Economic Analysis of the Audiovisual Sector in the Republic of Ireland

Technical Annex from Olsberg•SPI with Nordicity

12th December, 2017

OLSBERG•SPI

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1. INTRODUCTION

This document represents the background workings to Olsberg•SPI with Nordicity's Economic Analysis of the Audiovisual Sector in the Republic of Ireland. It will outline the steps taken by the consultants to generate the impact data presented in the published report.

Our analysis is presented here in the form of an unpublished, technical annex, provided to the Client and Irish Government for their background information, and for use in analysing the presented results.

This technical annex also includes a description of the economic contribution methodology used in this report (Appendix 1) and a methodology that can be used to produce annual updates to the economic contribution estimates (Appendix 2).

2. FURTHER ECONOMIC IMPACT DATA

The following section presents the detailed data and calculations used to derive the estimates of the economic impact of the audiovisual and radio sectors.

2.1. Film, TV and Animation

In the following sub-section, we present our estimates of the contribution of the film, TV and animation sector to the Irish economy. This is presented in eight separate areas:

- Independent live action production;
- In-house production by Irish broadcasters;
- Animation;
- Post-production and visual effects (VFX);
- Distribution;
- Cinema exhibition;
- TV broadcasting; and,
- Video on demand (VOD).

These sub-sectors are brought together in chapter 2.1.9, which collates the impacts of film, TV, and animation production in Ireland in 2016.

2.1.1. Independent Production (Live Action)

In this section, we examine the economic contribution from the independent production of films and TV programmes that are predominantly in a live action format – as opposed to a predominantly animation format.[1] In fact, our analysis isolates – as best as possible – the expenditures on live action elements. In Section 2.1.3, we examine the economic contribution of animation production.

2.1.1.1 Scale of Sector

Both films and TV programmes – made either by indigenous Irish producers or foreign producers – often stimulate significant expenditures within Ireland on cast and crew, and the purchase of local supplies and services. Expenditures on the independent production of (live action) films and TV programmes in Ireland totalled **€290 million** in 2016.[2] This included **€232.9 million** in production supported by **section 481** and an additional **€57.1 million** in estimated production funding from **Irish broadcasters** (which is not eligible for section 481 support).[3]

Out of the €290 million in total value of production,

- **€181.3 million** in expenditures were generated by **incoming** productions originating from outside Ireland, including Hollywood films shooting on location in Ireland; **€108.7 million** in expenditures were generated by **indigenous Irish** productions.

- **€185.2 million** in expenditures were generated by **TV series**; **feature films** accounted for **€35.1 million**; **documentaries** (**€12.5 million**) and **other types of TV programming** (**€57.1 million**)[4] accounted for the balance.

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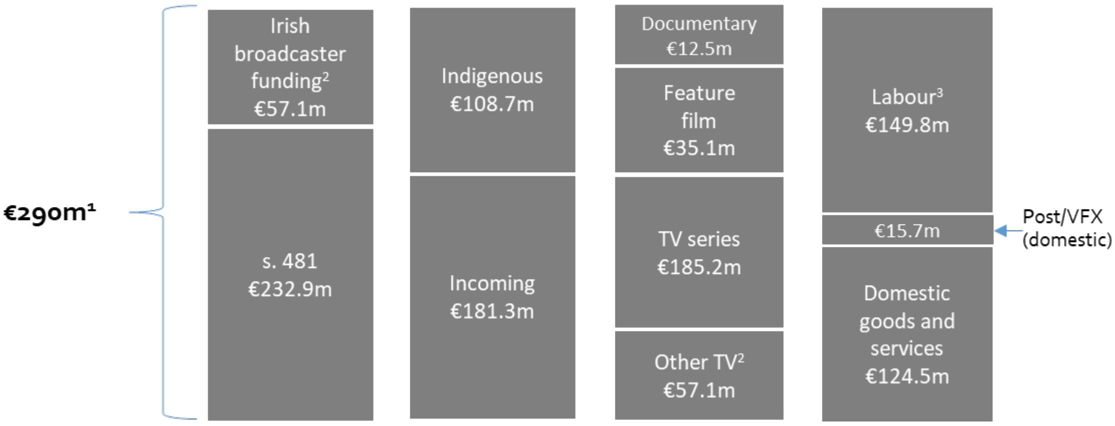
[1] We use the term "independent production" to distinguish these projects from TV programming produced in-house by Irish broadcasters. In other industry reports, the term independent production may refer to films and TV programmes made without the involvement (financial and creative) of the major Hollywood studios.
[2] This figure excludes animation production made with support from section 481. See Section 2.1.3.
[3] This €57.1 million includes estimated funding from RTE, TG4, TV3, and other commercial broadcasters.
[4] The entirety of the €57.1 million in Irish broadcaster funding has been assigned to the "Other TV" genre category, since a detailed genre breakdown of this funding was not available.

- **€149.8 million** was devoted to payments to **cast and crew** (i.e. direct labour); **€15.7 million** was paid to **domestic post-production/VFX studios**; and **€123.2 million** was paid to **domestic suppliers of goods and services** (e.g. accommodation, vehicle and equipment rentals, legal and accounting services).

Figure 1 Expenditures on independently produced live action film and TV production in Ireland, 2016



Source: Olsberg-SPI/Nordicity estimates based on data from IFB, Revenue, industry survey and CSO.
Notes:
1. Excludes animation production made with support from section 481. See Section 2.1.3.
2. Includes independent production commissioned by RTE, TG4, TV3 and other commercial TV broadcasters across various TV genres and formats (may include animation programming). The entirety of the €57.1 million in Irish broadcaster funding has been assigned to the "Other TV" genre category, since a detailed genre breakdown of this funding was not available.
3. Approximately 25% of labour expenditures were paid to cast and crew who were no permanently resident in Ireland.

2.1.1.2 Direct Economic Impact

According to the Irish Film Board (IFB), over 6,300 Irish residents work in Ireland's independent live action production industry.[5] This includes freelancers who work in a variety of roles, ranging from camera operators, costume and wardrobe specialists, set designers, construction workers and electricians, to make-up artists. It also includes actors and people working as extras, as well as the hundreds of Irish residents who work in the production industry as writers, directors and producers.

A detailed analysis of production budgets conducted by Grant Thornton indicates that the average annualised rate of compensation for below-the-line crew and extras (i.e. excluding above-the-line personnel and post-production/VFX personnel) was approximately €46,000 in 2016.[6] Based on this average full-time-equivalent (FTE) cost, we estimate that independent (live action) production generated 3,260 FTEs of direct employment (i.e. employment of cast and crew) in 2016.

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[5] This figure excludes employees and freelance workers in the post-production/VFX industry and animation industry. These workers are counted in the digital production segment (see Sections 2.1.3 and 2.1.4).
[6] This average FTE cost was based on data for below-the-line cast and crew to avoid the distortion caused by including the compensation of above-the-line personnel such as lead actors, directors, writers and producers. It is important to keep in mind that average FTE cost will be higher than the average annual compensation that worker in the film and TV production industry will actually earn. The average FTE cost includes not only compensation, but also Pay Related Social Insurance (PRSI) contributions and the costs of any other employee benefits. Furthermore, the average FTE cost reflects the compensation and other employment costs associated with a worker who worked a full work year (i.e. 220 days). However, many workers in the film and TV production industry may work fewer than 220 full days in a given year, due to periods of hiatus in between productions.

It is important to note that the number of persons on any specific film or TV project is often 3 to 4 times the number of FTEs generated by the project. Films and many TV programmes are shot over a period of weeks. TV series have longer shooting schedules. As a result, crews of dozens or even hundreds of personnel are employed for a matter of weeks. Extras will be employed for even shorter periods of time during shooting.

So, whilst the use of FTEs to measure provides consistency and comparability across industries, it tends to understate the overall "width" of employment in terms of the number of persons engaged in the industry at any given time. As such, this figure is compatible with the 6,300 individual residents recorded as working in the industry.

Cast and crew working in independent (live action) production in 2016 earned a total of €149.8 million in labour compensation and direct gross value added (GVA) in 2016. Exports totalled €123.3 million in 2016.

Table 1 Direct economic impact of independent production (live action), 2016

	Amount
Number of workers (employees + freelancers + actors + extras)	6,300
Employment (FTEs)	3,260
Average FTE cost (€)	46,000
Labour compensation (€m)	149.8
GVA (€m)	69.2
Exports (€m)	123.3

Source: Olsberg·SPI/Nordicity estimates based on data from IFB, Grant Thornton, industry survey and CSO.

2.1.1.3 Total Economic Impact

As noted above, independent production generates significant wider effects on the Irish economy through film and TV projects' purchases of supplies and services from other industries within the Irish economy.

To estimate the indirect impact of independent production – and thereby, its induced and total economic impact – we first removed all (estimated) expenditures on domestic post-production/VFX. These particular expenditures were counted separately in our analysis of the economic contribution that particular industry (see Section 2.1.4). The remaining value of supplies and services expenditures was then allocated to various industries on the basis of a production-spending-profile model. This model was prepared by Grant Thornton on the basis of anonymised and detailed budgets for €46 million worth of film and TV production.[7]

In addition to the direct economic impact, these supplies and services purchases generated an additional 1,210 indirect FTEs across the Irish economy, as well as €44.3 million in indirect labour compensation and €85.7 million in GVA.

After taking into account the independent production industry's supplies and services purchases (and its induced impact), we estimate that it generated 4,860 FTEs of employment,

[7] Some of the supplies and services expenditures in the Grant Thornton database actually represented mixed income earned by the production industry, including compensation paid to directors, writers and producers, and part of the payments allocated to producer fees and overhead. These mixed income amounts were allocated

€211.7 million in labour compensation, €194.5 million in GVA and €123.3 million in exports in 2016.

Table 2 Total economic impact of independent production (live action), 2016

	Direct	Indirect	Induced	Total
Employment (FTEs)	3,260	1,210	390	**4,860**
Labour compensation (€m)	149.8	44.3	17.7	**211.7**
GVA (€m)	69.2	85.7	39.5	**194.5**
Exports (€m)	123.3	--	--	**123.3**

Source: Olsberg·SPI/Nordicity estimates based on data from IFB, Grant Thornton, industry survey and CSO.

2.1.2. In-House Production

2.1.2.1 Scale of Sector

In addition to the independent film and TV production – both eligible and not eligible for section 481 – TV broadcasters in Ireland produce millions of euro worth of programming on an in-house basis. This broadcaster in-house production ("in-house production") includes not only news and current affairs programming, but drama programming as well.

RTE spent €91 million on in-house TV production in 2016. Assuming that 71% of its €54.7 million in in-house news and current affairs programme spending was for TV as well adds another €38.9 million, bringing the total value of RTE's in-house production to an estimated €129.4 million in 2016. We estimate that commercial TV broadcasters – namely TV3 and Eir Sport – spent another €23 million on in-house production.[8] In total, therefore, an estimated €152.4 million was spent on in-house production in 2016.

2.1.2.2 Direct Economic Impact

Our analysis of RTE's financial statements suggests that 570 of the 980 FTEs that it employs in its TV operations were engaged in in-house production in some manner. In the commercial TV segment, we estimate that 110 FTEs out of the estimated total employment of 510 FTEs were engaged in in-house production. In total, therefore, an estimated 680 FTEs were directly employed in in-house production in 2016.

These 680 FTEs earned an estimated €53.8 million in labour compensation. The direct GVA impact of in-house production was €61.2 million.

Table 3 Direct economic impact of in-house production, 2016

	Amount
Employment (FTEs)	680
Average FTE cost (€)	79,000
Labour compensation (€m)	53.8
GVA (€m)	61.2

Source: Olsberg·SPI/Nordicity estimates based on data from RTE, TG4, BBC, ITV, Irish Times, Core Media, Indecon and CSO.

[8] This estimate is based on the assumption that commercial broadcaster spent approximately 20% of their turnover on in-house production.

2.1.2.3 Total Economic Impact

To estimate the indirect (and induced) economic impact of in-house production, we assumed that its supplier-purchases profile matched that of the overall TV broadcasting industry rather than the independent production industry. In this regard, the TV broadcasting industry's goods and services expenditures would be fully accounted for – but split between the industry's production and transmission operations.

Overall, in-house production generated 1,620 FTEs of employment, €90.1 million labour compensation and €131.7 million in GVA for the Irish economy in 2016.

