, a postal rental service.

Input values

In order to estimate the direct and total economic impact of the video rental subsector we applied the methodology and assumptions as described in Appendix 1: Methodology and data sources in **Figure 4**. These imply the following input data and multipliers:

Table 16: Input figures for the rental subsector

Variable	Value
Gross output (sales) of 3 major chains	$121m
Estimated share of market	90%
Estimated total gross output	**$134m**
Employment (headcount)	1,980

Source: Video Dealers Association, Statistics NZ

Table 17: Ratios and multipliers for the rental subsector

Ratio or multiplier	Value
Direct impacts	
Ratio of retail margin to gross output	0.74
Ratio of value added to retail margin	0.59
Ratio of FTEs to RMEs	0.65
Ratio of labour income to value added	0.79
Indirect multipliers	
Value added	0.46
Employment	0.14
Labour income	0.32
Induced multipliers	
Value added	0.65
Employment	0.18
Labour income	0.41

Source: Butcher Partners, PwC calculations

Home video retail subsector

In 2011, the home video retail subsector had total gross output of $166 million. This is estimated to have directly generated $34 million in GDP and 740 full-time equivalent jobs. After accounting for multiplier effects, this subsector had a total economic impact of $71 million in GDP and 977 FTEs. The estimated average wage in the retail subsector was $35,700.

Table 18: Direct and total economic impact of the retail subsector

	Economic impacts	
Home video retail	**Direct**	**Total**
Value Added (GDP)	$23m	$48m
Employment (FTEs)	500	660
Labour income	$18m	$31m

PwC calculations

Definition of home video retail subsector

The home video retail subsector includes businesses that sell film or television content on any format (eg DVD, Blu-ray, obsolete formats such as videocassettes) to be viewed by the consumer in private.

Input values

In order to estimate the direct and total economic impact of the video retail subsector we applied the methodology and assumptions as described in Appendix 1: Methodology and data sources in **Figure 4**. These imply the following input data and multipliers:

Table 19: Input figures for the retail subsector

Variable	Value
Gross output (sales)	$112m

Source: GfK

Table 20: Ratios and multipliers for the retail subsector

Ratio or multiplier	Value
Direct impacts	
Ratio of retail margin to gross output	0.34
Ratio of value added to retail margin	0.59
Ratio of FTEs to $1m retail margin	13.0
Ratio of labour income to value added	0.79
Indirect multipliers	
Value added	0.46
Employment	0.14
Labour income	0.32
Induced multipliers	
Value added	0.65
Employment	0.18
Labour income	0.41

Source: Butcher Partners, PwC calculations

Online movie services

In 2011, online movie services had total sales of $1.7 million, a 55% increase over 2010. However, the employment and GDP impact to the New Zealand economy is likely to be minimal or accounted for elsewhere in our calculations.

Online services allow overseas film content to be imported "weightlessly" with little or no impact on the New Zealand economy, while revenues for New Zealand-originated content are likely to be measured by existing data collections.

Definition of online movie services

The online movie services subsector includes businesses that provide film content directly to consumers through online and mobile channels on either a subscription or an on-demand basis. It is distinct from online television services such as iSky and TVNZ Ondemand, which are operated by television broadcasters and hence included in that category.

Input values

IHS Screen Digest[9] tracks a number of firms operating in the online movie rental and retail space in New Zealand. Total New Zealand revenue from these services in 2011 is summarised in **Table 21**.

Table 21: Online movie service revenues, 2011

Variable	Value
Digital retail revenue	$1.2m
Digital rental revenue	$0.5m
Total gross output (sales)	$1.7m

Source: IHS Screen Digest

Online movie services available to New Zealand consumers at the end of 2011 include:

- CASPA OnDemand, a New Zealand-based joint venture between TVNZ and Australian company Seven Media Group
- The iTunes Store, owned by United States-based Apple Corporation but operated from Australia
- United States-based services including MovieFlix, Movieway, MUBI and Zune Video
- Europe-based services including Movieurope.

Quickflix entered the New Zealand market in March 2012, and additional providers are likely to enter the market in the near future, increasing competition and consumer choice. Additionally, improvements to broadband availability and affordability are likely to encourage increased uptake of online movie services.

