ROCKONOMICS: THE ECONOMICS OF POPULAR MUSIC*

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Contents

Abstract
This paper considers economic issues and trends in the rock and roll industry, broadly defined. The analysis focuses on concert revenues, the main source of performers' income. Issues considered include: price measurement; concert price acceleration in the 1990s; the increased concentration of revenue among performers; reasons for the secondary ticket market; methods for ranking performers; copyright protection; and technological change.

JEL codes: Z1; L82; O34
Key words: Rockonomics; concerts; superstars

*We thank Art De Vany and Bentley MacLeod for helpful comments and Gary Bongiovanni for data, and absolve them from any mistakes we may have made.

The fact of the matter is that popular music is one of the industries of the country. It's all completely tied up with capitalism. It's stupid to separate it.

– Paul Simon

1. Introduction

As was highlighted by a much ridiculed box in the 2004 *Economic Report of the President* that questioned whether fast food restaurants should be classified in the manufacturing sector, defining an industry necessarily entails some arbitrariness. We seek to survey the economics of the popular music industry, a subfield of economics that we euphemistically call *Rockonomics*. But what is popular music? Where does one draw the lines? Here, we will define popular music as music that has a wide following, is produced by contemporary artists and composers, and does not require public subsidy to survive. This definition rules out classical music and publicly supported orchestras. It includes rock and roll, pop, rap, bebop, jazz, blues and many other genres. What about Pavarotti? Well, we warned you that the border of the definition can be fuzzy. If the three tenors attract a large following and are financially viable, we would include them in the popular music industry as well.

Why is popular music worthy of a handbook chapter? There are several responses. First, Paul Simon's sentiment in the epigraph not withstanding, for many fans popular music transcends usual market economics and raises spirits and aspirations. In this vein, for example, Bruce Springsteen once commented, "in some fashion, I help people hold on to their own humanity, if I'm doing my job right." Dewey Finn, the character played by Jack Black in the hit movie, *School of Rock*, went even further,

immodestly claiming, “One great rock show can change the world.” The rock and roll industry arguably started as a social movement intended to bring about political, economic and cultural change, as much as it did as a business. Certainly, popular music is an important cultural industry.

Second, precisely because emotion and non-traditional economic concerns loom large in popular music, the industry can be a breeding ground for new insights into economics. Social considerations are important in transactions outside the music industry; they are just magnified when it comes to a rock and roll concert.

Third, the popular music industry provides a testing ground for some important economic theories. For example, popular music is a classic superstar industry, where rewards are highly skewed. Can economic models explain the distribution of rewards? Also, despite the non-economic forces that affect the popular music industry, can basic economic factors, such as supply and demand, still provide a good explanation of many of the important developments in the industry?

Fourth, the industry is profoundly affected by technological change, such as the advent of radio, TV, record albums, cassette tapes, CDs, MP3 players, the Internet, etc. Thus, popular music provides an unusual setting to understand how rapid technological change affects an industry.

Fifth, and finally, the popular music industry is, by definition, popular. As a consequence, students are particularly motivated to learn about the industry, and examples drawn from the industry thus provide good material for teaching economics.

To help guide our coverage, Table 1.1 provides a summary of the main income sources for the top 35 popular music performers who toured in 2002, ranked by income.

The figures, which are taken from *Rolling Stone* magazine, should be viewed as rough estimates. Another caveat to bear in mind is that some sources of income – such as revenue from merchandise sales, movies, commercials and (don't laugh) cell phone jingles – are not itemized in the table, but included in the total. These other sources of revenues can be substantial. The Osbournes, for example, had a huge success with their reality TV show that aired on MTV. Nevertheless, the table provides an indication of the relative importance of live concerts, record sales, and publication royalties in performers' income. Although the concert figures are somewhat inflated because artists do not tour every year (and our sample conditions on having toured), it is clear that concerts provide a larger source of income for performers than record sales or publishing royalties. Only four of the top 35 income-earners made more money from recordings than from live concerts, and much of the record revenue for these artists probably represented an advance on a new album, not on-going royalties from CD sales. For the top 35 artists as a whole, income from touring exceeded income from record sales by a ratio of 7.5 to 1 in 2002. Royalties from publishing music was slightly less than income from recordings. Consequently, we will devote much attention to live concerts in this paper.

The remainder of this chapter is organized as follows. The next section describes the organization of the music industry, devoting particular attention to live performances. Section 3 discusses theoretical issues in the pricing of concerts. Section 4 considers major developments in the popular music concert industry, with particular emphasis on prices, ticket sales, revenue, and concentration among promoters. Section 5 considers the important role played by scalpers. Section 6 provides a method for ranking performers based on economic data. Section 7 considers the role of the superstar model in the rock

and roll industry. Section 8 discusses the role of radio and royalties, and section 9 considers related issues involving file sharing. Section 10 concludes by highlighting important questions for further research.

2. The Players

The market for popular music has many players and complex contracts. Figure 2.1 provides a schematic diagram of the organization of key elements of the popular music industry. First and foremost, of course, are the musicians, who form a band. The band may write its own music and lyrics, or it may purchase music from an outside composer. In the Figure 2.1, we have illustrated a situation for a band that writes its own music. The bands have managers who represent them and take a share of their earnings in exchange for their managerial services. On behalf of the bands, managers make contracts with promoters to promote live concerts. The promoter secures a venue, advertises the event, and takes care of other arrangements. Successful bands also have contracts with recording companies to produce and market CDs. Record companies are occasionally involved in promoting concert tours, but they typically play only a peripheral role in concerts, when they are involved at all.

If a band composed its own music, it will also contract with a publisher to copyright the music. The publisher will contract with a performing rights organization, which licenses the music for radio stations, television and other users, monitors the use of the music, and collects royalties. The publisher usually takes half the royalties, and the composer receives the other half (some of which goes to the manager). The performing rights organizations also coordinate with performing rights organizations in other

countries to collect and distribute fees for music played abroad. (See Section 8.) Costs are not deducted from the publishing royalties the band receives.

As is clear from Table 1.1, bands receive relatively little of their income from recording companies. Indeed, only the very top bands are likely to receive any income other than the advance they receive from the company, because expenses – and there are many – are charged against the band's advance before royalties are paid out. In 2003 the total value of recording sales (including CDs, singles, LPs, etc.) in the U.S. was $11.8 billion according to IFPI (2004), while the total value of concert ticket sales was $2.1 billion according to our tabulations. Thus, from the consumers' perspective, recordings are a much larger market, but from the artists' perspective, concerts represent a much more important income source. This point was made by Scott Welch, manager of Alanis Morissette and LeAnn Rimes: "The top 10% of artists make money selling records, the rest go on tour."[1]

2.1 Contracts

Contractual arrangements between bands, promoters and record labels are heterogeneous, but the typical contract resembles a book contract, with an initial advance and then royalties if sales exceed a certain level. The typical contract between a band and a concert promoter is most easily illustrated with a hypothetical example. Consider an agreement covering a single concert.[2] The band receives a "guaranteed advance" – e.g., equal to the first $100,000 of ticket sales, and then, before additional revenue is distributed, the promoter recovers his expenses and a "guaranteed profit" – say $50,000 for expenses and $22,500 for profit. The expenses could include advertising, rent for the

[1] Quoted in Kafka and Powers (2003).
[2] It is interesting to note that as promoters have become more consolidated, more bands have signed nationwide tours with a single promoter.

venue, costs of unloading the equipment, etc. The band also has expenses (e.g., travel), which it pays for out of its income. The promoter and the band split any ticket revenue above the guarantee plus expenses and minimum profit (above $172,500 in this case), usually with the band receiving 85 percent and the promoter receiving 15 percent of these revenues.[3] The band's guaranteed advance and percent of revenue after expenses is higher for bands with greater bargaining power.

In its negotiation with the promoter, the band (or its manager on the band's behalf) agrees to the concert price, which naturally affects the amount of revenue collected. In addition, the band usually receives 100 percent of merchandise sales (e.g., T-shirts) that take place at the concert.[4] The venue usually receives the beer and parking revenue. An interesting economic question is why the contracts for concerts take this form. Because the parties receive revenue from the sources for which they are most responsible – the band and promoter from ticket sales, the band from merchandise sales, and the venue for parking and food – it is possible that this division of revenue streams provides optimal incentives for efficient provision.

Promoters contract with a ticket distributor to distribute tickets. Tickets may also be distributed directly by the venue box office and by the band to its fan club. By far the largest ticket distributor is Ticketmaster. Ticketmaster also has exclusive arrangements to distribute tickets for some venues. Ticketmaster fees are usually around 10 percent of the list price. Unknown to the consumer, in some cases the venue, promoter or performers receive a portion of this fee, depending on their contract.

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[3] These hypothetical figures were used by the head of a major management firm to illustrate a "typical" contract.

[4] In some cases, the band will be required to give a proportion (e.g., 30 percent) of the merchandise sales to the venue for the right to sell there, however.

Record companies tend to sign long-term agreements with bands that specify an advance on royalties and a royalty rate. The typical new band has very little negotiating power with record labels, and the advance rarely covers the recording and promotion costs, which are usually charged to the band. Because fixed recording costs vary little with band quality, only the most popular artists earn substantial revenue from record sales.

In the following passage from his book, *So You Wanna Be a Rock & Roll Star,* Jacob Slichter (2004), the drummer for *Semisonic* (and grandson of former AEA President Sumner Slichter), describes a typical recording contract:

> Thus, armed with an attorney and a manager, we began our negotiations with Electra. Dan [the lead singer] would relay the developments of those negotiations after our evening rehearsals, when we went out for drinks. I leaned back in my chair, sipped merlot, and listened as Dan and John tutored me in the basics of record contracts.
>
> Elektra would lend us money, called an *advance*, so we could pay for the recording costs of making an album. As I already knew, those costs would be high – studio rental could run $2,000 per day and recording could take months. Producers' and engineers' fees might add another $100,000, not to mention mastering, flights, hotels, rental cars – we could easily spend $250,000. If there were anything left over, we'd get to keep it, but it wouldn't amount to much.
>
> In return, we would grant Elektra the exclusive rights to our recordings. As money from the sales of records came in, we would be allotted a percentage of the proceeds, known as *points*. In a typical deal, the band gets thirteen or fourteen percentage points. We'd have to give a few of our own points (four perhaps) to the producer of our record (producers typically get a fee *and* points). Then we'd be down to ten points. Before calculating the value of those ten points, however, Electra would subtract a large percentage of the gross sales to account for *free goods*, records given away for promotional and other purposes. Thus, the amount on which our 10 percent was calculated would be reduced by 20 to 25 percent. So we'd be down even further, perhaps 10 percent on 75 percent of the wholesale album revenue. If our CD was sold in stores for fifteen dollars, the band's share of the revenue might be something between fifty cents and a dollar per CD. Would we get to keep it? No! Elektra would add up all of the expenses of

> recording and promoting our album – rock videos, radio promotion, touring costs, and so on. The total of those costs, which could run into the millions, would be our *recoupable debt* to the record company. Our share of each CD sold would be swallowed up by that debt. …. When it came time to record and release future albums, any unpaid debt from our past albums would carry forward. In fact, even if we sold millions of records (in which case the size of our share would increase), we might never recoup. As one friend of mine joked, we'd be rock-and-roll sharecroppers. (pp. 34-36)

Caves (2000) analyzes the contractual arrangements in the music industry in terms of the efficient division of risk, incentives and rewards. He emphasizes that reputation and the prospect of repeated contracts are essential for contract enforcement. Eliot (1993) provides many colorful examples of malfeasance in music contracts. For example, the Beatles accused Capitol Records of failing to pay royalties on 19 million albums and singles. An audit revealed more than 20 separate areas where Capitol/EMI had "wrongfully accounted" for costs or revenue concerning promotion, manufacture and sales, resulting in $19 million of unpaid royalties due the Beatles from 1969-1979. Caves prosaically notes that, "From the artist's viewpoint, a problem of moral hazard arises because the label keeps the books that determine the earnings remitted to the artist."

An analogous problem arises with live concerts. The following remark by Sharon Osbourne (2002; p. 56) underscores the difficulty of contract enforcement in the concert industry: "My husband's whole career, people stole from him. They walk off with thousands of dollars that's yours. So the only way, unfortunately, for me is to get nasty and to get violent." She described the following disagreement with John Scher, a legendary New York promoter, who claimed advertising expenses for ads placed long after a concert had sold out: "[H]e would not give in, and he was threatening that 'Ozzy will never work in the New York area again.' All this crap. So I got up and nutted him

with my head, and then I kicked him in the …." Caves notes that contract enforcement in this industry relies heavily on repeated transactions among parties who value their reputations. The Osbourne method is apparently another contract enforcement mechanism.

3. Some theoretical issues regarding concert pricing

Here we consider some of the main theoretical issues in concert ticket pricing, the main source of performers' incomes. As an economic good, concerts are distinguished by five important characteristics: (1) although not as extreme as movies or records, from a production standpoint concerts have high fixed costs and low marginal costs; (2) concerts are an *experience good*, whose quality is only known after it is consumed; (3) the value of a concert ticket is zero after the concert is performed; (4) concert seats vary in quality; (5) bands sell complementary products, such as merchandise and records.

Rosen and Rosenfield (1997) provide a thorough treatment of ticket pricing, devoting particular attention to price discrimination, the practice of charging different prices to different customers.[5] Price discrimination tends to occur when marginal costs are below average costs. Because fixed costs for a concert are high relative to variable costs, and because high- and low-elasticity demanders can be sorted by seat location, price discrimination is possible. Furthermore, bands are likely to have monopoly power, deriving from the fact that they produce differentiated products and have loyal fans.

Rosen and Rosenfield consider a case where there are two types of seats, high quality and low quality. Buyers prefer high quality to low quality. The seller chooses the total number of seats and the quantity of each class of seat, and a pricing policy for

[5] Also see Courty (2000) for a thoughtful summary of theoretical issues in ticket pricing.

complementary goods, such as merchandise. Buyers have reserve prices for high- and low-quality seats, conditional on the seat quality and prices of complementary goods. The seller knows the distribution of reserve prices, but cannot identify customers with high and low reservation prices; ticket quality is used to sort buyers. Rosen and Rosenfield show that the seller would solve the pricing problem in two steps: "First, given the quantities and quality of the two classes of seats and the price of complements, the seller chooses ticket prices to maximize revenue.… Second, given the optimum pricing policy, the seller decides on the quantity and quality of seats and on the price of complements."

The price of a concert ticket is set lower than it would be in the absence of complementary goods, because a larger audience increases sales of complements and raises revenue.

One puzzle in actual pricing is that price discrimination is surprisingly rare, as we will see in the next section. Another puzzle is that pricing results in excess demand for many concert performances, which leads to scalping; scalping is addressed in Section 5.

4. Concert Industry Trends

This section, which draws heavily from Krueger (2005), makes extensive use of *Pollstar*'s Box Office Report database to describe developments in the concert industry from 1981 to 2003. *Pollstar* is the trade magazine of the concert industry, and a widely recognized authority on concerts. Since 1981, the magazine has collected and published data on concert revenue, venue capacity, ticket sales and prices. The data are provided by venue managers, who have an incentive to report their data because *Pollstar* disseminates

it to potential clients. Managers report data on a wide range of musical concerts, and occasionally on other entertainment events, such as comedians, professional wrestling matches and traveling Broadway shows. The data are most complete for concerts, and we tried to exclude the non-concerts from the sample. Before restrictions, the database contains 260,081 box office reports. After eliminating non-concerts, benefit concerts (which we think of as charity events), and events that occurred outside the United States, the sample contains 232,911 reports, representing 270,679 separate performances.

Reporting of concerts to *Pollstar* increased substantially in the 1980s, so one potential problem is that the dataset may not be representative of the entire concert industry in all years. Major acts are more likely to be included in the dataset throughout. As a partial adjustment for changes in sample composition, in some of the analysis we restrict the sample to artists listed in *The Rolling Stone Encyclopedia of Rock & Roll*, hereafter called *Encyclopedia* bands.[6] This *Encyclopedia* contains information on 1,786 artists, and 1,275 of these artists performed at least one concert represented in the *Pollstar* database. The edition of the *Encyclopedia* we use was published in October 2001; two earlier editions were published in 1984 and 1995. Thus, the *Encyclopedia* contains something of a moving average of the leading bands in the period under study, which produces more of a consistent sample. Bands listed in the *Encyclopedia* are responsible for 75 percent of the dollar value of ticket sales in the *Pollstar* data from 1981 to 2003.

Two other limitations of the data should be noted. First, the ticket price and revenue pertain to the list price. Any service fees charged by the ticket distributor are excluded. Because service fees have been growing rapidly in recent years, this omission

[6] George-Warren et al. (2001)

probably serves to understate the acceleration in ticket prices in recent years. Second, we do not have information on the secondary market, and it might be common for tickets to be resold in a scalper market. Nevertheless, the list price, not the resale price, is relevant from the standpoint of artists and promoters, as their ticket revenue is derived from tickets sold at the list price. Moreover, fragmentary evidence summarized in Section 5 suggests that scalping is a less common phenomenon than widely believed.

4.1 Trends in Prices

Figure 4.1 displays the average price of a concert ticket (total revenue divided by total tickets sold each year) for all concerts from 1981 to 2003, and the (ticket-weighted) average high and low price of a concert ticket. The figure also shows what the average price would have been had it grown in lockstep with the CPI-U. From 1981 to 1996, concert prices grew slightly faster than inflation: concert prices grew a compound 4.6 percent per year while overall consumer prices grew 3.7 percent per year. From 1996 to 2003, concert prices grew much faster than inflation: 8.9 percent a year versus 2.3 percent a year. And if the sample of concerts is limited to those performed by bands listed in the *Encyclopedia of Rock & Roll* in an attempt to hold constant changes in composition and quality, the acceleration in concert prices after 1996 is slightly greater: 11.1 percent a year growth from 1996 to 2003 versus 4.9 percent a year in the 1981-96 period.

The cost of the highest priced ticket in the house has grown even faster than the average ticket (see the top dashed line in Figure 4.1). Weighted by total ticket sales, the average high price ticket grew by 10.7 percent per annum from 1996 to 2003, while the average of the lowest price ticket grew by 6.7 percent a year. Thus, price dispersion

increased across seats for the same concert. (The rise in income dispersion among consumers may partially account for the rise in price differentiation; unfortunately, data on consumers is unavailable.) Nonetheless, in 43 percent of concerts in 2003, *all* seats in the house were priced the same, suggesting less price discrimination than might be expected from Rosen and Rosenfield (1997).[7] Even in venues with more than 25,000 seats, 26 percent of shows charged just one price for all seats in 2003. The amount of price differentiation has grown over time, however: in the 1980s, 73 percent of concerts with more than 25,000 seats charged just one price for all seats.

