



The economic contribution of the screen industry

NZIER report to:

New Zealand Film Commission, Ministry of Business, Innovation and Employment, the Ministry for Culture and Heritage, New Zealand On Air, Auckland Tourism, Events and Economic Development, Wellington Regional Economic Development Agency

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Executive summary

The economic contribution of the screen industry aims to showcase the economic contribution of the New Zealand screen industry ecosystem by exploring three themes. These themes are:

- What does the industry do for the economy?
- What does the industry do for skills and employment?
- What does the industry do for 'NZ Inc.'?

The screen industry makes a strong economic contribution

The screen industry added \$1.015 billion to real GDP in 2016.

The motion picture sub-industry, a component of the screen industry, is geared towards exporting and its estimated contribution to export volumes is around \$706 million annually. The motion picture sub-industry includes the production and distribution of film, television, commercials and videos.

Without the New Zealand Screen Production Grant (NZSPG) scheme, exports would shrink by \$257 million, household consumption by \$144 million and real GDP by \$176 million. The NZSPG generates export revenue by attracting international firms to spend in the New Zealand economy during production. This screen industry revenue was considered to be exports in the same way as international visitor spending can be described as tourism exports.

The screen industry has increased job stability, increased wages and well paid visual effects jobs

There were 14,000 people working in the industry in 2015.

The number of jobs or contracts per person was two in 2006, and 1.76 in 2015.

Median earnings in the industry are growing faster than the average for the New Zealand economy, and are catching up. The largest improvement in annual earnings was experienced by those who earn the least.

The industry is home to some high tech and high productivity jobs. The typical post-production/visual effects worker had a median hourly rate of \$65. The national median for all industries was \$23 per hour.

Post-production is a high-tech industry where innovation is a key driver of success. The international market for post-production digital effects is globally competitive and the highly skilled creative labour force is globally mobile.

The screen industry supports New Zealand's attraction strategy

Film tourism has shown strong growth. Total spending by international visitors in the Matamata-Piako District, where Hobbiton is located, increased from \$9 million in 2010 to \$45 million in 2015.

International visitors increased by more than 200,000 in 2013 and 2014. The economic impact of this increase in tourism was estimated to increase real household welfare by \$268 million and tourism industry exports by \$861 million.

Productions that showcase New Zealand's natural environment, culture and society contribute to marketing New Zealand as an attractive tourist destination. The screen industry also provides an opportunity for New Zealand companies to work with international industry participants. International production partnerships are a signal that New Zealand is open for business beyond the screen industry.

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1. Foreword

The New Zealand screen industry has matured and continues to maintain a competitive position as a global export industry. We see this in the way the screen industry attracts a steady stream of repeat international business, the number of SciTech Awards for industry innovation and the way part-time work is becoming full-time. The post-production end of the screen industry pays high wages that well exceed the New Zealand average.

Few industry assistance programmes remain in New Zealand. Results from the NZIER computable general equilibrium (CGE) modelling show that the New Zealand Screen Production Grant (NZSPG) scheme increases exports and GDP more than if the funding was directed elsewhere.

New Zealand's international success provides more than direct economic benefits through spin-off benefits for other industries such as tourism, the technology sector and the domestic screen industry. The domestic screen industry is a big beneficiary because domestic New Zealand screen productions have access to world class facilities and expertise. Telling New Zealand stories with the same world class production values as our international work is important for national identity and pride. New Zealanders see world class production values in overseas productions and expect nothing less from local productions.

The New Zealand screen industry is in good shape but has proven very difficult to measure and track due to rapidly evolving technology and business practices in the financing, production, distribution and consumption of screen industry outputs worldwide. National statistics are becoming obsolete and need to adapt so that businesses and occupations such as interactive games and games developers are captured in future statistics. Because the screen industry is important to the economy and benefits from some public support, it will be important for official statistics to keep pace. To do this correctly, statistics must capture the wider creative sector which is experiencing the same changes as various creative and artistic media converge.

This NZIER reports adds to the body of similar reports from Australia, Canada and the United Kingdom. This report is the first time CGE modelling has been applied to the screen industry. The CGE modelling results show the very positive contribution of the NZSPG to the New Zealand economy and as such demonstrates it is an effective industry policy.

2. Introduction

This report provides an analysis of the economic contribution of New Zealand’s screen industry. Currently in New Zealand it is common for screen industry statistics to be produced by individual agencies, and in some instances without adequate reference to the industry. One of the objectives of this work is to establish a common set of frequently used statistics that will illuminate the role of the screen industry in the New Zealand economy and society.

The screen industry is broadly defined as the combination of the production, distribution and exhibition of film, television, online and digital content. Digital gaming is excluded from the statistical definition of the screen industry in the Statistics New Zealand Screen Industry Survey. Digital gaming is also not readily identifiable in other published Statistics New Zealand information. This is due to statistical definitions and collections not keeping pace with a rapidly evolving industry. However, we recognise that there is a high degree of complementarity between post-production in the screen industry and digital gaming, and that skilled professionals often move between the two.

2.1. Methodological approach

NZIER’s approach and framework is based around four key questions that broadly capture the dimensions of New Zealand’s screen industry ecosystem. The four key questions, shown in Table 1, are mapped to their areas of focus. These questions and areas of focus are primarily intended to provide a structure to the discussion in this report. In practice, many of the elements spill over into other areas. For example, skills and workforce issues spill over in macroeconomic outputs and shape the reputation of ‘NZ Inc.’ The last key question does not naturally fall into a single section of this report, rather the insights on opportunities and barriers emerge as themes throughout the report.

Table 1 What are the key questions?

Key question	Area of focus
What does the screen industry do for the economy?	Macroeconomic
What does the screen industry do for skills and employment?	Microeconomic
What does the screen industry do for ‘NZ Inc.’?	Tourism and international reputation
What are the opportunities and barriers to growth at the firm level?	Identification of the opportunities or constraints and how releasing them would support growth

Source: NZIER

The evidence base for this report was drawn from a variety of sources, to develop the most complete picture of the industry’s contribution to date. Statistics New Zealand’s Screen Industry Surveys were a key source of information. Other sources include:

- the Business Operations Survey (Statistics New Zealand)
- interviews, which underpin the case studies
- National Accounts (Statistics New Zealand)
- journal articles
- industry research
- unpublished firm-level data.

Case studies were used to inform the evidence base and provide tangible examples that showcase the industry's contribution to jobs, innovation, tourism, culture and soft diplomacy. The case studies have been written with support from the industry and in large part are a reflection of how the industry views its contribution to New Zealand.

2.2. Scope of the report

The *industry* scope of this report goes wider than Statistics New Zealand's Screen Industry Surveys, to capture the converging technology in the screen industry that has led to the integration of production, distribution and consumption across multiple formats.

The *value* scope of this report is that it examines the total impact of the screen industry. Total value is economic, social and cultural; that is, total value includes spillovers and non-market values. To deal with aspects that are difficult to measure, our analysis is supplemented by case studies. Cultural/non-market value counts as part of total value. But it is not included in this report, due to the lack of New Zealand-based primary research on the non-market value of the screen industry. Further research is needed to quantify the non-market benefits.

Readers should note that the publication of employment statistics and GDP estimates typically lag one year behind the other statistics.

3. Economic contribution

In this section of the report we look at the overall effects of the screen industry on the economy. We explore the contribution to GDP and overall gross revenue from the industry. This section takes a top-down, macroeconomic perspective. The bottom-up, microeconomic perspective is discussed in the next section, where employment, wages and sub-industry performance will be explored.

The economic contribution from the screen industry is wide ranging. It includes movies, television, online productions and software-based entertainment. There are also spillovers to tourism and cultural activities.

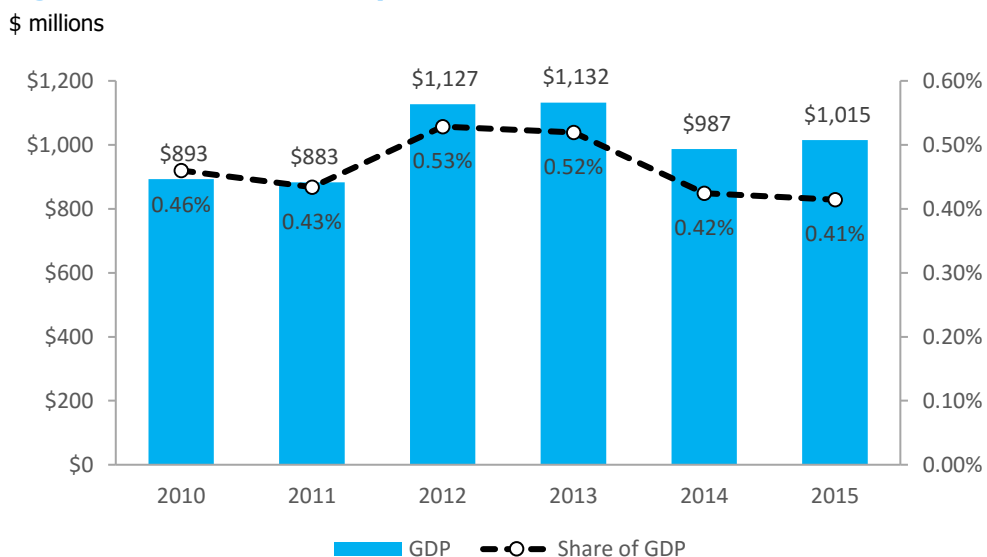
Employment in the industry is characterised by part-time work and/or contract work linked to the duration of the production. On average, an individual in the screen industry will have more than one contract within a given year. The labour force is highly mobile, which reflects the global nature of the industry. The demand for skills in the screen industry is extremely broad. Employment in the industry ranges from low skill, labour-intensive roles to high tech, high skill jobs.

Due to the wide range of skills, roles and productions, it is difficult to generalise about the direct and indirect economic contribution of the industry without understanding the underlying dynamic in the industry. For example, the high tech post-production sub-industry is international, fast moving and is characterised by high productivity, while other parts of the industry such as television production are more connected to domestic economic activity.

3.1. The industry adds over \$1B to GDP

The contribution to GDP from the screen industry was \$1.015 billion in 2015, which was 2.8% higher than the previous year. The industry is estimated to have directly contributed \$6.04 billion to GDP from 2010 to 2015 (see Figure 1.)

Figure 1 The screen industry’s contribution to GDP



Source: Statistics New Zealand and NZIER analysis

3.2. Modelling reveals the significance of the industry

To estimate the wider impact of the screen industry on the economy, NZIER modelled the impact of halving the size of the industry on GDP, wages, exports and household consumption. Next, the impact of removing the NZSPG was modelled, to demonstrate the economic impact of the grants.

NZIER's TERM-NZ CGE model was used to estimate the economy-wide impact of the screen industry and NZSPG. Using actual economic data, CGE models estimate how an economy reacts to major projects or changes in policy, technology or other external factors. CGE models are useful whenever we wish to estimate the effect of changes in one part of the economy upon the whole of New Zealand. Appendix A contains a description of the model.

A smaller screen industry would have negative effects on exports

To estimate the impact of the screen industry (including the NZSPG) we modelled a scenario that shocks the economy as if the screen industry revenue is reduced by half and the NZSPG did not exist. Screen industry business in New Zealand totalled \$3.22 billion in 2015.¹ Our 'what if' scenario removes half of that revenue from all screen industry business in New Zealand. The rationale for 'halving the industry' is to show what would happen if the industry was to shrink. It is hypothetical scenario to demonstrate the economic knock-on effects. Figure 2 (percentage change) and Figure 3 (absolute change) show that the economic impact of a reduction of \$1.6 billion in New Zealand screen industry revenue² would be:

- a decrease in GDP of \$525 million (0.22%)
- a contraction in export volumes of \$353 million (0.53%)
- a reduction in real wages by 0.23%
- a decrease in real household consumption by \$303 million (0.22%) due to lower incomes.

Screen industry exports are considered to be exports in the same way as international visitor spending can be described as tourism exports. They are good and services sold to overseas buyers. The relative impact on exports is larger than for the other measures in the model. This indicates that the screen industry is export-orientated, and spending in this industry contributes to expanding exports and supports export growth. The screen industry directly generates exports through three channels:

- live action productions for international customers (e.g. *Power Rangers* and *Pete's Dragon*)
- post-production and visual effects services (e.g. *Jungle Book* and *The B.F.G.*)
- selling domestic productions overseas (e.g. *Hunt for the Wilderpeople*).

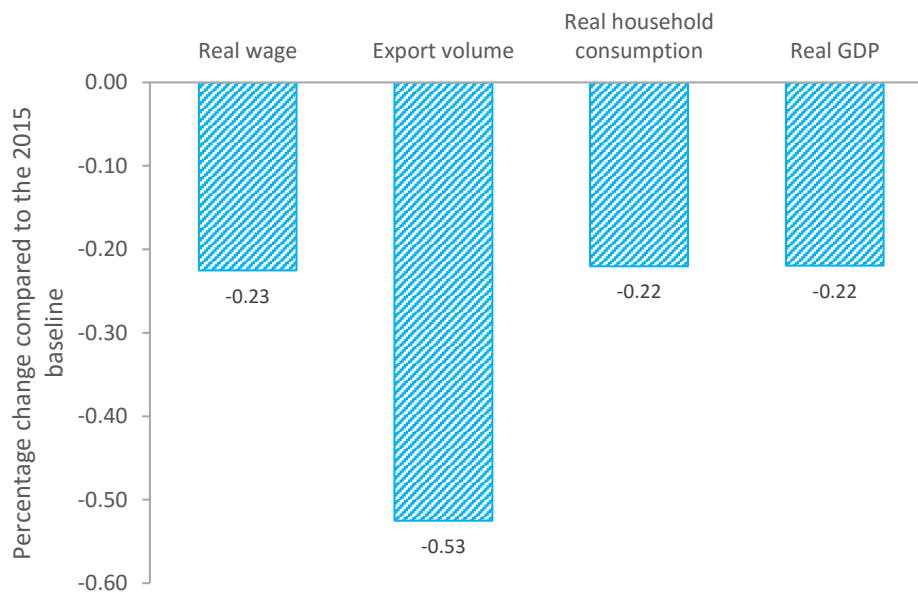
¹ Screen Industry: 2014/15 Statistics New Zealand, 13 April 2016.
http://www.stats.govt.nz/browse_for_stats/industry_sectors/film_and_television/ScreenIndustrySurvey_HOTP14-15.aspx

² Compared with the 2015 baseline.

The screen industry also supports growth in high skill, high tech jobs in the ICT category and increases the diversity of our exports and strengthens our international brand. The effects on skills, employment and tourism will be discussed later in the report.

The impacts of this scenario indicate that the screen industry overall contributes around \$1.05 billion to real GDP³ and around \$706 million to exports annually.⁴ This level of economic contribution is similar to the wine industry (\$1.09 billion); forestry (\$1.31 billion) and more than the printing industry (\$0.71 billion).

Figure 2 Relative impact of halving screen industry revenue

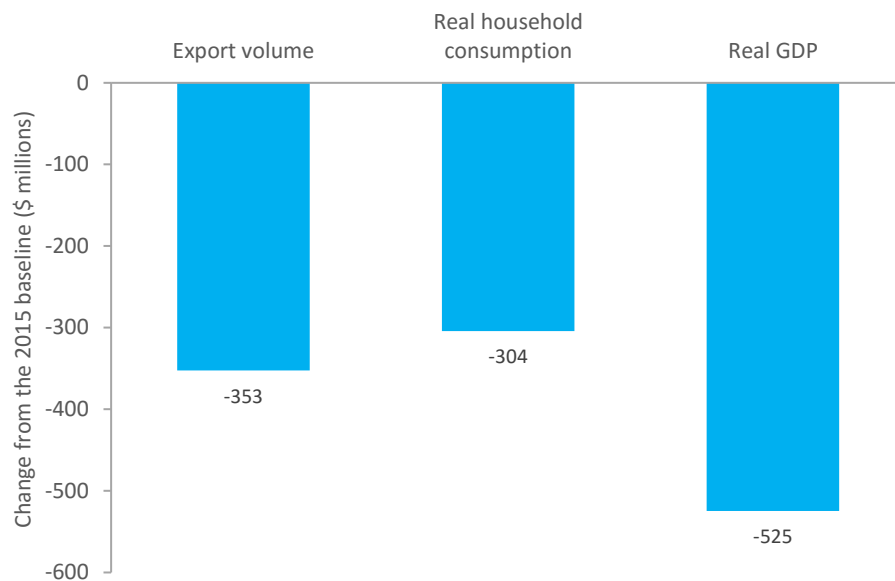


Source: NZIER computable general equilibrium model database

³ The real GDP results from the CGE modelling covers a wider range of economic spillovers than the Statistics New Zealand estimate of the contribution to GDP discussed previously.

