Digital Convergence and Diminished Creative Industry Growth: A New Zealand Case Study

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Executive Summary

The New Zealand Government's recent Green Paper "Exploring Digital Convergence" (EDC) suggests that so-called "digital convergence," or convergence in telecommunications, information technology, media and entertainment (TIME) sectors is facilitating the creation, dissemination and consumption of creative works.[1] This paper analyses the economic performance of the film and television industry in New Zealand to see if there has been any correlated increase in revenues, employment and output during the time of this convergence. Our review suggests the evidence in New Zealand is inconsistent with any suggestion that convergence has facilitated a dramatic increase in revenues or output for the creative sector. Our findings suggest the opposite:

- Total screen industry revenues as measured by Statistics New Zealand's Screen Industry Survey (SIS) which commenced in 2005 shows that from 2005-2015, there is a shortfall of total screen industry revenues over the ten-year period of approximately $4.6 billion against what they would have been had revenues kept pace with inflation and economic growth. This estimate includes just over $3 billion in the "production and post-production"[2] (PPP) sector.
- Alternative scenarios described in more detail in this paper involving historical data yield estimates for the shortfall in production and post-production (PPP) revenues ranging from estimates of $3.94 billion in total over the ten-year period from 2005 to 2015, including a $600 million shortfall in the final year, to a considerably higher estimate, where the shortfall in PPP revenues reaches $4.1 billion in the last year (2015) alone. This upper scenario further suggests that by the end of the 14-year period 2001-2015, the shortfall in *total screen industry* revenues would have been $8.5 billion in the last year (2015) alone. In other words, total screen industry revenues in 2015 would have been closer to $12 billion in 2015, rather than $3 billion actual.
- At the same time, screen industry employment is also down and there has been no measurable increase in film and TV output during the data available from 2011.

The data is more consistent with the need to move to stronger copyright in New Zealand to restore the effective rate of copyright protection and stem the loss of revenue and decreased production, not weaker copyright. More advanced empirical work, of course, is justified, but at this stage this is the direction to follow if one adopts an evidence-based approach to policy.

Total New Zealand Screen Industry Revenues

In this paper, we review data on total screen industry revenues as measured by Statistics NZ using the Screen Industry Survey (SIS), which commenced in 2005[3] against the counterfactual of what revenues would have been if they had kept pace with the rate of inflation and economy-wide GDP growth. This shows that by 2015, total screen revenues were 80% of what they would have been had they grown by the rate of inflation and the economy wide GDP rate in the subsequent ten years from 2005. Thus, revenues would have been 25% higher by 2015 (20%/80%) if they had kept up with the rate of inflation and the economy wide GDP growth rate from 2005. Based on

[1] Released in August 2015 by the Honourable Amy Adams, published here http://convergencediscussion.nz/wp-content/uploads/2015/08/Exploring-Digital-Convergence-Issues-for-Policy-and-Legislation-2015-08-27.pdf ;

[2] The *production and post-production sector* are involved in making screen productions, such as films, television programs or television commercials. Production refers here to all work leading up to and including filming, such as hiring crew, choosing locations and building sets. Post-production refers to all the work involved in putting scenes together to complete a production, such as editing, physical and digital effects, sound and picture post production.

[3] Total revenues include production and post-production, television broadcasting, film and video distribution and film exhibition.

the difference between actual revenues and those that would have been realized had revenues kept up with the rate of inflation and the economy wide GDP growth, the total lost or foregone revenues in the New Zealand screen industry over the ten-year period since the advent of BitTorrent in 2004 is around $4.6 billion. The deficit or loss since 2004 averages $465 million a year, but by 2015 had reached as high as nearly $800 million a year. This same analysis also shows that from 2005-15 the shortfall in production and post-production revenues alone was just over $3 billion, compared to what it would have been had it kept pace with inflation and economic growth. Production and post-production revenues constituted a fairly steady 47% of total revenues through the period 2005-15.

Production and Post Production Revenues

The above approach is limited in that it takes only one year, 2005, as its base, and uses economy-wide inflation and economic growth post 2005 as a benchmark for Screen Industry growth. Thus, we may be underestimating the real shortfall, if 2005 was already a low number, and/or if the New Zealand screen industry typically grew faster than inflation and economic growth prior to 2005. We therefore use data that is available on production and post-production revenues prior to 2005[4] to develop two other benchmark scenarios.

In the first scenario, in order to establish a counterfactual to judge actual against expected, we compare actual PPP revenues in New Zealand post 2005 (the same base year – 2005, the year after BitTorrent launched), against a conservative growth rate estimate developed by New Zealand Institute of Economic Research (NZIER) in 2005.[5] NZIER conservatively predicted that growth in PPP revenues in New Zealand would continue beyond 2004 at the 1994-1998 growth rate. This was viewed as conservative as 1994-1998 was a period of low growth relative to the period from 1999-2003.[6]

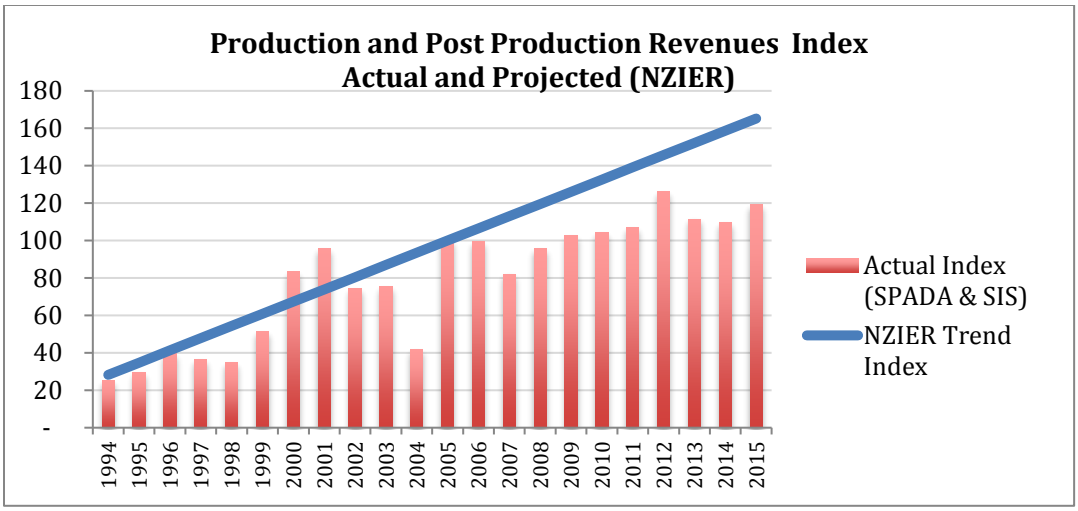
Subsequent trends based on the data collected from 2005 by Statistics NZ using the SIS shows that from 2005, growth in PPP revenues in New Zealand slowed rapidly from that conservatively projected by NZIER. By 2015, PPP revenues were 38% lower, or $600 million less, than would have been predicted by NZIER's 2005 conservative methodology using earlier trends. The total value gap (or shortfall in PPP revenues) across the ten-year period post 2005 was around $3.94 billion compared to the conservative projections. In other words, post 2005, following the spread of broadband Internet and the growth of piracy, PPP revenues failed to keep up with conservative expectations in New Zealand, based on earlier growth rates in the sector. The bar chart in the figure below shows how an index of actual PPP revenues performed compared to the NZIER's conservative trend line projection.[7]

[4] This data was collected between 1994 and 2004 on behalf of the Screen Production and Development Association (SPADA), with funding by a number of government agencies

[5] see NZIER "Survey of Screen Production in New Zealand 2004" at http://www.spada.co.nz/assets/Uploads/Highlights-SPADA-Screen-Production-Survey-2003-2004.pdf prepared for Screen Production and Development Association of New Zealand (SPADA).

