

# The economic contribution of the film and television industries in Taiwan



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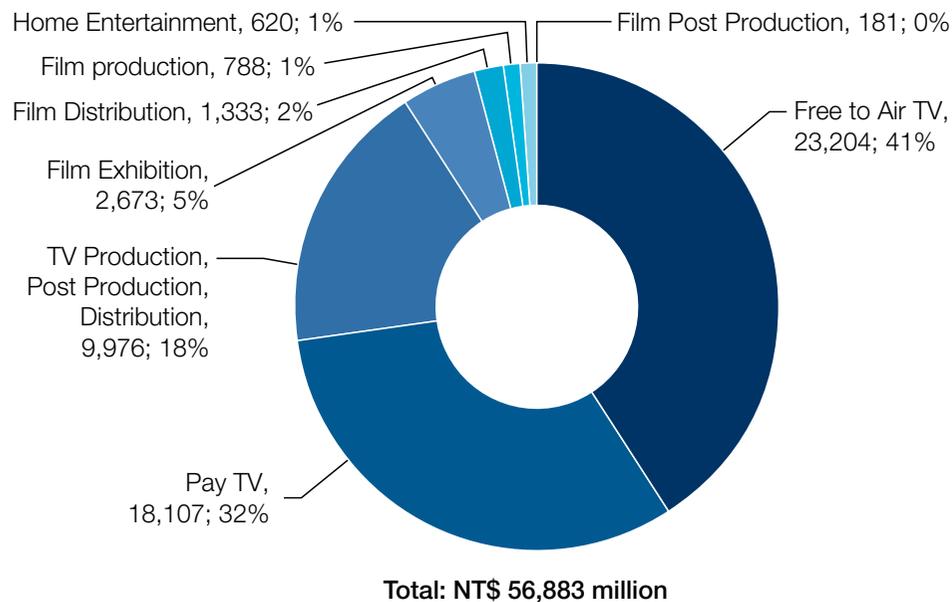
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# 1 Key findings

The film and television sectors make a notable direct contribution to the Taiwanese economy...

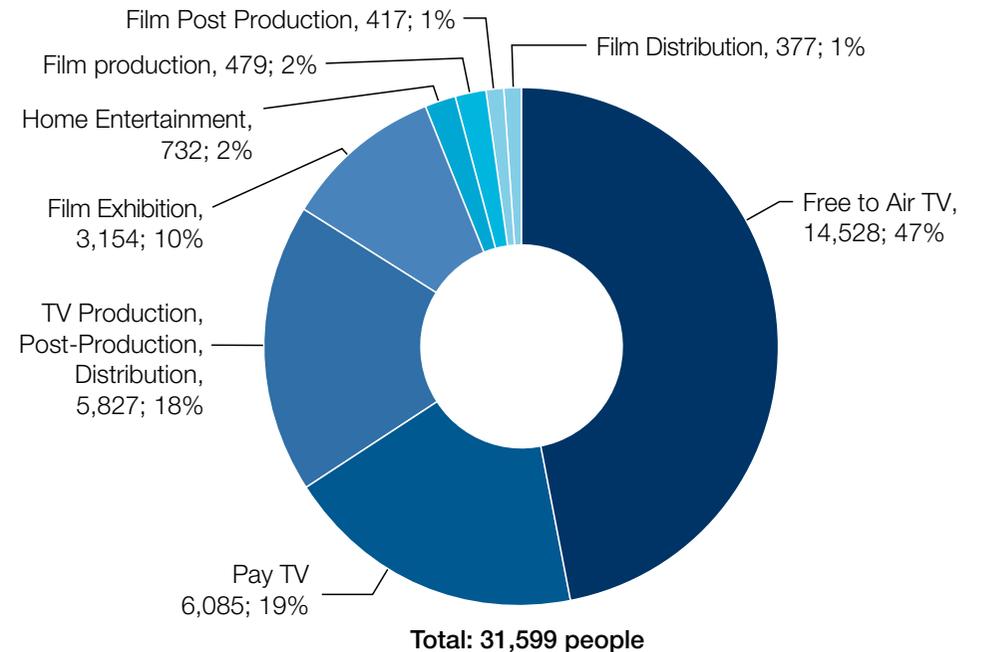
■ Oxford Economics estimates show that the film and television industries **directly** contributed an estimated **56,883 million New Taiwan Dollars (NT\$)** to the Taiwanese economy in gross domestic product (GDP)<sup>1</sup> in 2013. In the process they directly supported **31,599 jobs** and generated some **NT\$ 8,256 million** in tax revenues.<sup>2</sup>

**Chart 1.1: Direct GDP of the Taiwanese film and TV industry, 2013 (millions of NT\$ and percentage split)**



1 Throughout this report measures of GDP reflect GDP at 'basic prices' (also known as gross value added or GVA), rather than the 'market price' measure usually given 'headline' status in official statistics. (See 'Detailed methodology' at the end of this report.)

**Chart 1.2: Direct employment of the Taiwanese film and TV industry, 2013 (persons employed and percentage split)**



■ The film and television industries' direct contribution to GDP in 2013 was equivalent to some 0.4% of total national GDP.

■ Meanwhile, film and television's direct share of economy-wide employment was 0.3% while it generated 0.4% of total tax revenues.

2 Money values in this report are rounded to the nearest NT\$ 1 million, while (with the exception of the overall direct employment total of 31,599) job figures in the text of this report are rounded to the nearest 100 for simplicity. Also note that some of the totals reported in the charts of this report may not appear to sum exactly to the figures cited in the chart totals or the text due to the impact of rounding.

... and lend more significant support to that economy through multiplier effects, making the total contribution larger

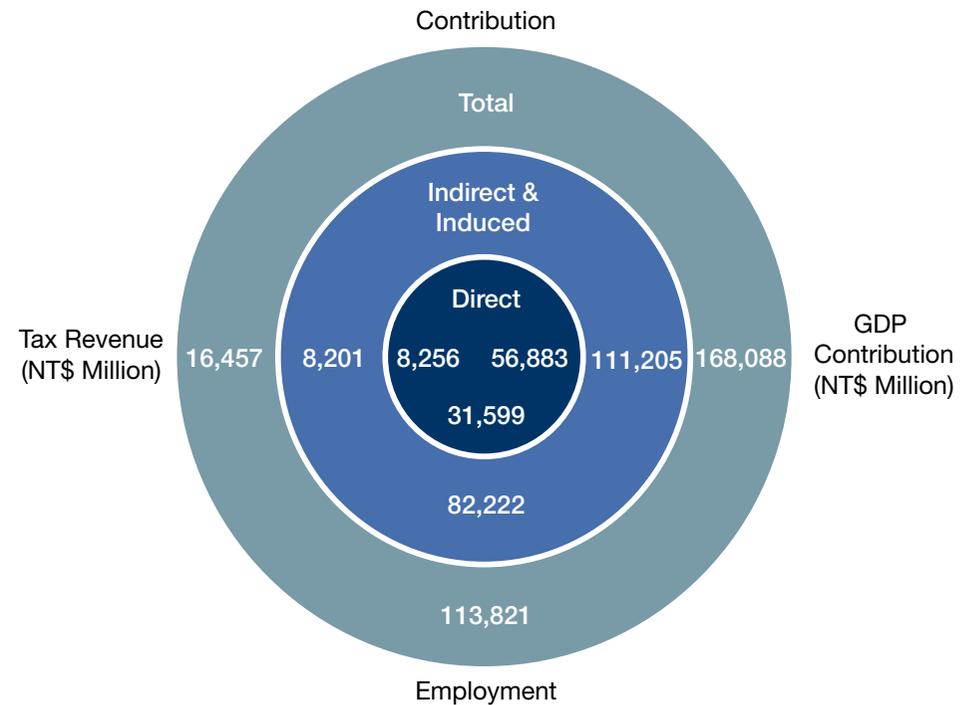
- The film and TV industries also produce ‘indirect’ and ‘induced’ effects across the entire Taiwanese economy. The indirect effects arise from purchases by the film and television sectors from other industries within the country, and from further transactions throughout various supply chains. The induced effects result from workers - directly employed within the film and TV industries or within the supply chain - spending their earnings, generating more rounds of economic activity. We estimate that the combined indirect and induced sectors made an additional GDP contribution of NT\$ 111,205 million, thereby supporting a further 82,200 jobs and NT\$ 8,201 million in tax revenues.