Instead of overall consumer price inflation rate, probably a more appropriate comparison for concerts is the price of other live entertainment events. Figure 4.2 reproduces Krueger's (2005) comparison of concert prices to the CPI-U sub-index for movies, sporting events and theater.[8] To make the data as comparable to the CPI as possible, a Laspeyres price index for concerts using the *venue* as the unit of observation was computed. It is clear that price growth for entertainment events exceeded overall price inflation throughout the period. Concert price growth tracked price growth for movies, theatre and sporting events remarkably well from 1981 to 1996, but beginning in 1997 the two series diverged. From 1997 to 2003, the concert Lasypeyres index rose 64 percent, whereas the CPI for other entertainment events increased 32 percent.

4.1.1 More on Price Indices

[7] Larger concerts are more likely to vary prices. A quarter of all tickets in 2003 were for shows that had just one price, as compared to 43 percent of concerts.

[8] To be precise, the BLS produces a CPI for movies, sporting events, theater *and* concerts. A separate sub-index covering just movies, sporting events and theater is not available from BLS, so Krueger adjusted the index as follows. In November and December 2001, concerts accounted for 8.4 percent of price quotes for this sub-index (email correspondence from Patrick Jackman, Feb. 7, 2002). Consequently, Krueger netted out the concert component using his Laspeyres estimate of the concert CPI.

Recall that the Laspeyres price index is defined as $L = \Sigma p_1Q_0 / \Sigma p_0Q_0$ and the Paasche index is defined as $P = \Sigma p_1Q_1 / \Sigma p_0Q_1$, where p is the price and Q is the quantity, and the subscript refers to either the base period (0) or the follow-up period (1). Intuitively, the Laspeyres index gives the proportionate increase in money needed to buy the exact same bundle of goods in the follow-up period as was purchased in the base period, and the Paasche index gives the proportionate difference in money if the bundle purchased in the follow-up period had been purchased in the base period at the base period prices. If tastes are constant – a strong assumption for musical entertainment – and other assumptions are met, the Laspeyres Index is expected to overstate the cost of living, and the Paasche Index is expected to understate it. The Fisher Ideal index, which approximates a true cost of living index, is the geometric mean of these two indices: $F = (LP)^{1/2}$.

Left unstated in these formulas is the unit of observation. When the CPI is computed, the sum is taken over products within stores. For entertainment events, the venue is the unit of observation in the CPI. In essence, the BLS interviewers go to a venue and ask for the price this month, and compare it to last month's price, *regardless of what the performance is.* This could obviously create a good deal of noise in the price data, as the product being compared is not exactly the same. For example, in April 2004, Beyoncé, Alicia Keys, Missy Eliott and Tamia performed a concert at Madison Square Garden for an average price of $81, and in May 2004, Yes performed there for an average price of $61. The within-venue price index would record this as a decline in price, while it might more appropriately be viewed as a decline in quality. (As further support for this view, we note that Beyoncé, et al. sold out, while Yes only sold 79 percent of the seats.)

An alternative to using the venue as the unit of observation is to use the performer as the unit of observation; that is, to follow the same movie or concert over time in different venues. Krueger (2005) computed a Fisher Ideal price index using the headline *band* as the unit of observation in an effort to hold composition constant. The artist was selected to more directly control for composition effects, although there are clearly problems with this approach as well: the venue could be larger or smaller, or in a more remote location, so the experience is different from concert to concert.

Thus, concerts by different performers in the same venue over time, or concerts by the same band in different venues over time are not the same products. It is therefore worthwhile to consider the impact of measurement error in prices on the various price indices. Suppose the baseline price is measured correctly, and the second period price is a noisy measure of the price of the same performance in the baseline. The simplest case is classical measurement error. Let $p_1' = p_1 + e$, where p_1' is the observed price, p_1 is the correct price (i.e., price for the same quality of performance), and e is a white noise, mean-zero measurement error. In this scenario, the Laspeyres and Paasche indices are still unbiased estimators, but the Fisher Ideal index will overstate the true rate of price inflation in the limit. The probability limit of the square of the Fisher Ideal index with the noisy price data in the second period (F') is:

$$(4.1) \quad p\lim[F'^2] = p\lim\left[\frac{\sum P_1' Q_0}{\sum P_o Q_0} \bullet \frac{\sum P_1' Q_1}{\sum P_o Q_1}\right] = F^2 + \frac{\sigma^2 \sum Q_0 Q_1}{\sum P_o Q_0 \sum P_o Q_1}$$

where σ^2 is the (assumed constant) variance of e. Because the last term is positive, in expectation the Fisher index will overstate the value of the index if prices were measured without error. Intuitively, the reason the index is biased upward is because the error in

follow-up period prices appears in the numerator of both the Laspeyres and Paasche indices.

If the error in prices were in the first period, the asymptotic bias would be in the opposite direction, because the variance of the errors would appear in the denominator. It seems more natural, however, to think of the first period concerts as defining the quality standard.

Table 4.1 explores the effect of the unit of observation on the various price indices for the *Pollstar* concert data. The first three columns report the Laspeyres, Paasche and Fisher ideal indices, respectively, using the headline artist as the unit of observation. The next set of three columns report the same indices using the venue as the unit of observation. The seventh column reports the CPI for movies, sporting events and theater, based on BLS data, which also uses the venue as the unit of observation. The weights used to compute the price indices for the concert data are updated each year, which is more frequent than the CPI.

Looking at Table 4.1, it is immediately clear that the price growth is much greater if the artist is used as the unit of observation instead of the venue, especially for the Laspeyres index. This is probably a result of sample selection: only artists who perform in adjacent years can be used in the analysis if the artist is the unit of observation. These artists may not be representative of all artists, and their prices appear to be growing very rapidly, especially when base period quantities are used as weights. It is also interesting to note that when the venue is used as the unit of observation, the growth in the Paasche index exceeds that of the Laspeyres index in two of the three subperiods.

A final issue about price indices worth mentioning involves rationing. The price indices, which already have well known deficiencies as measures of the cost of living (see Moulton, 1996), are even more problematic if there is rationing. If a concert is sold out, there is likely some degree of rationing. In 2003, a third of tickets sold were to concerts that were sold out, down from 55 percent in the 1980s. These figures may overstate the amount of rationing, however, if artists perform multiple shows in the same city, and tickets are available for some shows.

4.2 Shows, Sales and Revenues

Figures 4.3a, 4.3b and 4.3c, taken from Krueger (2005), summarize trends in the number of shows performed, tickets sold, and revenue collected from 1981 to 2003. The figures restrict the sample to artists in the *Rolling Stone Encyclopedia* because coverage in the *Pollstar* database should be more consistent for these artists.[9]

Several trends are noteworthy. First, the number of shows performed rose in the 1980s, plateaued in the first half of the 1990s, and has declined by 16 percent from 1996 to 2003.

Second, the number of concert tickets sold by these bands fluctuated around 30 million per year from the late 1980s until 2000, and has dropped since 2000. In 2003, 22 million tickets were sold to concerts performed by these bands. The drop in ticket sales is also consistent with a Gallup poll, which found that the percentage of teenagers who said they attended a rock concert fell from 40 percent in 1976 to 31 percent in 2000. (By contrast, the percent of teens who said they attended a pro sports event rose from 43 percent to 63 percent over this period.)

[9] The trend in capacity utilization for the full universe is similar to that for the *Encyclopedia* bands, but the number of shows and tickets sold has trended upwards if the larger sample is used.

Third, despite flat or declining tickets sales, total revenues (in 2003 dollars) trended upwards until 2000 because of price increases. Other things equal, these trends suggest the elasticity of demand was less than 1 before 2000. Since 2000, however, there has been a 10 percent drop in ticket revenue for these artists, suggesting that prices increases have been offset by a larger than proportional demand response.

Another trend worth noting is that the capacity utilization rate, or the fraction of available seats that are sold, has fallen over the last two decades. The fraction of tickets sold fell from around 90 percent in the late 1980s to just over 75 percent in 2003. Interestingly, the drop in the capacity utilization rate was much steeper for concerts held in larger venues.

One possible interpretation of these trends is that these artists are becoming less popular. But this view is hard to reconcile with the sharp increase in ticket prices for *Encyclopedia* bands. Instead, it seems that price growth is causing a movement up the demand curve for tickets.

4.3 Distribution of Revenues

As was documented, concert revenues increased in the 1980s and 1990s. Figure 4.4 displays the share of ticket revenue going to the top 1% and top 5% of all performers, ranked by their total annual concert revenue. Bear in mind that these are ticket revenues, and not income, but they still indicate how the fan dollars are allocated across the distribution of acts.

The figure indicates that concert revenues became markedly more skewed in the 1980s and 1990s. In 1982, the top 1% of artists took in 26% of concert revenue; in 2003 that figure was 56%. By contrast, the top 1% of income tax filers in the U.S. garnered

"just"14.6% of adjusted gross income in 1998 (see Piketty and Saez, 2003). The top 5% of revenue generators took in 62% of concert revenue in 1982 and 84% in 2003. Surely, this is a market where superstars receive the lion's share of the income. We return to the issue of superstar effects in section 7.

To further investigate the distribution of concert revenues, we followed De Vany's (2004) chapter on movies in this *Handbook* and De Vany and Walls (2004), and fit a Pareto distribution to the revenue data. As is well known, a Pareto distribution is characterized by thick tails (on one or both sides), and thus provides a good fit for income distributions. The Pareto distribution is part of a more general class of stable distributions, $S(\alpha,\beta,\gamma,\delta)$, of which the Gaussian is also a special case. The parameter of interest here is α, the tail weight, with $0 < \alpha \leq 2$. A tail weight of 2 implies a normal distribution. As α approaches 0, greater weight is placed in the tail of the distribution. To estimate α, we used a simple regression method.[10] We first assigned ranks to each artist's 2003 revenues, with rank 1 indicating the highest revenue, rank 2 the second highest, and so on. Then we regressed log revenue on the log of the ranks as follows:

(4.2) $\text{Log(Revenue)} = a - b\,\text{Log(Rank)}$,

where the inverse of b is an estimate of α. Note that in the class of stable distributions, the variance is infinite when α is less than 2, and when α is less than 1 the mean does not necessarily exist either.

We used this method to estimate α for the distribution of artists' concert revenues, as well as for promoters' revenues, in 2003. We find a coefficient α of 0.45 for artists' revenues, and 0.55 for promoters' revenues. In comparison, De Vany (2004) and De Vany and Walls (2004) estimate α to be in the range 1.3 to 1.7 for motion picture box

[10] See De Vany (2004).

office revenues. This suggests that the concert performers' revenues are not only very far from being Gaussian, but they are also more skewed than movie revenues. Probably a more appropriate point of comparison for artists' revenues is actors' lifetime cumulative movie grosses, however, for which De Vany estimates an α of 0.4 – very close to what we find for artists' revenues in 2003. Thus, the movie stars' lifetime revenues are positively skewed to about the same degree as concert performers' annual revenues.

Despite the infinite expected variance of revenues in the parametric distribution, in the finite sample of data we have the distribution of artists' revenues is fairly stable from year to year, with a correlation of 0.75 between revenues in 2002 and 2003. Promoters' revenues are even more stable, with a correlation of 0.98 between 2002 and 2003.

4.4. Explanations: Baumol and Bowen's disease; Cartelization; Bowie Theory

Krueger (2005) examines several explanations for the coincidence of declining ticket sales and rising prices, which he notes is consistent with the market becoming more monopolized over time, and inconsistent with a downward shift in demand. We consider these in turn.

In some respects, popular music concerts are a slow productivity growth sector: it takes just as long and about as many people to perform a concert today as it did 20 years ago. As Baumol and Bowen (1966) point out, prices should rise faster than overall inflation in low-productivity growth sectors because of cost increases. Baumol and Bowen's disease may well account for the mildly faster price growth in live entertainment events than overall price inflation in the pre-1996 period. Yet it is unlikely that there was a discrete jump in costs in the concert industry compared to other

industries – let alone other entertainment industries – after 1996. Indeed, reductions in the costs of audiovisual electronics equipment probably reduced the cost of concerts. Nevertheless, some concert promoters do point to an increase in production costs (e.g., pyrotechnics) and insurance costs as a rationale for the acceleration in prices.

Another popular explanation for the acceleration in concert prices is that the concert industry has become monopolized by Clear Channel Communications, the giant multimedia conglomerate. On the surface, there is an air of plausibility to this story. After the Telecommunications Act of 1996 relaxed constraints on radio station ownership, Clear Channel acquired nearly 1,200 stations. It also owns amphitheaters, billboards and TV stations. Clear Channel entered the concert promotion business in a major way by acquiring SFX Entertainment in 2000. As shown in Figure 4.5, the share of concert revenue that Clear Channel promotes rose dramatically from 1999 to 2001 and then fell sharply in 2002 and 2003. Despite the recent dip, concentration in the industry is still high at the national level.

Many critics have accused Clear Channel of using its vertical and horizontal concentration to monopolize the concert industry. Although anecdotal evidence abounds, and some court cases have charged Clear Channel with anticompetitive practices, Krueger finds little evidence linking Clear Channel to the sharp growth in concert prices.

First, he finds that Clear Channel's share of listeners in the radio market in a city was unrelated to the share of ticket revenue for concerts promoted by Clear Channel in those markets in 2000 and 2001. Additionally, at either the city or state level, Clear Channel's share of concert promotion dollars was insignificantly or negatively related to the growth in prices. It is possible that Clear Channel uses its muscle to sign up concerts

for national or international tours, obscuring the city- and state-level correlations, but it is surprising that the company does not exercise its monopoly position at a regional level as well.

Another fact that casts doubt on Clear Channel's role is that ticket prices have also risen sharply in Canada and Europe since the mid-1990's. Although, to some extent, prices are arbitraged between countries because bands play across national borders, it is unlikely that deregulation of radio in the United States and the rise of Clear Channel can account for concert price growth worldwide.

Perhaps the most important strand of evidence against the concentration argument is that concert promotion has always been a highly concentrated business on a regional level. In the 24 largest cities, the four-firm concentration ratio within cities has hovered around 90%, on average, for the last two decades. The average within-city Herfindahl-Hirschman Index (HHI) for promoters actually fell from a lofty 4,200 in 1986 to a still high but less lofty value of 2,800 in 2001. (An industry with an HHI above 1,800 is considered highly concentrated according to the Justice Department Merger Guidelines.) Thus, the concert industry has gone from having regional monopolies to having a large national firm, but within cities competition could quite possibly have increased.

Krueger's final hypothesis is that concert prices have accelerated because recording artists have seen a large decline in their income from record sales, a complementary product to concerts. Record sales slumped from 1999 to 2002, and were flat for 5 years before then, putting downward pressure on artists' royalties (see Weinraub, 2002). As discussed in Section 9, it is quite possible that record sales are

down because many potential customers frequently download music free from the Web or copy CD's, either legally or illegally.

Formally, the problem is one of a firm with two complementary outputs, concert seats and record albums, denoted good 1 and good 2, and monopoly power in both markets (see Tirole, 1988 or Rosen and Rosenfield, 1997). The demand curves for the band's products are denoted $D_1(p_1,p_2)$ and $D_2(p_1,p_2)$, each of which depends on both prices. Costs are independent of each other and depend only on the quantity of the specific good produced, $C_1(D_1)$ and $C_2(D_2)$. A profit maximizing band will set the proportionate markup of concert tickets over marginal cost so that:

$$(4.3) \qquad \frac{p_1 - C_1^{'}}{p_1} = \frac{1}{\varepsilon_{11}} + \frac{(p_2 - C_2^{'})D_2\varepsilon_{12}}{p_1 D_1 \varepsilon_{11}}$$

where the ε_{ij}'s represent the value of the own- or cross-price elasticities of demand. Bands will keep the price of concerts below the single-market monopoly price if greater attendance raises record royalties, but if this is no longer the case because of file sharing or CD copying, the price of concerts will rise.

To some extent, this model was anticipated by the rock and roll singer David Bowie, who predicted that, "Music itself is going to become like running water or electricity" and he advised performers, "You'd better be prepared for doing a lot of touring because that's really the only unique situation that's going to be left." (Quoted from Pareles, 2002.) Hence the name *Bowie Theory*.

As support, Krueger (2005) notes that relative to album sales, jazz fans are much less likely to download music from the Web than are fans of rock and pop, and that from 1996 to 2003 concert prices increased by only 20 percent for jazz musicians, but by 99

percent for rock and pop performers.[11] The declining complementarities argument can also account for the price growth in Canada and Europe. Section 9 provides a detailed review of the direct evidence on the effect of file sharing on record sales, and concludes that the evidence is mixed. Thus, the reason for the sharp acceleration in concert prices remains something of an open question.

5. Ticket Distribution and Scalping

As was mentioned, promoters and venues utilize a variety of options for ticket distribution, including the box office, Ticketmaster, and direct sales to fan clubs. Tickets are almost always initially distributed at a fixed price, as opposed to a floating price determined by an auction or other mechanism. Ticketmaster and other distributors have recently begun experimenting with using auctions to sell tickets, however. We suspect that ticket auctions will be more prevalent in the future, and a worthy topic for research.

About a third of popular music concerts currently sell out. Tickets for the hottest concerts are often sold on a secondary market, through unregistered scalpers, over the web (e.g., eBay), or through ticket brokers (who can also be online). These distribution channels are often lumped together and viewed as a *scalper or secondary market*. Persistent pricing of tickets at a level that permits scalping is a puzzle for neoclassical economic models of concerts. Why don't performers or promoters raise the price of

[11] Oberholzer and Strumpf (2004) note that jazz is the genre least downloaded on the internet, but do not provide a reason. Perhaps it is that MP3 files are of lower quality than CDs, and that jazz enthusiasts value quality more than others.

tickets and capture some of the revenue from the secondary market for themselves?[12] Below we consider theoretical issues and available evidence on scalping.

5.1 Scalping: Theoretical Issues

Various theories have been proposed for why a firm – restaurant, ski lift, or rock band – may price their services below the market level. None of them is entirely satisfactory. Becker (1991) presents a model in which eating at a popular restaurant (or going to a concert) is a social event, so customers' demands are positively related. The bigger the audience, the more enjoyable the experience. Concert promoters and fans often do treat concerts like social events, lending some credence to this view. As Courty (2000) points out, however, although Becker's model "explains why a firm may not raise prices in the short run when capacity is fixed, it does not shed much light on the long run outcome that firms typically do not raise capacity to meet excess demand." Kahneman, et al. (1986) argue that customers value being treated fairly, and the market clearing price may be considered unfair. Fairness is likely to be a more important consideration if attendance at a concert is viewed as a social event rather than an economic transaction.

