



The Impact of Internet Piracy on the Australian Economy

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DATE:

February 2011

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Executive Summary

In 2010, Australia's content industries including music, film, publishing, games and software development encompassed a significant segment of the national economy. The sector employs over 540,000 people and generates economic value over \$70 billion each year¹. It accounts for²:

- 5 per cent of the Australian workforce.
- 7.3 per cent of gross domestic product.
- Over 1 per cent of Australian exports.

With the rollout of the National Broadband Network (NBN) – which aims to bring fast broadband access to over 90 per cent of Australian homes and businesses – the content industries are poised to play an even greater role in Australia's productivity, as they generate the new entertainment, education and information products that will help drive demand for greater digital capacity.

While the potential to grow in the new NBN-enabled economy is significant, there are also important threats to innovation and investment in online content.

The ARC Centre for Excellence for Creative Industries in its paper *CCi Digital Futures 2010: The Internet and Australia*³ recently found that 27.8 per cent of Australian internet users admitted to using file-sharing services like BitTorrent to access content illegally. This was up from 23.6 per cent in 2008. It must be noted that as this survey asked respondents to admit to conducting an illegal activity, it is likely these figures underestimate the real levels of internet piracy.

It is clear that as high speed broadband becomes available through the NBN to more Australian homes and businesses, the impact of copyright theft to the content industries sector will become even more significant.

In March 2010, the independent Paris-based firm TERA Consultants delivered a report to the International Chamber of Commerce on the economic impact of internet piracy in the European Union (EU). The report *Building a Digital Economy: The Importance of Saving Jobs In the EU's Creative Industries* is one of the most comprehensive studies of this type in recent times and provides a good point of comparison for Australia.

Importantly, the TERA study focussed its data collection on Germany, France, the UK, Italy and Spain. In terms of size, these are countries with populations and economies more readily comparable to Australia than the USA where many other studies of this type have been conducted.

The TERA study estimates that in 2008 the EU had lost 186,600 jobs as a consequence of internet piracy and that this figure could grow as high as 1.2 million jobs by 2015. TERA Consultants predict that, unless remedial action is taken, the number of jobs in EU content industries lost to copyright theft will grow by a factor of 6.5 in less than a decade.

Using the TERA study as a base and building in available data from Australian online content industries our report estimates the impact of internet piracy on the Australian economy now and in the near future. We have combined the findings of the TERA study with Australian data to estimate:

- Lost retail value to the Australian content industries sector.
- The impact of internet piracy on jobs.
- Forgone revenue to the Commonwealth Government.

1 Sphere Analysis estimates.

2 Based on projections from data in PWC, *Making the Intangible Tangible – The Economic Contribution of Australia's Copyright Industries*, 2008, pages 15, 20 and 30.

3 17 May 2010 – available at <http://www.cci.edu.au/publications/digital-futures-2010>.

Key Findings – Sphere Analysis Estimates

In 2010:

- **4.7 million**⁴ Australian internet users accessed online content illegally.
- The annual value of lost retail to Australian content industries was **\$900 million**.
- Over **8,000 jobs** were lost in the content industries sector as a result of internet piracy.
- The annual impact of internet piracy to Commonwealth Government revenues was **\$190 million**.

By 2016 (including the potential impact of the NBN):

- **8 million**⁵ Australian internet users will access online content illegally.
- The value of annual lost retail to the Australian content industries sector will be **\$5.2 billion** – a loss of \$18 billion over the period 2010-2016.
- A further **40,000 jobs** could be lost in the sector as a result of internet piracy. Job losses due to copyright theft are projected to grow by a factor of 5.9 in less than a decade. It is also likely that by 2016 more jobs will be lost in the sector than created.
- The annual impact of internet piracy to Commonwealth Government revenues will be **\$1.1 billion** – a loss of \$3.7 billion over the period 2010-2016.

4 Based on the ARC Centre for Excellence for Creative Industries Research survey and Internet World Stats.

5 Based on Sphere projections from the ARC Centre for Excellence for Creative Industries Research surveys and Internet World Stats.

