or its fans, popular music transcends market economics as usual. As Bruce Springsteen once put it, “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 School of Rock, went further, claiming that “one great rock show can change the world.”

And, paradoxically, precisely because nontraditional economic concerns loom large in popular music, the industry can be a breeding ground for new insights into economics. 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 popular music, can basic economic factors still explain important developments in the industry?

Note, too, that the industry is especially interesting to economists because it has been profoundly affected by technological change: radio, TV, record albums, cassette tapes, com-
Impact discs, MP3 players, the Internet. Thus, popular music provides an unusual setting to understand how rapid technological change affects an industry.

The table on the next page summarizes the main income sources for the top 35 popular music performers who toured in 2002. Bear in mind that some sources of income—revenue from merchandise sales, movies, commercials and cellphone ringtones—are not itemized in the table, but included in the total.

Although the concert figures are somewhat inflated because artists do not tour every year, 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 made more money from recordings than from live concerts, and much of the record revenue for these artists probably represented advances on new albums, not ongoing royalties from CD and iTunes 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 generated slightly less income than recordings. As is clear from the table, bands earn relatively little from recording companies. Indeed, only the very top groups are likely to receive any income other than their advance from the company because expenses are charged against the band’s advance before royalties are paid out.

In 2003, total recording sales in the United States were $11.8 billion, while total concert ticket sales were $2.1 billion. Thus, from the consumer’s perspective, recordings are a much larger market. But from the artists’ perspective, concerts represent a much more important income source. “The top 10 percent of artists make money selling records,” explained Scott Welch, manager of Alanis Morissette and LeAnn Rimes. “The rest go on tour.”

**MAIN INCOME SOURCES, 2002 (MILLIONS)**

<table>
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<tr>
<th>RANK</th>
<th>ARTIST</th>
<th>CONCERTS</th>
<th>RECORDINGS</th>
<th>PUBLISHING</th>
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**NOTES:** Figures are estimates of pre-tax gross income. The total income may exceed the sum of the first three columns because of TV, movie, merchandise and other potential sources of income.

**SOURCE:** The authors.

MARIE CONNOLLY is a graduate student in economics at Princeton University. ALAN KRUEGER is the Bendheim professor of economics and public policy at Princeton. A more technical version of this paper can be found in *Handbook of the Economics of Art and Culture* (North Holland Press, 2006).
percent a year. Thus, price dispersion increased for each concert. Nonetheless, in almost half of concerts in 2003, all seats in the house were priced the same, suggesting less price discrimination — charging different prices for the same service — than might be expected from an industry with high fixed and low marginal costs (think of the contrast with airline pricing). Even in venues with more than 25,000 seats, one-fourth of shows charged just one price for all in 2003. The amount of price differentiation has grown over time, however: in the 1980s, three concerts in four with more than 25,000 seats charged just one price for all seats.

Concert price growth tracked price growth for movies, theater and sporting events remarkably well from 1981 to 1996. But beginning in 1997, the two series diverged. Indeed, from 1997 to 2003, the concert index rose 64 percent, compared with just 32 percent for the other entertainment events.

Several other concert trends are noteworthy. First, the number of shows performed rose in the 1980s, flattened in the first half of the 1990s and declined by 16 percent from 1996 to 2003. Second, the number of concert tickets sold by bands listed in the *Rolling Stone Encyclopedia* fluctuated around 30 million per year from the late 1980s until 2000, and has dropped since. In 2003, just 22 million tickets were sold. The drop is consistent with a Gallup poll, which found that the portion of teenagers who said they attended a rock concert fell from 40 percent in 1976 to 31 percent in 2000. (By contrast, the portion of teens who said they attended a pro sports event rose from 43 percent to 63 percent over this period.)

Third, despite flat or declining ticket sales, total revenues adjusted for inflation trended upward until 2000 because ticket prices rose. 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 price increases have been offset by a larger-than-proportional demand response.

Yet another trend worth noting is that the fraction of available seats sold has fallen from around 90 percent in the late 1980s to just over 75 percent in 2003. This drop was much steeper for concerts held in large venues like sports stadiums.

One interpretation consistent with these trends is that name-brand bands are becoming less popular — that the demand curve is, in effect, shifting. But this is hard to reconcile with the sharp increase in ticket prices. A better explanation is that price increases are causing a movement up a fairly stable demand
ROCKONOMICS

curve for tickets.