⁴ The overall impact of the industry is based on scaling up the results from halving the industry.

Figure 3 Impact of halving screen industry revenue



Source: NZIER computable general equilibrium model database

The New Zealand Screen Production Grant supports exports

This ‘what if’ scenario models the impact of the NZSPG scheme based on \$583 million of Qualifying New Zealand Production Expenditure (QNZPE) which consists of \$127 million in NZSPGs⁵ provided to attract Screen Production exports of \$456 million due to international firms spending money in New Zealand.

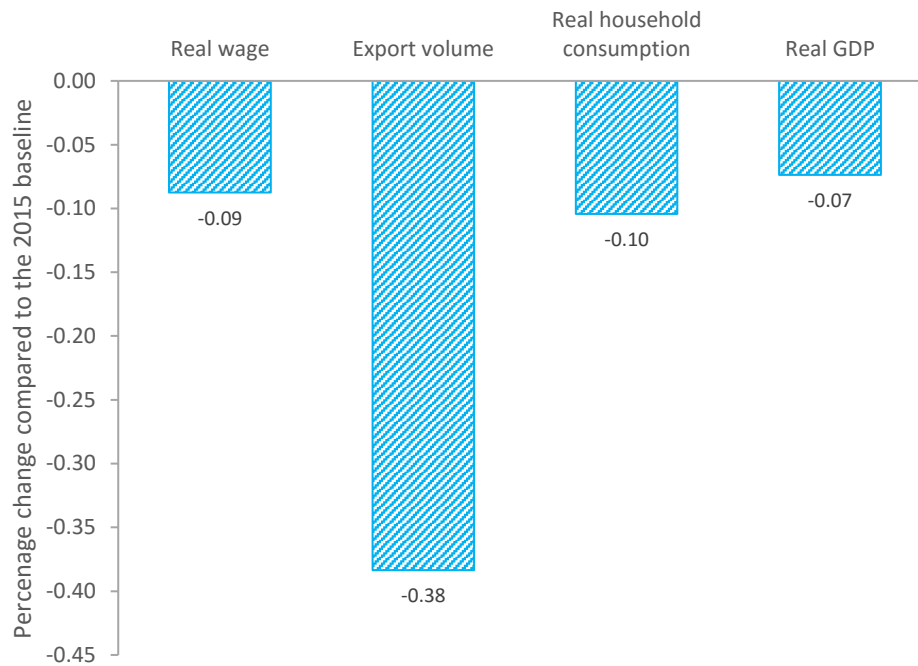
To estimate the impact of the NZSPG, we modelled a scenario that shocks the economy as if the revenue (an amount of \$456 million) from the Screen Production exports did not exist and the \$127 million of the NZSPG was spent somewhere else in the economy.

Figure 4 shows the economic impacts of the NZSPG compared with the baseline. The relative impacts compared to the 2015 baseline were:

- real GDP would be 0.07% lower
- export volumes would fall by 0.38%
- real wages would fall by 0.09%
- a decrease in real household consumption of 0.10%, due to lower incomes.

⁵ Over the 12 months ending in June 2016.

Figure 4 Impact of the loss of the NZSPG



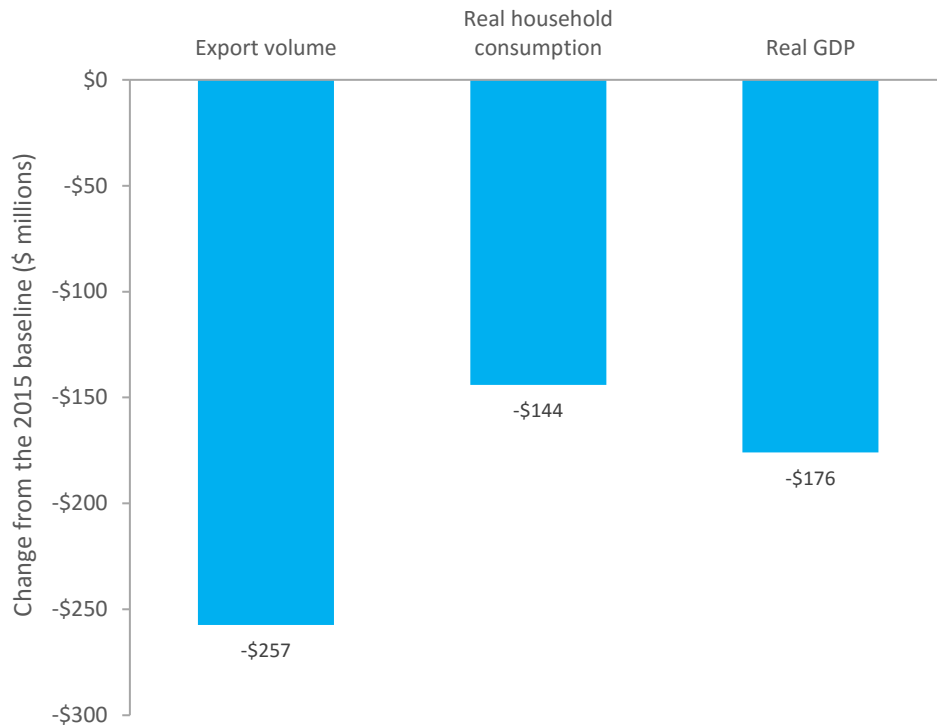
Source: NZIER modelling based on Statistics New Zealand data

Figure 5 shows the economy compared with the baseline in dollar terms. The economic cost of removing the NZSPG would be negative. Individuals and households would be worse off if the NZSPG did not exist. The results of removing the NZSPG are as follows:

- real GDP would be \$176 million lower
- exports would fall by \$257 million
- real household consumption would reduce by \$144 million.

The most significant impact of removing the NZSPG is the contraction in exports. The main aim of the international NZSPG is to attract international productions to New Zealand. This international spending in New Zealand represents an increase in exports. The results of this 'what if' scenario show that the NZSPG is effective in expanding exports and that these exports create positive spillovers in New Zealand, including higher wages, increased household income and higher GDP than would otherwise not occur if the NZSPG was invested elsewhere in the economy.

Figure 5 Impact of the loss of the NZSPG in NZD



Source: NZIER computable general equilibrium model database

3.3. The screen industry supports other industries

The screen industry plays an important role in supporting activity in other parts of the New Zealand economy. The screen industry businesses produce returns to labour and capital amounting to \$1.0 billion. Total services and commodities and returns to labour and capital are used to produce \$3.2 billion of screen industry outputs.

The screen industry has many linkages to other industries due to the complex nature of the products produced and the diverse range of inputs required. This means that the economic benefits from better performance and growth in the screen industry are distributed widely. Table 2 shows the purchases made by screen industry businesses to support their production of \$3.2 billion in 2015. The table shows how the industry earnings were spent on a wide range of intermediate inputs from screen industry sub-industries and other industries.

Table 2 Screen industry draws on inputs from a wide range of industries

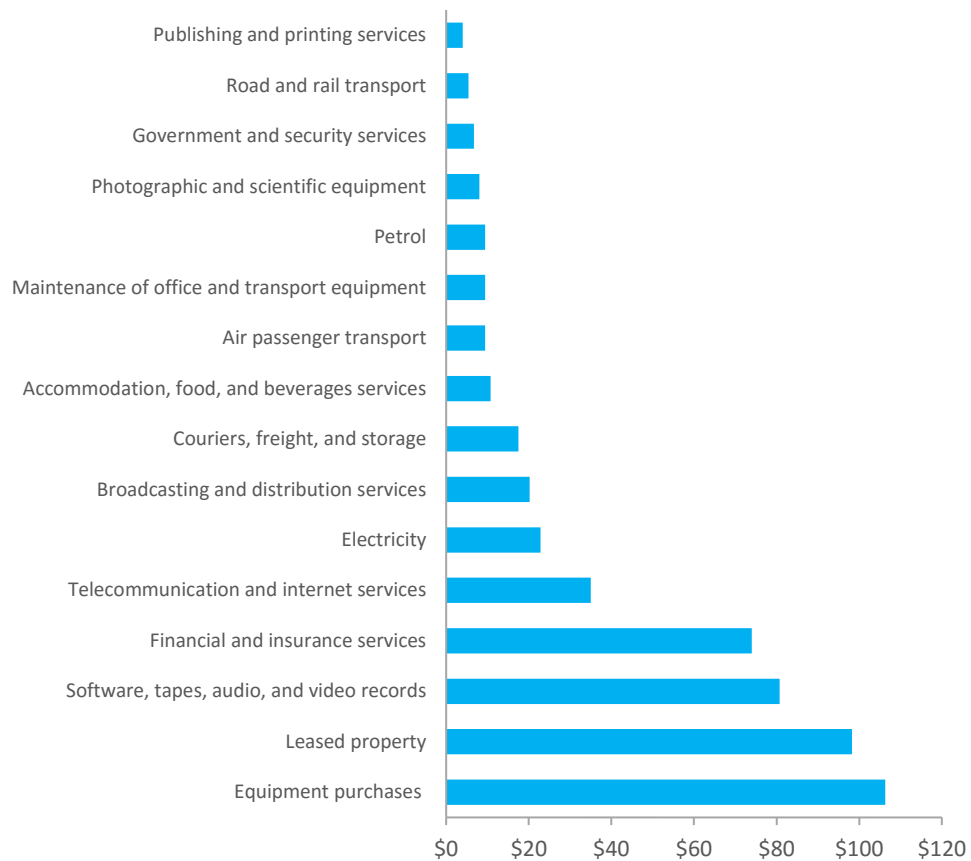
Industries and sub-industries	\$ millions
Motion picture, radio, and TV services	\$894
Equipment hire, computer, intellectual property, legal, accounting, tax, management and support services	\$766
Equipment purchases	\$106
Leased property	\$98
Software, tapes, audio, and video records	\$81
Financial and insurance services	\$74
Telecommunication and internet services	\$35
Electricity	\$23
Broadcasting and distribution services	\$20
Couriers, freight, and storage	\$17
Accommodation, food, and beverages services	\$11
Air passenger transport	\$9
Maintenance of office and transport equipment	\$9
Petrol	\$9
Photographic and scientific equipment	\$8
Government and security services	\$7
Road and rail transport	\$5
Publishing and printing services	\$4
Total intermediate inputs	\$2,177
Return to labour	\$400
Return to capital	\$643

Source: NZIER computable general equilibrium model database based on Statistics New Zealand data

Figure 6 illustrates the relative proportions of screen industry spending on the intermediate inputs, other than return to capital and labour, for screen sub-industries and other parts of the economy.

Figure 6 Relative screen industry spending in selected sub-industries and other parts of the economy

\$ million



Source: NZIER computable general equilibrium model database modelling based on Statistics New Zealand data

3.4. Exporting is a growth opportunity

Export-orientated countries tend to have faster economic growth than inward-looking countries.⁶

Exporting can be a source of growth and innovation for businesses. The potential advantages from exporting stem from access to larger markets, economies of scale and exposure to innovation. Table 3 describes the potential advantages of exporting for businesses. The screen industry has a comparative advantage in exporting because of the scalability and weightlessness of digital content.

⁶ Grossman, G.M. and Helpman, E., 1990. Trade, Innovation, and Growth. *The American Economic Review*, 80(2), pp.86-91.

Table 3 Advantages for businesses from exporting are well-established

Advantage	Description
Increased sales potential in larger markets	Exporting can increase sales by extending your market base to overseas countries where you can find new customers and niche markets.
Increased profit margins	Despite the added costs of exporting, you can save costs by producing on a scale that makes better use of resources (economies of scale), leading to higher profit margins.
Potential for faster growth	Selling in an overseas market can help your business grow at a faster rate than if you were confined to New Zealand markets.
Reduced local market dependence	Selling in different countries diversifies risks, such as exposure to New Zealand's economic conditions or seasonal factors. During a local economic downturn, your overseas customers may be unaffected.
Improved innovation	Exposure to new ideas, technology and processes can help your company develop innovative products and services.
Greater competitiveness	Trading in the global marketplace increases your exposure to international best practice, ideas and alternative ways of doing business – improving your chances of competing at home and overseas.

Source: [New Zealand Trade and Enterprise, Why export? Accessed 11 September 2017.](#)

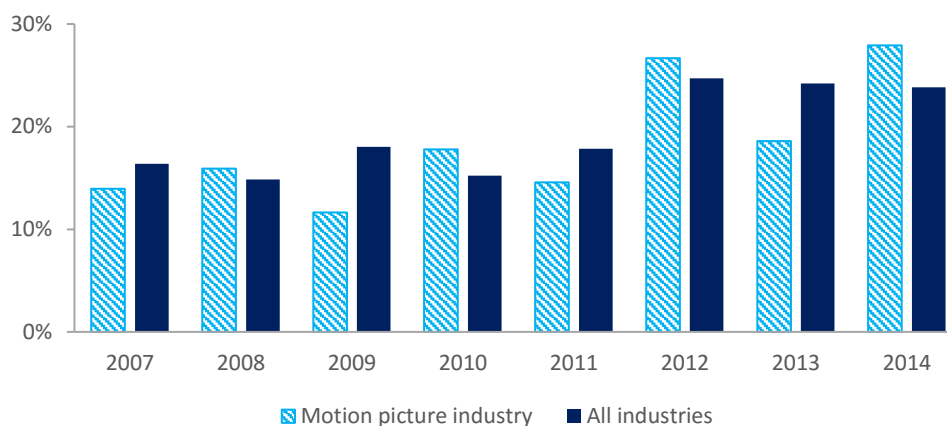
NZTE also recognises that businesses face challenges in exporting. The general challenges are:

- increased costs
- regulation
- legal challenges in unfamiliar jurisdictions
- political stability.

These advantages, opportunities and challenges for all exporters are useful background knowledge for any screen industry business looking to begin exporting. The Statistics New Zealand's Business Operations Survey (BOS) was used to inform the exploration of export potential in the screen industry. The screen industry was not an identifiable industry in the BOS. The motion picture industry was the best available representation of the broader screen industry in the BOS.

Analysis of the BOS shows the percentage of motion picture businesses that export increased from 14% in 2007, to 28% in 2014 (Figure 7). This increase in the percentage of motion picture businesses that export is similar to the increase in all industries that export.

Figure 7 The proportion of businesses that are exporting



Source: Statistics New Zealand

The screen industry has the potential to export more. The scalability and weightless of motion picture products specifically, and those of the screen industry generally, are comparative advantages for exporting the product compared to other industries. Distance to market is recognised as a challenge for New Zealand’s exporters. Distance to market and the associated transport costs are a challenge for agricultural exporters.⁷ The screen industry does not face distance to market challenges with its product, but it still needs to overcome the distance challenge in terms of developing and maintaining relationships and industry networks. Pukeko Pictures international partnerships in China, Canada, Australia and the United Kingdom are an important factor in its screen industry export success story. See the case study overleaf for more information on Pukeko Pictures.

The digital gaming industry is an example of an industry that has been successful at increasing export revenue. Gaming industry revenue increased from \$19.7 million in 2012, to \$99.9 million in 2017. Most of this revenue (97%) came from digital exports.⁸ The scalability of the digital content is a key factor in this growth. The creation and self-publication of intellectual property is a major source of revenue growth.⁹ These are aspects that the screen industry and digital gaming industry have in common and are a characteristic of the digital convergence.

The top two barriers to exporting reported by all industries were lack of experience in international business and lack of market knowledge.¹⁰ The motion picture industry reported the following barriers to exporting in the BOS:

- lack of experience
- limited knowledge about specific markets
- exchange rate volatility
- distance from markets
- language and cultural differences.

⁷ Onodera, O., 2008. Trade and Innovation Project: A Synthesis Paper. OECD trade policy paper no. 72.

⁸ Digital New Zealand, 2016. <http://www.igea.net/wp-content/uploads/2015/09/Digital-New-Zealand-2016-DNZ16.pdf>

⁹ <https://nzdta.com/survey2017/>

¹⁰ Sanderson, L., 2016. Barriers to Generating International Income: Evidence from the Business Operations Survey (No. 16/04). New Zealand Treasury.