Scope

The Australian Content Industry Group⁶ has commissioned Sphere Analysis to conduct a study into the economic impact of internet piracy⁷ in Australia. In particular we have been asked to estimate:

- The value of lost retail to the Australian content industries sector.
- The number of jobs lost in the Australian content industries as a result of forgone retail sales.
- The value of forgone revenue to the Commonwealth Government in terms of GST, income tax and company tax.

To perform this task, Sphere Analysis has obtained Australian data from the following sources.

Data Pertaining to Australian Content Industries

According to the 2008 Price Waterhouse Coopers report *Making the Intangible Tangible – The Economic Contribution of Australia’s Copyright Industries*⁸, in 2007, Australia’s core content industries⁹:

- Employed 5 per cent of the Australian workforce (520,901 people).
- Generated economic value equal to 7.3 per cent of gross domestic product (\$69.1 billion).
- Generated \$1.9 billion in exports (1.1 per cent of total exports).

On the basis of this information, Sphere Analysis estimates that in 2010, Australia’s core content industries:

- Employ 542,900 people¹⁰.
- Have a gross domestic value of \$73 billion¹¹.

This means that in 2010, every \$134,500 in the sector generated one job.¹²

6 Made up of the Australasian Performing Right Association Limited (APRA), the Australasian Mechanical Copyright Owners Society (AMCOS), the Australian Publishers Association (APA), the Australian Recording Industry Association (ARIA), Copyright Agency Limited (CAL), the Business Software Alliance (BSA), the Interactive Games and Entertainment Association (IGE), Microsoft Pty Ltd and Music Industry Piracy Investigations Pty Ltd (MIPI).

7 Internet piracy involving the illegal distribution of copyrighted content using the Internet including peer-to-peer (P2P) and non P2P.

8 Commissioned by the Australian Copyright Council and available at http://www.copyright.org.au/admin/cms-acc1/_images/13730910374c97f6ba497bf.pdf.

9 For the purpose of this study we have used figures for core copyright industries including music, motion pictures and video, games, books and software. This approach will result in conservative estimates as it excludes interdependent industries which might also be adversely impacted by internet piracy.

10 Based on Australian employment growth between 2006 and 2010 of 4.2 per cent. (Source: Australian Bureau of Statistics Cat No 6202).

11 Based on Australian GDP growth between 2007 and 2010 of 6.3 per cent (Source: Australian Bureau of Statistics Cat No 5206).

12 The Value Added per existing job is \$134,500.

Data Pertaining to Australian Internet Utilisation

According to Internet World Stats¹³, in 2010, 17 million Australians had access to the internet (see figure 1 below). As the Australian population in 2010 is estimated at 22.6 million¹⁴, the current internet penetration rate is approximately 76 per cent.

Internet World Stats also reports that in 2004, 33.6 per cent of internet users accessed the internet through dial-up (consequently at low speeds).

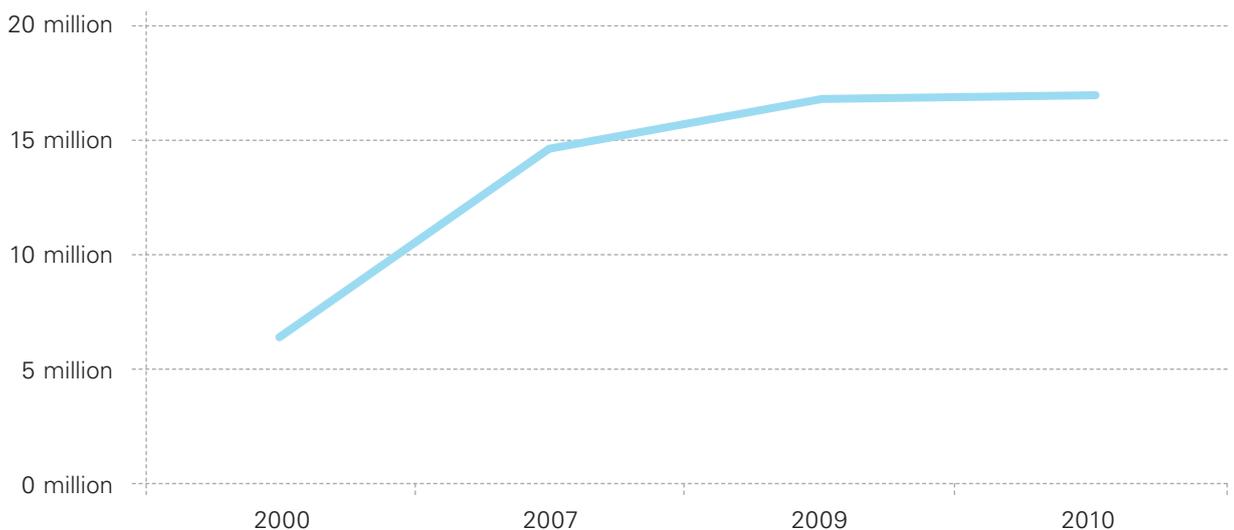
According to the ARC Centre for Excellence for Creative Industries¹⁵ in 2010, 27.8 per cent of Australian internet users admitted to using file-sharing services like BitTorrent to access content illegally. This was up from 23.6 per cent in 2008. As this survey asked respondents to admit to conducting an illegal activity, it is likely these figures underestimate the real levels of internet piracy.

