



Heads and Tails

The Long Tail in Australian Media Markets

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Abstract

This paper analyses sales of products within three Australian media markets – cinema box office, DVD retail and book retail – from 2002 to 2011. Several conclusions are drawn. First, significant long tail characteristics emerged in the books and particularly DVD markets, but not cinema, over the period. Second, where the number of titles selling in a market is changing rapidly, the choice of metric is vital for analysing the existence of a long tail. Third, across all three media, the analysis shows the oldest and most open market – books – has, by a narrow margin, the strongest blockbuster characteristics. Fourth, although the tail has grown for books and DVDs, it is very long and very, very thin. Finally, although this analysis has used three media products that involve comparable consumer transactions and analysed them as discrete markets, there are significant relationships between them which we hope to analyse in further research.

Keywords: long tail; cinema; book publishing; DVD; home entertainment

Introduction

In the years following the dot.com crash, *Wired Magazine's* Chris Anderson adopted a concept from statistics, the 'long tail', to describe how the internet had opened the doors to a new business model by driving demand from the head of the sales distribution curve to the tail (Anderson, 2004, 2006). Companies such as Amazon and iTunes were generating new supply economics, offering a wider range of digital goods and services with reduced storage and transaction costs.

Anderson's story popularised a developing body of academic writing on the effect of the internet on consumer and producer welfare and on product supply chains. In a world of physical constraints and scarce supply, markets for information goods had traditionally been dominated by small proportion disproportionately profitable blockbusters. This was for several reasons: customers choose recognised or greater talent over unknowns; they find social value in consuming the same cultural goods as friends; and larger sellers can take advantage of economies of scale on popular products and offer them for lower prices.

In the 2010 re-print of their 1995 book *The Winner-Take-All Society*, Frank and Cook wrote that, although the long tail might allow increased vibrancy and diversity of cultural products, they thought blockbuster markets had by no means run their course. By helping content creators to pursue a global audience, modern communications technologies may even have accentuated the extent to which small differences in talent and sheer luck can produce jackpot rewards (Elberse, 2008; Frank & Cook, 2010).

Here we are interested in how these shifts in technology and supply economics have affected the purchasing choices of Australian consumers. We examine how the sales of three media changed through the early 2000s.

Researching the Long Tail Effects

In their research commentary, Brynjolfsson, Hu and Smith (2010b) identify four areas of long tail/blockbuster research. First, research about *the existence of long tail and superstar outcomes in different environments* suggests more niche titles are being supplied to markets, but customers are not necessarily shopping the new long tail (Brynjolfsson, Hu & Smith, 2010a; Elberse, 2008; McKenzie, 2010; Michaels, 2008; Page & Garland, 2009; Walls, 2010).

The second research area is *the effect of the long tail on supply chains and the growth of the firm*. Changes in purchasing dynamics not only flow on to suppliers, but also affect cross-channel competition and competition between retailers (Brynjolfsson, Hu & Rahman, 2009). The long tail has underpinned the growth of many internet success stories – Google, eBay, Facebook as well as Amazon and iTunes all rely on accessing a broader customer base than can occur offline. Distribution, promotion and transaction channels are now, at least in theory, available to anyone. Whether this will weaken or strengthen the role of gatekeepers remains an open question.

Brynjolfsson, Hu and Smith's third research area is *the effect of the long tail on the marketing strategies of price, promotion and product*. (Place, here the internet, represents the fourth P of marketing.) This encompasses a wide range of possible research questions and approaches (Elberse, 2010; Goh & Bockstedt, 2008; Zhou & Duan, 2009). A growing body of literature examines the effect of search engines and recommendation tools on demand (Cachon, Terwiesch & Xu, 2008; Fleder & Hosanagar, 2009; Oestreicher-Singer & Sundararajan, 2012).

The fourth area is *the effect of the long tail on society*. As well as economic of welfare measures such as consumer and producer surplus, research in this area also encompasses the question of whether long tail consumption patterns will lead to a global village of informed citizens or to “fractured communications between balkanized groups of consumers” (Brynjolfsson et al., 2010b, p. 742).

This paper addresses Brynjolfsson, Hu and Smith's first research area, *the existence of long tail and superstar or blockbuster outcomes in different environments* in Australian media since the early 2000s. We analyse sales of products within different media markets – cinema box office, DVD retail and book retail – over time, from 2002 to 2011. This extends existing research on long tail effects in Australian media: Elberse's work on Quickflix, which examined six months of DVD rental data, and McKenzie's analysis of DVD revenues for titles achieving initial box office release (Elberse, 2008; McKenzie, 2010).

The Data

Cinema, DVDs and books were selected for analysis because they involve comparable consumer transactions but have very different histories and sales distributions (Figure 1). In all three markets, consumers make discrete purchases of individual titles or viewings of titles. Books have been around for centuries; cinemas for more than a century; DVDs, in Australia, only since 1998. Books and movies are both first-release distribution windows. DVD, as a secondary market, may be regarded in itself as part of a long tail for movies and television programs and is influenced by previous release windows (e.g. McKenzie, 2010; Walls, 2010). Here we use retail sales statistics to examine consumption of these three media.

Box office statistics are collected in Australia from distributors by the Motion Picture Distributors Association of Australia (MPDAA). The primary data covers box office revenue for all films screening commercially in Australian cinemas each calendar year, including new releases and re-releases. The

number of admissions for each title is not supplied directly, but is estimated using an annual average admission price, supplied by the MPDAA (Screen Australia, 2012b).

Australian DVD sales statistics are collected by GfK Retail and Technology Australia, through major retailers. The data is collected from a panel of 1,500 stores, covering around 71% of Australian DVD sales (Screen Australia, 2012a). Blu-ray and VHS are excluded from this analysis, to minimise the risk of confounding the results. Blu-ray was first recorded in the GfK statistics in 2008, and by 2011 represented about 12% of all Australian video sales. VHS sales fell below 2% of total video sales in 2005 and were collected for the last time in 2007. BluRay sales revenues and units are included in the Industry Aggregates section below.

Book sales have been recorded in Australia by Nielsen BookScan since 2003. Data is collected from a fixed panel of over 1,000 retailers covering about 85% of retail book sales (Nielsen BookScan, 2012). BookScan data includes physical sales by Australian retailers via shops and websites. It does not include online sales to Australian customers by offshore suppliers or ebooks.