Case study 1: Pukeko Pictures an export success

Pukeko Pictures (Pukeko) is a Wellington-based multi-platform production company with a business model oriented to children's screen projects. Pukeko is recognised by broadcasters worldwide as a creator of original storytelling of the highest quality.

Pukeko conceptualises and produces original creative content for the screen. The model is multi-platform from the outset: screen productions are planned at the same time as digital extensions, live entertainment experiences, brand licensing alliances and merchandise such as publishing and toys.

Pukeko has creative control of their intellectual property

Pukeko is a good example of an export-oriented business that leverages the creative intellectual property (IP) it creates. The Pukeko Pictures approach to management of IP is that:

- distinctive intellectual property attracts partnerships
- international partnership grows investment
- investment builds sustainability.

This has allowed Pukeko to grow from a company established in 2008 to develop intellectual property, to a company with four international shows in production during 2017. The budgets range from \$6 to \$20 million per production and generate spend in New Zealand of more than \$14 million.

The quality of the productions is shown by the many accolades won

Jane and the Dragon and *The WotWots* have both won Parents' Choice Awards in the United States and been nominated for awards in animation, writing, sound and musical score internationally. *Thunderbirds Are Go* has won or been nominated for multiple awards in the United Kingdom.

Connecting with a constantly regenerating audience

Children's animated screen content tends to age more slowly than live action screen production, so the intellectual property can be leveraged over a longer period. *The WotWots* has been broadcast consistently in Australia for more than 6 years.

Animated screen productions are more likely to have spin-off intellectual property layers because of the originality and timelessness of the assets – an animated character won't change as it ages, unlike an actor from a live action series. The market for children's animation is international because it is a stylised creative form that tends not to be as specific in culture, ethnicity or language as live action productions. That animation can be re-voiced in any language without the audience realising is core to its ability to travel.

Attracting new markets and international partnerships

Pukeko has spent years establishing partner relationships in China, grown from company director Richard Taylor's 15 plus years of engagement with China. Building on the international success of *The WotWots*, and with full control of the original IP in New Zealand, Pukeko has developed with their Chinese partner a sister show called *The Kiddets*. Creating the opportunity for the evolution of the original IP to reach an extended audience.

Pukeko's partners in China are a multi-layered entertainment company, able to take a vertically integrated approach to IP expansion. *The Kiddets* will roll out across China in a variety

of forms – live entertainment opportunities (e.g. branded playlands, indoor theme parks), brand alliances (e.g. food and beverage partnership), merchandise licensees (e.g. building blocks, toys) all supporting the launch of the TV series so the various activations cross-promote each other for the benefit of the IP.

Figure 8 The ripple effect of creative intellectual property extension



Source: Pukeko Pictures

Those partnerships also add value to the broader ‘NZ Inc.’ trade chain within China. A specific example is the brand alliance with Wahaha – China’s biggest producer of milk-based food and beverage products. Wahaha have committed to a licensee agreement with Huawen Century for *The Kiddets* to produce one billion branded children’s focused products which will be released in 2017. These products will be made using Fonterra milk powder. Those exports will now be branded with a New Zealand IP extension for Chinese consumers to enjoy, which will drive further financial returns to New Zealand.

Generating export income and high wage jobs

Pukeko as a firm provides high wage jobs. The mean and median annual salary at Pukeko are approximately twice the New Zealand mean and median annual salary. In 2008 the company had 3 full-time equivalent positions; in 2017 there are 60.

A clear contribution to lifting New Zealand’s economy

Pukeko is a strong contributor to New Zealand because they are:

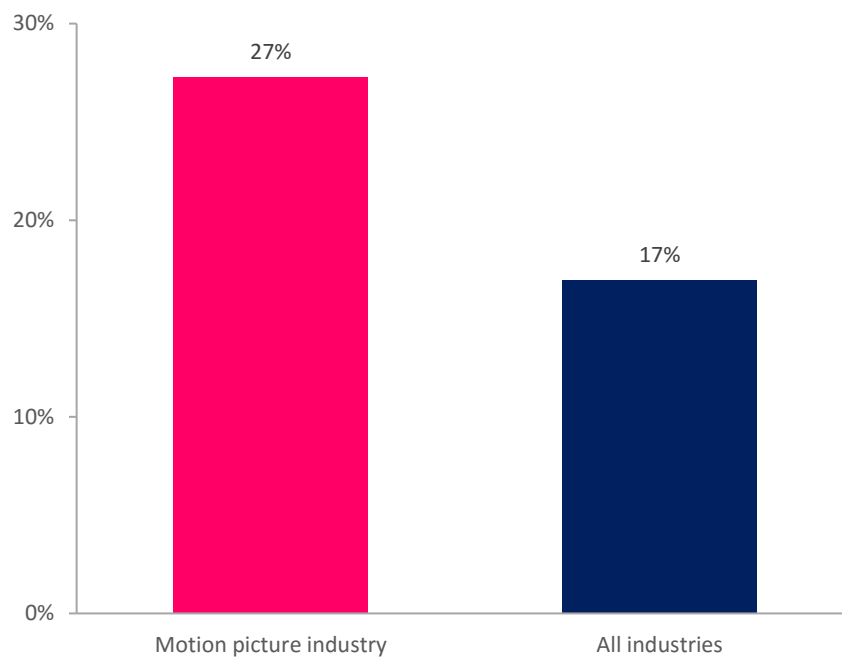
- creating intellectual property and attracting investment
- paying higher than average wages
- generating export income
- driving the ‘NZ Inc.’ story, particularly within China
- creating New Zealand content with world class production values.

3.5. Industry sources see barriers to innovation

Innovation is fundamental to the screen industry and innovation can happen in many areas including technology, content and medium. Figure 9 shows the proportion of businesses that report innovation in the motion picture industry compared to all industries.

Figure 9 Proportion of businesses that innovate

Percentage of respondents



Source: Statistics New Zealand Business Operations Survey

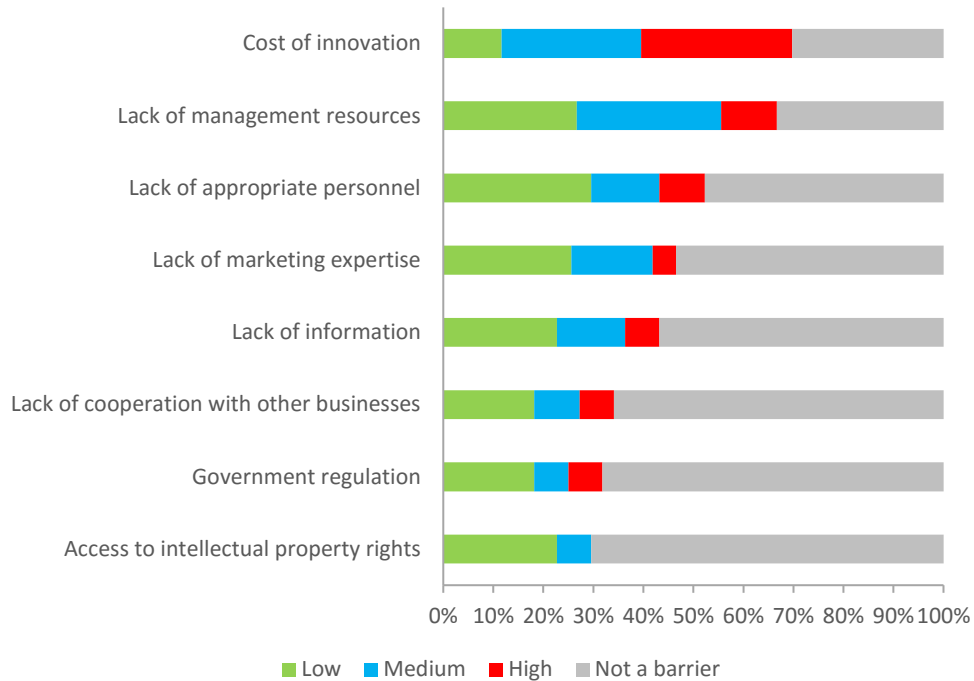
Innovation is an important driver of business performance. Innovation is critical to competing in the digital visual effects industry, where developing business culture and infrastructure that supports the rapid adoption of new technology and demonstrating its potential is part of being successful. Examples of innovation in the screen industry include digital technology, visual effects, costumes and prosthetics.

The most commonly reported barrier to innovation in the motion picture industry was the cost of innovating. The second most commonly reported barrier was the “lack of management resources”. This suggests that lowering the cost of innovation and increasing management productivity and capability would encourage greater innovation in the motion picture industry and the wider screen industry.

Figure 10 shows industries’ perceptions of barriers to innovation in the motion picture industry as an example of barriers in the screen industry.

Figure 10 Barriers to innovation

Respondents reporting barriers to innovation in the motion picture industry



Source: Statistics New Zealand Business Operations Survey

Social media, emerging digital technologies and digital content are changing the value chain in media production. The traditional ‘Hollywood model’ is supplier-driven. New technology and social media are challenging the traditional model by allowing independent distribution of bespoke productions and user input throughout the creative process and the value chain. This is creating a demand-driven value chain with greater flexibility than in the past.¹¹

Although small overall, crowd-funding has also become a channel for facilitating the international distribution of domestic productions such as *Boy* in 2010. According to Ferrer-Roca (2015, p. 222):¹²

New business models thanks to new technologies, such as crowd-funding platforms, provide a means for bottom-tier filmmakers to connect, interact and receive economic support directly from their potential audience. By bringing together two traditionally separated players in the value chain, the feature filmmakers and the audience, the export potential is decided directly by the amount of support received by the potential theatrical audience, thereby democratising the selection process of films for theatrical release.

¹¹ Kehoe, K. and Mateer, J., 2015. The Impact of Digital Technology on the Distribution Value Chain Model of Independent Feature Films in the UK. *International Journal on Media Management*, 17(2), pp.93-108.

¹² Ferrer-Roca, N., 2015. Multi-platform Funding Strategies for Bottom-Tier Films in Small Domestic Media Markets: *Boy* (2010) as a New Zealand Case Study. *Journal of Media Business Studies*, 12(4), pp.224-237.

3.6. The action is spread across the regions

A quick glance at Statistics New Zealand’s breakdown of gross revenue around New Zealand would suggest that the screen industry is a tale of two cities – Auckland and Wellington. Auckland dominates production, TV broadcasting and distribution, while Wellington specialises in post-production. Note however that these gross revenue statistics are based on the address of the main office of each of the respondents to the screen industry survey (Table 4).

Table 4 Regional distribution of screen industry gross revenue 2015/16

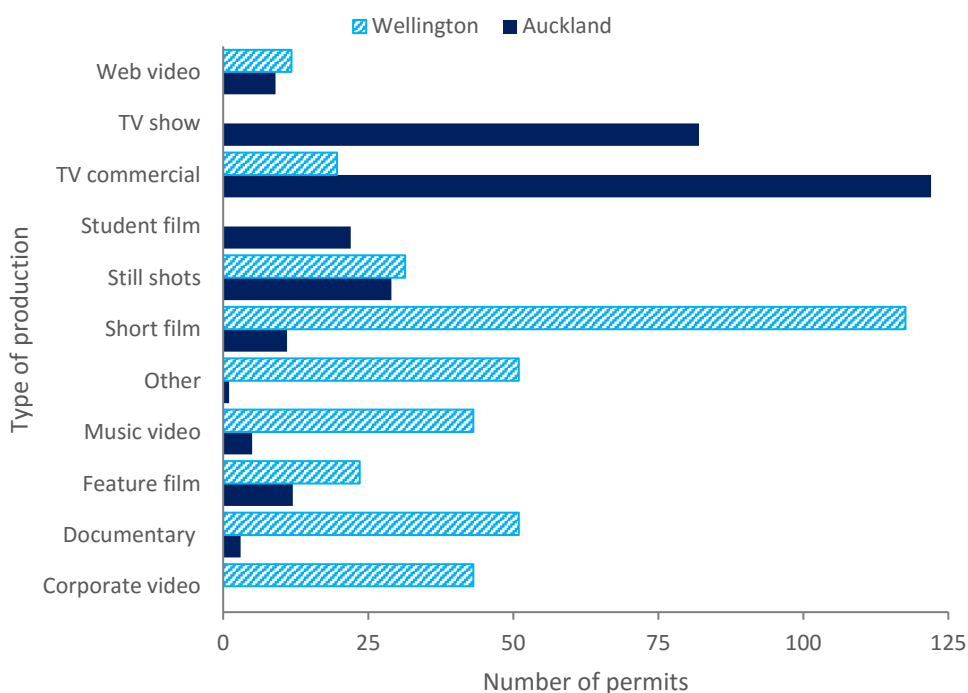
C reflects confidential statistics usually due to the small numbers of respondents.

	Production	Post-production	Television broadcasting	Film & video distribution	Film exhibition
Auckland	71%	24%	100%	98%	31%
Wellington	22%	73%	0%	1%	10%
Rest of the Nth. Is.	1%	1%	0%	C	C
South Island	6%	2%	0%	C	C

Source: Statistics New Zealand

A comparison of filming permits in Auckland and Wellington in 2015/16 shows that Wellington had a wide variety of production types, while Auckland had a greater focus on television commercials and programs. Overall there were 392 and 296 permits issued in Wellington and Auckland, respectively.

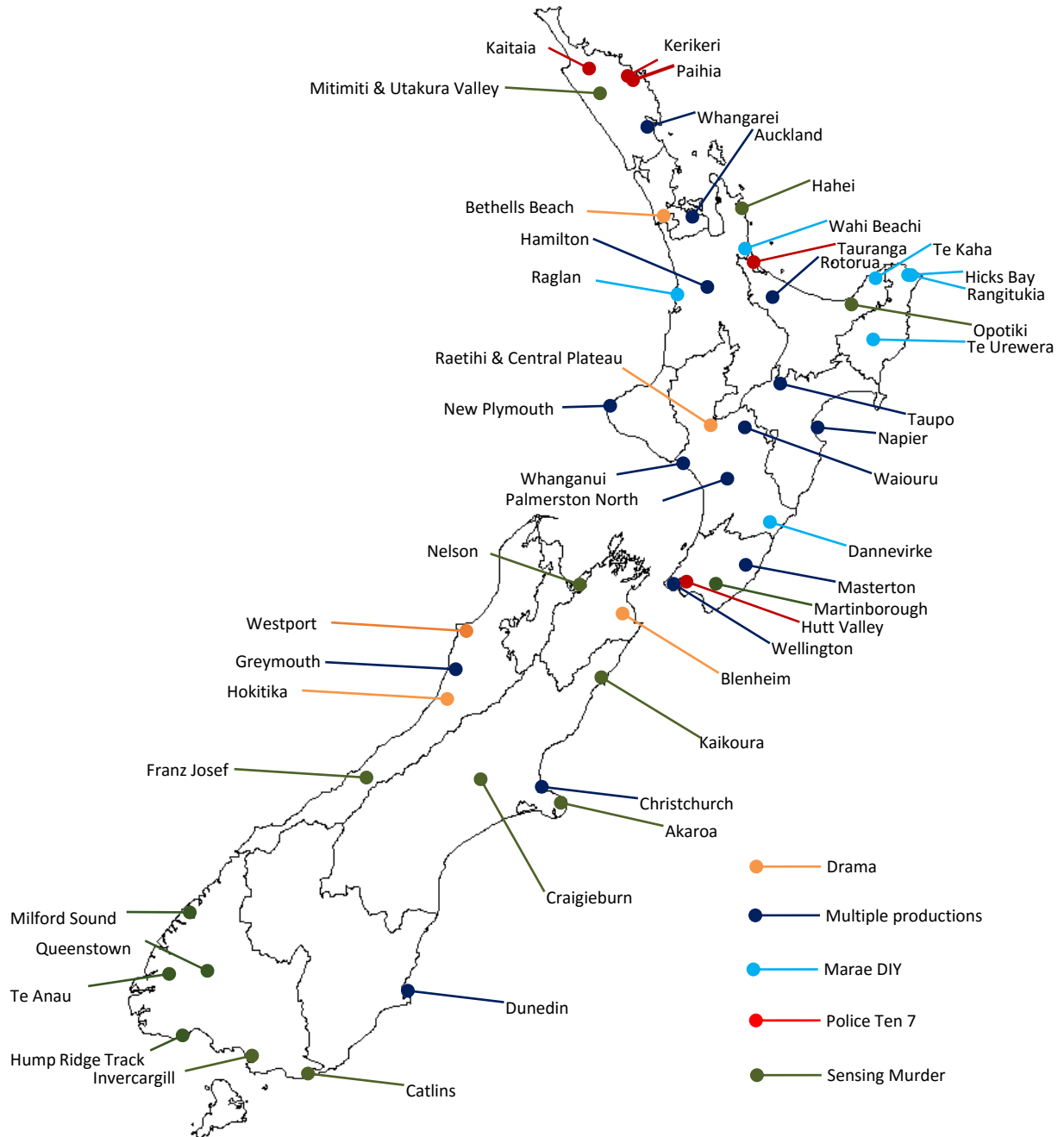
Figure 11 Permits for filming in Wellington and Auckland 2015/16



Source: Screen Wellington and ATEED

Filming on location is a way that the screen industry activities contribute to economic activities in the regions. For example, Screentime NZ is Auckland-based but shoots live action widely across New Zealand, as shown in Figure 12.