Because online movie services are largely based overseas and concentrate on providing overseas-originated content to New Zealand consumers, they are likely to have a relatively limited effect on the New Zealand economy. It is likely to be confined to the revenues received for New Zealand-originated content as well as a minor contribution for broadband subscriptions and credit card charges. For the most part, these revenues will be factored in to revenues in other parts of the film and television industry (eg production companies).

Due to the resulting potential for double-counting of revenues, we have not explicitly included the economic impact of online sales in our calculations. However, we expect that we have implicitly included these revenues in calculations based on the SIS.

[9] IHS Screen Digest is a UK-based analysis and consultancy firm that publishes market intelligence and industry reports on media markets.

Appendix 1: Methodology and data sources

Defining the film and television industry

What is included in this report?

We define the "New Zealand film and television industry" as the group of businesses located in New Zealand whose chief aim is the production, distribution, or sale to consumers of film and television content. The types of content included in this study are:

- feature films and short films
- television programmes
- commercials
- other non-broadcast media.

These categories represent the key outputs and most significant sources of industry revenue. Additionally, information is readily available on these outputs due to regular industry surveys conducted by Statistics New Zealand.

What is not included?

This report excludes two types of activity that are related to the film and television industry but not exclusively devoted to the production of its main outputs.

First, the production and retail of hardware for film and television viewing (eg televisions, DVDs, BluRay players) is excluded from Statistics New Zealand's definition of the industry and, consequently, this study. Although the television industry relies upon the existence of a television, the focus of this study is on content production and distribution rather than platforms for displaying content. This is an appropriate exclusion, as product cycles and retail dynamics in the hardware market are not comparable or entirely related to the dynamics of the film and television industry.

Second, although the production of television commercials is included in this study, we do not explicitly include all activities related to making advertisements. In particular, this report does not directly measure the contribution of advertising agencies. These firms typically provide services over a variety of media, including print, online, and radio campaigns as well as television ads. Identifying the share of their activity specifically related to television commercials is beyond the scope of this study. However, advertising firms' services will be implicitly counted by multiplier analysis in instances in which they provide intermediate inputs to the production process.

Accounting for output innovation

The film and television industry is undergoing considerable change. Its range of outputs is expanding away from traditional delivery mechanisms (ie TV broadcasts, home video rental and retail, and cinemas). New types of film and television output include:

- mobile phone screen entertainment
- film-related and television-related video gaming, books, mobile applications, etc
- sound tracks and audio recordings based on film and television
- online screen entertainment activity
- film festivals
- consoles and hardware manufacture, distribution and sale.

There is a strong rationale for accounting for new outputs when examining the economic impact of the film and television industry. Large numbers of consumers are already enjoying film and television content on their computers and mobile devices. The online and mobile market is likely to continue expanding and developing new revenue sources.

Nonetheless, this report largely focuses on traditional film and television outputs, as the national accounting framework responds relatively slowly to changing patterns of output and production. This makes it difficult to gather reliable and robust data on new film and television markets. Available data suggests that while revenue from new outputs is growing rapidly, it still makes up only a tiny share of overall industry revenue.

Where data is available (eg information on online subscription and on-demand movie services), we have attempted to include new outputs in our classification. However, we expect that our estimate of the economic impact will be conservative.

Definition of industry subsectors

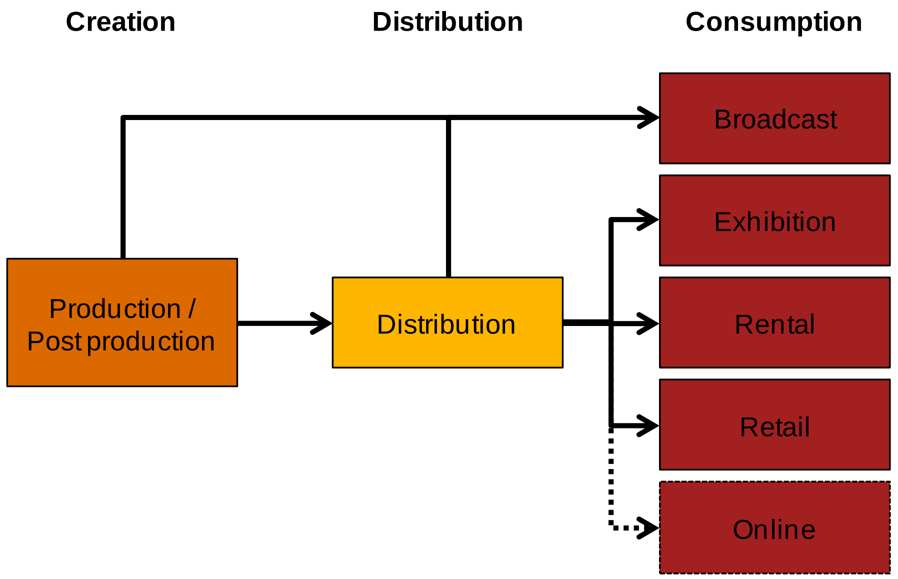
This study estimates the contribution to the economy from the entire value chain of the outputs outlined above – from the conception of an idea through to the viewing of its finished product. We examine seven distinct parts of the value chain:

