

Long-Lived Television Programs as Capital Assets

By Rachel Soloveichik

Abstract

In 2007, I estimate that studios and networks released long-lived television programs worth \$26.7 billion. Those long-lived television programs were first shown on TV in 2007 and will be broadcast for decades to come. Because of their long working life, the international guidelines for national accounts recommends that countries classify production of television and other entertainment, literary and artistic originals as an investment activity and then depreciate those television originals over time. However, BEA did not capitalize this category of intangible assets until the July 2013 benchmark revision. In order to change the national accounts, I collected data on television production from 1949 to 2010. I then calculated how GDP statistics change when television programs are classified as capital assets.

To preview, my empirical results are:

- 1) Long-lived US television programs accounted for approximately one third of total television viewership in 2007. The viewership share for long-lived television programs has been steady since 1949.
- 2) Nominal investment in long-lived television has been growing at 5.6% per year from 1990 to 2010, 0.9% faster than overall GDP. Accordingly, average nominal GDP growth rises slightly when long-lived television is counted as a capital asset
- 3) Thanks to computer technology, real prices for television investment have been almost flat over the past two decades.

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Introduction

Television was first invented in the 1920s (Sterling and Kittross 1978). However, the Great Depression and World War 2 delayed widespread adoption. In 1946, only 0.02% of household had television. Television spread rapidly in the post-war era. 65% of households owned a television by 1955 and 93% owned a television by 1965.

Despite the widespread ownership, television programs did not earn much money at first. In 1960, there was no cable television and broadcast television earned only \$1.1 billion, 0.2% of nominal GDP. In 1972, the FCC allowed cable companies to serve major cities. Since that decision, cable television has grown rapidly. By 2007, cable networks earned \$39 billion, more than broadcast networks. In total, television networks earned \$71.3 billion, 0.51% of nominal GDP.

In 2007, I estimate television studios, broadcast networks, cable networks and independent producers created long-lived television programs worth \$26.7 billion. This value includes domestic television licensing, foreign television licensing, DVD sales and merchandise licensing. In the national income and product accounts (NIPAs), this \$26.7 billion of television production could either be treated as a current expense or it could be treated as an investment. If long-lived television programs have a useful life of less than one year, then the production costs for television programs should be treated as a current expense. In that case, the final revenue from the sale of television programs is all that matters for gross domestic product (GDP), and production costs for television programs are an expense in the same way that broadcasting is an expense. Up until July 2013, BEA used this method to account for television production.

In contrast, items with a useful lifespan of more than one year are generally classified as capital assets. If television programs have a long useful life, then the production costs for television programs should be treated as a capital investment. In that case, the capital investment in television programs is added to GDP as part of private investment and added to the pre-existing capital stock of long-lived television programs to get the total capital stock of television programs. This capital stock of television programs then returns a flow of value to its owner, and that flow is counted in GDP as part of capital services. GDP counts both the flow of value and the initial investment. As a result, GDP is always higher when a good is changed method 1) to method 2). Finally, the total capital stock of television programs is depreciated, which is known as consumption of fixed capital. In addition to the well-known GDP, BEA also estimates net domestic production. Net domestic production equals GDP minus consumption of fixed capital. Because net domestic production does not include the cost of maintaining the capital stock, it is generally viewed as a better long-term measure of the total sustainable output of an economy.

My research on capitalizing television programs is part of a broader initiative by the BEA to improve the treatment of intangible assets in the national income and product accounts. Other researchers at the BEA have developed a satellite account measuring the annual investment and capital value of R & D (Robbins and Moylan 2007), educational investments (Fraumeni, Reinsdorf, Robinson and Williams 2008) and the role of intangible assets in foreign direct investment (Bridgman 2008). And I have also estimated annual investment and capital value of other entertainment capital such as books, theatrical movies and original music.

This paper will consist of four sections. In section 1, I describe my data on nominal revenue and nominal investment for television. I calculate television investment back to 1949, when the industry started earning advertising revenue. In section 2, I describe my price indexes and calculate the real value of long-lived television production back to 1949. In section 3, I estimate the depreciation schedule for television programs. I then use that depreciation schedule to calculate capital stock of television programs from 1949 to 2009. In section 4, I explore capitalizing television formats like soap operas where the individual episodes are short-lived but the show itself is long-lived. At the present time, BEA does not plan to count television format as entertainment originals in the national income and product accounts. Nevertheless, I include preliminary results for academic discussion.

1. Nominal Production

Total Revenue Earned by the Television Industry

The 2007 Economic Census is the primary dataset used in this paper. In 2007, cable networks earned \$21.6 billion in advertising and \$15.5 billion in licensing. Broadcast networks earned \$17.3 billion from national airtime, \$12.3 billion from local airtime and \$1.9 billion from network compensation (syndicated advertising). Public television stations spent \$1.8 billion on programming. Finally, I estimate that studios and networks earned \$2.1 billion from DVDs of television programs, \$1.9 billion from merchandise licensing and \$7.3 billion of foreign television licensing for long-lived television.

I use a variety of datasets to measure television revenue from 1949 to 2010. The Service Annual Survey (SAS) provides cable revenue from 1998 to 2010, national broadcast and local broadcast advertising revenue from 1998 to 2010, public broadcast spending from 2005 to 2010 and DVD sales from 2005 to 2010. The Annual Survey of Communication Services (ASCS) provides cable revenue from 1989 to 1997 and broadcast advertising from 1990 to 1997. The Corporation for Public Broadcasting (CPB) provides data on spending for public television from its start in 1969 until 2004. For syndicated advertising, I use data from Kantar that gives the ratio of syndicated advertising to national advertising back to 1995. Before 1995, I assume that syndicated advertising tracks national advertising. For television DVDs, I estimated the market share for television programs (vs. theatrical movies) and then multiplied that market share by consumer spending data from BEA's Table 2.4.5U. Finally, I use licensing data from the EPM licensing sourcebook to estimate merchandising revenue. I was not able to find any data on foreign licensing over time. However, data from "World Television" (Straubhaar 2007) suggest that the ratio of foreign licensing to domestic licensing has been relatively steady since the 1960's.

The Economic Census and other government datasets only track advertising revenue from outside companies. Television networks also devote a substantial amount of airtime to promoting their own programs. In this paper, I will count that foregone advertising revenue in network revenue as if networks had sold the airtime to outside companies. Later in the paper, I will count unpaid airtime value together with paid advertising expenditures. So, including the value of unpaid airtime has little impact on long-lived television revenue **minus** sales costs. However, it does impact my

depreciation rate because existing shows are often used to promote new shows. In order to do this, BEA purchased a special dataset from Kantar Media that tracks both paid airtime and unpaid airtime from 1995 to 2010. Based on that dataset, I calculate the ratio of unpaid airtime to paid airtime by channel type and year. I then multiply that ratio by the advertising revenue totals calculated earlier to get the implicit value of unpaid airtime by channel type and year.

Figure 1 shows total revenue from US television by category from 1949 to 2010. Table 2 shows the same data with more detailed categories. The most important result from Figure 1 and Table 2 is that cable television has been growing faster than broadcast. Until the 1970's cable networks were virtually non-existent. They then grew rapidly over the next 35 years. By 2010, cable networks earned 50% more than broadcast networks

Revenue from Long-Lived US Television

Because this project is focused on the United States national accounts, I will restrict my sample to US television programs. Even if a television program is filmed abroad, it is still included in my analysis if a US corporation or resident originally owned the copyright. A small number of television shows are co-produced by a US studio and non-US studio. In that case, I count the show as 50% US.¹ My data on production studios and country of ownership are taken from the website IMDB.com. That dataset is described in more detail in the paper “Theatrical Movies as a Capital Asset” (Soloveichik 2013a).

In this paper, I will study only long-lived television programs. These television programs are called ‘stock’ programs by the OECD (Handbook on Deriving Capital

¹I do not know how studios account for joint production in the Economic Census.

Measure of Intellectual Property Production 2010). The OECD defines ‘stock’ programs as genres with a useful lifespan of more than one year. The OECD also defines ‘flow’ programs as short-lived genres. These ‘flow’ programs are explicitly rejected from the category ‘artistic originals’. I also exclude theatrical movies shown on television because that television revenue has already been counted in the theatrical movie asset category (Soloveichik 2013a). On the other hand, I include television movies and direct-to-DVD movies in the long-lived television asset category. These movies are often very similar to pre-existing television programs and they are frequently shown on channels that rarely show theatrical movies (e.g. Cartoon Network, Disney).

Kantar Media provided the main dataset to measure market shares for long-lived US television. BEA purchased a special dataset that gives advertising revenue by program name, program genre, channel type, paid vs. unpaid airtime and quarter from 1995 to 2010. For example, the dataset might report that “Friends” earned \$1 million of paid airtime and \$0.3 million of unpaid airtime in 1995 Q1. I determined that the following genres are long-lived: animation, children’s educational, documentaries, documentary/salute/tribute, drama/adventure, feature film, instruction/advice, mini show,² science fiction, situation comedy, unclassified, unknown and western. I then matched a sample of program names to IMDB’s dataset to identify theatrical movies and

² Mini-show, mini-series, unclassified and unknown contain a very diverse collection of shows. I looked up each title in my sample to determine what percentage of shows were actually long-lived. For the rest of the genres, I assume 100% are long-lived. Kantar’s actual dataset uses abbreviations for some genres. The long-lived genres were identified using schedule information from Tribune Media Service (TMS). First, I identified the IMDB series title for all programs in the TMS data and then calculated what percentage of episodes were more than one year old. Next, I matched those same IMDB series titles to the Kantar program names. I then calculated what percentage of revenue for each genre is likely to come from episodes more than one year old. Finally, I classified a genre as “long-lived” if a substantial portion of revenue comes from episodes more than one year old. The two genres which were near the dividing line are ‘news documentaries’, which I chose to put in the long-lived category and ‘slice-of-life’ (reality shows), which I chose to put in the short-lived category.

foreign television. My sample covers 96% of advertising revenue tracked in Kantar³ and Kantar Media tracks almost all advertising shown on television. Accordingly, the quarterly variation seen in my numbers are primarily caused by changes in the market share for long-lived US television – not just sampling error.

Kantar Media only tracks advertising revenue, so it is not representative of total cable network revenue. Furthermore, Kantar does not include channels with little advertising revenue like Disney or Fox Sports Net. In order to make the Kantar data more representative, I created my own adjustment factor. First, I used schedule data from Tribune Media Services (TMS) and viewership information from Nielsen to calculate the market share for long-lived US television on each cable channel tracked in Nielsen's database. I then matched the market shares by channel to SNL Kagan data on advertising revenue and licensing revenue for each channel from 1984 to 2006. I then compared the market share for long-lived television based on advertising revenue with the market share for long-lived television based on total revenue.⁴ I also use the SNL Kagan data to calculate long-lived market shares from 1984 to 1994, before the Kantar data is available. These calculations assume that individual channels have kept their character over time.

Kantar Media does not track premium cable, public broadcast, DVDs of television programs or foreign licensing. I used the TMS schedules and Nielsen viewership data described earlier to estimate the market shares for long-lived US television on premium cable and public broadcast. I used DVD sales data from The-numbers.com to estimate

³I could not match all of the program names, so actual coverage is slightly lower. For many unmatched names, I used alternative datasets to measure some information about the program.

⁴In the actual spreadsheet, I create 14 adjustment factors for live fiction by seven different distributors and other long-lived by seven different distributors. Kantar does not cover every cable channel, and the coverage was worse early in the sample. I adjust for the missing channels too. After 2006, I do not have Kagan data on channel revenue. I assume the adjustment factor is fixed from 2006 to 2010.

the market share for long-lived US television on DVDs. The data from The-numbers.com only goes back to 2006. Before then, I use my best judgment to estimate the market share for television programs on DVD. Finally, I assume that 100% of all foreign licensing revenue earned by television studios is for long-lived television programs.⁵ The foreign licensing for theatrical movie has already been counted in the paper “Theatrical Movies as a Capital Asset” (Soloveichik 2013a).