Table 4 Total economic impact of in-house production, 2016

	Direct	Indirect	Induced	Total
Employment (FTEs)	680	750	190	**1,620**
Labour compensation (€m)	53.8	27.9	8.4	**90.1**
GVA (€m)	61.2	51.6	18.9	**131.7**

Source: Olsberg·SPI/Nordicity estimates based on data from RTE, TG4, BBC, ITV, Irish Times, Core Media, Indecon and CSO.

2.1.3. Animation

2.1.3.1 Scale of Sector

According to IFB, there were 48 companies engaged in animation production in Ireland in 2016, including 20 animation studios that were members of the industry's main trade body, Animation Ireland (AI).

Based on a survey of AI members, we estimate that the animation sector in Ireland earned €64.8 million in revenue in 2016. Of this total revenue, an estimated €54.3 million was associated with projects supported by section 481, with the balance of revenue, €10.5 million associated with animation content produced outside of section 481.

As with other forms of film and TV production, animation production in any given jurisdiction can be subject to significant year-to-year fluctuations, largely driven by programme commissioning cycles. For this reason, any given year (e.g. 2016) may not be indicative of the overall levels of industry revenue or employment in subsequent years.

11.1.3.2 Direct Economic Impact

The survey data also indicated that Ireland's animation studios employed 940 paid workers in 2016. This total included 570 full-time employees, 30 part-time employees, 340 freelancers. Ireland's animation studios also employed 22 interns.

The average FTE cost across all animation studios was approximately €49,000 in 2016. This average FTE cost was used in combination with the total wage spending across all the companies (€36.3 million) to derive an estimate of the FTEs employed in the sector. Based on this this approach, we estimate that the animation production sector employed 740 FTEs in 2016, including employees and freelancers.

The animation production industry also generated €20.6 million in GVA in 2016. Foreign clients accounted 74% of Irish animation studios' turnover in 2016, implying that the industry earned an estimated €48.2 million in services exports in 2016.

Table 5 Direct economic impact of animation production, 2016

	Amount
Number of paid workers (employees + freelancers)	940
Employment (FTEs)	740
Average FTE cost (€)	49,000
Labour compensation (€m)	36.3
GVA (€m)	24.1
Exports (€m)	48.2

Source: Olsberg·SPI/Nordicity estimates based on data from IFB, Revenue, industry survey and CSO.

2.1.3.3 Total Economic Impact

After taking into account animation studios' purchase of local supplies and services, we estimate that the animation production industry generated 1,050 FTEs of employment, €48.8 million in labour compensation, €50.6 million in GVA and €42.2 million in exports.

Table 6 Total economic impact of animation production, 2016

	Direct	Indirect	Induced	Total
Employment (FTEs)	740	220	90	**1,050**
Labour compensation (€m)	36.3	8.6	3.9	**48.8**
GVA (€m)	24.1	17.8	8.8	**50.6**
Exports (€m)	42.2	--	--	**42.2**

Source: Olsberg·SPI/Nordicity estimates based on data from IFB, Revenue, industry survey and CSO.

2.1.4. Post-production/VFX

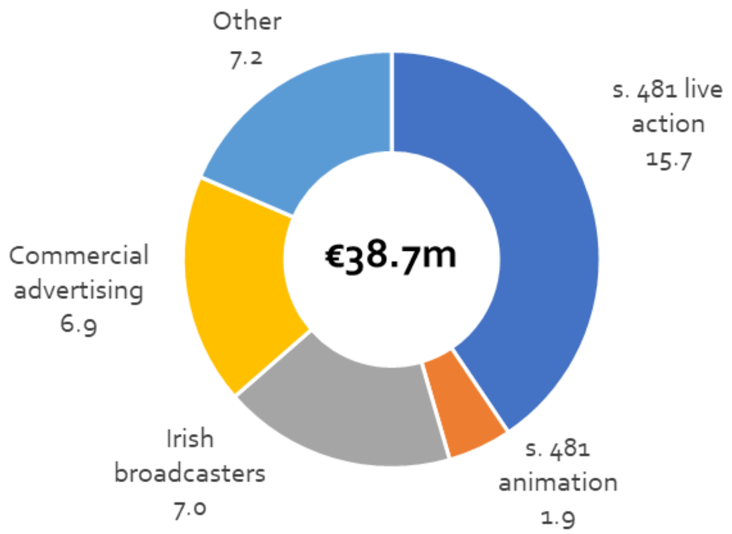
2.1.4.1 Scale of sector

According to data compiled by IFB, there were some 33 companies in Ireland providing post-production and VFX services in 2016. Amongst these 33 companies are the four large post-production/VFX houses (and members of VFXAI) – Windmill Lane, Piranha Bar, ScreenScene and Egg. There were another six mid-level post-production and audio studios, and 23 small studios.

These 33 companies employed an estimated 422 workers in 2016 – mostly on a full-time basis. Data compiled by IFB suggest that there were another 400 freelancers and trainee/apprentices working in post-production and VFX. In total, some 822 workers were engaged in post-production or VFX activities in some capacity in Ireland.

Based on survey research, we estimate that these 33 companies earned total revenue of €38.7 million in 2016. This revenue was derived from a variety of sources. The largest single source was work done for live action projects supported by section 481 (€15.7 million). Work done directly for Irish broadcasters (€7 million) and commercial advertising (€6.9 million) also represented important client segments.[9]

Figure 2 Sources of revenue for Irish post-production/VFX industry (€m)



Source: Olsberg·SPI/Nordicity estimates based on data from industry surveys, IFB, VFXAI and CSO.

2.1.4.2 Direct Economic Impact

Ireland's post-production/VFX industry generated an estimated 480 FTEs of direct employment, €21 million in direct labour compensation, €24.2 million in direct GVA and €12.3 million in exports in 2016. These direct impacts included work on section 481 projects (live action and animation) but excluded work on commercial advertising (see Section 2.2.2).

Table 7 Direct economic impact of post-production/VFX industry, 2016

	Amount
Number of workers (employees + freelancers + trainee/apprentices)	822
Employment (FTEs)[1]	480
Average FTE cost (€)	43,300
Labour compensation (€m)[1]	21.0
GVA (€m)[1]	18.5
Exports (€m)[1]	12.3

Source: Olsberg·SPI/Nordicity estimates based on data from IFB, Revenue, industry survey and CSO.
Note:
1. Excludes the economic contribution from post-production/VFX work for commercial advertising See Section 2.2.2.

2.1.4.3 Total Economic Impact

After taking into account post-production/VFX studios' purchases of local supplies and services, we estimate that the industry generated 600 FTEs of total employment, €25.7 million

[9] The economic contribution associated with post-production/VFX for commercial advertising is analysed in Section 2.2.2.

in labour compensation, €28.6 million in GVA and €12.3 million in exports for the Irish economy in 2016.

Table 8 Total economic impact of post-production/VFX industry, 2016[1]

	Direct	Indirect	Induced	Total
Employment (FTEs)	480	80	40	**600**
Labour compensation (€m)	21.0	3.0	1.7	**25.7**
GVA (€m)	18.5	6.1	3.9	**28.6**
Exports	12.3	--	--	**12.3**

Source: Olsberg·SPI/Nordicity estimates based on data from IFB, Revenue, industry survey and CSO.
Note:
1. Excludes the economic contribution from post-production/VFX work for commercial advertising See Section 2.2.2.

2.1.5. Distribution

Nine distribution companies operated in Ireland in 2016, including three independent Irish-owned distributors and six subsidiaries of the major global studios. In addition to these eight companies, we understand that several other distributors (e.g. Studio Canal, Lionsgate, eOne) serve the Irish market from their London offices.

Table 9 List of film and TV distributors operating in Ireland

Name	Nationality
Eclipse	Irish
Element	Irish
Wildcard	Irish
Universal	International
BVI/Disney	International
Paramount	International
Warner Bros.	International
Fox	International
Sony	International

Source: IFB

Consultations with the Irish distribution industry suggest that approximately 50 FTEs are engaged in distribution activities in Ireland at these nine companies. With an average FTE cost of €61,548 in the publishing, film and broadcasting industry in Ireland (according to statistics from the Central Statistical Office [CSO] statistics), these 50 FTEs earned an estimated €3.1 million in labour compensation in 2016. The industry would have also generated at least this much in GVA.

Whilst we did not collect detailed data on distributors' supplies and services, we know that one of the main supply chain impacts associated with film and TV distribution – and film distribution in particular – arises from the industry's spending on marketing and promotion.

According to the statistics from Nielsen Media (and re-published by the British Film Institute [BFI]), film distributors in the UK and Ireland invested £192 million (€221 million) in marketing and promotion in 2015.[10] Given that the cinema box in Ireland is equal to 7% of the combined UK/Ireland box office, we estimate that the total value of marketing expenditures in Ireland were approximately €15 million (€402.5 million x. 7.5% ≈ €30 million) in 2015. We assume this level of spending was unchanged in 2016.

[10] Film Distributors' Association (2017), *FDA Yearbook 2017*, p. 16.

A large portion of this advertising spend would have been directed to purchases of TV or radio airtime, and thereby, already be counted in the direct impact of these industries within the audiovisual sector (see Sections 2.1.7 and 2.4.4). According to Neilsen Media, 43% of film distributors total advertising spend in 2015 was directed to media other than TV and radio, such as outdoor billboards, the printed press and the Internet. This suggests that film distributors spent an estimated €6.6 million on marketing (not captured elsewhere in our economic impacts). This marketing expenditure is a key driver of the distribution industry's indirect – and total – economic impact.

After taking into account its marketing spend, we estimate that the distribution industry in Ireland generated 120 FTEs in total employment in 2016, as well as €6.3 million in labour compensation and €10.4 million in GVA.

Table 10 Total economic impact of distribution industry, 2016

	Direct	Indirect	Induced	Total
Employment (FTEs)	50	50	20	**120**
Labour compensation (€m)	3.1	2.6	0.7	**6.3**
GVA (€m)	3.1	5.7	1.6	**10.4**

Source: Olsberg·SPI/Nordicity estimates based on data from IFB, Odeon-UCI Cinema Holdings Limited, ONS and CSO.

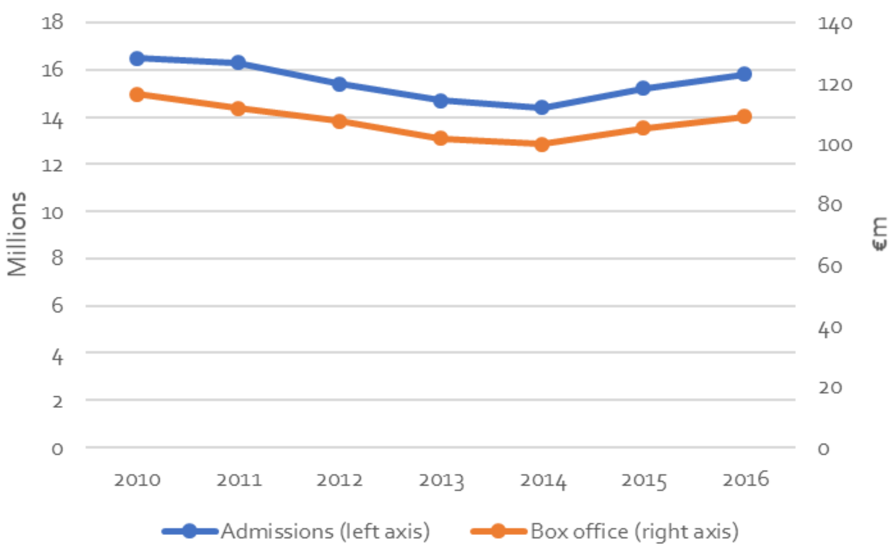
2.1.6. Cinema Exhibition

2.1.6.1 Scale of sector

As of 2016, there were 499 cinema screens in Ireland. These screens hosted nearly 15.8 million cinema admissions in 2016 generating €108.9 million in box office ticket sales. Both total admissions and box office earnings were up in 2016, with the former increasing from 15.2 million and the latter from €105.3 million in 2015.

Indeed, after several years of declining admissions and box office, Ireland's cinema exhibition market has been rebounded with two consecutive years of growth, despite the increasing platform options available to audiences.