Figure 12 Geographic distribution of Screentime NZ productions



Source: NZIER based on data from Screentime NZ, 2015

3.6.1. The Auckland screen industry is strong

To estimate the impact of the screen industry (including the NZSPG) on Auckland we modelled two scenarios. The first scenario shocked the economy as if the following happened:

- the industry revenue is reduced by half
- if the NZSPG did not exist for Auckland-based projects and the funding was not reallocated to other regions.

The gross revenue from all screen industry business in New Zealand was \$3.3 billion in 2016¹³ and Auckland's share of this was \$2.4 billion.

In the second scenario the NZSPG for Auckland was removed. The results show that the screen industry plays an important role in supporting activity in other parts of the Auckland economy (Table 5).¹⁴

Table 5 How the screen industry earnings are spent in other sub-industries

Auckland-based spending (spending may not add up due to rounding)

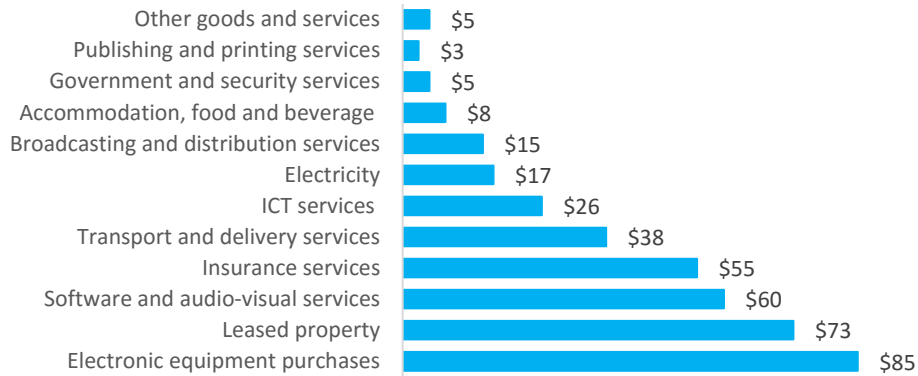
Spending in sub-industries	\$ million
Motion picture, radio and TV services	\$664
Equipment hire, IP, legal, accounting and management services	\$569
Electronic equipment purchases	\$85
Leased property	\$73
Software and audio-visual services	\$60
Insurance services	\$55
Transport and postal services	\$38
ICT services	\$26
Electricity	\$17
Broadcasting and distribution services	\$15
Accommodation, food and beverage	\$8
Government and security services	\$5
Publishing and printing services	\$3
Other goods and services	\$5
Total immediate inputs	\$1,623
Returns to labour	\$298
Returns to capital	\$479
Gross revenue of screen industry based in Auckland	\$2,401

Source: NZIER computable general equilibrium model database

¹³ Statistic New Zealand, 2017. Screen Industry: 2015/16, 12 April 2017.
http://www.stats.govt.nz/browse_for_stats/industry_sectors/film_and_television/ScreenIndustrySurvey_MR15-16.aspx

¹⁴ Returns to labour represents wages and salaries. Returns to capital is an estimate of the profits in the industry in Auckland.

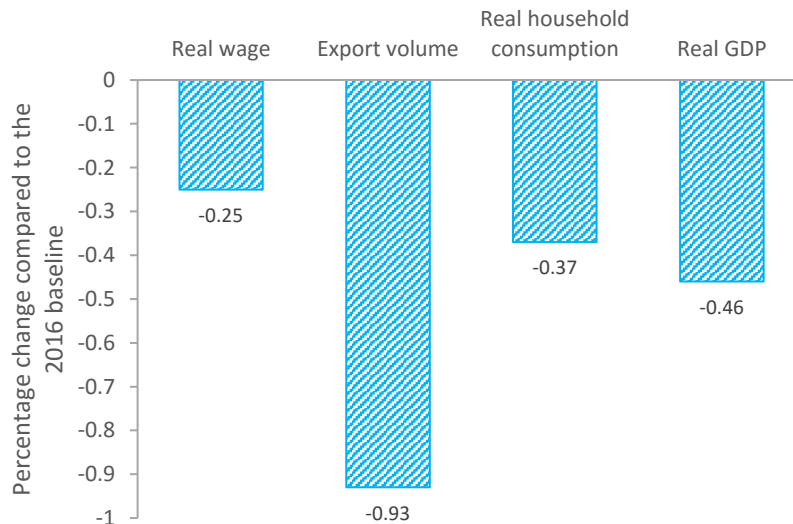
Figure 13 Auckland-based screen industry spending in other areas \$ millions



Source: NZIER computable general equilibrium model database

Figure 14 shows the economic impact of the reduction of \$1.2 billion in the Auckland screen industry compared with the baseline. The results of the CGE modelling indicate that a 50% reduction in screen industry revenue would reduce Auckland’s GDP by \$429 million or 0.46%. This result implies that the combined direct and indirect impact of the screen industry on Auckland’s GDP in 2016 was around \$858 million. Real household consumption would be 0.37% lower than the 2016 baseline. Export volumes and real wages would fall by 0.93% and 0.25%, respectively.

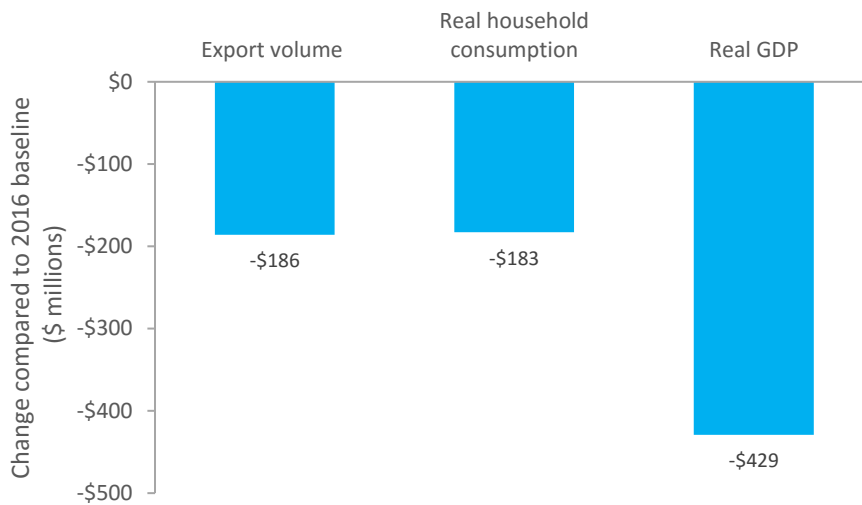
Figure 14 Impact on the Auckland screen industry



Source: NZIER

Figure 15 shows the economy compared with the baseline in dollar amounts. Real GDP would be \$429 million lower than the 2016 baseline. Real household consumption falls by \$183 million and export volumes fall by \$186 million.

Figure 15 Impact on Auckland screen production in NZD



Source: NZIER computable general equilibrium model database

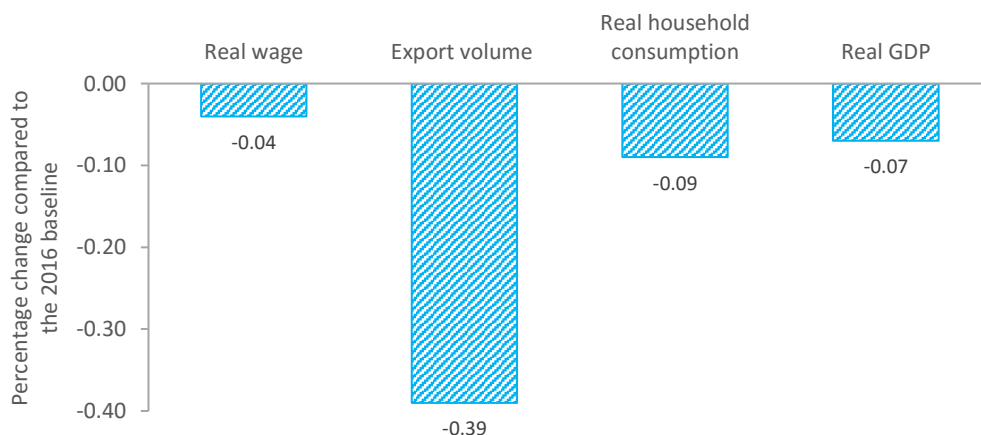
3.6.2. Auckland without the NZSPG

This ‘what if’ scenario models the impact of the NZSPG scheme based on \$137 million of QNZPE which consists of the \$29 million in NZSPGs¹⁵ provided to attract screen production exports of \$108 million.

To estimate the impact of the NZSPG, we modelled a scenario that shocks the economy as if the screen production exports revenue of \$108 million does not exist and the \$29 million of the NZSPG was spent by government elsewhere.

Figure 16 shows the economic impact of the NZSPG compared with the baseline. Real GDP would be 0.07% less than the 2016 baseline. Real household consumption would fall by 0.09%. Export volumes and real wages would fall by 0.39% and 0.04%, respectively.

Figure 16 Impact of NZSPG in Auckland

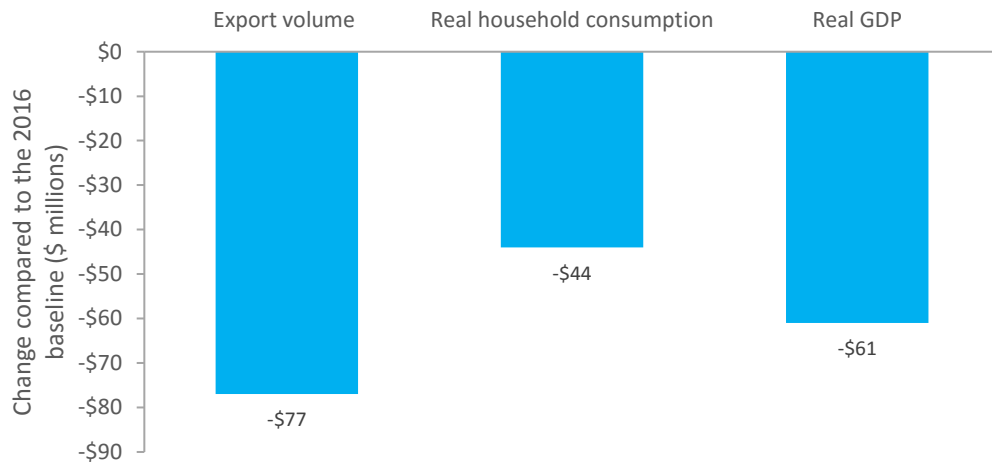


Source: NZIER computable general equilibrium model database

¹⁵ For Auckland based projects for the year ending February 2017

Figure 17 shows the economy compared with the baseline in dollar amounts. Real GDP would be \$61 million lower in the absence of the NZSPG. Real household consumption reduces by \$44 million and exports fall by \$77 million.

Figure 17 Impact of NZSPG in NZD



Source: NZIER computable general equilibrium model database

3.7. Regional case studies highlights

Case study 2: The Meg supported enduring industry expansion

The Meg (short for Megalodon - the largest marine predator that ever existed) is an action, sci-fi thriller filmed in Auckland and China and due for release in 2018. Filming in New Zealand was completed in 2017. *The Meg* is a good example of how attracting international film projects can fund:

- new infrastructure
- new skills development
- and leave legacy opportunities for domestic productions.

A former Fletcher factory has been transformed into the Kumeu Film Studios. The studios doubled Auckland's screen studio infrastructure. The 27-hectare site includes sound stages, workshops and two permanent water tanks, along with the development of two fit for purpose sound stages on the Kumeu site due for completion in January 2018.

Figure 18 Kumeu Film Studios



Source: Kumeu Film Studios

The production of *The Meg* has also tapped expertise from the marine industry to design and build aquatic props that allowed Tauranga-based marine businesses to develop and purchase new specialist equipment that can be deployed for marine projects and future film projects. In economics, this is known as dynamic efficiency, whereby innovation and investment improve production processes. In this case, new technology would not be available for new marine applications were it not for *The Meg*.

Development of New Zealand creative talent was one of the New Zealand Film Commission (NZFC) requirements for *The Meg* to receive a NZSPG. Three mentorships were provided as part of the production so that, early in their careers, directors had the opportunity to learn from the experience of well-established veterans such as *The Meg*'s executive producer Barrie Osborne.

Case study 3: Visual effects – high tech and high wages

New Zealand visual effects work is world class. Weta Digital alone has won 8 SciTech Awards since 2010. SciTech Awards are the ‘tech-Oscars’ and recognise excellence in new industry technology. In the post-production industry, traditional measures of innovation such as patents are a poor indicator of innovation because the speed of industry development means that new products and services quickly become obsolete and are overtaken by new innovations. Industry-recognised awards provide a good indicator of innovation and intellectual property creation, because it is the industry itself that is best placed to judge innovation when they see it.

Table 6 SciTech awards to Weta Digital since 2010

Year	Award Category	Subject
2017	Science and Engineering	Design, engineering, and development of the FACETS facial performance capture and solving system at Weta Digital.
2015	Technical Achievement	BarberShop (hair and fur simulations).
2014	Technical Achievement	Long-term development and continued advancement of innovative, robust and complete toolsets for deep compositing.
2014	Technical Achievement	Creation of the spherical harmonics-based efficient lighting system at Weta Digital.
2013	Science and Engineering	Development of the Tissue Physically-Based Character Simulation Framework.
2013	Technical Achievement	Invention and publication of the Pose Space Deformation technique.
2011	Science and Engineering	Development of influential facial motion retargeting solutions.
2010	Science and Engineering	Design and engineering of the Light Stage capture devices and the image-based facial rendering system developed for character relighting.

Source: Weta Digital, Academy of Motion Picture Arts (SciTech Awards)

The value placed on post-production work and the excellence achieved in New Zealand is reflected in the wages paid to post-production workers. The table below compares the median hour earning of post-production workers to other industries.

