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**The Evolution of Entertainment
Consumption and the Emergence
of Cinema, 1890-1940**

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The Evolution of Entertainment Consumption and the Emergence of Cinema, 1890-1940[‡]

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Abstract

This paper investigates the role of consumption in the emergence of the motion picture industry in Britain France and the US. A time-lag of at least twelve years between the invention of cinema and the film industry's take-off suggests that the latter was not mainly technology-driven. In all three countries, demand for spectator entertainment grew at a phenomenal rate, far more still in quantity than in expenditure terms. In 1890 'amusements and vacation' was a luxury service in all three countries. Later, US consumers consumed consistently more cinema than live, compared to Europe. More disaggregated data for the 1930s reveal that in Europe, cinema was an inferior good, in the US it was a luxury, and that in Europe, live entertainment was just above a normal good, while in the US it was a strong luxury. Comparative analysis of consumption differences suggests that one-thirds of the US/UK difference and nearly all of the UK/France difference can be explained by differences in relative price ('technology'), and all of the US/France difference by differences in preferences ('taste'). These findings suggest a strong UK comparative advantage in live entertainment production. Using informal comparative growth analysis, the paper finds that cinema consumption was part of a large boom in expenditure on a variety of leisure goods and services; over time, by an evolutionary process, some of these goods, such as cinema and radio, formed the basis of dominant consumption habits, while others remained relatively small. The emergence of cinema, then, was led to a considerable extent by demand, which, through an evolutionary process, was directed towards increasing consumer expenditure on spectator entertainment.

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1. Introduction

At the end of the nineteenth century, in the era of the second industrial revolution, falling working hours, rising disposable income, increasing urbanisation, rapidly expanding transport networks and strong population growth resulted in a sharp rise in the demand for entertainment. Initially, the expenditure was spread across different categories, such as live entertainment, sports, music, bowling alleys or skating rinks. One of these categories was cinematographic entertainment, a new service, based on a new technology. Initially it seemed not more than a fad, a novelty shown at fairs, but it quickly emerged as the dominant form of popular entertainment. This paper argues that the take-off of cinema was largely demand-driven, and that, in an evolutionary process, consumers allocated more and more expenditure to cinema. It will analyse how consumer habits and practices evolved with the new cinema technology and led to the formation of a new product/service.

Two questions are addressed: why cinema technology was introduced in the mid-1890s rather than earlier or later; and why cinema-going became popular only with a lag – a decade after the technology was available. Both issues can potentially be affected by changes in supply or changes in demand.

These issues are worthwhile to examine, because they can help us get insight into how new consumer goods and services emerge, how the process works by which certain new goods become successful and are widely adopted while others will disappear and are forgotten forever. The paper will also give us more insights and new ways to look at the interaction between demand and supply. The emergence of cinema is a major case study that enables us to examine several different aspects. Further, a comparative approach enables us to better ascertain which

aspects are due to local conditions and which ones appear to be more general.

This paper will use four major approaches to tackle the research questions: qualitative, quantitative, comparative and theoretical. On the qualitative level, history of technology will be analysed to assess the time lag between the availability of the constituent technologies and the appearance of the innovation of the cinematograph. It is expected that the findings will show that it is highly unlikely that there was no significant time-lag between the technologies being available and the innovation that embodied all these technologies appearing. The length of the time lag will also be estimated.

The quantitative part will start with analysing the shape of the growth pattern of the quantity of cinema consumed and expenditure on cinema. The time of the take-off will be estimated quantitatively (and its timing compared with the qualitative findings above). Also growth rates and quantities time series will be compared across countries. A second quantitative section will analyse family expenditure on entertainment between 1890 and 1940.

The comparative part will compare the above issues across Britain, France and the US. In this way, it can be ascertained how much of the consumption patterns are determined by local conditions and how much was part of a general trend. . It will be assessed how country differences can be explained; for example, whether differences in income elasticity's can explain differences in diffusion patterns. Further, a model with quantity elasticities and relative prices will be developed and used to disaggregate paired differences in consumption patterns into the effect of 'technology' and the effect of 'tastes'.

An experimental theoretical section investigates if and how the concepts used by Nelson and Winter (1982) to study mainly firms to the area of households and consumers. Three strata will specifically be

addressed: the development of consumption routines, skills and capabilities; the role of selection, replication, imitation and modification in their evolution; and finally, the role of random events and mutations. This paper will argue that the emergence of cinema was mainly demand-led. Consumers started to spend more time and money on leisure activities, and initially their expenditure was spread out among a lot of different categories. A lot of the demand, however went to spectator entertainment, and to reduce bottlenecks and increase revenues, entrepreneurs started to use cinema technology. Consumers reacted favourably to this technology, giving entrepreneurs incentives to develop it further. Using informal comparative growth analysis, the paper finds that, over time, in an evolutionary process, more and more expenditure was moved away from things such as tobacco and alcohol to entertainment expenditure, and within entertainment expenditure, more and more was spent on cinema. Cinema-going became a habit for consumers, sometimes daily, sometimes weekly. I.e. the outcome of the evolutionary process was that cinema became the dominant form of entertainment.

The rest of this paper is structured as follows: Section 2 sets both alternatives against a more detailed history of innovation and the emergence of cinema consumption, sharpening our sense of both the technology aspect and the lag between technical possibility and take-off. In section 3 the available data sources relevant to understanding how the consumption of cinema grew are identified and analyzed in depth, and national differences decomposed in those due to technology and those due to taste. Section 4 further investigates the demand-led explanation of the emergence of cinema by locating it within the changing demand for recreational spending as a whole.

2. The Evolution of Film Production

2.1 The lag between technology and innovation

As with many innovations, the idea of cinema preceded the invention itself. It is difficult to give an exact date to the emergence of the idea, or concept of cinema, but the first projection of moving images dates from the 1850s, and the first patents on the viewing and projection of motion pictures were filed in 1860/1861. The more specific idea of applying all these ideas into one technology must have emerged at least some time before the mid-nineteenth century (Michaelis 1958: 734-751; 734-736).

Many visual devices and gadgets preceded cinema, too many to list here in detail. A widespread and well-known one was the *camera obscura*, first constructed in 1645, which projected views in a dark room, for painters. Around the same time Anastasius Kircher built a special room to project images with mirrors, which looked somewhat like a cinema. A specialised building with many people using specialised equipment was necessary to project the images. About a decade later, in 1659, the Dutchman Christiaan Huygens invented the magic lantern, an easy, portable device, which could project images painted on a glass plate. Huygens interest was mainly scientific, but in the 1660s, the first showman, Thomas Walgensten, a Danish teacher and lens grinder living in Paris, travelled Europe giving exhibitions of the marvellous magic lantern. Not much later, a vibrant business of travelling showman, equipment manufacturers and slide painters emerged. At least from the 1740s onwards, magic lantern shows were also given regularly in the US (Musser 1990: 17-20).

In 1799 the Frenchman Etienne Gaspart Robert became well known for his spectacular shows with magic lanterns in Paris, which he named the *Fantasmagorie*. Robert used several projectors, moved by operators to get larger and smaller images, smoke, sound effects and many other tricks and gadgets. The audience saw, for example, a ghost

becoming larger and larger as if it was flying into the audience and then at the last moment disappear. In the early 1800s, Robert and his *Fantasmagorie* also travelled to Britain and the United States, where he asked a one dollar entry fee (Musser 1990: 24-25; Michaelis 1958: 736-737).

Cinema as it was introduced in the late 1890s, was based on seven important technologies, ideas or concepts (table 1). First, it was based upon photography, invented in the 1830s. It was also based upon two further innovations in photography. The separation of the process of taking pictures by first taking pictures on a negative, and only later making as many positives as one wants, was important for cinema technology, as it enabled duplication and it made faster picture-taking possible. This innovation took place in the late 1880s, and became the industry standard quickly after the introduction of the Kodak pocket camera by George Eastman (König and Weber 1990: 527-530). The third innovation, the roll film made it possible to take many pictures—a hundred in the first Kodak camera—without having to change film. Experiments with roll film started in the 1850s, and it became the standard with the introduction of the Kodak camera (König and Weber 1990: 527-530).

Table 1. The Technologies of Cinema, 1645-1888.

Technology	When available		Inventor	Alternatives
	In principle	Innovation		
Photography		1830s		Drawings/ cartoons
Positives and negatives		Late 1880s	Kodak	Positive-positive
Roll films	1850s	1888	Kodak	Cylinders with paper
Celluloid base	1868	1888	Goodwin/Kodak	Paper base
High sensitivity emulsion		Late 1880s		Low sensitivity emulsion with longer exposure
Projection	1645	1851		Peep-hole machines
Dissection/ persistence of vision	1826, 1872, 1874	1895		Continuous photography (CCD-microchips)

Fourth, celluloid was important. The first Kodak roll films used paper as a base, but since film cameras use large rolls, paper was not strong and reliable enough to serve as a base. Invented in 1868 and available in sheet form since 1888, celluloid could do the task, although for film-cameras thicker strips of celluloid were used than for photo-cameras. (Friedel 1979: 45-62; Michaelis 1958).

Fifth, a major obstacle for the invention of the motion picture camera was the low sensitivity of the photographic emulsion, which made it impossible to take pictures at high speed, and thus to film motion. For the early portraits, people had to sit still for several seconds, and for motion pictures this simply could not be done. In the late 1880s when new emulsions were tried, the sensitivity of film finally was so much improved that minimum length of exposure sufficiently shortened to make motion picture taking possible (Musser 1990: 45, 65).

Sixth, the concept of projection was important for motion pictures, although in the original Edison-invention, projection was lacking. In 1851, onwards, when the projection of photographic slides became possible, the magic lantern became wildly popular, and the industry started to grow quickly. (Michaelis, 1958; Musser 1990: 30-36).

A few specialised British and French slide suppliers dominated the trade. They collected photographs from all over the world in London or Paris, and distributed them quickly again to all corners of the globe. The largest firm was probably the French Levy and Company, which was acquired by the American firm of Benerman and Wilson in 1874. The photographic lantern slides enabled people to get used to sitting in a room and watching pictures of far away places, and for the first time to seeing pictures of news events that they had read about (Michaelis, 1958; Musser 1990).

Seventh, the idea of slicing a view with movements into small dissections, each of a fraction of a second, combined with the idea that when this would be shown the audience would see the movement because of the persistence of vision, was important to cinema. The notion of the persistence of vision is old, and was used in several of the visual gadgets of the 19th century, such as the *Thaumatrope* and the projection of a cartoon. The idea to dissect a view, however, was newer, and started with the photographs of Marey to capture the movement of horses in 1872, followed by the American Muybridge in the same year. The astronomer Jansen used the concept in 1874 to make observations of Venus.

2.1.1 The innovation process

After the preconditions for motion pictures had been established, cinema technology itself was invented. Already in 1860/1861 patents were filed for viewing and projecting motion pictures, but not for the taking

of pictures. The scientist Jean Marey completed the first working model of a film camera in 1888 in Paris. That year, Edison visited Marey and watched his films. In 1891, Edison filed an American patent for a film camera, which had a different moving mechanism than the Marey camera. In 1890, the Englishman Friese Green presented a working camera to a group of enthusiasts. In 1893 the Frenchman Georges Demeney filed a patent for a camera. Finally, the Lumière brothers filed a patent for their type of camera and for projection in February 1895. In December of that year they gave the first projection for a paying audience. They were followed in February 1896 by the Englishman Robert W. Paul. Paul also invented the 'Maltese cross', a device still used in cameras today, and instrumental in the smooth rolling of the film (Michaelis 1958; Musser 1990: 65-67; Low and Manvell 1948).

Several characteristics stand out in the innovation process. First, it was an international process that took place in several countries, the inventors building and improving upon each others inventions. This fits with Mokyr's notion that in the nineteenth century innovations increasingly came to depend on international communication between inventors (Mokyr 1990: 123-124). Second, it was what Mokyr calls a typical nineteenth century invention, in that it was a smart combination of many existing technologies. Many different innovations in the technologies which it combined had been necessary to make possible the innovation of cinema. Third, cinema was a major innovation because it was quickly and universally adopted throughout the western world, quicker than the steam engine, the railroad or the steamship.

To sum up, the basic constituent technologies were all available in 1888, while the first working innovation was produced three years later, in 1891, and the 'stable' innovation seven years later, in 1895. This shows a time lag, albeit it a rather short one. The time lag is long enough, however, to allow us to retain the hypothesis that the invention of cinema

was largely demand-led, but it is so short as to leave a lot of doubt and calls for the other tests to show more conclusive outcomes, if the null hypothesis (cinema was a supply-led invention) is to be rejected.

2.2. The lag between innovation and take-off

2.2.1. The take-off of the film industry/growth phases

For about the first ten years of its existence, cinema in the United States and elsewhere was mainly a trick and a gadget. Before 1896 the coin-operated *Kinematograph* of Edison was present at many fairs and in many entertainment venues. Spectators had to throw a coin in the machine and peek through glasses to see the film. The first projections, from 1896 onwards, attracted large audiences. Lumière had a group of operators who travelled around the world with the cinematograph, and showed the pictures in theatres. After a few years, around 1900, films became a part of the program in vaudeville and sometimes in theatre as well. Also, around 1900, travelling cinema emerged: cinemas which travelled around with a tent of mobile theatre and set up shop for a short time in towns and villages. These differed from the Lumière operators and others in that they catered for the general, popular audiences, while the former were more upscale parts of theatre programs, or a special program for the bourgeoisie (Musser 1990: 140, 299, 417-420).