These retail data sets have significant advantages over a unique sample survey: they provide time series running at least ten years for box office and DVD sales, and since 2003 for book sales; and, although they are not census collections, they each represent at least 70% of relevant sales within each media in each year. The data sets do, however, have two important limitations. First, because they do not include all internet sales within Australia, or any internet sales to Australian consumers from overseas suppliers like Amazon, they do not provide a complete picture of any long tail in Australian customer demand. This seems likely to be a bigger issue for books than for DVDs, because region-coding of DVDs provides at least some barrier to purchasing from off-shore. Second, because the GfK and BookScan data include titles selling at least one unit in Australia in the relevant years, they do not show all titles *available* for sale, which may have sold at least one unit in a previous period.

All sales revenue data quoted in the paper are converted into constant, or real, dollars using the consumer price index (Australian Bureau of Statistics (ABS), 2012).

Method

There are different ways of measuring and comparing the blockbuster and long tail characteristics of sales distributions, again usefully summarised by Brynjolfsson et al. (2010b). These include:

- *The relative distribution of revenue or sales units* describes sales in proportional terms. An example is the principle that 20% of products offered generate 80% of revenue. Here we adopt a more detailed approach, calculating the sales generated by each decile of products offered to the market. This relative metric has a significant disadvantage: it may not reveal a developing long tail in a growing sales distribution. Looking for long tail effects in a growing market using only a relative measure can suggest unhelpfully that the head and tail are both getting bigger as all deciles increase. Examples of this approach include Elberse (2008), and Tan and Netessine (2009).
- *Revenue generated or units sold for an absolute number of titles.* This approach partitions the sales distribution into fixed sets of titles (e.g. top 10, top 50). An absolute measure is more likely to reveal the emergence of a long tail, because any growth in the number of titles offered to the market can be separated from the pre-defined sets of top titles. This approach, also, is not without faults. Selecting the sets of top titles is fairly arbitrary. Interpreting what is meant by the ‘top X’ titles can be tricky: it could represent a large or small proportion of titles depending on the characteristics of the product. Examples here include Brynjolfsson, Hu and Smith’s (2003) measure of sales above a cut-off of 100,000 book titles.

- *The Gini coefficient*, a ratio that measures inequality within a frequency distribution, is traditionally used to quantify the distribution of income or wealth within an economy. More recently it has found a role in measuring distribution equality in biological and engineering systems and in measuring long tail effects. The Gini coefficient is calculated as a ratio and as such is a variation on the relative metric. Examples include Brynjolfsson, Hu and Simester (2011), Ehrmann and Schmale (2008), and Oestreicher-Singer and Sundararajan (2012).
- *The relationship between rank and revenue or units*. Modelling the slope of the sales distribution can demonstrate its bias away from or towards the head of the tail. Examples of research examining the relationship between rank and sales include Huberman's (2001) use of a power law to describe the relative popularity of websites, and Brynjolfsson et al.'s (2010a) and Page and Garland's (2009) findings that sales distributions may not strictly follow a power law. Walls (2010) adds a quadratic term to the power law, capturing information feedback effects in the demand for DVDs, while McKenzie (2010) compares estimates of tail weight parameters for box office and DVD revenues.

Each of these approaches provides limited information about a sales distribution and how it might change over time, and results can be ambiguous. For example, Anderson criticised Tan and Netessine's proportional analysis of Netflix DVD rentals, arguing that a relative analysis of the head and tail of demand was meaningless in a market with unlimited inventory (see Peoples, 2009; 'Rethinking the long tail theory', 2009; Tan & Netessine, 2009). So, rather than rely on one metric, here we apply measures from the first three of these categories to examine how box office and retail sales of books and DVDs changed in Australia during a period of increasing competition from online sales channels.

Industry Aggregates

Over the ten years of our analysis, aggregated data for the three sectors show striking similarities and differences (Figure 1). *Total revenue* was remarkably similar for much of the period. Between 2004 and 2010, revenue from each of these sectors ranged between \$1.0 billion and \$1.4 billion in 2011 dollars. Combined DVD and BluRay sales revenue rose sharply into that range at the start of the period and fell just as sharply out of it in 2011. It exceeded box office revenue for the first time in 2005 but fell back below it in 2010 after peaking in 2007. Books, like DVD and BluRay sales, fell in real terms in 2010 and 2011 after rising throughout the decade. Cinema revenue increased between 2002 and 2011, but fell sharply in 2005. Analysts commonly attribute the recent decline in book sales to: the take-up of e-reading and the collapse of REDGroup, which controlled Borders and Angus & Robertson bookstores in Australia (Rosenbloom, 2012); the decline in DVD sales to online video streaming and downloading (Dale, 2011; Kalina, 2012); and the decline in cinema in 2005, to some extent, to the then increasing popularity of DVDs and home theatre systems (Zion, 2005).

The patterns for *unit sales* are similar, but the differences between the sectors are much more significant. Cinema admissions were consistently higher than unit sales for both books and DVDs and BluRay disks – although some care should be taken in interpreting the time series as admissions are estimated using the average ticket price published by the MPAA. *Mean revenue per unit sold* shows that, although cinema tickets got a little more expensive during the study period, DVDs and books became much cheaper, closing the gap dramatically.

The really startling differences lie in the *number of titles* sold. Figure 1 uses a logarithmic scale to demonstrate this. In 2011, 437 films screened in Australian cinemas (342 new releases during the year), and around 36,000 DVD titles and 630,000 book titles sold at least one copy. The annual number of films screening in cinemas increased by a quarter through the period. The number of books selling at least one copy more than doubled from around a quarter of a million in 2003, the year Bookscan began collecting data. The number of DVDs rose faster but then crashed, increasing nearly ten-fold between 2002 and 2009 before falling 20% in the two years to 2011.