Courty (2003) makes the insightful point that customers for live entertainment events have time-dependent demands. He presents a model in which there are two types of consumers: die-hard fans who want to see a concert and secure a ticket in advance, and others who are not sure if they will be free during the concert. As time elapses, the uncertainty is resolved for the latter group. The late-demanders have higher valuations of the event than the die-hard fans in his model. He further assumes that promoters cannot

[12] As an aside, we note that Warren Buffett recently came to this realization. Tickets for the annual meeting of Berkshire Hathaway were given to shareholders, and then often resold. Apparently, Mr. Buffett was distressed by this practice, and began selling tickets for $5 a pair on eBay in 2004 to capture the secondary market.

compete with ticket brokers or scalpers, and that die-hard fans outnumber the late deciders. With these assumptions, in equilibrium ticket brokers will buy tickets early at face value and resell them for a profit. Although the model requires many ancillary assumptions to prevent promoters from taking over the secondary market, the observation that some customers learn about their demand over time is undoubtedly an important feature of the ticket market.

5.2 Evidence on Scalping

Because scalping is primarily an underground activity, little systematic empirical analysis has been done on secondary ticket markets. In an effort to make a small step toward closing that void, one of us (Krueger) conducted a survey of 858 fans at *Bruce Springsteen and the E Street Band's* concert at the First Union Center in Philadelphia on October 6, 2002, with the help of 12 Princeton students.[13] As was common in the past, every ticket in the house was originally sold for a single price, $75 (plus service charge if distributed by Ticketmaster). The concert was part of the group's "The Rising" tour, and it quickly sold out when tickets were put on sale. Thus, the concert would be expected to have a high scalping rate.

Several results of the survey are worth noting. First, only 20 to 25 percent of the tickets were bought through a scalper or ticket broker or over the Web. Many industry analysts had expected a higher reselling rate prior to the survey. Scalping at the stadium was quite rare; it was much more common for the secondary market to clear through purchases from licensed ticket brokers or the web. Second, the average ticket that was

[13] The survey of fans was conducted shortly before the concert began. A stratified random sample of rows and sections was drawn. Weights were computed to make the sample representative of the entire venue. The response rate for the survey was very high. Ticketmaster and the First Union Center arranged for us to have access to the venue before the start of the show.

resold went for around $280, yet most fans paid the list price. Third, tickets for the best seats were *less* likely to be resold than were seats in the upper deck, even though the consumer surplus was greater for the better seats. One interpretation of this finding is that serious fans queued for tickets (or applied to Ticketmaster early), and if they obtained a good seat they attended the concert and if they obtained a bad one they sold it. This finding, which was not anticipated, is consistent with how one would expect tickets to be allocated in a market: those who valued the best seats the most were the ones who sat in them. But one could argue that the distribution mechanism is inefficient (e.g., because of time wasted queuing and uncertainty), even if it mimics the market in terms of allocative efficiency.

Fourth, fans were asked when they purchased their tickets, in an effort to test Courty's model of scalping. The results yielded mixed support. On the one hand, tickets on the secondary market were purchased later than tickets sold by Ticketmaster or the box office, as expected. (Ninety percent of those who purchased their tickets from the box office or Ticketmaster bought their tickets more than a month before the concert, compared with 47 percent of those who bought from ticket brokers.) On the other hand, the price did *not* rise as the date of the concert approached, as Courty's model would seem to predict. Instead, prices on the secondary market fell as the day of the concert approached, consistent with the literature on the declining price anomaly in auctions (see Ashenfelter, 1989).

Fifth, the concert would have earned substantially more revenue if tickets were priced high enough to eliminate the secondary market. If the market price equaled $280, the average price of a ticket in the secondary market, then $4 million [= ($280-$75) x

19,738 tickets] of additional revenue could have been collected by Springsteen and his band. Given that the actual revenues collected were $1.5 million, this figure is staggering even if one allows for some error. The revenue foregone by the band in the secondary market alone was sizable, between $1.1 and $1.4 million, according to our estimates. These calculations suggest that, at least in the short run, performers sacrifice considerable income if they price their shows below the market rate.

An important cautionary note, however, is that these results pertain to just one concert, and it is unclear whether they generalize to concerts for other performers. The nature of the First Union Center, which is isolated alongside Intestate 95, may also have led to less on-the-street scalping than in other, more centrally located venues. But we would argue that replicating this type of survey in other concerts will yield valuable insights into secondary markets.

5.3 Scalping and Price Trends

An important question concerns the effect of the secondary market on the trends documented in Section 4. We have seen that the secondary market can be substantial, at least for some concerts. It is possible that the list price does not represent the price to consumers, because of widespread scalping. Perhaps the rise in ticket list prices has only cut out scalpers, and not affected the price to consumers.

Although we have no doubt that the secondary market is important in the popular music industry, the following three reasons lead us to doubt that a disconnect between the list price and price to consumers is responsible for the major trends documented in Section 4. First, the total number of tickets sold has declined. If concerts are no more expensive to consumers than before, then one would not expect to see attendance fall.

Second, the decline in the capacity utilization rate also suggests that customers are finding concerts more costly. Moreover, even in the early 1990s, most concerts did not sell out, so it would have been possible to avoid the higher priced secondary market. Third, Krueger (2005) found that prices surged in the late 1990s even when he limited the sample to concerts that sold fewer than 90 percent of their tickets, events where scalping would have been unnecessary.

6. Rankings

It is common in the arts for various parties to devise schemes for ranking artists. Music is no exception. For example, Billboard provides numerous "music charts" based on record album sales and radio airplay. Being ranked high on the charts is important to artists because future sales and recording contracts are related to their placement on the charts. Evidently, many consumers turn to rankings to decide which music to purchase or listen to, and radio stations rely on the charts to determine which music to play on the air. When information is costly to obtain, rankings can be very valuable to consumers, especially for goods that have social externalities (e.g., when you play music at a party, you would like your guests to enjoy the music).

Pollstar produces three sets of rankings of bands: one based on gross concert revenue; one based on the number of tickets sold; and one based on the number of hits seeking information about each band's schedule on its web page. Although useful, these methods have their limitations. An important limitation can be seen from Figure 6.1. Hypothetical demand schedules for three bands, denoted A, B, and C, are reported. As

drawn, the demand curves all have the same slope but different intercepts. Band C is the most popular: at any given price, it has the greatest ticket demand.

We can write the demand curves in Figure 6.1 as:

(6.1) $\text{Log } Q_i = a_i - \varepsilon \log P_i$

where Q is quantity of tickets sold, P is price, a_i is an indicator of band popularity, and ε is the elasticity of demand. The subscript i indicates the band. This constant elasticity demand curve is, of course, a simplification, but it illustrates a serious problem with current rankings, and provides an easily implemented solution. A more realistic model would also allow for the elasticity (ε_i) to vary across bands, but greatly increase the parameters needed for implementation.[14]

Now if the market clears, the band's concert supply curve also affects revenues and ticket sales. (We will discuss disequilibrium shortly.) Bands have different concert supply functions. Suppose band C hardly tours (e.g., Barbra Streisand) and band A tours a great deal (e.g., Dave Matthews). Band A could sell more tickets than band C and collect more revenue if it wanted. This framework highlights problems with *Pollstar's* methods for ranking bands. First, it is clear from equation 6.1 that as long as the band is on the demand curve, the quantity of tickets sold is not a good indicator of popularity because price varies. Second, total revenue would only be an appropriate measure of popularity in the unlikely event that the elasticity of demand equaled 1. Third, bands that tour frequently (or set prices lower) are likely to receive more hits from potential consumers on the web, but that reflects concert supply as well as popularity.

[14] Another addition to the model would be to allow for rival bands' prices to affect the demand for band i's concerts, and then take into account the effect of all other band's price on the choice of band i's price. We will leave this extension for IO economists.

A simple solution is to rank the bands according to $a_i = \text{Log } Q_i + \varepsilon \log P_i$. To implement this solution, one needs an estimate of ε. The first two columns of Table 6.1 provide rankings of the top 50 bands using ε=1 and ε=2.[15] The former corresponds to the *Pollstar* Top 100 Tour ranking, which is based on gross revenue.

If the market is in disequilibrium, the price and quantity may not be determined on the demand curve. In particular, if the band sets the ticket price below the market clearing level, the quantity of tickets demanded at the list price will exceed the quantity of tickets sold, and our method would not provide an accurate measure of a_i. We can still conceptualize notional demand curves in this situation, however. The challenge is to determine how much excess demand exists. As we saw in the previous section, at the Bruce Springsteen concert about 25 percent of tickets were purchased above the list price, suggesting that excess demand was at least 25 percent as large as the number of tickets sold. (An alternative method for estimating excess demand would be to use information on the number of willing -- or at least interested -- buyers who sought tickets from on-line sales venues after tickets were sold out.) A simple solution is to apply the 25 percent figure to all concerts that sell out. Accordingly, in columns 3 and 4 of Table 6.1, we inflated the quantity of tickets sold by 25 percent in all sold out concerts, and recomputed the rankings for ε=1 and ε=2.

For comparison, in column 5 we present the ranking based on revenue per show, which can be thought of as a crude indicator of the performers' wage rate. If demand for artists' performances were infinitely elastic, as in a competitive market, this would

[15] For simplicity, we have ignored price discrimination, and just used the average concert price as a measure of p_i.

provide a ranking of artists' potential income. And lastly in column 6 we report the ranking based on total tickets sold, which is one of *Pollstar's* criteria.

The results are sensitive to the type of ranking. Bruce Springsteen and the E Street Band, for instance, move from the top ranked artists by revenue in 2003 to second place when an elasticity of demand of 2 is used (or 3rd place if rationing is taken into account), to fifth place when revenue per show is used, and back to first place when the number of tickets is the basis of the ordering. Celine Dion is ranked second based on revenue and 14th based on tickets sold. The Rolling Stones move from 13th to 5th place when the elasticity is increased from 1 to 2. Overall, however, the rankings are fairly similar if popularity (a_i) is the criteria (the correlation between the ranks in column 3 and 4 is 0.91), and quite different if revenue per show or total tickets sold is the criterion (the correlation between columns 4 and 5 is 0.56).

We should emphasize that our framework misses many important features of the concert industry. Most importantly, we have made an *ad hoc* assumption about the elasticity of demand, and imposed the same elasticity for all bands. In addition, we have ignored advertising and promotion efforts, which are endogenous and undoubtedly influence ticket sales. A more complete approach would adjust for promotion efforts. Nevertheless, considering rankings in the framework of a simple supply and demand model highlights an often overlooked feature of existing rankings: popularity depends on both price and quantity. This simple insight applies to record sales as well as to concerts.

7. Superstar Effects

As we saw in section 4.3, the distribution of concert revenues is highly skewed, suggesting that the music industry is a superstar industry, where a small fraction of the performers earn a substantial share of the revenues. Sherwin Rosen (1981) was the first to provide a formal theoretical model to explain why "relatively small numbers of people earn enormous amounts of money and seem to dominate the fields in which they engage." Building on the intuition of Marshall (1947), Rosen models a market where demand is characterized by imperfect substitution among the sellers (here, the performers), and where "the costs of production (writing, performing, etc.) do not rise in proportion to the size of a seller's market." At the heart of the imperfect substitution of performers is the notion of quality, or talent, of a performer. As Rosen (1981) puts it, "Lesser talent often is a poor substitute for greater talent. The worse it is the larger the sustainable rent accruing to higher quality sellers because demand for the better sellers increases more than proportionately: hearing a succession of mediocre singers does not add up to a single outstanding performance." When combining the demand and supply as depicted above, Rosen ends up with a market equilibrium in which small differences in talent at the top of the distribution can account for large differences in revenue.

Borghans and Groot (1998) also address the issue of superstardom, arguing that a certain degree of monopolistic power of the artist generates higher revenues for superstars, on top of a difference in talent. They note that a stylized fact concerning superstars is that those whose talent is "suitable for media replication" earn much more than others. They argue that the availability of a mass media market gives the most talented artists an endogenous property right, derived from the fact that the public prefers to watch the best performances – consistent with the imperfect substitution assumption of

Rosen's model. Borghans and Groot conclude that, "Due to media production, only one person is needed to serve the whole market, where without this technology many producers are needed. Efficient allocation requires the most talented producer to be assigned to this task, but in practice the situation provides this person with an opportunity to exploit the number-one position."

Adler (2004), in his chapter in this *Handbook*, takes exception with Rosen's view of talent, and maintains that superstars do not exist because of differences in talent, but because of "the need of consumers to have a common culture." Because Adler's chapter thoroughly addresses this and related issues, we tread lightly on theoretical aspects of superstar models.

Empirical evidence and tests of the superstar model are not straightforward, because of the lack of reliable income data and, more importantly, because of the inherent difficulty of objectively measuring talent or quality in a meaningful metric apart from economic success. What is a small difference in talent? On what objective, cardinal metric is Celine Dion only slightly more talented than Rod Stewart? As Krueger (2005) notes, "An objective measure of star quality for popular musicians is hard to define and even harder to quantify." Measuring talent on a meaningful scale independently of economic success is an obstacle to testing the superstar model.

Hamlen (1991, 1994) looks at singers of popular music, and uses a measure of voice quality to assess the artist's quality. The measure, which is external and objective, is the harmonic content of a singer's voice sample. Hamlen then regresses the value of total record sales on harmonic content and a few observables for 107 singers, and finds an elasticity of 0.14. Since the Marshall-Rosen model would predict an elasticity above

unity, Hamlen concludes that his empirical findings do not support the superstar model. Krueger (2005) points out, however, that "it is unclear whether the scaling of units of quality is appropriate (a different scaling could produce an elasticity above 1) and consideration of other dimensions of star quality could possibly rescue the theory."

Krueger (2005) considers escalating superstar effects – perhaps due to the revolution in consumer electronics equipment which reduce the cost of copying and listening to music – as a possible explanation for the rising cost of concert tickets and increased concentration in concert revenue, which were documented in section 4. Specifically, he tests whether the increase in prices (or revenue per artist) could be linked to a stronger superstar effect over in the 1990s. He uses a novel measure of star quality: namely, the number of millimeters of print that are devoted to each artist in *The Rolling Stone Encyclopedia of Rock & Roll*.[16] This information is then merged with the *Pollstar* data on concert revenue and prices, and the following regression is estimated:

(7.1) $\ln Y_{it} = \alpha + \beta_t S_i + \boldsymbol{x}'_{it}\gamma + \delta_t + \varepsilon_{it}$,

where $\ln Y_{it}$ is the log average price (or log annual revenue or log revenue per show), S_i is the measure of Star Quality, $\boldsymbol{x}'_{it}$ is a vector of covariates (number of supporting acts, years of experience of the band, and dummies for genre, gender and foreign status), δ_t is a set of 22 unrestricted year fixed effects, and ε_{it} is an error term.

Notice that the coefficient on star quality, β, has a t subscript, indicating time period (1981-86, 1987-91, or 1997-2003). This allows the effect of star quality to vary across time periods. In the regressions, this is accomplished by interacting the amount of print with dummies indicating the four periods. The test of the rising-return-to-

[16] See Krueger (2005) for a more detailed explanation of the data and procedures.

superstardom hypothesis amounts to a test of whether there is a discrete jump in β_t after 1996.

Krueger finds that the return to superstardom has indeed increased over time, but that the timing does not coincide with the increase in ticket prices. He concludes that we must look at other factors to explain the rising prices.

Empirical testing of superstar models lags behind the development of new theoretical versions of the model. At least when it comes to music, and probably for many other branches of the arts, a major limitation of tests of superstar models is the absence of natural units with which to measure talent. Rosen postulates that "small differences in talent become magnified in larger earnings differences." But what is a "small" difference in quality of popular music performers? Surely there is an intrinsically subjective component to quality; some music appeals to a subset of listeners but not to others. Also, one might argue that talent should be measured within genres: otherwise, how is it possible to compare a jazz band to a heavy metal band? More empirical work could certainly be done on the superstar model, and perhaps the popular music industry could help shed light on some distributional and marginal return to labor issues in broader fields, but we are skeptical that current methods of measuring talent will shed much light on the superstar model.

8. The World of Radio Broadcasting

Ever since radio broadcasts started in the United States, England, and other countries in the early 1920s, the business of radio has been intertwined with that of music. As we will see, even if at first record companies and music publishers' profits

were threatened by the supply of "free" music on the radio, they quickly learned to promote their records and collect royalties from performing rights sold to radio broadcasters. Now, bands and composers also benefit from radio exposure. From a publicity standpoint, radio is an important part of record promotion. And from a royalties standpoint, composers can garner substantial returns if they have a hit song on the radio. Table 1.1 documents that artists receive substantial revenue from performing rights royalties.

8.1. Royalties from Performing Rights

Under Section 106 of the U.S. Copyright Act, a copyright on a musical work grants an exclusive right to reproduce, distribute copies, publicly perform, and create a derivative of the work in question. Thus, anyone who wants to legally play a copyrighted song on the radio, or press it on a compilation CD, must acquire a license to do so from the copyright owner. Artists generally transact with music publishing firms, which are often but not always affiliated with their record company, to collect their publishing income. Music publishers acquire administrative rights from the copyright owner, which entitle them to find users, issue licenses, collect money and pay the songwriter. The traditional split of publishing income is 50/50 between the publisher and the songwriter (see Passman, 2000; and Krasilovsky et al., 2003).

Various uses of a musical work are covered by different rights that must be purchased separately. Table 8.1 summarizes these rights.

The *reproduction right* is the exclusive right of a music copyright owner to authorize the mechanical reproduction of the work in a record, cassette or CD. The license granting such a right is called a *mechanical license*, and the fees charged for it are

the mechanical royalties, calculated at a certain rate per song and per unit manufactured and sold.[17] In the case of audiovisual productions, the license of reproduction rights is often referred to as a *synchronization license*, because the music is to be synchronized with the images.

The public performance right gives the copyright owner the exclusive right to authorize the use of the musical work in public. Radio and television broadcasts, as well as jukeboxes and music played in bars, restaurants and any type of public establishment, all fall under the public performance right. As such, broadcasters and establishment owners must acquire public performance licenses anytime they want to use copyrighted music. Because searching and bargaining with every single copyright owner and publisher would prove costly and infeasible, and because an individual owner of copyrighted music could not possibly survey all the radio stations to enforce his public performance right, all licenses are handled by performance rights organizations (PROs). PROs issue public performing licenses to broadcasters and establishment owners, monitor and survey radio and television broadcasts to determine the amount of airplay for each composition, and then remunerate the copyright owners.