[6] It nevertheless involved growth of 13.3% per annum reflecting the dynamism of the sector in the 1990s.

[7] As the chart incorporates two different data sources that do not overlap, an index is used. SPADA data is indexed against 2004, while SIS data is indexed against its 2005 value, in order to provide the trend line.



We further compare actual PPP revenue growth with a number of other alternative growth scenarios. In one scenario, using a less conservative approach than above, we compare actual PPP revenues to results that would have been achieved if, after reaching the highs in 1999-2003 (using 2001 when PPP revenues peaked as the base year), PPP revenues had kept pace with underlying inflation and economic growth. This analysis suggests an even greater shortfall. Indeed, by 2015 PPP revenues are shown to be 27% of what they might have been had they simply kept pace with inflation and economy wide growth after reaching a high in 2001. By 2015, PPP revenues alone in New Zealand would have been nearly 3.6 times higher in that year, or around $4.1 billion dollars higher in one year, at $5.7 billion in 2015, not $1.6 billion, had they kept pace with inflation and economic growth after 2001. If other screen industry revenues had similarly kept pace, then total screen revenues would have been nearly $8.5 billion dollars higher in 2015, at around $12 billion under this estimate, rather than the $3 billion actual in 2015.

Screen Industry Output (Production)

Despite the gap between actual screen industry revenues and what revenues would have been if they had kept pace with inflation and economy-wide growth, there may be a hypothetical version of an expanded creative market where prices dropped significantly, but the volume of film and TV creative works in New Zealand increased. The SIS has only collected data on output[8] since 2011, but contrary to that view, our analysis shows that television programming output in New Zealand fell, so that by 2015 the total number of one off TV programmes was 67% of the 2012 total, and the number of series 85% of the 2012 total, while feature film output was flat.

Screen Industry Employment

Finally, we analyze data collected by SIS on the number of people employed and the number of jobs in the screen industry in New Zealand from 2005 to 2015. Once again, it shows that over the period from 2005-2015 the number of people employed in the screen industry in New Zealand decreased by 1%, and the number of jobs decreased by 8%, while the New Zealand number of industry jobs overall grew 11% during that time period, according to Statistics NZ data.[9]

[8] Statistics New Zealand measures output as completed screen industry works including feature films, television programmes, commercials, non-broadcast media, music videos and other.

[9] http://nzdotstat.stats.govt.nz

In conclusion, our review of the data suggests that while convergence may have initially had a beneficial effect for the New Zealand film and TV industry, over the long term and during the spread of online piracy, production and post-production revenues, and total revenues in the screen industry in New Zealand have not kept pace with inflation and economy-wide growth, while employment and output have fallen. As a result, the total lost or foregone screen industry revenues to the NZ economy over the ten-year period since the advent of BitTorrent in 2004 is around $4.6 billion. The deficit or loss since 2004 averages $465 million a year, but by 2014 and 2015 had reached as high as nearly $800 million a year.

Therefore, at this stage, review of the evidence is inconsistent with the view that convergence has led to increased growth in the creative sector, and instead is more consistent with the need to move to stronger copyright in New Zealand to restore the effective rate of copyright protection.

Introduction

The New Zealand Government's recent Green Paper "Exploring Digital Convergence" (EDC) suggests that so-called "digital convergence," or convergence in telecommunications, information technology, media and entertainment (TIME) sectors has offered great opportunities for content creators by facilitating the creation, dissemination and consumption of creative works.[10]

This paper analyses economic performance of the film and television industry in New Zealand to see if there was a correlated increase in revenues, employment and output during the time of this convergence. Our review suggests the evidence in New Zealand is inconsistent with the view that convergence has facilitated a dramatic increase for the creative sector.

The Convergence Hypothesis

The New Zealand Government's hypothesis that digital convergence offers great opportunities for content creators is made clear in the EDC where it states that:

> "online distribution …. offers great opportunities for content creators. Social media platforms like Facebook and Twitter increase the speed at which ideas flow around the world. This has levelled the playing field between amateur and professional producers in their ability to influence public debate and popular culture, and is fostering a new generation of writers, film-makers, performers, and app developers." (EDC, page 5)

The hypothesis that digital convergence is facilitating the creation, dissemination and consumption of creative works is further elaborated later in the EDC, where it is commented that:

> "The convergence of communications technologies is changing how the creative sector disseminates its products to consumers in New Zealand and abroad. Together with technological developments facilitating the creation, dissemination and consumption of creative works, this has:
> - lowered the entry barriers for people trying to provide their creative works to end users,
> - enlarging the category of people who can effectively participate as creators or distributors." (EDC, page 20)

This view that convergence offers great opportunities for content creators by facilitating the creation, dissemination and consumption of creative works has been dominant in policy circles and has served as the basis for calls for an expansion of exceptions and limitations to copyright law, including adoption of US-style fair use exceptions.[11]

It is only now we have sufficient data to test the hypothesis upon which so much law and policymaking depends. Sufficient time has now passed since the beginning of the era of digital convergence to allow us to look at the data on sales, investment and employment in creative industries in New Zealand and see if they have boomed with the advent of the internet and digitisation. In this paper, we examine the data for the New Zealand film and television industries

[10] Released in August 2015 by the Honourable Amy Adams, published here: http://convergencediscussion.nz/wp-content/uploads/2015/08/Exploring-Digital-Convergence-Issues-for-Policy-and-Legislation-2015-08-27.pdf ;

[11] For example see the recent Australian Productivity Commission Report http://www.pc.gov.au/inquiries/current/intellectual-property/draft

to test the hypothesis that digital convergence has facilitated a dramatic increase in the revenues and output of the film and television sector in New Zealand, and the evidence leads us to reject it outright.

Impact on the New Zealand Screen Industry

The question, then, is whether the spread of digitisation and the internet is reflected in a correlated increase in sales, investment and employment in the New Zealand screen industry as suggested by the EDC.

Total Industry Revenues Post 2004

Starting in 2005, Statistics New Zealand (Statistics NZ) began the Screen Industry Survey (SIS). The SIS constitutes a census[12] and Statistics NZ report they achieve high response rates, with 97% for key respondents and 73% for all in 2005. Statistics NZ collects data annually in the SIS on gross revenues received by screen production businesses, including funding,[13] sales income, payments and other financing arrangements.

In Table 1 below, column two presents SIS data for total nominal screen industry revenues, which includes revenues for not only production and post-production, but also television broadcasting, film and video distribution, and film exhibition. Column three presents CPI and column four presents GDP (constant prices), both shown as an index from the base year of 2005.

If the EDC convergence hypothesis was correct, then (all else equal) one might expect to see screen industry revenues doing better than inflation and the economy wide GDP growth rate. In the remainder of the table, therefore, we test whether screen industry nominal revenues kept up with inflation and the economy wide GDP growth rate, to ascertain if the underlying data is consistent with the hypothesis that the spread of digitisation and broadband internet has been associated with an uplift in the growth in measured revenues in New Zealand. On the other hand, if nominal revenues failed to keep up with underlying inflation and economic growth, this would tend to be inconsistent with the hypothesis that the spread of digitisation and broadband internet has been associated with an increase in growth in screen industry fortunes.