***Taking into account ‘multiplier’ effects, in 2013 the Taiwanese film and television industries generated some NT\$ 168,088 million of GDP for their home country...***

- Taking the direct, indirect and induced contributions together, we estimate that the film and television industry’s total economic contribution to GDP in 2013 was NT\$ **168,088 million**. In addition, it supported **113,800 jobs** overall. And it generated total tax revenues of NT\$ **16,457 million**.

***... which was sufficient to support 113,800 jobs and provide NT\$ 16,457 million in taxes.***

Figure 1.1: Total contribution to Taiwanese GDP, tax and employment, 2013



### Industry productivity is well above the national average...

- Each person employed in the film and television sector in 2013 generated, on average, NT\$ 1.80 million of GDP – over 40% higher than the economy-wide average of NT\$ 1.28 million
- Employees' average earnings, at NT\$ 0.6 million a year, are also somewhat higher than the average across the economy as a whole (NT\$ 0.55 million).

### ...but the challenge for the sector is to develop future growth

- Taiwan is a relatively small player in terms of film production due to historical factors such as its relatively small market and population.
- Likewise current film and TV exports are minor, while historically the level of film and TV induced tourism would appear to be small
- However, recent government initiatives such as the Cross Straits Economic Cooperation Framework Agreement with mainland China and the Cultural and Creative Industry Act (both implemented in 2010) may help support the further development of both the industry in general and exports in particular, as well as promoting international and domestic tourism.

**Table 1.1: Overview of the economic contribution of the Taiwanese film and television industries**

| Metric  | GDP (NT\$ m)  |                | Employment    |                | Earnings (NT\$ m) |               | Tax (NT\$ m) |               |
|---|---------------|----------------|---------------|----------------|-------------------|---------------|--------------|---------------|
|   | Direct        | Total          | Direct        | Total          | Direct            | Total         | Direct       | Total         |
| Film Production                                 | 788           | 2,561          | 479           | 1,717          | 230               | 951           | 36           | 168           |
| Film Post-Production                            | 181           | 499            | 417           | 1,493          | 200               | 827           | 18           | 74            |
| Film Distribution                               | 1,333         | 3,675          | 377           | 2,463          | 181               | 1,364         | 48           | 237           |
| Film Exhibition                                 | 2,673         | 7,368          | 3,154         | 4,938          | 1,513             | 2,735         | 581          | 885           |
| Home Entertainment                              | 620           | 1,634          | 732           | 1,095          | 309               | 606           | 137          | 204           |
| TV Production, Post-Production and Distribution | 9,976         | 31,756         | 5,827         | 21,285         | 3,611             | 11,788        | 506          | 2,081         |
| FTA TV  | 23,204        | 67,736         | 14,528        | 45,401         | 9,004             | 25,144        | 3,865        | 7,047         |
| Pay TV  | 18,107        | 52,859         | 6,085         | 35,429         | 3,771             | 19,621        | 3,064        | 5,760         |
| <b>Total</b>                                    | <b>56,883</b> | <b>168,088</b> | <b>31,599</b> | <b>113,821</b> | <b>18,818</b>     | <b>63,036</b> | <b>8,256</b> | <b>16,457</b> |

Source: Oxford Economics estimates Note: figures may not add up to totals due to rounding

## 2 How we arrived at these figures

Oxford Economics was commissioned to assess the economic contribution of the film and television industries in Taiwan.

The starting point for our estimates was provided by data from the Taiwanese Ministry of Culture, Bureau of Audiovisual and Music Industry Development (2013) *2011 special report on industry trends research - television and film industry*. This publication reports 2011 data which we extrapolated to 2013. This differentiates between film production, post-production, distribution and exhibition as well as between TV production, post-production and distribution, free to air (FTA) TV and Pay TV. (Details are set out in the final chapter of this report.)

### 2.1 Direct economic contributions

The GDP, earnings, employment and tax contributions due to the activities of businesses in the film and television industries themselves are referred to as the **direct contributions**.

GDP and employment data are derived from the above-cited Taiwanese Ministry of Culture figures for the film production, post-production, distribution and exhibition subsectors as well as between TV production, post-production and distribution, the FTA TV and Pay TV subsectors. Our tax estimates rely on combining estimated industry income with knowledge of the country's tax system and tax-to-GDP and tax to earnings ratios found for broader sectors of the Taiwanese economy.

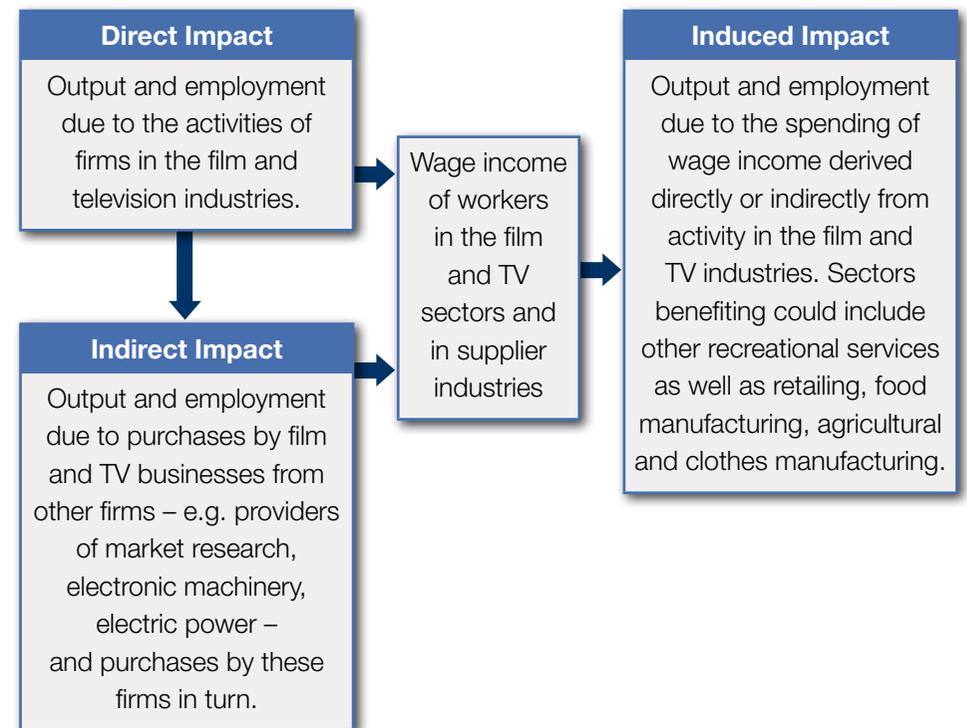
### 2.2 Additional economic contributions

To assess the total economic contribution of these sectors to the Taiwanese economy, we also need to take into account additional channels of economic contribution. The effect of these two key channels can be quantified by combining our estimates of direct contributions with output 'multipliers' implied by detailed national accounts data,

These estimates therefore cover:

- **Indirect contributions**, which relate to the output and jobs supported in Taiwanese-based supply chains, due to purchases by Taiwanese film and TV companies of goods and services from other firms located in the country, purchases by those suppliers in turn, and so on throughout the chains.
- **Induced contributions**, i.e. the Taiwanese output and jobs supported by workers in the film and TV industries – and other employees throughout the supply chains – spending the earnings ultimately derived from film and TV activities.