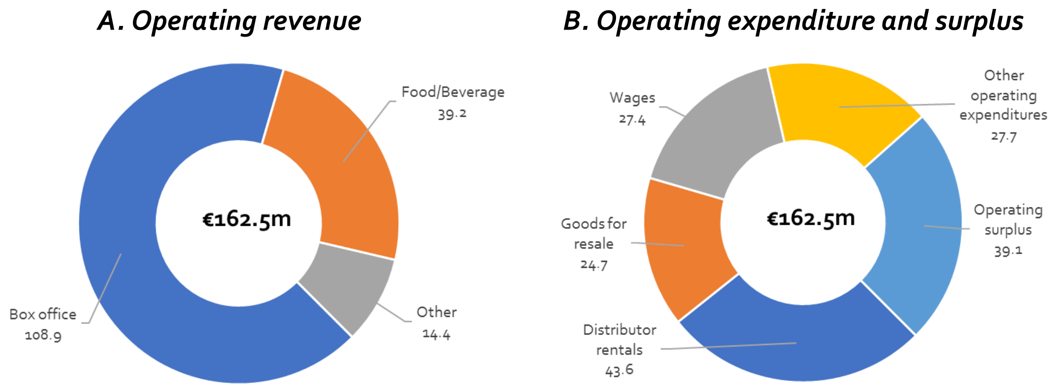
Figure 3 Ireland's cinema exhibition market, admissions and box office



Source: OBS, Media Salles

In addition to this box office revenue, cinemas earned an estimated €53.6 million from food and beverage sales, advertising and other revenue sources. Altogether, therefore, the cinema exhibition market in Ireland earned an estimated €162.5 million in 2016.

Figure 4 Financial performance in the cinema exhibition industry in Ireland, 2016



Source: Olsberg-SPI/Nordicity estimates based on data from IFB, Odeon-UCI Cinema Holdings Limited, ONS and CSO

Statistics for the UK's cinema exhibition industry and public financial data for certain cinema operators suggests that cinema operators' revenue is distributed in accordance with breakdown shown in Figure 4-A. Cinema operators remit an estimated €43.6 million to distributors as their share of the box office revenue (i.e. "distributor rentals"). An estimated €27.4 million is devoted to employee wages and €24.7 million is paid to suppliers of goods for resale (e.g. food and beverages). Other operating expenditures (e.g. rent, utilities) account for €27.7 million, leaving an operating surplus of €39.1 million.

2.1.6.2 Direct Economic Impact

Because it employs a lot of young people and entry-level workers, the cinema exhibition industry is a significant source of employment. In 2016, Ireland's cinema exhibition industry employed and 1,600 workers. These 1,600 workers were equivalent to 960 FTEs and earned an estimated €25 million in direct labour compensation. The industry also generated €52.3 million in direct GVA.

Table 11 Direct economic impact of cinema exhibition industry, 2016

	Amount
Number of employees	1,600
Employment (FTEs)	960
Average FTE cost (€)	26,000
Labour compensation (€m)	25.0
GVA (€m)	52.3
Exports (€m)	0

Source: Olsberg·SPI/Nordicity estimates based on data from IFB, Odeon-UCI Cinema Holdings Limited, ONS and CSO.

2.1.6.3 Total Economic Impact

Even after excluding distributor rentals (which are captured elsewhere in the value chain or flow offshore), the cinema exhibition industry sources a wide range of supplies and services from other industries, particularly the food and beverage industry. These purchases translate into a significant indirect economic impact and add to the industry's induced impact.

Overall, in 2016, the cinema exhibition industry in Ireland generated 1,520 FTEs of employment, €48.4 million in labour compensation and €101.3 million in GVA.

Table 12 Total economic impact of cinema exhibition industry, 2016

	Direct	Indirect	Induced	Total
Employment (FTEs)	960	390	170	**1,520**
Labour compensation (€m)	25.0	15.9	7.5	**48.4**
GVA (€m)	52.3	32.2	16.7	**101.3**

Source: Olsberg·SPI/Nordicity estimates based on data from IFB, Odeon-UCI Cinema Holdings Limited, ONS and CSO.

2.1.7. TV Broadcasting

2.1.7.1 Scale of the Sector

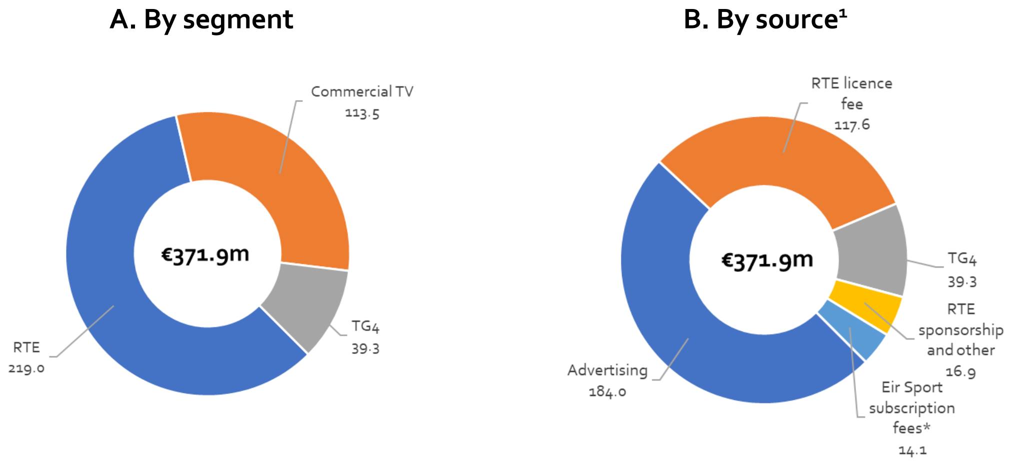
In 2016, Ireland's TV broadcasting industry (including RTE, commercial and community) earned an estimated €371.9 million in revenue.[11] This estimate was, in large part, based on the industry's performance in 2015, adjusted to reflect a projection of 3.6% growth in Ireland's TV advertising market in 2016.[12]

RTE was the largest player in the industry, accounting for €219 million in revenue, or 59%. The commercial TV segment (including Eir Sport) accounted for an estimated €113.5 million in revenue, or 31%. TG4 accounted for €39.3 million in revenue in 2016, or 11% of total industry revenue.

Sales of advertising by Irish broadcasters accounted for the largest share of revenue: an estimated €184 million, or 49% of total revenue. The allocation of the RTE licence fee to TV operations was worth €117.6 million in 2016, or 32% of total industry revenue. Other sources of industry revenue, including TG4 (Grant-in-Aid and other types), RTE's sponsorship and other revenue, and Eir Sport's estimated subscription fees (paid by Eir Sport consumer subscribers without Eir broadband) accounted for the remaining 19% of industry revenue.

[11] This estimate of total market size reflects the fact that approximately of 20% of TV advertising revenue in Ireland is in the form of opt-out ads sold by broadcasters based outside of Ireland (namely the UK).
[12] Laura Slattery and Core Media (2016). "Print and radio advertising plunges in 'tough' 2016." *Irish Times.* 26 November 2016.

Figure 5 Total revenue in the radio broadcasting industry in Ireland, 2016



Source: Olsberg-SPI/Nordicity estimates based on data from RTE, BAI, CRAOL, Irish Times, Core Media, Indecon and CSO.
1. Includes the sum of the licence fee attributed to RTE's TV operations (€72.3 million) plus an allocation of the licence fee amounts attributed to RTE's news and current affairs (€55 million), digital (€2.7 million), DTT (€633,000) and other segments (€6.1 million).
* An estimate of the annual subscription fees paid by Eir Sport consumer subscribers that are not also Eir broadband subscribers. Eir broadband subscribers receive Eir Sport for free as part of the Eir broadband subscription fee.

2.1.7.2 Direct Economic Impact (excluding in-house production)

After allocating employment from RTE's TV, overhead, and news and current affairs divisions, we estimate that it employed approximately 1,060 persons in its TV operations in 2016, or 980 FTEs.

Whilst we did not have direct data on employment levels at commercial TV broadcasters, we estimated their employment on pro-rata basis in relation to industry revenue. Based on this approach, we estimate that commercial TV broadcasters in Ireland (including Eir Sport) employed 510 FTEs in 2016. TG4 reported that it employed approximately 80 FTEs in 2016,[13] thus bringing total employment across commercial broadcasters and TG4 to 590.

In total, therefore, the TV broadcasting industry employed an estimated 1,570 FTEs in 2016. After adjusting these total FTE estimates to remove employment in in-house production (680 FTEs), we arrived at an estimate of 890 FTEs for direct employment in the TV broadcasting industry.

Table 13 Direct employment in the TV broadcasting industry, 2016

	Broadcast operations	In-house production	Total
RTE	410	570	980
Commercial broadcasters and TG4	480	110	590
Total	890	680	1,570

Source: Olsberg·SPI/Nordicity estimates based on data from RTE, TG4, BBC, ITV, Irish Times, Core Media, Indecon and CSO.
Note: Certain totals may not sum due to rounding.

[13] TG4's reported FTE figure of 77 has been rounded up to 80 FTEs.

Workers employed in the TV broadcasting industry (and not working in in-house production) earned an estimated €60.2 million in direct labour compensation. The industry also generated €71.9 million in direct GVA.

Table 14 Direct economic impact of TV broadcasting industry, 2016

	Amount
Employment (FTEs)	890
Average FTE cost (€)	70,800
Labour compensation (€m)	62.3
GVA (€m)	74.3
Exports (€m)	0

Source: Olsberg·SPI/Nordicity estimates based on data from RTE, TG4, BBC, ITV, Irish Times, Core Media, Indecon and CSO.

2.1.7.3 Total Economic Impact (excluding in-house production)

The TV broadcasting industry purchases a wide range of supplies and services from other industries, including marketing services, and transmission equipment and services. These purchases generate significant indirect impacts and add to the industry's induced impact. In 2016, the TV broadcasting industry's total employment impact (including direct, indirect and induced impacts) was 2,180 FTEs. These workers earned €113.9 million in labour compensation. The TV broadcasting industry's total GVA impact was €174.3 million.

Table 15 Total economic impact of TV broadcasting industry, 2016

	Direct	**Indirect**	**Induced**	**Total**
Employment (FTEs)	890	1,040	250	**2,180**
Labour compensation (€m)	62.7	39.7	11.5	**113.9**
GVA (€m)	74.3	74.3	25.7	**174.3**

Source: Olsberg·SPI/Nordicity estimates based on data from RTE, BAI, CRAOL, Irish Times, Core Media, Indecon and CSO.

2.1.8. Video on Demand

There were eight VOD services operating in Ireland in 2016, including four Irish-owned services, Netflix and three other international services. According to statistics published by Statista, total revenue in Ireland's VOD market in 2016 totalled USD35 million (€33 million). This included revenue earned by pay-per-view (transactional VOD), video download (electronic sell through [EST]) and subscription VOD (SVOD) services.

Table 16 Video on demand services available in Ireland

No.	Name	Nationality	Payment model
1	Volta	Irish	Transactional
2	Virgin Media /UPC	International	Transactional
3	Netflix	International	Subscription (SVOD)
4	RTE	Irish	Free
5	TG4	Irish	Free
6	TV3	Irish	Free
7	Sky Store	International	Transactional
8	Sky Movies	International	Subscription

Source: IFB

The un-monetised VOD activities of Irish broadcasters (RTE, TG4, TV3) was already incorporated in the economic impact of the TV broadcasting segment. No Ireland-specific figures were available for Sky's VOD services.

According to Digital TV Research, Netflix had 330,000 paying subscribers in Ireland in December 2015; this was forecast to have increased to 380,000 by December 2016. Despite these large subscriber numbers, our research indicates that Netflix does not have any permanent employees based in Ireland. And whilst it likely pays to purchase marketing and professional services in Ireland, these expenditures, and their economic impact are likely to be negligible.

Our industry research also indicates that the remaining Irish-owned VOD operators (Volta, Virgin Media / UPC, eircom) probably devoted a total of 10 FTEs to their VOD operations in 2016. With an average FTE cost of €61,548 in the publishing, film and broadcasting industry (according to CSO statistics), this translates into labour compensation of nearly €615,000 and at least the same in GVA.

Whilst the direct impact of this employment in the VOD sector would also yield induced economic impacts, we have made no allowance for any indirect economic impacts (i.e. purchase of supplies and services in Ireland) in our economic impact modelling, given the lack of data on purchases of supplies and services.

Table 17 Total economic impact of VOD industry, 2016

	Direct	Indirect	Induced	Total
Employment (FTEs)	10	--	0	**10**
Labour compensation (€)	614,578	--	25,812	**640,390**
GVA (€)	614,578	--	57,770	**672,348**

Source: Olsberg·SPI/Nordicity estimates based on industry consultations.

2.1.9. Summary of Economic Impact

2.1.9.1 Employment across the value chain

When viewed on a value-chain-segment basis, our analysis shows that live action production, including independent and in-house production accounted for the largest share of employment in the film, TV and animation industry. In 2016, that segment generated 3,940 FTEs of direct employment (i.e. cast and crew) and 6,480 FTEs of total employment.