Table 1: Total Screen Industry Revenues 2005-2015: SIS Statistics NZ

	Actual Total Revenues $ Millions	CPI Index	GDP Index	CPI *GDP Index	Hypothetical Revenues *CPI *GDP $ Millions	Difference Actual Less Hypothetical $ Millions
2005	2,639	100	100	100	2,639	-
2006	2,674	103	103	107	2,819	-145
2007	2,480	106	106	113	2,970	-490
2008	2,735	110	109	120	3,155	-420
2009	2,806	113	108	122	3,210	-404

[12] Statistics NZ noted in its first press release in 2005 "Previous data on the New Zealand screen industry can be obtained from the Screen Production and Development Association (SPADA). As this survey was conducted using different populations and methodologies, comparisons between the surveys are not recommended.

[13] Statistics NZ defines funding to include "direct investment made by government and private organisations specifically targeting a single project or series of projects to aid with costs and enable production. Funding agencies have no expectation of ownership or profit in return for money provided." SIS 20015 " Unlike the previous SPADA surveys, financing is not included within the funding figure."

2010	2,873	115	107	123	3,257	-384
2011	2,999	120	109	131	3,448	-449
2012	3,290	122	111	136	3,591	-301
2013	3,148	123	114	140	3,705	-557
2014	3,155	125	117	146	3,865	-710
2015	3,221	125	121	152	4,013	-792
Total						-4,653

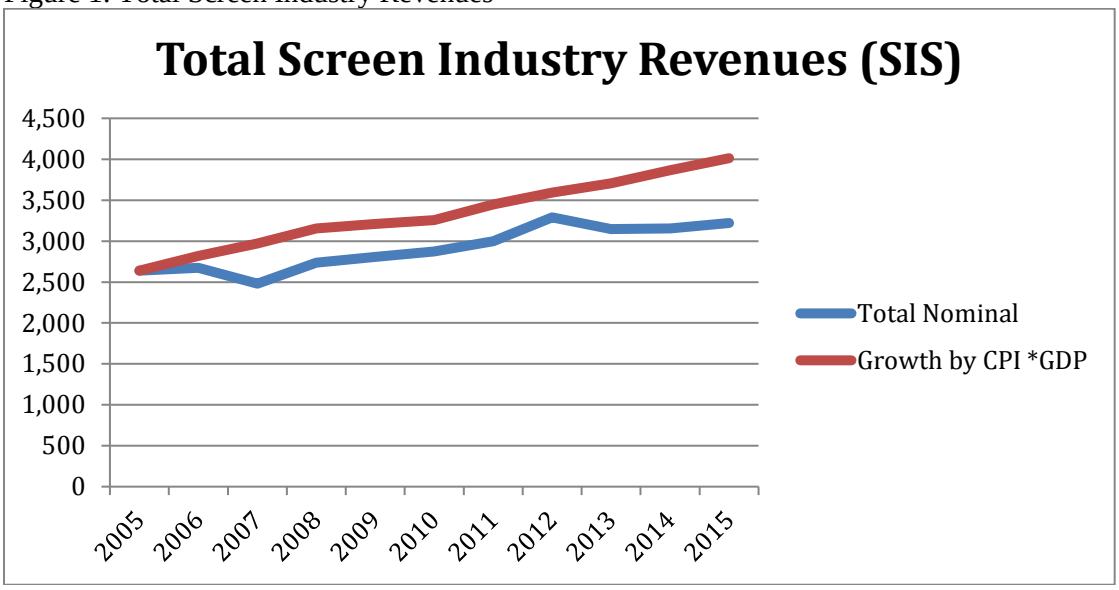
As a benchmark, then, column five of Table 1 presents an index based on 100 in 2005 which grows in subsequent years at a rate per annum equal to the combined actual economy wide rate per annum of CPI inflation (column 3) and real GDP growth (column 4) over the period. Thus, it shows the rate of growth in total revenues that would have been achieved if total screen revenues had kept up with the combined rates of growth of CPI inflation and real GDP growth. The sixth column then derives the hypothetical revenues that would have been realized in each year from 2005 had revenues kept up with the rate of inflation and the economy wide real GDP rate, using the index from the fifth column.

The last row of column six shows that by 2015 total screen revenues would have been $4.013 billion had they kept up with the rate of inflation and the economy wide real GDP growth rate from 2005. By comparison, as shown in the last row of column two, actual revenues in 2015 were only $3.22 billion, or only 80% of the $4.01 billion they would have been had total revenues kept up with the rate of inflation and the economy wide real GDP growth rate from. Thus, actual revenues would have been 25% higher (20%/80%) had they kept up with inflation and economic growth.

The final column of Table 1 shows the value gap or difference (deficit/loss) per annum between actual revenues, and hypothetical revenues, or those that would have been realized had revenues kept up with the rate of inflation and the economy wide GDP rate from 2005. As shown in the last row of the last column in Table 1, the total lost or foregone revenues over the ten-year period since the advent of BitTorrent in 2004 is around $4.65 billion. It averages $465 million a year, but the deficit surpassed $700 million a year by 2014, and has since risen to nearly $800 million in 2015.

The graph (Figure 1) below further illustrates clearly the growing deficit between actual nominal revenues which is the lower line, and what revenues would have been in each year from 2005 had revenues simply kept up with the rate of inflation (CPI) and the economy wide real GDP growth rate.

Figure 1: Total Screen Industry Revenues



NZ Production and Post-Production Revenues

The above approach is limited in that it takes only one year, 2005, as its base, and uses economy-wide inflation and economic growth post 2005 as a benchmark for screen industry growth. It would be helpful to go back further in the data and understand whether we may be underestimating the real shortfall, i.e. if 2005 was already a low number, and/or if the NZ screen industry typically grew faster than inflation and economic growth prior to 2005.

To examine trends over a longer period we first analyze SIS data collected from 2005-2015 for the subset of total screen industry revenues called production and post production (PPP) revenues[14] and then earlier data on PPP revenues from 1994 to 2004 collected on behalf of the Screen Production and Development Association (SPADA), with funding from Government agencies like NZ on Air and the New Zealand Film Commission. The SIS data which we drew on above separately identifies PPP revenues and shows that it constituted a fairly steady 47% of total screen industry revenues through the period 2005-15. PPP revenues may thus offer a reasonable proxy for trends in overall screen industry revenues. While the SPADA series was a less complete survey than the SIS – it only focused on PPP revenues not total screen revenues, and used a partial sample –it nonetheless enables us to take an earlier view on underlying trends. To overcome differences in the data we use an indexing method. Using PPP revenue data from both the SIS and SPADA data sets enables us to create a proxy growth index for PPP revenues over a 20 year period from 1994 to 2015, with PPP revenues as noted being a key component and therefore potentially useful proxy for overall industry revenues.

[14] The *production and post-production sector* are involved in making screen productions, such as films, television programs or television commercials. Production refers here to all work leading up to and including filming, such as hiring crew, choosing locations and building sets. Post-production refers to all the work involved in putting scenes together to complete a production, such as editing, physical and digital effects, sound and picture post production.

Screen Industry Survey - PPP Revenues 2005-2015

In Table 2 below, the second column shows the SIS estimated nominal dollar value of production and post-production[15] revenues in New Zealand by year for the period from 2005. Once again in the table we adjust the 2005 nominal revenue figure (in column two) for the rate of growth of the CPI and real GDP (shown in the third column) to obtain the hypothetical value that production and post-production revenues would have been in New Zealand (in the fourth column) had they kept pace with the rate of inflation and real GDP growth from 2005.