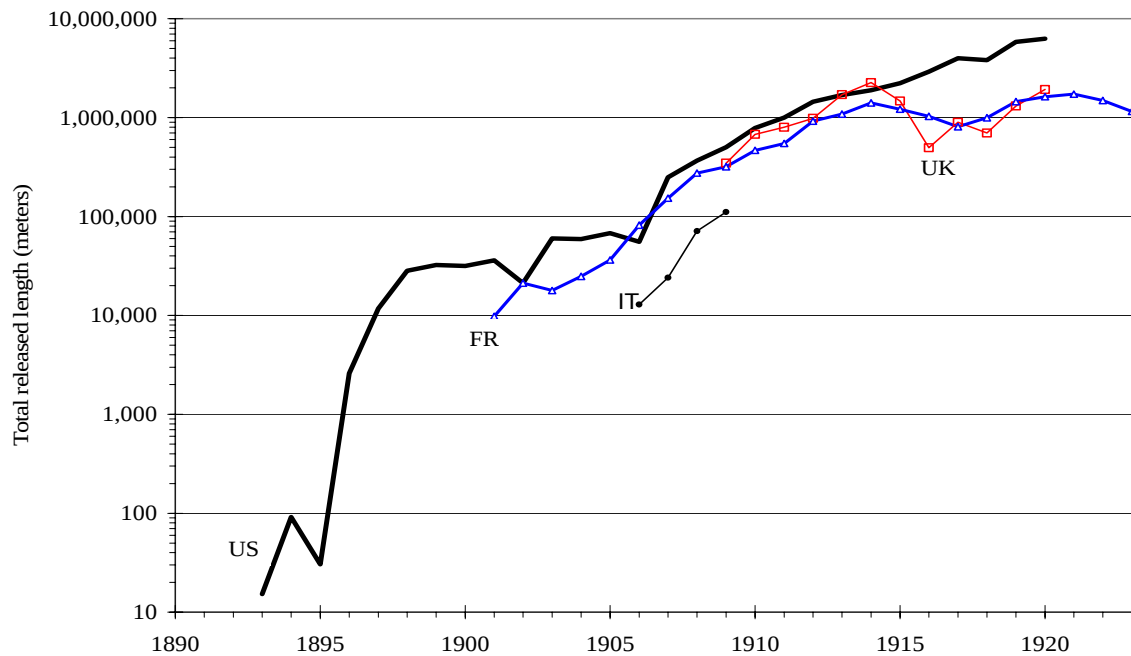
This era, which in the US lasted up to about 1905/1906, was a time in which cinema seemed just one of many new fashions, and it was not at all sure that it would persist. This changed between 1905 and 1907, when Nickelodeons, fixed cinemas with a few hundred seats, emerged and quickly spread all over the country.¹ It can be said that from this time

¹ For a partially quantitative case study on the rise of Nickelodeons in Manhattan, see Ben Singer, "Manhattan Nickelodeons: New Data on Audiences and Exhibitors," in: *Cinema Journal*, Vol. 34 No. 3 (Spring 1995), pp. 5-35. Singer updates an earlier work by Robert C. Allen, "Motion Picture Exhibition In Manhattan, 1906-1912: Beyond The Nickelodeon," *Cinema Journal*, Vol. 18 No. 2 (Spring 1979), pp. 2-15.

onwards cinema changed into an industry in its own right, which was distinct from other entertainments, since it had its own buildings and its own advertising. The emergence of fixed cinemas coincided with a huge growth phase in the business in general; film production increased greatly, and film distribution developed into a special activity, often managed by large film producers. However, until about 1914, besides the cinemas, films also continued to be combined with live entertainment in vaudeville and other theatres (Musser 1990; Allen 1980).

We can thus place the take-off of the cinema industry between 1905 and 1907. In these years it developed its own retail outlets and did not depend exclusively on theatres and travelling showmen. From this time onwards the business also came to be seen as more than just a fad or fashion like skating rinks and bowling alleys. At the same time an increase in its growth pace started: it began to grow very fast, and slowly but gradually some people substituted cinema for small-time vaudeville and “popular-priced theatres”.

Figure 1. Total Released Film Negative Length, US, UK, France And Italy, In Meters, 1893-1922.



Note: see Bakker 2005, appendix I for the method of estimation and for a discussion of the sources.

Source: Bakker 2001b; American Film Institute Catalogue 1893-1910; Motion Picture World 1907-1920; Cine Journal 1908-1923. French data between 1901 and 1907 have been obtained by calculating a weighted growth index from the growth indexes of Gaumont (1/3) and Pathé (2/3) of their released negative length [as reported in Meusy 2002:427]. This growth index is then linked to the Cine Journal length-series and used to compute length from 1901 to 1907. The years 1908 to 1910, for which both datasets are available, suggests that the growth rates are quite comparable, although not exactly the same. Italian data from Redi 1995, as quoted in Meusy 2002: 420. See Bakker 2005, appendix I for the method of estimation and for a discussion of the sources.

Figure 1 shows the total length of negatives released on the US, British and French film markets. The US time-series go back the farthest give an opportunity to analyse the early growth of the industry. Clearly, the initial growth between 1893 and 1898 was very strong, albeit from a very low initial base—the market increased with over three orders of magnitude. Between 1898 and 1906, far less growth took place, and in this period it may well have looked like the cinematograph would remain a

niche product, a gimmick shown at fairs that used to be interspersed with live entertainment. From 1906, however, a new, sharp sustained growth phase starts, with the market increased further again, by two orders of magnitude—and from a far higher base this time.²

During the interval in which time series overlap, the British and French negative length was growing at roughly the same rates as the US one, until 1914. That war year constitutes a great discontinuity, and from then on European growth rates are different and far lower than US ones.

At the same time, the average film length increased considerably, from eighty feet in 1897 to seven hundred feet in 1910 to three thousand feet in 1920. As a result, the total released length, which is the best indicator of production, increases more rapidly than the number released, in the US from 38,000 feet in 1897, to two million feet in 1910, to twenty million feet in 1920.

2.2.2 Emergence of cinema consumption

Representative audience surveys on early motion picture audiences are lacking, and modern market research was not yet done by the emerging movie companies (Bakker 2003). The only information available is from the press and trade press and from company sources. Before the era of fixed cinemas emerged, probably a dual audience existed. At the high end was the upper middle class, who saw the first shows of Lumière's cinematograph probably in a legitimate theatre, as a special event, and later on between the live-acts in big-time vaudeville. At the other end, a more mixed social cross-section of local communities came to see the travelling cinema when showmen visited their town. This

² See also Gerben Bakker, "The Economic History of the International Film Industry," in: Robert Whaples ed., *Eh.net Encyclopedia*, 16 December 2005, <http://eh.net/encyclopedia/article/bakker/film>.

audience probably came from all layers of the population (Musser 1990: 140, 417-420).

In the US, once the Nickelodeons had emerged between 1905 and 1907, their audience seems to have been mixed. Women and children probably constituted about half of the audiences and they might even have been the majority of visitors. Richard Abel relates, for example, that in New York, women often went with their children to the Nickelodeon after or during shopping, as these venues were handily located in the shopping districts (Abel 1999: 48). A substantial difference between cinema and many other entertainments was that cinema was consumed by members of both sexes, while football, other sports, drinking and music hall were mostly an all-male event. When women were allowed in music halls, it was on the galleries, separated from the men. Compared to the previous entertainments, cinema was thus a whole new experience for consumers (Bakker 2001a).³ Garth Jowett (1983) distinguishes three major audience groups: the middle classes that had never attended theatre or other amusements because of religious beliefs; the middle and upper working class patrons of the live theatre, especially fans of popular melodramas; and the large urban working class who seldom went near theatrical entertainment. Some estimates put 78% of the New York audience in the latter group (Jowett 1983).

Little is known about the age of the cinemagoers. The intuition is that they were mainly below the age of thirty or forty (Abel 1999: 48). Even so, little is known about the frequency of visits. People who happened to live or work near a Nickelodeon would probably visit it once a week, and other people less frequently. The audience is generally thought to be the less well-off classes, and immigrants who had difficulty

³ A. J. P. Taylor, for example, (1976: 181) writes enthusiastically: "Women joined their husbands in enjoyment, as they had never done at football matches or other public pleasures." *English history, 1914-1945* (London, Oxford University Press, rev. ed. 1976, orig. ed., 1965).

with the English language and therefore were a natural market for motion pictures (Musser 1990: 417-420). But Abel (1999: 48) has shown that many of these shopping women who visited the Nickelodeons with their children were actually middle-class women.⁴

The price of cinema was probably an important factor for the kind of audience it interested. Before the Nickelodeon prices varied, from a dollar or more for the first special Lumière events, to a few cents to fifty cents for a travelling showman (Musser 1990: 299). But in general, the market was in too turbulent a condition to put a reliable average price on motion picture watching. This even harder because they were often part of live entertainment.

The prices the Nickelodeon charged were between five and ten cents, which often enabled the spectator to stay as long as they liked. Around 1910, when larger cinemas emerged on key city centre locations, more closely resembling theatres than the small and shabby Nickelodeons, prices increased. When the feature film had established

⁴ Within film history, substantial research has been done into the composition of early cinema audiences, generally in a qualitative way. The current paper does not aim to analyse cinema audiences socially or culturally; it only provides some perspective in this section as a background to the quantitative analysis that will follow. Film historical works on audiences include Robert Sklar, *Movie-made America. A cultural history of American movies* (New York, Vintage Books, 1975, rev ed. 1993); Thomas Elsaesser ed., *Early cinema : space, frame, narrative* (London, British Film Institute 1990, 1994); David Bordwell, Janet Staiger and Kristin Thompson, *The classical Hollywood cinema. Film style and mode of production to 1960* (New York, Columbia University Press, 1985); Douglas Gomery, *Shared pleasures. A history of movie presentation in the United States* (Madison, University of Wisconsin Press, 1992); Miriam Hansen, *Babel and Babylon. Spectatorship in American silent film* (Cambridge, Mass., 1991); Steven J. Ross, *Working-class Hollywood. Silent film and the shaping of class in America* (Princeton, Princeton University Press, 1998); Janet Staiger, "Announcing wares, winning patrons, voicing ideals. Thinking about the history and theory of film advertising," *Cinema Journal*, Vol. 29 (1990) No. 3, pp. 3-31; John Sedgwick, John, *Popular film in 1930s Britain. A choice of pleasures* (Exeter, University Press of Exeter Press, 2000); Jeffrey Richards, "Cinema going in worktown," *Historical Journal of Film Radio and Television*, Vol. 14 (1994) No. 2, pp. 147-166; Claude Forest, *Les derniers seances. Cent ans d'exploitation des salles de cinéma* (Paris, CNRS-Editions, 1995); Georges Sadoul, *Le cinéma français, 1890-1962* (Paris, Flammarion, 1962); Jean-Jacques Meusy, *Paris-Palaces ou le temps du cinéma (1894-1918)* (Paris, CNRS-Editions, 1995).

itself as standard in about 1917, the average price was around twenty cents (Koszarski 1990: 13-15). However, substantial differences in prices existed. In individual theatres, different seats often had different prices. Moreover, in the larger cities, prices were differentiated among theatres, with the city centre theatres which showed the first run of films sometimes charging \$1 to \$1.50 for a performance, while the small and shabby neighbourhood cinema might still charge 5 cents for a sixth run. In between these two were stratifications of other theatres with different prices.⁵

The above indicates that a time lag existed of at least twelve years between the availability of the stable innovation and the take-off of cinema in 1907. This suggests that the null hypothesis can be rejected that cinema was nearly exclusively technology-driven and supply-led. During the twelve-year lag, demand for entertainment grew steadily and people had more discretionary left income to spend on cinema, as will be discussed in the section below.

3. The Evolution Of Entertainment Consumption

3.1 Total consumer expenditure

Between about 1900 and 1940 over-all per capita expenditure on spectator entertainment showed a roughly similar long-run growth pattern in the US, Britain and France (figure 2). The average growth rates, although not having entirely identical periods, were within a narrow range of 2.3 and 2.7 percent per annum (table 2).⁶ The 2.5 percent per capita growth rate for the UK, compares to an average annual growth of real

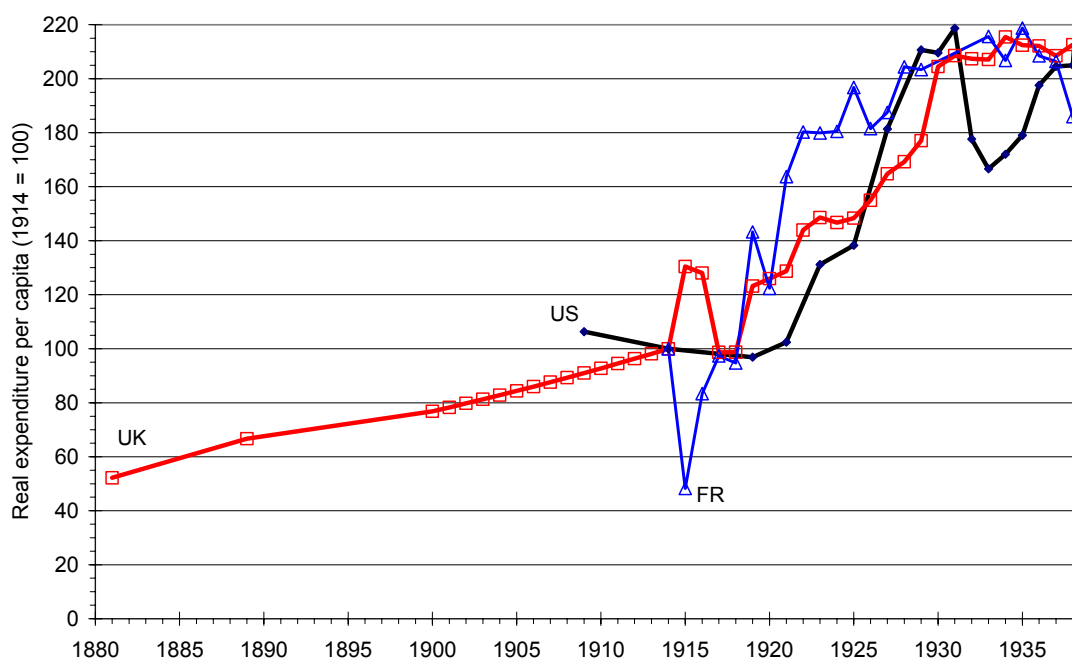
⁵ For detailed historical research on cinema prices in 1900s London, see Burrows 2004. Sedgwick 1998 contains a detailed case study of price-differentiating in 1930s Britain.

⁶ The series are not entirely comparable, as the British one includes admissions to sports matches from 1900 onwards (see figure 3 and Stone 1966: 81).

wages in industry of 1.0 percent between 1881 and 1913, and 3.0 percent between 1914 and 1938, or about 1.9 percent for 1881-1938.⁷

Entertainment was a luxury, the consumption of which, in monetary terms, increased faster than real wages. The falling price of a spectator-hour of entertainment made the difference even higher in quantity terms.