The transmission segment was another significant source of employment given the large number of jobs in the cinema exhibition sub-industry. In 2016, the transmission segment generated 1,860 FTEs of direct employment and 3,710 FTEs of total employment.

Digital production was also an important source of employment. The animation and post-production/VFX industries in Ireland combined to generate 1,220 FTEs of direct employment and over 1,650 FTEs of total employment.

Table 18 Employment across the film, TV and animation value chain, 2016 (FTEs)

	Live action production	Digital production	Distribution	Transmission
Direct	3,940	1,220	50	1,860
Indirect	1,960	300	50	1,430
Induced	580	130	20	420
Total	**6,480**	**1,650**	**120**	**3,710**

Source: Olsberg·SPI/Nordicity estimates based on data from IFB, industry surveys, Grant Thornton, RTE, TG4, BBC, ITV, BAI, CRAOL, Irish Times, Core Media, Indecon and CSO.

2.1.9.2 Total Economic Impact

Overall, all of the segments of the value chain for the film, TV and animation industry in Ireland combined to generate 11,960 FTEs of employment, €545.7 million in labour compensation, €692 million in GVA and €183.8 million in export earnings for the Irish economy. Of this total impact:

- The **direct impact** generated within the various value chain segments that comprise the industry (e.g. independent production, animation production, distribution, cinema exhibition, TV broadcasting) accounted for 7,070 FTEs of employment, €352.3 million in labour compensation and €303.3 million in GVA.
- The supply chains to these segments (i.e. the "**indirect impact**") accounted for 3,740 FTEs, €141.9 million in labour compensation and €273.5 million in GVA.
- The **induced impacts** felt across the wider Irish economy accounted for 1,150 FTEs, €51.5 million in labour compensation and €115.2 million in GVA.

Table 19 Total economic impact – film, TV and animation industry, 2016

	Direct	Indirect	Induced	Total
Employment (FTEs)	7,070	3,740	1,150	**11,960**
Labour compensation (€m)	352.3	141.9	51.5	**545.7**
GVA (€m)	303.3	273.5	115.2	**692.0**
Exports (€m)	183.8	--	--	**183.8**

Source: Olsberg·SPI/Nordicity estimates based on data from IFB, industry surveys, Grant Thornton, RTE, TG4, BBC, ITV, BAI, CRAOL, Irish Times, Core Media, Indecon and CSO.

2.2. Commercial Advertising

2.2.1. Live Action Production

2.2.1.1 Scale of sector

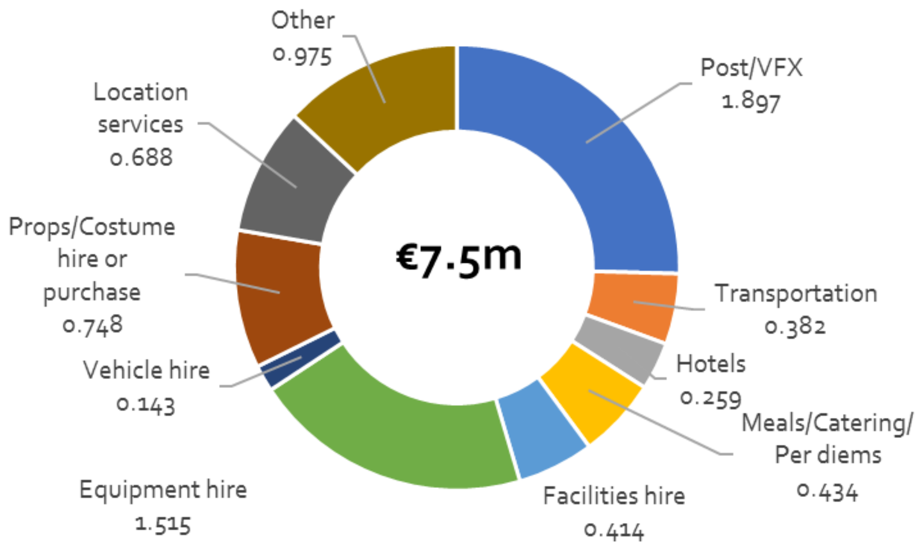
In addition to the scripted, factual and in-house film and TV production that occurs in Ireland, some 15 Irish production companies are focused on the production of commercial advertising. Commercial advertising producers will make commercials for Irish TV on behalf of Irish and foreign brands. They also produce commercials in Ireland on behalf of foreign brands that air primarily outside of Ireland. And finally, these producers will shoot commercials on location outside of Ireland for global brands.

To better understand the economic contribution of live action commercial advertising production, we surveyed members of Commercial Producers Ireland (CPI). Eight of the fourteen production-companies responded to the survey. The survey responses were treated as a census – i.e. no imputation or estimation was applied for non-respondents. For this reason, our estimates of the economic contribution may be considered conservative.

The eight responding companies reported total production spending of €14.7 million in 2016. Approximately half of these expenditures (€7.2 million) were paid to local crew and performers. The balance (€7.5 million) of the production budgets was spent on the purchase of local goods and services. A profile of this local spending is provided in Figure 6.

The domestic post-production and VFX industry was single biggest recipient of these purchases (€1.897 million). Other important categories of local spending included equipment hire (€1.515 million), props/costume hire or purchase (€748,000), location services (€688,000)., meals/catering (€434,000), facilities hire (€414,000) and transportation (€382,000).

Figure 6 Profile of commercial advertising producers' local purchases of goods and services (€m)



Source: Olsberg·SPI/Nordicity estimates based on data from industry survey.

2.2.1.2 Direct Economic Impact

Based on an average FTE cost of €46,000, the total labour expenditures of €7.2 million generated approximately 160 FTEs of employment for cast and crew. The industry's direct GVA impact consisted of its direct labour compensation.

Commercial advertising producers also reported that €3 million of their €14.3 million in production in 2016 was ultimately commissioned by foreign brands or agencies; thus, export earnings essentially accounted for 21% of industry revenue.

Table 20 Direct economic impact of commercial advertising production (live action), 2016[1]

	Amount
Employment (FTEs)	160
Average FTE cost (€)	46,000
Labour compensation (€m)	7.2
GVA (€m)	7.2
Exports (€m)	3.0

Source: Olsberg·SPI/Nordicity estimates based on data from industry survey and CSO.
1. Estimates only include contribution from live action production and exclude the value of post-production/VFX work. Statistics for post-production /VFX are presented separately (see Section 2.2.2)

2.2.1.3 Total Economic Impact

Through its employment of local cast and crew, and purchases of local supplies and services, Ireland's commercial advertising production industry generated 190 FTEs of total employment, €9.8 million in labour compensation, €13.8 million in GVA and €3 million in exports in 2016.

Table 21 Total economic impact of commercial advertising production (live action), 2016[1]

	Direct	Indirect	Induced	Total
Employment (FTEs)	160	50	20	**230**
Labour compensation (€m)	7.2	1.8	0.8	**9.8**
GVA (€m)	7.2	4.7	1.9	**13.8**
Exports (€m)	3.0	--	--	**3.0**

Source: Olsberg·SPI/Nordicity estimates based on data from industry survey and CSO.
1. Estimates only include contribution from live action production and exclude the value of post-production/VFX work. Statistics for post-production /VFX are presented separately (see Section 2.2.2)

2.2.2. Post-production/VFX

2.2.2.1 Scale of sector

Alongside Ireland's producers of live action commercial advertising, five Irish companies are active in providing post-production and VFX services to domestic and offshore commercial advertising clients.

The survey research indicated that Irish post-production/VFX companies earned an estimated €6.9m in revenue from the provision of services to commercial advertising clients in 2016.

2.2.2.2 Direct Economic Impact

Out of the €6.9 million spent on post-production/VFX services in 2016, an estimated €4.6 million (66%) was paid to studio workers (employees and freelancers) as labour compensation. At an average FTE cost of €43,300, this labour compensation generated 110 FTEs of employment. It also generated €5.3 million in GVA and €900,000 in exports in 2016.

Table 22 Direct economic impact of commercial advertising production (post-production/VFX), 2016[1]

	Amount
Employment (FTEs)	110
Average FTE cost (€)	43,300
Labour compensation (€m)	4.6
GVA (€m)	5.3
Exports (€m)	0.9

Source: Olsberg·SPI/Nordicity estimates based on data from industry survey and CSO.
1. Estimates only include contribution from post-production/VFX work on commercial advertising for Irish producers and offshore producers.

2.2.2.3 Total Economic Impact

Overall post-production/VFX work in Ireland on commercial advertising generated 140 FTEs of employment, €5.6 million in labour compensation, €7.5 million in GVA and €900,000 in export earnings.

Table 23 Total economic impact of commercial advertising production (post-production/VFX), 2016[1]

	Direct	Indirect	Induced	Total
Employment (FTEs)	110	20	10	**140**
Labour compensation (€m)	4.6	0.6	0.4	**5.6**
GVA (€m)	5.3	1.3	0.9	**7.5**
Exports (€m)	0.9	--	--	**0.9**

Source: Olsberg·SPI/Nordicity estimates based on data from industry survey and CSO.
1. Estimates only include contribution from post-production/VFX work on commercial advertising for Irish producers and offshore producers.

2.2.3. Summary of Economic Impact

Summing the impacts of live action production and post-production/VFX work on commercial advertising indicates that commercial advertising production generated 370 FTEs of employment for the Irish economy in 2016. It also generated €15.4 million in labour compensation, €21.2 million in GVA and €3.9 million in exports.

Table 24 Total economic impact of commercial advertising production in Ireland, 2016

	Direct	Indirect	Induced	Total
Employment (FTEs)	270	70	30	**370**
Labour compensation (€m)	11.8	2.4	1.2	**15.4**
GVA (€m)	12.5	6.0	2.7	**21.2**
Exports (€m)	3.9	--	--	**3.9**

Source: Olsberg·SPI/Nordicity estimates based on data from industry survey and CSO.

2.3. Video Games

2.3.1. Development

In this section, we present estimates of the economic contribution of independent (Irish-owned) video games development companies. These companies develop (i.e. design and program) video games for various platforms, ranging from consoles to mobile devices to social media sites.

2.3.1.1 Scale of sector

Information provided by Imirt suggests that there were 40-50 video games development companies operating in Ireland in 2016.

2.3.1.2 Direct Economic Impact

Data from two separate surveys of the Ireland's video games industry was used to estimate the direct economic impact. The IFB conducted a survey of employment at Imirt member companies in late 2016. A second survey of Imirt members was conducted for this study in early 2017.

Between these two surveys a total of 37 video games companies reported that they employed 117 persons (76 full-time, 41 part-time) in 2016., as well as 98 freelance workers. Given that these two surveys obtained responses from 37 of the 40 companies on Imirt's list of video games development companies in Ireland, we estimated total paid employment in the industry at 126 persons, including 82 full-time employees and 44 part-time employees.

The survey conducted in 2017 also collected various financial and operating data. A total of 16 companies completed this survey. Based on the employment data reported through this survey, these 16 companies accounted for 74 of the 126 paid employees in the industry in 2016. On an employment-weighted basis, therefore, the response rate for the second survey was 58.7%.

To estimate the performance of the entire video game development industry, therefore, we multiplied the survey results by a factor of 1.71 (1/0.587 = 1.71). Based on this approach, we estimate that Irish-owned independent video games developers earned €4.5 million in revenue, of which export earnings accounted for €3.3 million or 75%.

An estimated €2.7 million, or 61% of total turnover, was devoted to labour compensation, including employee salaries and payments to freelancers. The survey research also indicated that the average FTE cost was €21,000 in 2016. This average FTE cost implied that the industry generated 126 FTEs of employment in 2016. Coincidentally, this is equal to the number of paid employees.

The survey results also indicated that the industry generated an estimated €3.8 million in direct GVA.

Table 25 Direct economic impact of the video games development industry, 2016

	Amount
Paid employees (FTEs)	126
Employment (FTEs)	130
Average FTE cost (€)	21,000
Labour compensation (€m)	2.7
GVA (€m)	3.8
Exports (€m)	3.3

Source: Olsberg·SPI/Nordicity estimates based on data from industry survey, Imirt and CSO.

2.3.1.3 Total Economic Impact

Through the survey, we also collected data on video games companies' spending on supplies and services. The resulting profile of the industry's supplies and services spending were used to estimate the industry's indirect impacts.

Overall the Irish-owned independent video games development industry generated 150 FTEs of employment, €3.1 million in labour compensation, €4.8 million in GVA, and €3.3 million in exports for the Irish economy in 2016.