Performing rights also cover cellular phone *ringtones*, which cell phone owners increasingly download from the internet. In 2003, ringtones were a $2.5 billion industry worldwide (Flynn, 2004)! PROs have struck deals with the ringtone providers, and now compensate composers for each ringtone downloaded. On their website, BMI, one of the American performing rights organizations, boasts of having deals with 175 ringtone

[17] Once a work has been made available to the public (after its first-use), a copyright owner is obligated to grant a mechanical license to anyone paying the statutory rate. For this reason, it is called a compulsory mechanical license.

providers reaching more than 90% of U.S. cell phone subscribers. BMI's payments are of 5¢ per ringtone, 2.5¢ each for the publisher and the composer.[18]

In the United States there are three performing rights organizations, typically known by the acronyms: ASCAP, BMI and SESAC. All offer blanket licenses, which grant the right to use all the songs in their respective catalogs.[19] Artists and composers can sign on with only one PRO. Radio stations can contract with multiple PROs. A radio station that wanted to play both Springsteen and Madonna, for example, would need to contract with both ASCAP and BMI.

Founded in 1914, the American Society of Composers, Authors, and Publishers (ASCAP) is the oldest of the performing rights organizations. It was the first organized effort to collect fees for public performances of music, which had been protected since the inception of the Copyright Act of 1897. In its first few years, ASCAP struggled to establish itself and persuade publishers to become members. Only in 1921 did it write its first royalty checks to publishers and composers. That is also the time when radio broadcasting began, suddenly creating a whole new market for ASCAP compositions. Broadcasters, however, were reticent to pay for the performing rights, arguing that once they had a copy of the record they were allowed to do whatever they pleased with it, including playing it on the radio. By 1932, the radio lobby had convinced seven states to outlaw ASCAP, on the basis of illegal racketeering practices and attempted extortion. Eliot (1993) relates: "In 1940, as many of the contracts ASCAP held were about to expire, the organization threatened to withdraw all member recordings if radio stations didn't agree to a broad-based, cohesive form of royalty payment. …. In retaliation, even

[18] See BMI's website at www.bmi.com/news/200406/20040616b.asp .
[19] See Passman (2000), Krasilovsky et al. (2003), and Besen et al. (1992), as well as www.ascap.com, www.bmi.com, and www.sesac.com for more on the different American PROs.

as the FCC was threatening to outlaw the paying of records on the air, which ASCAP felt was largely the result of the broadcast lobby, station owners decided to start their own organization, to break what they claimed was ASCAP's monopolistic tactics."

Kleit (2000) notes that ASCAP's blanket license rate rose from 2% to 7.5% in the 1930s, parallel with the popularization of radio. Needless to say, the radio broadcasters were unhappy with the rising cost of the copyrighted music. To increase competition and to provide an alternative to writers and publishers not represented by ASCAP, the National Association of Broadcasters, together with NBC and CBS, created Broadcast Music Incorporated (BMI) in 1939.

ASCAP is now a not-for-profit entity owned by its members. The membership totals more than 180,000, including composers, songwriters, lyricists, and music publishers of every kind of music. Approximately 100,000 new songs are added to the catalog every year. The fees charged by ASCAP for its blanket license are not based on the amount of airplay its music gets, but on the station's or venue's gross revenues less certain adjustments. The current basic rate is just under 2% of the adjusted gross advertising revenue for radio stations. BMI is a non-profit company owned by broadcasters. It now represents approximately 300,000 songwriters, composers, and music publishers in all musical genres, and its website mentions a repertoire of about 4.5 million compositions. BMI's blanket license rate for radio stations is about 1.6% of adjusted gross advertising receipts.

The Society of European Stage Authors and Composers, or SESAC, is the smallest of the three American performing rights organizations, with a market share estimated at 3%. Market shares are not easily computable, but Krasilovsky et al. (2003)

report that a 1990 court proceeding concerning pay cable determined the current market shares at 54% for ASCAP, 43% for BMI and the remaining 3% for SESAC. SESAC is a for-profit private licensing company founded in 1930. It currently represents over 8,000 publishers and writers and has a repertoire of more than 200,000 compositions. SESAC specializes in country and Latin music, and operates differently from ASCAP and BMI. It has a somewhat more selective procedure to accept new writers in their catalog, but also it charges fees for blanket licenses based on fixed determinants, such as market population served by the radio station and the station's standard advertisement rates.

While law papers on the topic abound, few articles have been written about performing rights in the economic literature. Notable exceptions include Besen, Kirby and Salop's (1992) article on copyright collectives and Kleit's (2000) study of competition among PROs. Besen, Kirby and Salop present an economic model that attempts to explain why copyright collectives are formed, how they operate and how they may compete. They start with a model of an unregulated monopoly copyright collective, where the cost for each individual copyright owner to collect fees from the broadcasters is prohibitively high, justifying the formation of the copyright collective as a means of saving costs. A collective also gives the copyright owners the possibility of cooperative price setting, and thus of more market power vis-à-vis big broadcasters. Besen et al. look at both models where the collective has the ability to limit the membership, and where it lacks such ability. They analyze the competition between the collectives as well as the effect of different types of government regulation. No formal statistical tests of their models are presented, although their predictions accord with certain stylized facts. As

Johnson (1992) notes in a commentary, Besen et al. address the puzzle of the coexistence of ASCAP and BMI, but cannot test their suggested answer.

Interestingly, in most countries there is only one copyright collective. Besen et al. suggest three explanations for this fact: "First, government regulation may authorize only a single collective to administer a particular right. This is especially likely in countries like Austria, Germany, and Switzerland, where collectives must be licensed by the government. Second, government policies that mandate open entry and equal treatment of members may lead to a single collective. …. Third, efficient negotiation between the monopoly collective and user groups may eliminate any incentive for competitive entry." Why exactly did three organizations come to coexist in the U.S. is still something of a mystery. Besen et al. suggest that perhaps ASCAP miscalculated its hold on the market, and by requesting too high fees, it led excluded songwriters and broadcasters to form a collective of their own.

Kleit (2000) takes the blanket licenses offered by the PROs as a form of bundling, or block booking. He proposes a model of competition between PROs using blanket licenses, and shows that such licenses lead to higher profits for the PROs and higher costs for the users of the copyrighted music when there are a small number of competing licensing organizations.

8.2. Music Publishing in the U.S.

The United States is by far the largest market for music publishing. Table 8.2 gives a breakdown of revenues by source of income. In 2001, the performance-based revenues alone almost reached $1 billion, for a total publishing income of nearly $2 billion. That represents 29.3% of the world publishing income. By comparison,

Germany, the second biggest market, shows a total income of just over $800 million, for 12.2% of world income (see Table 8.4 below).

8.3. Foreign Markets

In the U.S., both ASCAP and BMI earn just above 20% of their revenue from foreign sources. Performing rights organizations have agreements with their affiliates in other countries to share revenues. They both collect revenues from abroad for their national members, as well as collect from users in the United States on behalf of foreign PROs. Table 8.3 lists the PROs in the U.S. and the other top ten markets in the world.

While figures on the flows of revenues from copyright licenses from country to country are hard to obtain, we can observe total revenues for each country. Table 8.4 shows the top ten countries and the breakdown of the publishing revenues.

Table 8.5 shows ASCAP's flows of revenues from foreign publishing companies. Overall, we can see that the balance is positive, meaning that the United States (or at least ASCAP) is a new exporter of musical talent to the rest of the world.

8.4. Payola

Payola is the practice of record companies giving cash or gifts to radio stations in exchange for airplay. Payola is interesting both for its history and from an economics standpoint because payola is an illegal economic transaction. Payola has been a federal criminal offense since 1960.[20] One may ask, What is wrong with payola? It could be argued that payola only creates a market for radio hits, a market in which the amount paid by the record company to the radio station becomes the price of a hit. It is akin to advertisement and promotion of a song by a record company. Indeed, if record

[20] It is legal for a record company to directly pay a radio station to broadcast a song as long as an announcement is made to the public. Undercover and undisclosed payments are illegal.

companies are willing to pay to promote their songs on the radio, it must be that radio promotion translates into higher record sales.[21]

So why has payola become illegal? Perhaps an analogy is instructive. Payola is analogous to a professor paying bribes to the editor of the *American Economic Review* to publish his paper. The professor would be willing to pay since a publication is good for career advancement, and eventually translates into higher future earnings. But AER readers expect the published articles to be the best and most relevant to the field, not the ones written by those with the deepest pockets or the most eager to get tenure. An essential function of a scientific journal is to screen papers. One could argue that an essential feature of a radio station is to screen records, especially since the right to broadcast on the radio waves is licensed by the government.

Payola has a colorful history. Payola is a contraction of the words "pay" and "Victrola", an early type of LP record player.[22] The first laws and court cases involving payola were in 1960, but payola had been around for much longer, and still persists today, albeit under a different name. Coase (1979) traces the history of payola, going as far back as 1867 in England. Of course, back then the payments were not made to radio stations, but to public performers, with a request to play a song from the publisher's catalog. The agents that involved in this business were referred to as song-pluggers, and it became commonplace for vaudeville singers to be compensated for adding certain songs to their repertoire. When radio came about, song-pluggers turned to big bands performing live on radio stations to plug their songs. And then, when records made their

[21] Liebowitz (2004a) points out that even though radio spins seem to increase sales of the particular record being spun, it does not mean that the recording industry as a whole benefits from radio broadcasting. Indeed, record sales fell in the first half of the 1920s after the popularization of the radio.
[22] See http://www.history-of-rock.com/payola.htm .

appearance on the air, radio stations and their employees were approached by record companies to play their songs.

Coase (1979) explains, "Payola took the form of cash payments (which might be on a regular weekly or monthly basis), royalties on the sales of records, a share in a record company, advertisements in the disc jockeys' hit sheets, the reimbursement of recording stars' fees for appearances on the disc jockeys' programs or at record hops which they organized, expensive gifts, and mortgage loans on disc jockeys' homes." Early on, payola was viewed as an impediment to competition. Many attempts were made to outlaw the practice, but these attempts only succeeded in pushing payola underground. The situation changed in 1959, when the president of the American Guild of Authors and Composers wrote a letter to the FCC (Federal Communications Commission) and the FTC (Federal Trade Commission) about payola and other deceptive practices, urging a congressional enquiry.[23] After a year of widely publicized hearings, the FCC amended the Communications Act of 1934 to make unannounced payments to deejays a criminal offense. Over twenty-five deejays and program directors were exposed in the scandal, but the top two deejays in the country, Dick Clark and Alan Freed, were the hardest hit.

Most of the pressure to outlaw payola came from ASCAP, which lost ground to BMI-licensed rock and roll records from small independent record labels during the 1950s. Coase (1979) points out that "during the period 1948 through 1955, 68% of the tunes which were number 1 on *Billboard's* top hits were controlled by ASCAP, and ASCAP's share was never less than 50% (in 1951). In 1956, its share was 23 %, in 1957

[23] This came at the end of a Congressional hearing on a television quiz show scandal, in which shows were exposed to be rigged and fixed in advance.

and 1958, 25% and in 1959, 31%. In the circumstances, it is hardly surprising to find that the suppliers of 'good music' [ASCAP-licensed music] came to the conclusion that something was wrong with the economic organization of the popular music industry."

After 1960, program directors took over the playlist and left the disc jockeys out of the loop, shielding them away from payola charges. However, the pay-for-play business did not stop there. Soon, what became known in the industry as "independent record promoters" started acting as middlemen between the record companies and the radio stations, blurring the transactions and making this sort of payment not quite payola, but with a similar result and intent. Coase (1979) sees this as inevitable: "When a pricing system is not used and something of value is provided for nothing, people are willing to incur costs up to its worth in order to secure the benefits of that service." He goes on to argue that a payment system "is both natural and desirable," and that a ban on payola leads to a lower real income of the community. True enough, independent record promoters, or *indies*, could also be compared to food and beverage distributors who pay for placement in grocery stores, facilitating the connection between wholesaler and retailer. But Boehlert (2001) warns that "radio isn't really retail – that's what the record stores are. Radio is an entity unique to the music industry. It's an independent force that, much to the industry's chagrin, represents the one tried-and-true way record companies know to sell their product."

How big is the independent promoter business? Boehlert (2001) explains: "There are 10,000 commercial radio stations in the United States; record companies rely on approximately 1,000 of the largest to create hits and sell records. Each of those 1,000 stations adds roughly three new songs to its playlist each week. The indies get paid for

every one: $1,000 on average for an "add" at a Top 40 or rock station but as high as $6,000 or $8,000 under certain circumstances. That's a minimum $3 million worth of indie invoices sent out *each week*." While it is easy to think that big record companies have a financial advantage in playing this game, Surowiecki (2004) argues that the big players already have the biggest names in show business, the biggest sales staff and the connections that go with it. Independent record promoters could thus enable small labels to get their artists on the radio, much the same way payola helped propel rock and roll in the 1950s. "Paying to play, then, creates a rough marketplace democracy: if you can come up with the cash, you get a shot. But that's all. Labels can buy themselves exposure; they can't buy themselves a hit. If people don't want to hear a record, radio stations won't keep playing it of their own accord."[24]

So payola, even if disguised a bit, is still present.[25] Whether or not the current laws are optimal for the society is a good question for economists. Surowiecki (2004) says that pay for play is simply a signaling mechanism enabling record companies to signal which songs they think will be hits, thus reducing the radio station's scouting efforts. Interesting developments are sure to come, with the growing consolidation of the radio business and power houses like Clear Channel Communications, which owns well over 1,000 radio stations in the U.S., and with the advent of internet radio stations and file sharing. Some stations, such as KROQ in Los Angeles and Clear Channel, also refuse to accept payment from independent record promoters. Perhaps the record companies will find new ways to promote their records, or perhaps big radio conglomerates will need to exert caution and stay away from the independent promoters

[24] Surowiecki (2004)
[25] Interestingly, these promotion payments are among the many costs that are deducted from record sales before bands receive royalties.

business, to avoid payola charges or to enhance their reputation for independent judgment. It is also possible that large media conglomerates will use their position in multiple markets to extract even larger payments from record companies.

8.5. Digital Recordings in the Internet Era

With the advent of new technologies, such as streaming and downloading on the internet, the Copyright Act no longer provided adequate protection for copyrighted works. In 1995, the Digital Performance Right in Sound Recordings Act was passed in an effort to strengthen copyright protection. The Act recognizes that digital transmissions of sound recordings are required to have an appropriate license. Interestingly, the license is administered by SoundExchange, a nonprofit entity created by the RIAA (Recording Industry Association of America), and not by the performing rights organizations. Krasilovsky et al. (2003) note that between 1996 and March 2000, 80 million performances were licensed by SoundExchange. The revenues are split: 50% goes to the record company (NOT the publisher), 45% to the featured musicians and vocalists, and 5% to an escrow fund for distribution to the nonfeatured musicians and vocalists. In addition, the Act establishes a statutory digital mechanical license rate, separate from the one for physical records.

Another Act was passed in 1998, the Digital Millennium Copyright Act. This Act was designed to implement two 1996 World Intellectual Property Organization Treaties dealing with copyrights in a digital environment. It provides restrictions on the use of technologies to copy and transmit copyrighted works, by making it illegal to circumvent measures put in place to guarantee the copyrights. The next section explicitly addresses new technologies and copyright issues.

9. File sharing and other new technologies

Throughout the 20th century, the rise and fall of various technologies have affected and shaped the way the world listens to music. Broadcasting, first via radio, jukeboxes, and movies, and then through television, cable television, and satellite television – including music channels like MTV and VH1 – and, very recently, via internet webcasts, has allowed music to reach more and more listeners. Sound recordings also have evolved, with new formats –and along with them new playback machines – being introduced, and most often completely replacing the earlier generations. Recordings began with Edison's cylinders and Berliner's gramophone, then vinyl 33 1/3 rpm records, then 45 rpm singles, eventually followed by 8-track tapes, and then cassette tapes and Sony's Walkman. Records, as we know them today, in the form of laser compact discs (CDs), were introduced in the mid 1980s. By 1992, CD sales eclipsed cassette sales in the US.[26] Since 2000, CDs account for more than 90% of the market, whether one looks at total value of records sold or number of units shipped. In 2003, the CD market share was 95%.[27]

The supremacy of the compact disc is now threatened by a new format: the MP3, which stands for MPEG-1 Layer 3, a standardized digital file format that compresses audio to enable many songs to fit in a small amount of disc space.[28] Along with the spread of broadband internet connections, file sharing and peer-to-peer (P2P) software, MP3 players have dramatically grown in popularity in the early 2000s. The actual number of song downloads seems to be impossible to pin down, but estimates suggest

[26] In units per capita. See Table 5, Liebowitz (2003a).
[27] Source: RIAA, www.riaa.com. Note that the figures do not include digital download sales.
[28] MPEG is the acronym for Moving Picture Experts Group.

that more than one billion songs are downloaded *each week*! (See Oberholzer and Strumpf, 2004; and Zentner, 2004.) While many music lovers rejoice and engage in massive downloading and illegal file sharing, record companies and many music copyright holders deplore the practice, alleging that file sharing is responsible for declining album sales and lower profits. Industry executives were quick to put the blame on MP3 sharing. The Recording Industry Association of America (RIAA) successfully sued to shut down Napster in 2001, and as P2P networks provided an alternative platform for users, the RIAA is now suing thousands of individual users.[29]

9.1 Intellectual Property Issues

Economists have begun to look into the question of file sharing and CD sales. The situation can be considered from a normative perspective, questioning the legitimacy of the existence of copyright protection, especially since it can be seen as hindering the development of new technologies. Indeed, as Liebowitz (2004a) notes: "It is common in the literature, particularly in the more popular press, to encounter the claim that copyright owners always cry wolf when a new technology appears to threaten the old, only later to discover that the new technology was nothing short of a bonanza. This claim implies that foolish copyright owners misunderstood the new technology and were fortunate enough to have been thwarted in their attempts to restrict the new technology."[30]

How far does intellectual protection go? Are rights strong enough to encourage the optimal amount of innovation? The problem stems from the fact that musical compositions are nonrival goods, whose property rights, as laid out by Nordhaus (1969),

[29] Napster was up and running in its original incarnation between June 1, 1999, and July 11, 2001.
[30] Liebowitz (2004a) goes on to argue that, for example, when the VCRs were introduced, television broadcasters had a legitimate concern because of the possibility that users would be able to time-shift television viewing and thus kill the possibility for broadcasters to sell advertisement, their principal source of revenue.

generate a trade-off between under-provision of the nonrival good (with weak rights) on the one hand and monopoly distortions (when the property rights are strong) on the other.[31] The RIAA is clearly pushing for stronger rights, and is lobbying for greater governmental control over technology. Romer (2002) points out that "The relevant economic question is whether the net harm (if any) created by a shift along the Nordhaus trade-off justifies this kind of intervention." He also warns that "giving an industry veto power over new technologies that threaten its current business model would set a very dangerous public-policy precedent."