Figure 2.1: The channels of economic impact



## 3 Film industry

In this chapter we set out the economic impact in greater detail, breaking down the contribution of the film production, post-production, distribution and exhibition sub-sectors. We also include a section on home entertainment. We focus on each subsector's contribution to GDP, to taxes and to employment, including direct, indirect and induced effects.

Data for film production, post-production, distribution and exhibition is sourced from the Ministry of Culture, Bureau of Audiovisual and Music Industry Development (2013) *2011 special report on industry trends research - television and film industry*. This publication reports 2011 data which we extrapolated to 2013. The report differentiates between film production, post-production, distribution and exhibition.

Economic activity relating to TV activities is separately identified by the Ministry of Culture and this activity is presented in the following chapter.

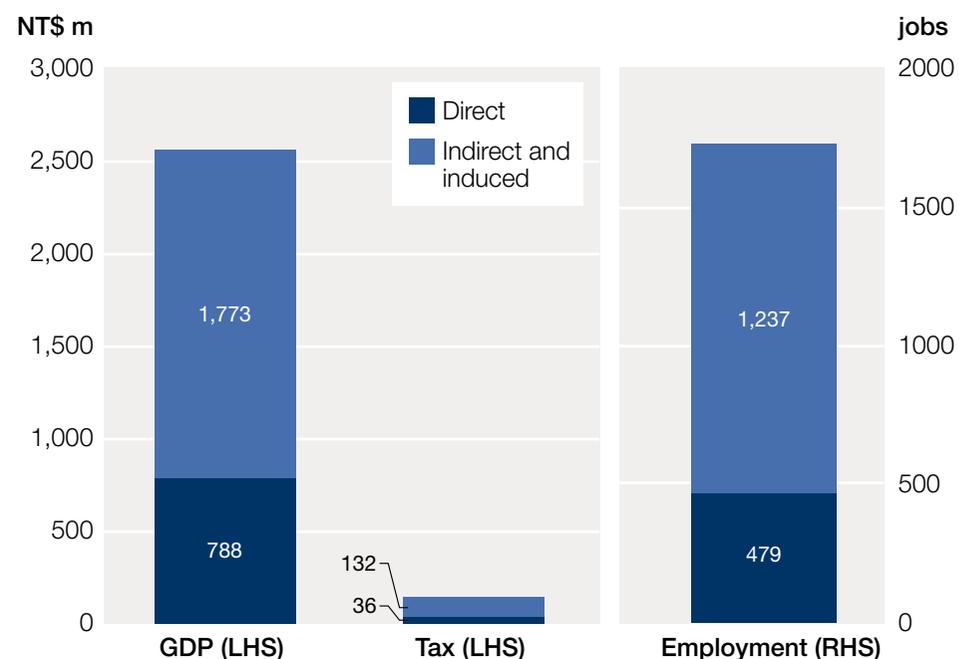
Data relating to home entertainment activities in 2013 were estimated indirectly based on information derived from Screen Digest.

### 3.1 Film production

This area of activity relates to the physical process involved in production of motion pictures.

We estimate that in 2013 film production was worth some NT\$ 788 million in GDP and directly responsible for creating around 500 jobs. Moreover, this activity helped to generate NT\$ 36 million in tax revenue. Taking into account indirect and induced effects these figures rise to NT\$ 2,561 million in GDP, creating 1,700 jobs and raising NT\$ 168 million for the Taiwanese government in tax receipts.

Chart 3.1: Economic contribution of film production, 2013



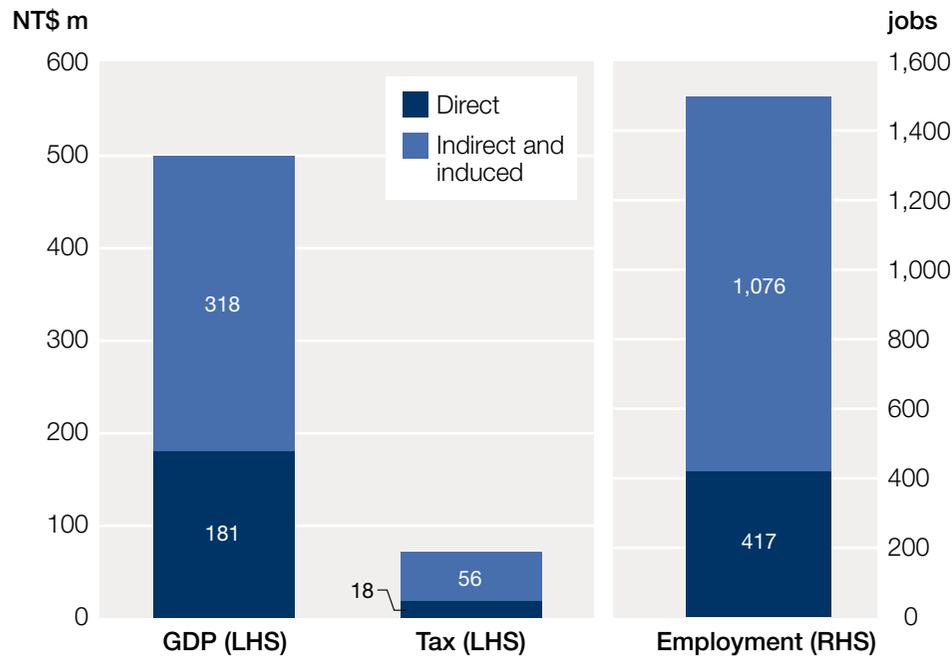
Source: Oxford Economics estimates

### 3.2 Film post-production

Film post-production mainly relates to editing, titling, subtitling, credits, computer graphics, animation and special effects as well as the activities of motion picture film laboratories.

We estimate that in 2013 these activities were worth some NT\$ 181 million in GDP and directly responsible for creating roughly 400 jobs. Moreover, this activity helped to generate NT\$ 18 million in tax revenue. Taking into account indirect and induced effects these figures rise to NT\$ 499 million in GDP, creating some 1,500 jobs and raising NT\$ 74 million for the Taiwanese government in tax receipts.