Before 1995, I use viewership data from Nielsen’s ‘Pocketpiece’ survey to calculate market shares for long-lived television on broadcast networks. That survey reported the number of programs and their average rating for the last two weeks by genre. Because of budget limitations, BEA was not able to purchase all the ‘Pocketpiece’ reports. But we did get the complete set for 1995 and a sample from 1950 to 1994. In order to get a consistent time series, I benchmarked the 1995 Nielsen Pocketpiece data to the Kantar market share data from 1995.

Figure 2 shows the market share for long-lived television by category from 1949 to 2010. The most important result is premium cable networks show far less long-lived television than regular cable networks. The SAS combines both premium cable networks and regular cable networks into single industry, NAICS 5152. Accordingly, I cannot calculate the average market share for long-lived television on cable networks without knowing the relative weights for premium cable and regular cable. I assume that all regular cable channels earn all advertising revenue for NAICS 5152. For licensing, I use consumer spending to estimate weights. Cable distributors (NAICS 5175) earn approximately 80% of their revenue from basic cable packages. If licensing payments

⁵Major international sporting events like the Olympics or the World Cup can bring in significant foreign licensing if they are held in the US. However, they account for a relatively small portion of total licensing. Furthermore, that licensing revenue might be reported in the sports industry rather than television.

are proportional to consumer spending, then premium cable networks account for 20% of licensing revenue and 6% of total cable network revenue.⁶ Using that split, long-lived US television accounts for 34% of cable network revenue.

Since 2000, reality shows and other short-lived programs have become a bigger revenue source for broadcast networks. Therefore, it might seem that broadcast networks are investing a lower percentage of their revenue on long-lived television programs. However, broadcast television shows are now earning more money from cable licensing and other non-broadcast revenue. The net effect is a relatively steady ratio of investment to revenue. After 2010, BEA does not have Kantar data providing precise market shares for long-lived US television. In order to calculate annual investment, BEA will assume that the ratio of investment to revenue is fixed at the 2010 values.

Non-Artwork Costs for Long-Lived Television

Of course, television network revenue from long-lived television programs is not the same as licensing revenue. Television networks spend money on physical costs like broadcast towers⁷ or DVD stamping. Television networks also spend time and money negotiating with potential advertisers like General Motors and cable distributors like Comcast. Finally, television networks spend a considerable amount of unpaid airtime

⁶On the other hand, there is suggestive evidence that premium cable channels earn higher licensing payments. The 2007 Economic Census reports that theatrical movies earned \$22 billion in licensing revenue. I calculate that approximately \$14 billion of that licensing revenue was for television airing. I also calculate that cable distributors earned approximately \$21 billion from theatrical movies. Even assuming that premium networks charge no mark-up over studio licensing fees, that still yields a distributor mark-up of only 50%. In contrast, the aggregate cable distribution industry charges consumers 300% more than they pay cable networks for licensing content. However, these numbers may reflect problems with the classifications in the Economic Census or within-company pricing details.

⁷In addition to the physical costs of running broadcast towers, television networks also require broadcast spectrum licenses. These spectrum licenses could be considered an intangible asset and capitalized in the national accounts. However, that is a separate problem from long-lived television considered in this paper.

promoting their new shows. Earlier in this section, I counted that unpaid airtime when measuring total network revenue. In order to be consistent, I subtract that unpaid sales time as an advertising cost.

My primary dataset for network costs is an SNL Kagan report from 2000. In that report, they estimated the licensing fees paid and the net ad revenue earned by the top 400 programs for the 1998-1999 season. Based on that data, I calculate that studios paid 83 cents in licensing for every dollar of ad revenue. Licensing rates were similar for short-lived programs like news and long-lived programs like sit-coms. I assume that broadcast networks and cable networks spend 17 cents on non-artwork costs for every dollar in advertising revenue. Public broadcasters do not sell advertising explicitly, but they do raise money from corporations, governments and the public. I assume that they also spend 17 cents on non-artwork costs for every dollar they receive in donations. I have not been able to find any data on cable network costs for negotiating prices with cable distributors. However, I believe that it is cheaper to negotiate with a few cable distributors than thousands of individual advertisers. I will assume that cable networks spend 5 cents on contract negotiations for every dollar they receive in licensing payments. Finally, I assume that television networks spend 15 cents stamping DVDs for every dollar in revenue.

My primary dataset on advertising costs is Kantar Media. BEA purchased a special dataset from Kantar Media that gives the value of unpaid airtime by the program of airing and program promoted. This dataset is separate from the Kantar data on advertising revenue described earlier. Between 2008 to 2010, long-lived television programs received 14 cents in unpaid airtime for every dollar they earned in paid airtime.

Kantar Media also reports that television networks spent 4 cents on paid advertising for every dollar in revenue they earn. Finally, I add in 2 cents of overhead for the 18 cents of paid advertising described earlier. In order not to mislead with false precision, I round the advertising budget to 20% of licensing fees for all long-lived television.

It might seem surprising that advertising overhead is only 10% of total television advertising. For books, music and miscellaneous artwork, marketing overhead is much larger amount (Soloveichik 2013b, c and d). The difference is driven by the timing of television production compared to all of those other artworks. For other entertainment originals, they are first produced and then marketed. In contrast, new television episodes are being filmed even as the network markets existing episodes. Because of the timing overlap, market research like Nielsen's viewership data is used both to sell existing episodes and to determine which shows should be continued. Therefore, I count market research as part of television investment rather than part of advertising.

Figure 3 shows the non-artwork costs relative to US television revenue from 1949 to 2010. The most important result from Figure 3 is that broadcast networks have higher costs than cable networks. Over the past few decades, cable networks have grown faster than broadcast networks. Accordingly, non-artwork costs fell since 1980. But this effect is small. Regular cable networks earn more than half of their licensing revenue from advertising. Therefore, they still must spend time and money serving thousands of individual companies who want air time. Only premium cable networks are free to concentrate on cable distributors.

Live Fiction Programs vs. Other Long-Lived Television

Later in this paper, I will create two separate price indexes: one for live fiction programs like sitcoms and one for other long-lived programs like animated cartoons or documentaries. In order to create a combined price index for long-lived television, I need to know the market shares for each sub-category of television. Once again, Kantar Media was my primary dataset for splitting the two sub-categories. All programs classified as animated, instructional, documentaries, etc. were put in other long-lived. I also classified programs as other long-lived if they are marked as animated in the IMDB dataset. Finally, I hand-checked programs in ambiguous genres like childrens or mini-series.

Figure 4 shows the relative share for live fiction programs by category from 1995 to 2010. The most important result is that regular cable and public television have much less live fiction than another other category. This result is consistent with everyday experience. Regular cable has entire channels devoted to non-fiction programs like cooking, nature documentaries and other programs without actors. Public television has cartoons for children in the morning and educational programming for adults in the evening. Within each market type, live fiction shares have been relatively steady over time. Going forward, BEA will assume that the ratio of live fiction to total long-lived revenue is fixed for each market type until additional information becomes available.

Long-Lived Television Investment by Original Distributors

Four separate industries produce long-lived television: television studios (NAICS 5121), television broadcasters (NAICS 5151), cable networks (NAICS 5152) and

independent producers and artists (NAICS 7115).⁸ I have not been able to find any data that tracks industry of ownership for individual programs. I will use the industry of the **first** distributor as a proxy for industry of ownership. In particular, I assume:

- a) Shows that premiere on for-profit broadcast networks are owned 50% by television studios and 50% by television broadcasters.
- b) Shows that premiere on public television are owned 100% by public broadcasters.
- c) Shows that premiere on regular cable or premium cable are owned by cable networks.
- d) Shows that premiere as direct-to-DVD are owned 100% by television studios.
- e) Shows that premiere on syndicated television are 100% owned by independent producers and artists.
- f) Merchandise licensing, foreign licensing and U.S. owned shows that premiere on foreign television programs are distributed between industries proportionally to the rest of investment. Based on NAICS 5121, I calculate that these revenue sources account for approximately one third of total television revenue.

Figures 5 and 6 compare revenue based on original distributor with current distributor. The most important result from both figures is that total revenue from US television programs is significantly higher than US television revenue.⁹ In other words, US television studios are big exporters. US television studios also earn money from

⁸ In recent years, Internet broadcasters like Youtube have started producing their own content. A very small percentage of those shows have moved to cable networks or DVD. In addition, other programs like theatrical plays or exercise shows are sometimes sold on DVD. I ignore those minor industries

⁹ Figure 2 strips out foreign television as well as theatrical movies and short-lived programs. However, for-profit broadcasters and cable networks show very little foreign television, so the graph would not change if imports were included.

merchandise licensing and all other operating revenue. Between 2003 and 2010, I use SAS and the 2007 Economic Census to determine the annual ratio of foreign licensing to domestic licensing. Before then, I do not have good data on historical export rates or licensing rates. In the book 'World Television' Straubhaar (2007) analyzes broadcast schedules for a sample of countries back to the 1960's. He finds that the market share for US shows abroad has been roughly constant. Based on that data, I assume that foreign licensing is fixed at the average for 2003-2010.

The second noteworthy result from Figures 5 and 6 is that for-profit broadcast networks premiere more shows than they air. In other words, cable networks re-run programs that premiere on for-profit broadcast. The reverse is rarely true: for-profit broadcast networks almost never show programs that premiere on cable or public broadcast. As a result, I calculate that investment by for-profit broadcast networks is larger and investment by cable networks is smaller than one might think based on their direct revenue alone.

Unlike theatrical movies, I cannot calculate real investment directly. In my paper on theatrical movies, I used IMDB data on real movie inputs to estimate real movie investment from 1915 to 2004 (Soloveichik 2013a). I then multiplied by my price index to calculate nominal investment directly. Unfortunately, the IMDB data on television inputs is much worse. For live fiction, IMDB does track individual episodes. However, their coverage is pretty spotty for historical production. For other long-lived television, IMDB has minimal data on individual episodes.

Instead, I will calculate television investment from licensing revenue. I assume that the ratio of nominal investment to nominal licensing revenue is constant from 1949

to 2010. However, I do allow live fiction programs and other long-lived programs to have different ratios. Real investment in other long-lived programs has been growing much faster than real investment in live fiction programs. Because of the fast growth, there are relatively few older programs in the ‘other long-lived’ category. Accordingly, ratio of new investment to existing licensing revenue is slightly higher for that category.

Figure 7 shows my estimates of investment relative to licensing revenue.¹⁰ I calculate that average investment relative to revenue has risen over time. This rise is related to the drop in live fiction television shown in Figure 4. Over the past few decades, live fiction has dropped from more than 90% of television investment in 1970 to only 67% in 2010. This decrease in live fiction television is related to the rise of public television in 1970’s and then cable networks in the 1990’s and 2000’s. Both network types show less live fiction than for-profit broadcast networks like Fox or ABC.

Figure 8 shows nominal television investment from 1949 to 2010.¹¹ I find that television investment grew very quickly during the 1950’s and 1980’s. The first growth spurt was caused by spread of broadcast television after World War 2. The second growth spurt was caused by the spread of cable television during the 1980’s. During those two growth spurts, the ratio of nominal television investment to nominal GDP grew rapidly. After the growth spurts, the ratio of nominal television investment to nominal

¹⁰ It is possible that the numbers in Figure 7 underestimate investment early in the period. The television industry was very new in the 1950’s – so it had very few re-runs to show. On the other hand, some early television sitcoms and dramas were performed live and never recorded. The net effect on television investment relative to revenue is uncertain.

¹¹ The numbers in Figure 8 are not precisely the same as the television investment numbers that will be released in the 2013 benchmark revision of the national income and product accounts. The benchmark numbers are based on an earlier estimate of television investment I made in April of 2012. Since then, I have changed a few of the minor assumptions in my calculations. Because of the changes, my investment and capital stock numbers are not precisely equal. However, changing one time series for television investment would have required recalculating many other time series as well. For simplicity, we kept the preliminary numbers in the benchmark calculations.

GDP remained steady at the earlier high. Accordingly, re-classifying long-lived television programs as capital assets boosts GDP growth slightly during the 1950's and 1980's.