There is a prospect of increased levels of internet piracy through:

1. A higher penetration rate (i.e. more internet users).
2. More users having access to higher connection speeds (i.e. generating larger volumes of internet traffic). Higher-speed connections mean a much greater opportunity to illegally download and upload larger files and more content (i.e. video as well as music). According to CISCO, in just a decade the average global residential internet connection download speed has increased by a factor of 35¹⁶. In practice this means that whilst in 2000 the average time to download a DVD-quality movie was 3 days, it is now only 2 hours.

Clearly, the proposed NBN will have a great impact on both these factors.

Figure 1: Internet Users in Australia



¹³ Based on Nielsen surveys.

¹⁴ Based on Australian Bureau of Statistics population projections (Cat No 3222).

¹⁵ CCi Digital Futures 2010: The Internet and Australia

¹⁶ Cisco Visual Networking Index Forecast found at http://newsroom.cisco.com/dlls/010/prod_060210.html.

Methodology

In March 2010, the independent Paris-based firm TERA Consultants produced the report *Building a Digital Economy: The Importance of Saving Jobs In the EU's Creative Industries*¹⁷ for the International Chamber of Commerce. The report deals with the economic impact of piracy in the EU¹⁸ and is one of the most comprehensive studies available on this subject.

Our methodology is based on applying the findings of this study to the Australian context to estimate a base line for:

- Retail loss
- Lost jobs
- Forgone tax revenue to the Commonwealth Government.

Key metrics from the TERA study are summarised in Table 1.

Table 1: Summary of TERA Findings (2008)	France	Germany	Italy	Spain	United Kingdom	5 Country Average
Population	64.8 m	82.3 m	58.1 m	46.5 m	62.3 m	62.8 m
Value Added (Content Industries' GDP)	€ 142 b	€ 162 b	€ 93 b	€ 62 b	€ 175 b	126.8 b
Content Industries' GDP per Capita (€)	€ 2,200	€ 2,000	€ 1,600	€ 1,300	€ 2,800	€2,000
Internet Users	45 m	65 m	30 m	29 m	51 m	44.1 m
Internet Penetration (%)	69%	79%	52%	63%	83%	70%
Average Internet Growth 2000-2010	43%	17%	13%	44%	23%	27%
Retail Loss ¹⁷	€ 1,681 m	€ 1,178 m	€ 1,434 m	€ 1,707 m	€ 1,410 m	€ 1,482 m
Retail Loss (as a % of CI GDP)	1.2%	0.7%	1.5%	2.8%	0.8%	1.2%
Content Industries Jobs	1.7m	2.7m	1.4m	1.2m	2.7m	1,940,000
Jobs Lost	31,400	34,000	22,400	13,200	39,000	28,000
% Job Losses	1.8%	1.3%	1.6%	1.1%	1.4%	1.4%
A. Value Added per Existing Job	€ 83,500	€ 60,000	€ 66,400	€ 51,700	€ 64,800	€ 65,400
B. Value of Lost Retail per Lost Job	€ 53,500	€ 34,600	€ 64,000	€ 129,300	€ 36,200	€ 52,900
Ratio A:B	1.6	1.7	1.0	0.4	1.8	1.2

The five countries from which TERA collected data have populations and economies which are much smaller than the USA (where many other studies on internet piracy have been previously conducted). Consequently, they represent a more appropriate point of comparison for the Australian context.