Table 2: Production and Post Production Revenues 2005-2015: SIS Statistics NZ

1	2	3	4	5	6
	Actual PPP Revenues $ Millions	CPI *GDP Index	Hypothetical Revenues * CPI *GDP $ Millions	Difference Actual less Hypothetical $ Millions	Actual % Of Hypothetical
2005	1,311	100	1,311	-	100
2006	1,305	107	1,401	-96	93
2007	1,076	113	1,476	-400	73
2008	1,258	120	1,567	-309	80
2009	1,347	122	1,594	-247	84
2010	1,366	123	1,618	-252	84
2011	1,403	131	1,713	-310	82
2012	1,654	136	1,784	-130	93
2013	1,462	140	1,841	-379	79
2014	1,435	146	1,920	-485	75
2015	1,565	152	1,994	-429	79
Total				-3,037	

In the fifth column, we show the shortfall in actual PPP revenues compared to the hypothetical value per annum. The cumulative shortfall in PPP revenues compared to what they would have been had they kept pace with inflation and economic growth over the ten-year period is approximately $3.04 billion as shown in the last row of the fifth column. This represents around 65% of the deficit in total screen industry revenues identified earlier of $4.65 billion.

The sixth and last column of Table 2 shows actual SIS measured production and post-production revenues in New Zealand as a percentage of the hypothetical revenues had they kept up with the underlying rate of inflation and economic growth from 2005. As shown in the last row of the last column, the most recent SIS data suggests that the value of production and post-production revenues in 2015 was 79% the value it would have been had it grown at the rate of inflation and GDP growth over the period since 2005. This is about the same shortfall as the fall in total screen industry revenues to 80% of the value it would have been as identified above, indicating PPP revenues may be quite a good proxy for analyzing growth rates in total screen industry revenues.

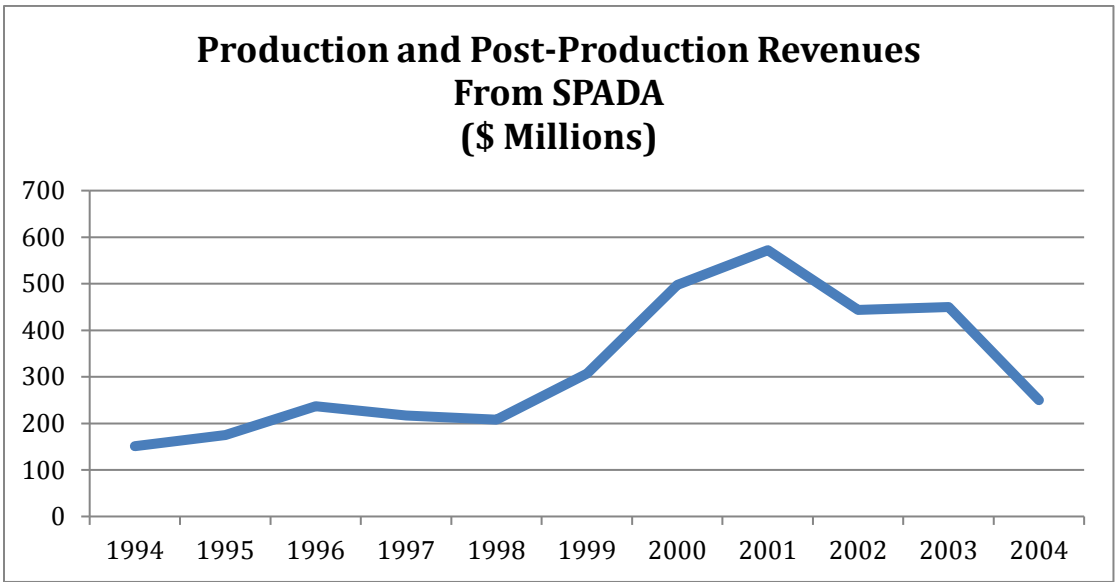
[15] Statistics NZ defines production to include all work leading up to and including filming. This includes development, pre-production and principal photography. Post Production includes all activities involved in putting together scenes to make a production complete, for example editing, duplication, visual effects, audio.

SPADA Data – PPP Revenues 1994-2004

To examine trends in PPP revenues prior to 2005, as noted it is possible to use the data on production and post-production revenues in New Zealand collected from 1994 to 2004 on behalf of the Screen Production and Development Association (SPADA) with funding from Government agencies like NZ on Air and the New Zealand Film Commission. Although the SPADA data was not a complete census, it provides a measure of PPP revenues over time from which we may be able to form a view on the underlying growth trend prior to 2005 when the SIS data started to be collected.

The SPADA data is shown in Figure 2 below. While it appears the early days of digitisation that supported animation of films may have helped with steady growth through the 1990s, the value of production and post-production revenues appear to peak in 2001 and then decline.

Figure 2: Nominal Production and Post Production Revenues ($ Millions) – from SPADA



In what follows we compare the above trend in actual PPP revenues from 1994 to 2004 taken from SPADA data with what PPP revenues would have been had they kept pace with actual economy wide inflation and real GDP growth from 1994 to 2004.

In Table 3 below, the second column presents the data on nominal production and post-production revenues in New Zealand collected on behalf of SPADA from 1994 to 2004 and used in the above graph. Column three presents the CPI and column four, the GDP (constant prices), both shown as an index from the base year of 1994. As can be seen from these two columns, inflation averaged around 2% per annum over the period, while the underlying real growth rate in GDP averaged around 3.5% per annum. Inflation alone would have had the effect of increasing nominal revenues by over 20% over the period 1994 to 2004. The underlying long run GDP growth rate would also have increased it further - by over 40%. The combined effect of both the underlying inflation and real growth rates in increasing revenues would thus have been significant.

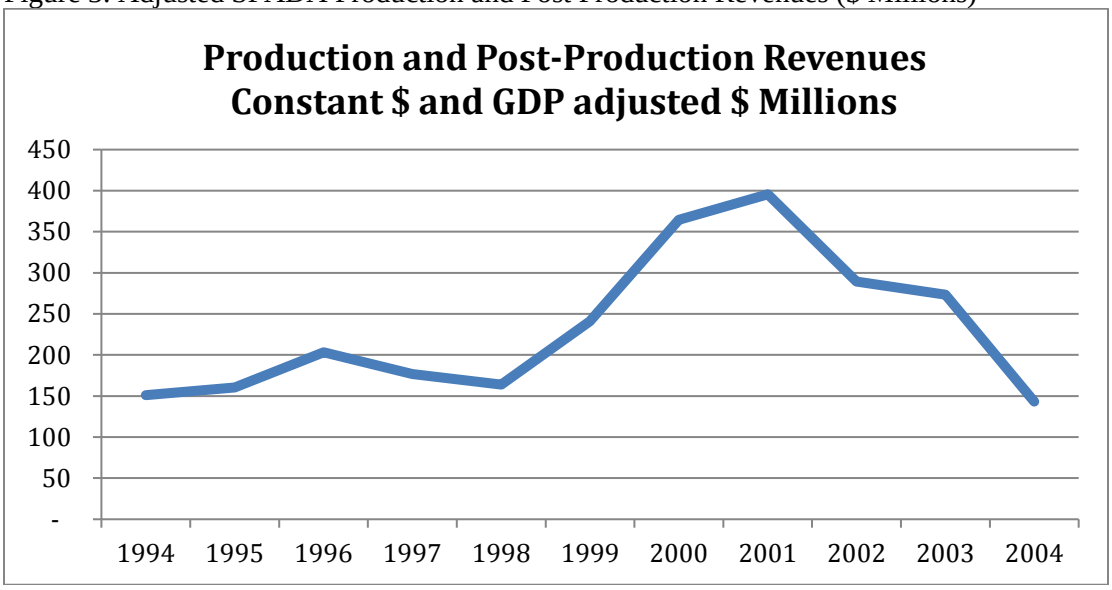
Table 3: Production and Post Production Revenues: 1994-2004 SPADA Data