Table 26 Total economic impact of the video games development industry, 2016

	Direct	Indirect	Induced	Total
Employment (FTEs)	130	10	10	**150**
Labour compensation (€m)	2.7	0.1	0.2	**3.1**
GVA (€m)	3.8	0.5	0.5	**4.8**
Exports (€m)	3.3	--	--	**3.3**

Source: Olsberg·SPI/Nordicity estimates based on data from industry survey, Imirt and CSO.

2.3.2. Publishing and Middleware

In the section, we examine the economic contribution generated by video games companies engaged in publishing and middleware activities. These publishing activities may involve the distribution – physical and digital – and marketing of video games. It also includes customer support and localisation activities. Many of the companies operating in the publishing segment are foreign-owned companies with offices in Ireland.

2.3.2.1 Scale of sector

Whilst there is no comprehensive data – to our knowledge – as to the number of game publishing and middleware companies operating in Ireland, our research indicated that there at least nine companies operating in this segment. Among these nine companies were Electronic Arts (Galway), Activision Blizzard (Cork), King Digital, Zynga, Bioware, Riot Games, Webzen, Demonware and Havok.

Of these nine companies, we obtained from the Companies Registration Office (CRO) financial data and employment data for seven companies. And whilst this financial and employment was for 2015 (for all but one company) we have used the data to estimate the economic contribution in 2016.

The seven reporting companies earned €640 million in revenue in 2016 and employed an estimated 700 FTEs. A large portion – perhaps the majority – of these companies' revenue was derived from customers located outside of Ireland. However, there is no reliable data on the origin of revenues, which would permit estimating the level of export earnings in this industry.

Information available from IDA Ireland indicated that total employment in the Irish games publishing sector was at least 1,320 FTEs in 2016. In other words, our company research covered 53% of employment. We used this coverage-ratio to estimate the overall economic contribution, by assuming that the other economic data we collected (e.g. turnover, labour compensation, GVA estimates) also represented 53% of the overall games publishing industry in Ireland.

2.3.2.2 Direct Economic Impact

Based on the data for the seven reporting companies and the employment information from IDA Ireland, we estimate that the video games publishing and middleware industry generated 1,320 FTEs of employment in 2016, and an estimated €71.1 million in labour compensation and €91.6 million in GVA. No data was available to estimate the level of exports generated by the industry.

Table 27 Direct economic impact of video games publishing industry, 2016[1]

	Amount
Employment (FTEs)	1,320
Average FTE cost (€)	53,800
Labour compensation (€m)	71.1
GVA (€m)	91.6
Exports (€m)	--

Source: Olsberg·SPI/Nordicity estimates based on data from company accounts, IDA Ireland, ONS and CSO. 1. Due to timelines for financial reporting, the majority of the financial data sourced from company accounts was for financial years ending in 2016.

2.3.2.3 Total Economic Impact

Given that the majority of the workers and economic activity in Ireland's games publishing industry is associated with customer support and localisation, we utilised cost structure data from SIC 82.20 Activities of call centres (published by the UK's Office for National Statistics [ONS]) to model the industry's purchases of supplies and services, and thereby its indirect impact (and part of the induced impact). Based on this approach, we estimate that the industry €22 million in supplies and services in 2016, or €0.56 for every €1.00 spent on employee compensation in the industry.

Overall the games publishing industry generated an estimated 1,890 FTEs of employment, €97 million in labour compensation and €138.9 million in GVA for the Irish economy in 2016.

Table 28 Total economic impact of the video games publishing industry, 2016

	Direct	**Indirect**	**Induced**	**Total**
Employment (FTEs)	1,320	400	170	**1,890**
Labour compensation (€m)	71.1	18.2	7.7	**97.0**
GVA (€m)	91.6	30.2	17.2	**138.9**

Source: Olsberg·SPI/Nordicity estimates based on data from company accounts, IDA Ireland, ONS and CSO.

2.3.3. Summary of Economic Impact

Overall the video games sector in Ireland – including the Irish-owned development industry and the publishing/middleware industry – generated 2,040 FTEs of employment for the Irish economy in 2016. It also generated €100.1 million in labour compensation, €140.1 million in GVA.

Table 29 Total economic impact of video games sector in Ireland, 2016

	Direct	Indirect	Induced	Total
Employment (FTEs)	1,450	410	180	**2,040**
Labour compensation (€m)	73.8	18.4	7.9	**100.1**
GVA (€m)	95.4	30.6	17.7	**143.7**

Source: Olsberg·SPI/Nordicity estimates based on data from industry survey, Imirt, company accounts, IDA Ireland, ONS and CSO.

2.4. Radio

2.4.1. Overview of the sector

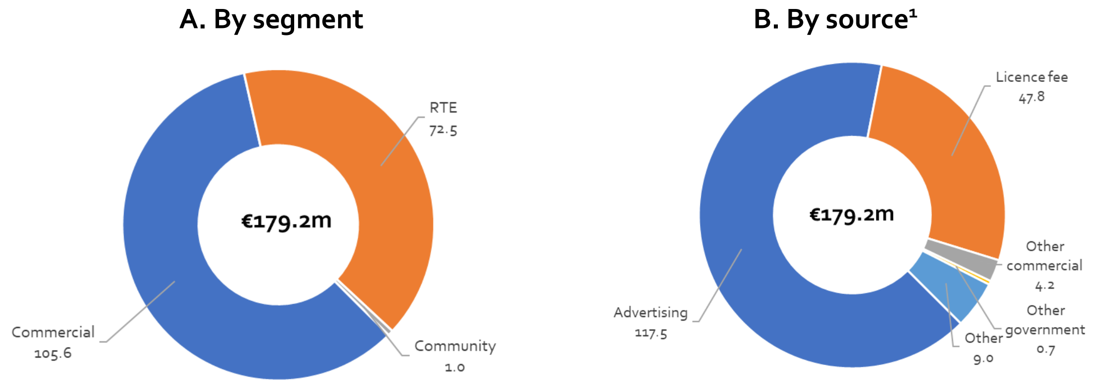
There were over 50 radio broadcasters operating in Ireland in 2016. In addition to RTE, there were 32 licensed commercial radio broadcasters and over 20 community radio stations in operation, including rural, urban and campus radio stations.

In 2016, Ireland's radio broadcasting industry (including RTE, commercial radio broadcasters and community radio broadcasters) earned an estimated €179.2 million in revenue. This estimate of total revenue itself reflects an estimated 5% decline in the radio advertising market in Ireland in 2016.[14] The commercial segment accounted for €105.6 million of this revenue, or 59%, whilst RTE accounted for €72.5 million, or 40%. According to data from the Community Radio Forum of Ireland (CRAOL), the community radio segment earned approximately €1 million in revenue in 2016.

Sales of advertising accounted for the largest share of revenue: an estimated €117.5 million, or 66% of total revenue. The RTE licence fee was second most important source of revenue: accounting for €47.8 million or 27%. Other sources – commercial and public – accounted for the other €13.5 million of revenue.

[14] Laura Slattery and Core Media (2016). "Print and radio advertising plunges in 'tough' 2016." *Irish Times.* 26 November 2016.

Figure 7 Total revenue in the radio broadcasting industry in Ireland, 2016



Source: Olsberg-SPI/Nordicity estimates based on data from RTE, BAI, CRAOL, Irish Times, Core Media and CSO.
1. Includes the sum of the licence fee attributed to RTE's radio operations (€29.6 million) plus an allocation of the licence fee amounts attributed to RTE's news and current affairs (€55 million), digital (€2.7 million), DTT (€633,000) and other segments (€6.1 million).

2.4.2. In-house Production

2.4.2.1 Scale of sector

The majority of the economic contribution arising from the radio sector comes from the in-house production of radio programming by RTE, and commercial and community broadcasters. Of the estimated €74.7 million in radio operating expenditures at RTE in 2016, €63.1 million was allocated to in-house production. This included €47.3 million reported by RTE's radio division and an allocation of €15.9 million (29% x €54.7 million) in in house production of news and current affairs programming at RTE. In other words, RTE spent 77% of its total radio operating expenditures on the production of in-house programming.

Whilst we did not have precise statistics on the level of in-house production spending by commercial or community broadcasters, we assumed that they were proportionately smaller as a ratio of total operating expenditures. In television, we found that the rate of in-house production spending among private broadcasters was approximately 39% what it was at RTE, when viewed in terms of a share of total operating expenditures. If one applies this same ratio to the radio broadcasting industry, then it implies that spending on in-house production at commercial and community radio broadcasters was equal to 34% of total operating expenditures (39% x 86% = 34%).[15]

This approach implied that commercial and community radio broadcasters spent an estimated €29.4 million on in-house production in 2016. In total, therefore, the in-house production of radio programming was worth €92.5 million in 2016, or 56% of total operating expenditures (€166.2 million) in the industry.

[15] This ratio was validated by comparison to detailed production and financial statistics for Canada's commercial radio broadcasting industry, where 40% of total operating expenditures are typically devoted to in-house programme production.

Table 30 Total value of expenditures on the in-house production of radio programming, 2016

	Amount (€m)
RTE	63.1
Commercial and community radio broadcasters	29.4
Total	**92.5**

Source: Olsberg·SPI/Nordicity based on data from RTE, BAI, CRAOL, Irish Times and Core Media.
Note: Some totals may not sum due to rounding.

2.4.2.2 Direct Economic Impact

The in-house production of radio programming by Ireland's radio broadcasters generated an estimated 780 FTEs of employment in 2016. This included an estimated 390 FTEs at RTE (out of 490 total FTEs) and 350 FTEs in the commercial and community radio segments (out of total 1,250). Radio industry workers engaged in in-house production earned €50 million in labour compensation in 2016 and generated €57.1 million in GVA.

Table 31 Direct economic impact of in-house radio programme production, 2016

	Amount
Employment (FTEs)	740
Average FTE cost (€)	64,300
Labour compensation (€m)	47.9
GVA (€m)	57.1
Exports (€m)	0

Source: Olsberg·SPI/Nordicity based on data from RTE, BAI, CRAOL, Irish Times, Core Media and CSO.

2.4.2.3 Total Economic Impact

The radio broadcasting industry purchases a wide range of supplies and services from other industries in order to complete in-house production. These purchases generate significant indirect impacts and add to the industry's induced impact.

In 2016, the production of in-house radio programming generated a total employment impact (including direct, indirect and induced impacts) was 1,180 FTEs. These workers earned €66.3 million in labour compensation. In-house radio production also generated a total GVA impact of €101.5 million.

Table 32 Economic impact of in-house radio programme production, 2016

	Direct	Indirect	Induced	Total
Employment (FTEs)	740	310	130	**1,180**
Labour compensation (€m)	47.9	12.6	5.8	**66.3**
GVA (€m)	57.1	31.4	13.1	**101.5**

Source: Olsberg·SPI/Nordicity based on data from RTE, BAI, CRAOL, Irish Times, Core Media and CSO.

2.4.3. Independent Production

Alongside the in-house production of radio programming (which drives the sector's economic contribution), Ireland has been able to nurture the independent programming of radio programming through the funding that BAI provides to radio producers from the Sound and Vision Fund.

2.4.3.1 Scale of sector

In 2016, the Sound and Vision Fund award just under €1.17 million to support the production of independent radio programming (outside of the community radio sector). The co-funding system used by the Sound and Vision Fund means that funding recipients contribute third party project financing equivalent to 5-10% of total project funding. Because of this, the overall value of the independent radio production is approximately €1.28 million – i.e. 10% higher than the value of the Sound and Vision funding.

2.4.3.2 Total Economic Impact

According to data collected by the BAI from Sound and Vision fund applications and consultation with the Association of Independent Radio Producers Ireland (AIRPI), there were an estimated 30 FTEs of employment in independent radio production in 2016. This includes radio producers funded by the BAI and those working directly for radio broadcasters on a freelance basis, and freelance/project based sound engineers working on independent radio productions.

To estimate the economic impact of independent radio production, 50% of the overall value of the production (€1.28 million) was allocated to direct labour (e.g. producer, engineer, other freelancer); the remaining 50% was allocated across typical purchases, including travel, archival footage, rights clearance, production overheads, and equipment and facilities hire. These breakdowns were based on data provided by BAI from a random sample of Sound and Vision fund applications.

In total, independent radio production generated 34 FTEs of employment in 2016, just over €800,000 in labour compensation and nearly €1.3 million in GVA. The majority of this economic impact, particularly employment, was in the form of direct economic impact within the radio production industry.