**Chart 3.2: Economic contribution of film post-production, 2013**



Source: Oxford Economics estimates

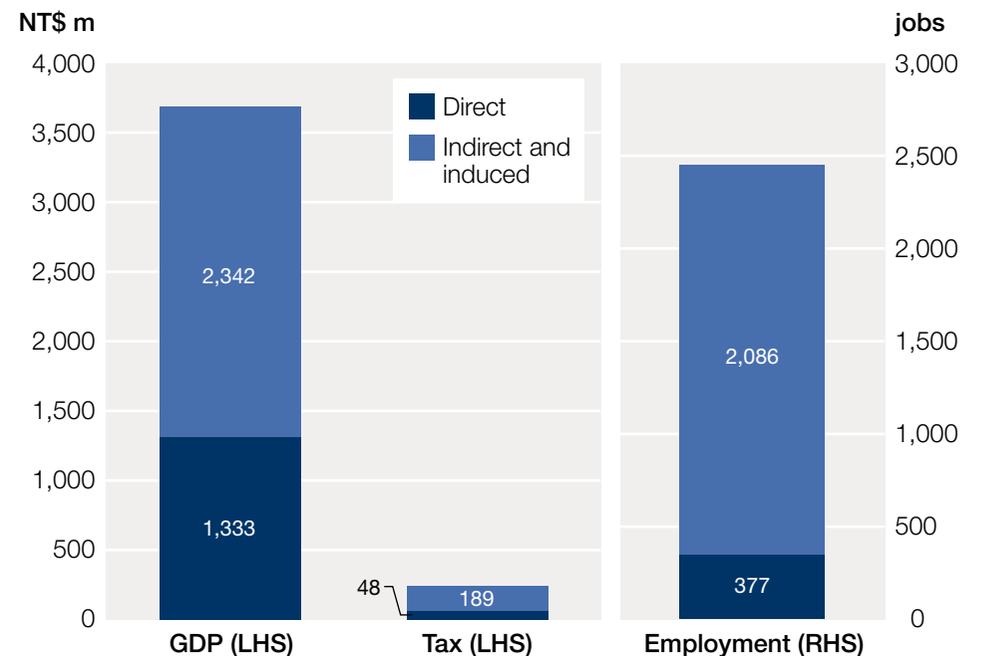
### 3.3 Film distribution

The ‘film distribution’ sector includes the distribution of films to motion picture theatres. This involves the launching and sustaining of films in the market place, with firms responsible for the logistical task of shipping film prints around the world and building audience awareness and interest through PR and marketing campaigns. Recent technological innovations have meant that digital distribution techniques have become increasingly prominent, with the growth of video-on-demand and download platforms.

We estimate that the GDP of film distribution was some NT\$ 1,333 million in 2013 and was directly responsible for creating around 400 jobs. Moreover, this activity helped to generate NT\$ 48 million in tax revenue. Taking into account indirect and induced effects these figures rise to NT\$ 3,675 million in GDP, creating approximately 2,500 jobs and raising NT\$ 237 million for the Taiwanese government in tax receipts.

The film distribution sector’s labour productivity (i.e. its GDP per worker) is some \$NT 3.54 million – the highest of all the sub-sectors in this chapter. This may result from the relatively small number of sector employees, combined with the potential for large margins in this sector.

**Chart 3.3: Economic contribution of film distribution, 2013**



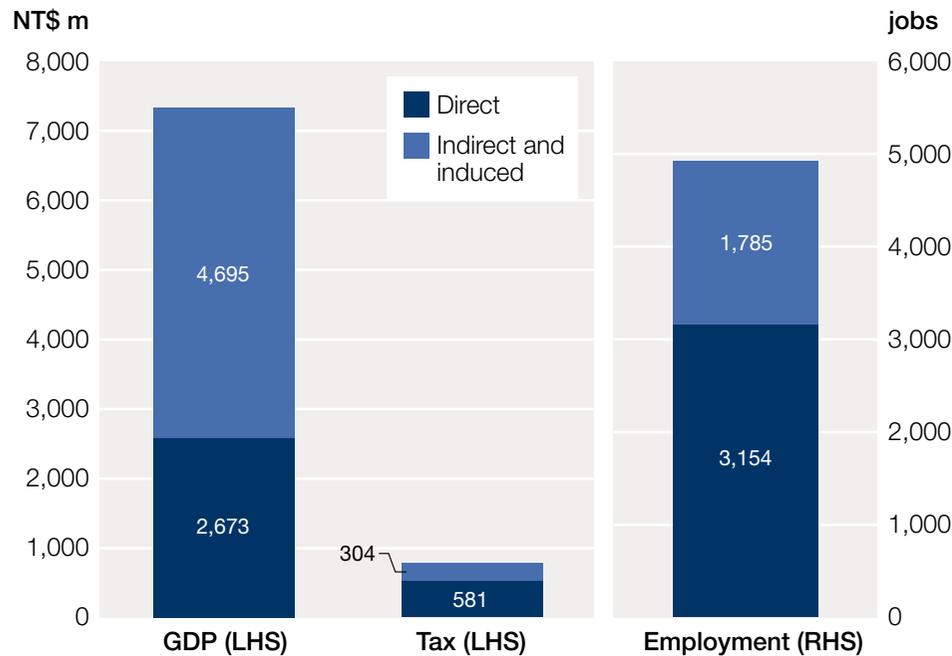
Source: Oxford Economics estimates

### 3.4 Film exhibition

By ‘film exhibition’ we mean the process of screening films to the public, at indoor and outdoor cinemas or in other projection facilities.

We estimate that the direct GDP of film exhibition was NT\$ 2,673 million in 2013, supporting some 3,200 jobs. Moreover, this activity helped to generate NT\$ 581 million in tax revenues. Taking into account indirect and induced effects these figures rise to NT\$ 7,368 million in GDP, supporting 5,000 jobs and raising NT\$ 885 million in tax receipts.

**Chart 3.4: Economic contribution of film exhibition, 2013**



Source: Oxford Economics estimates

Film exhibition makes a bigger contributor to Taiwanese GDP and employment than production, post-production or distribution film exhibition. Indeed, in 2013, this area alone accounted for 54% of the combined Taiwanese film production, post-production, distribution and exhibition sector's GDP (excluding home entertainment) and 71% of its jobs.

This result is likely to be due to a combination of the relatively small size of the Taiwanese film production industry, the large market penetration of foreign films and labour intensive nature of cinema exhibition.

***Film exhibition is a much bigger contributor to Taiwanese GDP and employment than either production, post-production or distribution.***

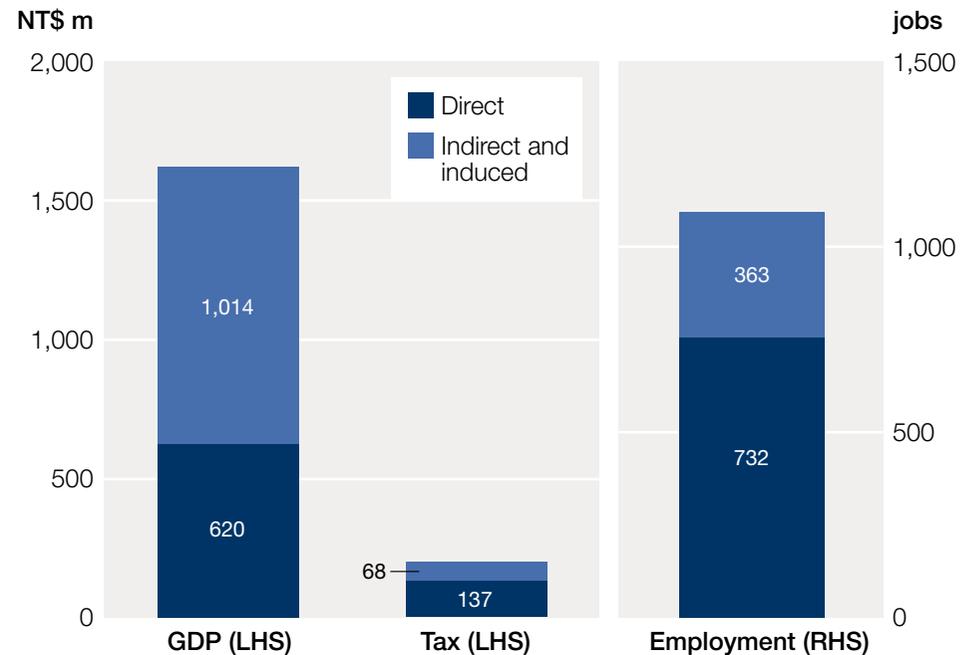
### 3.5 Home entertainment

For the purposes of this report this sub-sector comprises the retail and rental of Blu-ray discs and DVDs. It excludes hardware such as Blu-ray and DVD players, however.