Table 2 shows a comparison of key metrics between Australia and the five EU countries in the TERA study.

Table 2: Comparison Australia and Average of five countries in TERA study (2008)	Five Country Average (2008)	Australia (2008)²⁰
Population	62.8 million	21.6 million
Value Added (Content Industries' GDP)	€ 127 billion	€ 53 billion
Content Industries' GDP per Capita	€ 2,000	€ 2,400
Internet Users	44 million	15 million
Internet Penetration	70%	71%
Average Internet Growth 2000-2010	27%	16%
Content Industries Jobs	1.9 m Jobs	532,000 Jobs

¹⁷ Available at [http://www.iccwbo.org/uploadedFiles/BASCAP/Pages/Building%20a%20Digital%20Economy%20-%20TERA\(1\).pdf](http://www.iccwbo.org/uploadedFiles/BASCAP/Pages/Building%20a%20Digital%20Economy%20-%20TERA(1).pdf).

¹⁸ The TERA study included digital and physical piracy. It found that the principle contributor to economic loss was digital piracy. The TERA report did not include the economic impact of copyright infringement to books, newspapers, magazines or video games.

¹⁹ The Retail Loss takes into account the piracy rates in each country and relevant substitution rates for lost sales.

²⁰ Sphere projections for 2008 – using an exchange rate of AU\$1.64 per Euro.

Calculation of Lost Retail and Lost Jobs as a Result of Internet Piracy

Peer-to-peer (P2P) file-sharing networks, originally including Napster, Kazaa and Limewire, have rapidly emerged over the last five to ten years as vehicles for, among other uses, inducing and facilitating mass infringement of copyright. In simple terms, these networks operate by distributing software among users ('peers') spread around the world which facilitates the sharing of copyright-protected content stored on individual users' computers. The extent of P2P file sharing around the world is substantial and, due to the particular characteristics of music files (i.e. relatively small in size), the music industry in particular has been heavily impacted by this phenomenon. It is now clear, however, that with the spread of faster broadband services around the developed world, other forms of copyright material are being illegally shared in rapidly increasing volumes – for instance, software, books, games, television shows and films.

In July 2010, the University of Ballarat released research on the extent of copyright infringing content on BitTorrent networks in Australia.²¹ Close to 90 per cent of content was found to be infringing the rights of creators. Illegal movie and television shows made up over 70 per cent of the traffic.

To estimate the impact of such piracy on the content industries – represented as the value of lost retail and the number of lost jobs – we have applied two key indicators from the TERA study to Australian data (highlighted in Table 1):

1. Retail lost as a proportion of content industries' GDP – to estimate the value of retail lost. This takes into account relevant piracy rates and substitution rates for lost sales.

21 ICSSL, *Investigation into the extent of infringing content on BitTorrent networks*, April 2010 – available at http://www.afact.org.au/research/bt_report_final.pdf.

2. The ratio between the value added per existing job and the value of lost retail per lost job – to convert the value of lost retail to the number of lost jobs²².

Through this approach we have estimated a base line for Australia by extrapolating the average of the five EU countries in the TERA study.

We have also estimated upper and lower boundaries by extrapolating the metrics from the individual countries which result in the highest and lowest levels of retail loss and lost jobs.

Calculation of Lost Revenue to the Commonwealth Government

Once lost retail and lost jobs have been estimated we have also estimated the forgone tax revenue to the Commonwealth Government. We have performed this task by applying:

- A 10 per cent GST rate to the value of lost retail.
- The Australian average annual income to lost jobs and the marginal income taxation rate corresponding to this income²³.
- A 30 per cent company tax rate with a profit margin of 7 per cent²⁴ on retail loss.

22 We have used this ratio to avoid using indicators which require currency conversion. This ratio captures the relationship between current jobs, lost retail and lost jobs without relying on the value of the currency.