2. Price Indexes and Real Production

Creating an Input-Based Price Index

It is difficult to develop a price index for long-lived television programs shows. Each program is a unique artistic creation, so I can never compare the cost of producing two identical television episodes at different times. In this paper, I use input prices to calculate production costs for the television industry. The input-based index assumes that each actor, each non-actor, each filming location and each special effects company produces the same amount of entertainment capital over time. This price index assumes zero multifactor productivity growth since 1949¹² and omitted inputs grow at the same rate as inputs tracked. However, the television industry has benefited from better video cameras and faster computers to edit the raw footage. The better video cameras and faster computers are part of the huge technology progress in the computer and electronic product industry.

In a previous paper on theatrical movies (Soloveichik 2013a), I used IMDB data on real movie inputs to calibrate my input-based price index. Unfortunately, IMDB does not contain useful data on real television inputs. Furthermore, I have not been able to locate any other data sources that track real television inputs over time. Accordingly, I

¹²Multi-factor productivity could rise if directors learned better production techniques over time. Alternatively, it could fall if early television shows used up all the good storylines.

cannot calibrate my input-based price index precisely. Instead, I will use my best judgment to develop two separate price indexes.

Price Index for Live Fiction Shows

My first price index tracks live fiction shows. The main input to these shows is a live performance with professional actors and elaborate studio sets. Television studios also use video cameras to record the live performance and computers to edit the resulting footage. These same inputs are used to create theatrical movies. Furthermore, many workers alternate between television shows and theatrical movies. Therefore, it seems reasonable to assume that live fiction television prices track theatrical movie prices.¹³

My paper “Theatrical Movies as a Capital Asset” describes the IMDB data used to construct a price index for theatrical movie investment. Based on that IMDB data, I created an input-based price index that uses three pre-existing price indexes: a) Live performance prices are taken from BEA’s table 2.4.4U (line 211); b) Video camera prices are taken from BLS’s producer price index (PPI) for photographic and photocopying equipment (PCU333316333316); c) Computer prices are taken from BLS’s PPI for computers (PCU334111334111). Since 2000, I give live performances a 70% weight, video cameras a 15% weight and computers a 15% weight. Before 1990, I assume computer usage was negligible. Based on that assumption, I give live performances an 85% weight and video cameras a 15% weight. Between 1990 and 2000, I assume that computers were gradually introduced into television studios.

¹³ In general, theatrical movies are much more expensive per hour of final footage. However, I only need the ratio of television costs to movie costs to remain steady over time.

Price Index for Other Long-Lived Programs

This category includes **both** animated fiction shows and non-fiction shows like documentaries. Both of these genres rely less on live performances and more on computers. The substitution is clearest for animated programs, which use computer animated characters instead of actors and costume designers. However, documentaries also substitute computers for live performances. Most documentaries start out with a video of pre-existing places of scientific, historical or social interest. Because documentaries show a real place, they do not need elaborate sets like live fiction television. Furthermore, documentaries generally hire a few narrators rather than a cast of paid actors. However, documentaries need a large amount of videotape and then careful splicing to create a coherent narrative. For example, an animal documentary might film a monkey colony for weeks and then pick out half an hour of footage. This type of show would have been prohibitively expensive in 1970, when video cameras were delicate and computer editing was impossible.

For my other long-lived price index, I use the same input series described earlier for theatrical movies. But live performance prices only have a 60% weight and computers have a 15% weight. Just like before, video cameras have a 15% weight. Furthermore, I assume that computers were first introduced in 1985 and reached their current level by 1995. At first glance it seems a little surprising that live performances are counted as heavily as they are. But animated shows still need writers to create the script and graphic designers to translate ideas into film. Documentaries still need narrators to transform raw footage into a coherent storyline. All of these jobs require highly skilled creative workers. Those same workers have wages that track live performance prices

Price Indexes and Real Production

Figure 9 shows price indexes from 1949 to 2010. The most important result is that prices for other long-lived television dropped even as prices for live fiction television rose. This drop in relative prices may explain why studios have chosen to create so many animated shows and non-fiction shows in recent years. Although not studied in this paper, reality shows have also benefited from cheaper computer editing in recent years. This relative price drop may explain why broadcast networks have switched from long-lived live fiction series to short-lived reality shows.

Figure 10 shows real production from 1949 to 2010. The general trends are very similar to the nominal investment numbers shown in Figure 8. Figure 10 may underestimate real production during recessions and overestimate real production in booms. The price indexes in Figure 9 are very smooth. I also assume that investment is a fixed percentage of revenue. At the same time, nominal advertising revenue is very sensitive to the overall economy. Accordingly, I calculate that real production drops during recession. It is possible that real investment is smooth – but television production prices drop during recessions. After all, actors and other production workers have limited outside options. They may be willing to accept lower wages during recessions. However, this argument is very speculative because I do not have direct data on television production inputs or budgets. In the national accounts, I will use the smooth investment prices given in Figure 9.

Alternative Price Indexes for Television

Consumption-based prices for television might offer another potential price index. BEA produces a consumption-based price index for cable television (line 219 of Table 2.4.4U). In addition to out-of-pocket spending on cable, consumers also pay an implicit price for ad-supported television. In 2010, consumers watched 23 cents of ads for every hour of ‘free’ television.¹⁴ In comparison, consumers only watched 3 cents worth of ads per hour in 1950.

Figure 11 compares my investment price index with consumption-based prices for cable and implicit consumption-based prices for advertising supported television. I find that both price measures track each other reasonably well in the long-term. But neither price measure tracks the television investment price. I believe that different trends are caused by quality improvements in television over time. These quality improvements are not necessarily captured in BLS’s existing price index for cable or my implicit price index for advertising supported television.

Even if the consumption-based price indexes were adjusted for quality, they still might not be useful investment price indexes. Based on the Kantar data, I calculate that long-lived television programs account for only one third of advertising revenue. Based on licensing data from SNL Kagan, I calculate that long-lived television accounts for less than 25% of consumer spending on cable. The rest of revenue comes from theatrical movies shown on television and short-lived television programs like sports, news, etc. It is entirely possible that sports licensing prices have not tracked long-lived television investment prices. After all, the NFL has a monopoly on football games and can charge what the market will bear. In contrast, there are usually multiple television studios competing to offer long-lived television programs.

¹⁴ This includes regular cable ads and public television spending (i.e., corporate sponsors are ads). The American Time Use Survey excludes young children, so total viewership is slightly understated.

3: Depreciation Schedules and Capital Stock

In this paper, I define the value of a television episode as the expected present value of future revenues minus future costs.¹⁵ I define the depreciation schedule as the rate at which a television episode declines in value over time. There are many possible reasons why a television original might decrease in value over time. For example, all consumers in a target market might have already watched the show and are now sick of it. In this paper, I will not attempt to distinguish between obsolescence of the special effect technology, physical depreciation of the recording itself, or any other reason why consumers stop watching an old show. I will simply attempt to estimate the schedule at which studios earn revenue from television episodes and the costs associated with those revenues.

Tribune Media Services Schedule Information

Tribune Media Services (TMS) provided the main dataset to measure depreciation. For ten randomly selected days, BEA purchased a complete schedule of shows on regular cable, premium cable, broadcast television and public television. TMS generously included schedules for one day before and one day after for cable television and two days before and two days after for broadcast television. In total, I have 30 days of data on cable television and 50 days of data on broadcast television. I then matched TMS's data with IMDB data and other online resources to determine the original airing date for each episode shown. In most cases it was relatively straightforward to determine

¹⁵ I discount future revenues at 7% real. Furthermore, I assume that television prices will continue to grow slower than the PCE deflator. The depreciation schedule changes if I use a different discount rate.

the original airing date. However, a few episodes could not be found, had ambiguous release dates or the online resources reported release dates well after the TMS reported an airing.¹⁶ I dropped those observations from the sample.

The final TMS sample is not completely representative. I had a much easier time matching live fiction programs than other long-lived programs. It was also harder to match older episodes because they were less likely to be in on-line resources. I suspect that my depreciation schedules would be slightly different if I could somehow match every single episode. But most unmatched episodes were on small cable channels, and so they earned relatively little money. Therefore, they had little effect on aggregate depreciation rates.

Nielsen Ratings Data

BEA purchased a special dataset from Nielsen that gives ratings for every program on ten randomly selected days. I then matched the ratings data with TMS's schedule information to get ratings data by airing date. The Nielsen data includes for-profit broadcast networks, the top regular cable networks and the top premium cable networks. Unfortunately, Nielsen does not track public television viewership. Also, BEA did not purchase ratings data for local broadcast television. I will impute viewership for shows not covered in Nielsen's sample. I also impute viewership for the TMS days not tracked in Nielsen's ratings data.

I use Nielsen viewership data as a proxy for licensing revenue. On average, premium cable channels earn more per viewer-minute than regular cable channels and

¹⁶ It is relatively common for online resources to give release dates a few weeks after the TMS airing. In that circumstance, I just rounded the release date down to the TMS date.

broadcast channels earn even less. Holding constant the channel type, I assume that revenue is proportional to viewership.

As a robustness check, BEA also purchased Nielsen viewership data by demographics. In general, advertisers pay higher rates for young adult viewers. So, average advertising revenue could change over time even while total viewership is constant. In fact, the Nielsen data report similar ages and genders for re-runs and original airings. Accordingly, adjusting for viewership demographics would have little impact. For simplicity I will use the total number of viewers in my depreciation schedules.

I found that most powerful predictor of viewership is time of day. On weekdays, television viewership is low throughout the day and then increases during the evening. On weekends, television viewership is higher during the day but still peaks in the evening. Average viewership is also higher on channels with higher average viewership.

Nielsen ratings are also correlated with the age for individual episodes. On for-profit broadcast networks, ratings are 75% higher for episodes released in the past year. In contrast, cable ratings do not change much with age. This may be related to different types of viewers or different types of shows on cable vs. broadcast. Because Nielsen does not track public television, I do not know how viewership changes with episode age.¹⁷ For simplicity, I impute viewership based only on time of day.

In order to use the complete TMS sample, I impute viewership revenue for every episode. My imputations are based on time of day, channel and the age of the individual episode. In practice, the depreciation curve would be very similar if I used only time of day and channel. Most programs shown on broadcast television are relatively new, so the

¹⁷It is also unclear whether public spending on a program is correlated with viewership. PBS donors might prefer to spend money on educational programming that attracts few viewers.

lower ratings for those few re-runs are not influential. Cable television shows a lot of re-runs, but those re-runs earn similar ratings to original airings.

Calibrating the Nielsen Ratings Data to Kantar's Revenue by Genre

Nielsen viewership is not a perfect proxy for licensing revenue. According to SNL Kagan, ESPN and other sports channels earn more licensing revenue per viewer minute than other cable channels. Furthermore, I was forced to drop some episodes in the TMS data because I could not identify their original airing dates. In order to get a more representative sample, I will calibrate my depreciation schedules against the Kantar data. In section 1, I estimated revenue for long-lived television programs by channel type, production method, original distributor and quarter. Based on that revenue data, I calculate that cable networks earn 50% more per viewer from live fiction than other long-lived television. Accordingly, I weight live fiction viewers higher when calculating my depreciation schedule.

Figure 12 shows market share by vintage for each television category. The most obvious result is that all channel types have a very high market share in the quarter of first release. This is partially because the quarter of first release always has at least one airing (by definition). But new shows are also more likely to be on prime-time, more likely to be on popular networks and more likely to be supported by advertising. Looking past the first quarter, we can see a clear difference between the channel types. Older shows have a very low market share on premium cable and for-profit broadcast. In contrast, regular cable and public television have significant market shares for re-runs.

By chance, half of the randomly selected dates in the TMS schedule were in fall. Broadcast networks typically start their new season in September. Accordingly, the fall has fewer re-runs than the rest of the year. I use the quarterly Kantar data to correct for this bias. Even though it does not have episode information, Kantar reports the series title for each program in the sample. For each series in my dataset, I calculate real quarterly investment in new episodes. I then regress real quarterly revenue on past investment. Based on that regression, I believe that the TMS schedule includes 50% more newly released episodes, 80% fewer episodes in their second quarter of life, 58% more episodes in their third quarter and 13% fewer episodes in their fourth quarter or later. I adjust the market share data in Figure 12 to match.