Boldrin and Levine (2002) argue against intellectual property protection. They present a model of competition where downstream licensing, in this case copyright protection, leads to the Pareto *worst* outcome, whereas a case without copyrights results in first-best. "'Intellectual property' has come to mean not only the right to own and sell ideas, but also the right to regulate their use. This creates a socially inefficient monopoly, and what is commonly called intellectual property might be better called 'intellectual monopoly'." Klein, Lerner and Murphy (2002) reject Boldrin and Levine's model and reach the opposite conclusion: file sharing technologies reduce the value of the copyright to its holder.[32] These models remain theoretical, without any support from empirical evidence.[33] The first question to ask here is whether or not there exists a causal relationship between file sharing and the slump in CD sales.

9.2. Does File Sharing Lower CD Sales? Preliminary Considerations

[31] Musical compositions are nonrival goods, since once their reproduction cost is paid, they can be simultaneously enjoyed by many. Efficiency would dictate a price (above reproduction costs) of zero, but then composers would be underpaid, and the production of music recordings would be too low. See Liebowitz (2003b).

[32] Klein, Lerner and Murphy (2002) reject Boldrin and Levine's model on the basis that it is based on "the innocuous assumption that the copyright holder's demand is elastic."

[33] Hui and Png (2002) provide empirical evidence on the movie industry by estimating the impact of economic incentives on the supply of motion pictures.

There is no unambiguous theoretical prediction regarding the effect of MP3 file sharing, or other illegal forms of music piracy, on CD sales. Various effects have been suggested that point in opposing directions. Furthermore, available evidence is, at best, mixed. Liebowitz (2004b) and Peitz and Waelbroeck (2004b) present the most thorough reviews of the existing theoretical and empirical literatures. Before we review the results, it is informative to take a look at trends in record sales. Figure 9.1 shows the evolution of recording sales (of all formats) worldwide and in the United States from 1969 to 2003, in constant dollars. It is apparent that the value of sales has declined in recent years, after peaking in 1999 in the U.S. and in 1995 worldwide.[34] Sales have dropped an average of 7% per year since 2000 in the U.S.. The picture is similar for the global music industry. At least for the U.S., the downturn coincides with the launch of Napster and new portable MP3 players, such as Diamond's Rio in 1999. One should also note that CD copying became widely feasible on home computers in the late 1990s. Could these technologies be responsible for the drop in record sales?

The timing for the U.S. is certainly suggestive, but it should be noted that there have been periods of sharp declines in sales before. In the late 1970s and early 1980s, sales plummeted, though not as sharply as in the last few years. Furthermore, the fact that the decline in sales began outside the U.S. before it did in the U.S. is suspicious, because Internet technology was more widespread in the U.S. than elsewhere in the 1990s.

Before jumping to conclusions from the coincidence of these trends, one needs to also consider other factors that affect record sales. Liebowitz (2003a, 2004b) lists the

[34] One limitation of these data is that the dollar value is based on the suggested retail list price, not on the actual sales generated by the albums.

price of records, income, population, changes in taste, and prices of substitutes and complements as relevant factors. Liebowitz (2004b) looks at these standard demand determinants and concludes, "They do not appear capable of explaining the decline in sound recordings that had occurred."

On a theoretical level, file sharing, or more broadly piracy, can have many potential effects on CD sales.[35] The main argument set forth by Napster and other "pro-file-sharers" is commonly called the *sampling* argument. (See Gopal, Bhattacharjee and Sanders (2004) for a formal model of sampling.) Sampling is thought to have a positive effect on CD sales by allowing potential customers to hear songs before they purchase them. Because of file sharing, customers would be better informed, making CDs a less risky purchase. Like advertising, sample could have the effect of increasing sales. However, Liebowitz (2004b) questions the force of the sampling argument, pointing out that once someone has in his or her possession a song obtained for free, he or she might not go the extra step of actually paying to legally purchase the CD. He concludes that "the effect of sampling (more music-listening services at a constant CD price) is to lower the price of music-listening services. The net effect should be to lower the revenues generated by music-listening services. With a price per CD that is independent of the sampling effect, this implies that the quantity of CDs will fall due to sampling." Thus, sampling could be viewed as a supply shift as well as an information source, with opposing effects on sales.

Another effect, known as the *substitution* or *replacement* effect, clearly is expected to have a negative impact on sales: here, music downloaded simply replaces

[35] This section focuses on file sharing. For more on piracy and the effect on CD sales, see Hui and Png (2003). Using international data from 1994 to 1998, they find that piracy reduces CD sales by 6.6%.

purchased CDs. Even if MP3s and CDs are not perfect substitutes since CDs come in a package with the CD jacket and perhaps lyrics and liner notes, and since the sound quality of MP3s can be inferior to CDs, we would nevertheless expect that if people can download a song for free, it will to a certain extent replace their purchases of music.

A third effect that Liebowitz (2004b) cites is the *network* effect, but again, there is no clear prediction as to whether this would have a positive or a negative impact on CD sales. A network effect occurs when the value of a commodity varies with the number of people that are using it.

Another point to consider is that perhaps what has occurred is not just substitution of CDs for MP3 files, but a shift in leisure activities brought about by the new technologies. Internet and computers could have created a change in how people spend their time, possibly reducing the demand for pre-recorded music. Peitz and Waelbroeck (2004b) look at different surveys of time use and daily internet activities, and conclude that "there is evidence that the increasing availability of broadband is changing the spare time activities of consumers in favor of online activities."

9.3. Empirical Studies

Perhaps the first empirical study of the effect of illegal file sharing on CD sales was produced by the RIAA during the Napster trial. SoundScan's CEO, Michael Fine, (2000) had been engaged by the plaintiffs to produce evidence on the question. His report is not very compelling. His main claim is that because sales declined more at stores near colleges and universities, and because college students are heavier downloaders than the rest of the population, then it must be that file sharing reduces CD sales. However, this analysis does not take into account the fact that the students might

use the internet to legally buy CDs online, thus also reducing the sales at local music stores.

Liebowitz (2004b) surveys the existing empirical literature, classifying papers in terms of their unit of analysis. He distinguishes between countries, records, cities, households, and genres as possible units of analysis. Liebowitz (2004b) notes that a methodology relying on genres would be interesting, but dismisses such studies because of lack of consistent and reliable data. He reviews the household methodology quickly, citing Michel (2004) as an example. Michel builds a model in which the consumer has the choice between buying a CD and copying music illegally. He then derives the market demand for CDs, and finds that the introduction of new file sharing technologies actually brings to the market people who were not previously buying any music. This would imply that CD sales should not decrease because of P2P networks. Michel uses household level data from the Consumer Expenditure Survey, taking computer ownership as a proxy for file sharing. This has obvious problems, since it measures neither internet access nor file sharing behavior. Michel uses a difference-in-differences estimator to assess the impact of MP3 downloads on CD sales between 1998 (pre-treatment) and 2001 (post-treatment). He finds an insignificant effect, and is therefore unable to reject the hypothesis that "some file sharing (prior to 2002) was undertaken by consumers formerly not in the market for music." One caveat that we need to mention here is that this result would hold if nothing else had changed between the two years studied. We can however suspect that computer ownership and internet use has greatly expanded in that time period, so we would not necessarily be capturing the behavior of the same type of households.

Liebowitz (2004b) also criticizes Boorstin's (2004) study, which used cities as the unit of analysis, with Census data from 1998, 2000, and 2001. Boorstin regressed CD sales by city on the number of people with internet access. Liebowitz argues that the regression is flawed because it includes dummy variables for the years 2000 and 2001, which are likely to pick up the effect of file sharing. He redoes Boorstin's analysis without the year dummies, and regressing on *per capita* CD sales (not total sales), and ends up finding that file sharing could explain a decline in CD sales of 12% in the U.S., when the actual total decline was of 15%. Liebowitz concludes that "These two values are so close that we can say that this evidence is consistent with a view that all of the decline is due to file sharing. This is a charming story, but it isn't clear how reliable these results are."

A study by Zentner (2004) uses data from a European consumer mail survey from October 2001. In an OLS regression of a dummy for buying CDs on a dummy indicating regular downloading, he finds an insignificant effect. However, as he points out, "simultaneity between tastes for music and peer-to-peer usage makes it difficult to isolate the causal effect of music downloads on music purchases." Consequently, Zentner instruments for regular downloading, using variables such as the speed of the individual's internet connection and measures of internet sophistication.[36] He then finds a negative and significant effect, indicating that music downloads reduce the probability of CD purchases by around 30%, which would explain a drop of 7.8% in the sales of music in the countries covered by the survey.

[36] Zentner's (2004) measures of internet sophistication include whether or not the individual publishes his own webpage, participates in online auctions, asks for technical support online, reads computer magazines, and how long he or she has used email and the internet.

Peitz and Waelbroeck (2004a) use countries as a basis of analysis, with data from 16 countries representing 90% of world sales and from an IPSOS-REID survey, for 2000 and 2001. Taking first-differences, they run a regression of CD sales (expressed in units of CDs sold) on GDP, downloads (defined as the percentage of adults who downloaded MP3s at least once during the period) the percentage of households with broadband connection, and two variables indicating the sales of musical cassettes and the number of CD players per household. They find a significant and negative effect of downloads on music sales, reducing the sales by about 11% between 2000 and 2001. They then use survey data from the U.S. for the period 2000-2002 to try to assess the partial effect of internet piracy on CD sales. After making necessary assumptions, they conclude that "internet piracy alone can only explain 22.5% of the CD decline in 2002 and is most likely not to be a significant factor in 2003 as the percentage of internet users who download music is reported to have declined further after the series of legal actions undertaken by the RIAA in the summer of 2003." They note that this implies that a coefficient more than 4 times bigger would be needed to fully explain the drop of 8.9% in CD sales in the U.S. in 2002. Peitz and Waelbroeck note, however, that their "results should be taken with caution since we consider a small number of countries in the econometric analysis. Also, the use of aggregated data and the particular choice of explanatory variable can be questioned."

One study that stands out from the others in terms of sophistication and data is Oberholzer and Strumpf (2004), which reaches the controversial conclusion that file sharing does not have a significant impact on CD sales. They have access to unique data on actual downloads and sales, whereas the rest of the literature mostly relies on small-

scale survey data or national and international aggregates.[37] Their data set contains 1.75 million file downloads, which represent about 0.01% of the world downloads for the seventeen-week period spanning from September 8, 2002, to December 31, 2002. They link this data set to album sales from Nielsen SoundScan from the second half of 2002, and also merge on information on the artists and track time taken from the website www.allmusic.com. They use the data set to regress observed record sales on album characteristics and the number of downloads for that album, using a fixed effects model to control for album-specific, time-invariant characteristics. To avoid endogeneity problems they instrument for the number of downloads, using shifters related to download costs, which they argue influence downloads but should have no effect on sales. The shifters they use as instruments are: album average and minimum track length, time length of albums in the same music category, and also the percentage of German students on vacation due to German school holidays. They maintain that the last variable is a valid shifter of the supply of files available for downloads because in their sample, one out of six U.S. download is from Germany. When German children are on vacation, they would spend more time at their computer at home sharing files, thus shifting up the supply of MP3s. This choice of instruments has been criticized on various grounds. One criticism is that if, as the authors argue, file sharing leads to more CD sales through an advertising or (sampling effect), then cost shifters should enter the demand equation for CDs directly, rendering the identification strategy invalid. In any case, throughout their various specifications, they find that downloads have an insignificant effect on album sales. When comparing their estimates with the sharp drop in record sales, Oberholzer

[37] Their download data are logs from two OpenNap servers (centralized P2P network), which tells them which files users searched for and which files they downloaded, for seventeen weeks from September 8 to December 31, 2002.

and Strumpf conclude that "At most, file sharing can explain a tiny fraction of this decline."

Liebowitz (2004b) criticizes this conclusion and the underlying methodology. He warns about a potential fallacy of composition that would arise because records are the unit of analysis. Just as the elasticity of demand at the industry level is expected to be lower than at the firm level, downloading could increase the sales of one particular album and reduce overall CD sales. This effect, as Liebowitz points out, can seriously change the interpretation of Oberholzer and Strumpf's results: "A regression using downloads to explain sales would return a positive coefficient, assuming that all other simultaneity problems were overcome. After all, increases in downloads, by assumption, lead to an increase in the sales of the downloaded recordings in this example. But that does not mean that downloads increase overall record sales. A positive coefficient could be entirely consistent with record sales being severely harmed by downloads and thus couldn't answer the question about the overall impact of downloading."

Needless to say, the effect of file sharing on record sales remains a hotly contested issue. This is one area where we expect a good deal of research in the near future.

9.4. Searching for a New Business Model

The jury might still be out on the effect of file sharing on CD sales, but one thing is certain: the record industry is suffering. And it is likely that the business model for distributing music will change dramatically in the near future. Zhang (2004) claims that the current music distribution system is inefficient and that peer-to-peer file sharing networks might be a solution: "P2P networks help to provide a better information

environment for music listeners to experience the music works." He further predicts, "While smaller labels and unknown artists welcome the new technology, the big labels and stars suffer from the transition. The overall effect on social welfare is positive, but it is harmful to the music industry if only a small proportion of P2P users buy albums." Gayer and Shy (2004) present a model of an artist and her publisher, and show that the artist's revenues are greater under file sharing since the more revenue comes from live concerts, which get better publicity from the distribution of songs on P2P networks. However, in that model, music publishers lose from file sharing. In an interesting twist on Rosen's superstar model, Gopal, Bhattacharjee and Sanders (2004) predict that sharing technologies erode the superstar phenomenon widely prevalent in the music business. This implies that top artists actually loose from file sharing, but that less popular artists may gain from the extra exposure and lower distribution costs that the internet has to offer. Michel (2003, chapter 3) similarly predicts, "It appears that the artists and the consumers will reap most of the benefits of the new technologies." It is not surprising then to see how strongly the record companies react to the technological changes.

Legal issues are also prominent. Millions of people are infringing copyright laws, and the RIAA, as well as the Motion Picture Association of America (MPAA), its equivalent in the movie industry, are actively suing users and P2P software companies alike. In the midst of all this, some are proposing new copyright systems. A compulsory license system, much like the performing rights system right now, where radio stations acquire a blanket license to have the right to broadcast songs, and artists and publishers

get compensated via a performing rights organizations (ASCAP, BMI, SESAC in the U.S.), has been proposed, for example, in a recent book by Fisher (2004).[38]

Peitz and Waelbroeck (2004b) describe technology developments known as Digital Rights Management, or DRM. DRM refers to technologies aimed at monitoring and blocking the use of copyrighted files. Some companies have already included such features in their software. It is unclear whether blocking technology will succeed in the race against file sharing.

9.5. New Business Practices

Napster is now back – as a legitimate service selling songs over the internet. Other competitors include Apple's iTune and RealNetworks' Rhapsody. The terms they offer vary. Some offer a sort of rental service where, for a monthly subscription fee, the user can download an unlimited quantity of songs onto his PC or portable device, but cannot burn CDs; once the subscription expires, the files can no longer be read. Others sell songs for a fee – 49¢ or 99¢ per song, or $9.99 per album – and the tracks belong to the buyers forever. These services originally received a lukewarm reception: why pay for songs that are available for free on P2P networks? But interest at universities and colleges, fertile grounds for illegal file sharing (and lawsuits) with their broadband connections and student population, is growing. Some schools are starting new partnerships with music providers, in order to save bandwidth and curtail piracy. Napster has signed deals with eight colleges, including Penn State University, the University of Rochester, Cornell and George Washington University, through which the students receive free subscription to the regular Napster service (which is usually $9.99 per

[38] See also Liebowitz (2003b), footnote 2 on page 2, for a list of references. Liebowitz (2003b) discusses the pros and cons of the compulsory license, insisting on the cons and concluding that "only as a very last resort should we replace the current system with a compulsory license."

month).[39] Berkeley and the University of Minnesota have signed agreements with RealNetworks.[40] Others, including Yale, Duke, Wake Forest and the University of Colorado at Boulder, have a similar deal with Cdigix (formerly Cflix), to receive not only music but also movies.[41]

10. Conclusion

Rather than summarize our lengthy survey, we conclude by suggesting some worthwhile questions for further study, which might stimulate research on the popular music industry. Below is our list of 11 areas that seem particularly worthy of further research:

- Why do contracts in the popular music industry take the form that they take? Are they efficient?

- Why have prices for popular music concerts grown so much faster than prices of other entertainment events since the late 1990s? Can more appropriate price indices for concerts – that take into account price discrimination, rationing, shifts in demand, and other factors – be constructed?

- What determines the amount of price differentiation within concerts, and why has price discrimination grown since the 1980s? Is there less regional variation in prices for the same concerts than one would expect in an efficient market? If so, why?

[39] See Young (2004a).
[40] See Young (2004b).
[41] The movie industry is also confronted with illegal file sharing, albeit perhaps on a smaller scale. Like the RIAA, the MPAA has taken legal action. On August 19, 2004, the 9th U.S. Circuit Court of Appeals in Los Angeles ruled that P2P software developers were not infringing the copyright law by making products that people use to illegal download copyrighted material. The case was against the Grokster and Morpheus softwares. This is probably only an early opening round in the battles to come.

● How has increased concentration in promoters and media affected the popular music industry? Will continued technological change cause the industry to become more or less concentrated?

● There is a paucity of evidence on demand elasticities for concerts. As always, identifying demand and supply parameters requires some assumptions or exclusion restrictions. One potential approach is to use supply shocks, caused by factors like bad health (especially for older performers), to identify the elasticity of demand for concerts. Once a set of parameters is available, more elaborate rankings could be computed.

● The internet lowers the cost of band promotion. How will the continued development of the internet change the music industry? If bands rarely receive much income from record sales, will they seek other means for distributing their music? Will start-up bands have greater bargaining power with record companies because they can directly promote their music themselves on the internet?

● How will future technological developments, which are hard to predict at present, affect the concert industry and the distribution of recorded music? Will the variety in popular music increase because of new distribution technologies?

● We lack systematic data on concert production costs over time. What are the trends in concert production costs? Can these costs account for the trend in prices?