Table 33 Economic impact of independent radio production, 2016

	Direct	Indirect	Induced	Total
Employment (FTEs)	30	2	2	**34**
Labour compensation (€)	640,828	84,931	77,480	**803,239**
GVA (€)	640,828	442,084	173,408	**1,256,320**

Source: Olsberg·SPI/Nordicity estimates based on data from BAI and CSO.

2.4.4. Transmission (non-production functions)

2.4.4.1 Scale of sector

In Section 9.2, we analysed the economic contribution associated with the in-house production of radio programming at radio broadcasters in Ireland, including RTE, commercial and community radio broadcasters. This in-house production accounted for 56% of radio broadcasters' total operating expenditures.[16] This in-house production was supported by other "non-production" functions within broadcasters such as transmission, marketing and corporate administration, which accounted for the balance (44%) of operating expenditures.

[16] The rate of 58% represents the weighted average of RTE (86%) and the commercial/community radio broadcasting segments (34%).

2.4.4.2 Direct Economic Impact

The non-production functions within Ireland's radio broadcasting industry generated an estimated 1,000 FTEs of employment in 2016. This included an estimated 100 FTEs at RTE (out of a total of 490 FTEs), and 900 FTEs in the commercial/community radio segment (out of a total of 1,250 FTEs). These non-production functions also generated €50.3 million in direct labour compensation and €57.3 million in GVA in 2016.

Table 34 Direct economic impact of non-production functions in radio broadcasting industry, 2016

	Amount
Employment (FTEs)	1,000
Average FTE cost (€)	47,200
Labour compensation (€m)	47.2
GVA (€m)	54.4
Exports (€m)	0

Source: Olsberg·SPI/Nordicity based on data from RTE, BAI, CRAOL, Irish Times, Core Media and CSO.

2.4.4.3 Total Economic Impact

The radio broadcasting industry purchases a wide range of supplies and services from other industries, including marketing services, and transmission equipment and services. These purchases generate significant indirect impacts and add to the industry's induced impact.

In 2016, the non-production functions in the radio broadcasting industry generated a total of 1,350 FTEs of employment (including direct, indirect and induced impacts) along with €62 million in total labour compensation and €90.2 million in total GVA.

Table 35 Economic impact of non-production functions in radio broadcasting industry, 2016

	Direct	Indirect	Induced	Total
Employment (FTEs)	1,000	240	110	**1,350**
Labour compensation (€m)	47.2	9.9	5.0	**62.0**
GVA (€m)	54.4	24.7	11.2	**90.2**

Source: Olsberg·SPI/Nordicity based on data from RTE, BAI, CRAOL, Irish Times, Core Media and CSO.

2.4.5. Summary

Summing the economic impact of the independent radio production and radio broadcasting provides an estimate of the radio sector's overall economic contribution. In total, Ireland's radio sector generated 2,560 FTEs of employment, €129.1 million in labour compensation and €193 million in GVA. These totals included direct impacts of 1,770 FTEs, €95.7 million in labour compensation and €112.1 million in GVA.

Table 36 Economic impact of radio industry, 2016

	Direct	Indirect	Induced	Total
Employment (FTEs)	1,770	550	240	**2,560**
Labour compensation (€m)	95.7	22.5	10.9	**129.1**
GVA (€m)	112.1	56.5	24.4	**193.0**

Source: Olsberg·SPI/Nordicity based on data from RTE, BAI, CRAOL, Irish Times, Core Media and CSO.

2.5. Summary of Economic Impact by Sub-Sector

Table 37 Employment impact of the audiovisual and radio sectors in Ireland, by sub-sector (FTEs), 2016

	Film, TV and animation	Commercial advertising	Video games	Radio	Total
Direct	7,070	270	1,450	1,770	**10,560**
Indirect	3,740	70	410	550	**4,770**
Induced	1,150	30	180	240	**1,600**
Total	**11,960**	**370**	**2,040**	**2,560**	**16,930**

Source: Olsberg·SPI/Nordicity estimates based on data from RTE, BAI, CRAOL, Irish Times, Core Media, IFB, Imirt, industry surveys, company accounts, ONS, Indecon and CSO.

Table 38 Labour compensation impact of the audiovisual and radio sectors in Ireland, by sub-sector (€m), 2016

	Film, TV and animation	Commercial advertising	Video games	Radio	Total
Direct	352.3	11.8	73.8	95.7	**533.6**
Indirect	141.9	2.4	18.4	22.5	**185.2**
Induced	51.5	1.2	7.9	10.9	**71.5**
Total	**545.7**	**15.4**	**100.1**	**129.1**	**790.3**

Source: Olsberg·SPI/Nordicity estimates based on data from RTE, BAI, CRAOL, Irish Times, Core Media, IFB, Imirt, industry surveys, company accounts, ONS and CSO.

Table 39 GVA impact of the audiovisual and radio sectors in Ireland, by sub-sector (€m), 2016

	Film, TV and animation	Commercial advertising	Video games	Radio	Total
Direct	303.3	12.5	95.4	112.1	**523.3**
Indirect	273.5	6.0	30.6	56.5	**366.7**
Induced	115.2	2.7	17.7	24.4	**159.9**
Total	**692.0**	**21.2**	**143.7**	**193.0**	**1,049.9**

Source: Olsberg·SPI/Nordicity estimates based on data from RTE, BAI, CRAOL, Irish Times, Core Media, IFB, Imirt, industry surveys, company accounts, ONS, Indecon and CSO.

2.6. Summary of Economic Impact by Value Chain Segment

Table 40 Employment impact of audiovisual and radio sectors, by value chain segment (FTEs), 2016

	Live action production	Digital production	Distribution	Transmission	Total
Direct	4,870	1,460	1,370	2,860	**10,560**
Indirect	2,320	330	450	1,670	**4,770**
Induced	730	150	190	530	**1,600**
Total	**7,920**	**1,940**	**2,010**	**5,060**	**16,930**

Source: Olsberg·SPI/Nordicity estimates based on data from RTE, BAI, CRAOL, Irish Times, Core Media, IFB, Imirt, industry surveys, company accounts, ONS, Indecon and CSO.

Table 41 Labour compensation impact of audiovisual and radio sectors, by value chain segment (€m), 2016

	Live action production	Digital production	Distribution	Transmission	Total
Direct	259.4	64.6	74.2	135.5	**533.6**
Indirect	86.6	12.3	20.8	65.5	**185.2**
Induced	32.8	6.3	8.4	24.0	**71.5**
Total	**378.8**	**83.2**	**103.3**	**225.0**	**790.3**

Source: Olsberg·SPI/Nordicity estimates based on data from RTE, BAI, CRAOL, Irish Times, Core Media, IFB, Imirt, industry surveys, company accounts, ONS, Indecon and CSO.

Table 42 GVA impact of audiovisual and radio sectors, by value chain segment (€m), 2016

	Live action production	Digital production	Distribution	Transmission	Total
Direct	195.3	51.7	94.6	181.6	**523.3**
Indirect	173.9	25.7	35.9	131.2	**366.7**
Induced	73.5	14.0	18.7	53.7	**159.9**
Total	**442.7**	**91.4**	**149.3**	**366.5**	**1,049.9**

Source: Olsberg·SPI/Nordicity estimates based on data from RTE, BAI, CRAOL, Irish Times, Core Media, IFB, Imirt, industry surveys, company accounts, ONS, Indecon and CSO.

3. APPENDIX 1 – ECONOMIC IMPACT METHODOLOGY

The Appendix outlines how Olsberg-SPI/Nordicity estimated the direct, indirect and induced economic impacts generated by various segments of the audiovisual sector in Ireland.

3.1. Construction of input-purchases vector

Data collected through primary and secondary research was used to prepare a profile of input purchases in each audiovisual-sector segment (i.e. film and TV production, animation, cinema exhibition, etc.). After removing expenditures on sources of value added (i.e. labour compensation [LC], mixed income), the remaining expenditures were mapped to a 58 x 1 vector (**x**) of industries (corresponding with the industries listed in the 2011 input-output tables published by the Central Statistical Office [CSO]). A list of these 58 industries can be found at the end of this appendix.

3.2. Estimation of indirect output

The 2011 Leontief inverse matrix (**L**) for the Irish economy was sourced from the CSO. The following formula was then used to estimate a 1 x 58 vector (**y**) containing the changes in output, y_i, in each industry as a result of the input purchases arising from the audiovisual sector.

$$\mathbf{y} = \mathbf{x'L}$$

Where:

y is a 1 x 58 vector of changes in output ($\mathbf{y}_i$)
x is 58 x 1 vector of input-purchase expenditures (by receiving industry) arising from the audiovisual sector
L is the 58 x 58 Leontief inverse matrix

3.3. Calculation of indirect gross value added (GVA)

The GVA ratio ($\mathbf{a}_i$) was calculated for each of the 58 industries listed in the CSO input-output tables and **L**. These ratios were calculated as:

$$\mathbf{a}_i = \mathbf{GVA}_i \,/\, \mathbf{z}_i$$

where:

$\mathbf{GVA}_i$ is the value of GVA generated in industry i as per the 2011 input-output tables
$\mathbf{z}_i$ is the total value of output in industry i as per the 2011 input-output tables

These ratios ($\mathbf{a}_i$) can be found at the end of **Appendix 3**.

The total indirect GVA impact across all industries (**g***) was calculated in the following manner:

$$\mathbf{g^*} = \mathbf{a'y}$$

Where:
a is a 58 x 1 vector of $\mathbf{a}_i$
y is a 58 x 1 vector of $\mathbf{y}_i$

3. Calculation of indirect labour compensation (LC)

The LC ratio ($\mathbf{b}_i$) was calculated for each of the 58 industries listed in the CSO input-output tables. These ratios were calculated as:

$$\mathbf{b}_i = \mathbf{LC}_i \,/\, \mathbf{z}_i$$

where:
LC_i is the value of LC generated in industry *i* as per the 2011 input-output tables
z_i is the total value of output in industry *i* as per the 2011 input-output tables

These ratios (b_i) can be found at the end of this appendix.

The total indirect LC impact across all industries (**w***) was calculated in the following manner:

$$\mathbf{w^*} = \mathbf{b'y}$$

Where:
b is a 58 x 1 vector of **b_i**
y is a 58 x 1 vector of **y_i**

3.4. Estimation of indirect employment

The number of indirect jobs (measured in full-time equivalents [FTEs]) was estimated by dividing the LC impact in each industry (**w_i**) by the average FTE cost in each industry (**m_i**).

$$\mathbf{q}_i = \mathbf{w}_i / \mathbf{m}_i$$

where:

w_i is the total wage impact (measured in euros) in industry *i*
m_i is the average FTE cost in industry *i* (see below)

The average FTE costs are listed at the end of this appendix and are related to the average earnings for the particular industry or the closest industry.

- The CSO only publishes average salary data for 13 NACE industry groups. As a result, these 13 average salary observations had to be mapped to the 58 industries in the input-output tables.

- Average FTE costs were arrived by summing the average hourly earnings (excluding irregular earnings) and (ii) average hourly other labour costs for each industry group (for Q3 2016).

- This overall average hourly employee cost was multiplied by 1,872 hours to derive an annualised employee cost figure.

Total indirect employment (**q***) was arrived at by summing the employment impacts (**q_i**) across the 58 industries.

$$\mathbf{q^*} = \sum_i \mathbf{q}_i$$

3.5. Estimation of induced output

The values of direct and indirect output were summed to arrive at an estimate of Type I output.

$$\mathbf{y}_{\text{TYPE I}} = \mathbf{y}_{\text{DIRECT}} + \mathbf{y}_{\text{INDIRECT}}$$

The Type I output was then multiplied by a ratio of 1.20 to arrive at an estimate of Type II output. This ratio was obtained from research of the relationship between Type I and Type II ratios (see box below).

$$\mathbf{y}_{\text{TYPE II}} = 1.20 \cdot (\mathbf{y}_{\text{TYPE I}})$$

Relationship between Type II and Type I ratios
In The Economic Impact of the UK Film Industry (September 2012), Oxford Economics reported that induced impact multiplier was 1.25.[17] In other words, the ratio of the Type II to Type I multipliers for the UK economy was 1.25. This is corroborated by the Type I and Type II multipliers published the Scottish Government for the Scottish economy (see Input-Output Tables 1998-2013 - Leontief Type 2 Table"). For the Scottish economy, the Type II employment multipliers are on average equal to 1.20 times the Type I multipliers. The slightly lower induced impact multiplier for Scotland is understandable, given the likelihood that some portion of household spending will leak from the Scottish economy into the economies of England, Wales or Northern Ireland. **The household consumption pattern for the Republic of Ireland is likely similar to that of Scotland, thereby, providing the basis for using a ratio of 1.20**.