Sales Costs by Vintage

In section 1, I estimated that networks spend 20 cents promoting their new shows for every dollar of revenue those shows earn. Unfortunately, I do not have any data on advertising for individual television episodes. Kantar Media does track promos by program name – but the program name only identifies the series. Even if Kantar did track specific promotions, many of them are too general to identify an individual episode. Paid airtime is even more aggregated. I will assume that all promotions for on-going television series are for new episodes. Comparing the Kantar promo data to the Kantar advertising data, I find that studios spend approximately 17 cents promoting new shows for every dollar of revenue they earn. In contrast, studios only spend 1.1 cents promoting completed series for every dollar of revenue earned.¹⁸ For every dollar of new

¹⁸ I restrict the sample to live action fiction because IMDB tracks episodes for that genre much better. Results are similar if I include other long-lived television as well.

investment, I calculate that studios spend 18.7 cents on advertising in the first quarter and 1.3% of revenue for every quarter thereafter.

In section 1, I estimated that networks spend 17 cents on customer service for every dollar of advertising revenue and 5 cents on customer service for every dollar of licensing revenue. Broadcast networks are much more likely to air new episodes than cable networks. Furthermore, broadcast networks get virtually all of their revenue from advertising. Accordingly, new television shows have higher physical costs. However, the difference is small. In the release quarter, I estimate that networks spend 16 cents on physical costs for every dollar of revenue. After the first year, networks spend 13 cents on physical costs per dollar of revenue.

Calculating Depreciation Schedules

The market share data in Figure 12 is not enough to calculate a depreciation schedule. The television industry has been growing rapidly since 1950, and so the low market share for 1950's shows partially reflects the low production during that decade. I use the real investment numbers in Figure 10 to calculate quarterly service:

$$\text{Services}_t = (\text{Real Quarterly Revenue}_t)/(\text{Real Investment})^{19}$$

I then calculate the net present value (NPV) of television revenue from initial release until the episode fully depreciates:

$$\text{Real NPV}_0 = \text{Revenue}_0 - \text{Sales Costs}_0 + \text{NPV}_1/(1+r)$$

$$\text{Real NPV}_1 = \text{Revenue}_1 - \text{Sales Costs}_1 + \text{NPV}_2/(1+r)$$

¹⁹ In practice, the problem is somewhat circular. I need to know depreciation schedules to calculate the ratio (investment)/(licensing revenue). I start out by assuming that investment is proportional to revenue. Based on that, I calculate an initial depreciation schedule. I then adjust that depreciation schedule for higher investment ratios on other long-lived programs.

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Figure 13 shows the depreciation schedule for television.²⁰ In their first year of life, television episodes lose one third of their value. After that depreciation slows significantly. Television episodes lose 11.4% per year from age 1 to 11. From age 11 to 21, television episodes lose 7.5% per year. After age 21, depreciation virtually ceases. On average, television shows depreciation at 4.16% per quarter. This is slightly faster than depreciation for theatrical movies (Soloveichik 2013a), books (Soloveichik 2013b) and miscellaneous artwork (Soloveichik 2013c) but slower than the depreciation rate for music (Soloveichik 2012d).

Capital Stocks Over Time

Figure 14 shows real capital stocks of television from 1949 to 2010. The numbers are calculated by combining the real investment numbers in Figure 11 with the depreciation numbers in Figure 13. Overall, the geometric depreciation schedule does a very good job of matching aggregate capital stocks. Because the match is so close, I will use a geometric rate to calculate capital stocks and consumption of fixed capital.

When calculating nominal capital stock, readers should be careful not to multiply the combined capital stocks in Figure 14 with the combined price index in real capital stocks in Figure 14 with the price index in Figure 9. The price index in Figure 9 tracks investment prices for new television programs. Over the past few decades, real investment in live fiction television has grown much slower than real investment in other long-lived programs. Because of the slower growth, the ratio of capital stock to new

²⁰ This depreciation does not account for possible spill-overs between new episodes and pre-existing episodes of the same series. I welcome suggestions how to measure spillovers and adjust depreciation.

investment is higher for live fiction. Accordingly, the pre-existing capital stock of television consists of mostly live fiction and capital stock prices track live fiction prices very closely.

Section 4: Valuing Television Format Rights

What Are Long-Lived Format Rights?

In this paper, I only value individual television episodes as capital assets. This is consistent with the handbook on intellectual property (OECD 2010). However, another researcher might count format rights as an entertainment original. For example, an individual reality show might be shown live and never replayed. Because the episodes are so short-lived, they are not counted as capital assets. On the other hand, the reality show re-uses the same storyline and rules for multiple seasons. Soap operas also re-use the same storyline day after day to produce new episodes

Early radio shows often used long-lived formats as an input to production. For example, a radio soap opera used the same characters and storyline for years. After television was invented, many popular radio programs switched to television. I will treat this switch as a transfer of artistic capital from the radio industry to the television industry. Therefore, aggregate growth in long-lived formats is much lower than growth in the television industry during the 1950s.

The results in this section are very preliminary. At the present time, BEA is not planning to classify long-lived format rights as entertainment originals. As a result, none

of the estimates reported in this section will be included in the national income and product accounts. Nevertheless, I present these numbers for interested researchers.

Nominal Revenue from Long-Lived Television Formats

Soap operas, game shows and reality television are the main genres with long-lived formats and short-lived individual episodes. I use Kantar's advertising data to track the market share for long-lived format revenue by television type. This data is described in section 1.²¹ Based on the TMS schedule data, I believe that premium cable and public television show very few soap operas, game shows or reality television. I will set their revenue equal to zero for simplicity. Before 1995, I use Nielsen's Pocketpiece reports to track long-lived format revenue.

Figure 15 shows the market share for long-lived formats from 1949 to 2010. Overall, long-lived formats have a U-shaped market share. Soap operas, variety shows and game shows were popular during the 1950's and 1960's. Their market share gradually diminished until 2000. After 2000, reality shows started becoming more popular. I do not know whether these trends are caused by technology changes or just shifts in consumer taste. Regardless, the U-shaped curve is far more volatile than the steady market share for long-lived television shown in Figure 2.

Nominal Revenue from Long-Lived Radio Formats

The handbook on intellectual property (OECD 2010) recommends that long-lived radio programs be treated in the exact same way as long-lived television shows. Unlike

²¹ In section 1, I adjusted the long-lived revenue share for differences between the Kantar advertising data and Kagan's data on total revenue. I use the same adjustment factors here.

television, it is very rare for radio episodes to re-run. Modern radio shows are almost exclusively music, news or other short-lived genres. Before 1950, radio shows often played dramas, sit-coms or other long-lived genres. However, audio recording technology was not good enough for re-runs to be feasible (Sterling and Kittross 1978).²² Instead, radio dramas were broadcast live every episode. Because radio re-runs are so uncommon, I do not count any long-lived radio episodes as capital assets.

Even though individual radio episodes are never long-lived, radio formats might be long-lived. Before 1950, radio soap operas and game shows were common. If a researcher chooses to capitalize long-lived television formats, they might also choose to capitalize long-lived radio formats as well. I used ratings data from the book “Stay Tuned” (Sterling and Kittross, 1978 and 2002) to calculate the market share for long-lived formats from 1929 to 1961. By 1961, radio soap operas had virtually disappeared. I assume that long-lived formats accounted for 1% of radio revenue after 1961.

Figure 16 shows the market share for long-lived formats. When radio was first invented, long-lived formats were very rare. Radio soap operas grew rapidly in the 1930’s and 1940’s and then peaked in 1949. During the 1950’s, most radio soap operas transitioned to television. This transition could be considered a transfer of intangible capital from radio networks to television networks. In most cases, the transfer occurred within a company – so there are no explicit payments.

²² Movies and records were both popular before 1950. However, the combination of recording distortions and radio broadcast distortions was too much. Many stations did record shows for archival purposes. In a few cases, these recorded shows have been digitally improved and sold on CD in recent years.

Nominal Investment, Prices, Depreciation and Capital Stock

Only a portion of the revenue shown in Figure 15 and 16 can be attributed to the long-lived format. In addition to normal broadcast costs, studios must also pay their actors, writers and other people who produce each individual episode. Because individual episodes are short-lived, those costs must be subtracted from revenue. I have not been able to locate any data that value of long-lived formats alone. I was also unable to measure prices for long-lived formats. Because I am so uncertain, I will not present any estimates of nominal investment, prices, depreciation or capital stock.

Even though I cannot measure depreciation precisely, I believe that long-lived formats have a very low depreciation rate. Many soap operas have lasted from the 1930's until the 2000's. Furthermore, game shows like "Wheel of Fortune" or "Jeopardy" have been continuing for decades. Reality shows are newer, so we cannot observe their eventual lifespan. But successful reality shows like "American Idol" have already lasted a decade. One explanation for the long lifespan might be the ability to transition new people into an existing format. For example, soap operas frequently replace actors without changing the character at all. This allows the show to continue even after individual actors move to other projects or die.

Conclusion

In this paper, I constructed estimates of investment, prices, depreciation and capital stocks of long-lived television programs. This change helps bring the NIPAs in

line with SNA 2008, which recommended that entertainment originals be treated as capital assets.

I find that investment in television programs has been growing rapidly over time. In 1960, studios spent \$0.6 billion producing long-lived television episodes, 0.11% of nominal GDP. By 2010, long-lived television had grown to \$28.3 billion, 0.20% of nominal GDP. On average, nominal GDP growth increases by 0.0018% per year when long-lived television programs are classified as a capital asset. I also found that real prices for television investment have been flat since 1990.

Table 1: List of Datasets Used and How They Are Used

Dataset	Description of Dataset	Used to Create
2007 Economic Census	The Economic Census is conducted every 5 years by the Census Department. It surveys businesses in the United States.	Nominal Television Production
2004-2008 Service Annual Survey	The Service Annual Survey is conducted every year by the Census Department. It surveys businesses in the service sector. However, it is less detailed than the Economic Census.	Nominal Television Production, Real Television Production & Depreciation Schedules
IMDB.com and other on-line sources	IMDB provides the nationality of the producing studio and the distributing company. I also used Wikipedia, tvrage.com and other sources to locating distributors for some shows	Industry split for television production, US market shares
Tribune Media Service data	This is a dataset of American movies shown on US television stations. The dataset records the name of the movie, the date it was shown and the channel it is shown on.	Television Licensing Revenue Schedule & Depreciation Schedule
Nielsen Ratings data	This is a dataset of viewership for national broadcast and national cable channels on ten randomly selected days.	Market Share for Long-Lived television programs; Depreciation Schedule
Kantar Media Services data	This is a dataset that tracks advertising spending by product in the US. BEA purchased a special dataset that gives advertising by channel type, program genre and program name. I then matched those program names to IMDB data to identify theatrical movies, non-US television and distributors	Market Share for Long-Lived Television, Industry Split for Television and other figures