- screen production
- film and television distribution
- television broadcasting[10]
- film exhibition
- home video rental
- home video retail sale
- online movie services.

Figure 3 summarises the position that these subsectors occupy on the overall industry value chain. The subsectors highlighted in red are in the business of supplying consumers with film and television content through different media and venues (eg television, movie cinemas, rental shops). The subsectors highlighted in orange and yellow are responsible for making film and television content and distributing it to various sales channels, respectively.

[10] Which includes free to air and subscription based services.

Figure 3: Film and TV industry value chain



Source: PwC

Screen production – This includes both *production*, which involves all work leading up to and including filming (eg development, pre-production, and principal photography), and p*ost-production*, which includes all activity that takes place after filming in order to complete a screen production (eg editing, visual effects, computer graphics, animation and special effects, developing, printing and processing, captioning and sub-titling, film and video transfers or reproduction, and audio and duplication).

Film and television distribution - This includes businesses that distribute the completed work for display to the market (eg film, TV or software distribution; film library operation, and film leasing). This process includes marketing of the completed work but excludes retail distribution.

Television broadcasting - This includes firms that distribute works to consumers through media such as television or the Internet.

Film exhibition - This includes businesses that display a completed work to the public at a pre-set location, such as a cinema, drive-in-theatre, film festival, or as part of a museum display.

Home video rental - This includes businesses that rent film or television content on any format (eg DVD, Blu-ray, videocassette) to be viewed by the consumer in private.

Home video retail - This includes businesses that sell film or television content on any format to be viewed by the consumer in private.

Online movie services - This includes businesses that provide film or television content directly to consumers through online and mobile channels on either a subscription or an on-demand basis.

Measures of Economic Impact

This study measures the contributions of the film and television industry to the economy in three different ways:

- gross output (or gross revenue or total sales)
- value added (or GDP contribution)
- employment (or labour input).

This section further defines the economic measures by describing the manner in which they are applied to assess economic impact.

Gross output (or gross revenue or total sales)

Gross output is the total value of goods and services provided by firms and individuals operating in the film and television industries. It is calculated based on the collective sales of all industry participants and expressed as a dollar amount.

Gross output includes the value of all goods and services used as inputs to generate that output, referred to as intermediate inputs, as well as the work done within the industry (measured as the total value of payments to labour and capital).

Value added (or GDP contribution)

The value added of an industry is equal to the total value created within that industry. It is often described as the gross domestic product (GDP) contribution of an industry. GDP measures the contributions of labour (through wages and salaries) and capital (through profits and depreciation) to the output produced by an industry, as well as the taxes that it pays (less subsidies received). As a result, it is equivalent to the gross output of an industry, less the value of all inputs purchased from other sectors. Value added is expressed as a dollar amount.

GDP is the most commonly used measure of the value generated by an industry or by the economy as a whole. It is the **most easily comparable** measure of total economic impact. Using this measure enables comparisons with national GDP statistics from Statistics New Zealand and with economic impact studies of other industry sectors.

GDP versus GNI

However, it is important to understand what GDP **does** and **does not** include when using our estimates. 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 domiciled within New Zealand (often called Gross National Income, or GNI). As a consequence, it includes profits earned in New Zealand by overseas-owned companies, even in instances when they are repatriated offshore.

Although GDP does have some weaknesses, they are not unique to the New Zealand film 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 sectors 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. GNI, by contrast, accounts for both of these factors.

Employment (or labour input)

We measure employment on the basis of full-time equivalent jobs (FTEs), rather than total (full-time and part-time) jobs. This measure counts part-time jobs as a proportion of a full-time job and accounts for working proprietors and independent contractors. For example, a job that involves working half of a full work-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 and self-employment can vary between different industries.