The method used to calculate lost jobs involves two steps. Firstly, determining lost retail per lost job:

$$\text{Ratio A:B} = \frac{\text{A. Value Added for Existing Job}}{\text{B. Lost Retail per Lost Job}}$$

$$\text{B. Lost Retail per Lost Job} = \frac{\text{A. Value Added per Existing Job}}{\text{Ratio A:B}}$$

Secondly, calculating the estimated number of jobs lost:

$$\text{Jobs Lost} = \frac{\text{Retail Loss}}{\text{B. Lost Retail per Lost Job}}$$

$$\Rightarrow \text{Jobs Lost} = \frac{\text{Retail Loss X Ratio A:B}}{\text{A. Value Added per Existing Job}}$$

23 \$51,251 per annum (Source: Australian Bureau of Statistics, Cat No 6302) with a 18.3 per cent marginal income tax rate.

24 Based on Australian Bureau of Statistics data for Cultural and Recreational Services (Cat No 8142).

Base Line 2010 Estimates

Table 3 summarises our base line findings for 2010 together with lower and upper boundaries.

The estimates using the 5 country average assumes that the retail loss as a proportion of content industries' GDP is 1.2 per cent and that the ratio between the value added per existing job (A) and the value of lost retail per lost job (B) is 1.2. We have then applied these metrics to Australian content industries' GDP to estimate retail loss and jobs lost in Australia. For the upper and lower boundaries we have used the same approach but have chosen the metrics from the countries which deliver the highest and lowest estimates.

Table 3 : Findings (2010)	5 Country Average Applied to Australia	Lower Boundary	Upper Boundary
Value of Lost Retail	\$900 million p.a.	\$500 million p.a. ²⁵	\$2,000 million p.a. ²⁸
Number of Lost Jobs	8,300 Jobs	5,900 Jobs ²⁶	10,400 Jobs ²⁹
Forgone Tax Revenue to the Commonwealth Government	\$190 million p.a.	\$120 million p.a. ²⁷	\$300 million p.a. ³⁰

This means that our 2010 base line for Australia (used to calculate future estimates) is:

- \$900 million lost retail.
- 8,300 lost jobs.²⁹
- \$190 million in lost revenue to the Commonwealth Government.

²⁵ When comparing Australia to Germany or the United Kingdom.

²⁶ When comparing Australia to Spain.

²⁷ When comparing Australia to Germany.

²⁸ When comparing Australia to Spain.

²⁹ When comparing Australia to France.

³⁰ When comparing Australia to Spain.

³¹ We estimate every \$108,800 in lost retail results in one lost job.

Projections 2010-2016

We have projected retail loss, lost jobs and forgone tax revenue to the Commonwealth Government for the period 2010-2016.

In order to estimate these metrics into the future, we have used the following methodology:

- Growth in internet users has been estimated by assuming that the NBN will increase the penetration rate to 90 per cent by 2016³².
- We have assumed that the rollout of the NBN will allow Australian internet traffic to grow in line with global projections³³. In June 2010, CISCO forecasted that global IP traffic will grow at a compound annual growth rate (CARG) of 34 per cent – this means traffic will quadruple by 2014.
- We have assumed that volume of internet piracy grows at the same rate as IP traffic³⁴ and that substitution rates remain constant.
- Future job growth in the content industries has been estimated by applying the average employment growth rate for the last four years into the future³⁵ and then subtracting the estimated number of lost jobs.
- Population projections are based on Australian Bureau of Statistics forecasts³⁶.

Table 4 shows projections for key metrics over the period 2010-2016.

Table 4 : Australian Projections (2010-2016)	2010	2011	2012	2013	2014	2015	2016
Population	22.6 m	22.8 m	23.0 m	23.2 m	23.5 m	23.7 m	23.9 m
Internet Users	17.0 m	17.8 m	18.5 m	19.3 m	20.0 m	20.8 m	21.5 m
Retail Loss (2010 \$AU)	\$0.9 b	\$1.21 b	\$1.62 b	\$2.18 b	\$2.91 b	\$3.90 b	\$5.21 b
Jobs Lost	8,300	11,300	15,100	20,300	27,200	36,300	48,600
Lost Revenue to Commonwealth (2010 \$AU)	\$190 m	\$250 m	\$340 m	\$450 m	\$610 m	\$810 m	\$1,090 m
Estimated Creative Jobs	542,900	549,265	554,940	559,313	562,061	562,656	560,062
Estimated Annual Net Job Growth in Content Industries	5,500	6,365	5,675	4,373	2,748	596	-2,594