Table 2: Television Revenue by Category 1949-2010

	Cash Revenue Earned, Millions of Current \$'s									Value of Unpaid Airtime		
	Regular Cable Licensing and Airtime	Premium Cable Licensing	National Broadcast	Local Broadcast	Syndication	Public Broadcast	TV Programs on DVD	Foreign Licensing	Merchandise Licensing and Other Misc. Revenue	Regular Cable	National Broadcast	Local Broadcast
2010	44,818	3,348	16,337	10,959	1,761	1,665	1,999	7,575	2,856	4,964	3,081	3,227
2009	42,045	2,973	14,478	9,731	1,640	1,604	2,032	7,280	2,347	4,960	2,777	3,830
2008	40,652	2,846	16,773	12,294	1,786	1,838	2,363	7,302	2,442	4,626	3,237	3,823
2007	37,568	2,408	16,538	12,651	1,843	1,723	2,409	7,319	1,882	4,277	3,240	3,858
2006	34,380	2,050	17,250	12,877	1,943	1,793	2,050	7,164	1,746	4,647	3,954	3,562
2005	31,881	1,950	17,030	12,118	2,010	1,516	1,602	6,650	1,862	4,598	3,948	3,480
2004	28,625	1,947	17,055	11,993	1,887	1,556	1,477	6,097	1,769	4,303	3,702	3,192
2003	25,867	1,828	15,935	11,288	1,685	1,513	1,270	5,884	1,888	4,172	3,547	3,457
2002	22,754	1,963	16,410	10,887	1,535	1,459	1,147	5,569	1,750	3,606	3,340	2,892
2001	20,722	1,969	14,428	10,054	1,556	1,582	985	5,311	1,719	3,829	3,070	2,930
2000	19,746	1,837	15,369	11,742	1,522	1,582	829	5,262	1,852	3,601	3,214	3,048
1999	16,670	1,784	13,908	10,628	1,458	1,412	676	4,864	1,938	2,787	2,763	2,707
1998	14,055	1,784	12,444	10,551	1,292	1,235	507	4,320	1,894	2,376	2,604	2,602
1997	11,682	1,727	11,544	9,672	1,185	1,240	385	3,855	1,872	2,045	2,443	2,360
1996	9,842	1,693	11,271	9,374	1,121	1,284	348	3,616	1,804	1,825	2,392	2,514
1995	8,360	1,777	10,726	8,702	1,238	1,164	322	3,372	1,498	1,416	2,274	2,367
1994	7,295	1,878	9,900	8,016	1,142	1,096	306	2,928	1,373	1,174	2,099	2,180
1993	6,296	2,235	8,995	7,327	1,040	1,055	275	2,709	1,241	974	1,907	1,993
1992	5,579	2,655	9,083	7,296	1,045	1,042	251	2,725	1,137	822	1,926	1,984
1991	4,861	2,928	8,769	7,019	1,007	1,018	245	2,417	1,046	701	1,859	1,909

	Regular Cable Licensing and Airtime	Premium Cable Licensing	National Broadcast	Local Broadcast	Syndication	Public Broadcast	TV Programs on DVD	Foreign Licensing	Merchandise Licensing and Other Misc. Revenue	Regular Cable	National Broadcast	Local Broadcast
1990	4,238	3,270	9,558	7,244	1,074	975	250	2,399	1,077	606	2,026	1,970
1989	3,449	3,409	8,986	6,893	1,015	927	241	2,132	1,033	532	1,905	1,875
1988	2,836	3,191	8,832	6,697	993	870	228	1,946	1,024	428	1,872	1,821
1987	2,259	2,985	8,240	6,413	936	813	206	1,837	1,039	329	1,747	1,744
1986	1,760	3,072	7,941	6,155	900	649	178	1,894	1,068	244	1,684	1,674
1985	1,454	3,148	7,395	5,671	835	612	143	1,667	1,030	199	1,568	1,542
1984	1,232	2,990	7,229	5,153	794	559	99	1,510	811	169	1,533	1,401
1983	1,055	2,477	6,095	4,532	680	557	69	1,322	539	147	1,292	1,233
1982	761	1,748	4,818	4,097	567	699	47	1,145	392	95	1,021	1,114
1981	545	1,031	4,805	3,517	533	659	31	1,022	257	61	1,019	957
1980	374	507	4,368	3,069	477	618	22	732	147	34	926	835
1979	259	236	3,928	2,697	425	489	15	795	143	15	833	734
1978	173	87	3,424	2,448	376	485	9	678	116	0	726	666
1977	151	30	2,917	2,069	320	419	4	617	103	0	618	563
1976	128	11	2,464	2,022	286	319	0	508	85	0	522	550
1975	115	2	1,963	1,524	223	252	0	373	62	0	416	414
1974	97	0	1,811	1,406	205	203	0	357	60	0	384	382
1973	83	0	1,663	1,293	189	142	0	304	51	0	353	352
1972	70	0	1,496	1,237	174	142	0	318	53	0	317	337
1971	60	0	1,289	1,075	150	94	0	273	46	0	273	292
1970	51	0	1,274	1,159	154	61	0	273	46	0	270	315
1969	39	0	1,270	1,155	154	20	0	256	43	0	269	314
1968	30	0	1,145	1,041	139	0	0	232	39	0	243	283

	Regular Cable Licensing and Airtime	Premium Cable Licensing	National Broadcast	Local Broadcast	Syndication	Public Broadcast	TV Programs on DVD	Foreign Licensing	Merchandise Licensing and Other Misc. Revenue	Regular Cable	National Broadcast	Local Broadcast
1967	23	0	1,031	937	125	0	0	238	40	0	219	255
1966	18	0	1,000	910	121	0	0	261	44	0	212	247
1965	14	0	891	810	108	0	0	207	35	0	189	220
1964	12	0	811	738	98	0	0	175	29	0	172	201
1963	10	0	720	655	87	0	0	170	29	0	153	178
1962	9	0	672	611	81	0	0	161	27	0	142	166
1961	8	0	599	545	73	0	0	156	26	0	127	148
1960	7	0	576	524	70	0	0	146	25	0	122	143
1959	5	0	542	493	66	0	0	138	23	0	115	134
1958	4	0	491	447	60	0	0	120	20	0	104	122
1957	3	0	456	414	55	0	0	119	20	0	97	113
1956	3	0	434	395	53	0	0	107	18	0	92	107
1955	2	0	367	333	44	0	0	84	14	0	78	91
1954	2	0	287	261	35	0	0	65	11	0	61	71
1953	1	0	215	195	26	0	0	49	8	0	46	53
1952	1	0	161	146	19	0	0	37	6	0	34	40
1951	1	0	118	107	14	0	0	24	4	0	25	29
1950	1	0	61	55	7	0	0	11	2	0	13	15
1949	1	0	21	19	2	0	0	4	1	0	4	5