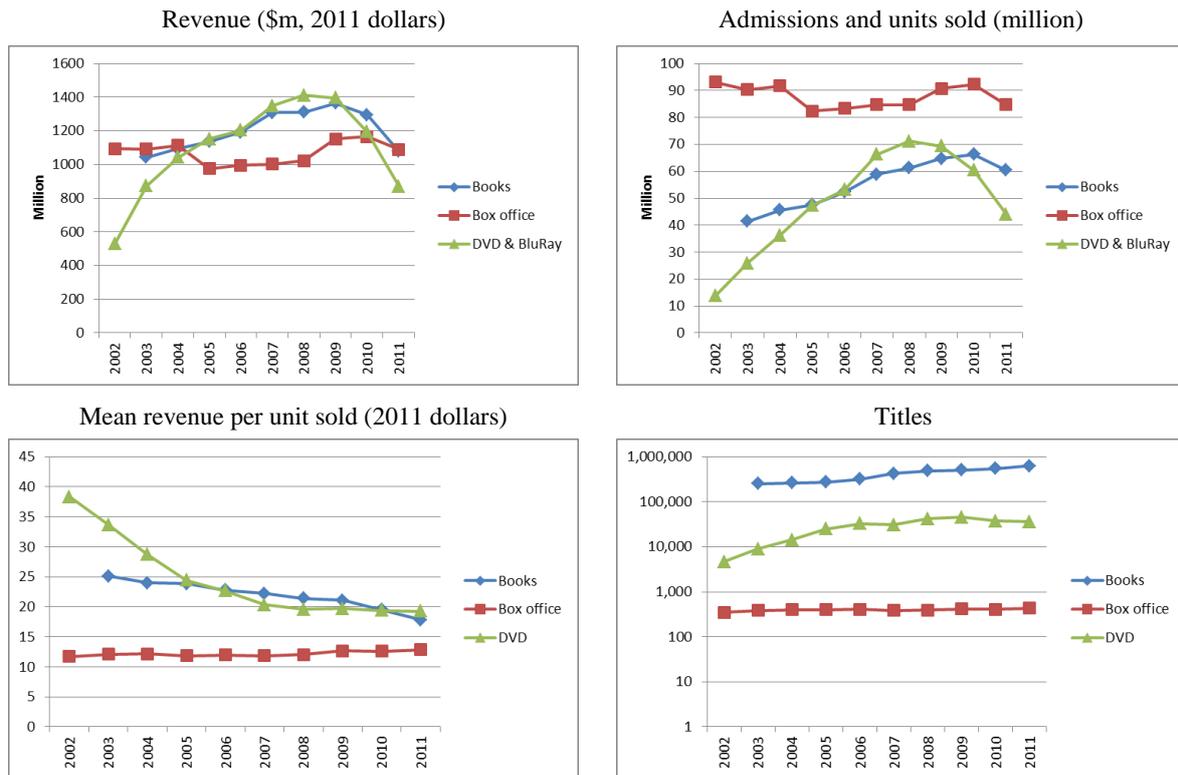


Figure 1 – Industry sector aggregates

Note: The ‘Titles’ time series are plotted on a logarithmic Y axis.

Sources: GfK Australia; MPDAA; Nielsen Bookscan

Although the growth in books and DVDs was strong, the fact that they grew faster than film titles at the cinema is not surprising: films are shown and then move out of cinemas, often within weeks; book and DVD titles are cumulative, with best sellers remaining on catalogues for years.

There are also significant differences in the proportion of the total inventory that can be offered for sale across Australia’s roughly 500 theatres (with around 2,000 screens), up to 1,000 bookshops (plus department stores and newsagents) and up to 10,000 DVD retail outlets (Good Reading, 2012; Romano, 2008). For example:

- Movie theatres are subject to physical and time constraints (seats, screens and the number of screenings possible in a day) that limit their offerings (Eliashberg et al., 2009). For example, in the screening week beginning Thursday 1 November 2012, Marion Megaplex in Adelaide had 30 separate titles screening (plus 3D versions of four of the same titles). The chain of which it is part, Event Cinemas, had 59 films screening across the country (plus the 3D versions) including 17 titles in the Jewish Film Festival screening only at Bondi Junction (Event Cinemas, 2012a, 2012b).
- A large DVD shop might stock between 500 and 1,500 DVD titles (Brynjolfsson, Hu & Smith, 2006). In November 2012, the Australian Broadcasting Corporation (ABC) listed 7,257 DVDs for sale on its website, while Sanity listed a total of 21,828 DVDs, both excluding music (ABC, 2012; Sanity, 2012).
- One industry observer estimates that the average department and discount store in Australia carries about 1,000 book titles and the ‘average’ independent or chain bookstore around 2,000-3,000 titles, although the figures range widely from about 5,000 titles for a big independent like Readings in Carlton to about 1,000 for the small Paperback Bookstore in central Melbourne (M. Webster, personal communication, December 10, 2012).

The rapid turnover of titles is particularly obvious in cinemas, but it is a feature of all three media.

Analysis – Relative versus Absolute Measures

To allow like-with-like comparisons, we compile the sales data for each media sector using relative and absolute measures. For the relative metric, we calculate revenue generated by each decile of titles in each year. For the absolute metric, definitions of the head are fixed at the numbers of titles that represented the top deciles in the first year of each time series:

- An ‘extreme’ head – the top 20 titles. This is chosen subjectively to be high enough to represent extreme blockbusters but low enough to minimise volatility.
- Top titles. Each definition of the head is set as a constant number of titles using the top 10%, top 20% and top 50% of titles by sales revenue in the first year of each series. The definitions for each media sector are different, but each captures a similar proportion of sales (Table 1).
- The tail. The tail is fixed as all titles other than the top 50% in the first year.

Measure	Number of titles		
	Box office	DVDs	Books
Top 20 titles (extreme head)	20	20	20
Top 10% in year 1	40	500	25,000
Top 20% in year 1	80	1000	50,000
Top 50% in year 1	200	2500	125,000
Tail	201+	2501+	125,001

Table 1 – Absolute metric: Number of titles in each revenue category

Cinema Box Office

Using either the relative or the absolute measures, cinema shows itself to be a blockbuster business (Figure 2 and Figure 3). Using the relative metric, between 2002 and 2011:

- The top 10% of titles generated an average of 62% of revenue over the study period;
- The top 20% of titles generated an average of 83% of revenue;
- The top 50% of titles generated an average of 98% of revenue; and
- The tail, the bottom 50% of titles, generated an average of 2% of revenue.