Figure 2. Real Entertainment Expenditure Per Capita, US, Britain And France, 1881-1938 (1914=100).



Note: from 1900 onwards the UK index includes admissions to sports matches (see figure 3).

Source: Bakker 2001b; based on US Department of Commerce 1975; Prest 1954; Stone 1966; Cinématographie Française: 1930, 1935; Durand 1956: 213.

⁷ Mitchell 1993: 182, 184, combined with Mitchell's consumer prices deflator (pp. 847, 849). The two series could not be linked because they do not overlap. The two rates have therefore to be combined to form a 56 year period to calculate the approximate average annual growth.

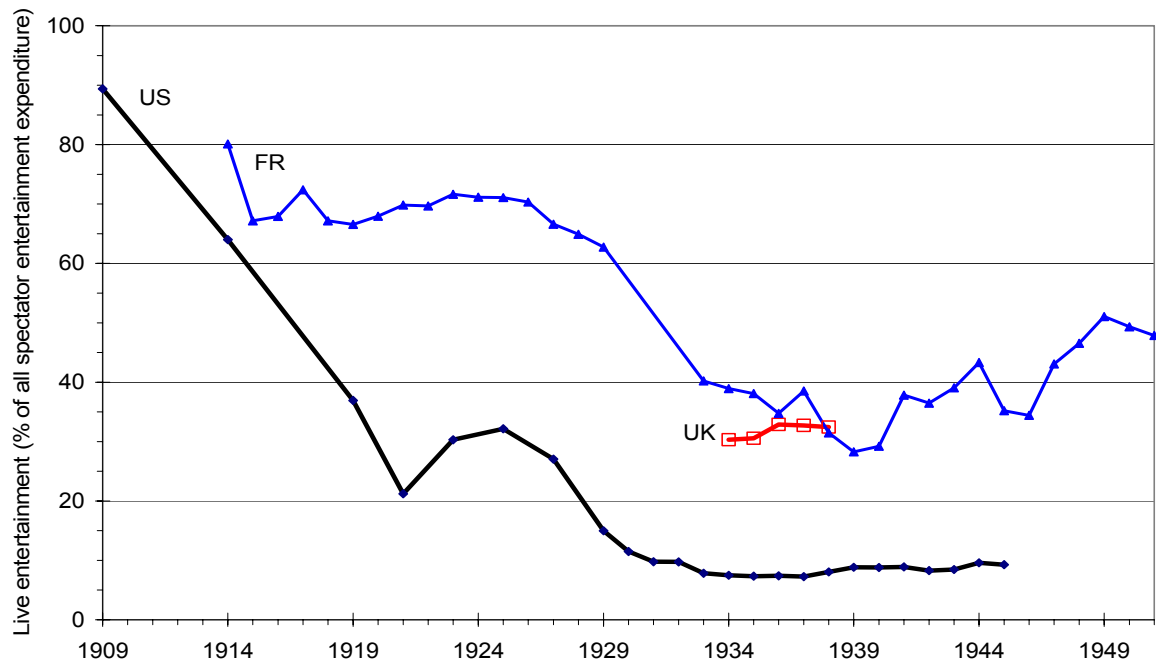
Table 2. *Average annual growth of real entertainment expenditure, US, Britain and France, 1881-1938.*

	US	UK	FR
	Cinema and live		
1881-1938		2.50	
1900-1938		2.70	
1909-1938	2.29		
1914-1938			2.63
1934-1938		-0.33	
	Cinema		
1881-1938			
1909-1938	10.99		
1914-1938			8.06
1934-1938		-1.24	
	Live		
1881-1938		0.82	
1900-1938		0.02	
1909-1938	-3.83		
1914-1938			-1.29
1934-1938		1.38	

Source : Bakker 2001b; Bakker 2004.

In the short-run, however, substantial differences existed. During the First World War entertainment expenditure moved in opposite directions in France and Britain and remained stable in the US. During the great depression US real entertainment expenditure shrunk substantially, while European levels remained stable. The French expenditure level was substantially lower than in the other two countries, about a fifth in 1938 using exchange rates, although the difference is difficult to quantify because of devaluation of the franc and purchasing power parity issues. French expenditure also fluctuated more in the short term.

Figure 3. Share Of Live Entertainment Expenditure In Total Spectator Entertainment Expenditure, US, Britain And France, 1909-1951 (In Percent).



Note: the British data includes admissions to sports matches, but could not be disaggregated further. For the tax year 1937-1938, it was estimated that sports admissions accounted for about twenty percent of all non-cinema admissions (Stone 1966: 81), and probably for far less of expenditure. Therefore, to estimate the British data, for all years the ticket price for sports matches is set at half the price of live entertainment, which results in the live expenditure share declining by between 2.3 to 2.4 percentage points.

Source: Bakker 2001b; see sources figure 2.

The relative similarity of overall entertainment expenditure hid sharp differences in its composition. In the early 1910s, the expenditure share of live entertainment was roughly the same in the US as in France, but subsequently the US product mix changed sharply, with the share of live declining until the early 1920s (figure 3). From then on the difference in expenditure share remained stable. When sound film arrived (in 1927-1929), it declined in both countries at about the same rate. In expenditure terms sound film made a similar relative impact in France as in the US,

although price and quantity data would be needed to test this. The sparse UK data suggests the expenditure mix was roughly the same as in France (though the quantity mix was rather different, data for 1938, below, will show).

Expenditure data for the US show a mild decline in net total expenditure between 1909 and 1921. This was composed of falling live expenditure and rapidly growing film expenditure. It is likely that the other countries experienced a similar substitution. Between about 1923 and 1925, US expenditure on cinema stabilised and live expenditure rebounded. Then, with the arrival of sound, cinema expenditure grew rapidly again and live expenditure fell sharply—well before the great depression started, showing that initially it was driven by sound, not depression. During the early depression years, cinema expenditure continues to grow, probably because sound film was still a novelty and substantially cheaper than live alternatives. Unemployment decreased both the opportunity costs of entertainment activities for many consumers, and consumers' purchasing power. People thus were encouraged to substitute even more cinema for live entertainment. After the First World War, expenditure on live entertainment always remained several factors lower than that on cinema, despite the rebounds in the 1920s and 1940s. Those rebounds might have been due to the recovery from economic recessions.

The differences between France and the US, and possibly also between Britain and the US, might be explained by the US dominance of European cinema screens from the late 1910s onwards (Bakker 2005). This gave British and French live entertainment a competitive edge over cinema that American live entertainment lacked. Before the coming of sound, the French live entertainment industry offered consumers entertainment in the local social, cultural, political and intellectual

environment. After sound, live entertainment gained a second competitive advantage because it was spoken originally in the local language.⁸

3.2. Early consumer surveys

Few quantitative indicators exist on the demand for, and consumption of, entertainment. For household expenditure, and entertainment as a part of it, only some anecdotal, sparse, case-by-case data exists before the late nineteenth century. From the mid nineteenth century onwards studies of the conditions of the working classes became more common, many inspired by the pioneering work of Frédéric le Play (1877). These early studies on family budgets seldom looked at expenditure on entertainment and recreation.⁹

The earliest scientific information is from Dorothy Brady (1972; David and Solar 1977), who constructed representative sample budgets for American families in the 1830s, which are slightly above the relevant averages for each of three types of residential location: farm, village and city. Brady found relatively high expenditures on reading and recreation: about two percent of all expenditures for all groups (table 3). Church and charity outlays were even higher, varying from nine percent on farms to three percent in cities. Possibly these items were over-reported, because giving generously could be considered socially desirable. Part of charity expenditure may also have been used like present-day social security contributions, especially in the farm and village communities. Farm

⁸ Dubbing still yields a film of a different quality than an original language film, in which local actors directly speak the local language. Differentiation may also explain the surprising rebound of French live entertainment expenditure in the late 1940s, when it reached roughly the same level as expenditure on cinema—the explanation of which is not the purpose of this work. Because of the war, French film production was temporarily halted, and possibly the cinemas could not provide enough locally-made entertainment to constitute a satisfying mix.

⁹ See, for example, also Horrell 1996: 561-604. The many early nineteenth century family budget studies Horrell used do not contain information on entertainment expenditure. For an overview of numerous early family budget studies, starting as early as the middle ages, see Nystrom 1931 and Zimmerman 1936.

families spent more on tobacco than they spent on reading and recreation, while city dwellers spent only 0.8 percent, and village families were caught in the middle.

Table 3. *Estimated breakdown of American family expenditure, 1830s.*

Item	Farms	Villages	Cities
Purchased food	39.0	49.0	43.6
Clothing	27.0	20.0	20.0
House operation	1.5	3.0	2.3
House furnishings	8.0	6.0	6.7
Transportation	4.5	4.8	4.1
Personal care	3.0	1.6	1.8
Medical care	2.5	2.6	2.4
Tobacco	2.5	1.6	0.8
Reading, recreation	2.0	1.8	1.8
Church, charity	9.0	4.6	3.1
Not itemised	1.0	5.0	13.4
Total (excl. shelter)	100.0	100.0	100.0

Source: Brady 1972: 73, 76, 78; quoted in David and Solar 1977: 41.

3.3 The 1889-1890 household expenditure survey

Only in 1889-1890 was the first systematic household expenditure survey conducted, with a large number of respondents, and a sample that at least partially started to resemble a random sample. Under supervision of Carroll D. Wright, the US Commissioner of Labour, the US Department of Labour carried out a family expenditure survey, as part of a production cost study on nine protected industries (bar iron, pig iron, steel, bituminous coal, coke, iron ore, cotton textiles, woollens, and glass).¹⁰ The survey is not fully random or representative because it selected and interviewed only workers in co-operating firms, because it selected only

¹⁰ The author wishes to thank Michael Haines for generously making available the computerised data of the survey. This research is discussed in detail in Haines 1979: 289-356.

co-operating workers who provided information in sufficient detail, and because only industrial workers with families were included.

Nevertheless, Michael Haines has shown that, at least for the United States, comparison with the US census gives some support to the representativeness of the data (Haines 1979: 292-295).

The survey lists several categories relevant to leisure: expenditure on amusements and vacation, reading, liquor, religion and charity. The category 'amusements and vacation' includes live entertainment, but it is impossible to say which share went to sports matches, music hall, concerts or theatre.

Table 4. *Descriptive statistics of income, size and entertainment expenditure for households, US, UK and France, 1889-1890.*

	Income (\$)			Household size (persons)			Entertainment expenditure (\$)		
	US	UK	FR	US	UK	FR	US	UK	FR
Sample size	6809	1024	263	6809	1024	263	6809	1024	263
Mean	684	532	409	4.78	4.95	4.99	7.57	18.65	15.86
Standard deviation	337	235	238	2.12	1.94	2.15	21.25	25.46	21.23
Coefficient of variation	0.49	0.44	0.58	0.44	0.39	0.43	2.81	1.37	1.34
Minimum	84	177	43	1	1	1	0	0	0
Maximum	4,500	1,582	1,737	15	13	12	600	204	193
Range	4,416	1,405	1,694	14	12	11	600	204.39	193
Interquartile range	378	286	220	3	3	3	6.00	24.30	18.20
Median	597	462	347	4	5	5	0.00	9.70	9.70
Mode	600	389	290	4	5	5	0.00	0.00	0.00
Mean expenditure/income (%)							1.11	3.50	3.88

Note: the heading 'Entertainment' refers to the survey item 'Amusements and vacations'.

Source : Data US Commissioner of Labor Survey 1891, provided by Michael Haines.

The survey showed that the US had the highest average income, and also the highest range of incomes, suggesting a more skewed income distribution than Britain and France (table 4). The average household income was \$684, substantially above the non-farm average in the U.S. at the time, which was \$471 in 1889 and \$475 in 1890. Probably more members of the sample households were working. Despite higher income and similar household size, average US entertainment expenditure was less than half that of Britain and France, and relative to income less than a third of that in Britain and France (1.11 percent vs. 3.50 and 3.88 percent). If the samples are broadly representative this suggests a sharp contrast in US and European consumer preferences.

The income elasticity of entertainment expenditure can offer further insight into this difference. Given that many households did not report any entertainment expenditure, calculating income elasticity based on the whole sample may be misleading. We therefore use two alternative ways. First of all, we fit an OLS model to the whole sample and calculate the (biased) elasticity accordingly. Second, we fit a logit model for the whole sample, investigating how the likelihood of positive entertainment expenditure increases with income, and then calculate income elasticity for the cases with non-zero expenditure in two ways: using an OLS model or a log-log constant elasticity model.¹¹

Using the first method, income elasticity was substantially above unity, for all three countries suggesting that entertainment was a luxury everywhere (table 5). In both the US and the UK entertainment was highly income elastic, as elasticity was more than twice unity, while in France entertainment was substantially less elastic and far closer to being a normal good that was part of the necessities of the everyday French consumer in 1890.

¹¹ Method based on Feinstein and Thomas 2002.

Table 5: *Household entertainment expenditure in the US, Britain and France, 1889-1890.*

	US	UK	FR
OLS whole sample			
Average income (\$)	684	532	409
Average expenditure (\$)	7.57	18.65	15.86
Expenditure share (%)	1.11	3.51	3.88
Coeff. variation	2.81	1.37	1.34
Income elasticity	2.14	2.16	1.41
Impact inc. elast.	1.56	2.16	1.41
Logit model			
Share nonzero expenditure (%)	49	71	79
Intercept (%)	20	29	65
Marginal effect (%)	0.050	0.076	0.030
Units to 100% (\$)	3236	1639	1444
(100 % likelihood)/average	4.7	3.1	3.5
Point elasticity	0.71	0.57	0.16
Impact effect	15.0	13.6	6.2
Unit elasticity	0.63	0.43	0.13
OLS for cases expenditure > 0			
Income elasticity	1.43	1.68	1.26
Impact income elast.	1.43	1.68	1.26
Log-log for cases expenditure > 0			
Constant elasticity income elasticity	1.13	1.80	1.07
Constant elasticity impact income elasticity	1.16	3.51	2.79

Notes: for the respective impact effects, one standard deviation of income has been taken as the unit for each country.