Over the period 2010-2016, we have estimated that:

- 1 Internet users will grow by 4.5 million (26 per cent).
- 2 Internet traffic will grow by around 580 per cent – this will be influenced by growth in users but mainly driven by many more users having access to high connection speeds. This will significantly increase the opportunity for internet piracy of more complex, high quality content.
- 3 The volume of illegally downloaded content will grow by 34 per cent p.a. – in line with IP traffic growth.

32 This is consistent with the Australian Government's stated aim of the NBN will bring fast broadband access to over 90 per cent of Australian homes and businesses.

33 Cisco Visual Networking Index Forecast available at http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11481360_ns827_Networking_Solutions_White_Paper.html.

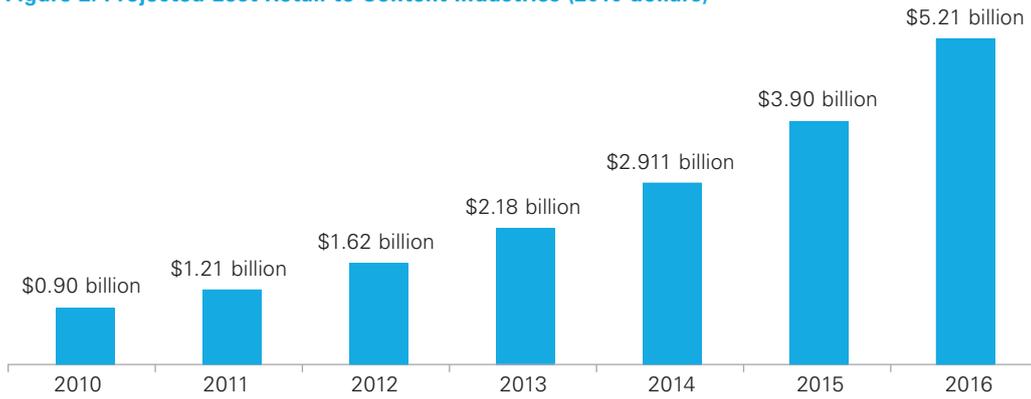
34 The TERA report provides for two scenarios – first, that digital piracy activity will grow in line with file-sharing traffic, providing a conservative estimate of losses of 18 per cent. The second scenario, which is more applicable to the Australian environment with the introduction and take-up of the NBN, is that digital piracy activity growth will follow consumer IP traffic trends. We have therefore adopted the results from this scenario.

35 1.7 per cent per annum, (Source: Australian Bureau of Statistics Cat No 6202).

36 1.0 per cent per annum, (Source: Australian Bureau of Statistics Cat No 3222).

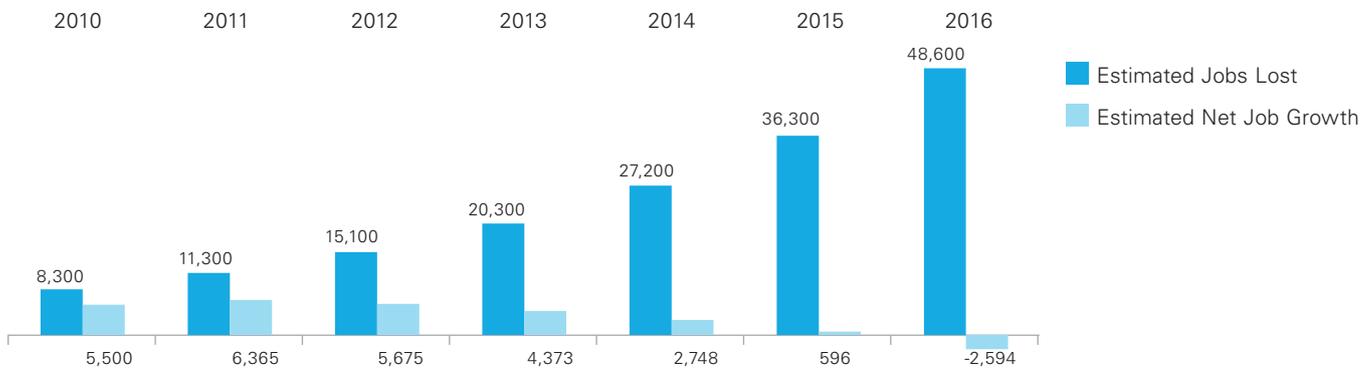
4 The cumulative value of lost retail will be \$17.9 billion.