Figure 1: Total Television Revenue

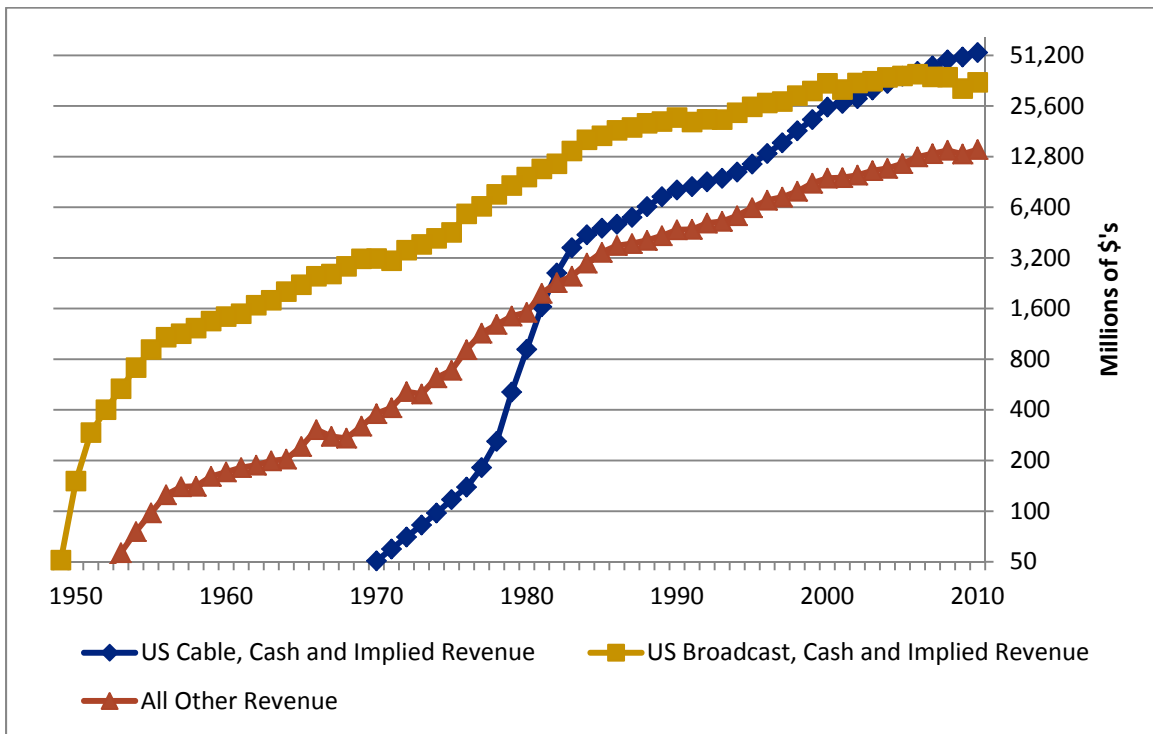


Figure 2: Market Shares for Long-Lived US Television

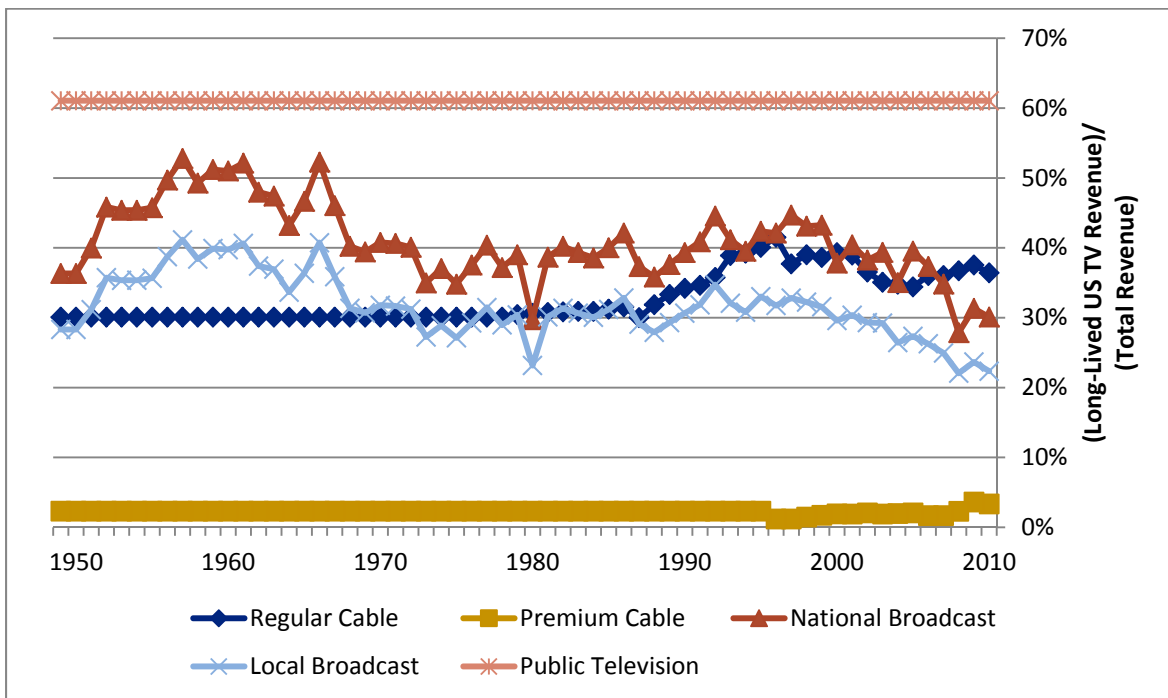


Figure 3: Non-Artwork Costs vs. Revenue

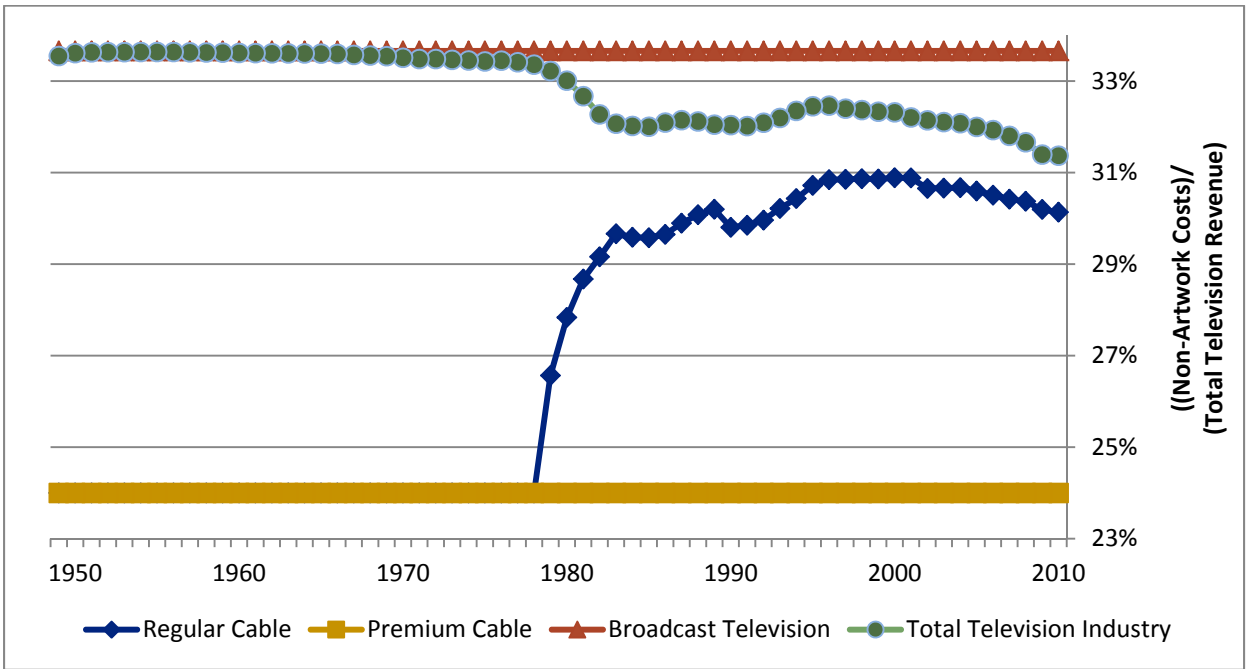


Figure 4: Market Share For Live Fiction Television

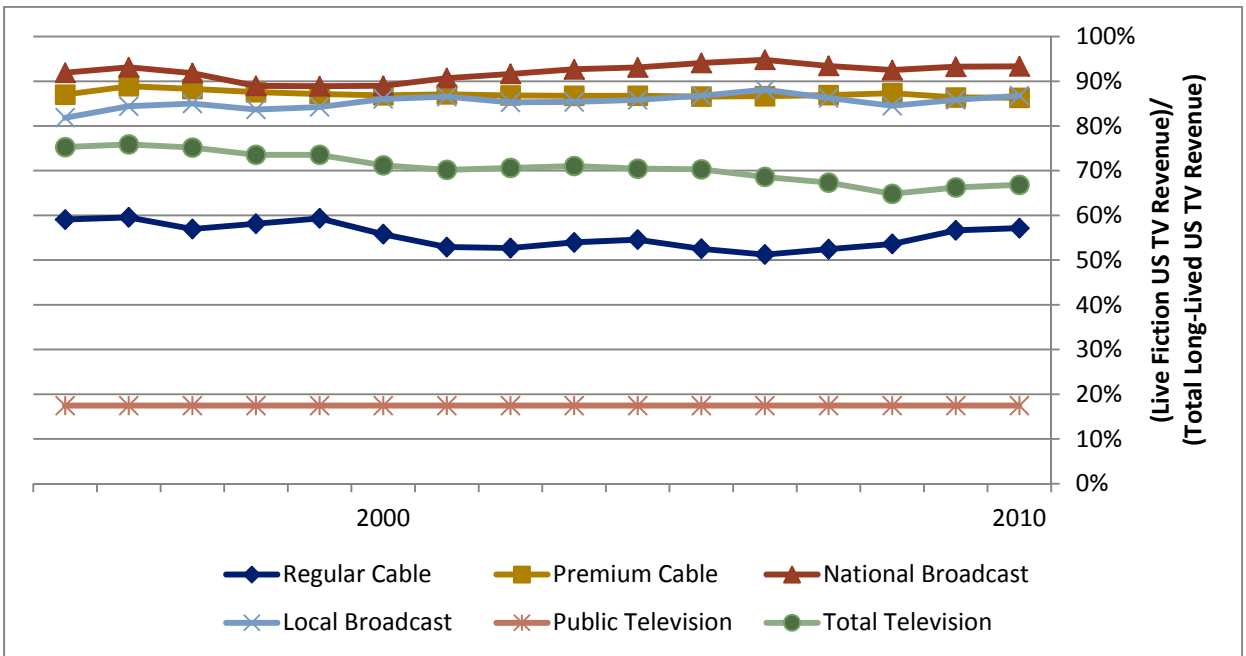


Figure 5: Relative Revenue by First Distributor, Live Fiction Television Only

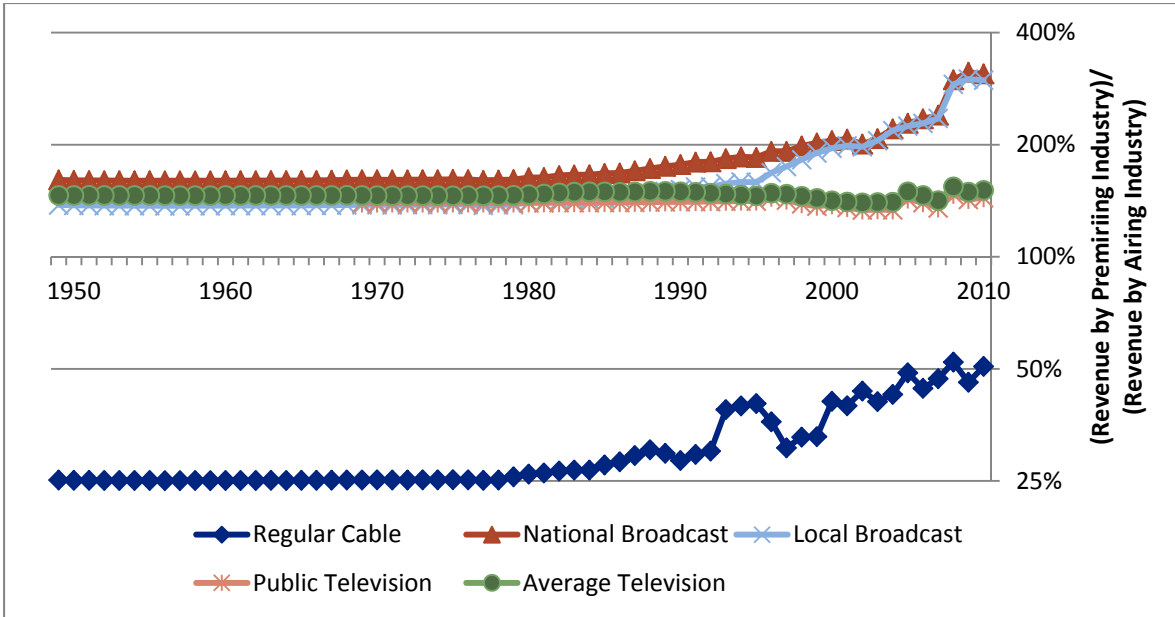


Figure 6: Relative Revenue by First Distributor, Other Long-lived Television Only