1	2	3	4	5	6	7
	PPP Revenues $ Millions	CPI Index	GDP Index	CPI *GDP Index	Hypothetical Revenues * CPI *GDP $ Millions	Difference Actual less Hypothetical $ Millions
1994	151	100	100	100	151	-
1995	175	104	105	109	165	10
1996	237	106	110	117	176	61
1997	217	108	113	123	185	32
1998	208	110	116	127	192	16
1999	307	109	116	127	192	115
2000	497	111	123	136	206	291
2001	572	115	126	145	218	354
2002	444	117	131	153	232	212
2003	450	120	137	165	249	201
2004	250	122	143	175	264	-14

We show the combined effect of inflation and GDP growth in the index in the fifth column. We use this index to adjust the 1994 nominal value of measured PPP revenues in New Zealand upwards to identify in the sixth column how PPP revenues would have grown had they kept pace with inflation and the underlying GDP growth rate - hypothetical PPP revenues. The final or seventh column in the table shows the difference between the actual PPP revenues (column two) and hypothetical (column six). It thus shows in each year how much actual revenues grew over and above inflation and the real GDP growth rate from 1994. The last row of the last column shows that after declining from 2001, by 2004 the actual value of PPP revenues (shown in column 2) was $14 million less than it would have been had it grown at the rate of inflation and real GDP (shown in column six).

Figure 3 below shows the same trend line in Figure 2, but this time using CPI and GDP adjusted PPP revenues, or PPP revenues in constant dollars (adjusted for inflation) and adjusted for real GDP growth. If PPP revenues had only grown by inflation and real GDP growth then adjusted PPP revenues would have been constant, and displayed as a straight horizontal line. Figure 3 thus shows the substantial growth during the 1990s and the subsequent decline post 2001 compared to underlying inflation and GDP growth.

Figure 3: Adjusted SPADA Production and Post Production Revenues ($ Millions)



As can be seen from the final column of Table 3 above and Figure 3, when one adjusts the data for inflation and economic growth, it is not consistent with the EDC convergence hypothesis. Convergence does not appear to have offered great opportunities for content creator revenues. Instead the data is more consistent with the notion that

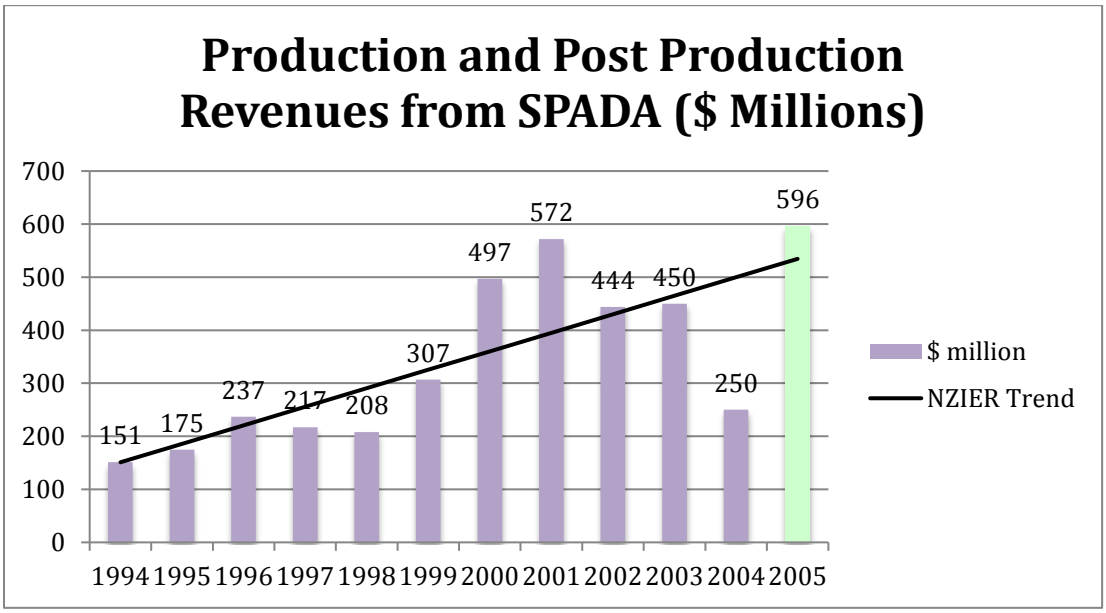
1) Initially digital convergence might have been good for the New Zealand film and television industry. Until the peak in 2001, measured production and post-production revenues in New Zealand had grown by more than inflation and underlying GDP growth. In 2001, actual PPP revenues reached $572 million, which as shown in Table 3 was 2.62 times the $218 million it would have been if it had grown only by inflation and the underlying GDP growth rate from 1994.
2) From 2001, however, the value of production and post-production revenues starts to fall, so much so that by 2004 it is below the level it would have been had it grown at the underlying rate of inflation and GDP growth from 1994. By 2004, the value of production and post-production revenues was 95% the value it would have been had it grown at the rate of inflation and GDP growth over the period since 1994.

After 2004, the SPADA data series came to an end. Instead, this method of collecting data by the industry was replaced by the Screen Industry Survey (SIS) run by Statistics NZ. We know from our analysis of SIS data above, that screen industry revenues have continued to fall since 2004, with the most recent SIS data suggesting that by 2015 the value of production and post-production revenues were 79% the value they would have been had it grown at the rate of inflation and GDP growth over the period since 2005**.** In the following sections, we explore ways to combine the SPADA data prior to 2004 with the SIS PPP revenue data for the period post 2004, so we can further explore how the industry performed through the entire period 1994-2015. The problem we have to overcome first is that there is no overlapping year between the SPADA and SIS series that would have enabled us to simply link an index of PPP revenue growth using both series.

NZIER Review of SPADA data and Growth Forecast for 2005

When the SPADA data collection came to end in 2005, the New Zealand Institute of Economic Research (NZIER) was asked to do a review of the data collected to that point.[16] The diagram below replicates a graph from the NZIER report of PPP revenues measured using the SPADA method.[17]

Figure 4: Production and Post Production Revenues: 1994-2004 SPADA Data, 2005 NZIER Forecast



As part of its review and report on the data, NZIER developed a prediction for what would happen to PPP revenues in 2005. We shall use this forecast to provide the link between the SPADA and SIS data series. NZIER predicted that growth in PPP revenues in New Zealand would continue beyond 2004 at the 1994-1998 growth rate. This was viewed as conservative as 1994-1998 was a period of low growth relative to the period from 1999-2001.[18] Figure 4 shows NZIER's trend line used for making a prediction for 2005 based on 1994-1998 growth rates, which resulted in a forecast value for PPP revenues in 2005 of around $535 million. It is interesting to note that the NZIER also included in the bar chart a higher value estimate for PPP revenues in 2005 of $596 million, which was not fully explained. This higher bar chart estimate for 2005, however, appears overly optimistic, as it is not only higher than the NZIER's trend line based on 1994-98 growth rates, but also higher than the 2001 peak of $572 million, and further ignores the fact that PPP revenues were already falling post 2001. Indeed, as we have shown, by 2004 PPP revenues were 36% what they would have been had they grown post 2001 simply by the CPI inflation rate and real GDP growth rate for the period. Thus, in what follows we shall instead use the value for 2005 that would have been predicted using the NZIER trend line (around $535 million), to create the missing link between the SIS and SPADA data series in 2005 for the purpose of developing a single growth index from the two datasets.