We estimate that home entertainment retail and rental made a NT\$ 620 million contribution to GDP, directly creating over 700 jobs. Moreover, this activity helped to generate NT\$ 137 million in tax revenue. Taking into account indirect and induced effects these figures rise to NT\$ 1,634 million, creating around 1,100 jobs and raising NT\$ 204 million for the Taiwanese government in tax receipts.

Even the combined direct GDP contribution of the retail and rental sub-sectors is less than a quarter that of film exhibition, illustrating the relatively small size of this sector. The sub-sector is dominated by home entertainment retail, which accounted for an estimated 64% of home entertainment gross output.

**Chart 3.5: Economic contribution of home entertainment, 2013**



Source: Oxford Economics estimates

## 4 Television industry

This chapter sets out the economic impact of television production, post-production, distribution (combined), free to air (FTA) TV and Pay TV. As is the case in the previous chapter the concentration is on each subsector's contribution to GDP, to taxes and to employment, including direct, indirect and induced effects.

As is the case for film production, post-production, distribution and exhibition, data relating to the Taiwanese TV industry is sourced from the Taiwanese Ministry of Culture, Bureau of Audiovisual and Music Industry Development (2013) *2011 special report on industry trends research - television and film industry*. This publication reports 2011 data which we extrapolated to 2013.

The television sector accounts for 90% of the direct GDP of the combined 'film and television' industry, and for 84% of its direct employment. It therefore dominates the Taiwanese film and TV economic landscape. Moreover, given these figures, its labour productivity (NT\$ 1.94 million per employee) is higher than that of the combined film production distribution and exhibition and home entertainment industry (NT\$ 1.09 million per employee).

***The combined television sector accounts for 90% of the direct GDP of the combined film and TV industry and 84% of its employment.***

### 4.1 TV Production, post-production and distribution

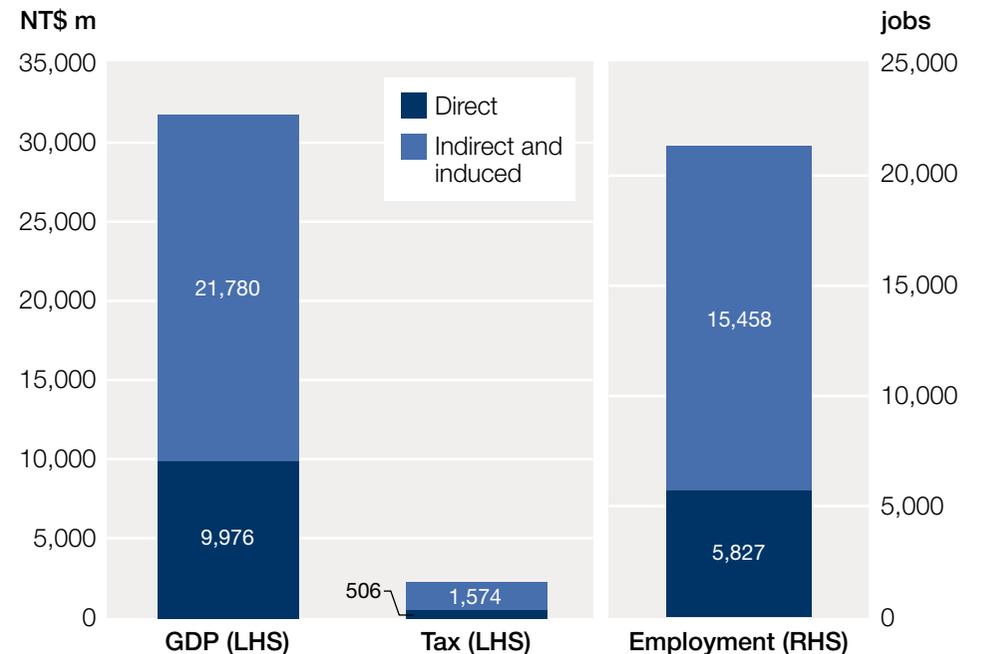
This combined sub-sector comprises of the production and post-production of TV content and the subsequent distribution of such content.

We estimate that in 2013 these combined sectors were worth some NT\$ 9,976 million in GDP and directly responsible for creating around 5,800 jobs. Moreover, this activity helped to generate NT\$ 506 million in tax revenue. Taking into account indirect and induced effects these figures rise to NT\$ 31,756 million, creating 21,300 jobs and raising NT\$ 2,081 million for the Taiwanese government in tax receipts.

The size of this sub-sector relative to the (combined) film production, post-production and distribution sub-sectors is also notable. For example the sub-sector generates some 4.3 times as much (direct) GVA as these combined film industry sub-sectors.

Although the combined value of TV production, post-production and distribution is presented here, it is worth noting that the value of the sub-sector is dominated by TV production, which accounts for an estimated 78% of sub-sector gross output.

**Chart 4.1: Economic contribution of TV production, post-production and distribution, 2013**



Source: Oxford Economics estimates

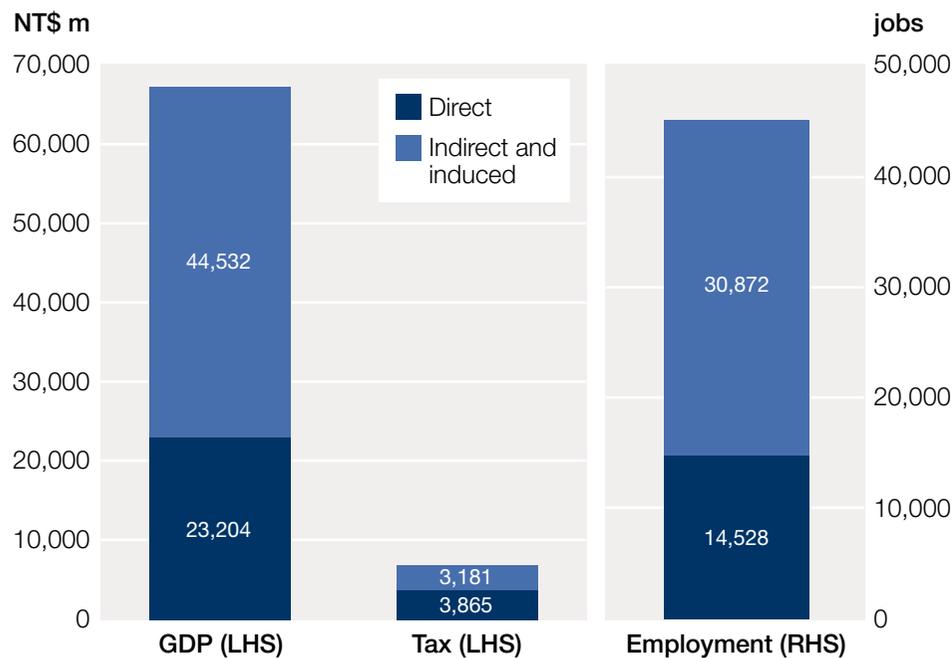
### 4.2 Free-to-air (FTA) television broadcasting

This sector covers the broadcasting of content through FTA television networks. These include Taiwan Television, China Television, Chinese Television System, Formosa Television and Public Television Service.