Table 7 Hourly wage comparisons for selected industries

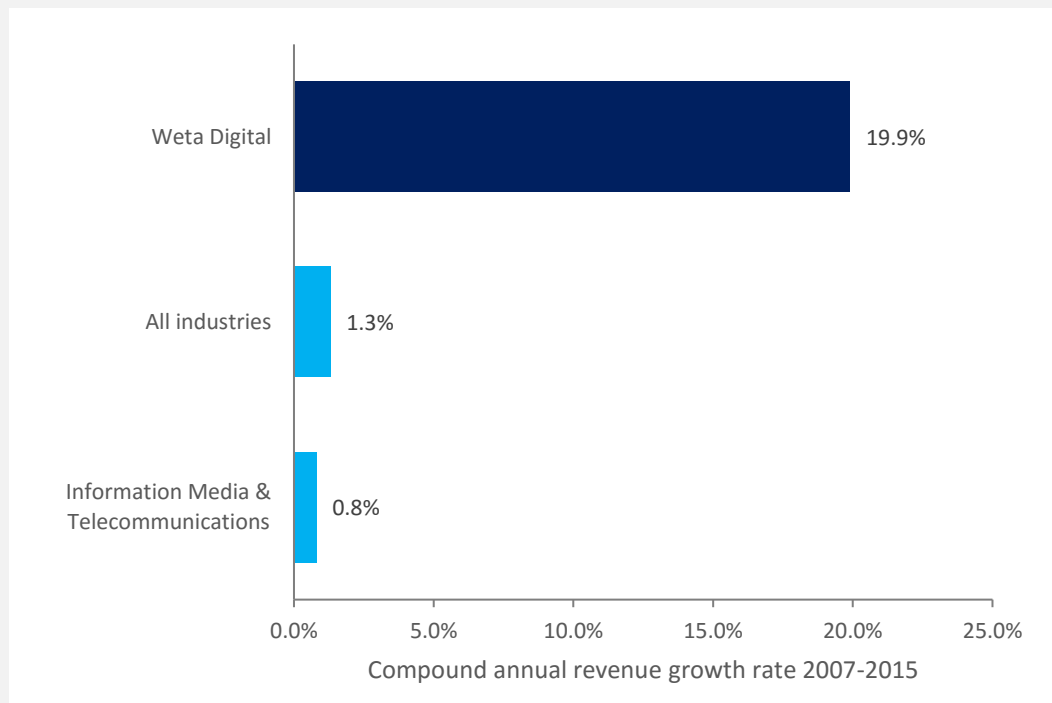
Industry	Median hourly wage
Typical post-production worker (median)	\$65
Post-production worker less maximum (20%) possible grant	\$52
Finance industry worker	\$34
Information, media and communications worker	\$29
Median across all industries	\$23

Source: Statistics New Zealand, post-production industry sources

At \$52 per hour, once the maximum possible screen production grant is subtracted, the median post-production worker is still paid 53% higher than the median in the finance industry which is otherwise the highest paid industry in New Zealand.

The New Zealand post-production sub-industry has experienced a high rate of growth in the last decade. Post-production is an internationally competitive business. It is growing and well paid. Scale matters in post-production. Weta Digital, one of New Zealand’s best known post-production firms, continues to win international work and this is reflected in Weta Digital’s revenue growth rates as set out in Figure 19.

Figure 19 Weta Digital revenue growth outpaces the economy



Source: Statistics New Zealand, Weta Digital

Case study 4: Queenstown's screen activity: diverse

The Otago/Southland film region is one of New Zealand's most diverse film locations by format type due to a high proportion of TV commercials, stills and online content, with the occasional blockbuster film mixed in. While there are annual fluctuations, the trend is upwards from 82 productions permitted by Film Otago Southland in 2011/12 to 188 productions in 2015/16. The 188 productions were granted permits across a range of formats, making Queenstown a diverse production location. Film permits granted by format in 2015/16 included:

- 53 TV commercials
- 41 still shoots
- 34 online/web/internet ads
- 28 TV content shoots
- 12 documentaries
- 12 short films or student projects
- 5 music videos
- 3 feature films.

Year-to-year variability is a characteristic of the industry, so a diverse source of permitted productions allows Otago/Southland firms to remain sustainable. The diverse markets for the screen productions in 2015/16 provides a degree of sustainability in a cyclical environment with 37% of productions permitted for global markets, 31% for New Zealand markets, 21% for Asian markets and the remaining 11% for Australia, the United States, Europe and South America.

Recent examples of this diversity

The feature film *Alien: Covenant* began shooting on April 9th and was shot over 14 days in iconic Milford Sound resulting in 450 jobs, and was released globally on May 11th.

The Fiordland shoot was possible because of Film Otago Southland's close working relationship with Environment Southland and the Department of Conservation (DOC).

The television series *Wanted 2* was in the Otago/Southland region for 30 pre-production days and 45 shoot days over a five-month period, in various locations including Arrowtown, Queenstown, Glenorchy, Alexandra and Dunedin, and with an average size crew/cast of 75. The six-part series launched to 1.18 million viewers across Australia's five capital cities. That figure rose to \$1.4 million (consolidated) once catch-up viewing was added in.

Chinese TV fantasy series, *The Legend of Zu* had a New Zealand budget of \$6 million, and a cast and crew of about 150 that were flown in for a 21-day stretch.

Figure 20 The Legend of Zu



Source: The Legend of Zu

A large-budget 30-second television commercial for the mobile game *Evony: The King's Return* was shot in Queenstown. It starred Hollywood's Aaron Eckhart, Jeffrey Dean Morgan and Fan Bingbing. It was shot over a 5-day period and involved up to 229 cast and crew. It aired in the third quarter of American Football Super Bowl 2016, which is screened to 111 million people worldwide.

A Opdivo drug commercial project was shot over 14 days from March to April, in Central Otago, Queenstown and Southland, involving up to 77 cast and crew; this is yet to be released.

The comparative advantage

Many film locations compete on the same attributes across the world and within New Zealand. Otago/Southland effectively leverages these attributes as a *full complement* in relation to other Southern hemisphere locations, especially as winter scenes can be ready in time for screening in the upcoming Northern Hemisphere winter. The full package makes it easy to do business and includes:

- off season, just in time delivery for Northern hemisphere markets
- locally-based crew and equipment
- natural beauty
- diverse landscapes within 2 hours that are easily accessible
- English as the language of business
- trust and confidence in the lack of corruption
- infrastructure in the form of quality hotels, restaurants and transport that make business relatively hassle free.

Low cost production and distribution available to all

The means of production and distribution in the screen industry have been democratised with professional grade equipment affordable to the masses. The production, distribution and financing barriers to entry are lower than ever, causing disruption to the industry. Video and still cameras are now television quality and are compact, easy to transport and can give a professional-looking result. When mounted on a drone, the speed and efficiency with which camera work is done has revolutionised the ability to achieve high production values on a shoestring. This also means that screen finance costs are low. Queenstown is adapting as evidenced by the diverse type of work being permitted and technology being deployed to make things happen, especially at the very high end of the production market.

High tech for high terrain

Queenstown-based Shotover Camera Systems is an important part of the Queenstown screen ecosystem. Shotover designs and manufactures high performance camera systems for the screen, survey and surveillance markets. Shotover works at the premium end of the market where production values require top end stable images from a range of vantage points.

Shotover's income is derived 98% from exports. Shotover was established in Queenstown in 2009 by local owners. Shotover could be based anywhere in New Zealand or overseas. Shotover has stayed in New Zealand and provides high wage jobs that sit in the upper quartile of engineering jobs.¹⁶

With production and distribution costs at an all-time low and demand for content at an all-time high, there are high growth rates in film and TV production, particularly for Asian markets.¹⁷ In China, box office revenues are projected to double by 2020, making China the world's largest market. High growth rates are underway for in-home video, now larger than cinema in key New Zealand export markets like the United States.¹⁸

This market growth in demand for production and screen content has been an opportunity for Shotover. Shotover has focused on supporting the production of high quality premium content that needs high quality, stable images that cannot be shot with existing stabilised systems.

Being surrounded by natural beauty and nested amongst feature film locations, Shotover leverages the Queenstown advantage in marketing and the training opportunities offered to overseas clients.

¹⁶ IPENZ Remuneration Survey, 2016.

¹⁷ <https://www.pwc.com/gx/en/entertainment-media/pdf/outlook-cinema-article-2016.pdf>

¹⁸ <http://www.pwc.com/us/en/industry/entertainment-media/publications/global-entertainment-media-outlook/cinema.html>

4. The firm-level trends

This section of the report explores the firm-level trends in the screen industry. The trends in gross revenue are investigated by looking at revenue from the various sub-industries and international revenue versus domestic revenue. The number and size of screen industry businesses are also discussed.

4.1. Gross revenue continues to grow

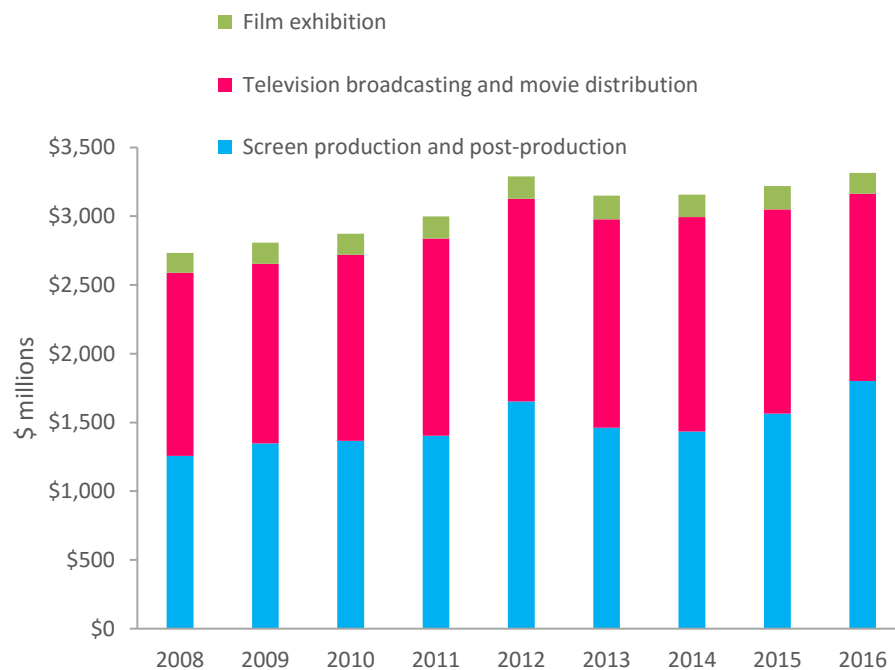
The gross revenue from the screen industry increased from \$2.7 billion in 2008, to \$3.3 billion in 2016. This is an overall increase of \$518 million (21%) over a period which included subdued domestic and international economic activity due to the global financial crisis (GFC). The screen industry overall weathered the economic uncertainty and increased its gross revenue.

Figure 21 shows the breakdown of gross revenue by industry sub-category. In 2015 these sub-categories generated the following gross revenue:

- film exhibition generated \$153 million
- television, broadcasting and distribution generated \$1.36 billion
- screen production and post-production generated \$1.80 billion.

Figure 21 Gross revenue from 2008 to 2016

Nominal



Source: NZIER based on the Statistics New Zealand Screen Industry Survey

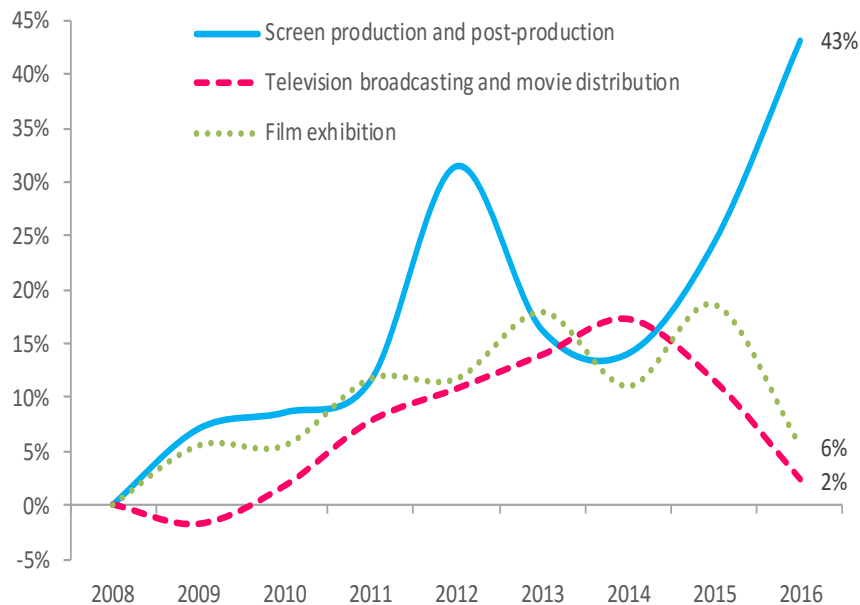
Figure 22 shows the growth in gross revenue compared to 2008 revenue levels in each of the sub-categories. Overall screen production and post-production had the biggest increase in gross revenue. Relative to 2008, revenue increased by 43% overall, with very strong years in 2012 and 2016.

Television and broadcasting experienced steady growth in revenue from 2009 to 2014, with decreases in 2015 and 2016. Overall gross revenue for television and broadcasting was 6% higher in 2016 than it was in 2008 which is the net effect of the steady growth over most years. Film exhibition experienced a higher growth rate than television and broadcasting overall. However, the rate of growth was more volatile from year-to-year than television and broadcasting. Over the period from 2008 to 2016 film exhibition revenue increased by 6%.

Broadcasting and film exhibition faced an increase in competition over this period. Netflix was launched in New Zealand in March 2015. Lightbox and Neon have also increased the competition for consumer media attention, and challenges the traditional broadcast venue of movie theatres. Notably there has been a significant decrease in the number of Civic Video and Video Ezy stores as streaming has become more readily accessible.

Figure 22 Gross revenue compared to 2008

Percentage growth in growth compared to 2008

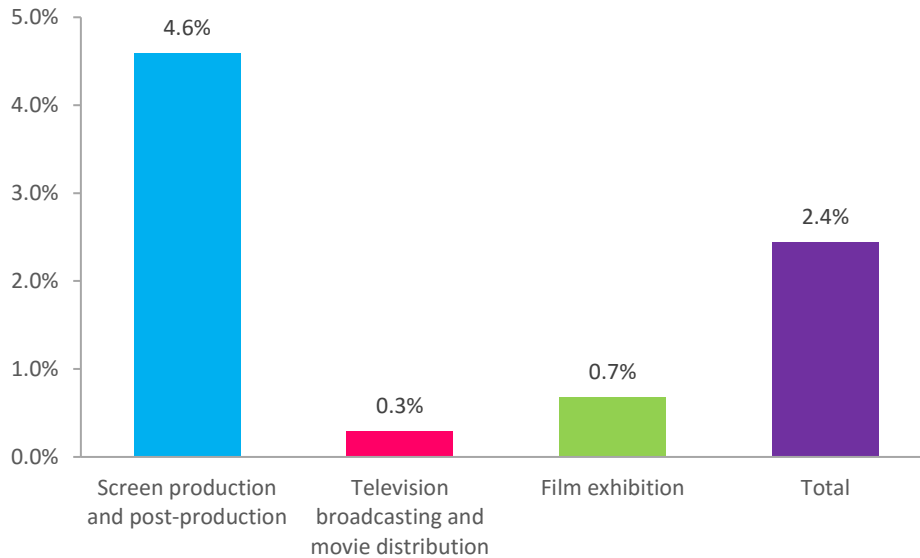


Source: NZIER

Figure 23 shows the screen industry’s average annual growth of gross revenue from 2008 to 2016. The combined average annual growth in the screen industry over the period was 2.4% per year. Production and post-production had the highest annual average growth rate of 4.6%. Television and broadcasting had the lowest annual average growth rate of 0.3% per year. Film exhibition earned the lowest amount of revenue and had an annual average revenue growth rate of 0.7%.

Figure 23 Gross revenue compounding average growth rates

Annual average growth from 2008 to 2016



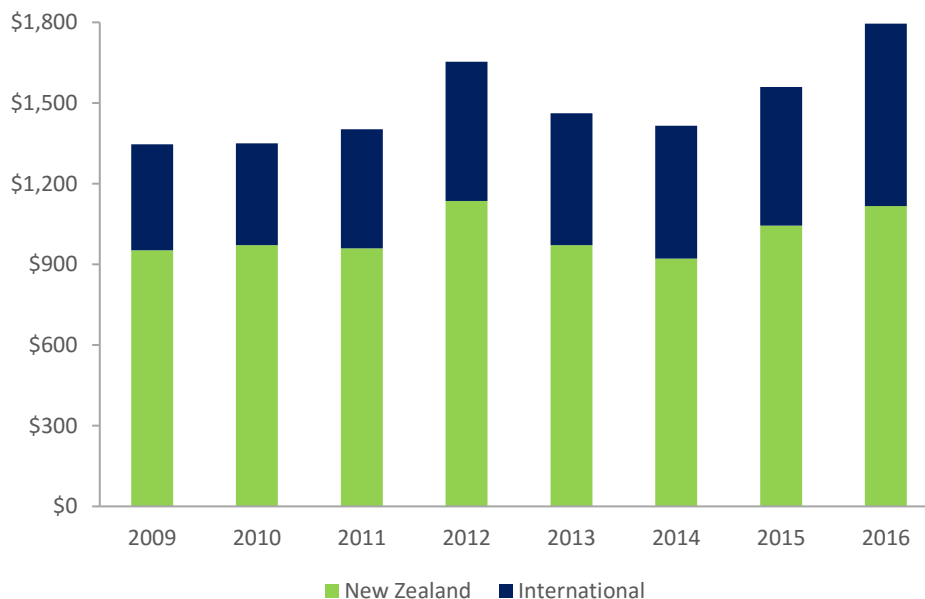
Source: NZIER

4.2. International revenue is increasing

International contracts are an important source of revenue for production and post-production. Gross revenue from production and post-production was \$1,795 million in 2016 – the highest it’s been since 2008. About a third of gross revenue for screen production and post-production is generated by international business (see Figure 24).