[16] see NZIER "Survey of Screen Production in New Zealand 2004" at http://www.spada.co.nz/assets/Uploads/Highlights-SPADA-Screen-Production-Survey-2003-2004.pdf prepared for Screen Production and Development Association of New Zealand (SPADA).
[17] Ibid page 4
[18] It nevertheless involved growth of 13.3% per annum reflecting the dynamism of the sector in the 1990s.

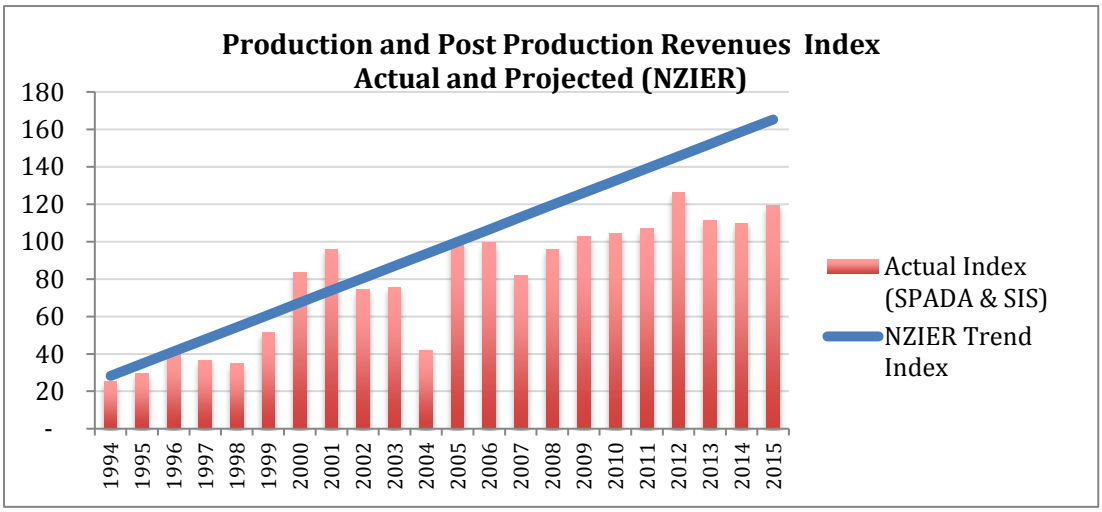
In Table 4 below, column two identifies PPP revenues for the period 2005-2015 taken from the SIS. In column three, we then use this SIS data to derive a growth index for the period 2005-2015, with the index set at 100 in 2005 as the base year. In column four, we present actual PPP revenues measured by SPADA from the survey from 1994 to 2004, and then include NZIER's 1994-98 trend line growth prediction for 2005 as our estimate for 2005, which creates an overlap between the SPADA and SIS series in 2005, as well extending the NZIER trend line to create estimates for the following years. In column five, we use this SPADA data series to derive a growth index for PPP revenues from 1994-2005 with the index again set at 100 in 2005 and the NZIER trend line used to create an index for the subsequent years. Using 2005 as the common base year for both series, column six then presents the result of merging the SIS growth index for 2005-2015 from column three (base year 2005 = 100) with the SPADA index for 1994-2005 from column five (base year 2005 = 100).

Table 4: Merged Growth Index for PPP Revenues 1994-2015

1	2	3	4	5	6	7	8
	SIS Actual Revenues $ Millions	SIS Growth Index (Base 2005 = 100)	SPADA Actual & NZIER Trend Projection $ Million	SPADA Actual & NZIER Trend Index	Merged Index (SPADA & SIS)	% Diff. Between Merged Index & NZIER Trend Index	Value Gap $ Millions
1994			151	28	28		
1995			175	35	35		
1996			237	41	41		
1997			217	48	48		
1998			208	54	54		
1999			307	61	61		
2000			497	67	67		
2001			572	74	74		
2002			444	80	80		
2003			450	87	87		
2004			250	93	93		
2005	1,311	100	535	100	100	0%	
2006	1,305	100	569	107	100	7%	92
2007	1,076	82	604	113	82	38%	406
2008	1,258	96	639	120	96	25%	310
2009	1,347	103	674	126	103	23%	306
2010	1,366	104	709	133	104	27%	373
2011	1,403	107	744	139	107	30%	421
2012	1,654	126	779	146	126	15%	256
2013	1,462	112	813	152	112	36%	533
2014	1,435	109	848	159	109	45%	646
2015	1,565	119	883	165	119	38%	601
							3,942

Figure 5 below shows the resulting merged or combined growth index from column six as a bar chart, and compares it to the SPADA & NZIER trend index line from column five.[19] This shows that from 2005, growth in PPP revenues in New Zealand measured by the growth index, slowed rapidly compared to the conservative trend growth line projected by NZIER in 2005.

Figure 5: Production and Post Production Revenues Index: Actual and NZIER Trend Projection



The size of the annual difference in Figure 5 between the growth index based on merged SPADA and SIS data from 2005 (shown in the bar chart), and that predicted by the NZIER trend line, is identified in column seven of Table 4 above. The last column of Table 4 identifies the size of the implied value gap, or the implication for value of the difference between observed PPP revenue growth rates, and what they would have been if growth had continued at the rate predicted by the NZIER growth trend. Thus, as shown in the last column of Table 4 above, by 2015, PPP revenues were 38% lower, or $600 million less, than would have been predicted by NZIER's 2005 base year trend line created using growth trends from 1994-98. The total value gap or shortfall in PPP revenues using this methodology across the ten year period post 2005 was around $3.94 billion, as shown in the last row of the last column of Table 4. In other words, post 2005, following the spread of broadband internet and the growth of piracy, PPP revenues failed to keep up with the expected growth based on growth rates from 1994-1998. The cumulative shortfall in PPP revenues of $3.94 billion compared to NZIER projections in 2005 across the ten year period post 2005 is 30% higher than the approximately $3 billion shortfall estimated earlier using growth projections based on inflation and economic growth from 2005-2015.

Alternative Growth Scenarios

As noted earlier, the NZIER forecast amount for 2005 that we used in building the merged growth index above was seen to be conservative at the time because the trend growth line they