In order to estimate FTEs in the film industry, we begin with the rolling mean average employment (RME) data provided in the 2011 SIS. RME tracks the average number of employees (full time and part time) over a twelve month period. It does not include working proprietors or self-employed contractors, which represent a significant source of labour input in the film industry.

We then converted RMEs into FTEs using PwC's Regional Industry Database (RID) and the underlying Statistics New Zealand data. The RID uses Statistics New Zealand data on full-time and part-time employment and owner-operators and self-employed workers to estimate the number of FTEs in disaggregated ANZSIC industries. It assumes that:

- On average, part-time workers work 50% of a full-time work week
- Owner-operators and self-employed workers have similar rates of full- and part-time employment as employees in their industry.

We arrive at industry-level estimates of the ratio of FTEs to RMEs by dividing the RID estimate of FTEs by the total number of (full- and part-time) employees in the industry. These ratios were used to convert RME figures into FTEs. Because we started with employment figures averaged over a year rather than taken at a single point in time, our estimate of total labour input is also implicitly a rolling average.

Multiplier analysis

Direct, indirect and induced impacts

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

Indirect (or upstream) impacts occur as a result of purchases of goods and services from other sectors. When a screen production is made, businesses within the film industry purchase a range of inputs: set construction, catering, transportation services, machinery and instruments, rented real estate, etc.

Indirect impacts are typically estimated using Type 1 multipliers, which account for the first-round and indirect effect of purchases of goods and services by an industry.

Induced (or downstream) impacts occur as a result of the wages and salaries paid out by the film industry. When an actor or technician is paid, he or she will then spend some of that money on a range of goods and services, thereby stimulating further economic impact.

Induced impacts are typically estimated using Type 2 multipliers, which account for the consumption that is induced as a result of the wages, salaries, and profits paid by an industry.

We estimated the indirect and induced impacts of the New Zealand film industry using multiplier analysis based on the most recent available input-output tables for the New Zealand economy.

Estimating direct economic impacts

We estimated the direct component of the film and television industry's economic impact in terms of its contribution to gross output, value added, and employment as follows:

- For each industry subsector, we started with figures on the total gross revenue of firms in that subsector.
- We then chose a representative ANZSIC industry (eg J551 Motion Picture and Video Activities, J562 Television Broadcasting, G Retail Trade) for each industry subsector.
- We used data from the PwC Regional Industry Database and national Input-Output tables provided by Butcher Partners to estimate the ratios of value added (VA) to gross output (GO), GO to employment, and GO to gross labour income in these industries. These ratios were then used to estimate direct VA and employment in each subsector.

Estimating spillover impacts

As a result of indirect and induced impacts, every dollar that is spent directly in the film and television industry will also stimulate or support other types of economic activity. This is often described as the **multiplier effect** of spending.

Our estimates of the **total economic impact** of this industry therefore accounted for indirect and induced impacts. In order to make this estimate, we applied multipliers calculated using 2006/07 input-output tables for all New Zealand industries. These tables are the most recent available. Multipliers were available for gross output, value added, employment, and household income in these industries.

Avoiding double counting

Multiplier analysis is typically used to estimate the effects of additional, incremental expenditures. In this instance, we are applying it to comprehensive data on total revenues and RME within the *entire* industry. These figures are derived from a Statistics New Zealand census of businesses in the film and television industry and are likely to be an accurate and comprehensive measure of the industry.

When used with figures that account for the total revenue of an entire industry, multiplier analysis poses the risk of double-counting due to the fact that firms within an individual industry often purchase inputs from each other. This is a particularly important issue in the film and television industry, where lead production companies typically play a coordination role for a series of contractors. According to the 2006/07 national input-output tables, 13.5 percent of gross revenue in the "Motion picture, radio, and TV services" industry is made up of purchases from within the same industry.

In order to avoid double-counting this output – and the intermediate inputs that were required to produce it – we recalculated GDP and employment multipliers. We consulted with Butcher Partners, who provided adjusted multipliers for the 2009 PwC study[11], in order to ensure that our calculations were robust and consistent with those from the previous report.