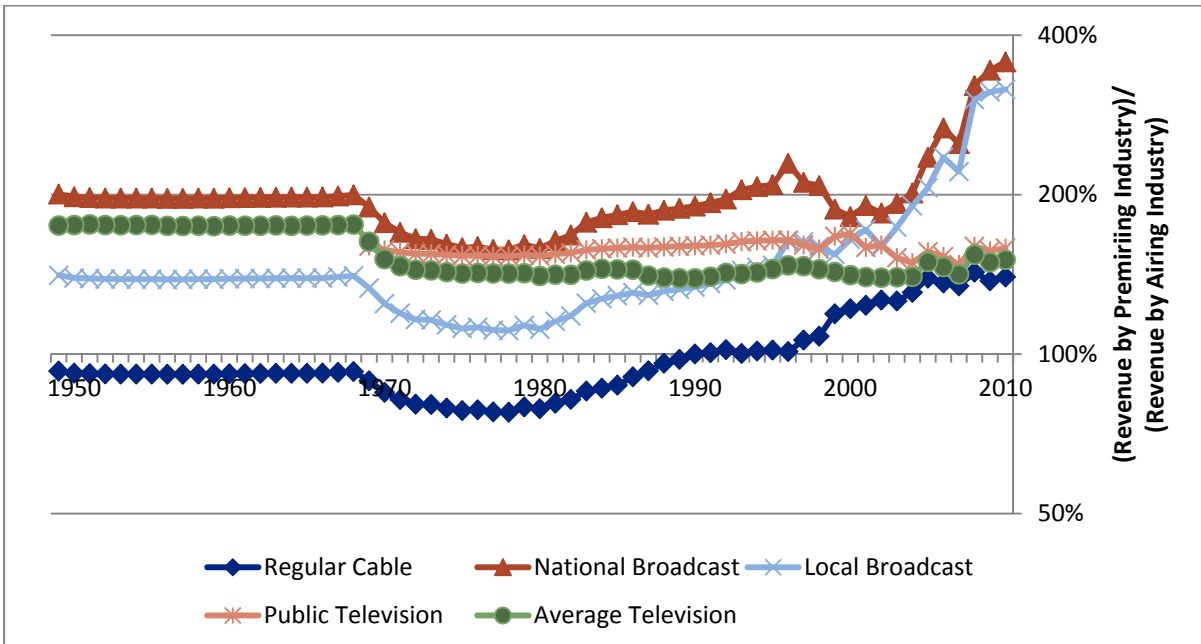


Figure 7: Investment Relative to Licensing Revenue

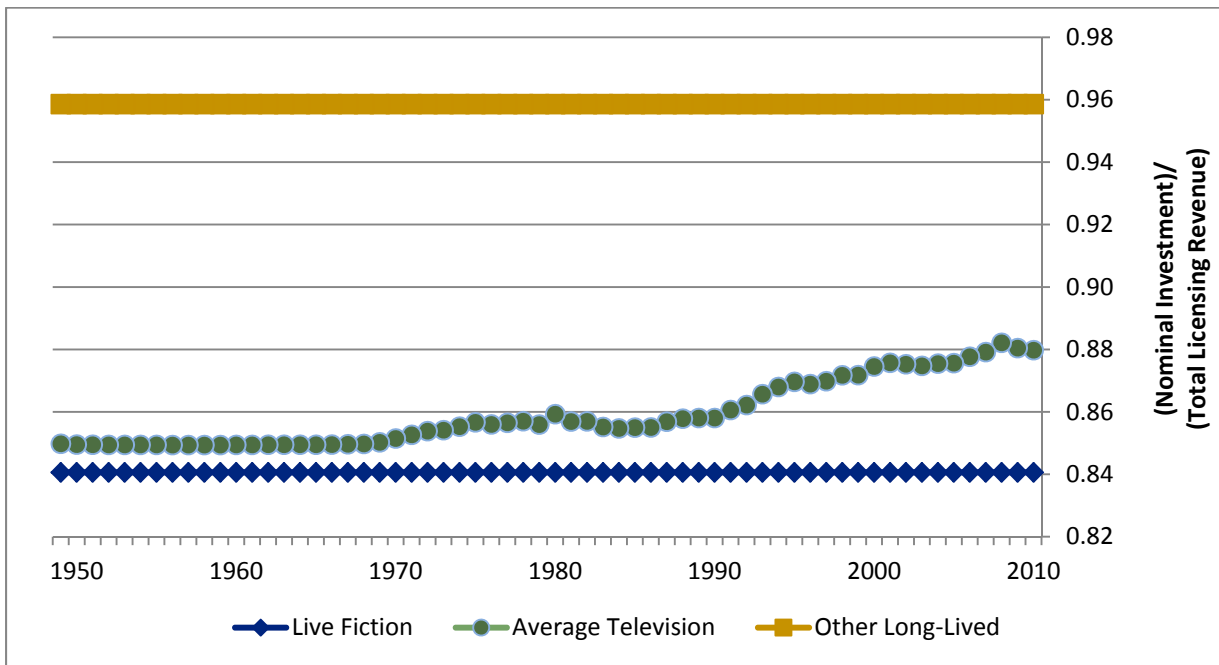


Figure 8: Nominal Television Investment

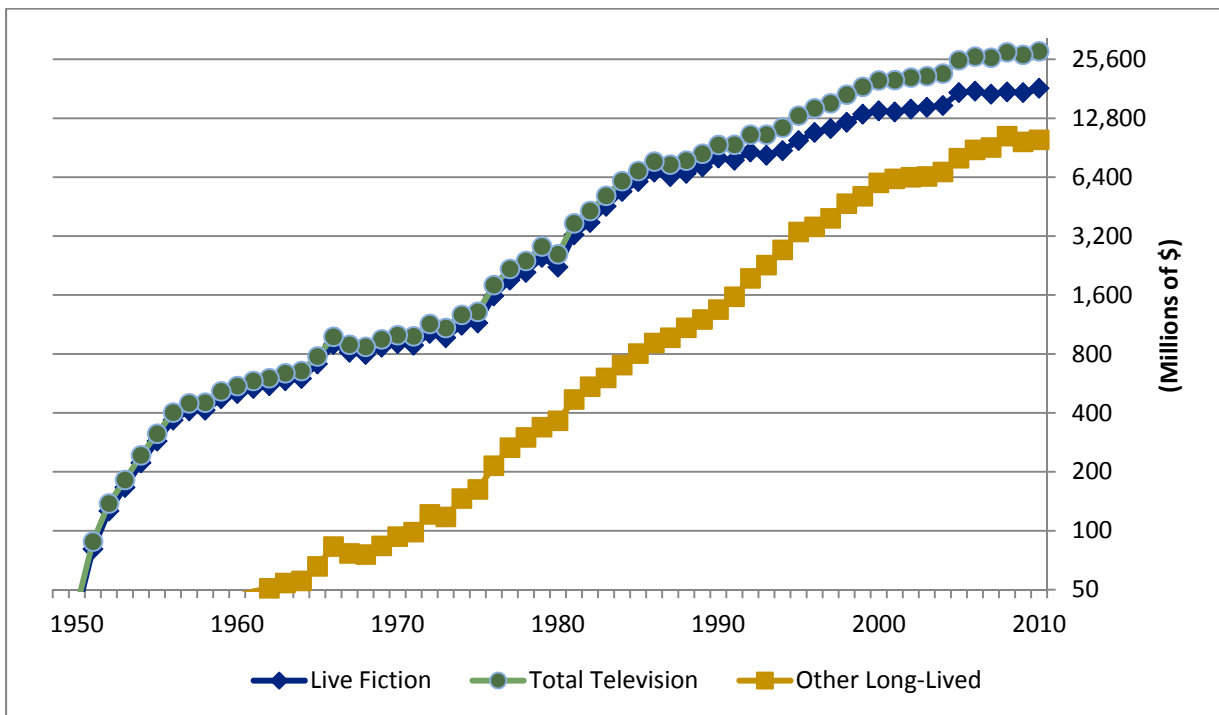


Figure 9: Television Investment Prices

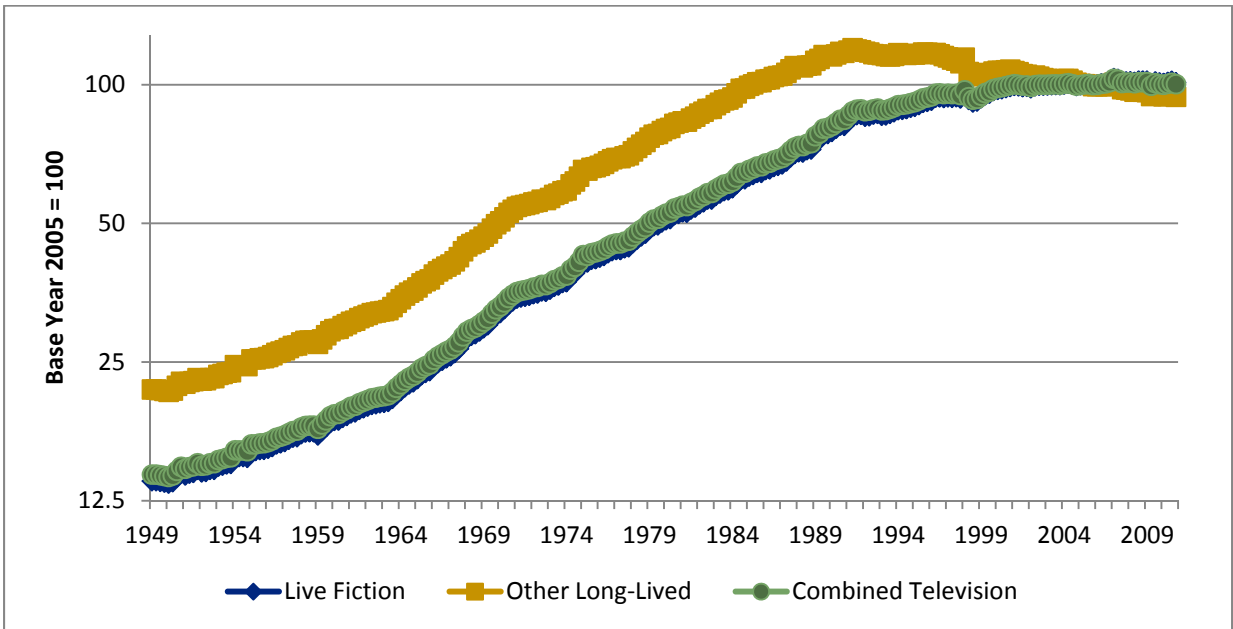


Figure 10: Real Television Investment

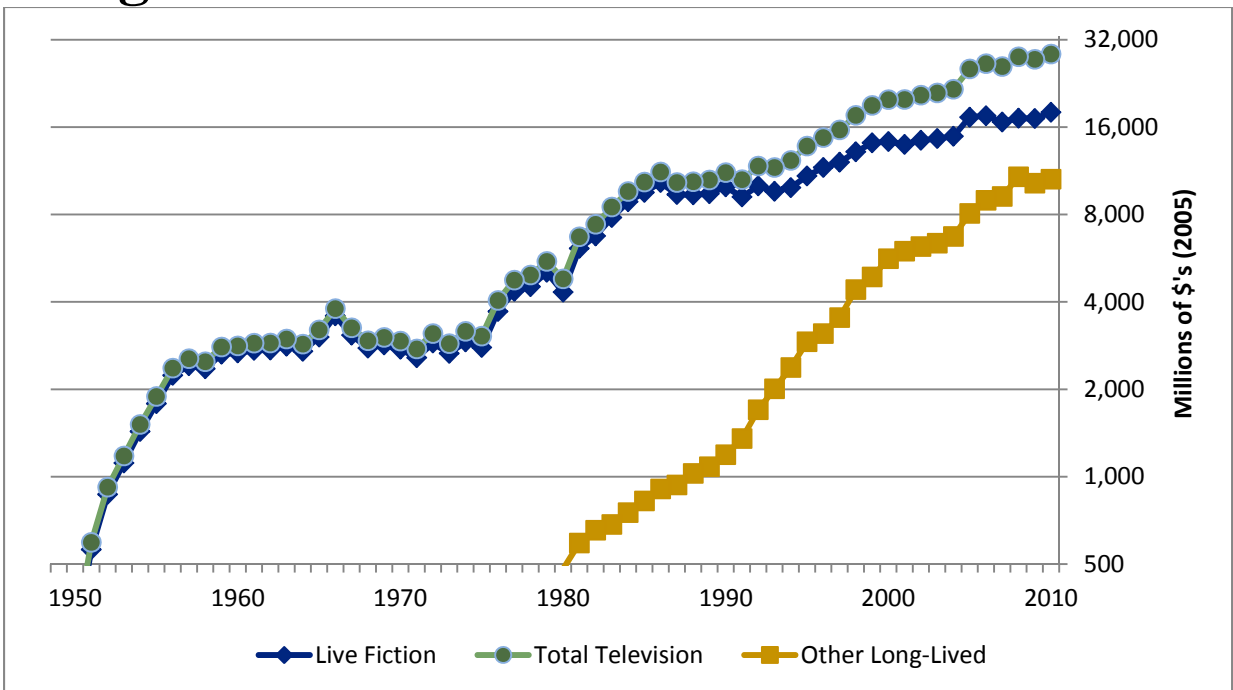


Figure 11: Consumer Prices for Television

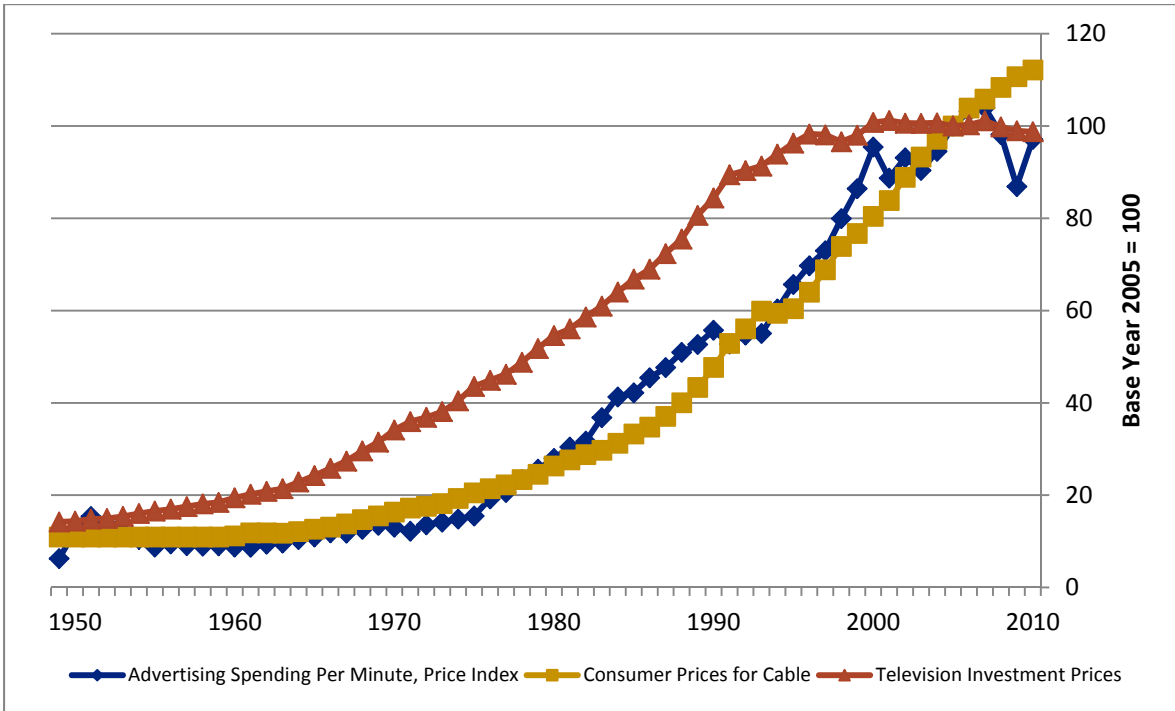