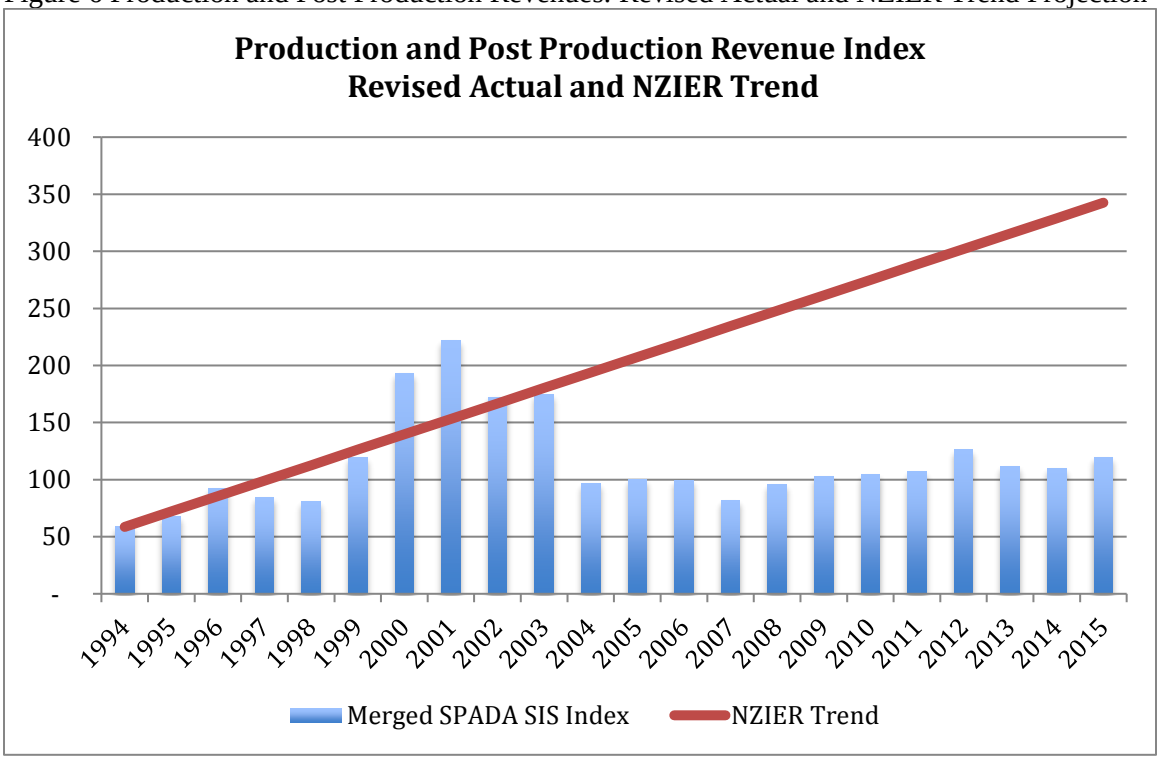
[19] As the chart incorporates two different data sources that do not overlap, an index is used.

used for projection (1994-98) was considerably lower than that later experienced from 1998-2001. Indeed, if NZIER had used trend growth from 1998-2001 this would have projected considerably higher revenues in 2005 of $720 million.

It is, however, worth examining a different "starting point" for 2005 than the $535 million NZIER projected based on the observation that PPP revenues declined post 2001. By 2004, PPP revenues had dropped to $250 million, 44% of the 2001 nominal peak of $572 million, and 47% of the NZIER projection for 2005 of $535 million. This fall in actual revenues relative to NZIER projections after 2001 can be seen in Figure 4 above, which shows the NZIER trend line projected figure for 2005 was considerably higher than the value of the index for the prior three years 2002-04.

Therefore, in a new scenario, we assume measured SPADA PPP revenues in 2005 would have followed the trend in revenues from 2000. Instead of the NZIER forecast of $535 million, we use $258 million as an alternative estimate of the likely PPP revenue figure for 2005. This is calculated based on projecting the trend from 2000-2004 out to 2005. Figure 6 below presents the revised growth index based on a "merged SPADA and SIS" data series using this $258 million as our estimate of the likely PPP revenue figure for 2005, being the overlapping base year, rather than the NZIER prediction for 2005. As shown, this new growth index series shown as a bar chart falls from 2001 and then remains relatively flat. The NZIER trend line in Figure 6 also reflects the change, with 2005 as the base year (base year= 100).

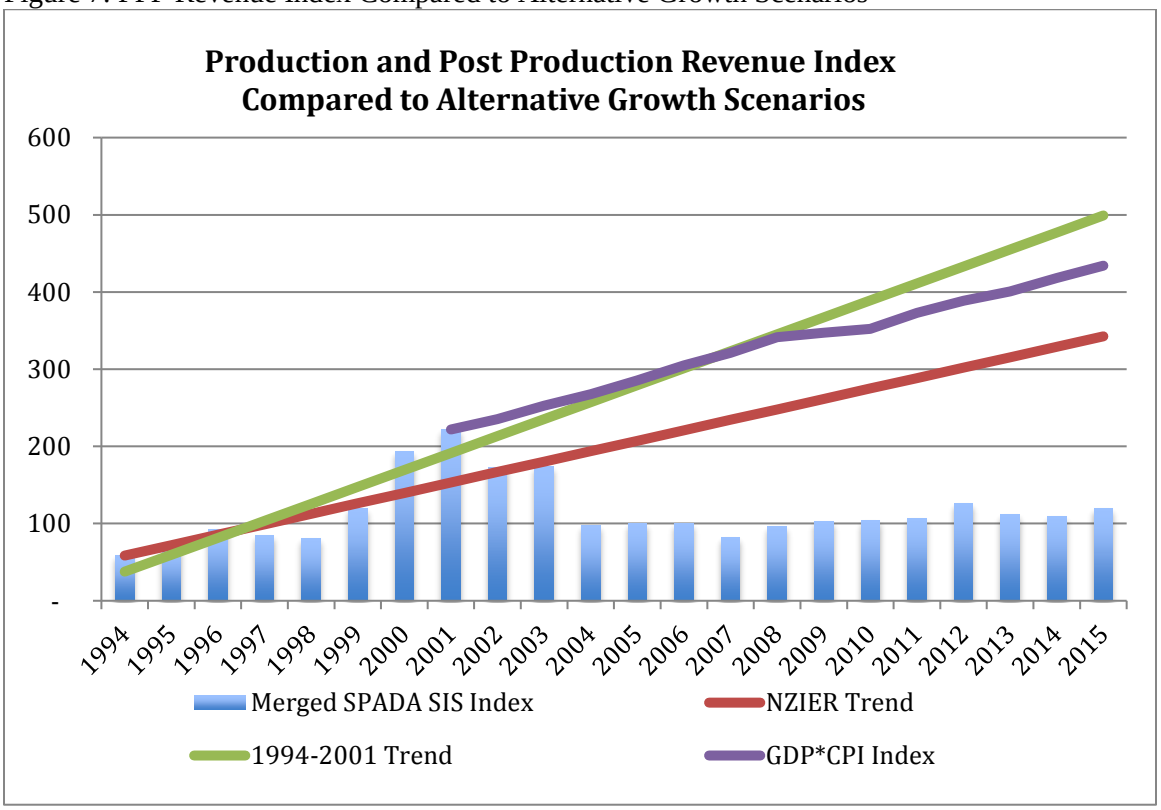
Figure 6 Production and Post Production Revenues: Revised Actual and NZIER Trend Projection



Using the $258 million trend estimate as the revised starting point for PPP revenues for 2005 and 2005 as the index base year generates considerably different measures of the value gap compared to that obtained earlier. This is due to NZIER's predicted starting point revenues in 2005 being 107% higher than the $258 million trend estimate. The size of this annual difference shown in Figure 6 between the revised growth index (shown in the bar chart) based on the revised starting point of $258 million and that predicted by the NZIER trend line then further grows from 107% at the outset in 2005, to around 187% by 2015. This 187% shortfall implies PPP revenues measured in SIS are around $2.9 billion less in 2015 than they would have been had growth been as predicted by NZIER's trend line. The total value gap compared to NZIER's projections (or shortfall in PPP revenues) across the ten-year period post 2005 would be around $24.5 billion, 6.2 times the $3.94 billion shortfall implied by the NZIER projections in 2005 discussed above.