Figure 24 Gross revenue for screen production and post-production

\$ millions in nominal terms



Source: NZIER based on the Statistics New Zealand Screen Industry Survey

There is potential to generate more international revenue using the technology that mitigates the distance between New Zealand and the industry’s key markets. But developing more international business is dependent on the following two factors:

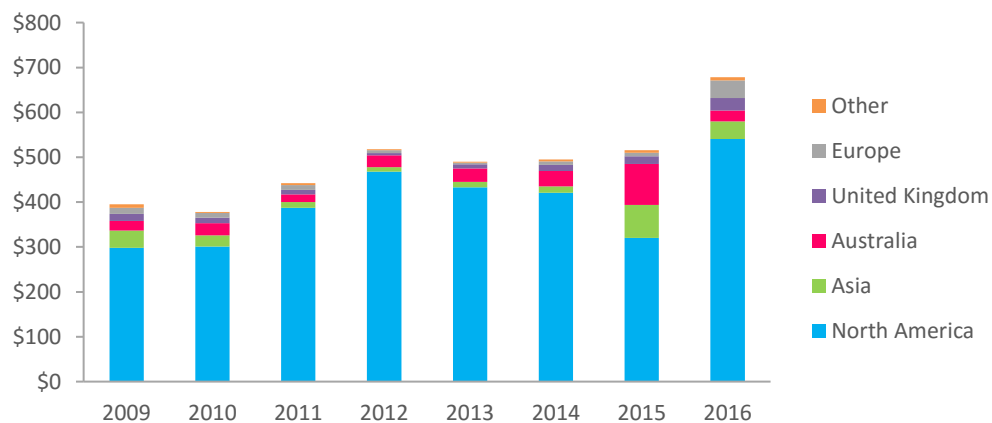
- the availability of New Zealand-based businesses to engage and maintain relationships from a distance
- the supply capacity of New Zealand to deliver to an international market.

The second of these factors is influenced by New Zealand’s availability to train, retrain and attract skills and talent in an international industry characterised by high labour mobility.

Figure 25 shows the breakdown of international revenue for screen production and post-production by country. Unsurprisingly North America (USA and Canada) are the primary sources of international revenue. North America accounted for 90% of international revenue from 2009 to 2014. Australia and Asia accounted for a much larger share of the revenue in 2015, however this coincided with a change in the survey methodology, so it would be unwise to read too much into the drop in the shares. Further research is required to definitively determine if the international market is changing, but that is beyond the scope of this project.

Figure 25 International screen production and post-production gross revenue by country

\$ millions in nominal terms



Source: NZIER based on the Statistics New Zealand Screen Industry Survey

Screen production and post-production revenue from North America recovered strongly in 2016, after a decrease in 2015. Revenue from North America was \$320 million and \$541 million in 2015 and 2016, respectively – this is a 69% increase.

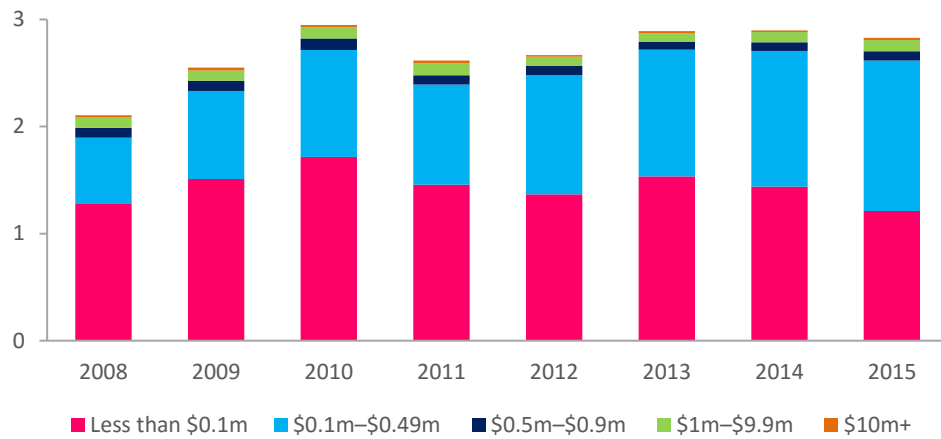
4.3. The number of businesses has increased

The number of New Zealand businesses in the screen industry increased from 2,223 in 2008 to 2,931 in 2015. This is a 32% increase. Over the same period total employment in the industry decreased (see Section 5 for more discussion on this). The increase in the number of businesses is probably linked to the contracting and self-employed nature of work in the industry. A business entity can be a single self-employed person.

Figure 26 shows the number of screen production and post-production businesses clustered by the level of revenue. Half of the businesses generated less than \$100,000 in revenue in 2008. But the structure and performance of the industry has changed over time. By 2015, the number of businesses generating between \$100,000 and \$500,000 had more than doubled compared to 2008, and represented 50% of the number of production and post-production businesses.

Figure 26 The number of screen production and post-production businesses by revenue category

Thousands of businesses

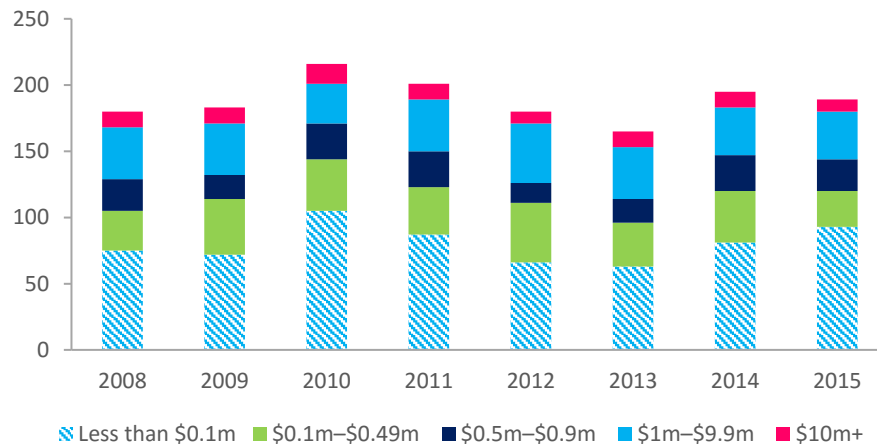


Source: NZIER based on the Statistics New Zealand Screen Industry Survey

In contrast to screen production and post-production, the number of businesses in the other sub-industries has not changed much over time. Figure 27 shows the number of distribution, broadcasting and exhibition businesses clustered by the level of revenue. Based on these clusters it appears the growth in businesses in the screen industry is led by production and post-production.

Figure 27 Film and video distribution, film exhibition, and TV broadcasting businesses

Number of businesses by gross revenue range



Source: NZIER based on the Statistics New Zealand Screen Industry Survey

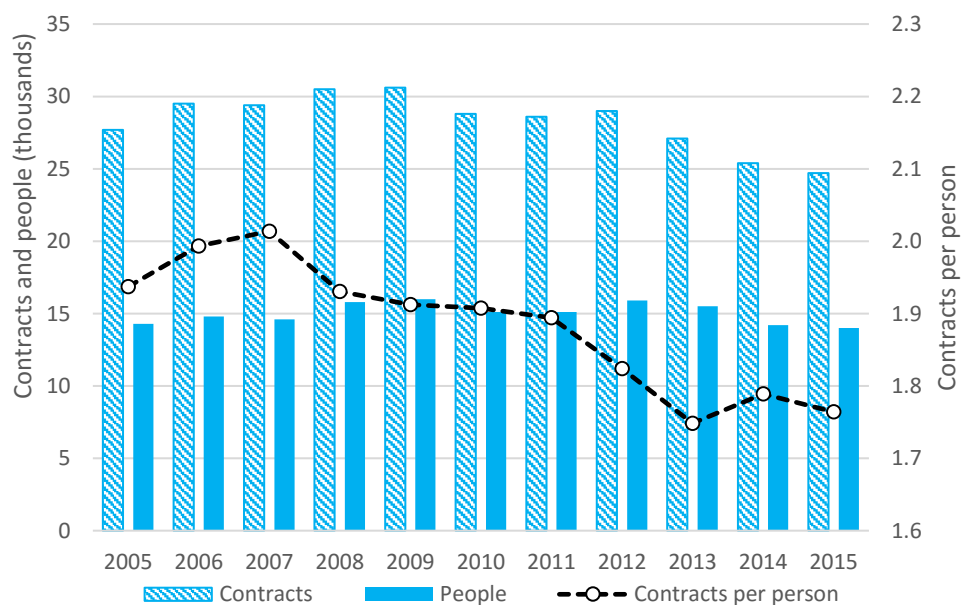
5. Employment and skills

This section takes a bottom-up perspective by investigating the trends in employment and skills. The human capital in employment and skills is the foundation for economic outcomes. The screen industry's current and future performance is inextricably linked to the industry's ability to attract and retain deep expertise.

5.1. Employment trends mean more job stability

Employment within the industry is a mix of overlapping activities particularly between film and TV production. Workers tend to have more than one part-time role, or project-specific contracts, rather than a single full-time job. Figure 28 shows that, on average, people working in the screen industry had two part-time jobs or contracts within the industry in 2006. Since then the average contracts per person has decreased to 1.76 in 2015. This is due to the number of contracts decreasing more than the number of people in the industry. To understand whether this means the number of jobs is consolidating into more substantial roles we would need to investigate the distribution of hours worked and see if the proportion of full-time equivalent roles is increasing.

Figure 28 People and employment

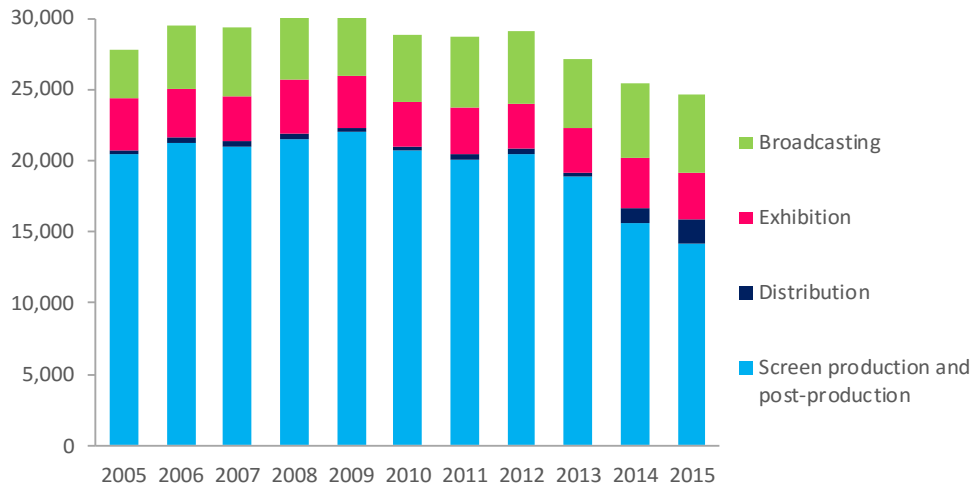


Source: Statistics New Zealand

The Screen Industry Survey 2015/16 showed that there was a decrease in the number of jobs/contracts in the screen industry in 2014 and 2015. This decrease was driven by a reduction in the number of jobs in the production and post-production sub-industry. The number of jobs in production and post-production decreased by 35% or 7,800

from 2009 to 2015 (see Figure 29). This was partially off-set by an increase in jobs in broadcasting and distribution which increased by 900 and 1,380, respectively.

Figure 29 Screen industry jobs by main activity



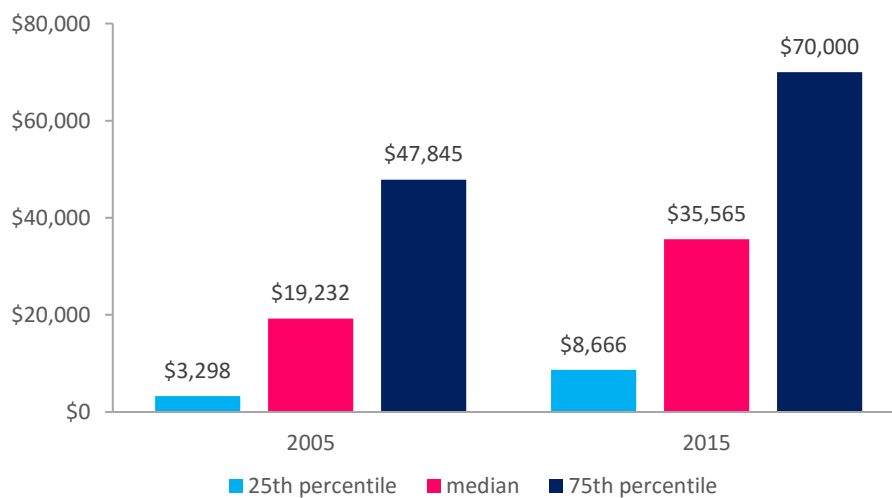
Source: Statistics New Zealand

5.2. Wages are growing

The level and distribution of earnings in the screen industry changed noticeably from 2005 to 2015. Three-quarters of screen industry workers earned less than \$70,000 annually. Figure 30 shows earnings in the screen industry for 2005 and 2015 divided into the 25th percentile, median (50th percentile) and 75th percentile.

Figure 30 The distribution of earnings in 2005 and 2015

Annual earnings per contract, in nominal terms

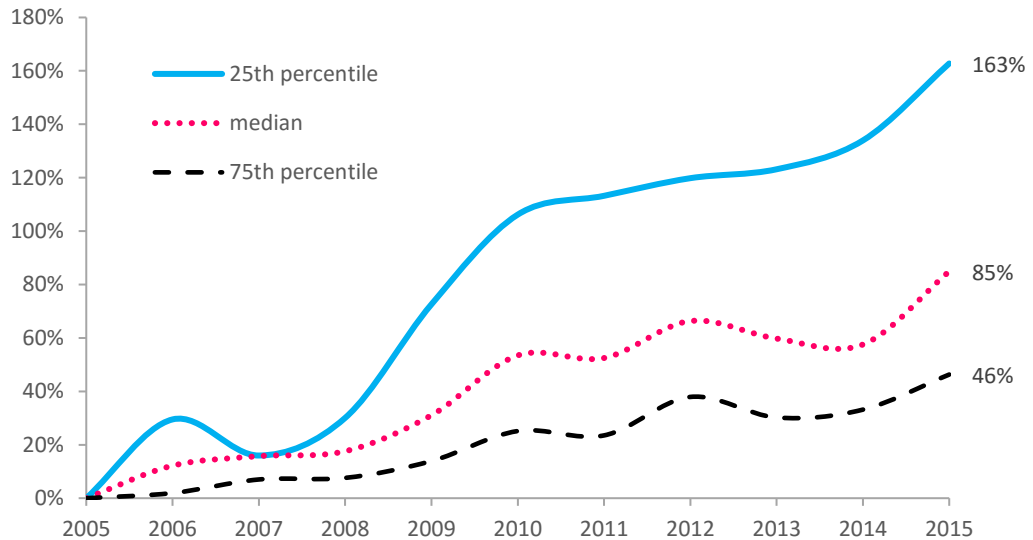


Source: NZIER

In 2005, the bottom quarter of the labour force earned significantly less than the minimum wage, which reflects the number of short-term contracts and part-time roles. However, those in the 25th percentile experienced the largest growth rate in

annual earnings (see Figure 31). The level of earnings in this percentile more than doubled between 2005 and 2015 (it increased by 163%).