Looking at the absolute metric over the same period:

- The extreme head, the top 20 titles, generated an average of 44% of revenue;
- The top 40 titles generated an average of 63% of revenue;
- The top 80 titles generated an average of 84% of revenue; and
- The tail, about 200 titles and equivalent to about 50% of titles throughout the time series, generated no more than 2% of revenue.

The results produced by the two metrics are similar and steady over the period. Independent of measurement technique, a fairly small share of movies generated the vast majority of box office revenue. Box office might not quite be a winner-takes-all market, but it is a winner-takes-most. There appears here to be no evidence that a long tail has emerged for the Australian box office, although we note that MPDAA data does not cover films that screen only in film festivals.

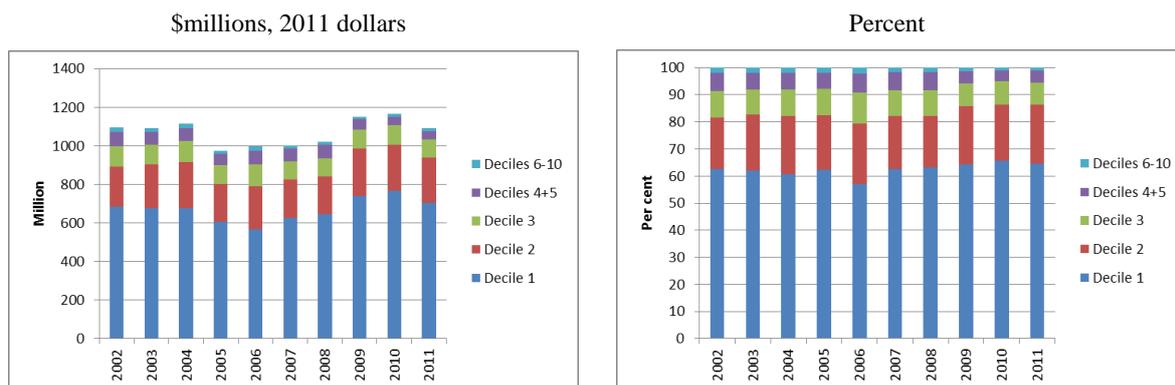


Figure 2 – Relative metric: Box office revenue by decile
Source: MPDAA

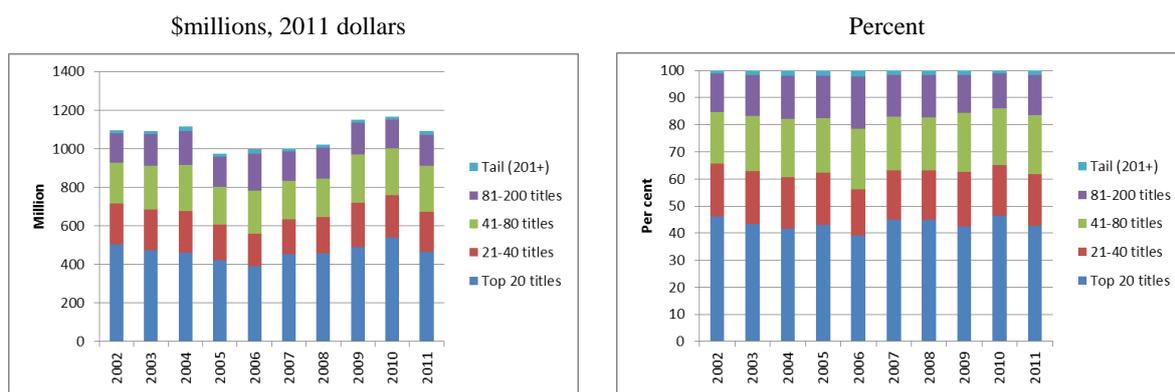


Figure 3 – Absolute metric: Box office revenue for top titles
Source: MPDAA

DVD Retail Sales

The DVD data tells different stories through the relative and absolute metrics. DVD sales revenue grew through the first decade of the 2000s, and is now in decline – the relative measure shows this growth as an increasing head (Figure 4); the absolute measure shows a developing long tail (Figure 5).

For the relative measure, as the number of titles sold in Australia increases, so does the number of titles falling into each decile. As the top deciles capture both the revenue generated by blockbusters and an increasing number of popular titles, they attract not only more revenue in real terms but also a growing proportion of total revenue. Looking at the proportion of revenue earned by different groups of titles over the study period:

- The top 10% of titles generated 70% of total revenue in 2002 and 78% in 2011;
- The top 20% generated 83% of total revenue in 2002 and 91% in 2011;
- The top 50% generated 96% of total revenue in 2002 and 99% in 2009; and
- The tail, the bottom 50%, generated 4% of total revenue in 2002 and 1% in 2009.

By defining the head as a fixed number of titles through the time series, the absolute measure reveals the growth of a long tail for DVD titles. Between 2002 and 2011, revenue generated by:

- The top 20 DVD titles fell from 20% to 7% of total revenue;
- The top 500 DVD titles fell from 71% to 41%;

- The top 1,000 DVD titles fell from 84% to 53%; and
- The tail (titles 2,501 and up) *increased* from 3% to 30%.

For DVD sales, then, the metrics provide different insights into the changing nature of the market. The relative metric shows the blockbuster business model continues to be important. The absolute metric provides a different perspective – the head of the sales distribution has shrunk since 2004. By contrast, the tail, defined as all titles outside the top 2,500, grew strongly. By 2008, the tail of DVD retail sales was long – nearly 40,000 DVD titles – and contributed almost one-third of sales revenue. A long tail now appears to be a steady feature of the DVD sales distribution.