3.6. Estimation of induced GVA

The total value of induced impact GVA was estimated by multiplying the economy-wide GVA-to-output ratio (as per the 2011 input-output tables) by the estimate of Type II output.

$$\mathbf{g}_{\text{INDUCED}} = (\mathbf{a*})\cdot(\mathbf{y}_{\text{TYPE II}})$$

Where:

a*is the GVA-to-output ratio across all industries (0.47)

3.7. Estimation of induced LC

The total value of induced impact LC was estimated by multiplying the economy-wide LC-to-output ratio (as per the 2011 input-output tables) by the estimate of Type II output.

$$\mathbf{w}_{\text{INDUCED}} = (\mathbf{b*})\cdot(\mathbf{y}_{\text{TYPE II}})$$

Where:

b*is the LC-to-output ratio across all industries (0.21)

3.8. Estimation of induced employment

The number of induced impact FTEs ($\mathbf{q}_{\text{INDUCED}}$) was estimated by dividing the estimate of induced LC ($\mathbf{w}_{\text{INDUCED}}$) by the average FTE cost across the Irish economy (**m***).

$$\mathbf{q}_{\text{INDUCED}} = \mathbf{w}_{\text{INDUCED}} / \mathbf{m*}$$

Where:

m*is the average FTE in the Irish economy in 2016 (€45,209)

[17] Oxford Economics (2012), *The Economic Impact of the UK Film Industry*, http://www.bfi.org.uk/sites/bfi.org.uk/files/downloads/bfi-economic-impact-of-the-uk-film-industry-2012-09-17.pdf, p. 38.

3.9. Total economic impact

The total economic impact in terms of GVA, LC and employment was arrived at by summing the estimates of the direct, indirect and induced impacts.

Table A - 1 List of industries and economic ratios

No.	SIC	Name	GVA ratio (a)	LC ratio (w)	Average FTE cost (€)
1.	1-3	Agriculture, forestry and fishing	0.288	0.081	45,209
2.	5-9	Mining, quarrying and extraction	0.317	0.254	48,316
3.	10-12	Food & beverages and tobacco products	0.251	0.070	48,316
4.	13-15	Textiles, wearing apparel and leather products	0.458	0.324	48,316
5.	16	Wood and wood products (excl furniture)	0.238	0.234	48,316
6.	17	Pulp, paper and paper products	0.274	0.291	48,316
7.	18	Printed matter and recorded media	0.396	0.258	48,316
8.	19,31,32	Petroleum; furniture; other manufacturing	0.402	0.116	48,316
9.	20	Chemicals and chemical products	0.688	0.080	48,316
10.	21	Basic pharmaceutical products	0.306	0.014	48,316
11.	22	Rubber and plastics	0.331	0.247	48,316
12.	23	Other non-metallic mineral products	0.247	0.245	48,316
13.	24	Basic metals	0.220	0.165	48,316
14	25	Fabricated metal products	0.441	0.369	48,316
15.	26	Computer, electronic & optical products	0.305	0.081	48,316
16.	27	Electrical equipment	0.240	0.170	48,316
17.	28	Machinery and equipment n.e.c.	0.367	0.222	48,316
18.	29	Motor vehicles, trailers and semi-trailers	0.326	0.195	48,316
19.	30	Other transport equipment	0.112	0.206	48,316
20.	33	Repair/installation of machinery & equipment	0.523	0.391	48,316
21.	35	Electricity and gas supply	0.555	0.153	48,316
22.	36	Water collection, treatment and supply	0.510	0.351	48,316
23.	37-39	Sewerage, refuse and remediation services	0.492	0.187	48,316
24.	41-43	Construction and construction works	0.257	0.397	40,304
25.	45	Motor fuel and vehicle trade and repair	0.717	0.575	36,429
26.	46	Wholesale trade	0.402	0.179	36,429
27.	47	Retail trade	0.588	0.348	36,429
28.	49	Land transport services	0.459	0.390	43,374
29.	50	Water transport services	0.329	0.149	43,374
30.	51	Air transport services	0.295	0.097	43,374
31.	52	Warehousing	0.672	0.389	43,374
32.	53	Postal and courier services	0.712	0.655	43,374
33.	55-56	Accommodation and food & beverage services	0.629	0.489	25,235
34.	58-60	Publishing, film and broadcasting	0.689	0.038	61,458
35.	61	Telecommunications services	0.733	0.381	61,458
36.	62-63	Computer consultancy; data processing	0.112	0.089	61,458
37.	64	Financial intermediation services	0.529	0.167	63,816
38.	65	Insurance, reinsurance and pension funding	0.117	0.109	63,816
39.	66	Other financial activities	0.431	0.219	63,816

No.	SIC	Name	GVA ratio (a)	LC ratio (w)	Average FTE cost (€)
40.	68	Real estate services	0.678	0.024	63,816
41.	69-70	Legal and accounting services; mgt consultancy	0.698	0.199	51,667
42.	71	Architectural and engineering services	0.870	0.572	51,667
43.	72	Scientific research and development services	0.792	0.571	51,667
44.	73	Advertising and market research services	0.822	0.363	51,667
45.	74-75	Other professional, scientific services	0.621	0.423	51,667
46.	77	Rental and leasing services	0.795	0.060	35,137
47.	78	Employment services	0.839	0.762	35,137
48.	79	Travel and tourism service activities	0.805	0.614	35,137
49.	80-82	Security, office & business support services	0.708	0.539	35,137
50.	84	Public administration	0.520	0.402	49,046
51.	85	Education services	0.774	0.679	69,526
52.	86-88	Human health and social work services	0.772	0.646	44,029
53.	90-92	Cultural and sporting services	0.881	0.272	35,400
54.	93	Recreation services	0.914	0.457	35,400
55.	94	Membership organisation services	0.152	0.168	35,400
56.	95	Repair of consumer goods	0.581	0.439	35,400
57.	96	Other services	0.639	0.483	35,400
58.	97	Private households with employed persons	1.000	0.847	45,209

4. APPENDIX 2 – METHDOLOGY FOR ANNUAL UPDATES OF ECONOMIC CONTRIBUTION ANALYSIS

4.1. Overview

In general, the economic contribution analysis presented in this report for 2016 may be updated for 2017 and subsequent years by using the economic impact ratios derived through this analysis. These economic ratios (presented below) can be multiplied by "adjusted turnover/production-spending" to arrive at estimates of full-time equivalent (FTEs), labour compensation, gross value added (GVA) and tax revenue.

This approach assumes or entails the following:

- The use of technology, and the profile of good and services expenditures in each industry segment do not change in any significant manner in relation to 2016.
- The reader can obtain updated data on the gross turnover or production spending in each industry segment. This methodology recommends approaches for obtaining this data.
- The reader can also obtain the basic data required to convert gross turnover/ production-spending into "adjusted turnover or production spending". This methodology describes how to do these conversions.
- Wages and rates of compensation in the audiovisual and radio sectors increase in line with general nominal wage inflation observed across the Irish economy. The employment impact ratios should be adjusted to take into account wage inflation. This process is described below.
- There are no significant changes in the tax structure of the Irish economy or the effective rates of taxation that workers in the audiovisual and radio sectors are subject to.

4.2. Economic Impact Ratios

The following table presents the employment impact ratios that can be multiplied by estimates of adjusted turnover/production-spending to estimate levels of employment in future years. Since nominal wages in most economies increase from year-to-year, these ratios should be adjusted to take into account general wage inflation. For example, if the Central Statistical Office (CSO) reports that wages in the Irish economy **increased** by an average of 2% in 2016, then all of the employment impact ratios should be **decreased** by 2% before being multiplied by adjusted turnover/production-spending for 2017.

Table 43 Employment impact ratios

Industry	Value chain segment	Sub-industry	FTEs per €m of adjusted turnover/production-spending			
			Direct	Indirect	Induced	Total
Film, TV and animation	Live action production	Independent production	11.9	4.4	1.4	**17.7**
		In-house	4.6	5.0	1.3	**10.9**
	Digital production	Animation	11.4	3.4	1.4	**16.2**
		Post-production/VFX	15.5	2.6	1.3	**19.4**
	Distribution	Distribution	1.6	1.6	0.6	**3.8**
	Transmission	Cinema	5.9	2.4	1.0	**9.4**
		TV broadcasting	4.1	4.8	1.1	**10.0**
		VOD	0.3	0.0	0.0	**0.3**
Commercial advertising	Live action production	Independent production	10.9	3.4	1.4	**15.6**
	Digital production	Post-production/VFX	15.9	2.9	1.4	**20.3**
Video games	Digital production	Game development	28.9	2.2	2.2	**33.3**
	Distribution	Game publishing	1.1	0.3	0.1	**1.6**
Radio	Live action production	Independent production	23.1	1.8	1.3	**26.2**
		In-house	8.0	3.3	1.4	**12.7**
	Transmission	Radio broadcasting	12.8	3.1	1.4	**17.3**

Source: Olsberg·SPI/Nordicity estimates based on data from RTE, BAI, CRAOL, Irish Times, Core Media, IFB, Imirt, industry surveys, company accounts, ONS, Indecon and CSO.

The following table presents the labour-compensation impact ratios that can be multiplied by estimates of adjusted turnover/production-spending to estimate levels of labour compensation in future years. Unlike the employment impact ratios, the labour-compensation impact ratios do not need to be adjusted to take into account wage or price inflation in the Irish economy.

Table 44 Labour-compensation impact ratios

Industry	Value chain segment	Sub-industry	€ of labour compensation per €1 of adjusted turnover/production-spending			
			Direct	**Indirect**	**Induced**	**Total**
Film, TV and animation	Live action production	Independent production	0.546	0.161	0.064	**0.772**
		In-house	0.361	0.187	0.057	**0.605**
	Digital production	Animation	0.560	0.132	0.060	**0.753**
		Post-production/VFX	0.679	0.096	0.057	**0.832**
	Distribution	Distribution	0.098	0.082	0.022	**0.202**
	Transmission	Cinema	0.154	0.098	0.046	**0.298**
		TV broadcasting	0.287	0.182	0.053	**0.522**
		VOD	0.019	0.000	0.001	**0.019**
Commercial advertising	Live action production	Independent production	0.492	0.119	0.057	**0.668**
	Digital production	Post-production/VFX	0.664	0.094	0.055	**0.813**
Video games	Digital production	Game development	0.606	0.030	0.050	**0.687**
	Distribution	Game publishing	0.059	0.015	0.006	**0.081**
Radio	Live action production	Independent production	0.493	0.065	0.060	**0.618**
		In-house	0.515	0.135	0.063	**0.713**
	Transmission	Radio broadcasting	0.605	0.127	0.064	**0.795**

Source: Olsberg·SPI/Nordicity estimates based on data from RTE, BAI, CRAOL, Irish Times, Core Media, IFB, Imirt, industry surveys, company accounts, ONS, Indecon and CSO.

The following table presents the GVA impact ratios that can be multiplied by estimates of adjusted turnover/production-spending to estimate levels of GVA in future years. Unlike the employment impact ratios, the GVA impact ratios do not need to be adjusted to take into account wage or price inflation in the Irish economy.

Table 45 GVA impact ratios

Industry	Value chain segment	Sub-industry	€ of GVA per €1 of adjusted turnover/production-spending			
			Direct	**Indirect**	**Induced**	**Total**
Film, TV and animation	Live action production	Independent production	0.252	0.313	0.144	**0.709**
		In-house	0.410	0.347	0.127	**0.884**
	Digital production	Animation	0.372	0.274	0.135	**0.781**
		Post-production/VFX	0.599	0.199	0.127	**0.925**
	Distribution	Distribution	0.098	0.183	0.050	**0.331**
	Transmission	Cinema	0.322	0.198	0.103	**0.623**
		TV broadcasting	0.340	0.340	0.118	**0.798**
		VOD	0.019	0.000	0.002	**0.020**
Commercial advertising	Live action production	Independent production	0.492	0.318	0.127	**0.936**
	Digital production	Post-production/VFX	0.764	0.194	0.124	**1.082**
Video games	Digital production	Game development	0.851	0.104	0.111	**1.065**
	Distribution	Game publishing	0.076	0.025	0.014	**0.116**
Radio	Live action production	Independent production	0.493	0.340	0.133	**0.966**
		In-house	0.614	0.338	0.140	**1.092**
	Transmission	Radio broadcasting	0.697	0.316	0.143	**1.157**

Source: Olsberg·SPI/Nordicity estimates based on data from RTE, BAI, CRAOL, Irish Times, Core Media, IFB, Imirt, industry surveys, company accounts, ONS, Indecon and CSO.