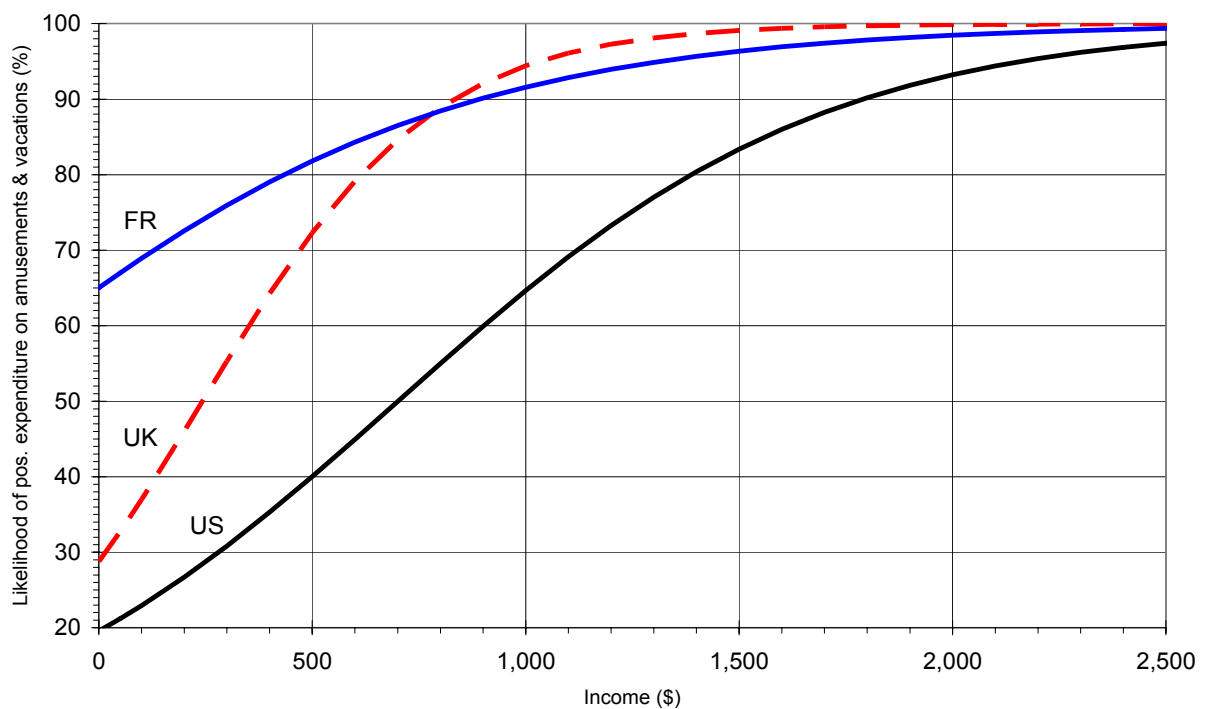
most findings significant at the 1% level, some at the 0.1 % level.

Note: the heading 'Entertainment' refers to the survey item 'Amusements and vacations'.

Source : Data US Commissioner of Labor Survey 1891, provided by Michael Haines.

This is corroborated by the logit model (table 5 and figure 4), which shows that at the lowest income levels, French households were three times as likely to have positive entertainment expenditure than US ones and two times as likely than UK ones. Consequently the marginal effect of an additional *dollar* of income on the likelihood of positive French entertainment expenditure (0.03 percent) was substantially smaller than elsewhere. The UK had the strongest marginal effect (2.5 times the French effect), while the US had the largest likelihood elasticity, the *percentage* increase in likelihood for a percentage increase in income. The latter is probably due to the US incomes being for more dispersed to the right, yielding a larger average point elasticity.

Figure 4: Likelihood Of Positive Expenditure Of Households On Amusements And Vacations, US, Britain And France, 1889-1890.



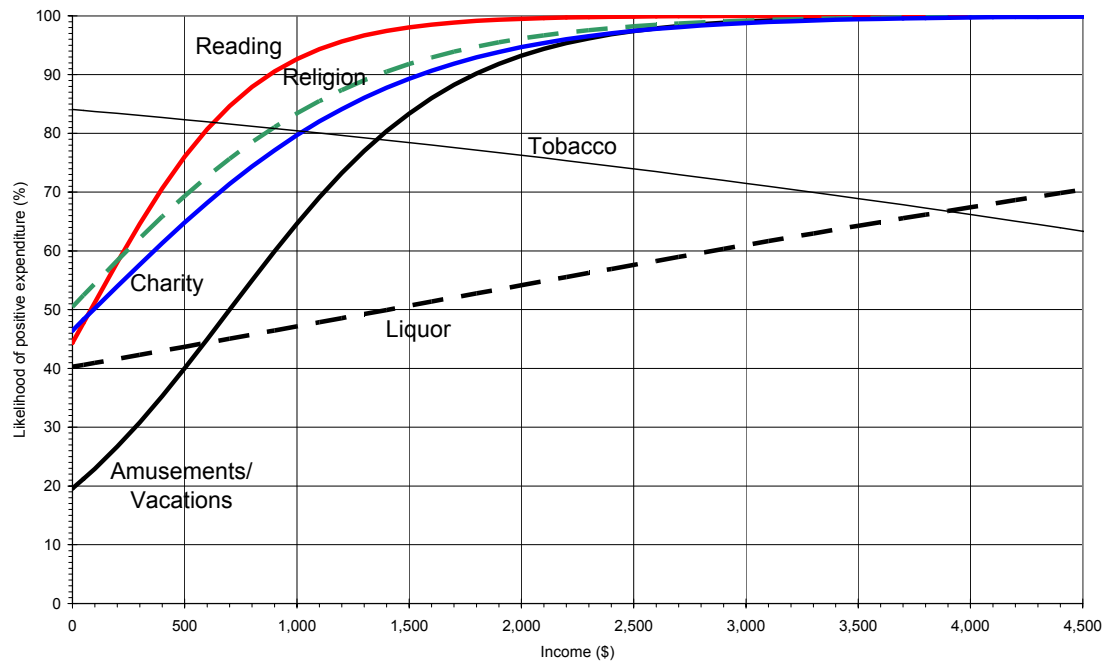
Source: U.S. Commissioner of Labor Survey (1891) dataset, provided by Michael Haines

The income elasticities for households with nonzero expenditures are closer together than those for the whole sample, and also closer to unity. Also, entertainment was more of a luxury in the UK than in the US. A log-log/constant elasticity model magnifies these differences, by bringing French and US elasticities close to unity, while UK elasticity remains far above unity.

The category 'amusements & vacations' of the 1889-1890 survey, is, of course, an imperfect proxy, as it also contains expenditure for vacations. Another survey on Britain between 1891 and 1894 gives some ballpark indication about the relative share of vacations and amusements. The Economic Club (1896) carried out a survey among 28 'industrial families'. The representativeness of the sample can not be established, and the survey only recorded expenditure, not income. Average annual income for the 28 families was £92.16, or \$449, considerably below the

1889-1890 survey average income of \$532. Likewise the percentage of households with positive expenditure on 'recreation' and 'travelling' was lower, 54 percent and 21 percent, versus 71 percent. The logit model predicts a value of 68 percent for UK income of \$449, suggesting that not all of the difference can be explained by the lower average income in the 1891-1894 sample. The total expenditure on 'recreation' and 'travelling' was 2.41 percent, well below the 3.51 percent of the 1889-1890 survey. Expenditure on recreation was roughly twice that on travelling: 1.62 versus 0.79 percent. The income elasticity for aggregate expenditure on these two items was 1.63, considerably below the 2.16 elasticity estimated by OLS for the 1889-1890 survey, though not far from the OLS elasticity for cases with positive expenditure (1.68) and the log-log constant elasticity estimate (1.80). This elasticity breaks down into an elasticity of 1.31 for recreation and 2.29 for travelling, suggesting that, for the 1889-1890 survey, the elasticity for 'amusements' expenditure without 'vacations' may be substantially lower than the aggregate elasticity.

Figure 5. Likelihood Of Positive Expenditure Of Households On Various Leisure Goods, US, 1889-1890.



Source: U.S. Commissioner of Labor Survey (1891) dataset, provided by Michael Haines

The question remains how entertainment compared to expenditure on other leisure goods/services. For the US, logistic curves have been estimated for all leisure goods/services in the survey over the meaningful income interval of \$0-\$2,000 (figure 5). Three patterns attract the attention. First, a marked difference is apparent between liquor and tobacco on the one hand, and the other items on the other. The number of households that spend on liquor and tobacco was quite stable over the income interval, with liquor starting from quite a low initial value and rising slightly, and tobacco starting from the highest value in the group and declining slightly. The other four items rose quite substantially with income. Second, entertainment expenditure had the lowest starting value, with only a fifth of the families reporting expenditure, but rose the most rapidly with income. Although cross-section results cannot predict long-term changes, this nevertheless suggests that a rise in income could

result in a disproportionately large rise in entertainment expenditure.

Third, all the four other leisure goods/services approached 100 percent as income approached the highest values (if we forget about the few outliers above \$2,000), with all above 90% at an income of \$2,000.

The comparison of expenditure across countries shows some marked differences (table 6). As a share of income, French households spend about half the amount on reading as British and US households, British households spend about half as much on religion as their US counterparts, and French households about a third as much on religion as the British. The French also spend a fourth to a seventh the amount on charity as Britain and the US, and double or triple the amount on liquor. On leisure in total as a percentage of income, the French spent the most, followed by the British and only then the US households. In absolute (dollar) terms, however, the expenditure was roughly the same.

Table 6. *Household expenditure on leisure goods/services, US, UK and France, 1889-1890.*

	Expenditure (% of income)			Expenditure (\$)			Coefficient of variation			Range (max/min)
	US	UK	FR	US	UK	FR	US	UK	FR	
Amusements/vacations	1.10	3.47	3.85	7.53	18.46	15.75	2.82	1.38	1.35	2.45
Reading	0.80	0.90	0.46	5.47	4.79	1.88	1.19	0.93	1.36	2.91
Religion	0.97	0.54	0.18	6.64	2.87	0.74	1.42	1.65	3.02	9.01
Charity	0.40	0.26	0.06	2.74	1.38	0.25	2.43	2.36	6.09	11.15
Liquor	1.80	2.36	5.16	12.31	12.56	21.11	2.39	1.41	1.21	1.71
Tobacco	1.30	1.13	0.99	8.89	6.01	4.05	0.92	1.11	1.18	2.20
Total	6.37	8.66	10.70	43.58	46.08	43.77	1.86	1.47	2.37	1.06

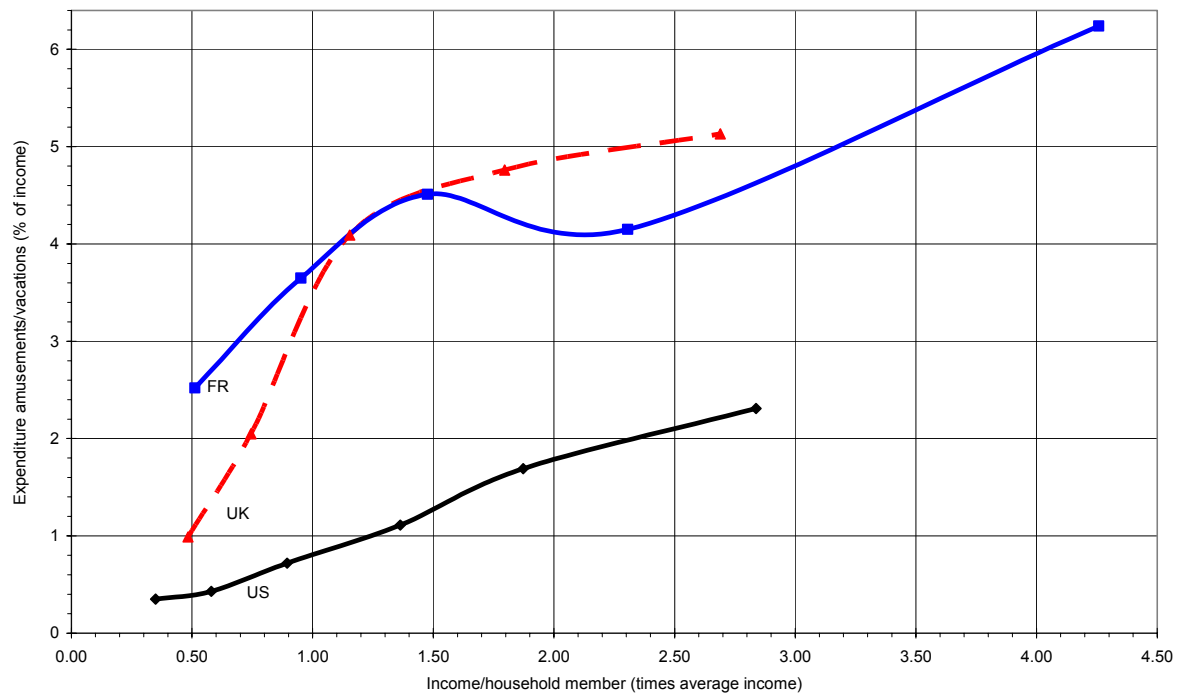
Note: total for coefficient of variation is unweighted average

Source : Data US Commissioner of Labor Survey 1891, provided by Michael Haines.

The question remains to what extent these expenditures are comparable. The researchers in 1890 seem to have used the exchange rate to convert all amounts into dollars. The exchange rate however, generally reflects international trade in goods and services and capital flows, although in 1890 most exchange rates were fixed by the gold standard. Since these leisure goods and services were partially un-traded, PPP-ratios may be needed to get a more accurate reflection, but even then one could debate whether the comparison is meaningful or not. As would be expected, the expenditure range is the lowest for the two traded goods (liquor and tobacco) and far higher for the four non-traded services.

When the expenditure on amusements/vacations is compared across the three countries against income, it is clear that in all three countries it was a luxury, with relative expenditure increasing as income increases, although it is less so in France (figure 6). Second, we see again the important difference between Europe and the US, now not only in levels, but also in the speed of increasing entertainment expenditure as income increased. US households spent less on entertainment, and expenditure rose less rapidly when income rose. Potential explanations could be the low relative price of entertainment in the US (so that in quantity terms the difference would be smaller), a lower US consumer preference for entertainment, or, on the contrary, that the relative price of entertainment was so high, because of the scarcity of skilled labour, that households could not afford to spend much on it. Data from on spectator entertainment in 1900 show that entertainment prices (compared at exchange rates) were high in the US and that the quantity consumed per capita was small, about a fifth compared to Britain (Bakker 2004). The quantity in France was tiny and prices very high. Given the low per capita expenditures in 1900, however, it is questionable whether the two data-sets are comparable.