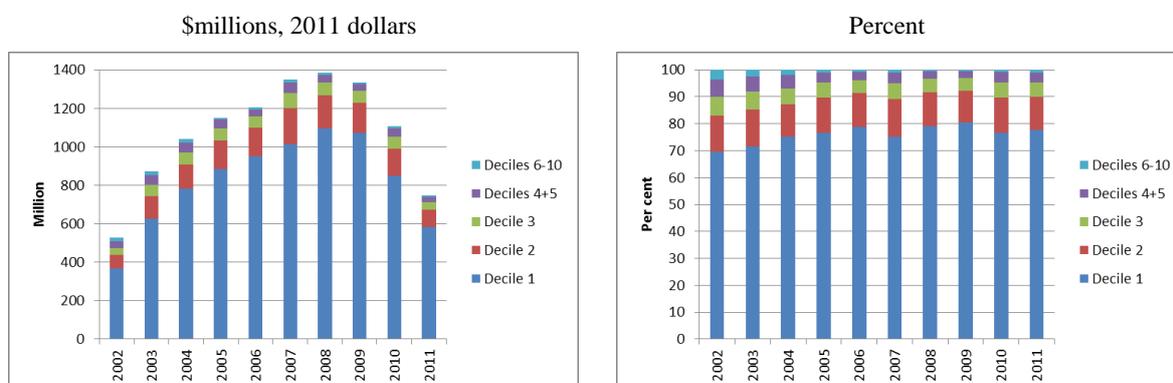


Figure 4 – Relative metric: DVD revenue by decile
Source: GfK Australia

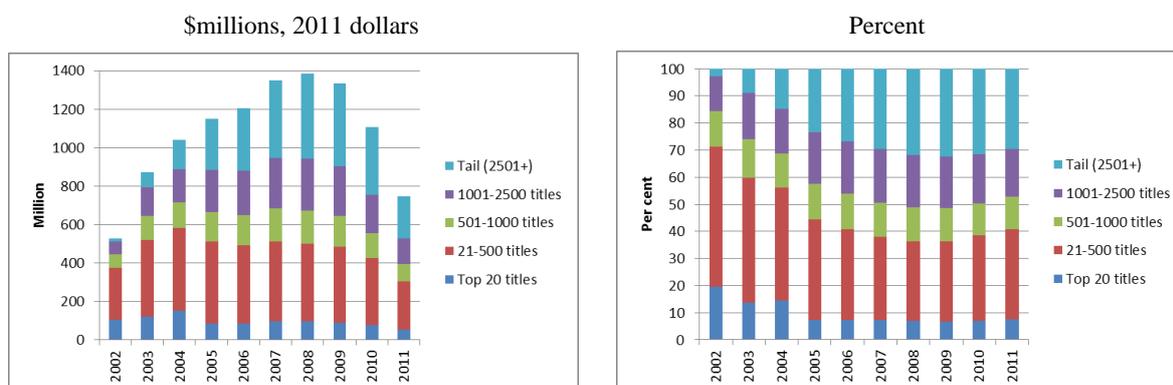


Figure 5 – Absolute metric: DVD revenue for top titles
Source: GfK Australia

Book Retail Sales

The relative and absolute metrics for books also reveal different trends due to growing numbers of titles, although book sales are even more blockbuster-driven than DVD or cinema. Similar to DVD sales, book sales grew in real terms through the 2000s, but fell from their 2009 peak to around 2003 levels in 2011. Unlike DVDs, however, the number of book titles sold in Australia kept growing. Using the relative metric, as with DVDs, the top deciles of titles attracted a growing proportion of revenue as the number of titles sold in Australia increased (Figure 6). Between 2003 and 2011:

- Revenue generated by the top 10% of titles increased from 83% to 88% of total revenue;
- Revenue generated by the top 20% of titles increased from 91% to 93% of total revenue;
- The top 50% of titles generated a steady average of 98% of revenue; and
- The tail, the bottom 50% of titles, generated an average of 2% of revenue.

The growth in revenue generated by the top deciles of book titles reflects increases in units sold. Average prices fell for all decile groups between 2003 and 2011 – for example, the average price of titles in the top decile fell from \$24 to \$17, for the second decile from \$31 to \$22, and for the relative tail from \$51 to \$31.

The absolute measure, on the other hand, shows evidence of an emerging long tail for books (Figure 7). Between 2003 and 2011, revenue generated by:

- The top 20 book titles fell from 7% to 4% of total revenue;
- The top 25,000 titles fell from 83% to 76%;
- The top 50,000 titles fell from 91% to 85%; and
- The tail (titles 125,001 and up) *increased* from 2% to 7% – the number of titles in the tail grew from around 127,000 in 2003 to just over 505,000 in 2011.

The falls in books sales revenue in 2010 and 2011 occurred within the head of the sales distribution, reflecting both falls in prices and in units sold. The tail, defined by the absolute metric, actually grew during these years, from \$59 million in 2009 to \$72 million in 2011. This was driven by increases in unit sales, as average prices fell from \$35 to \$27.

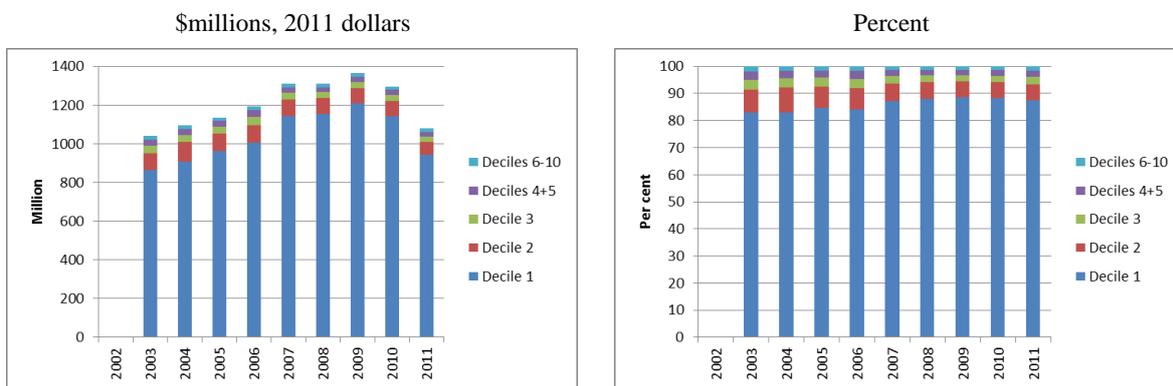


Figure 6 – Relative metric: Book sales revenue by decile
Source: Nielsen Bookscan