We estimate that the direct GDP of FTA TV was worth NT\$ 23,204 million in 2013, directly supporting 14,500 jobs and generating NT\$ 3,865 million in tax revenue. Taking into account indirect and induced effects, these figures rise to NT\$ 67,736 million in GDP, sufficient to account for 45,400 jobs and yield NT\$ 7,047 million in tax.

This sub-sector is by far the largest of the TV industry, accounting for 45% of its GVA and 55% of its jobs.

**Chart 4.2: Economic contribution of FTA, 2013**



Source: Oxford Economics estimates

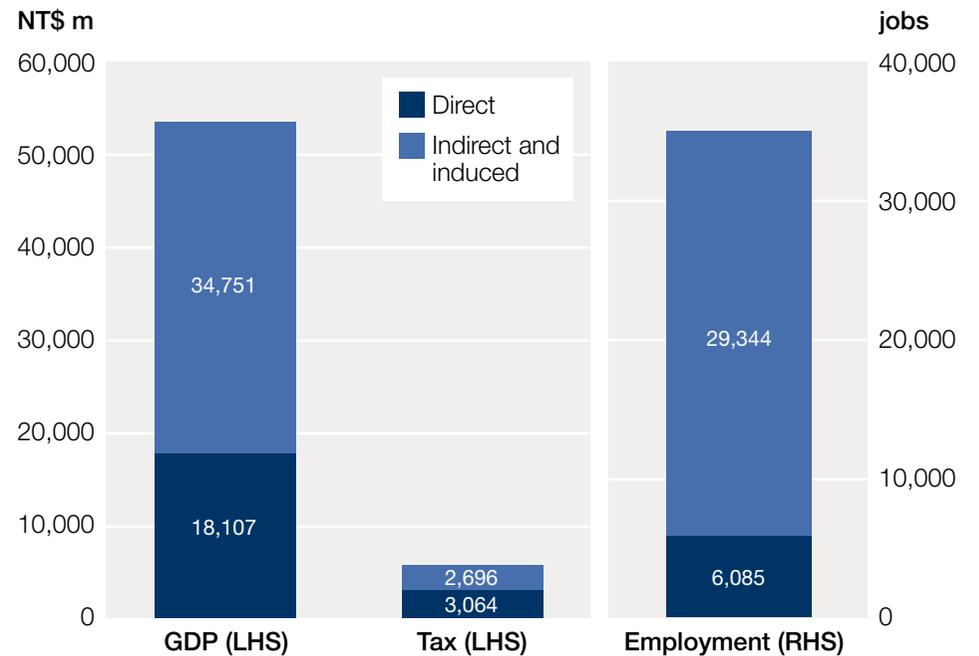
### 4.3 Pay TV

Pay TV includes the broadcast of TV content via cable TV, satellite and IPTV.

We estimate that the direct GDP of Pay TV was worth NT\$ 18,107 million in 2013, directly supporting some 6,100 jobs and generating NT\$ 3,064 million in tax revenue. Taking into account indirect and induced effects, these figures rise to NT\$ 52,859 million in GDP, sufficient to account for 35,400 jobs and produce NT\$ 5,760 million in tax revenues.

GDP per employee (i.e. labour productivity) is estimated at NT\$ 3.0 million- making this the highest productivity sub-sector within the TV industry.

**Chart 4.3: Economic contribution of Pay TV, 2013**



Source: Oxford Economics estimates

## 5 Exports, tourism and festivals

### 5.1 Film and TV exports

Taiwan's relatively small domestic market, and correspondingly small film and TV industry, has limited its export potential. The Taiwanese film production industry has undergone a revival in recent years with 2008's *Cape No.7* being followed by a series of local hits and the market value of local films climbing from some NT\$ 200m in 2007 to NT\$ 1.3 billion and 20% of the market in 2011.<sup>3</sup> Despite this, the value of local film exports was still less than NT\$ 90 million in 2011.<sup>4</sup>

The export market is dominated by TV (with Pay TV in turn accounting for roughly half TV's export share). Based on previous trends and Ministry of Culture data<sup>5</sup> we estimate that film exports totalled some NT\$ 93 million in 2013, with TV exports of NT\$ 1,085 million to make a combined total of NT\$ 1,178 million. Taiwan's TV exports are mainly directed to ethnic Chinese communities in Hong Kong, Singapore, mainland China and Japan.<sup>6</sup>

Note that any film or TV exports would effectively be captured in the direct film and TV economic contribution figures reported above, since exports are a component of GDP.

Under the 2010 Cross Straits Economic Cooperation Framework Agreement, Taiwanese films are no longer subject to Beijing's restrictions on foreign film imports. This provides an opportunity for Taiwanese filmmakers to increase their penetration of the vast mainland Chinese market, albeit with the complications that Chinese censorship could impose.<sup>7</sup>

3 *Taiwan Today* 3 October 2013 <http://taiwantoday.tw/ct.asp?xitem=202545&CtNode=426>

4 Ministry of Culture Bureau of Audiovisual and Music Industry Development (2013) *2011 special report on industry trends research - television and film industry*

5 *Ibid*

6 *Taiwan Times* 10 September 2011 *Capitalizing on Taiwan's cultural soft power* <http://www.taiwantoday.tw/ct.asp?xitem=177647&ctNode=1767>

7 *Taiwan Today* 3 October 2013, *op. cit.* <http://taiwantoday.tw/ct.asp?xitem=202545&CtNode=426>

8 *Taiwan Times* 10 September 2011, *op. cit.*

The Cultural and Creative Industry Act, passed in January 2010 allows for a range of rebates to the arts and subsidies to filmmakers.<sup>8</sup>

The development of these initiatives give scope for Taiwan's film exports in particular to develop in years to come.

### 5.2 Film and TV induced tourism

As indicated above, Taiwan's relatively small local film industry and limited export market have likewise constrained the potential for film induced tourism. There have been attempts remedy this situation recently however. The success of Ang Lee's *Life of Pi* which was partly shot in Taiwan, raised expectations of a boost in international tourism in 2013. There have been suggestions that the film has resulted in increased tourism from some markets, with the Taiwan Tourism Board (TTB) noting a 43% increase in Australian visitors during the first quarter of 2013 compared with the same period in the previous year and crediting the film for being a contributory factor in this.<sup>9</sup>

The TTB has also been active in collaborating with South Korea to organise the shooting of *Grandpas Over Flowers* in Taiwan at scenic locations such as Sun Moon Lake and Taroko Gorge. The expectation is that this will help establish Taiwan as a tourism destination for South Korean seniors.<sup>10</sup>

There is also some evidence that a revival of the Taiwanese film industry in recent years has induced domestic tourism. 2011's *Seediq Bale*, would appear to have inspired increased tourism to Taiwan's East Coast National Scenic Area, where it was filmed and a growing interest in the local indigenous culture.<sup>11</sup> Likewise Johnsgiao St. in Tainan - where most of the 2013 film *Zone Pro Site* - was filmed has recently experienced a tourism influx.<sup>12</sup>

9 *Taiwan credits Ang Lee's Life of Pi filming for Australian tourism boost* <http://www.thelocationguide.com/blog/2013/05/ng-film-tourism-taiwan-credits-ang-lee%E2%80%99s-life-of-pi-filming-for-australian-tourism-boost/>

10 Ministry of Culture, 24 July, 2013 *Korean TV Show to Promote Cultural Tourism to Taiwan* <http://english.moc.gov.tw/article/index.php?sn=873>

11 *CNN Travel* 23 November 2011, '*Seediq Bale*': *Taiwan's biggest movie sparks indigenous tourism* <http://travel.cnn.com/hong-kong/visit/seediq-bale-401232>

12 *Taipei Times* September 8, 2013, <http://www.taipeitimes.com/News/taiwan/archives/2013/09/08/2003571640>

### 5.3 Film festivals

Taiwan hosts a number of regular film and TV festivals including the:

- Taipei Film Festival
- Golden Horse Film Festival
- Taiwan TV Festival
- Taiwan International Ethnographic Film Festival
- Kaohsiung Film Festival

While there are annual fluctuations, data provided through the Directorate-General of Budget, Accounting and Statistics indicates that the numbers of International Film Festival entries in particular has generally grown in recent years, along with the numbers of films selected and cinema awards.