Figure 6. Expenditure On Amusements And Vacations Across Different Income Classes, For The US, Britain And France, In Times Average Income, 1889-1890.



Source: U.S. Commissioner of Labor Survey (1891) dataset, provided by Michael Haines

Table 7. Descriptive statistics of income, size and entertainment expenditure for households, US, UK and France, 1918, 1934-1939.

	Income (\$ of 1936)				Household size (persons)				Entertainment expenditure (\$)				Cinema expenditure (\$)				Live entertainment expenditure (\$)			
	US18	US35	UK	FR	US18	US35	UK	FR	US18	US35	UK	FR	US18	US35	UK	FR	US18	US35	UK	FR
Sample size (households)	12,096	14,469	3,580	92																
Mean	1,391	1,543	1,560	69	4.9	3.6	3.6	3.7	9.74	18.83	24.49	2.62	6.82	16.98	12.64	1.59	0.83	0.46	7.33	0.43
Standard deviation	377	265	971	32																
Coefficient of variation	0.27	0.17	0.62	0.47																
Minimum	748	979	430	42	4.3	2.0	2.8	3.1	2.54	7.64	4.04	1.58	1.87	6.17	3.09	1.07	0.07	0.10	0.69	0.19
Maximum	2,566	2,426	5,308	145	6.4	6.5	3.8	3.8	34.89	25.72	61.04	5.65	22.58	29.84	22.29	3.19	4.87	3.64	28.66	1.19
Range	1,818	1,447	4,878	103	2.1	4.5	1.0	0.7	32.35	18.08	57.00	4.08	20.71	23.67	19.20	2.12	4.80	3.54	27.97	1.00
Interquartile range																				
Median																				
Mode																				
Mean expenditure/income (%)									0.70	1.22	1.57	3.81	0.49	1.10	0.81	2.31	0.06	0.03	0.47	0.63
Income elasticity (mean maxmin)									2.54	1.02	0.74	1.04	2.32	1.49	0.49	0.89	4.40	8.16	1.22	1.54

Note: UK data concerns expenditure, not income.

3.4 The surveys in the 1930s

Similar surveys were carried out in the US between 1934 and 1936¹² (and also in 1917-1919¹³), in France between 1936 and 1938¹⁴, and in Britain between 1937 and 1939. Although the years differ, the data are probably quite comparable. The US data appears to be the most reliable, because it has a reasonable standard deviation compared to income, and a low coefficient of variation. The other samples have large standard deviations and coefficients of variation, which raise questions of their representativeness (table 7). Different income distribution may not be the cause as British inequality was similar to the US, the top quintile receiving half of national income.¹⁵ For France, where just 92 households

¹² Researchers interviewed 14,469 “white and negro” families from 42 cities spread over the US each with a population of over 50,000 inhabitants. Families included in the survey had an income of at least \$500 a year, received no relief during the survey year, had at least one earner employed for 36 weeks and earning at least \$300. No clerical workers earning over \$200 a month or \$2000 a year were included. Within this boundaries, the researchers tried to obtain a random sample.

¹³ Covering 12,096 “white” families, in 92 cities or localities in 42 states. The aim of the survey was “to get representative data that would show living conditions in all sections of the country and in all kinds of localities.”

¹⁴ A survey among 92 families in Toulouse, between 1936 and 1938. It is unclear how representative the sample is, and the numbers seem too small to yield a robust outcome. Nevertheless, since few other sources on family entertainment expenditure exist, it is used to extract information about orders of magnitude and general expenditure patterns for entertainment expenditure. The 92 families all consisted of married couples; single-person households were left out. The families were divided into two social groups, the working class, “ouvriers”, and the middle class, “employees”, and into four income groups: those with an annual family income below 1,200 francs, those with an income between 1,200 and 1,800 francs, those with a family income above 1,800 francs, with an average income of 2,000 francs and, finally, “the rich”, with an average income of 3,700 francs. Because it is unclear how the difference between working class and employees was exactly defined, and how the social difference mattered, as well as to obtain a larger sample, here the social groups are taken together, and income is used as the sole criterion for the four sample groups.

¹⁵ During the late 19th and twentieth century, Britain experienced a sharp increase in income equality, which may have affected the habits of entertainment consumption, and give some credence to the reasoning above. The Gini-coefficient decreased from 0.52 in 1867, or between 0.47 and 0.59 in 1880, to 0.34 in 1962-1963 [Brenner, Kaelble and Thomas 1991: 26]. Likewise, the share of the top twenty percent in total income decreased from 62 percent in 1867 and 58 percent in 1880, to about fifty percent in the 1930s, and 43 percent in 1963 [Williamson 1991:58]. For comparison, in the US the share of the top twenty percent fell from 52 percent in 1935-1936 to a low of 44 percent in 1960, after which it increased again [Ibid.].

in one city were surveyed, the data can only be taken as a first rough indication of spending patterns. The French dollar income is over an order of magnitude lower than British income and over two orders of magnitude lower than US incomes, obviously the result of the devaluation of the French franc. PPP-data would probably result in different relative incomes.

In the US, the income share of entertainment expenditure increased from 0.70 in 1918 to 1.22 percent in 1935. The income elasticity fell from 2.54 to 1.02, making entertainment nearly a normal good, and not incompatible with the fact that, at the cross-section level, as income tends to infinity, income elasticity of a specific item eventually approaches unity, if expenditure increases linearly with income.¹⁶ For all three countries, income elasticities were roughly in the same ballpark in the 1930s, and not very much different from unity. For cinema expenditure, we see a similar drop in US elasticity, while a marked transatlantic difference surfaces: in the US cinema is a luxury, with expenditure rising faster than income, in Europe cinema is inferior. Within Europe, cinema was most inferior in Britain.

A decline in the luxuriousness of entertainment expenditure relative to the 1890s concurs with Owen's findings that the aggregated expenditure on leisure and recreation as a percentage of GDP increased substantially between 1900 and 1930, but remained stable after that, at about five percent of GDP, at least until the late 1960s (Owen 1970: 86-94).

Income elasticity for live entertainment expenditure was far larger in the US than in Europe, and it even doubled between 1918 and 1935. The main reason seems to be the small and declining share in income; the

$$^{16} \lim_{Y \rightarrow \infty} \varepsilon_y = \frac{1}{\frac{a}{bY} + 1}$$

With Y = income, and the line a + bY the estimated expenditure line.

smaller the expenditure item, the larger income elasticity if we assume expenditure increases linearly with income. The decline of live entertainment expenditure was largely caused by cinema, and especially by sound films. The large volume-low margin-high profit part of live entertainment was automated away by cinema, while what remained split into a highly commercial/profitable metropolitan low-volume-high margin-high profit part and a heavily subsidized low volume-low margin-low profit part (Bakker 2004). In Britain and France the relative live expenditure was far higher, suggesting that cinema was less of perfect substitute (for example because most films shown were not in the consumers' mother tongue) or that those countries had more competitive live entertainment industries that had a comparative advantage (lower relative price) compared to the US.¹⁷

For all countries the entertainment income elasticities were lower than the amusements & vacations elasticities in 1890 (not a perfect comparison, as vacations are absent in the 1930s). Again, as total income increases, it could be expected that income elasticity declines, although this concerns time series rather than cross-sections. Only for the US, for 1918, was the income elasticity substantially higher than in 1890.

When the shape of entertainment expenditure relative to income is examined (figure 7) a similar order as in 1890 shows: expenditure was highest in France and lowest in the US, roughly across all income classes. The distribution of US and French income was less dispersed than British income, which contained extremes for both low and high incomes. Britain and France also had less steep curves than the US. Further, a marked increase in US expenditure was visible between 1918

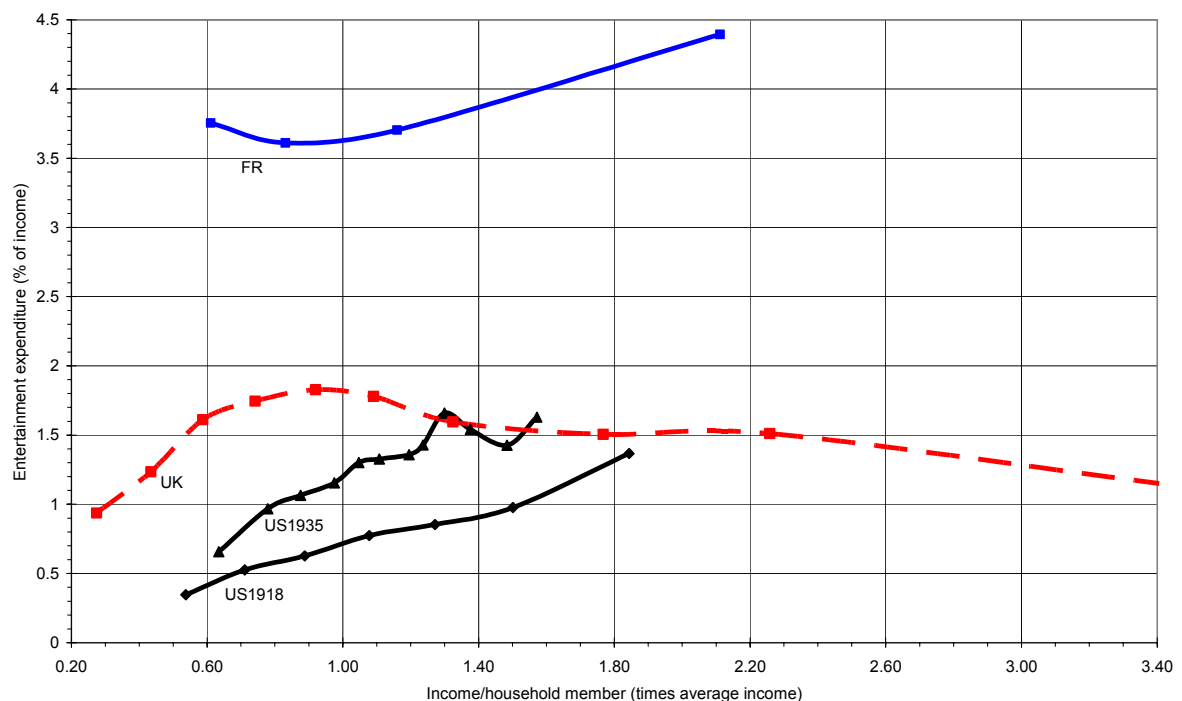
¹⁷ Part of the difference may be due to potentially biased samples for Britain and France; national total consumer expenditure estimates, below, show a far smaller difference between Britain and the US, although not between France and the US.

and 1935, consistently for all income groups, although the shape got slightly steeper.

For cinema expenditure (figure 8) the pattern changed, and US expenditure overtook British expenditure at about 0.80 of average income. Even 1918 US expenditure overtook British expenditure in the last income class; assuming the British curve would have been lower in 1918 as well, this suggests a similar US-UK pattern for 1918. France showed a sharp drop in expenditure from the first to the second income class, and then a slightly increasing curve.

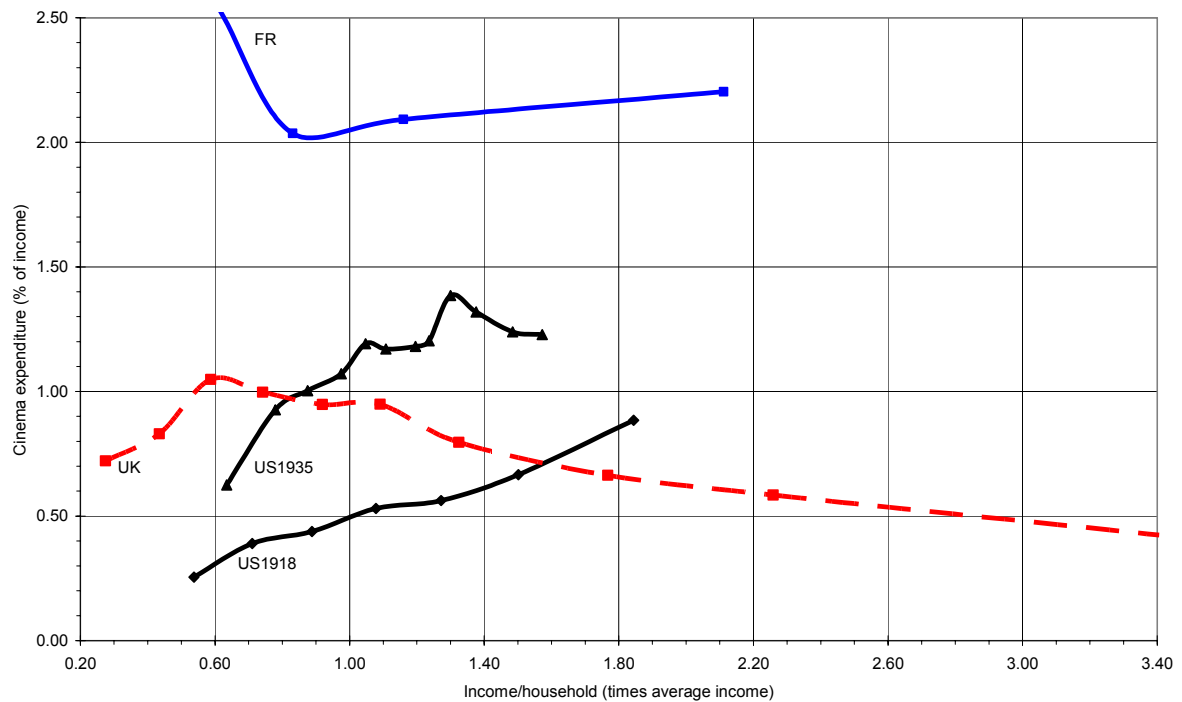
For live entertainment (figure 9), the order of magnitude difference between the US and Europe clearly showed, as well as a far slower increase with income in the US than in Europe. British and French expenditures were quite close and exhibited broadly similar patterns.