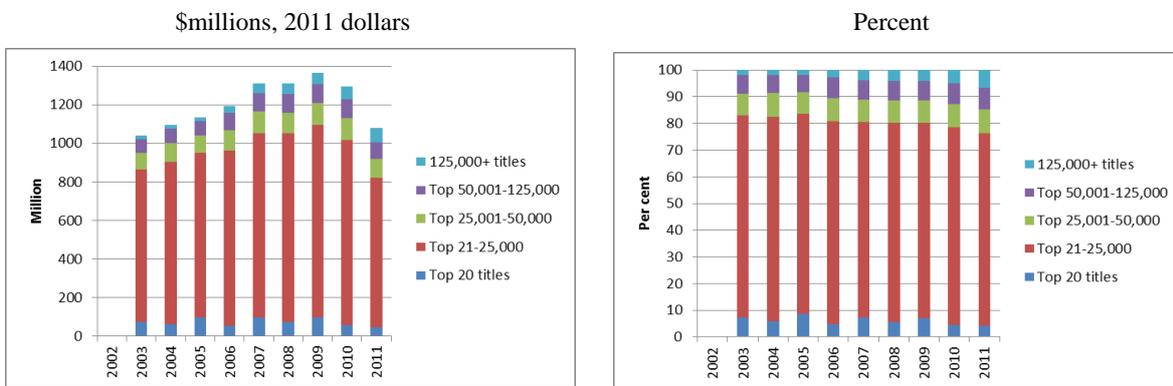


Figure 7 – Absolute metric: Book sales revenue for top titles
Source: Nielsen Bookscan

This analysis also reveals striking differences in the unit sales of titles in the heads and tails for the three media, because of the enormous differences in the numbers of titles that sell (Table 2). For cinema, a movie in the head, using either metric, attracted between 800,000 and 900,000 admissions in 2011. One in the tail attracted around 5,000, many times more than the average sales of a title in the head of the distribution for books. In the long, long tail for books in 2011 – around 125,000 titles using the relative measure and more than 500,000 using the absolute measure – a title averaged sales of just a handful of copies.

		Box office	DVDs	Books
All titles	Year 1 [2002; 2003 for books]	264,674	2,987	164
	Year 10 - 2011	193,948	1,072	96
Head – Top 20% - 2011	Relative metric	835,977	4,758	458
	Absolute metric	884,601	18,324	1,074
Tail – Bottom 50% - 2011	Relative metric	4,662	26	2
	Absolute metric	5,808	389	5

Table 2 – Mean units per title

Analysis – Sales Concentration

Although developed as a measure of income equality, the Gini coefficient has more recently been adopted as a measure of concentration of product sales. It takes a value of zero where sales are perfectly evenly distributed, and increases towards one as sales become more concentrated. Gini coefficients for information goods tend to take higher values than those for nations' incomes. McKenzie (2010), for example, found Gini coefficients of 0.65 and 0.75 for Australian box office and DVD revenues for a sample of theatrical films subsequently released on DVD, while the Organisation for Economic Co-operation and Development (OECD) currently estimates Australia's Gini coefficient (before taxes and transfers) at 0.47 (OECD, 2013).

Here, we calculate Gini coefficients empirically for box office and DVD sales for each year from 2002 to 2011. For books, the study has access to sales data for the top 5,000 titles only, and summary data for each decile of the remaining sales distribution. We calculate the portion of the Gini coefficient relating to the top 5,000 books empirically, and estimate the balance by modelling the log-linear cumulative sales distribution (or Lorenz curve) using the summary data and ordinary least squares regression (Figure 8). This approach seems reasonable: Brynjolfsson et al. (2011) found their Gini estimates for different sales channels were robust by comparing estimates based on transactions for all products and for a random sample.

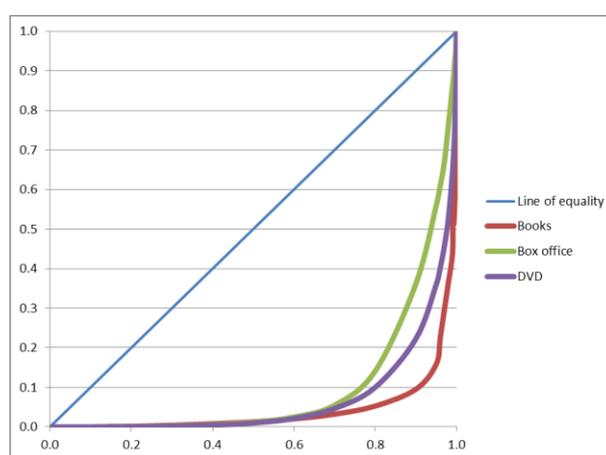


Figure 8 – Cumulative sales distributions, or Lorenz curves, for three media, 2011
Sources: GfK Australia, MPDAA, Nielsen Bookscan

Throughout the study period, the Gini coefficients for box office are lower than those for book and DVD sales, implying that box office sales are consistently less concentrated than those of the other media (Figure 9). Over time, the Gini estimates appear to be increasing slowly. Interpretation of the increase is not, however, straightforward. Like the relative metric, the Gini coefficient is a proportion, and may be misleading where titles are increasing (Brynjolfsson et al., 2010b). To control for growth in the number of

titles, especially of books and DVDs, we also calculate an alternative ‘absolute Gini’ using a fixed number of top titles over the study period for each media.

As with the absolute metric in the previous section, selecting the top titles for each media is necessarily subjective. We set the limit as the top 50% of titles in the first year of each time series: the top 150,000 titles for books and the top 200 movies for box office. For DVDs, we set the limit at 10,000 titles, and only estimated the Gini coefficient from 2004 because of the high rate of growth in the number of titles available in the market.

Looking at change in the full and absolute Gini coefficients supports the observations we have already made, that book and DVD sales both demonstrate a growing long tail, but that books are more blockbuster-driven.

- For box office, both the Gini coefficients increased slightly, although the absolute Gini is lower. Note that our Gini estimates are higher than those estimated by McKenzie (2010). This is not surprising – our estimates include all theatrical releases and McKenzie’s only those subsequently released on DVD. Our higher estimates include more films generating low revenues and therefore suggests a more concentrated market.
- The coefficients for DVDs move in different directions over time. Here, DVD’s emerging long tail drives the full Gini estimate higher. The absolute Gini, however, shows sales of the top 10,000 titles becoming more evenly distributed, before shifting back towards the blockbusters in 2010 and 2011.
- The Gini coefficient for books is very robust, and insensitive to growth in titles. We tested how much of the sales distribution we would need to eliminate before book sales appeared less concentrated – in 2011, the top 50,000 titles yielded an absolute coefficient of 0.88 and the top 1,000 titles a coefficient of 0.76. Not only is the book sector the most concentrated of the three media, it is also the media with the most narrowly-defined head.