**Table 5.1: International Film Festival entries, selections and awards 1999-2012**

| International Film Festivals |                   |                             |                          |
|------------------------------|-------------------|-----------------------------|--------------------------|
| Year                         | Number of Entries | Films Selected in Festivals | Numbers of Cinema Awards |
| 1998                         | 140               | 52                          | 5                        |
| 1999                         | 141               | 129                         | 11                       |
| 2000                         | 249               | 91                          | 7                        |
| 2001                         | 76                | 88                          | 32                       |
| 2002                         | 185               | 140                         | 17                       |
| 2003                         | 183               | 82                          | 5                        |
| 2004                         | 209               | 69                          | 8                        |
| 2005                         | 104               | 61                          | 22                       |
| 2006                         | 224               | 83                          | 9                        |
| 2007                         | 193               | 93                          | 14                       |
| 2008                         | 208               | 91                          | 16                       |
| 2009                         | 211               | 125                         | 12                       |
| 2010                         | 239               | 124                         | 32                       |
| 2011                         | 206               | 122                         | 23                       |
| 2012                         | 244               | 96                          | 35                       |

Source: Directorate-General of Budget, Accounting and Statistics

The Taipei Film Festival's patronage is estimated at around 100,000 visitors per year, while the Golden Horse Film festival is Taiwan's rough equivalent of the Academy Awards.

The 2012 Taipei TV Festival reported 7,500 attendees including international visitors, with on-site deals reported as worth \$US 17 million and post-show agreements worth more than \$US 35 million.<sup>13</sup>

13 <http://www.roc-taiwan.org/public/Data/3868255771.pdf>

## 6 Conclusion

This report has provided a detailed overview of the film and television sectors in Taiwan, systematically quantifying the economic impact of various sub-sectors of the industry.

These estimates indicate that film and television make a material contribution to economic activity in Taiwan, directly contributing NT\$ 56,883 million of GDP, in turn supporting 31,599 jobs and generating NT\$ 8,256 million in tax revenues. The sector therefore accounts for 0.4% of total Taiwanese GDP, 0.3% of total jobs across the economy and 0.4% of the country's total tax revenue.

Allowing for “multiplier” effects and taking the direct, indirect and induced contributions together, we can say that the industry's total economic contribution in 2013 was NT\$ 168,088 million of GDP. Associated with this activity, the sector's total contribution to employment was some 113,800 jobs and its total contribution to tax revenues was NT\$ 16,457 million.

Looking ahead there is clear scope for further growth. While the local population and film market are relatively small by Asian standards, there is clear scope to push up the volume of film exports given their negligible value.

Recent government initiatives such as the Cross Straits Economic Cooperation Framework Agreement, and the Cultural and Creative Industry Act may help support the further development of both the industry in general and exports in particular, resulting in increased international tourism. Further there are signs that the increased market share of local films has helped promote domestic tourism to well-known film locations within Taiwan.

## 7 Detailed methodology

### 7.1 GDP measure

GDP can either be measured at basic prices or at market prices. The estimates produced in this report are measured using GDP at *basic prices*, which exclude taxes (less subsidies) on products. Gross Value Added (GVA) is another term for GDP at basic prices.

While taxes on products (such as indirect taxes like VAT) are excluded from GDP at basic prices, the indirect taxes generated by the film and television industries are estimated in the main body of this report and included as a part of the industry's tax contribution.

GDP at market prices is the “headline measure” of GDP used in Taiwan and most other countries. GDP at market prices includes all taxes less subsidies on products.

### 7.2 Quantifying the direct contribution

The main source used to quantify the direct contribution was the Taiwanese Ministry of Culture, Bureau of Audiovisual and Music Industry Development (2013) *2011 special report on industry trends research - television and film industry*.

<http://www.bamid.gov.tw/BAMID/Code/NewListContent36.aspx?id=583f46f2-9169-44d1-9397-1dd0da4b14e2>

This publication reports 2011 data which we extrapolated to 2013. This differentiates between film production, post-production, distribution and exhibition as well as between TV production, post-production and distribution, free to air (FTA) TV and Pay TV.

This publication reports the results of a 2012 survey detailing 2011 data. The 2012 report provided statistics for calendar year 2011 on gross output (or sales), employment and exports.

While this was a relatively rich data source, it was still necessary to extrapolate these figures forward to derive estimates for 2013.

With the exception of home entertainment, film and TV GDP estimates for 2013 were derived through use of Oxford Economics' Global Economic Model and its associated Global Economic Databank. These sources provided economy wide GDP figures for 2011 as well as a forecast for 2013. Nominal GDP growth between those two years was used to estimate film and TV GDP in 2013.

GDP estimates for home entertainment retail and rental were based on recent revenue trend data supplied by Screen Digest, extrapolated at an average growth rate to 2013. The revenue estimates for 2013 were converted to GDP estimates by dividing these figures into rental and distribution components and using the GDP/revenue (gross output) ratios for the Taiwanese rental and motion picture, video and music publishing sectors (derived from the Taiwanese input-output tables).

In order to extrapolate film and TV in 2013 employment, we likewise used the Oxford Economics Global Economic Databank figures for Taiwanese employment in 2011 and its forecasts for employment growth to 2013.<sup>14</sup>

Earnings data for film and TV in 2013 were based on monthly earnings data for 2011 in the motion picture and video and broadcasting and programming sectors, as reported by the Directorate-General of Budget, Accounting and Statistics (DGBAS).<sup>15</sup> These were then extrapolated based on Oxford Economics Global Economic Databank Taiwanese average earnings per employee. The growth rate in these earnings between 2011 and 2013 was used to grow earnings for the film and TV industries. Earnings figures for home entertainment were based on a weighted combination of DGBAS motion picture and video earnings data and the GVA/earnings ratio data for rentals sourced from the input-output table.

<sup>14</sup> Note that the labour productivity estimates for the film and TV sub-sectors, cited in the main body of the report, can be derived by dividing sub-sector GDP by the number of employees in that sub-sector. This produces an estimate of GDP per employee or labour productivity.

<sup>15</sup> See <http://www.dgbas.gov.tw/public/Attachment/393019288W75YTOV0.xls>

### 7.3 Modelling the total economic contribution

Broadly speaking, input-output multipliers measure the relationship between an initial shock (such as spending) and final outcomes across the whole of the economy in terms of gross output, GDP and employment.