We eliminated any double-counting in the multipliers by adjusting the national input-output table to **exclude** all purchases from within the "Motion picture, radio, and TV services" industry. We reduced intra-industry purchases within the film industry from 13.5 percent of gross revenue to zero percent. We also zeroed out purchases from the film industry that were made by other sectors or by household consumers.

We then recalculated GDP and employment multipliers using this adjusted input-output table. This enabled us to arrive at estimates of the industry's total economic impacts that do not double-count revenues that have already been counted in our input data.

Different approaches for different sub-sectors

To estimate gross output, value added and employment for each sub-sector involved different calculations depending on the basis of the underlying data, the comparable industry within the national account reporting framework, as well as some technical adjustments for wholesale and retail components to reflect their different treatment in national input-output tables. The table below summarises the different approaches.

[11] PwC (2009), *Economic Contribution of the New Zealand film and television industry*, report for NZFA©T.

Figure 4: Methodology and assumptions for the different industry sub-sectors

Subsector	Information base	Direct value added	Direct FTEs	Direct labour income	Total value added, FTEs, labour income
Production	Gross output and RME figures from SIS	Based on ratio of value added to gross output in the "Motion picture, radio and TV services" industry	Based on RMEs adjusted to account for the large number of owner-operator businesses, then by the estimated ratio of FTEs to the employee headcount within the "Motion Picture and Video Activities" industry.	Based on ratio of labour income to value added from 2009 PwC report. Assumes that distribution of value added does not change greatly over this period.	Indirect and induced impacts based on multipliers in the "Motion picture, radio and TV services" industry
Distribution	As above	Based on the ratio of value added to gross revenue for the Australian distribution subsector, derived from a 2011 Access Economics study[12]	Based on RMEs adjusted by the estimated ratio of FTEs to the employee headcount within the "Wholesale Trade" industry	As above	Indirect and induced impacts based on multipliers in the "Personal and household goods wholesaling" industry
Television broadcasting	As above	Based on ratio of value added to gross output in the "Motion picture, radio and TV services" industry	Based on RMEs adjusted by the estimated ratio of FTEs to the employee headcount within the "Television Broadcasting" industry	As above	Indirect and induced impacts based on multipliers in the "Motion picture, radio and TV services" industry
Film exhibition	As above	As above	Based on RMEs adjusted by the estimated ratio of FTEs to employee headcount within film exhibition	As above	As above
Home video rental	Estimated industry gross output from the NZ Video Dealers Association	Based on ratio of value added to retail margin in the "Other personal and household goods retailing" industry and ratio of retail margin to gross output estimated using Statistics NZ data	Based on Statistics New Zealand figures on employee headcounts in the "Video and Other Electronic Media Rental" industry, adjusted by the estimated ratio of FTEs to employee headcount	Based on average ratio of labour income to value in the combined rental and retail sectors from 2009 PwC report. Assumes that labour inputs are similar for both retail and rental.	Indirect and induced impacts based on multipliers in the "Other personal and household goods retailing" industry
Home video retail	Gross output based on industry sales provide by GfK	As above	Based on the ratio of FTEs to value added in the home video rental market, estimated from above calculations. Assumes that labour requirements are comparable in both subsectors.	As above	As above

[12] Access Economics (2011), Economic Contribution of the [Australian] Film and Television Industry, report for Australian Federation Against Copyright Theft (AFACT).

Main quantitative data sources

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

- The 2011 Statistics New Zealand *Screen Industry Survey* (SIS), an annual survey of all firms in the production, distribution, television broadcasting, and film exhibition subsectors[13]. The survey had a response rate of 77 percent and is therefore extremely comprehensive.
- Estimates of home video rental revenues from the New Zealand Video Dealers Association, an industry body representing the three major rental chains
- Estimates of home video retail revenues derived from the 2009 PwC report on the film and television industry and Video Dealers Association data
- Data on home video retail sales provided by GfK
- 2011 estimates of industry-level economic activity (GDP and employment) from PwC's proprietary Regional Industry Database
- 2006/07 input-output tables and multipliers for all New Zealand industries, provided by Butcher Partners.

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

Reporting of results

Values are in 2011 New Zealand dollars unless otherwise stated

The 2011 financial year (year ended March quarter) has been selected as the basis for the economic impact calculations because 2011 is the most recent full set of annual data available. All amounts in this report, then, relate to impacts that occur in this period.