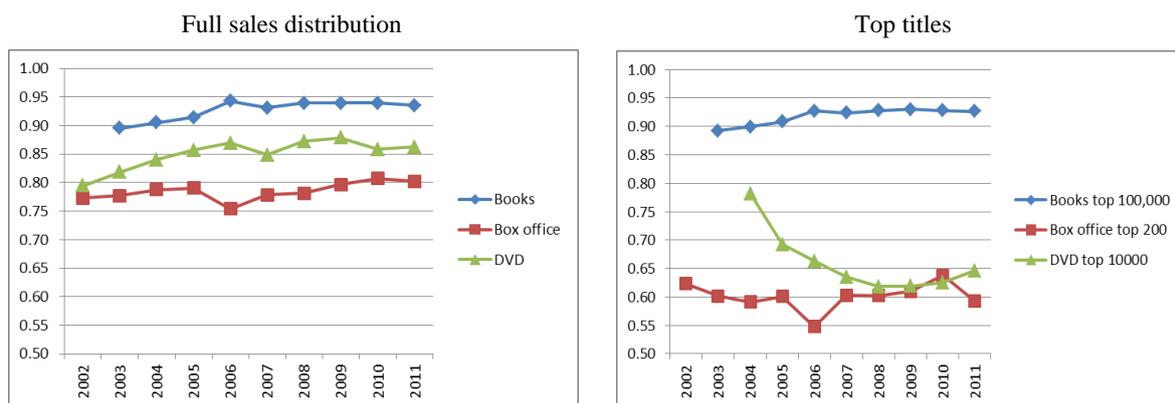


Figure 9 – Gini coefficients for books, box office and DVDs, 2002 to 2011
Sources: GfK Australia, MPDAA, Nielsen Bookscan

Conclusion

We draw several conclusions and pointers to further research from this analysis. First, the long tail is real for some media. Although, as earlier authors have found, the relative metric demonstrates the continuing validity of simple ‘80/20 rule’ characterisations of the cinema, DVD and books markets in Australia, this metric alone masks the emergence of significant long tail characteristics in the book and particularly DVD markets over the last decade.

Second, where the number of titles available and selling in a market is changing rapidly, the choice of metric is vital for analysing the shifts in demand and supply that might reveal a long tail. For all three

media studied here, the relative metrics demonstrate the durability of the blockbuster, generally revealing a bigger head and smaller tail over the study period. The absolute metrics, however, reveal a growing long tail for books and particularly DVDs that coincides initially with growth in the number of titles sold by Australian retailers, but now appears to be a feature of their sales distributions. How the market is defined also determines the shape of any eventual long tail. If, for example, this analysis was performed on movie titles in all exhibition windows, rather than by media, we may have found a differently shaped tail that extended from theatrical release through to DVD sale.

Third, across all three media, on either metric, the oldest and most open market – books – has, by a narrow margin, the strongest blockbuster characteristics. This contradicts the idea that demand will fragment inexorably and continuously as technology lifts supply constraints. It supports Frank and Cook's argument (2010) that access to a global audience might tend to accentuate jackpot rewards and further encourage publishers, producers and distributors to pursue them. Although, as noted at the outset, the data used – especially for books – does not provide a complete picture of any long tail in Australian customer demand.

Fourth, although the tail has grown for books and DVDs, it is very long and, especially for books, very, very thin. Like the long tails identified by Elberse (2008) and Page and Garland (2009), the tails observed here include a vast number of titles that sell only rarely. Knowing that the long tail is indeed very long is useful for businesses that can aggregate a lot of such titles; it is not so useful commercially for small-scale producers of the titles that sit, largely unwanted, on the shelf or server.

Finally, although this analysis has used three media products that involve comparable consumer transactions and analysed them as discrete markets, there are significant relationships between them, as demonstrated by McKenzie (2010) and Walls (2010). Books are turned into films; films are sold on DVD. Cinema is essentially a first release market; the books market offers both first release titles and back catalogue; DVD is essentially, although not entirely, a back-catalogue market for the cinema and television. The book industry is not only driven by its blockbusters, it serves them up for cinematic consumption. DVD may be the box office's long tail, but it is books that often begin the blockbuster cycle, and are where movie-makers go to stick their long noses.

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References

- Australian Broadcasting Corporation (ABC) (2012). *Total DVDs search result*. Retrieved November 9, 2012, from http://shop.abc.net.au/t/formats/dvd?WT.svl=Shop_nav_V1
- Australian Bureau of Statistics (ABS) (2012). *Consumer price index* (cat. no. 6401.0). Canberra: ABS.
- Anderson, C. (2004). The long tail. *Wired*, 12.10. Retrieved from <http://www.wired.com/wired/archive/12.10/tail.html>
- Anderson, C. (2006). *The long tail: How endless choice is creating unlimited demand*. London: Random House Business Books.
- Brynjolfsson, E., Hu, Y. J. & Rahman, M. S. (2009). Battle of the retail channels: How product selection and geography drive cross-channel competition. *Management Science*, 55(11), 1755-1765.
- Brynjolfsson, E., Hu, Y. J. & Simester, D. (2011). Goodbye Pareto principle, hello long tail: The effect of search costs on the concentration of product sales. *Management Science*, 57(8), 1373-1386.