Figure 2: Projected Lost Retail to Content Industries (2010 dollars)



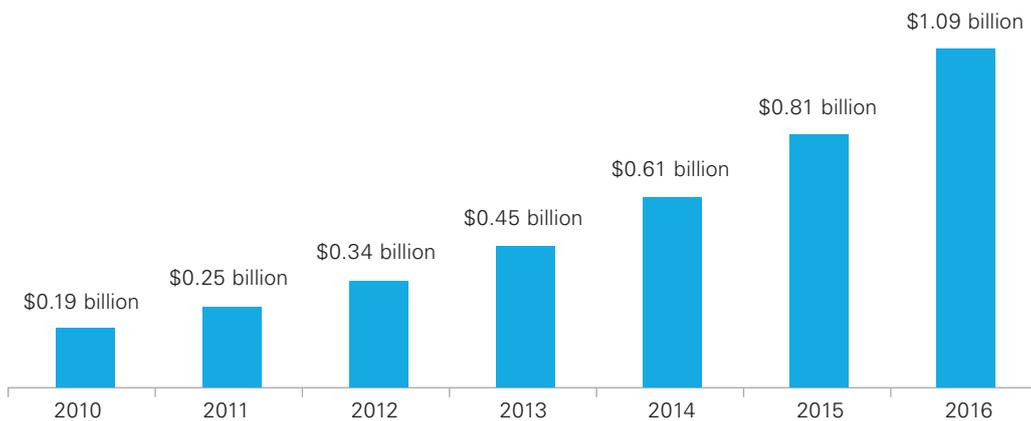
5 An additional 40,300 jobs in the content industries will be lost. Significantly, we estimate that by 2016 more jobs will be lost in the sector than created.

Figure 3: Projected Jobs In Australian Content Industries



6 The cumulative value of forgone revenue to the Commonwealth Government will be \$3.7 billion.

Figure 4: Projected Lost Revenue to Commonwealth Government (2010 dollars)



Conclusion

Based on the information that we have available to us, we estimate that in 2010 internet piracy in Australian took \$900 million out of the Australian economy and was responsible for the loss of over 8,300 jobs. The consequent taxation revenue loss to the Commonwealth Government was \$190 million.

This level of economic loss is significant, in particular considering that a quarter of the Australian population still has no access to the internet and one third only has access to low-speed connections.

Furthermore, unless remedial action is taken, the economic costs of internet piracy are likely to grow exponentially. Our estimates show that by 2016:

- The value of lost retail to content industries will grow by a factor of 5.8.
- The number of lost jobs will grow by a factor of 5.9.
- Revenue forgone by the Commonwealth Government will grow by a factor of 5.7.

This will be caused both by growth in internet users and growth in internet traffic due to higher connection speeds. From 2010 to 2016 we estimate that the number of internet users accessing online content illegally will grow from 4.4 million to 8 million²².

In practice, greater access to faster connections to the internet will be a much more significant factor than additional users when it comes to the overall volume of internet piracy.

It is clear that the rollout of the NBN will contribute to greater access on both counts.

Our estimates also show that by 2016, content industries could be losing more jobs than they create. This would be a devastating outcome for a sector that should be experiencing strong growth with the rollout of the NBN. It is also a sector that had been an Australian economic success story as reflected by the fact that, as shown in Table 2, our content industries' GDP per capita is higher than the average for the five EU countries used in the TERA study.

²² Based on ARC Centre for Excellence for Creative Industries finding that the proportion of internet users utilising file-sharing to access content illegally grew from 23.6 per cent in 2008 to 27.8 per cent in 2010 (an additional 2.1 percent per annum).

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