This study uses “Type II” multipliers. Type II multipliers allow for both the “indirect” supply chain effects (i.e. the film and TV industries purchasing from other industries) and “induced” effects which arise from workers spending wages (derived from employment) on goods and services. (Studies which only allow for the indirect or supply chain effects use what is known as Type I multipliers. Type II multipliers will be larger than Type I multipliers.)

In order to estimate the indirect and induced contributions, we used a 165-sector Taiwanese Input Output (IO) table for the year 2006, sourced from National Statistics, Republic of China.<sup>16</sup> An IO table details economy-wide transactions between sectors in matrix form, quantifying the extent to which different industries sell to and purchase from each other.

By appropriately manipulating the IO matrix, we were able to estimate the contribution of, for example, film production on the rest of the economy through its supply-chain purchases (indirect effect) and through the spending of those employed directly and indirectly in film production (induced effect).

No specific sector capturing all of the activities of the film, home entertainment and TV industries exists within IO tables, as these are split among several industries and the IO tables aggregate many industries together. We therefore allocated each sub-sector to a relevant IO category.

Accordingly, the activities covered by the film industry along with the retail of DVDs and Blu-ray disks were allocated to the “Motion picture, Video and Music Publishing Services” category, while the rental of DVDs and Blu ray discs was allocated to “rental and leasing”. TV programming and broadcasting-related activities were allocated to the “Broadcasting and Programming services” category.

<sup>16</sup> Source: National Statistics, Republic of China  
[http://eng.stat.gov.tw/ct\\_view.asp?xItem=25745&ctNode=1650](http://eng.stat.gov.tw/ct_view.asp?xItem=25745&ctNode=1650) Note that while this is described as a 554 sector table, the table is not symmetrical and had to be adjusted to allow for a symmetrical 165x165 input-output matrix. The Purchasers Prices table was used for this analysis.

We then “shocked” the IO table using the level of direct gross output (or sales), derived from the values reported by the Taiwanese Ministry of Culture and Screen Digest data (for Home Entertainment) described above. Shocking the model simulated the contribution of the film and TV sectors on gross output in the rest of the economy.

### 7.4 Leakage and adjustment for double counting

Generally, when domestic demand expands there will also be an increase in the demand for imports. For example, if consumers spend money on the film and TV industry some of this spending will flow out of the country (e.g. due to the payment of film royalties or the purchase of imported materials by production companies). This is formally known as “leakage”. Allowing for leakage is important as otherwise the contributions on domestic demand will be overestimated.

The standard format of the Taiwanese IO tables does not allow for such leakage as imports are not included as a row in the calculation of gross output. Disaggregated data on sectoral imports are however reported in a column of the IO table. This data was used to adjust for imports in the calculation of multipliers. This had the effect of downwardly adjusting the multipliers.

The Type II multipliers used in this study were also (downwardly) adjusted to reflect the fact that, while the IO table reports the gross compensation of labour, (including gross wages and salaries) employees will ultimately only be able to spend on other goods and services using their net income (i.e. disposable income after income tax).

Accordingly, the Type II multipliers reported in the IO tables were downwardly adjusted using data for Taiwan indicating the average proportion of income tax relative to employee gross earnings. This ratio was estimated to be some 6.6% in the case of Taiwan. This ratio was based on a comparison of estimated total employee earnings in 2012 (using average earnings and employment data from the Oxford Economics Global Economic Databank) and official Taiwanese Ministry of Finance income tax data.<sup>17</sup>

<sup>17</sup> Ministry of Finance (2013) *Guide to ROC Taxes 2013*  
<http://www.mof.gov.tw/engweb/ct.asp?xItem=73441&ctNode=688&mp=2>

Finally, for certain sub-sectors, it was clear that downward adjustments to the indirect and induced contributions would also need to be made to avoid double counting of output. This is because, in some cases, part of a given industry’s supply chain is included other sub-sectors that have been classified as part of the film and television market. For example, exhibitor direct revenues implicitly reflect purchases from film distributors, so adding purchases from distributors as a part of indirect revenue could be double counting.

Multipliers for the film and TV sub-sectors were therefore adjusted to reflect this fact.

The full list of final gross output and GDP multipliers associated with the modelling described above are reported in Table 7.1.

**Table 7.1: Gross output and GDP multipliers**

| Sub-sector                     | Type II Multiplier | Type II Multiplier |
|--------------------------------|--------------------|--------------------|
|                                | Gross Output       | GDP                |
| Film Production                | 2.90               | 3.25               |
| Film Post-Production           | 2.46               | 2.76               |
| Film Distribution              | 2.46               | 2.76               |
| Film Exhibition                | 2.46               | 2.76               |
| Home Entertainment             | 2,25               | 2.64               |
| TV Production, Post Production | 3.39               | 3.18               |
| FTA TV                         | 3.11               | 2.92               |
| Pay TV                         | 3.11               | 2.92               |

## 7.5 Estimating GDP, earnings and employment

The gross output totals derived from the above modelling were converted into estimates for total (i.e. direct, indirect and induced) GDP contributed by each sub-sector using the overall estimated ratio of GDP to total gross output, derived from the input-output model. These were then converted into employment estimates the overall employment to GDP ratio also derived from the input-output model

Direct earnings, were estimated using the information described in Section 7.2 above. For the indirect and induced contributions, we applied the average economy-wide gross annual wage sourced from the Oxford Economics Global Economic Databank to our estimate of indirect and induced employment in each sub-sector.

## 7.6 Modelling tax revenues

The taxes allowed for in this study included Taiwanese Value Added Tax (VAT), personal income tax and corporate income tax.

In order to model the level of revenue that would be raised for the government as a result of this activity, we made use of a number of different data sources.

We allowed for the fact that VAT of 5% would apply to film exhibition gross output (revenues) as well as home entertainment retail and rental revenues, most FTA revenues and Pay TV revenues. These taxes were effectively “built into” the gross output (revenue) data we received from the sources listed in Section 7.2.<sup>18</sup> So for the direct estimates the relevant tax revenue was estimated by deriving the appropriate proportion of reported gross output accounted for by such taxes.

For the total contribution estimates the impacts of VAT was derived by estimating the national ratio of the indirect tax revenue to Taiwanese GDP in 2012 (roughly 2.1%) and then applying this to modelled GDP contributions.<sup>19</sup>

<sup>18</sup> In the case of FTA revenues, an adjustment was made for the fact that the Ministry of Culture’s 2011 special report on industry trends research - television and film industry indicated that donations and grants accounted for 11.24% of total revenues. It was assumed these would not incur VAT.

<sup>19</sup> The indirect tax revenue was again estimated using the Ministry of Finance (2013) *Guide to ROC Taxes 2013* <http://www.mof.gov.tw/engweb/ct.asp?xItem=73441&ctNode=688&mp=2>

Personal income tax contributions were estimated by estimating the national average ratio of income tax to average employee earnings (6.6%) in 2012. The sources for this data were again the Oxford Economics Global Economic Databank and the Taiwanese Ministry of Finance's (2013) *Guide to ROC Taxes 2013*. This ratio was then applied to estimated direct and total earnings to derive the respective direct and total personal income tax contributions.

Finally corporate income taxes were derived by estimating the national ratio of the corporate tax revenue to GDP (2.7%) using the Oxford Economics Global Economic Databank and the Taiwanese Ministry of Finance's (2013) *Guide to ROC Taxes 2013*. This ratio was then applied to estimated direct and total GDP to derive the respective direct and total corporate income tax contributions.

These various sources of taxation were then combined to derive the total amount of taxation.



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