Figure 7. Entertainment Expenditure Across Income Groups, In Share Of Average Income, US, Britain And France, Later 1930s.



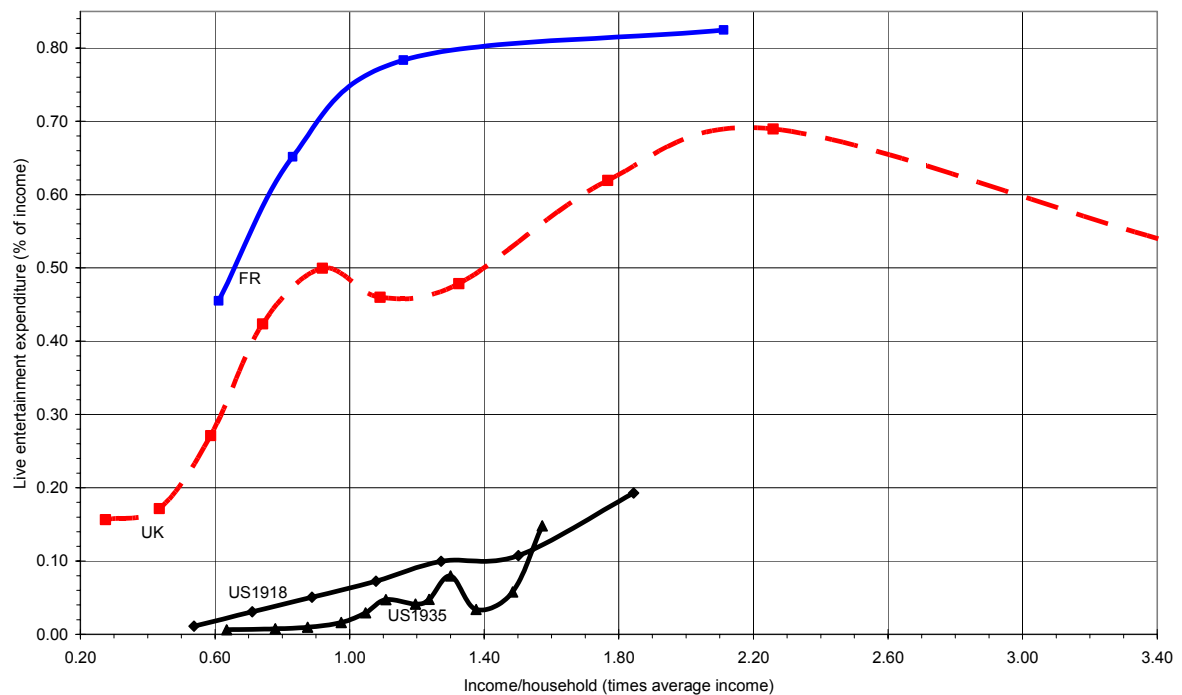
Source: see table 7 and text.

Figure 8. Cinema Expenditure Across Income Groups, In Share Of Average Income, US, Britain And France, Later 1930s.



Source: see table 7 and text.

Figure 9. Live Entertainment Expenditure Across Income Groups, In Share Of Average Income, US, Britain And France, Later 1930s.

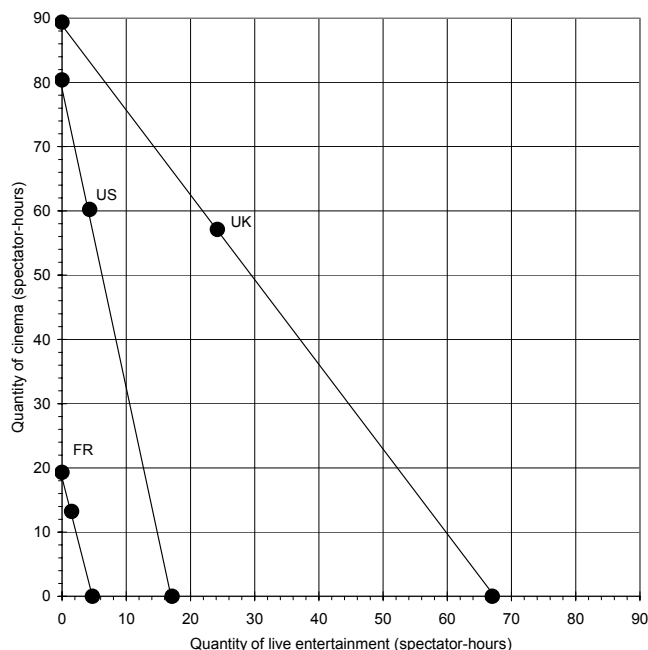


Source: see table 7 and text.

3.5 Decomposing international consumption differences in technology and taste effects

Price and consumption per capita data for 1938 (from Bakker 2004) enables the calculation of national budget constraints (figure 10).¹⁸ When a country can potentially buy more cinema tickets, it can also buy more live entertainment tickets. It is also evident that, while US and French 'technology' (relative prices) are broadly similar, Britain had a low price for live entertainment (table 8) and its share was as much as 25 percent, compared to just over two percent in the US and ten percent in France. This difference must have been at least partially due to a different organisation of entertainment production rather than exclusively to consumer preferences.

Figure 10. Live Vs. Entertainment Quantities Consumed And Budget Constraints, Average Per Capita, US, Britain And France 1938.



Source: Corrected estimates from Bakker 2004.

¹⁸ For Britain, an estimate of expenditure on and quantity of tickets to sports matches had to be deducted to arrive at comparable data (see the notes to figure 3, above).

Table 8. *Indicators of the consumption of live and cinema spectator-hours, Britain, France and the US, 1938.*

	qc+ql	qc	ql	alpha	gamma	Pc/pl	Eqs
US	54.2	53.0	1.2	0.92	0.978	0.26	-11.34
UK	76.5	57.1	19.4	0.67	0.75	0.68	-1.99
FR	14.7	13.2	1.5	0.68	0.898	0.25	-2.17
Index (US=100)							
US	100	98	2	100	100	100	100
UK	141	105	36	72	76	263	18
FR	27	24	3	74	92	96	19

Notes: all figures are national averages per capita for 1938.

qc = the number of spectator-hours of cinema consumed.

ql= the number of spectator-hours of live entertainment consumed.

alpha = the expenditure share of cinema consumption.

gamma = the quantity share of cinema consumption.

pc/pl = the relative price of cinema over live entertainment.

Eqs = the quantity elasticity of substitution of cinema for live entertainment.

Source : corrected estimates from Bakker 2004a.

It is possible to formally decompose these national differences in consumption patterns into those due to differences in relative price ('technology') and those due to differences in consumer preferences ('taste'). First, it is assumed that consumers spend a constant income share on spectator entertainment, and then divide it between cinema and live entertainment. Second, it is assumed that the relative price p_c/p_l (the slopes of the budget constraints in figure 10) largely reflects differences in production technologies rather than differences in demand.

Given p_c/p_l , consumption preferences can be characterised by the quantity elasticity of substitution ε_{qs} (which defines the position of the data point on the budget constraint). The latter is the percentage change in cinema-hours for a percentage change in live hours. Consumers chose a certain 'exchange rate', a certain value of ε_{qs} , which is defined as follows:

$$\varepsilon_{qs} = \frac{\% \Delta q_l}{\% \Delta q_c} = \frac{q_c}{q_l} \cdot \frac{dq_l}{dq_c} = \frac{q_c}{q_l} \cdot \frac{1}{TRS} = -\frac{\alpha}{1-\alpha} \quad (1)$$

Where q_c is the amount of spectator-hours of cinema consumed, q_l the spectator-hours of live entertainment, TRS the technical rate of substitution and α the share of cinema expenditure in total expenditure on live entertainment and cinema.

It is clear that 'consumer preferences', as proxied by this quantity elasticity of substitution of cinema for live entertainment, were not the same across the countries. The US had an incredibly high ε_{qs} , meaning that the US consumer, by reducing the quantity of cinema consumed by one percent, could increase the quantity of live entertainment consumed by eleven percent. In France, ε_{qs} was 2.2, and in Britain it was only 2.0 (table 8). This suggests that besides technology, consumer preferences were also important to explain national differences.

The difference between countries in the quantity share (γ) of cinema in all spectator entertainment consumed, can be decomposed into the effects of ε_{qs} ('taste'), differences in p_c/p_l ('technology') and their joint effect. Their relative magnitude is calculated using the equations below. The intercepts and points on the budget constraints are defined as follows:

$$q_c^{\max} = \frac{1 + \varepsilon_{qs}}{\varepsilon_{qs}} q_c \quad (2)$$

$$q_c = \frac{\varepsilon_{qs}}{1 + \varepsilon_{qs}} q_c^{\max} \quad (3)$$

$$q_l^{\max} = (1 + \varepsilon_{qs}) q_l \quad (4)$$

$$q_l = \frac{1}{1 + \varepsilon_{qs}} q_l^{\max} \quad (5)$$

Yielding:

$$\gamma = \frac{q_c}{q_c + q_l} \quad (6)$$

$$\Delta\gamma = \gamma_2 - \gamma_1 = \frac{\frac{1}{1 + \varepsilon_{qs}} q_l^{\max}}{\frac{1}{1 + \varepsilon_{qs}} q_l^{\max} + \frac{\varepsilon_{qs}}{1 + \varepsilon_{qs}} q_c^{\max}} - \gamma_1 = \frac{1}{1 + \varepsilon_{qs}} \left(\frac{q_l^{\max}}{q_l^{\max} + \varepsilon_{qs} q_c^{\max}} \right) - \gamma_1 \quad (7)$$

Where $q_c^{\max}$ and $q_l^{\max}$ are the maximum amounts of cinema and live entertainment that can be consumed.

To examine the effect of technology, tastes are kept constant; $q_l^{\max}$ is computed using the relative price (slope) of the comparator country (and keeping all other variables constant), and introduced as $q_{l_2}^{\max}$ in (7), giving the result:

$$\Delta\gamma = \frac{\varepsilon_{qs} q_c^{\max}}{1 + \varepsilon_{qs}} \left(\frac{(q_{l_2}^{\max} - q_{l_1}^{\max})}{(q_{l_2}^{\max} + \varepsilon_{qs} q_c^{\max})(q_{l_1}^{\max} + \varepsilon_{qs} q_c^{\max})} \right) \quad (8)$$

To examine the effect of tastes, technology is kept constant; the ε_{qs} of the comparator country is introduced in (7) as ε_{qs_2} (keeping all other variables constant), giving the result:¹⁹

$$\Delta\gamma = q_l^{\max} \left(\frac{1}{(1 + \varepsilon_{qs_2})(q_l^{\max} + \varepsilon_{qs_2} q_c^{\max})} - \frac{1}{(1 + \varepsilon_{qs_1})(q_l^{\max} + \varepsilon_{qs_1} q_c^{\max})} \right) \quad (9)$$

To measure the effect of technology, for example, the US relative price has been set at the UK relative price, keeping elasticity constant (table 9). The effects can be measured in two directions and the average effect, which cancels out the joint effect, gives a rough and ready estimate of the relative importance of technology and taste in explaining country differences. Although not explicitly assumed, this method is consistent with Cobb-Douglas preferences and a Cobb-Douglas technology/taste decomposition gives exactly the same results.²⁰

¹⁹ A scale-independent statement for gamma, which yields the same results in the case above, of course, is:

$$\begin{aligned} \gamma &= \frac{q_c}{q_c + q_l} \\ \frac{q_c}{q_l} + 1 &= \frac{q_c}{q_l} \frac{1}{\gamma} = \frac{p_l}{p_c} \varepsilon \frac{1}{\gamma} \\ \gamma &= \frac{1}{1 - \frac{p_c}{\varepsilon \cdot p_l}} \end{aligned}$$

²⁰ Using

$$\frac{P_l}{P_c} = \frac{1 - \alpha}{\alpha} \frac{q_c}{q_l}$$

and

$$q_c = -\frac{1 - \alpha}{\alpha} \frac{q_c}{q_l} q_l + q_c^{\max}$$

yielding:

$$\gamma = \frac{1}{1 + \frac{1 - \alpha}{\alpha} \frac{P_c}{P_l}}$$

Table 9. *The effect of relative price and quantity elasticity of substitution on differences in cinema consumption, US, Britain and France, 1938.*

	In percentage-points				In percentage of total difference			
	Total difference %point	Effects			Total difference %	Effects		
		dpc/pl %point	de %point	joint %point		dpc/pl %	de %	joint %
US to UK	-23.2	-3.4	-9.2	-10.5	100	15	40	45
UK to US	23.2	13.9	19.8	-10.5	100	60	85	-45
Average		8.7	14.5	-10.5		37	63	0
US to FR	-8.0	0.1	-8.4	0.3	100	-1	105	-4
FR to US	8.0	-0.4	8.1	0.3	100	-5	101	4
Average		0.2	8.2	0.3		-3	103	0
UK to FR	15.2	14.4	1.6	-0.8	100	95	11	-5
FR to UK	-15.2	-13.6	-0.8	-0.8	100	89	5	5
Average		14.0	1.2	-0.8		92	8	0
Index US to UK = -100								
	-100	-15	-40	-45				
	100	60	85	-45				
		37	63					
	-34	0	-36	1				
	34	-2	35	1				
		1	35					
	66	62	7	-3				
	-66	-59	-4	-3				
		60	5					

Notes: all figures are national averages per capita for 1938.

dpc/pl = the difference in relative price ("technology").

de = the difference in the quantity elasticity of substitution ("taste").

Average' refers to the average size of the effect in absolute terms, not to the direction.

Source : Appendix, tables A1, A2 and A3; corrected estimates from Bakker 2004a.

Thus the difference in relative cinema consumption between the US and Britain can be explained for about three-fifths by technology and for about two-fifths by taste. Given that the data are not extremely precise, this suggests that the lower price and differences in taste were about equally important for the large quantity of British live entertainment consumed.²¹ The difference between Britain and France, on the contrary, can be explained almost exclusively by differences in technology. The difference between France and the US, on the contrary, is far smaller and could be wholly explained differences in taste.