Figure 7 below again presents a further revised growth index (shown as a bar chart), which assumes starting point revenues in 2005 (the linking year between SPADA and SIS) followed the revenue trend from 2000-04 ($258 million). Figure 7 then enables us to compare this bar chart with three alternative growth counterfactuals, or comparator growth scenarios (shown as lines): (1) in red, the NZIER 1994-98 growth trend line comparison seen in Figure 6; (2) in green, a straight line growth trend reflecting the higher growth trend observed over the longer period 1994-2001; and (3) in purple, the actual rate of change in economy wide CPI inflation and real GDP from 2001 to 2015. All three of these comparator growth trends significantly outperformed the revised actual industry growth index. Once again this clearly refutes the EDC convergence thesis.

Figure 7: PPP Revenue Index Compared to Alternative Growth Scenarios



Focusing on the middle (purple) comparator growth scenario, which uses the actual rate of change in economy wide CPI inflation and real GDP over the period from 2001 to 2015, enables us to compare the index trend in actual PPP revenues from the merged SPADA and SIS series to the outcome that would have emerged if PPP revenues had kept pace with underlying CPI and GDP growth after reaching the high in 2001when PPP peaked. This analysis suggests that by 2015 PPP revenues were 27% of what they might have been had they simply kept pace with inflation and economy wide growth after reaching a high in 2001. In summary:

- *PPP revenues* alone in New Zealand would have been nearly 3.6 times higher in 2015, or around $4.1 billion dollars higher in one year - at $5.7 billion, not $1.6 billion - had they kept pace with inflation and economic growth after 2001.
- If other screen industry revenues had similarly kept pace with this PPP revenue growth, then *total screen revenues* would have been nearly $8.5 billion dollars higher in 2015, at around $12 billion under this estimate, rather than the $3 billion actual in 2015.

The foregoing results are clearly inconsistent with the prediction or assumption that online distribution has been associated with an increase in revenues for content creators.

Output Measures

It might be suggested that such substantial shortfalls in revenues as outlined above might still be consistent with the convergence hypothesis advanced in the EDC. The convergence hypothesis in that case would be that prices have fallen a lot, driving down revenues, but creative output has risen – thus causing a huge gain to consumers, who enjoy much lower prices, *and* an increase in output. It is therefore useful to look at output numbers.

The SIS has collected data on completed works since 2011, as shown in Table 5 below. This shows the number of one off or stand-alone television programmes collapsed from 2012, so that in 2015, at 1,000, it was 67% of what it was in 2012, at 1,500. Similarly, by 2015 the number of completed TV series were 80% of the level in 2012, down to 240 from 280, while feature film output was flat at around 35-40. This suggests that the fall in sales outlined earlier has been driven by reductions in prices *and* output.

Table 5: Number of completed works by production format

Production format	Number completed				
	2011 (1)	2012	2013	2014	2015
Feature films	35	40	40	40	35
Television programmes (2)	2500				
Numbers of series	..	280	400	480	240
Number of one-off/stand alone	..	1,500	1,200	1200	1000
Commercials	2300	1,900	2,200	2400	2100
Non-broadcast media	1800	2,900	2,500	3200	2500
Music videos	100	150	120	110	300
Other(3)	110	250	920	420	900

1. Breakdown for television programmes is only available from 2012 onwards.
2. From 2012, the survey asks for the number of television programmes by number of series or number of one-off/standalone programmes. Before 2012, the survey asked for the number of television programmes only
3. Other includes short films.

Note: The figures here are not weighted to represent the screen industry due to variability between individual businesses. These figures represent a lower bound. These figures are graduated random rounded.

Employment impacts

The SIS has also collected data on the number of people employed and the number of jobs in the screen industry in New Zealand over the last ten years. This data is presented in Table 6 below. Contrary to the convergence hypothesis, the number of people employed by the screen industry has fallen by 1%, over the period from 2005-2014, and the number of jobs by 8%. During the same period, the number of jobs in New Zealand overall grew 11%, according to Statistics NZ data.[20]

Table 6: Employment and Jobs: SIS data 2005-2014

Year	Number of People	% Change per annum	Number of Jobs	% Change per annum
2005	14,300		27,700	
2006	14,800	3%	29,500	6%
2007	14,600	-1%	29,400	0%
2008	15,800	8%	30,500	4%
2009	16,000	1%	30,600	0%
2010	15,100	-6%	28,800	-6%
2011	15,100	0%	28,600	-1%
2012	15,900	5%	29,000	1%
2013	15,500	-3%	27,100	-7%
2014	14,200	-8%	25,400	-6%
% Change 2005-2014	-1%		-8%	

Conclusion

The New Zealand Government's recent Green Paper "Exploring Digital Convergence" (EDC)[21] suggests that so-called "digital convergence," or convergence in telecommunications, information technology, media and entertainment (TIME) sectors is facilitating the creation, dissemination and consumption of creative works. To test this "convergence hypothesis", our paper analyses economic performance of the film and television industry in New Zealand to see if there was a correlated increase in revenues, employment and output during the time of this convergence. Our review suggests the evidence in New Zealand is inconsistent with the view that convergence has facilitated a dramatic increase for the creative sector. Our findings suggest the opposite:

- Total screen industry revenues as measured by Statistics New Zealand's Screen Industry Survey (SIS) which commenced in 2005 shows that from 2005-2015, there is a shortfall of total screen industry revenues over the ten-year period of approximately $4.6 billion against what they would have been had they kept pace with inflation and economic

[20] http://nzdotstat.stats.govt.nz

[21] Released in August 2015 by the Honourable Amy Adams, published here http://convergencediscussion.nz/wp-content/uploads/2015/08/Exploring-Digital-Convergence-Issues-for-Policy-and-Legislation-2015-08-27.pdf ;

growth. This estimate includes just over $3 billion in the production and post-production[22] sector.

- Alternative scenarios described in more detail in this paper involving historical data yield estimates for the shortfall in PPP revenues ranging from estimates of $3.94 billion in total over the ten-year period from 2005 to 2015, including a $600 million shortfall in the final year, to a considerably higher estimate, where the shortfall in PPP revenues reaches $4.1 billion in the last year (2015) alone. This upper scenario further suggests that by the end of the 14-year period 2001-2015, the shortfall in total screen industry revenues would have been $8.5 billion in the last year (2015) alone. In other words, total screen industry revenues in 2015 would have been closer to $12 billion in 2015, rather than $3 billion actual.
- At the same time, screen industry employment is also down and there has been no measurable increase in film and TV output during the data available from 2011.

In conclusion, our review of the data suggests that while convergence may have initially had a beneficial effect for the New Zealand film and TV industry, over the long term and during the spread of online piracy, production and post-production revenues, and total revenues in the screen industry in New Zealand have not kept pace with inflation and economy-wide growth, while employment and output have fallen. As a result, the total lost or foregone screen industry revenues to the NZ economy over the ten year period since the advent of BitTorrent in 2004 is around $4.6 billion. The deficit or loss since 2004 averages $465 million a year, but by 2015 had reached as high as nearly $800 million a year.

Therefore, at this stage, our review of the evidence is inconsistent with the view that convergence has led to increased growth in the creative sector. The evidence instead is more consistent with the need to move to tighten copyright in New Zealand to restore the effective rate of copyright protection and stem the loss of revenues and decreased production, not to weaken copyright. More advanced empirical work is, of course, justified, but this is the direction to follow if one adopts an evidence-based approach to policy.

[22] The *production and post-production sector* are involved in making screen productions, such as films, television programs or television commercials. Production refers here to all work leading up to and including filming, such as hiring crew, choosing locations and building sets. Post-production refers to all the work involved in putting scenes together to complete a production, such as editing, physical and digital effects, sound and picture post production.