Figure 31 Growth in earnings compared to 2005 by percentile

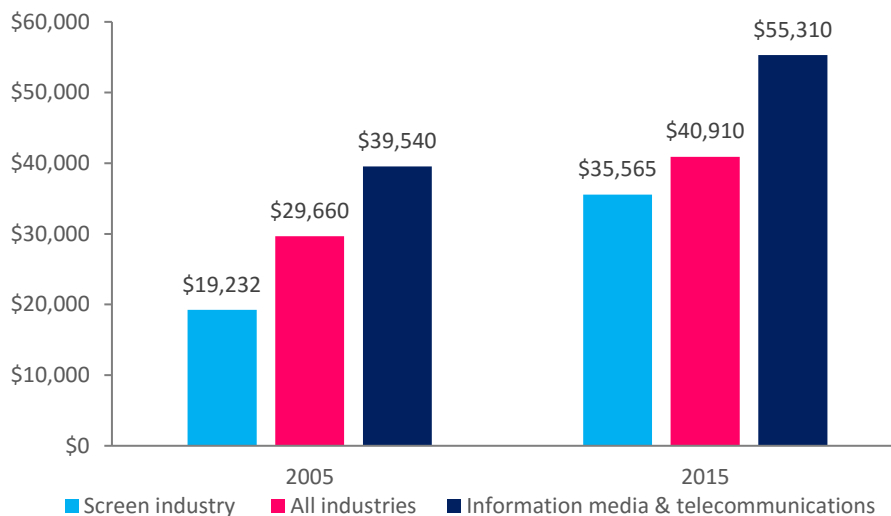


Source: NZIER

There has been an increase in median annual earnings in the screen industry (see Figure 32). The screen industry needs improved reporting so that there is information on earnings and hours of work disaggregated by screen industry sub-industry to get a clear understanding of changes over time. This will help industry stakeholders understand whether jobs in the industry are transforming into full-time careers.

Figure 32 Median earnings compared to other industries

Median annual earnings, in nominal terms

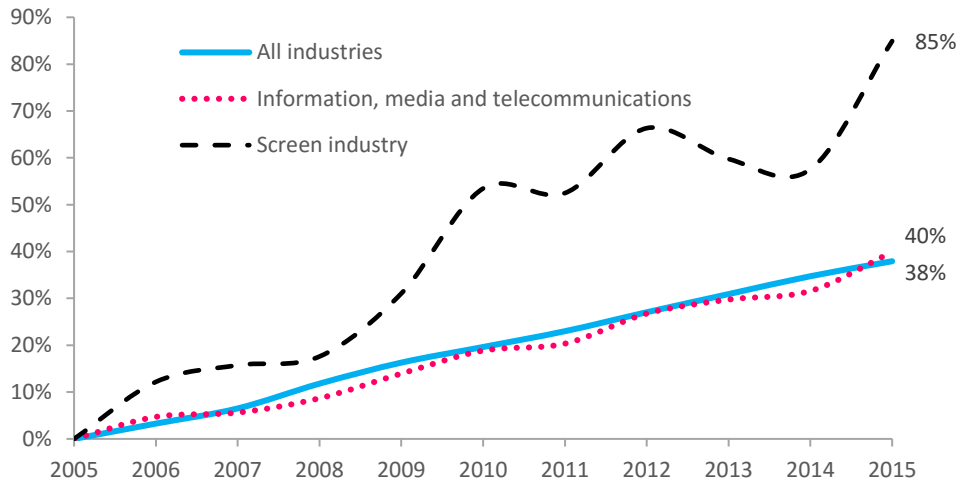


Source: Statistics New Zealand

Figure 33 shows that median earnings in the overall screen industry increased faster than other industries between 2005 and 2015.

Figure 33 Growth in median earnings compared to other industries

Median annual nominal earnings relative to 2005



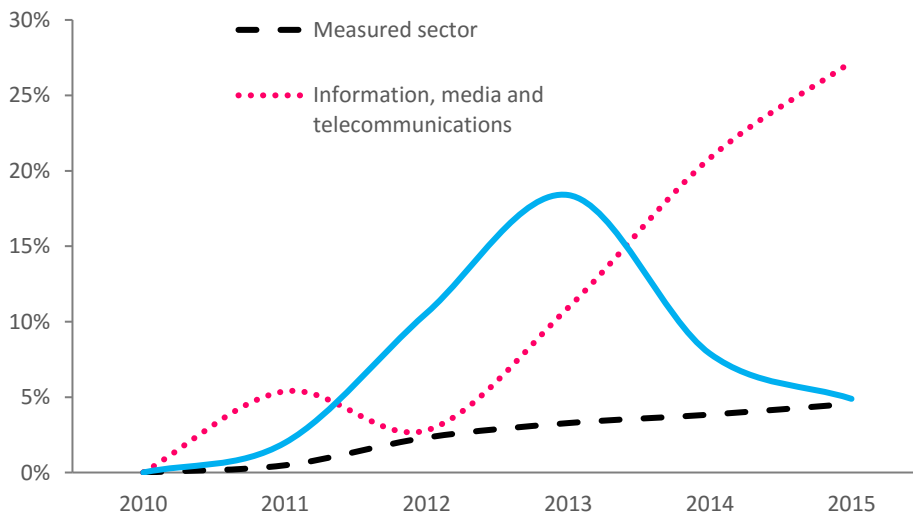
Source: NZIER

5.3. Labour productivity has varied

Labour productivity is measured by the ratio of the level of output (GDP) to the total earnings from labour inputs. Estimated growth in labour productivity in the screen industry fluctuated from 2010 to 2015. It increased from 2010 to 2013 and then decreased. Improved collection of statistical data is required to firm up estimates of labour productivity in the screen industry, to ensure that the industry’s output and input can be measured robustly and consistently.

Figure 34 Growth in labour productivity comparison

Change in labour productivity indices relative to 2010 levels



Source: Statistics New Zealand – Productivity Indices

The level of change may be related to the composition of labour and skills required for different types of productions. Some productions are likely to be more labour intensive, while others will involve a higher proportion of high tech skills that demand higher hourly rates.

When the current estimate of labour productivity growth in the screen industry is compared to the information, media and telecommunications industry and the overall economy (represented by the measured sector), labour productivity in the screen industry experienced stronger growth than either comparator from 2011 to 2013. Over the period from 2010 to 2015 productivity in the screen industry grew 5%. This rate of growth lies between the growth of the information, media and telecommunications industry and the measured sector (approximately 58% of the entire economy).

5.4. The workforce is young and competitive

The screen industry workforce is dominated by younger people – 68% of the workers are less than 40 years old. Part-time work and multiple part-time contracts are common. The hours of work can exceed 40 hours – digital visual effects workers are routinely rostered for a minimum of 50 hours per week. Highly skilled technical staff are in global demand and therefore highly mobile.

Labour costs are driven up by this global competition. Talent attraction and retention are issues for New Zealand. The competitiveness of New Zealand’s production incentives schemes plays a role in the industry’s competitiveness and in attracting workers and their skills to New Zealand.

The screen industry is part of the creative industry, which relies heavily on human capital for growth and innovation. There is significant overlap between some areas of the screen industry and the tech industry, especially in digital visual effects. According to the report ‘Digital Nation New Zealand: from Tech Sector to Digital Nation’ released in 2016:¹⁹

The number one catalyst for the success of the tech sector is a sustainable supply of skilled resources.

The success of screen industry businesses is sometimes heavily dependent on the reputation of key people and their networks in production and financing.²⁰ This presents a succession of challenges for the stability and growth of the screen industry.

The most recent information available on labour shortages in the motion picture industry in Statistics New Zealand’s Business Operations Survey from 2014 shows:

- 76% of the responding businesses had vacancies
- 30% of vacancies were defined as ‘hard to fill’.

¹⁹ Available at <https://nzier.org.nz/publication/digital-nation-new-zealand-from-tech-sector-to-digital-nation> - see p. 17.

²⁰ NZIER, 2016. Global Value Networks: How to Succeed in Business Without Worrying About Scale, Distance or Thin Networks. Report to NZPECC. <https://nzier.org.nz/publication/global-value-networks>

6. 'NZ Inc.', film tourism and soft diplomacy

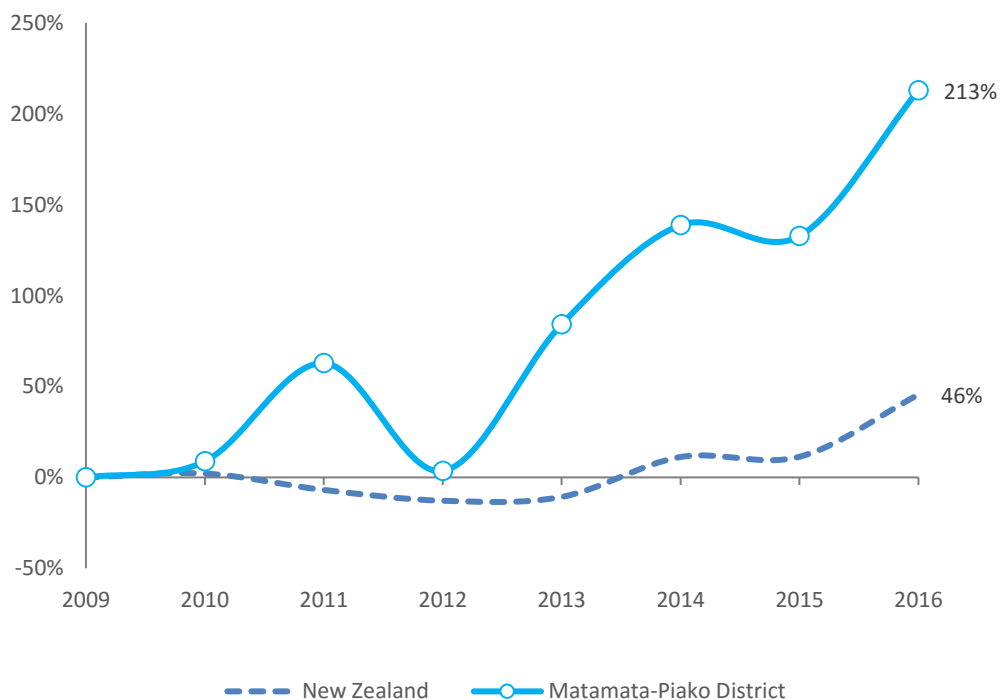
The screen industry contributes to promoting 'NZ Inc.' and New Zealand as a top tourism destination. Screen industry outputs such as *The Hobbit* trilogy showcase the beauty of New Zealand's flora and fauna on the global stage. The depiction of New Zealand landscapes could be a factor in visitor decision-making when they are choosing between alternative destinations. When this translates into tourism or further productions, it boosts the economic spillovers from the screen industry. When screen productions are a two-country partnership they can be a way to highlight that we hold some common purpose, common values and can work together. This is 'soft diplomacy'. Other shows like *Coast New Zealand* play a supporting role in the promotion of New Zealand as a tourist destination.

6.1. Film-related tourism has grown

The role of films and television in influencing tourists to visit locations is an emerging market for tourism. *The Lord of the Rings* and *The Hobbit* trilogies are excellent examples of film-induced tourism. *The Lord of the Rings* and *The Hobbit* trilogies have left an enduring film tourism legacy in the Waikato. Nowhere is this clearer than in the Matamata-Piako District, an agricultural area, that has been transformed into a major tourist attraction.

Figure 35 International visitor growth in Matamata-Piako

Percentage growth compared to 2009



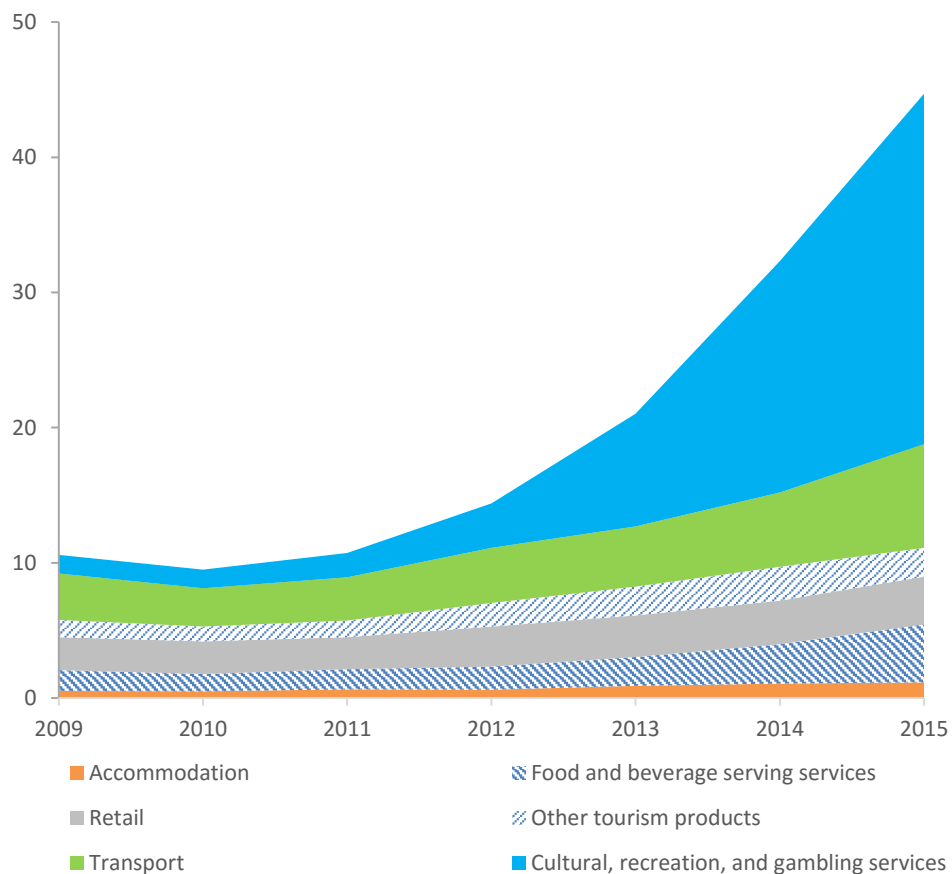
Source: NZIER, Statistics New Zealand

The success of Hobbiton near Matamata shows that the addition of a new and relevant tourist attraction can stimulate a relatively large amount of new international tourism expenditure. That activity spills over to additional spending in other areas such as transport, retail, and dining out.

Figure 36 shows the dramatic effect that the release of three *Hobbit* films and the revitalisation of Hobbiton had on visitor spending in Matamata. Total international spending in the Matamata-Piako District in 2009 was \$9 million. Spending on cultural activities contributed around \$1 million. Spending on cultural activities grew strongly from 2011 to 2015. It contributed \$26 million in 2015. Spending in other areas correspondingly increased by \$10 million. Total spending by international visitors increased from \$9 million in 2010, to \$45 million in 2015.

Figure 36 International visitor spending in Matamata-Piako

\$ millions, in nominal terms



Source: MBIE regional tourism expenditure estimates

The economic impact of film tourism from *The Hobbit* trilogy was assessed by Li et al. (2017), using a combination of CGE and econometric modelling.²¹ They estimated that *The Hobbit* trilogy resulted in an additional 214,811 international visitors in 2013 and

²¹ Li, S., Li, H., Song, H., Lundberg, C., & Shen, S., 2017. The Economic Impact of On-Screen Tourism: The Case of The Lord of the Rings and the Hobbit. *Tourism Management*, 60, 177-187.

2014 to the district. They also found that *The Hobbit* trilogy had positive effects on the tourism industry that spilled over to an increase in societal welfare.

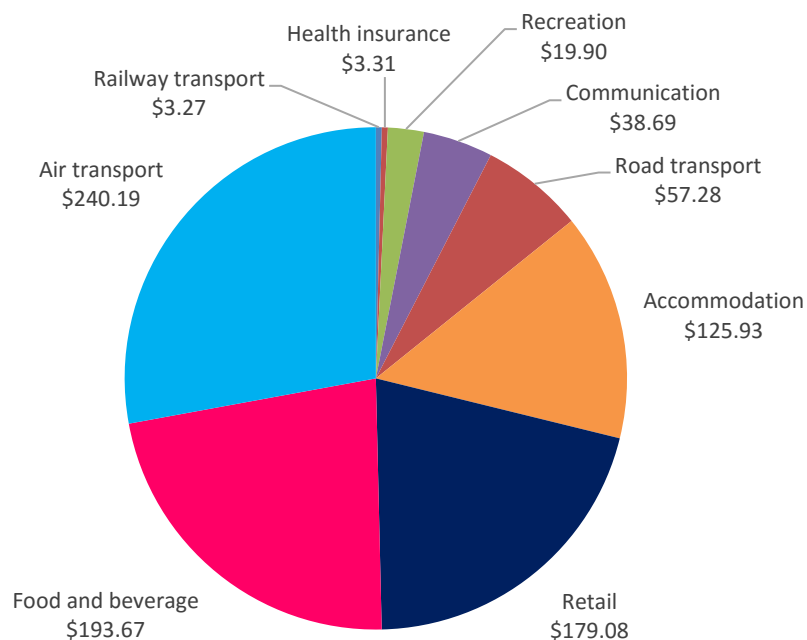
The economic impact of *The Hobbit* trilogy was estimated to:

- increase household welfare by \$268.2 million
- increase international visitor spending by \$1.11 billion
- increase tourism-related industry exports by \$861.3 million.