Figure 12: Market Share by Vintage

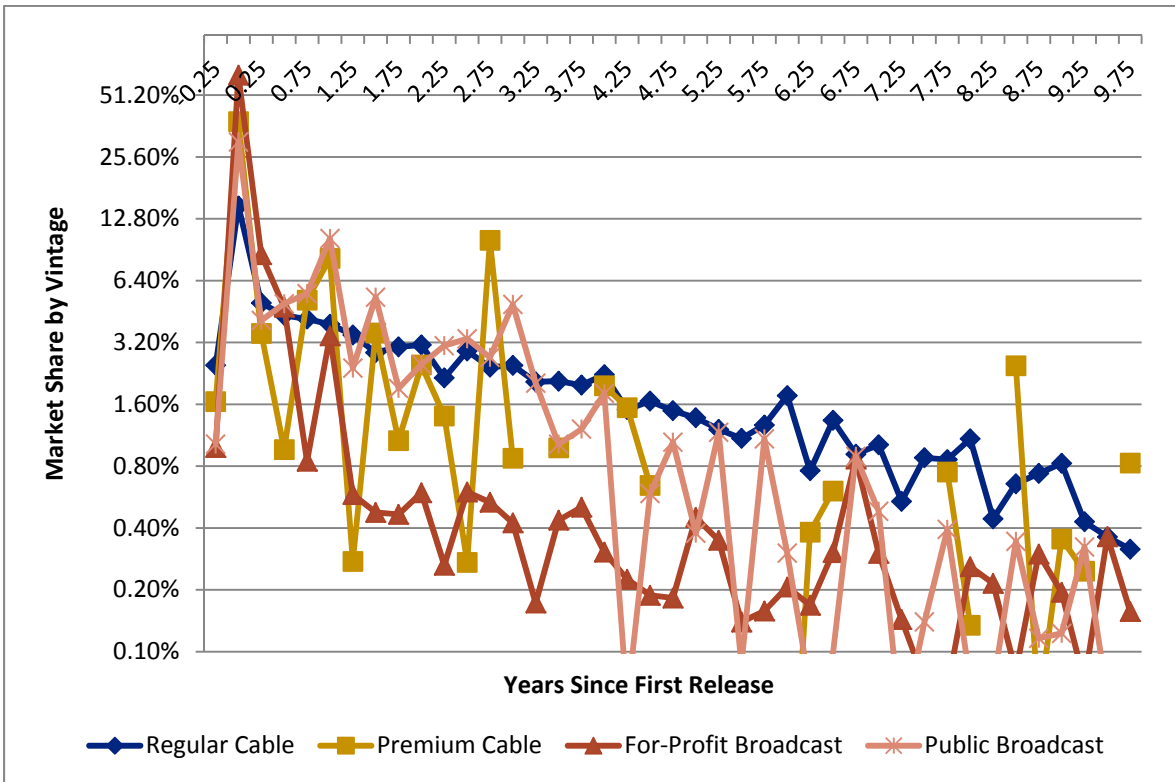


Figure 13: Depreciation Schedules

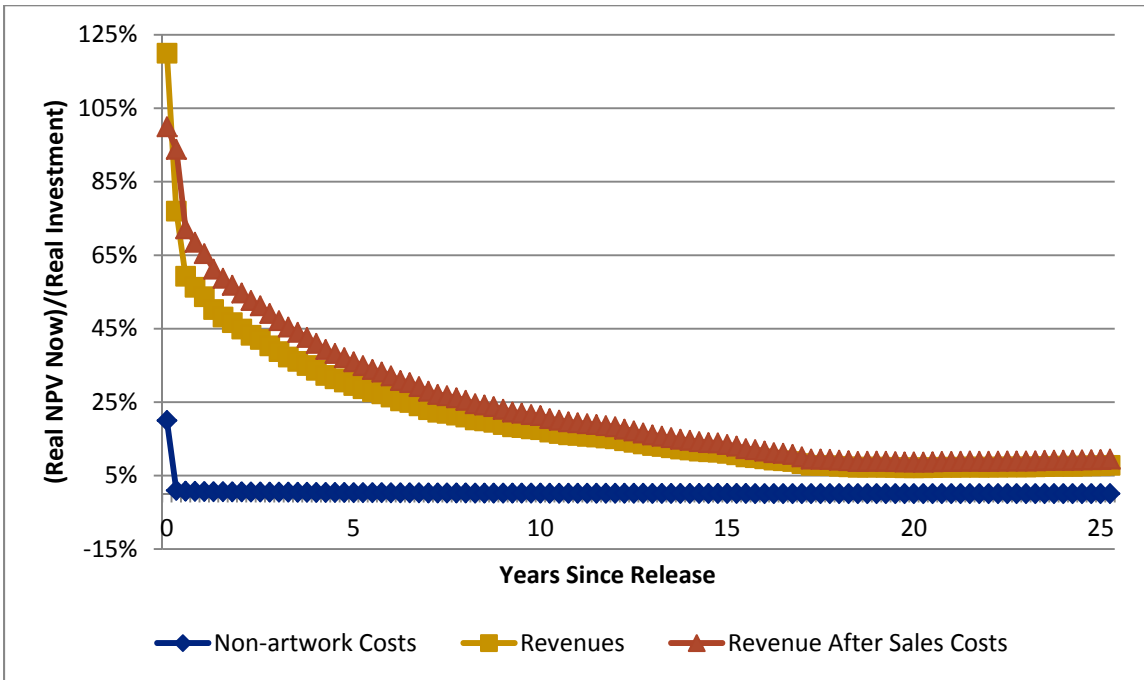


Figure 14: Real Capital Stock

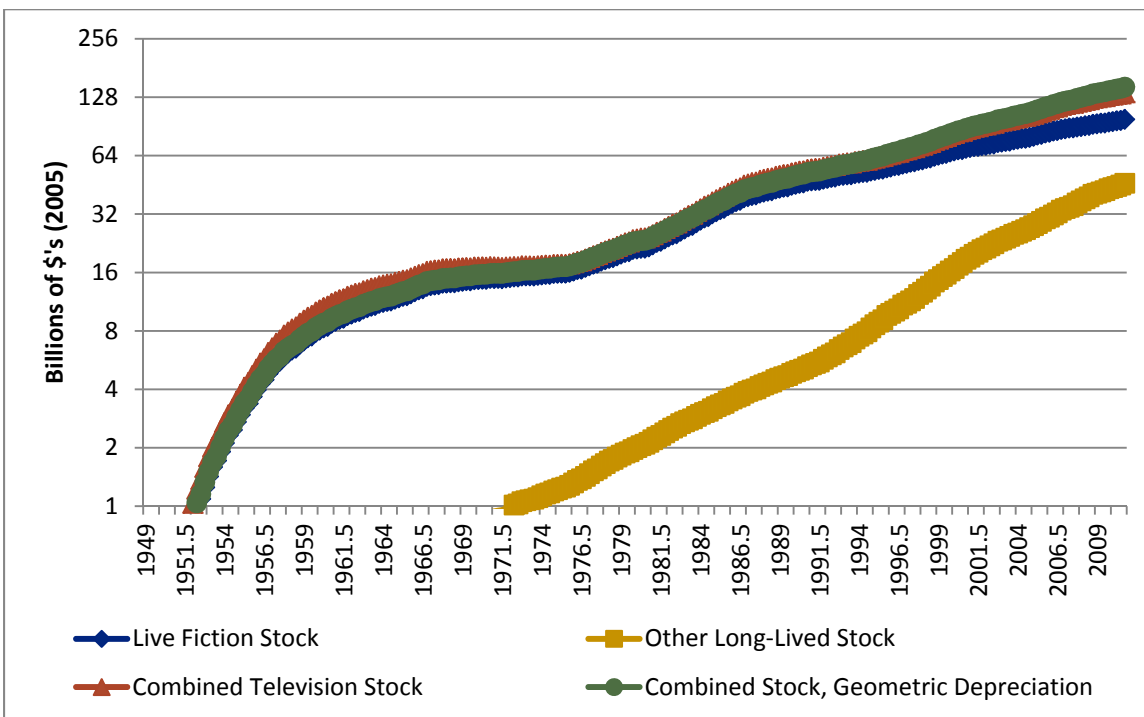


Figure 15: Market Shares for Long-Lived Formats

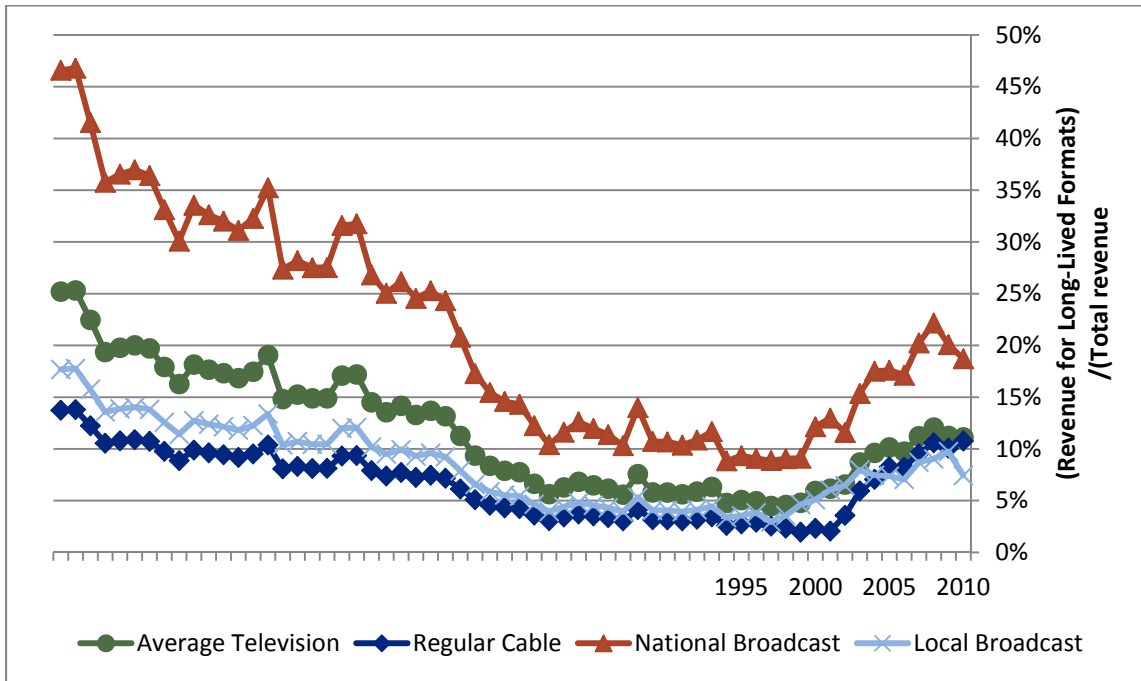
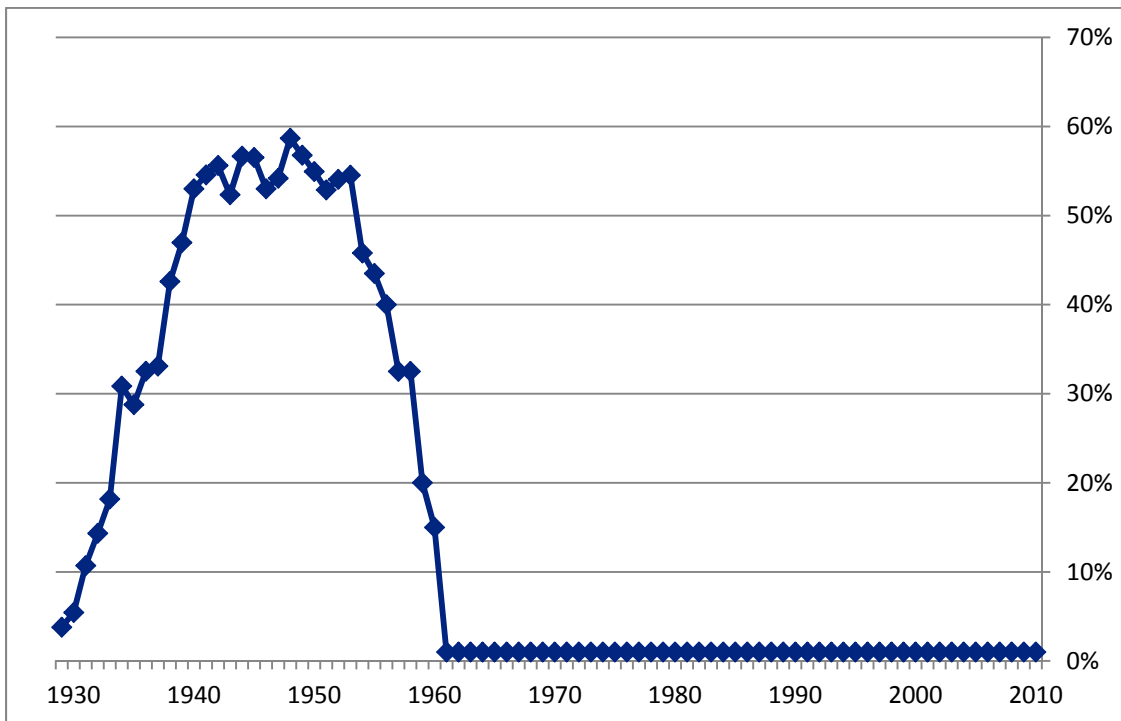


Figure 16: Long-Lived Radio Formats



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