● Tickets are beginning to be distributed in auctions. How do ticket auctions affect the average price and the size of the secondary market? What strategies do fans use when they have the option of purchasing tickets in an auction.

● Why is there a secondary market for tickets? Why do tickets appear to be under priced for many concerts?

- Does the practice of legal payola (i.e., payments to radio stations via independent record promoters) affect the popularity of bands? Will payola become a common practice in new domains, such as webcasts, as technological change continues to shape the popular music industry?

References

Adler, Moshe (2005), "The Economics of Superstars: A Review with Extensions", in: Victor Ginsburgh and David Throsby, eds., Handbook on the Economics of Arts and Culture, forthcoming, Elsevier.

Ashenfelter, Orley (1989), "How Auctions Work for Wine and Art", Journal of Economic Perspectives 3(3): 23-36.

Baumol, William J. and William G. Bowen (1966), Performing Arts: The Economic Dilemma (The Twentieth Century Fund: New York NY).

Becker, Gary, (1991), "A Note on Restaurant Pricing and Other Examples of Social Influences on Price", Journal of Political Economy 99(5): 1109-1116.

Besen, Stanley M., Kirby, Sheila N. and Steven C. Salop (1992), "An Economic Analysis of Copyright Collectives", Virginia Law Review (Symposium on the Law and Economics of Intellectual Property) 78(1): 383-411.

Boehlert, Eric (2001), "Pay for Play", salon.com (March 14, 2001). Available at http://dir.salon.com/ent/feature/2001/03/14/payola/index.html .

Boldrin, Michele and David Levine (2002), "The Case against Intellectual Property", American Economic Review, AEA Papers and Proceedings 92 (2): 209-212.

Boorstin, Eric. S (2004), "Music Sales in the Age of File Sharing", Senior Thesis (Department of Economics, Princeton University), http://www.princeton.edu/~eboorsti/thesis/Music%20Sales%20in%20the%20Age%20of%20File%20Sharing.pdf.

Borghans, Lex and Loek Groot (1998), "Superstardom and Monopolistic Power: Why Media Stars Earn More Than Their Marginal Contribution to Welfare", Journal of Institutitonal and Theoretical Economics 154(3): 546-571.

Caves, Richard E. (2000), Creative Industries: Contracts between Art and Commerce (Harvard University Press, Cambridge MA).

Coase, R.H. (1979), "Payola in Radio and Television Broadcasting", Journal of Law and Economics 22(2): 269-328.

Courty, Pascal (2000), "An economic guide to ticket pricing in the entertainment industry", Louvain Economic Review 66(1): 167-191.

Courty, Pascal (2003), "Some Economics of Ticket Resale", Journal of Economic Perspectives 17(2): 85-97.

De Vany, Arthur S. (2005), "The Movies", in: Victor Ginsburgh and David Throsby, eds., Handbook on the Economics of Arts and Culture, forthcoming, Elsevier.

De Vany, Arthur S. and W. David Walls (2004), "Motion Picture Profit, the Stable Paretian Hypothesis, and the Curse of the Superstar", Journal of Economic Dynamics and Control 28: 1035-1057.

Eliot, Marc (1993), Rockonomics: The Money behind the Music, 2nd edition (Carol Publishing Group, New York NY).

Fine, Michael (2000), "SoundScan Study on Napster Use and Loss of Sales", Report of the CEO of SoundScan, engaged by the plaintiffs in the action, A&M Records, Inc. et al. v. Napster, Inc., http://www.riaa.com/news/filings/pdf/napstert/fine.pdf.

Fisher, William W. III (2004), Promises to Keep: Technology, Law, and the Future of Entertainment, (Stanford University Press, Stanford CA).

Flynn, Laurie J. (2004), "The Cellphone's Next Makeover: Affordable Jukebox on the Move", The New York Times (August 2, 2004).

Gayer, Amit and Oz Shy (2004), "Publishers, Artists, and Copyright Enforcement", Unpublished paper (Department of Economics, University of Haifa).

George-Warren, Holly, Patricia Romanowski and Jon Pareles (2001), The Rolling Stone Encyclopedia of Rock & Roll (Revised and Updated for the 21st Century) (Fireside, New York NY).

Goldstein, Paul (1992), "Commentary on 'An Economic Analysis of Copyright Collectives'", Virginia Law Review (Symposium on the Law and Economics of Intellectual Property) 78(1): 413-415.

Gopal, Ram D., Bhattacharjee, Sudip and G. Lawrence Sanders (2004), "Do Artists Benefit from Online Music Sharing", Journal of Business, forthcoming.

Hamlen, William A. Jr., (1991), "Superstardom in Popular Music: Empirical Evidence", Review of Economics and Statistics 73(4): 729-33.

Hamlen, William A. Jr., (1994), "Variety and Superstardom in Popular Music", Economic Inquiry 32(3): 395-406.

Hui, Kai-Lung and I.P.L. Png (2002), "On the Supply of Creative Work: Evidence from the Movies", American Economic Review, AEA Papers and Proceedings 92 (2): 217-220.

Hui, Kai-Lung and Ivan P.L. Png (2003), "Piracy and the Legitimate Demand for Recorded Music", Contributions to Economic Analysis & Policy, Berkeley Electronic Press 2 (1): Article 11.

Johnson, William R. (1992), "Commentary on 'An Economic Analysis of Copyright Collectives'", Virginia Law Review (Symposium on the Law and Economics of Intellectual Property) 78(1): 417-419.

Kafka, Peter and Kemp Powers (2003), "Celebrity 100, The Road to Riches", Forbes.com (July 7, 2003).

Kahneman, Daniel, Jack Knetsch and Richard Thaler (1986), "Fairness as a Constraint on Profit Seeking: Entitlements in the Market", American Economic Review 76(4): 728-41.

Klein, Benjamin, Lerner, Andres V. and Kevin M. Murphy (2002), "The Economics of Copyright 'Fair Use' in a Networked World", American Economic Review, AEA Papers and Proceedings 92 (2): 205-208.

Kleit, Andrew N., 2000, "ASCAP versus BMI (versus CBS): Modeling Competition between and Bundling by Performance Rights Organizations", Economic Inquiry, 38 (4), 579-590.

Krasilovsky, M. William and Sidney Shemel, cont. by John M. Gross (2003), This Business of Music; The Definitive Guide to the Music Industry, 9th edition (Billboard Books, New York).

Krueger, Alan B. (2005), "The Economics of Real Superstars: The Market for Concerts in the Material World", Journal of Labor Economics, 23(1): 1-30.

LaFranco, Robert (2003), "The 2nd Annual Rolling Stone Money Report, Rock's 50 Richest", Rolling Stone 919 (April 3, 2003): 57-61.

Liebowitz, Stan J. (2003a), "Will MP3 Downloads Annihilate the Record Industry? The Evidence So Far", in: Gary Libecap, ed., Advances in the Study of Entrepreneurship, Innovation, and Economic Growth 15 (JAI Press, Greenwich CT).

Liebowitz, Stan J. (2003b), "Alternative Copyright Systems: The Problems with a Compulsory License", Unpublished paper (School of Management, University of Texas at Dallas), www.utdallas.edu/~liebowit/intprop/complpff.pdf.

Liebowitz, Stan J. (2004a), "The Elusive Symbiosis: The Impact of Radio on the Record Industry", Unpublished paper (School of Management, University of Texas at Dallas).

Liebowitz, Stan J. (2004b), "Pitfalls in Measuring the Impact of File sharing", Unpublished paper (School of Management, University of Texas at Dallas), www.utdallas.edu/~liebowit/intprop/pitfalls.pdf.

Marshall, Alfred (1947), Principles of Economics, 8th edition (MacMillan, New York NY).

Michel, Norbert J. (2003), "A Theoretical and Empirical Analysis of The Impact of the Digital Age on the Music Industry", Doctoral thesis (Department of Financial Economics, University of New Orleans).

Michel, Norbert J. (2004), "The Impact of the Digital Age on the Music Industry: A Theoretical and Empirical Analysis", Unpublished paper (The Heritage Foundation, Washington DC).

Moulton, Brent (1996), "Bias in the Consumer Price Index: What is the Evidence?" Journal of Economic Perspectives 10 (4): 159-177.

NMPA International Survey of Music Publishing Revenues, 12th edition, National Music Publishers' Association, Inc. and The Harry Fox Agency, Inc. (available online at www.nmpa.org)

Nordhaus, William D. (1969), Invention, Growth, and Welfare: A Theoretical Treatment of Technological Change (MIT Press, Cambridge MA).

Oberholzer, Felix and Koleman Strumpf (2004), "The Effect of File Sharing on Record Sales, An Empirical Analysis", Unpublished paper (Harvard Business School and Department of Economics, University of North Carolina Chapel Hill), www.unc.edu/~cigar/papers/FileSharing_March2004.pdf.

Osbourne, Sharon (2002) "Interview: Women in Rock", Rolling Stone 908 (October 31, 2002): 54-56.

Pareles, Jon (2002), "David Bowie, 21st-Century Entrepreneur", The New York Times (June 9, 2002).

Passman, Donald S. (2000), All You Need to Know about the Music Business, 4th edition, (Simon & Schuster, New York).

Peitz, Martin and Patrick Waelbroeck (2003), "Piracy of Digital Products: A Critical Review of the Economics Literature", CESifo Working Paper No. 1071.

Peitz, Martin and Patrick Waelbroeck (2004a), "The Effect of Internet Piracy on CD Sales: Cross-Section Evidence", CESifo Working Paper No. 1122.

Peitz, Martin and Patrick Waelbroeck (2004b), "An Economist's Guide to Digital Music", CESifo Economic Studies Conference, Working Paper.

Peitz, Martin and Patrick Waelbroeck (2004c). "Making Use of File sharing in Music Distribution", Unpublished paper (University of Mannheim and ECARES, Université Libre de Bruxelles).

Piketty, Thomas and Emanuel Saez (2003), "Income Inequality in the United States, 1913-1998" Quarterly Journal of Economics 118(1): 1-39.

Read, Brock (2004), "College Leaders and Record Executives Tell Congress of Steps to Curtail Music Piracy", The Chronicle of Higher Education (August 25, 2004).

Romer, Paul (2002), "When Should We Use Intellectual Property Rights?", American Economic Review, AEA Papers and Proceedings 92 (2): 213-216.

Rosen, Sherwin (1981), "The Economics of Superstars", American Economic Review 71(5): 845-858.

Rosen, Sherwin and Rosenfield, Andrew M (1997), "Ticket Pricing", Journal of Law & Economics 40(2): 351-376.

Slichter, Jacob (2004), So You Wanna Be a Rock & Roll Star, How I Machine-Gunned a Roomful of Record Executives and Other True Tales from a Drummer's Life (Broadway Books, New York NY).

Surowiecki, James (2004), "Paying to Play", The New Yorker (2004-07-12).

Tirole, Jean (1988), The Theory of Industrial Organization (MIT Press: Cambridge MA).

Weinraub, Bernard (2002), "For the Industry, Less to Celebrate at the Grammys", The New York Times (February 25, 2002): C1.

Young, Jeffrey R. (2004a), "Napster and 6 Colleges Sign Deals to Provide Online Music to Students", The Chronicle of Higher Education (July 30, 2004).

Young, Jeffrey R. (2004b), "RealNetworks Announces Deals With Berkeley and U. of Minnesota to Offer Online Music", The Chronicle of Higher Education (August 24, 2004).

Zentner, Alejandro (2004), "Measuring the Effect of Music Downloads on Music Purchases", Unpublished paper (Department of Economics, University of Chicago), home.uchicago.edu/~alezentn/musicindustrynew.pdf.

Zhang, Michael X. (2002), "Stardom, Peer-to-peer and the Socially Optimal Distribution of Music", Unpublished paper (School of Management, MIT).

Table 1.1: Estimated pre-tax gross income by source for 35 top artists who toured in 2002
(Millions of US Dollars)

Rank	Artist	Live Concerts	Recordings	Publishing	Total Income
1	Paul McCartney	$64.9	$2.2	$2.2	$72.1
2	The Rolling Stones	39.6	0.9	2.2	44.0
3	Dave Matthews Band	27.9	0.0	2.5	31.3
4	Celine Dion	22.4	3.1	0.9	31.1
5	Eminem	5.5	10.4	3.8	28.9
6	Cher	26.2	0.5	0.0	26.7
7	Bruce Springsteen	17.9	2.2	4.5	24.8
8	Jay-Z	0.7	12.7	0.7	22.7
9	Ozzy Osbourne/the Osbournes	3.8	0.2	0.5	22.5
10	Elton John	20.2	0.9	1.3	22.4
11	The Eagles	15.1	0.7	1.4	17.6
12	Jimmy Buffett	13.7	0.2	0.5	17.6
13	Billy Joel	16.0	0.0	1.0	17.0
14	Neil Diamond	16.5	0.0	0.3	16.8
15	Aerosmith	11.6	1.0	0.8	16.5
16	Crosby, Stills, Nash & Young	15.7	0.0	0.3	16.0
17	Creed	10.9	1.1	1.6	13.4
18	Rush	13.4	0.0	0.0	13.4
19	Linkin Park	1.7	4.7	6.3	13.1
20	The Who	12.6	0.0	0.0	12.6
21	Red Hot Chili Peppers	6.1	3.4	2.7	12.1
22	Brian "Baby" Williams	0.2	2.7	0.9	11.8
23	Nsync	7.7	0.5	0.9	9.4
24	Barry Manilow	8.0	1.2	0.0	9.2
25	Britney Spears	5.5	1.8	1.0	9.1
26	Alan Jackson	4.6	3.0	1.4	9.0
27	Rod Stewart	6.6	1.4	0.8	8.8
28	Andrea Bocelli	8.1	0.2	0.4	8.7
29	Brooks and Dunn	6.7	0.4	1.4	8.1
30	Enrique Iglesias	4.4	1.5	1.7	7.6
31	Tom Petty	6.6	0.2	0.7	7.5
32	Tool	7.3	0.0	0.0	7.4
33	Kid Rock	3.4	0.8	1.3	7.0
34	Kenny Chesney	5.8	1.1	0.1	7.0
35	Santana	6.0	0.0	0.7	6.9
	Average	$12.7	$1.7	$1.3	$17.4

Notes: Figures are estimates of pre-tax gross income in 2002. The total income may exceed the sum of the first three columns because of TV, movie, merchandise and other potential sources of income.

Source: LaFranco, 2003.

Figure 2.1. Organization of the Popular Music Industry

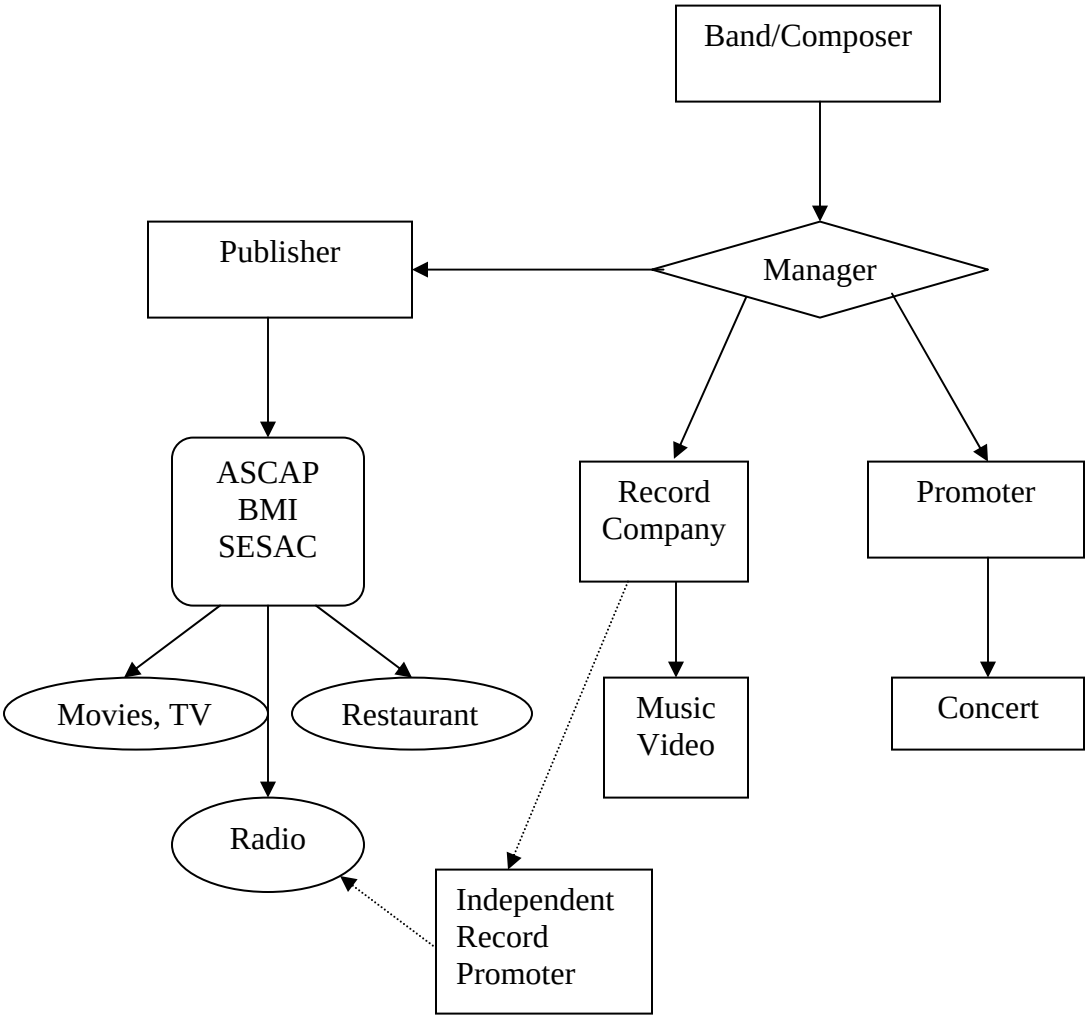


Figure 4.1: Average Price per Ticket, High and Low Price Tickets, and Overall Inflation Rate, 1981-2003