These findings suggest that UK had a clear comparative advantage towards live entertainment, the US towards cinema, while the situation of France was undetermined. Unfortunately for Britain, live entertainment could hardly be traded, meaning that a specialisation on live entertainment would yield less advantage to Britain than a specialisation on cinema yielded to the US.

4 Composition And Growth Of Recreation Expenditure As A Whole

The last quarter-century has seen a number of scholarly attempts to introduce an evolutionary framework to the study of organizational ecology and economic change” [Nelson and Winter 1982; Hannan and Freeman 1989]. This section aims to widen the framework employed so far to help us choose between our two competing explanatory hypotheses by investigating the potential role of wider consumption routines, skills and capabilities in the evolution of demand through processes such as selection, replication, imitation and modification and through random

²¹ If we would assume scale effects, a greater preference for live entertainment in a country could lead to lower relative prices. These scale effects appear to be different from the joint effects (of e on pc/pl and vice versa).

events and 'mutations'. The preferred hypothesis – that the emergence of cinema was mainly demand-led – is retained, but it is shown that it is compatible with an evolutionary account. Consumers started to spend more time and money on leisure activities, and initially their expenditure was spread out among many different categories. Much of the demand, however, went to spectator entertainment, and to reduce bottlenecks and increase revenues, entrepreneurs started to use cinema technology. Consumers reacted favourably to this technology, giving entrepreneurs incentives to develop it further. Over time, in an evolutionary process, more and more expenditure was moved away from things such as tobacco and alcohol to entertainment expenditure, and within entertainment expenditure, more and more was spent on cinema. Cinema-going became a habit for consumers, sometimes daily, sometimes weekly. The outcome of the evolutionary process was that cinema became the dominant form of entertainment.

To sketch the environment in which demand for live entertainment and cinema boomed, the developments in other recreation products and services are outlined briefly and broadly below. The rise of cinema took place within a general rise in demand for recreation products, influenced by five factors: more time, more money, urbanisation, new transport networks and population growth. The rise in expenditure on spectator entertainment was not simply a redistribution of existing recreation expenditure, but was also connected to these five underlying forces.

In historical and cross-country research many types and kinds of quantitative information exist that are often difficult to compare because of differing time spans, units, accuracy of measurement and reporting. To overcome this, a method of informal comparative growth analysis and simulation is used, which allows us to compare the data systematically, by converting all time series data into real per capita growth rates. This makes data more comparable across industries/markets and countries,

and the combination of quantity and expenditure growth rates allow ballpark estimates of real and relative price growth rates, which otherwise would be difficult to obtain for many smaller goods and services. This method is far from perfect and not very precise, but it offers a better way of comparing different types of incomplete historical data than many alternative methods. It is no more than a rough and ready approach to get insight into the order of magnitudes of growth of leisure spending and on relative growth rates. Since data are for three countries and for differing time-spans, aggregate growth rates do not accurately reflect 'real' national growth rates. They are no more than abstract constructs that shed some limited light on relative growth rates in the absence of complete and fully comparable data series. One can also do simulation experiments with the rates allowing more insights into the workings of the process, not unlike simulations in evolutionary or population ecology and organisational ecology.

Table 10. *Per capita growth of leisure goods and services, 1832-1950, US, Britain and France, quantity, real expenditure and intensity.*

Category	Product	Country	Period	Growth per capita per annum					Price after	
				Quantity	Expenditure	Intensity	Price	Rel. Price	48 years	
Unweighted averages										
	Printed		1897	1937	2.53	3.38		0.33	-1.03	0.61
	Audiovisual		1898	1931	10.85	3.28		-0.70	0.00	1.00
	Sports		1901	1923	4.55	4.18	6.50	-0.08	-0.62	0.74
	Non-market		1913	1941	7.76		6.07			
	Drink		1860	1903	0.57	1.12		0.97	-1.66	0.45
	Grouped average		1894	1927	5.25	2.99	6.29	0.13	-0.83	0.67
	All-item average		1894	1927	5.78	3.27	6.40	-0.39		
Coefficients of variation										
	Printed		1850	1950	0.21	0.00				
	Audiovisual		1850	1940	1.01	1.31				
	Sports		1875	1947	0.96	0.42	0.41			
	Non-market		1896	1941	0.64		0.00			
	Drink		1832	1923	1.98	0.00				
	Grouped average		1861	1940	0.96	0.43	0.21			
	All-item average									
Printed										
	Newspapers	US	1850	1950	2.45					
	Periodicals	US	1904	1947	2.40					
	Newspapers	UK	1900	1938		3.37				
	Newspapers	UK	1900	1919	2.68					
	Books and periodicals	UK	1900	1938		3.39				
	Published editions of adult fiction	UK	1911	1935	3.39					
	Publ. editions all classes of books	UK	1911	1935	1.74					
	Unweighted average	US, UK	1897	1937	2.53	3.38		0.33	-1.03	0.61
	Standard deviation		1850	1950	0.53	0.01				
	Coefficient of variation				0.21	0.00				
Audiovisual										
	Piano	US	1850	1909	4.10					
	Automated piano	US	1900	1919	15.00					
	Piano	UK	1870	1910	2.10					
	Piano	FR	1850	1910	2.25					
	Phonograph rolls and discs	UK	1905	1930		10.60				
	Cinema and live entertainment	US	1900	1938	5.59			-0.66	-0.04	0.98
	Cinema and live entertainment	US	1909	1938		2.29				
	Cinema and live entertainment	US	1900	1940		2.79				
	Cinema and live entertainment	UK	1900	1938	2.63	2.72		0.03	-0.73	0.70
	Cinema and live entertainment	UK	1881	1938		2.50				
	Cinema and live entertainment	FR	1900	1938	5.99			-0.56	-0.14	0.94
	Cinema and live entertainment	FR	1914	1938		2.63				
	Live entertainment	US	1909	1938		-3.83				
	Live entertainment	UK	1881	1900		1.92				
	Live entertainment	UK	1900	1938		0.02				
	Live entertainment	FR	1914	1938		-1.29				
	Cinema	US	1909	1940		10.99				
	Cinema	FR	1914	1938		8.06				
	Radio licenses	UK	1923	1938	32.00					
	Radio licenses	FR	1933	1938	28.00					
	Unweighted average	US,UK,FR	1898	1931	10.85	3.28		-0.70	0.00	1.00
	Standard deviation		1850	1940	10.92	4.30				
	Coefficient of variation				1.01	1.31				
Sports										
	Baseball attendance	US	1901	1921	3.21					
	Baseball attendance	US	1921	1940	-0.01					
	Sports and games	UK	1900	1919		5.95				
	National Football League Revenue	UK	1937	1947		2.41				
	First Division League Football atten	UK	1888	1913	10.45					
	First Division League Football atten	UK	1888	1913			6.67			
	Cup Final average crowd	UK	1875	1914			9.72			
	Rugby League attendance cup final	UK	1897	1914			3.12			
	Unweighted average	US, UK	1901	1923	4.55	4.18	6.50	-0.08	-0.62	0.74
	Standard deviation		1875	1947	4.37	1.77	2.70			
	Coefficient of variation				0.96	0.42	0.41			
Nonmarket										
	Membership bowling associations	US	1896	1941	15.00					
	Members per bowling alley	US	1924	1941			6.07			
	Softball diamonds per capita	US	1924	1941	13.41					
	Bathing beaches	US	1916	1941	3.86					
	Swimming pools	US	1915	1941	4.52					
	Supervised playgrounds	US	1910	1941	5.58					

	Visits to national parks	US	1904	1941	13.90				
	Visits to forests	US	1904	1941	3.41				
	Hunting licences	US	1923	1941	2.41				
	Unweighted average	US	1913	1941	7.76		6.07		
	Standard deviation		1896	1941	5.00		0.00		
	Coefficient of variation				0.64		0.00		
Drink	Alcohol	UK	1870	1919		1.12			
	Spirits	UK	1877	1912	-1.67				
	Beer	UK	1877	1912	-0.59				
	Wine	FR	1832	1872	1.15				
	Wine	FR	1872	1923	0.70				
	Beer	FR	1832	1872	1.88				
	Beer	FR	1872	1923	0.78				
	Spirits	FR	1832	1872	1.86				
	Spirits	FR	1872	1923	0.46				
	Unweighted average	US,UK,FR	1860	1903	0.57	1.12	0.97	-1.66	0.45
	Standard deviation		1832	1923	1.13	0.00			
	Coefficient of variation				1.98	0.00			

Intensity = attendance/production per unit; e.g. number of spectators per stadium, users per bowling alley, etc.

Rel. price = the percentage per annum with which the price difference between the good in question and audiovisual goods changes.

Price after 48 years: this is the change in the hypothetical relative price of audiovisual goods compared to the good in question, applying the growth rates to 1890-1940; for example, in 1938, the relative price of audiovisual entertainment, expressed in printed matter, was 61 percent of what it had been in 1890.

Averages: these are informal, unweighted averages of incomplete sets of growth rates covering different timespans, different products and different countries.

Source : Bakker 2001b.

For printed media, audiovisual media, sports, non-market entertainment and alcoholic drinks growth rates have been calculated from dispersed data sources that could be tracked down (table 10). Except for drink, these rates suggest that the increasing demand for spectator entertainment was part of a broad-based boom in demand for recreation as a whole, both for commercially provided and non-commercial recreation.

Although the consumption of all goods grew rapidly, audiovisual entertainment consumption grew about twice as fast as the average for all groups, while expenditure increased only slightly above average, suggesting a substantial decline in the real price. The substantial increase in quantity was hidden by an exceptional fall in price. This was at least partially brought about by substitution of filmed for live entertainment. Even compared to prices of other leisure goods, entertainment prices fell substantially. If the growth rates are hypothetically applied to the whole 1890-1938 period, audiovisual prices in 1938 were only 61 percent of what they had been expressed in quantity of printed matter in 1890, only 74 percent expressed in sports tickets, and only 45 percent expressed in

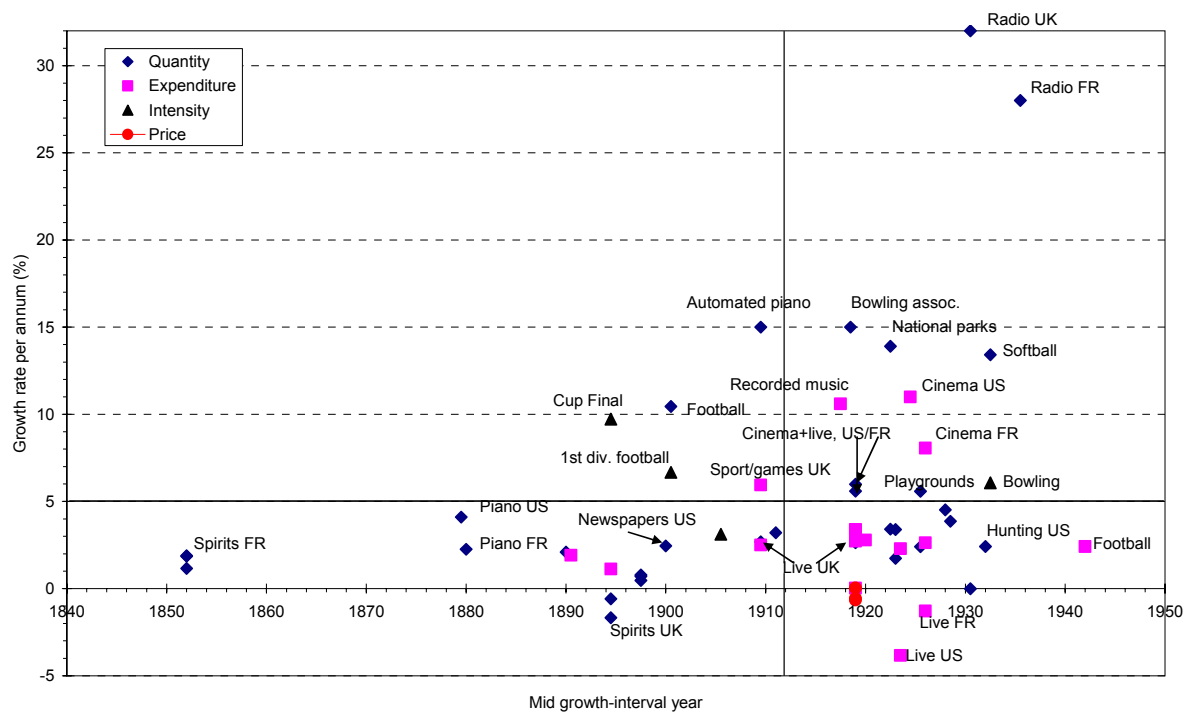
drinks. Three audiovisual goods with high growth rates—the automated piano, cinema and radio licenses—brought up the average substantially.

The growth intensity for sports suggest substantial scale effects, as recreation facilities attracted and could handle more and more consumers. A year-on-year growth of about 6 percent in utilisation, even if we allow for additional capital to build larger venues, is phenomenal. It results in venues that in 1938 would be 16 times as large as those in 1890. Urbanisation and transport networks also contributed to increased utilisation. The scale effects probably also mitigated potential rises in prices, as average costs would come down substantially and continuously, until full venue size was reached.

The growth of non-market goods is surprisingly fast, and shows that increased cinema consumption can not be fully explained by consumers substituting informal, traditional, non-market recreation for commercialised entertainment. The rapid increase in leisure time, the efforts of states and communities to provide leisure goods, and the low price of non-market recreation probably all played a role. The similar growth rate of audiovisual products and non-market recreation could be driven by strong public good characteristics. Both have a strongly non-diminishing character. An additional person watching a film does not deplete the copyright, and hardly depletes the celluloid, an additional person visiting a national park or a playground diminishes the resource only at a low rate. Both also have some non-excludability properties: only copyrights enabled strong excludability for filmed entertainment, and radio and television were largely non-excludable. Likewise, it is not easy, although possible, to exclude people from national park, playgrounds or public softball diamonds. High fixed and sunk costs in both cases mean that average costs will decrease for a long interval—for films even when sales equalled the entire market—so that prices could be relative low in

competitive situations or when a social planner wants to maximise total economic welfare.

Figure 11. Calendar Growth Interval Midpoint Versus Annual Per Capita Growth Rate, Various Leisure Goods And Services, US, Britain And France, 1850-1950.