Because this report is based on annual data, it provides a useful snapshot of the New Zealand film and television industry. However, it is necessary to consider that film and television industry product cycles tend to be longer than a single year. Large-budget screen productions typically take several years to develop, produce, and bring to market, while television shows often continue for multiple seasons.

Carrying out this study on an annual basis could help to provide a longer-term picture of the industry and support decision-making by both industry and government.

Estimates versus official statistics

Our calculations are based on actual, officially published data wherever possible. However, official statistics were not available for all industry subsectors as home video rental, home video retail, and the online market were not surveyed by Statistics New Zealand. We have referred to these figures as **estimates** to distinguish them from **official statistics** published by Statistics New Zealand[14].

Likewise, we refer to our measures of the direct and total (indirect and induced) GDP impact and employment of the film and television industry as **estimates** due to the fact that they are calculated using national multipliers and ratios.

[13] The SIS collects data on "all economically significant New Zealand businesses involved in any screen industry activity. The screen industry encompasses all film, video, television, commercial, music video, and non-broadcast media activities in the aspects of production (including pre-production), post-production, distribution, exhibition, and broadcasting." This includes all firms from seven ANZSIC industries associated with film and television – J5511, J5512, J5513, J5514, J5621, J5622, J6020 – as well as additional businesses listed in *The Data Book*, New Zealand's screen production directory.

[14] Reported Statistics New Zealand figures will vary slightly from the true figures due to the fact that they are anonymised by randomly rounding them up or down to the nearest significant digit.

Glossary

Downstream impacts	See *Induced impacts*
Full-time equivalents (FTEs)	A measure of employment that allows comparison of total labour inputs across different industries. It takes into account the casual / part-time nature of some industries such as hospitality relative to industries where full-time employment is more common such as manufacturing. It also accounts for independent contractors and working proprietors.
GDP	Gross Domestic Product, which is the market value of all final goods and services produced within defined area in a given period. It is equivalent to the value of the wages, salaries, profits, and taxes paid out in the defined area – ie the value added by the main factors of production. In this report, the area of analysis is the whole of New Zealand. It is also referred to as "value added" in this report.
Gross output	Refers to the total revenue earned by a set of businesses. It includes the value of wages, salaries, profits, and taxes paid by the businesses as well as the value of the intermediate inputs they purchased from other firms. It is a "top-line" rather than "bottom-line" measure as it does not measure firms' net economic contribution. Gross output is also described as "total sales" or "gross revenue".
Indirect impacts	The impacts on supplier industries that result from direct economic activity in the industry being studied. For instance, a new sawmill operation will require inputs from log producers, machinery manufacturers, energy providers and imported products. As the sawmill pays for these inputs into its operation, it also generates economic activity (jobs and GDP) at those suppliers. The same basic principle holds for the film and television industry as a whole. These are sometimes referred to as "upstream" or "Type I" multiplier impacts.
Induced impacts	The impacts on the economy as workers in the industry being examined and in supplier industries, spend their wages in the economy. For instance, workers at a new sawmill and at the forestry operation that supplies the sawmill spend their wages at supermarkets, petrol stations and movie tickets, generating employment there. The same basic principle holds for the film and television industry as a whole. These are sometimes referred to as "downstream" or "Type II" multiplier impacts.
Input-output tables/analysis	A quantitative economic technique that represents the interdependencies between different components of the economy in matrix form. It shows how the output of one industry is an input to each other industry. Multipliers are derived from input-out tables.
Multipliers	A factor of proportionality that measures how much one variable changes in response to a change in some other variable. In the case of input-output analysis, multipliers measure the ratio of total employment and GDP to direct employment and GDP. For instance, a GDP multiplier of 3.4 means that for every $1.00 of direct GDP generated, $3.40 of total GDP is generated (including indirect and induced impacts).
Retail margin	Retail and wholesale trade businesses typically purchase finished goods from other sector for resale. The retail margin for an individual retail business is equivalent to the total sales (or gross output) of the business, less the value of goods purchased for resale. Estimates of retail margin have been used to focus on the direct economic contribution of businesses in the home video rental and retail sectors.
Upstream impacts	See *Indirect impacts*
Value added	See *GDP*.

Appendix 2: Restrictions

This economic impact assessment has been commissioned by the New Zealand Federation Against Copyright Theft and has been prepared solely for the purpose described in the introduction on page 5 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 letter of engagement dated 18 June 2012.