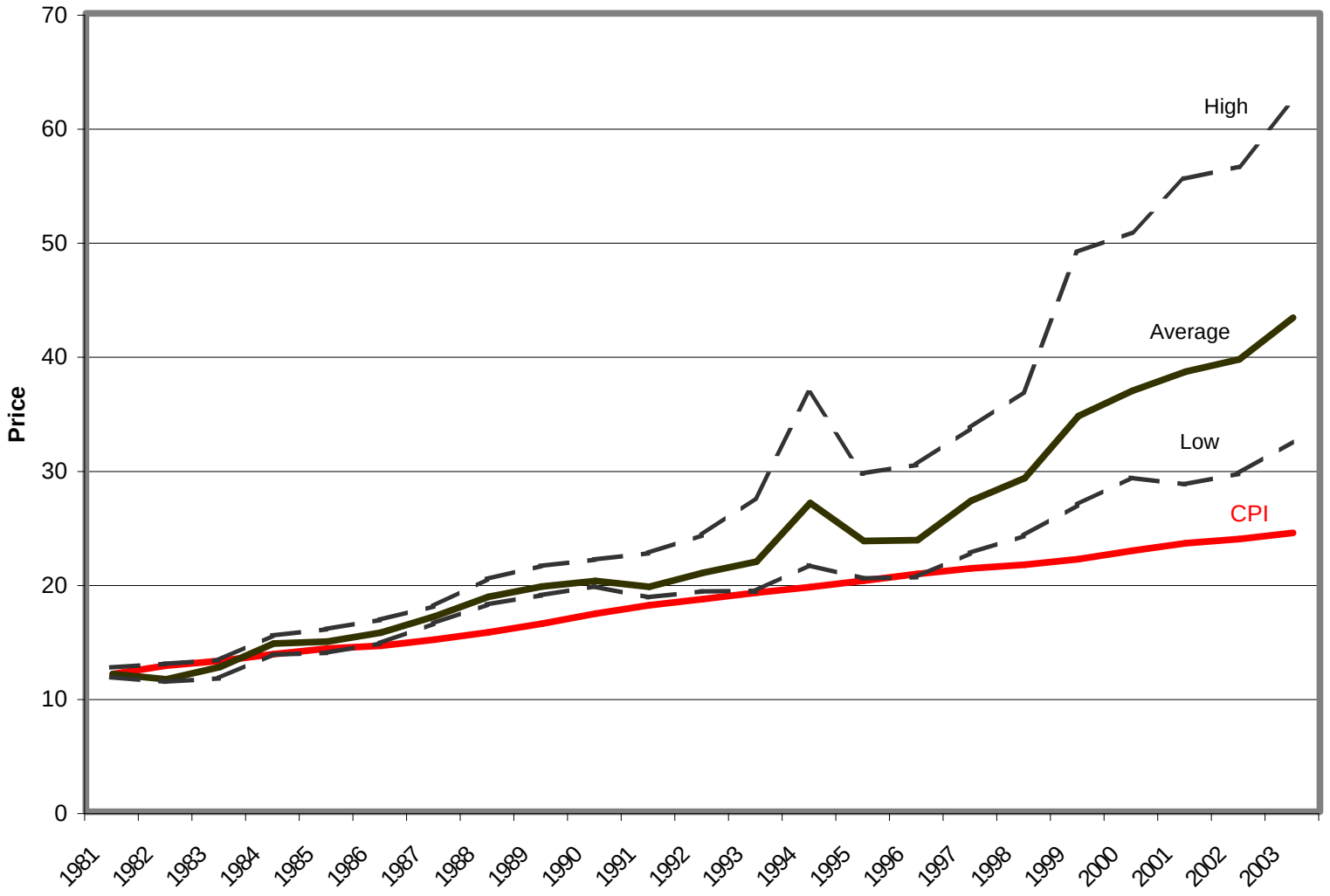


Table 4.1: Various price indices for concert tickets and other entertainment events, using either the headline artist or venue as the unit of observation

	Artist			Venue			Venue
Year	Laspeyres (1)	Paasche (2)	Fisher (3)	Laspeyres (4)	Paasche (5)	Fisher (6)	Movies, Sports & Theater (CPI) (7)
1981	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1982	112.8	108.9	110.8	106.0	106.3	106.2	106.1
1983	129.6	118.0	123.6	115.2	115.7	115.5	113.4
1984	143.8	126.0	134.6	124.7	127.0	125.8	120.8
1985	157.2	136.5	146.5	130.8	132.8	131.8	127.8
1986	166.5	144.9	155.4	142.7	142.1	142.4	133.0
1987	179.1	155.0	166.6	150.7	148.4	149.5	140.3
1988	199.6	171.6	185.0	167.4	165.2	166.3	147.1
1989	215.3	187.6	201.0	168.1	169.3	168.7	159.6
1990	236.0	200.3	217.5	181.2	185.1	183.1	170.5
1991	254.0	207.7	229.7	182.3	188.6	185.4	180.3
1992	273.9	214.3	242.3	190.8	198.8	194.7	186.0
1993	286.6	225.8	254.4	198.3	207.0	202.6	188.7
1994	310.0	209.5	254.9	229.3	235.1	232.2	195.7
1995	340.5	219.5	273.4	216.4	227.7	222.0	205.4
1996	398.5	234.6	305.8	220.1	225.2	222.6	217.1
1997	426.2	238.6	318.9	238.6	230.9	234.7	223.7
1998	518.0	273.9	376.7	258.2	251.5	254.8	230.1
1999	606.0	273.0	406.7	298.0	288.5	293.2	240.4
2000	671.7	300.9	449.6	312.2	304.7	308.4	256.1
2001	750.1	324.7	493.5	340.3	326.9	333.5	264.3
2002	802.1	334.9	518.3	348.5	336.1	342.2	272.9
2003	877.1	365.1	565.9	360.7	347.3	353.9	287.5
Per Annum Percentage Growth Rate							
1981-89	10.1%	8.2%	9.1%	6.7%	6.8%	6.8%	6.0%
1989-96	9.2%	3.2%	6.2%	3.9%	4.2%	4.0%	4.5%
1996-03	11.9%	6.5%	9.2%	7.3%	6.4%	6.8%	4.1%

Notes: authors' calculations based on Pollstar data and data from BLS. Index sets 1981 to 100.
Weights are updated each year for columns 1-6.

Figure 4.2: Concert Prices Tracked Movie, Theater and Sports Tickets Well Until 1997
Venue Laspeyres Price Index versus CPI-U for Movies, Theater and Sports Events

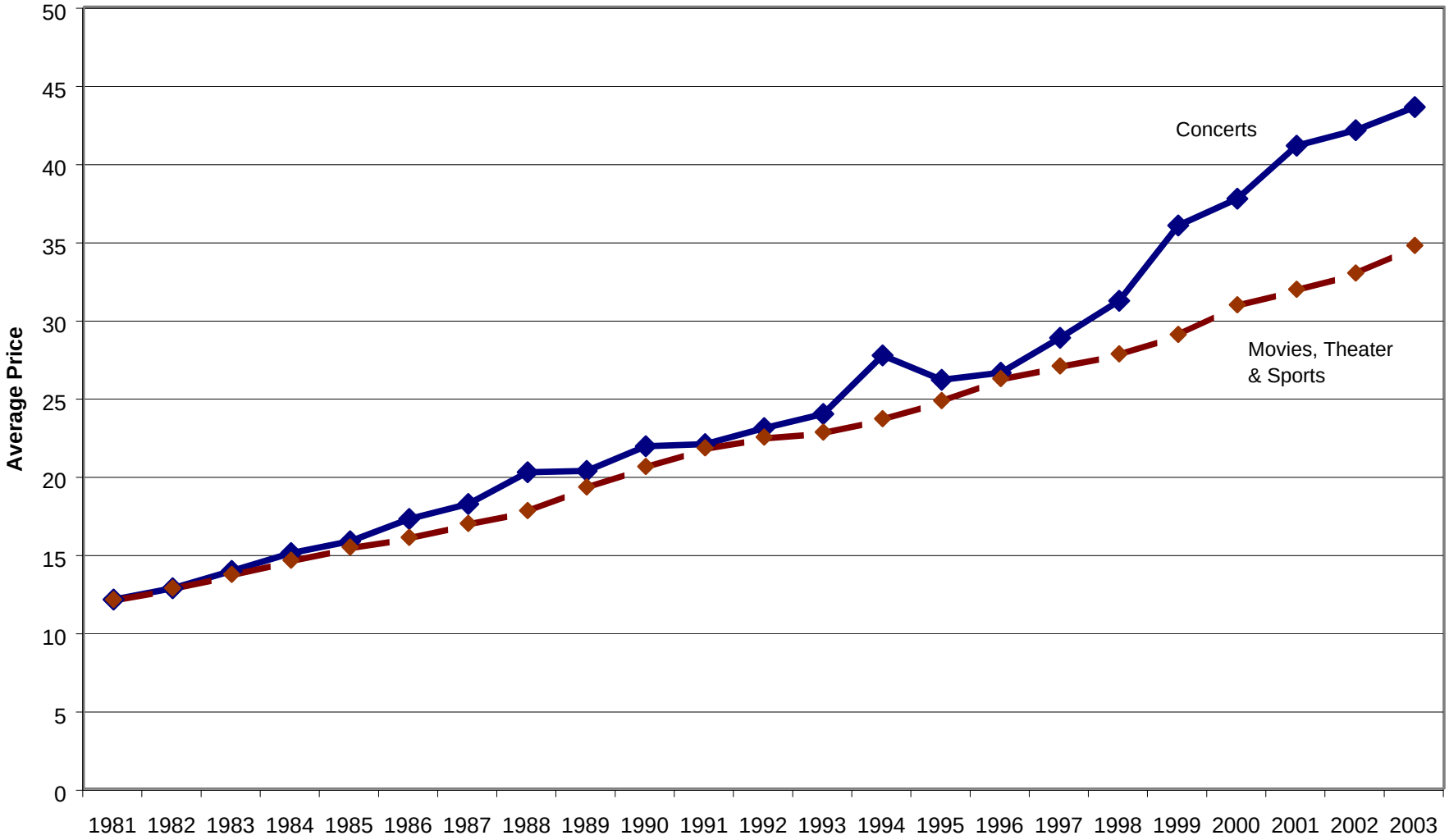


Figure 4.3a: Number of Shows Each Year
***Rolling Stone Encyclopedia* Artists**

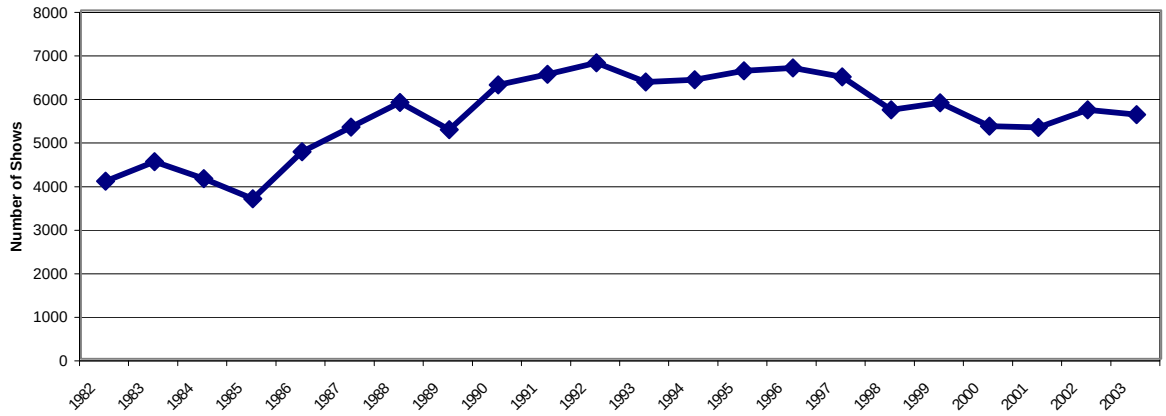


Figure 4.3b: Number of Tickets Sold Each Year
***Rolling Stone Encyclopedia* Artists**

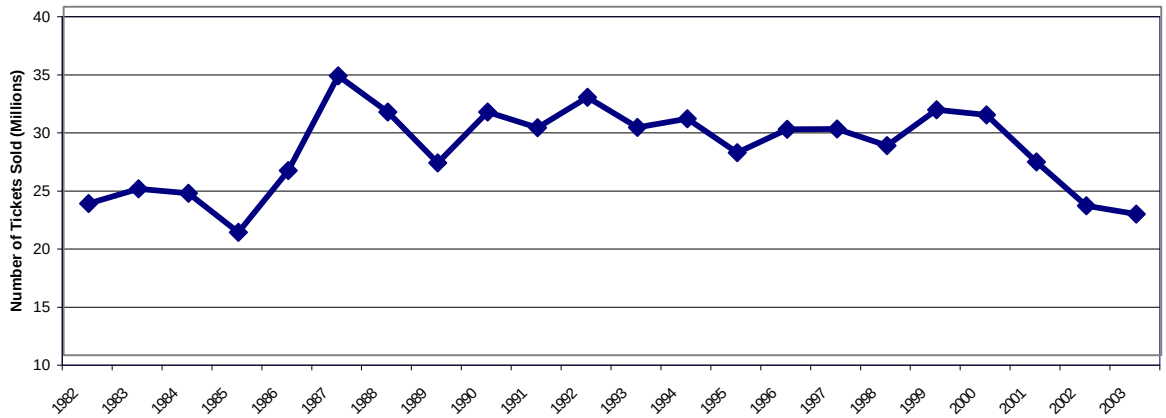


Figure 4.3c: Total Ticket Revenue in 2003 Dollars
***Rolling Stone Encyclopedia* Artists**