Note: the average growth interval midpoint is 1911 (median of the intervals is 1919, standard deviation 20 years, and coefficient of variation 0.3).

Source: Table 10.

When the growth rates are plotted against time (figure 11), it becomes evident that the highest growth rates tended to take place later, although a substantial part of this can be explained by the late average of the growth intervals (1911). Second, radio was an outlier that significantly increased the audiovisual growth rate. Third, nearly all the growth rates above five percent were due to either audiovisual or non-market entertainment, and again took place in later years.

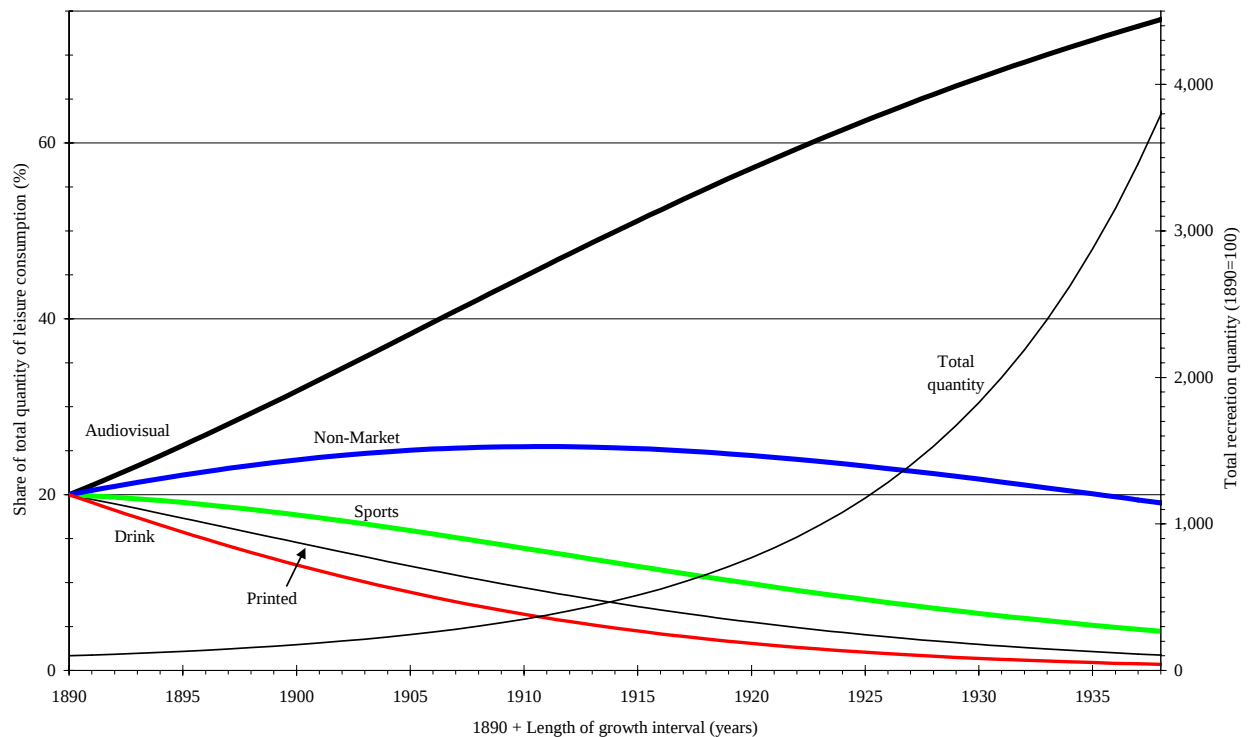
The above growth rates enable a simulation of growth patterns. If the five categories are assumed to have had equal shares of recreation

quantity consumed in 1890, then it is possible to estimate hypothetically what those shares would have been in other years, using actual growth rates (figure 12). Because of its high growth rate, audiovisual entertainment would have reached fifty percent in 1914, when the feature film was becoming the industry standard, and would have reached about 75 percent by 1938.²² Non-market goods were the only other category that would have kept a meaningful market share, peaking at 26 percent in 1910, and remaining 19 percent in 1938. The recreation market as a whole grew tremendously, reaching nearly forty times its 1890 size by 1938 (figure 12).²³

²² And in 1990, this would have reached 90 percent, although this finding is meaningless, as growth rates for the period after 1945 have not been used.

²³ It should be emphasized that this is an entirely hypothetical growth/share simulation. If we look at the calendar years at which the quantity consumed drops below one percent of the total quantity of the five categories (i.e. leisure goods/services consumed), this would be 1934 for drink, 1947 for printed media, 1967 for sports, and, finally, 2053 for non-market recreation.

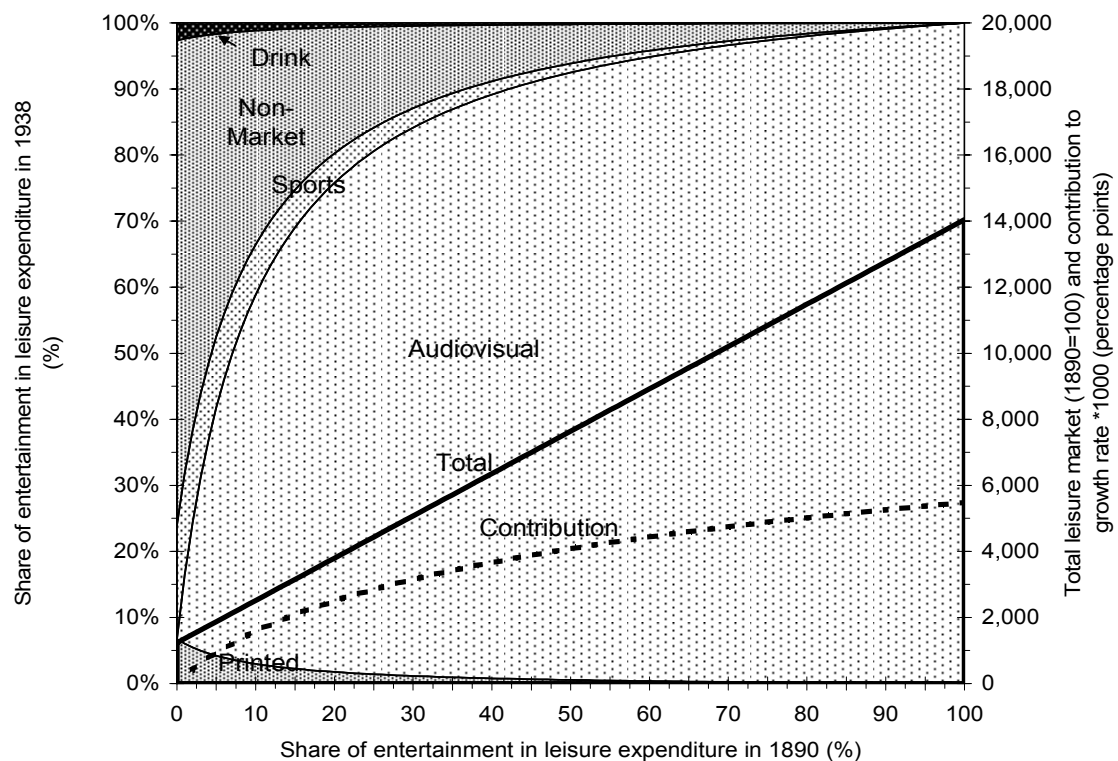
Figure 12: Hypothetical Share Of Audiovisual Entertainment In Total Quantity Of Leisure Goods/Services Consumed As A Function Of Equal 1890 Shares, With Historically Observed Growth Rates Applied From 1890 Onwards, And Hypothetical Quantity Consumed 1890-1938 (Percentage Share And 1890=100).



Source: Table 10.

One can also examine how the audiovisual market share by 1938 depends on its initial share in 1890 (figure 13). Even if audiovisual entertainment had had an initial market share of only 2.5 percent in 1890 (and the remaining 97.5 percent was divided equally among other categories) then it would have reached a 26 percent share by 1938. For five percent this would have been 40 percent, and for ten percent 58 percent. This suggest that audiovisual entertainment made a significant growth contribution to recreation as a whole.

Figure 13: Hypothetical Share Of Audiovisual Entertainment In Total Quantity Of Leisure Goods/Services Consumed In 1938, As A Function Of The 1890 Share.



Note: total (solid black line) = total leisure market size in 1938, in quantity (1890=100); the size of this market increases as the 1890 quantity share of audiovisual entertainment increases. Contribution to growth rate (dotted line) = the additional growth rate relative to the hypothetical growth rate without audiovisual entertainment (which was 5.4 percent per annum). A value of 4,000, for example, means that $4,000/1,000 = 4$ percent-points additional growth was caused by audiovisual entertainment.

Source: Table 10.

It probably goes too far to say that the boom in demand for live entertainment directly forced the emergence of cinema discussed earlier in this paper. Nevertheless, without sharply rising demand, for a long time the cinematograph would have remained what it had been during its first years: a novelty, a specialty, a luxury product every now and then shown in theatres and schools, or occasionally by travelling showmen. Cinema

would not have taken off as a large-scale industry.²⁴ The huge growth burst of demand enabled cinema to develop into a specialised industry with its own dedicated distribution delivery system. Without this boom in demand, the market would probably have been too small for a separate distribution delivery system, and costs sunk in film productions would have had to remain limited, hampering the possibility of films to rapidly increase their audience. Prices of film performances would probably have remained closer to the prices of theatre and big-time vaudeville, further preventing any take-off of a new industry.

5. Conclusion

The paper explored the hypothesis that the take-off and growth of the film industry was largely demand-driven. A time lag of about ten years existed between the availability of cinema technology and the take-off of the industry. This lag was short, but long enough to allow rejection of the null-hypothesis that technology alone accounted for the development of the film industry. The alternative, or demand-driven explanation, was sustained through examinations of total consumer spending, cross-section studies of household expenditure, estimates of cross-country taste/technology differences, and an informal comparison of growth rates of different recreation goods and services.

The household expenditure survey from 1889-1890 shows that entertainment was a superior product, with an income elasticity substantially above one. Although this is a cross-section and not time

²⁴ At best, without the boom in demand, cinema may have suffered the same fate as the phonograph, which for years remained somewhat of an expensive elite product, both because of its consumers and because of its content (its styles of music). It never reached the same number of consumers as cinema had done. It was only in the 1950s with its affluent teenagers that the phonograph really became a mass product, and the music industry came to look a bit more like the film industry. See, for example, Gerben Bakker, "The Making of a Music Multinational: PolyGram's International Businesses, 1945-1998," in: *Business History Review*, Vol. 80 No. 1 (Spring 2006), pp. 81-123.

series data, it does make it more plausible that as real incomes increased, entertainment expenditure would increase disproportionately. In France, income elasticity was the lowest, and entertainment was far less a superior good than in Britain and the UK; at every income level, the likelihood of positive expenditure was substantially higher. Increase in real income in France would have a far smaller effect on total entertainment expenditure than in Britain and the United States. US expenditure was lowest as a percentage of income, probably caused by a high price of live entertainment.

The 1930s show a far lower income elasticity for entertainment than the 1889-1890 survey for all countries, an elasticity not very different from unity. Cinema turned out to be a superior product in the US, but inferior in Europe, possibly because of a more competitive European live entertainment industry, with lower relative prices and higher relative quality (because most films shown in Europe were American). Live entertainment was superior in all three countries, but while income elasticity was only slightly above unity in Britain and France, in the US the elasticity was disproportional large, at 8.2, and nearly double of what it had been in 1918. US surveys for 1918 and 1935 show a consistent upward shift in entertainment expenditure across all income classes and a substantial decrease of the income elasticity of expenditure.

Comparative technology/taste effect analysis of consumption differences suggests that two-thirds of the US/UK differences can be explained by differences in technology, while two-thirds of the US/France difference can be explained by differences in taste. About four-fifths of the UK/France difference can be explained by technology. These findings suggest a strong UK comparative advantage in live entertainment production. Had cinema and the film industry only developed from a technological imperative, one would not expect such marked differences

between countries. These differences suggest that demand played an important role in shaping the evolution of the film industry.

Using informal comparative growth analysis, the paper finds that cinema consumption was part of a large boom in expenditure on a variety of leisure goods and services; over time, by an evolutionary process, some of these goods, such as cinema and radio, formed the basis of dominant consumption habits, while others remained relatively small. The growth rate of the quantity of audiovisual entertainment consumed between c. 1890 and 1940 was far larger than growth rates on most other recreation products, and over time it obtained a far larger quantity share (in spectator-hours) of the basket of leisure goods/services consumed. The share was far less in expenditure, because of a sharp drop in real prices of audiovisual entertainment, brought about by innovations such as the automated piano, cinema, radio and recorded music. The only other recreation good coming close to the quantity growth rate of audiovisual products was non-market recreation, probably because of some similar quasi-public good characteristics that likewise resulted in minimal marginal costs and sharply falling average costs.

These investigations into consumption do not provide sufficient reason to fully reject a technology-based account, but they do justify a strong presumption in favour of demand factors.

Two stories, then, can be told about the emergence of the film industry. The most popular one so far has been the story about great men, genial inventors who step by step invented all the necessary components for film technology, starting with projection in the 1850s, celluloid in the 1860s, roll-films in the 1880s, and finally the cinematograph in the 1895. The heroes of this story are men such as George Eastman, Georges Marey, Louis Lumière, Thomas Edison, William Kennedy Dickson, Robert Paul, Friese Green and Albert E. Smith. According to this story, these great men with their great inventions laid

the foundation of the modern twentieth century film industry, and on their shoulders stood great men, great entrepreneurs that quickly marketed their innovations to the world, men such as Charles Pathé, Léon Gaumont, Charles Urban or Carl Laemmle.

In the second story, however, the great men are just ripples on great waves, and while their great invention singularly may have highly contributed to scientific knowledge, it hardly contributed to the take-off of the film industry. Their invention might have stayed a mere gadget, a visual toys and a novelty, as was the fate of its predecessors in the nineteenth century. It might have remained a premium product for a limited elite, as was the fate of its major fellow traveller, the phonograph. It might have become a fad for a short spell, such as the skating rinks and bowling alleys of the 1900s. Instead, because of fundamental changes in the composition and growth of consumer demand, it broke out of the control of its great inventors and quickly developed into the greatest entertainment industry of all.

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