Figure 37 shows the estimated industry level impacts of *The Hobbit* trilogy for the tourism-related industries.

Figure 37 Hobbit trilogy tourism-related industry exports

\$ millions (NZD)



Source: Li et al. 2017 values converted to New Zealand dollars by NZIER

The impact of *The Hobbit* trilogy was more significant than the *Lord of the Rings* due to more strategic use of promotional initiatives associated with the film, including linking New Zealand as a destination to depictions of Middle Earth.

In general, productions that showcase New Zealand's natural environment, culture and society contribute to marketing New Zealand as an attractive tourist destination. For example, *Coast New Zealand* features New Zealand's landscapes and includes significant exposure of major tikanga elements and Māori culture. *Coast New Zealand* has been seen in 42 countries through the BBC Earth channel.

The impact of *Coast New Zealand* is discussed further in the following case study.

Case study 5: Coast New Zealand showcases Aotearoa

Coast New Zealand is based on the hit BBC international factual format *Coast*. It focuses on New Zealand's unique coastline, targeting a different strip of coast for each episode and gathering stories about the history, the people, the archaeology, the geography and the marine and animal life. It was funded through NZOA's Platinum Fund and produced by Great Southern Television. TVNZ commissioned it and it was first broadcast on TVNZ 1 in early 2016. It is co-written by New Zealanders and features New Zealand talent, crew and imagery.

Neil Oliver and four New Zealanders present this series. The series is popular in New Zealand with 11.7% (503,000) of New Zealanders watching each episode when it first broadcast in 2016. It is particularly appealing to older New Zealanders. More than one-in-four New Zealanders aged over 55 watched each first-run episode. *Coast New Zealand series 2* is currently in production.

Figure 38 Coast New Zealand



Source: Great Southern Television

Coast New Zealand is an example which demonstrates that a New Zealand production can hold the same high production values as that of its international counterparts; the numerous BBC televised series of *Coast* and the revised Australian *Coast* series.

New Zealanders can take pride in the success of *Coast New Zealand* using a successful factual format from the BBC while retaining a strong element of local culture and identity. The majority of the presenters and crew were local Kiwis and it was filmed in 6 key regions of New Zealand. *Coast New Zealand* differentiates itself from other *Coast* series by including significant exposure of major tikanga elements to explore Māori culture and represent stories of their tūpuna. *Coast* is part of a larger body of screen productions that reinforces New Zealand's image.

The total budget was NZD\$2.078 million, of which \$1.783 million was spent in New Zealand.

Table 8 Local expenditure on Coast New Zealand

Item	Series 1 expenditure (NZD, thousands)
Above the line	\$395
Staff	\$444
Location expenses	\$18
Technical and film equipment	\$216
Post-production	\$257
Music and archive	\$52
Travel and accommodation	\$202
Office, admin and legal costs	\$198
Total	\$1,783

Source: Great Southern Television

Above the line New Zealand costs include development, writers, consultants, rights, producers, directors and presenters (excluding BBC rights and Australian producer and Neil Oliver) and total \$395,100.

New Zealand personnel includes production staff, camera, sound, and editing crews that amount to \$444,373. Location expenses total \$18,166.

Technical and film equipment include New Zealand (props, cameras, lighting, sound gear and editing equipment) expenditure was \$216,373. The total New Zealand post-production expenditure which includes offline hire, editing equipment, facility costs film and tape stock was \$256,837.

Music and local archive material amounts to \$52,115 and travel and accommodation expenditure totals \$201,803. The production company overhead, office costs, other general expenses, legal fees, insurances, publicity, interest and audits totalled \$198,370.

Coast New Zealand is a showcase of New Zealand talent, stories and scenery. The top line statistics from New Zealand for Series 1 included:

- 11.7% of New Zealanders watched each episode when it was first broadcast on TVNZ 1
- 12.6% of New Zealanders were watching a single episode at its peak
- over 3 million New Zealanders tuned in at some stage to watch the series
- averaged 503,000 viewers per episode
- 1 in 4 New Zealanders aged over 55 saw each episode of *Coast New Zealand* when it was first broadcast.

Through the reach of the BBC Earth channel *Coast New Zealand* has been seen in 42 countries, and direct sales to broadcasters in the following territories:

- Australia (Foxtel / History channel)
- Canada (OEC)
- New Zealand (Foxtel / History channel)
- Pan Far East (Turner Broadcasting / various).

It may yet be sold to BBC2, as both series of *Coast Australia* have rated well in the UK.

6.2. Overseas production partnerships are part of soft diplomacy

The screen industry is a global industry that draws on skills and capital from around the world to produce stories. New Zealand cast, crew, directors and producers gain access to capital and pathways to markets via the networks established by the marketing efforts of individuals, the New Zealand Film Commission and regional film offices.

Many of these opportunities are made possible through co-production agreements. Co-production agreements assist New Zealand to match talent and creative ideas with capital and access to markets. New Zealand has 17 co-production agreements. Significant among these is the co-production agreement with China for both film and television. China operates a quota of 34 foreign films for cinema release. New Zealand co-productions sit outside the China quota.

Co-production agreements, as formal agreements between governments, are a strong signal that two countries are willing to work together, not just for on-screen productions but for business in general. Trade and joint business ventures require a 'safe' environment of trust. Co-production agreements are a signal of trust and confidence in doing business.

The German-aired *Emilie Richards* series (case study 6 over the page) is not well known in New Zealand, but in Germany it played a role in cross-cultural understanding. In the case of *800 Words* (case study 7 overleaf), our Trans-Tasman relationship plays out in a drama series featuring New Zealanders and Australians together in daily life.

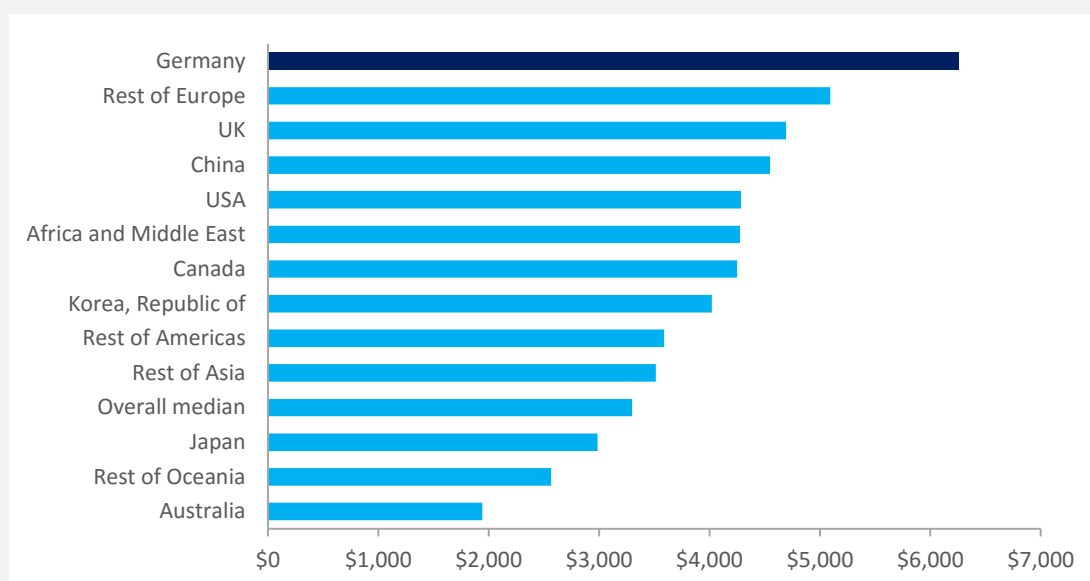
Case study 6: Emilie Richards shows off New Zealand

The *Emilie Richards* series produced by Auckland's General Film Corporation provided 15 hours of high quality drama for primetime German television over a four-year period from 2009-12. The series, based on a German-New Zealand love interest, featured top New Zealand tourist locations such as Akaroa, Queenstown, Bay of Islands, Auckland and Wellington.

The series aired on Zweites Deutsches Fernsehen (ZDF), Germany's most watched television channel.²² The series averaged 7 million viewers per episode. The regular Sunday prime time airing in people's living rooms provided a basis for German audiences to become familiar with New Zealand culture, values and way of life. This makes it easier for Germans to feel a connection to New Zealand and helps with the New Zealand brand image when it comes to doing business or making travel choices. The series provides a supporting role to a larger body of screen productions that reinforces New Zealand's image.

Germany is New Zealand's 6th largest tourism market with 96,848 arrivals in 2016. Germans are high value visitors who tend to stay longer and spend more than the average visitor (Figure 39)

Figure 39 Median visitor spend by country of origin in 2016



Source: MBIE, NZIER

Repeatedly reaching 7 million viewers in a premium tourism market provides exposure that is difficult to value or replicate through tourism marketing. The production fell under the German-New Zealand co-production agreement making it easy to conduct business and shoot the series in New Zealand. The production featured New Zealand cast and crew at wage rates attractive to overseas producers. A typical episode employed 50 New Zealanders for a 2-3 month period.

The *Emilie Richards* series has provided enduring benefits for the General Film Corporation, contributing to growth from a 1-2 person company to an 12-15 person operation. General Film Corporation is gaining new business because of the series. Establishing a track record has meant General Film Corporation has continued to gain international business and exposure.

²² <https://zdf-enterprises.de/en/news/press/pressreleases/zdf-once-again-most-watched-german-tv-broadcaster-of-the-year>

Case study 7: 800 words depicts a slice of New Zealand

800 Words is a New Zealand-based production from Auckland-based South Pacific Pictures working with Australia's Seven Productions. It is written by New Zealanders and features New Zealand cast, crew and imagery. It is the first drama to be commissioned by an Australian television network, to be made in New Zealand by a New Zealand production company. Since its launch, it has been one of the top rating dramas on Australian television, and is performing well in New Zealand too. Network Seven have recently completed a third series of the show.

800 Words demonstrates the benefits of screen projects from cultural and economic perspectives. From a cultural perspective, this series has world class production values and can hold its own on the world stage. New Zealanders will only take pride in and value New Zealand programmes if they can see that they have the same high production values as their international counterparts. An environment that attracts international productions to our shores means that we have more experienced practitioners on the ground and our overall production values are increased. *800 Words* has benefited from this environment. Being able to access the NZSPG to make this series has meant that we as New Zealanders have had more hours of local drama on screen than our normal funding model would allow for.

Figure 40 800 Words



Source: South Pacific Pictures/Seven Productions

The financial and employment benefits from the series are clear. *800 Words* engaged 237 workers over its 11-week shoot for Series 1, and another 345 people over the 22-week shoot for Series 2. This includes cast and crew but not extras – extras, on average, numbered 600 workers in Series 1 and 1,200 workers in Series 2.

Local expenditure back into the economy over the two series has been significant, at \$16 million in total.

Table 9 Expenditure on 800 Words

Item	Series 1 and 2 expenditures, \$NZ million
Salaries	\$9.00
Materials and construction	\$0.83
Locations, fees security	\$0.52
Offices and studios	\$0.71
Equipment and vehicle hire costs	\$1.90
Catering	\$0.25
Post-production	\$1.10
Music	\$0.38
Administration and legal	\$1.30
Total	\$16.00

Source: South Pacific Pictures

Salaries for New Zealand personnel including directors, producers, writers, actors, designers, costume, make-up, camera and sound crew, stunt people and extras, over both series totalled approximately \$9 million.

Materials and making of sets (timber, paint, etc.) as well as costume buying and make up was \$828k. Fees for location owners, councils (permits) and expenses such as security, amounted to \$520k. Fees for offices and studios were \$712k. Hireage of film making equipment (cameras, lights, generators, dollies and sound recording equipment) and truck and car hireage including fuel, totalled \$1.9 million. Catering for the two seasons amounts to \$247k.

Total New Zealand post-production expenditure which included editing equipment, sound mixing personnel along with high quality picture finishing came in at \$1.1 million. Music spend was \$381k, which included composing and recording musicians as well as licencing local New Zealand music. The production company's overheads, legal fees, insurances, publicity, interest and audits totalled \$1.3 million.

800 Words is a showcase of New Zealand talent and scenery. The headline statistics from Australia for Series 1 included:

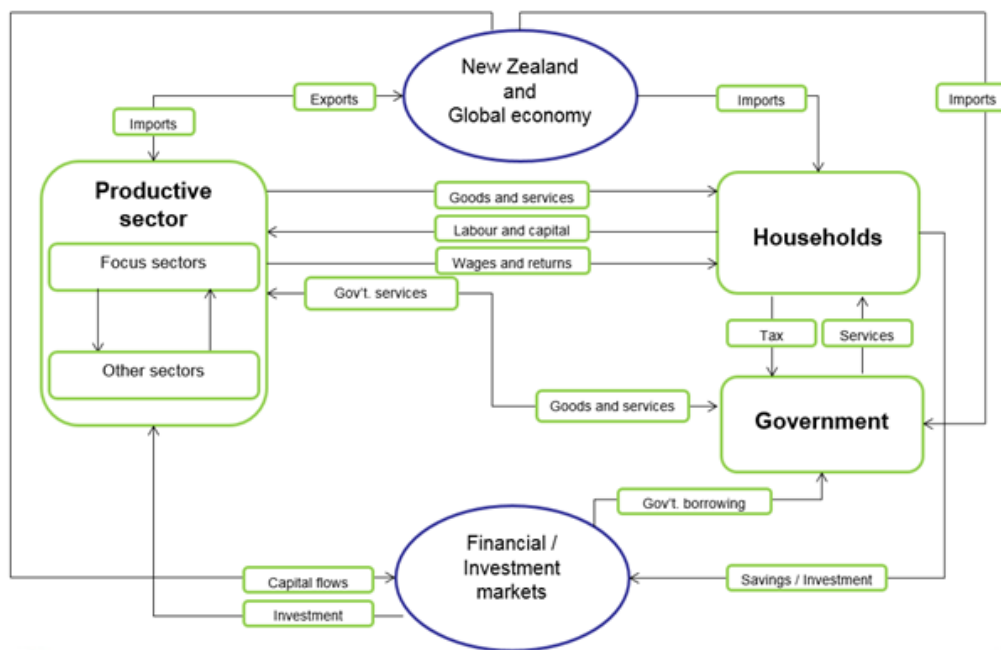
- over 7 million Australians tuned in at some stage to watch the series
- an average 2.1 million viewers per episode
- the highest market share in its timeslot with a 30.4% share
- the highest-ranking entertainment program on every Tuesday it aired
- ranking no. 3 regular program for the year to date (after *My Kitchen Rules* and *The Voice*)
- ranking no. 1 regular drama programme for the year
- ranking no. 2 new series for the year.

Appendix A NZIER's national CGE model

NZIER's national CGE model, ORANI-NZ,²³ is a top-down model of the New Zealand economy, which begins with components of the economy and sums them up to obtain an aggregate description of the economy. It is based on Statistics New Zealand's 2013 input-output tables, which have been updated to reflect the economy in 2015.

A visual representation of ORANI-NZ is shown in Figure 41. It highlights how the model can capture the complex and multidirectional relationships between the various parts in the economy and how they interact with the rest of New Zealand and rest of the world.

Figure 41 CGE models cover the whole economy



Source: NZIER

The model includes 106 industries and 201 commodities in its standard form. Due to limitations on PWD employment data by industry, we aggregate the 106 industries into 20 broader sectors.

²³ ORANI-NZ stands was developed at NZIER based on the original Australian ORANI model created by the Centre of Policy Studies, Victoria University-Melbourne, Australia. <http://www.copsmodels.com/term.htm>. NZIER maintains close connections with the Centre, ensuring that our modelling techniques reflect international best-practice.