- Brynjolfsson, E., Hu, Y. J. & Smith, M. D. (2003). Consumer surplus in the digital economy: Estimating the value of increased product variety at online booksellers. *Management Science*, 49(22), 1580-1596.
- Brynjolfsson, E., Hu, Y. J. & Smith, M. D. (2006). From niches to riches: Anatomy of the long tail. *MIT Sloan Management Review*, 47(4), 67-71.
- Brynjolfsson, E., Hu, Y. J. & Smith, M. D. (2010a). *The longer tail: The changing shape of Amazon's distribution curve*. Retrieved from <http://www.ssrn.com/abstract=1679991>
- Brynjolfsson, E., Hu, Y. J. & Smith, M. D. (2010b). Research commentary - Long tails vs superstars: The effect of information technology on product variety and sales concentration patterns. *Information Systems Research*, 21(4), 736-747.
- Cachon, G. P., Terwiesch, C. & Xu, Y. (2008). On the effects of consumer search and firm entry in a multiproduct competitive market. *Marketing Science*, 27(3), 461-473.
- Dale, D. (2011, February 19). Dominant DVD in terminal decline. *The Sydney Morning Herald*, p. 22.
- Ehrmann, T. & Schmale, H. (2008). The hitchhiker's guide to the long tail: The influence of online reviews and product recommendations on book sales - Evidence from German online retailing. *International Conference on Information Systems (ICIS) 2008 Proceedings*. Retrieved from <http://aisel.aisnet.org/icis2008/>
- Elberse, A. (2008). Should you invest in the long tail? *Harvard Business Review*, July-August. Retrieved from <http://hbr.org/2008/07/should-you-invest-in-the-long-tail/ar/1>
- Elberse, A. (2010). Bye bye bundles: The unbundling of music in digital channels. *Journal of Marketing*, 74(3), 107-123.
- Eliashberg, J., Hegie, Q., Ho, J., Huisman, D., Miller, S. J., Swami, S., et al. (2009). Demand-driven scheduling of movies in a multiplex. *International Journal of Research in Marketing*, 26(2), 75-88.
- Event Cinemas (2012a). *Now showing*. Retrieved November 8, 2012, from <http://www.eventcinemas.com.au/movies>
- Event Cinemas (2012b). *Weekly sessions*. Retrieved November 8, 2012, from <http://www.eventcinemas.com.au/sessions>
- Fleder, D. & Hosanagar, K. (2009). Blockbuster culture's next rise or fall: The impact of recommender systems on sales diversity. *Management Science*, 55(5), 697-712.
- Frank, R. H. & Cook, P. J. (2010). *The winner-take-all society: Why the few at the top get so much more than the rest of us*. London: Random House.
- Goh, K. H. & Bockstedt, J. (2008). Unbundling and the long tail: New evidence on the consumption of information goods. Paper presented at *WISE 2008: Twentieth Workshop on Information Systems and Economics*. Paris. Retrieved from <http://www.stern.nyu.edu/CeDER/Events/WISE2008/index.htm>
- Good Reading (2012). *Find a bookseller*. Retrieved November 22, 2012, from <http://www.goodreadingmagazine.com.au/bookshops.cfm?p=42>
- Huberman, B. H. (2001). *The laws of the web: Patterns on the ecology of information*. Cambridge, MA: MIT Press.
- Kalina, P. (2012, January 5). D-Day for sales of DVDs. *The Age*, p. 7.
- McKenzie, J. (2010). How do theatrical box office revenues affect DVD retail sales? Australian empirical evidence. *Journal of Cultural Economics*, 34(3), 159-179.
- Michaels, S. (2008, December 23). Most music didn't sell a single copy in 2008. *The Guardian*. Retrieved from <http://www.guardian.co.uk/music/2008/dec/23/music-sell-sales>
- Nielsen BookScan (2012). *Measuring and analysing sales around the world*. Retrieved September 3, 2012, from <http://www.nielsenbookscan.com.au/>

- Oestreicher-Singer, G. & Sundararajan, A. (2012). Recommendation networks and the long tail of electronic commerce. *MIS Quarterly*, 36(1), 65-83.
- Organisation for Economic Co-operation and Development (OECD) (2013). Income distribution - Inequality - Australia. *StatExtracts*. OECD. Retrieved April 9, 2013, from <http://stats.oecd.org/>
- Page, W. & Garland, E. (2009). The long tail of P2P. *Economic Insight*, 14. Retrieved from <http://www.prsformusic.com/creators/news/research/Documents/The%20long%20tail%20of%20P2P%20v9.pdf>
- Peoples, G. (2009, September 23). Academic research conflicts with 'long tail'. *Film Journal International*. Retrieved from http://www.filmjournal.com/filmjournal/content_display/news-and-features/features/movies/e3ie2038d49cf28a7302b2c3e967c413717
- Rethinking the long tail theory: How to define 'hits' and 'niches' (2009, September 16). *Knowledge@Wharton*. Retrieved from <http://knowledge.wharton.upenn.edu/article.cfm?articleid=2338>
- Romano, B. J. (2008, July 24). Digital films coming to Xbox Live. *The Seattle Times*. Retrieved from http://seattletimes.com/html/business/technology/2008069599_xboxlivevideo24.html?syndication=rss
- Rosenbloom, H. (2012, February 27). Book-trade blues [blog post]. *Scribe*. Retrieved from <http://scribepublications.com.au/news-and-events/post/book-trade-blues/>
- Sanity (2012). *Total DVDs search result*. Retrieved November 9, 2012, from <http://www.sanity.com.au/Search.aspx?sanquery=>
- Screen Australia (2012a). *About the data - Australian content - video sales*. Retrieved November 8, 2012, from <http://www.screenaustralia.gov.au/research/statistics/mrvideoabout.asp>
- Screen Australia (2012b). Total screens, seating capacity and theatres in Australia, 1980-2011. *Audiovisual markets: Cinema*. Retrieved February 23, 2012, from <http://www.screenaustralia.gov.au/research/statistics/wcsttotal.asp>
- Tan, T. F. & Netessine, S. (2009). *Is Tom Cruise threatened? Using Netflix prize data to examine the long tail of electronic commerce*. Retrieved from <http://knowledge.wharton.upenn.edu/papers/1361.pdf>
- Walls, W. D. (2010). Superstars and heavy tails in recorded entertainment: Empirical analysis of the market for DVDs. *Journal of Cultural Economics*, 34(4), 261-279.
- Zhou, W. & Duan, W. (2009). Product variety, online word of mouth and long tail: An empirical study on the internet software market. *ICIS 2009 Proceedings*. Retrieved from <http://aisel.aisnet.org/icis2009/30>
- Zion, L. (2005, August 13). Big screen fades to a cut price DVD. *The Australian*, p. 19.

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