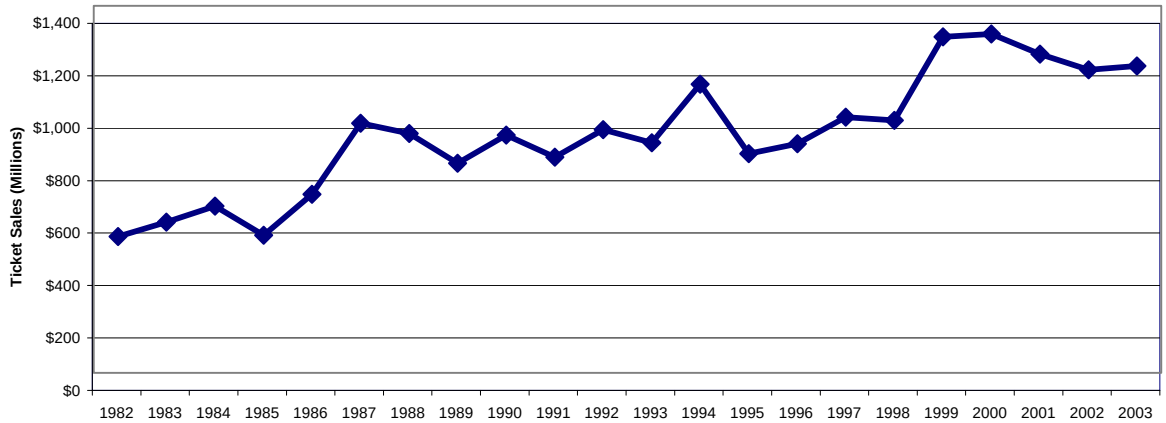


Figure 4.4: Share of Total Ticket Revenue Accruing to Top Performers, 1982-2003

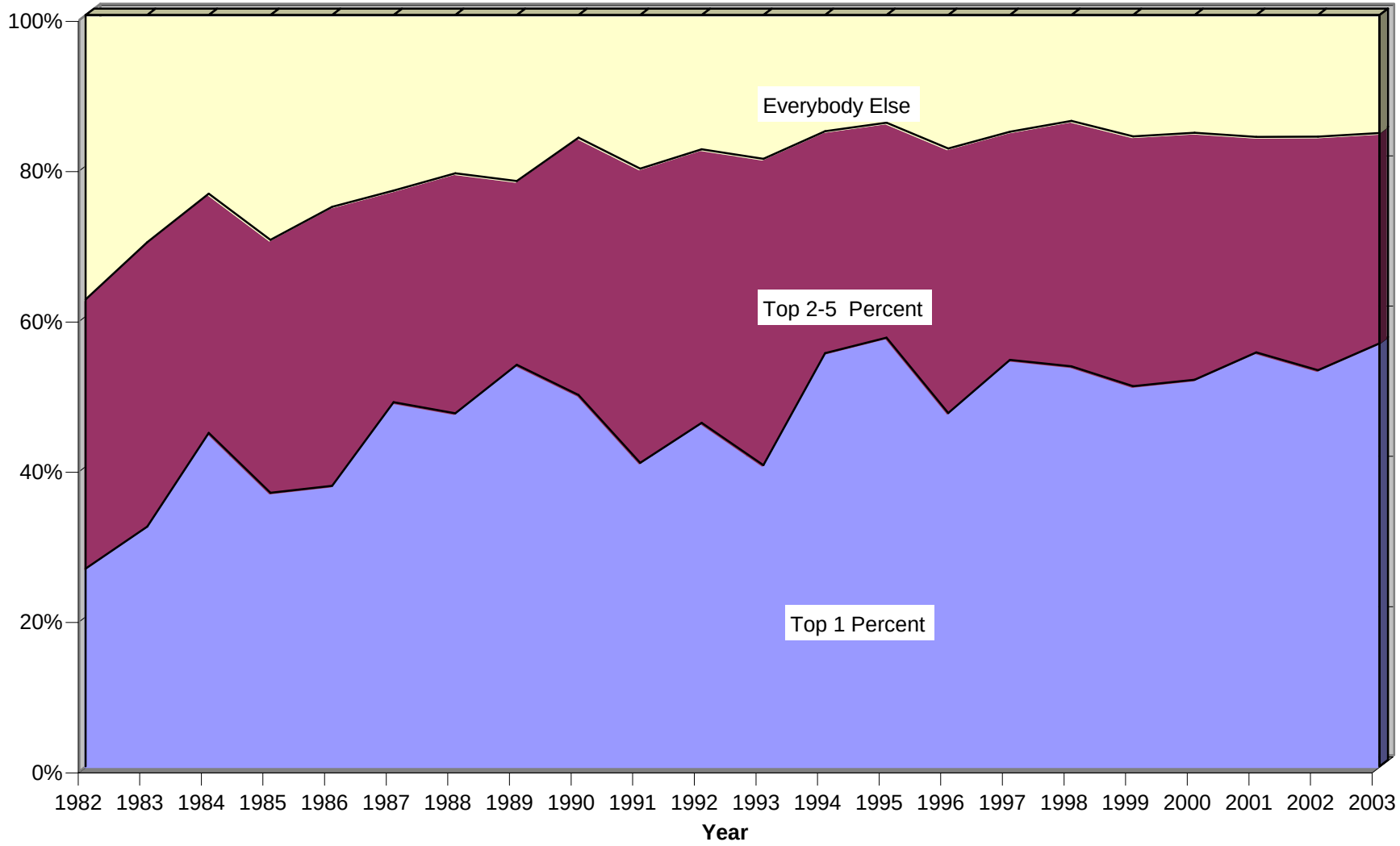
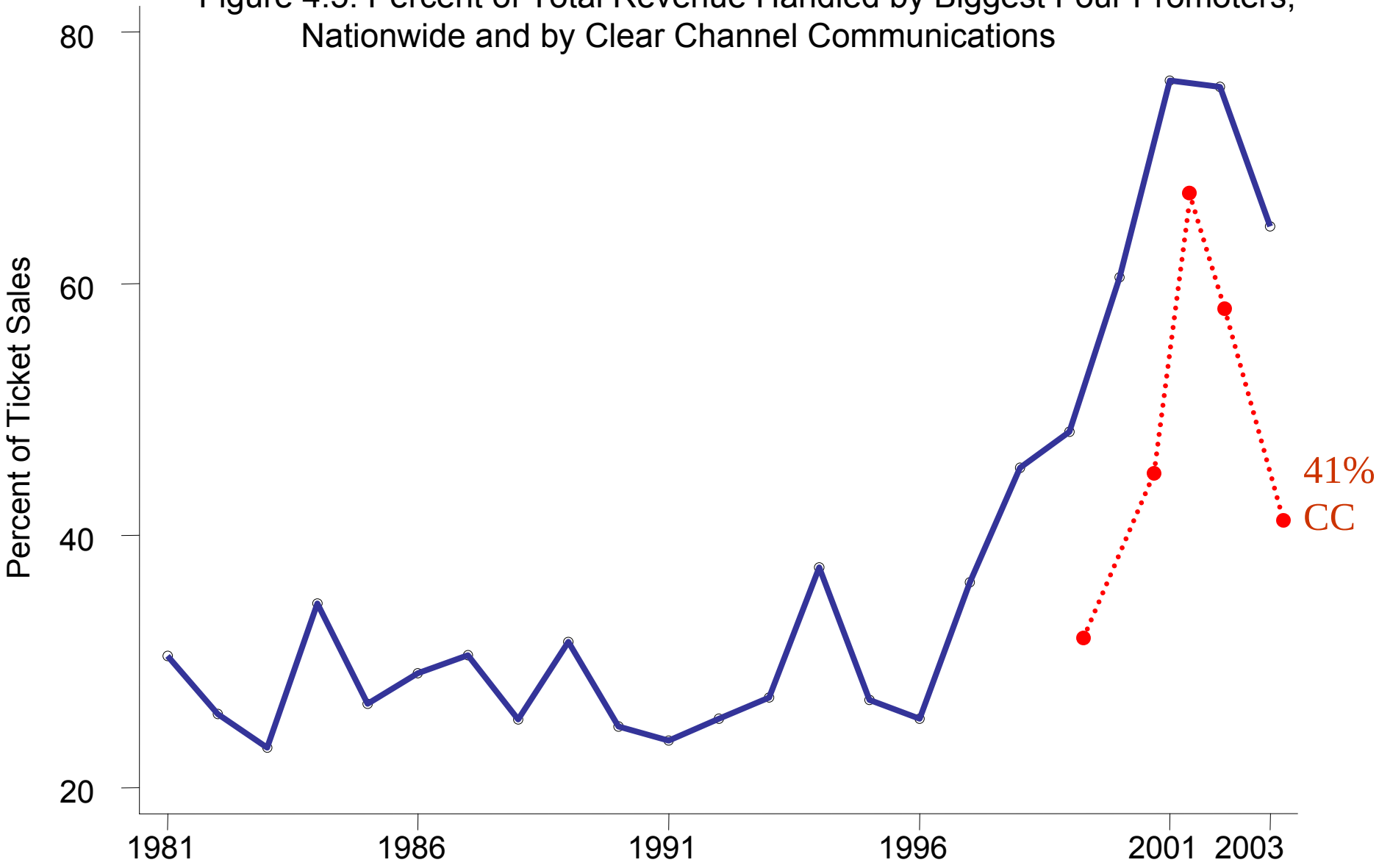


Figure 4.5: Percent of Total Revenue Handled by Biggest Four Promoters, Nationwide and by Clear Channel Communications



Source: Calculated by Alan Krueger based on Pollstar data. Only concerts performed in the U.S. are included in the analysis. Sample consists of artists listed in Rolling Stone *Encyclopedia*.

Figure 6.1: Hypothetical Demand Curve for 3 Bands

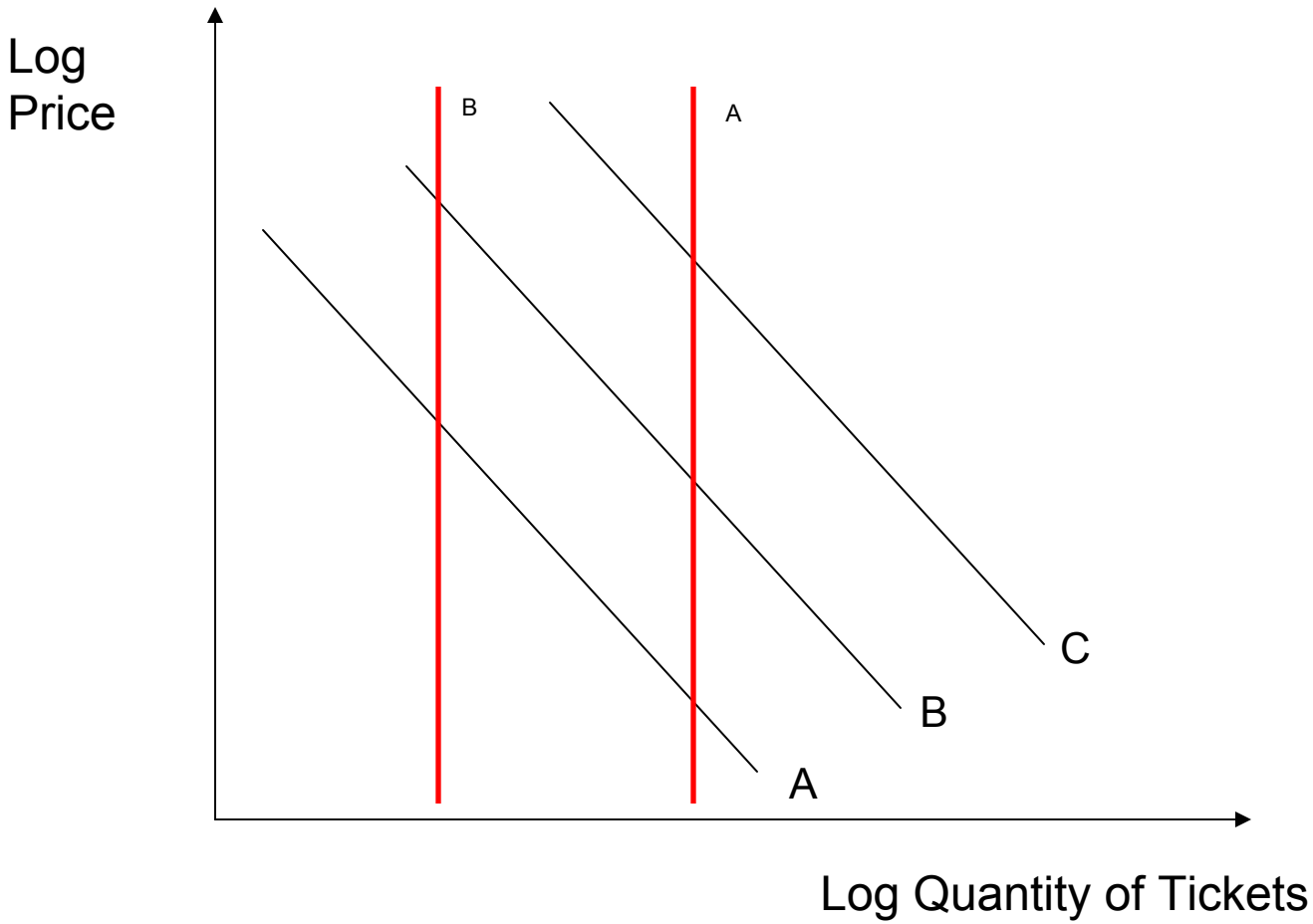


Table 6.1: Alternative rankings of artists who toured in 2003

Artist	Rank1	Rank2	Rank3	Rank4	Rank5	Rank6
Bruce Springsteen & The E Street Band	1	2	1	3	5	1
Celine Dion	2	1	2	1	41	14
Fleetwood Mac	3	6	4	6	15	8
Eagles	4	3	6	4	9	13
Simon & Garfunkel	5	4	3	2	7	12
Cher	6	9	5	9	32	4
Aerosmith / KISS	7	8	7	8	12	7
Dixie Chicks	8	10	8	10	14	6
Billy Joel / Elton John	9	7	9	7	6	27
Dave Matthews Band	10	12	10	12	19	3
Summer Sanitarium Tour / Metallica	11	11	12	11	4	17
Toby Keith	12	16	13	17	54	5
The Rolling Stones	13	5	11	5	2	51
Kenny Chesney	14	21	14	21	56	2
Tim McGraw	15	14	15	15	36	15
Shania Twain	16	13	16	13	16	21
Justin Timberlake / Christina Aguilera	17	15	18	14	30	23
Jimmy Buffett	18	17	17	16	13	20
Phish	19	23	19	23	29	9
Pearl Jam	20	25	20	26	51	10
Ozzy Osbourne	21	20	22	22	21	24
James Taylor	22	24	21	25	53	16
Yanni	23	18	24	20	61	30
50 Cent	24	34	25	30	79	11
Bon Jovi	25	19	23	18	20	34
John Mayer / Counting Crows	26	32	26	31	43	18
Matchbox Twenty	27	35	28	37	111	22
Alabama	28	30	29	32	50	26
Red Hot Chili Peppers	29	36	27	36	59	25
The Dead	30	29	30	29	33	31
Michael Flatley's Lord of the Dance	31	31	32	34	392	32
American Idols Live	32	38	31	38	63	29
Alan Jackson	33	39	34	39	82	33
Brooks & Dunn	34	43	35	45	84	28
George Strait	35	27	33	27	26	45
Lollapalooza 2003	36	40	37	40	42	37
Steely Dan	37	33	40	35	75	55
Radiohead	38	44	36	41	31	39
Def Leppard	39	45	39	46	143	40
Bill Gaither & Friends Homecoming	40	67	41	70	125	19
ZZ Top	41	47	42	48	121	41
Santana	42	49	43	49	70	42
Widespread Panic	43	55	38	52	216	36
Journey / Styx / REO Speedwagon	44	41	46	42	60	49
Luis Miguel	45	28	45	28	47	81
Elton John	46	37	44	33	34	77
Mana	47	46	48	44	44	60
Mamma Mia	48	42	52	43	226	70
Ben Harper / Jack Johnson	49	61	47	59	80	44
Trans Siberian Orchestra - East	50	58	50	56	136	54

Notes: Rank1 assumes elasticity of demand is 1 (gross revenue); **Rank2** assumes elasticity of demand is 2; **Rank3** assumes elasticity of demand is 1 and that latent demand is 25% greater than ticket sales for sellouts; **Rank4** assumes elasticity of demand is 2 and that latent demand is 25% greater than ticket sales for sellouts; **Rank5** is based on revenue per performance; **Rank6** is based on number of tickets sold. Rankings are computed for all artists, but only the first 50 according to **Rank1** are shown.

Table 8.1 – Rights attached to musical compositions

Right	What it covers	Standard rate
Public performance right	The right to publicly perform a composition, for example on the radio, in a club, in a concert, or on a jukebox.	Blanket license via a performing rights organization (ASCAP, BMI, SESAC), rate based on factors such as advertising revenues and size of audience reached
Compulsory Mechanical Right (called compulsory because the composer cannot refuse to grant it once he gets paid)	The right to record and distribute recordings of a composition, only once it has been made public	8.5 cents per composition, or 1.65 cents per minute, whichever is greater
Synchronization Right	The right to use a sound recording in a movie, commercial, or TV program (must be coupled with a performance right)	It depends on the length used and the use itself (background, integral part)

Source: Krasilovsky *et al*. (2003) and Passman (2000)

Table 8.2 – 2001 Revenues from Music Publishing in the U.S. (Millions of U.S.D.)

Performance-Based Income	
Radio	$ 317.17
TV/Cable/Satellite	381.09
Live Performance & Recorded	216.40
	914.66
Reproduction-Based Income	
Phono-Mechanical	552.70
Synchronization	102.31
	655.01
Distribution-Based Income	331.85
Interest Investment Income	37.10
Misc.	1.80
TOTAL	1,940.42

Source : *NMPA International Survey of Music Publishing Revenues*, 12th edition, Table 6, Master Survey Data

Table 8.3 – List of Performing Rights Organizations

Country	Organization	Acronym
Unites States of America	American Society of Composers, Authors, and Publishers; Broadcast Music Incorporated; Society of European Stage Authors and Composers	ASCAP; BMI; SESAC
Germany	Gesellschaft für musikalische Aufführungs- und mechanische Vervielfältigungsrechte	GEMA
Japan	Japanese Society for Rights of Authors, Composers and Publishers	JASRAC
United Kingdom	Performing Rights Society	PRS
France	Société des Auteurs, Compositeurs et Éditeurs de Musique	SACEM
Italy	Società Italiana degli Autori ed Editori	SIAE
Spain	Sociedad General de Autores Y Editores	SGAE
The Netherlands	BUMA-STEMRA	BUMA-STEMRA-CEDAR
Canada	The Society of Composers, Authors, and Music Publishers of Canada	SOCAN
Switzerland	Société Suisse des Auteurs, Suisse Auteurs	SSA, SUISA

Table 8.4 – Publishing Income in the Top Ten Countries (U.S.$M – 2001)

Country	Performance-Based Income	Reproduction-Based Income	Distribution-Based Income	Interest Investment Income	Misc.	**2001 Grand Total**	% of Total World Income	% Cumulative
U.S.A.	914.66	655.01	331.85	37.10	1.80	**1,940.42**	29.3	29.3
Germany	305.28	318.81	153.72	30.55	0.00	**808.36**	12.2	41.5
Japan	291.17	350.74	49.64	0.50	67.60	**759.64**	11.5	52.9
United Kingdom	260.11	321.75	72.65	8.05	7.17	**669.73**	10.1	63.0
France	320.80	166.58	61.17	0.00	0.00	**548.55**	8.3	71.3
Italy	257.01	73.93	22.90	0.00	0.00	**353.83**	5.3	76.7
Spain	70.51	114.43	2.15	9.68	0.00	**196.77**	3.0	79.6
The Netherlands	78.03	53.21	29.22	16.12	0.00	**176.57**	2.7	82.3
Canada	71.40	44.39	18.84	4.53	0.00	**139.17**	2.1	84.4
Switzerland	50.08	24.71	25.83	5.01	0.00	**105.63**	1.6	86.0
TOP TEN TOTAL	**2,619.05**	**2,123.56**	**767.97**	**111.54**	**76.57**	**5698.67**	**86.0**	

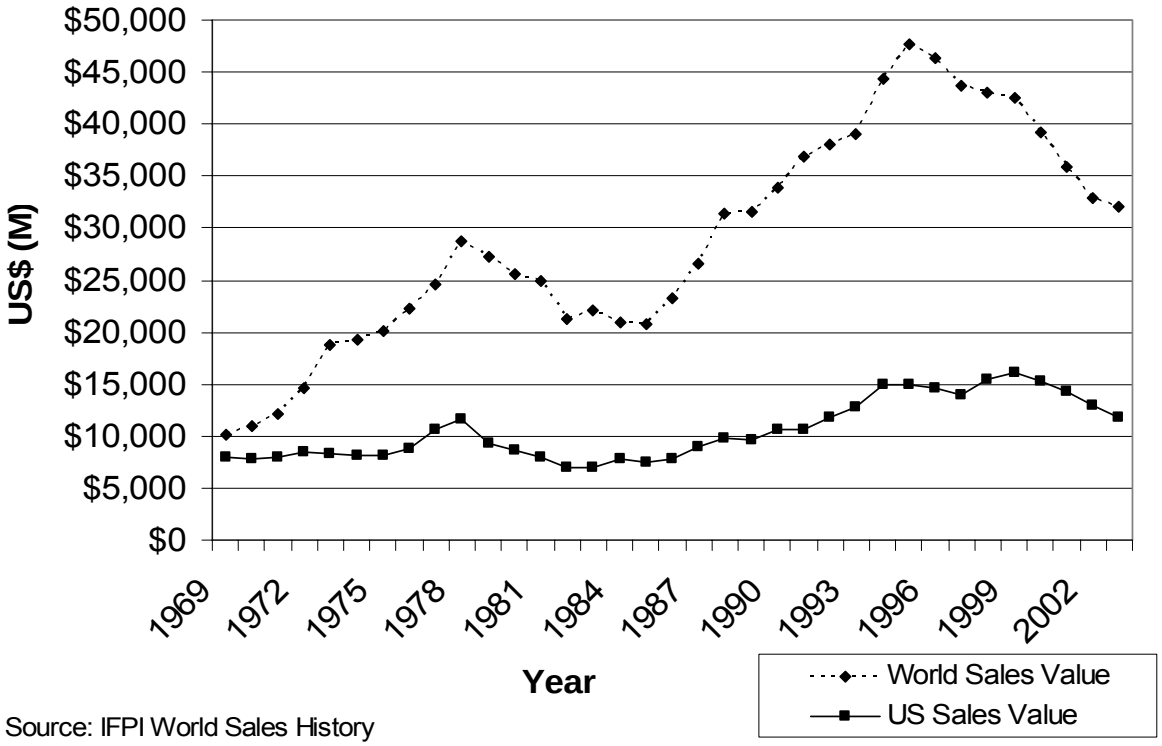
Source : *NMPA International Survey of Music Publishing Revenues*, 12th edition, Table 6, Master Survey Data

Table 8.5 – ASCAP's Foreign Relations (U.S.$M)

	2002	2003
Amount received from foreign publishing	$148,027	180,309
Amount distributed to foreign companies	133,253	149,526
Balance	+14,774	+30,783

Source: Jim Steinblatt, ASCAP Media Relations, personal communication.

Figure 9.1 - Total value of record sales, 1969-2003



Source: IFPI World Sales History

Notes: All values in millions of 2003 constant US dollars.

Turkey and China are excluded as they do not comply with IFPI standards and definitions.

Other audio formats (MiniDisc, DVD-A, SACD) included in totals from 1997 onwards.

Music video figures included in totals from 2001 onwards. Digital download sales excluded.