The following table presents the tax impact ratios that can be multiplied by estimates of adjusted turnover/production-spending to estimate levels of tax revenue in future years. Unlike the employment impact ratios, the tax impact ratios do not need to be adjusted to take into account wage or price inflation in the Irish economy.

Table 46 Tax impact ratios

Industry	Value chain segment	Sub-industry	€ of tax revenue per €1 of adjusted turnover/production-spending			
			Direct	Indirect	Induced	Total
Film, TV and animation	Live action production	Independent production	0.115	0.102	0.047	**0.264**
		In-house	0.134	0.113	0.041	**0.288**
	Digital production	Animation	0.121	0.089	0.044	**0.255**
		Post-production/VFX	0.195	0.065	0.041	**0.301**
	Distribution	Distribution	0.032	0.060	0.016	**0.108**
	Transmission	Cinema	0.105	0.065	0.034	**0.203**
		TV broadcasting	0.111	0.111	0.038	**0.260**
		VOD	0.006	0.000	0.001	**0.007**
Commercial advertising	Live action production	Independent production	0.115	0.104	0.041	**0.260**
	Digital production	Post-production/VFX	0.249	0.063	0.040	**0.353**
Video games	Digital production	Game development	0.277	0.034	0.036	**0.347**
	Distribution	Game publishing	0.025	0.008	0.005	**0.038**
Radio	Live action production	Independent production	0.161	0.111	0.043	**0.315**
		In-house	0.200	0.110	0.046	**0.356**
	Transmission	Radio broadcasting	0.227	0.103	0.047	**0.377**

Source: Olsberg·SPI/Nordicity estimates based on data from RTE, BAI, CRAOL, Irish Times, Core Media, IFB, Imirt, industry surveys, company accounts, ONS, Indecon and CSO.

4.3. Adjusted turnover/production-spending

This section outlines the various data sources, approaches and considerations for estimating adjusted turnover/production-spending in future years.

4.3.1. Film, TV and animation: Independent production

- Detailed data on the level of gross production spending supported by Section 481 can be sourced from the Irish Film Board (IFB). IFB can also provide detailed breakdowns of Section 481 production spending (i.e. indigenous vs. inward; live action vs. animation; labour vs. goods and services) required to convert gross production spending to adjusted production spending.
- Since Irish broadcasters' spending on independent production does not qualify for Section 481 support, data should also be sourced from RTE and TG4 for their respective funding of independent television production. This data can be found in these broadcasters' public reports. Estimates should also be made for the funding of

independent production by TV3 and Eircom, through interviews with those broadcasters.

- The overall level of gross production spending for independent production can be arrived at by summing the data for Section 481, RTE, TG4 and commercial broadcasters' production.
- To convert this overall level of gross production spending to adjusted production spending, the following adjustments should.
    - Deduct the total value of animation production supported by Section 481. It will be captured in the estimates for the domestic animation industry (see "Film, TV and animation: Animation" below).
    - Deduct the value of post-production/VFX services provided by domestic post-production/VFX studios. This figure can be obtained through a survey of domestic post-production/VFX studios (see "Film, TV and animation: Post-production/VFX" below). The value of domestically provided post-production/VFX services will be captured in the estimates for that industry segment.
- After making these two deductions, the resulting figure will represent adjusted production spending.
- When preparing updates to the economic contribution of this segment, attention should be paid to any significant changes in the breakdown of production spending between labour, and goods and services. Any significant changes in the distribution of spending across these two categories would warrant a re-calibration of the economic impact ratios for this industry segment.
- For example, if a larger share of production spending is devoted to labour in the future, then this could imply that all the economic impact ratios (i.e. employment, labour compensation, GVA and tax revenue) may need to be adjusted upwards.

4.3.2. Film, TV and animation: In-house

- For the calculation of gross turnover in the TV broadcasting industry segment, please see "Film, TV and animation: TV broadcast" below.
- To estimate gross and adjusted production spending (which would be equal) for the in-house production of television programming, one should sum the following elements:
    - RTE's spending on the in-house production of television programming: Data found in RTE's annual report indicates how much it spends on in-house production within its television division.
    - RTE's spending on the in-house production of news and current affairs programming for television: This can be estimated by multiplying the total level of spending on in-house production of news and current affairs programming across all media (found in RTE's annual report) by 71%.
    - Estimated spending on in-house production at commercial television broadcasters (including TV3 and Eir Sport): Whilst precise data on commercial television broadcasters' in-house production is not publicly available, it can be estimated by multiplying the estimated total turnover in the commercial television broadcasting segment (see "Film, TV and animation: TV broadcast", below) by 20%.

4.3.3. Film, TV and animation: Animation

- Whilst a comprehensive survey of animation studios in Ireland was conducted in 2017 to obtain data for this economic contribution analysis, in future years, a shorter survey of animation studio could be conducted.

- This shorter survey could collect data on total turnover, a breakdown of the sources of this turnover (Section 481 vs. other; domestic vs. foreign clients) and updated data on employment (i.e. full-time employees, part-time employees, freelancers/contract).
- Updated data on employment (i.e. full-time employees, part-time employees, freelancers) should also be collected.
- Updated data on average full-time salaries should also be collected.
- No adjustments are needed to gross turnover amount before applying the economic impact ratios.

4.3.4. Film, TV and animation: Post-production/VFX

- Whilst a comprehensive survey of post-production/VFX studios in Ireland was conducted in 2017 to obtain data for this economic contribution analysis, in future years, a shorter survey of post-production/VFX studio could be conducted.
- This shorter survey could collect data on total turnover, a breakdown of the sources of this turnover (i.e. Section 481 vs. commercials, vs. other; domestic vs. foreign clients).
- Updated data on employment (i.e. full-time employees, part-time employees, freelancers) should also be collected.
- To convert gross turnover to adjusted turnover, the portion of turnover earned from commercials production should be deducted, since it will be captured in the economic contribution of the commercial advertising sub-sector (see Commercial advertising: Post-production/VFX [below]).

4.3.5. Film, TV and animation: Distribution

- To estimate the level of adjusted turnover of the Ireland-based distribution industry, one can use the following approach.
    - Conduct a survey distribution companies in Ireland to ascertain the number of FTEs they employ within the Republic of Ireland. Alternatively, this employment data may be available from accounts file at the Companies Registration Office (CRO).
    - Multiply the number of FTEs by an annual FTE cost of €61,548 (2016), adjusted for annual wage inflation in the Irish economy. For example, if wage inflation is 2% in 2016, then the average FTE cost for 2017 should be set equal to €61,548 x 1.02.
    - Multiply the resulting estimate of total labour compensation by the average turnover-to-employment-cost ratio of 10.1:1 observed in the UK's film distribution industry between 2009 and 2015.
- The resulting figure represents adjusted turnover in the distribution industry in the Republic of Ireland.

4.3.6. Film, TV and animation: Cinema

- Annual box office data can be obtained from IFB.
- The box office data can be used to estimate the cinema operators' total revenue (i.e. including revenue from food and beverage sales, and other sources) by examining the public financial reports of major cinema operators in the UK or by applying the ratio of 1.54 derived for this report. This will provide an estimate of total turnover in the industry.
- No adjustments are needed to the gross turnover amount before applying the economic impact ratios.

4.3.7. Film, TV and animation: TV broadcasting

- Gross turnover can be arrived at by summing the following amounts:
  - Total net advertising revenue earned by Irish television broadcasting industry
  - Licence fee allocated to RTE's television operations (less any amounts transferred to TG4)
  - Other commercial revenue earned by RTE's television operations
  - 71% of the RTE licence allocated to news and current affairs programming
  - Commercial revenue (other than net advertising revenue) earned by Virgin Media's broadcast operations in Ireland and Eir Sport
  - Total revenue earned by TG4
- To convert gross turnover to adjusted turnover, deduct the value of in-house production spending. See "Film, TV and animation: In-house" (above) for a description of the methodology for estimating the value of in-house production spending.

4.3.8. Film, TV and animation: VOD

- A combination of consumer surveys or data from third-party reports on the VOD market can be used to estimate the total turnover earned by VOD operators (domestic and foreign) in the Republic of Ireland.
- No adjustments are needed to gross turnover amount before applying the economic impact ratios.

4.3.9. Commercial advertising: Independent (live action) production

- Whilst a comprehensive survey of commercial production companies was conducted in 2017 to obtain data for this economic contribution analysis, in future years, Commercial Producers Ireland (CPI) members could simply be polled to obtain data on their annual level of production expenditures (i.e. production budgets) and the respective portions of these expenditures paid to domestic or foreign post-production/VFX houses.
- The amounts reported for expenditures on domestic and foreign post-production/VFX services should be deducted from total production expenditures to arrive at adjusted production spending.
- Commercial production companies should also be asked to report the portion of their production expenditures ultimately financed by foreign clients.

4.3.10. Commercial advertising: Post-production/VFX

- Whilst a comprehensive survey of post-production/VFX companies doing commercials work was conducted in 2017 to obtain data for this economic contribution analysis, in future years, these companies could be polled to obtain data on their annual turnover and the portions of this turnover earned domestic producers, foreign producers and other foreign clients.
- No adjustments are needed to gross turnover amount before applying the economic impact ratios.

4.3.11. Video games: Game development

- Updated data on industry turnover should be obtained through a survey of independent Irish games development companies.
- No adjustments are needed to gross turnover amount before applying the economic impact ratios.

4.3.12. Video games: Game publishing

- Whilst the research conducted for this project indicated that there were at least nine games publishing companies operating Ireland (and engaged either the marketing of video games in Ireland, customer support or games localisation), additional industry mapping is required.
- Once this industry mapping is completed, the Department should monitor an annual basis the opening or closing of operations in Ireland.
- Data on the total turnover, labour compensation, purchases of domestic goods and services, and the number of employees and freelance workers should be collected on an annual basis through an industry survey or reference to CRO filings.
- Data on the overall employment base within Ireland's games publishing industry may also be obtained from IDA Ireland (as it was for this report). This employment data can also be used to assess the response rate (weighted by company size) to any industry survey.
- Gross and adjusted turnover (which would be equal) for the video games publishing industry and can obtained estimated using the data from an industry survey or CRO filings.
- Given the changing composition of companies and activities in this particular industry segment, the Department should pay particular attention to any changes in this ratio of turnover to labour compensation or the number of employees, as per the data collected from the proposed survey or CRO filings. Significant changes in these ratios would indicate that either the composition of the industry had changed or that the industry's expenditure profile had changed – i.e., the industry's expenditures on domestic labour and goods and services. Such changes would warrant an update to the economic impact ratios.

4.3.13. Radio: Independent production

- The Broadcasting Authority of Ireland (BAI) can provide data on the total budgets for independent radio production supported by Sound & Vision.
- No adjustments are needed to the total-budgets data amount before applying the economic impact ratios.

4.3.14. Radio: In-house

- For the calculation of gross turnover in the radio broadcasting industry segment, please see "Radio: Radio broadcasting" below.
- To estimate gross and adjusted production spending (which would be equal) for the in-house production of radio programming, one should sum the following elements:
    - RTE's spending on the in-house production of radio programming: Data found in RTE's annual report indicates how much it spends on in-house production within its radio division.
    - RTE's spending on the in-house production of news and current affairs programming for radio: This can be estimated by multiplying the total level of spending on the in-house production of news and current affairs programming across all media (found in RTE's annual report) by 29%.
    - Estimated spending on in-house production at commercial and community broadcasters: Whilst precise data on commercial and community radio broadcasters' in-house production is not publicly available, it can be estimated by multiplying the total operating expenditures at commercial and community broadcasters (as per data that can be sourced from BAI and CRAOL; see "Radio: Radio broadcasting", below) by 31%.

4.3.15. Radio: Radio broadcasting

- Gross turnover can be arrived at by summing the following amounts:
    - Licence fee allocated to RTE's radio operations
    - Other commercial revenue earned by RTE's radio operations
    - 29% of the RTE licence allocated to news and current affairs programming
    - Total revenue earned by commercial radio broadcasting industry (can be sourced from BAI)
    - Total revenue earned by community radio broadcasters (can be sourced from CRAOL)

To convert gross turnover to adjusted turnover, deduct the value of in-house radio production spending. See "Radio: In-house" (above) for a description of the methodology for estimating the value of in-house production spending.