The figure below shows the share of ticket revenue going to the top 1 percent and 5 percent of all earners, ranked by their total annual concert revenue. Concert revenues became markedly more skewed in the 1980s and 1990s. In 1982, the top 1 percent of artists took in 26 percent of concert revenue; by 2003 that figure reached 56 percent. The top 5 percent took in 62 percent of concert revenue in 1982 and 84 percent in 2003. This is a market, then, in which superstars garner most of the income. Movie stars’ lifetime revenues are skewed to about the same degree as concert performers’ annual revenues. By contrast, the top 1 percent of income earners in the economy overall earned “only” 17 percent of total income in 2005, and the top 5 percent took in 33 percent of total income.

A popular explanation for the acceleration in concert prices is that the concert industry has become monopolized by Clear Channel Communications, the giant media conglomerate. 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 the figure on page 55, the share of concert revenue that Clear Channel promotes rose sharply 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.

Critics have accused Clear Channel of monopolizing the concert industry. Although anecdotal evidence abounds and some lawsuits have charged Clear Channel with anti-competitive practices, our own research found little evidence linking Clear Channel to the growth in concert prices. Clear Channel’s share of listeners in a local radio market was unrelated to the share of ticket revenue for concerts promoted by Clear Channel in that market in 2000 and 2001. Moreover, Clear Channel’s share of concert promotion dollars in local markets was not statistically related to the growth in prices. It is still possible that Clear Channel uses its muscle to sign up concerts for tours. If that were the case, though, it would be surprising that the company did not exercise its monopoly position at a regional level as well. Yet Clear Channel’s live entertainment division was not profitable, and it was spun off as Live Nation in 2005.

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-1990s. It is unlikely that deregulation of radio in the United States and the rise of Clear Channel can account for concert price growth in other countries.

Perhaps the most important strand of evidence against the concentration argument is that concert promotion has always been a highly concentrated business at the regional level. In the 24 largest cities, the local market share of the top four promoters has hovered around 90 percent for the last two decades. Concentration actually fell from 1986 to 2001. Thus, the concert industry has gone from having regional monopolies to having a dominant national firm. But within cities, competition has quite possibly increased.

One last hypothesis is that concert prices have accelerated because recording artists have experienced a large decline in their income from record sales, a product that is complementary to concerts. Record sales slumped from 1999 to 2002 and were flat for five years before then, putting downward pressure on artists’ royalties. As we will discuss later, it is quite possible that record sales are down because many potential customers download music free from the Web or copy CDs, either legally or illegally.

Economic theory suggests that bands will keep the price of concerts below the monopoly price if greater attendance increases ancillary income in the form of record royalties. But if this is no longer the case because of file sharing or CD copying, the price of concerts should rise. This model was anticipated by the rock singer David Bowie, who predicted that “music itself is going to become like running water or electricity.” He advised performers to be “prepared for doing a lot of touring, because that’s really the only unique situation that’s going to be left.”

The evidence available to test this theory is mixed, but we suspect file sharing and other innovations have led to a decline in record sales, which, in turn, has forced artists to look at concerts as a profit center and charge prices that take advantage of their monopoly positions. Still, the reason for the sharp acceleration in concert prices after 1996 remains open to debate.

**SUPERSTAR EFFECTS**

As we saw earlier, the distribution of concert revenues is highly skewed. That suggests the music industry is a “superstar industry,” where a small fraction of the performers earn a substantial share of the revenues. Sherwin Rosen was the first to provide a formal 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 Alfred Marshall, Rosen imagined a market in which the services of the sellers (performers) are not perfect substitutes. As Rosen put it, “Lesser talent often is a poor substitute for greater talent,” noting that “hearing a succession of mediocre singers does not add up to a single outstanding performance.” Now add the reality that “the costs of production (writing, performing, etc.) do not rise in proportion to the size of a seller’s market.” Rosen ends up with a market equilibrium in which small differences in performers’ talent at the top of the distribution can account for large differences in revenue.

Tests of the superstar model are not straightforward because of the lack of reliable income data and, more important, because of the inherent difficulty of measuring talent or quality. By what objective metric is Celine Dion only slightly more talented than Rod Stewart?

William Hamlen did use an objective measure of voice quality – the harmonic content of a singer’s voice – to assess an artist’s quality. Hamlen then looked at the statistical relationship between quality and record sales for 107 singers, and found only a weak relationship. Since the superstar winner-take-most model would predict a strong relationship, Hamlen concludes that his findings do not support the model. But the argument is not entirely convincing: a different scaling of the units of harmonic content could rescue the superstar theory.

One of us (Krueger) considered escalating superstar effects (perhaps because of the revolution in consumer electronics equipment, which has reduced the cost of copying and listening to music) as an explanation for the rising cost of concert tickets and increased concentration in concert revenue. Specifically, he tested whether the increase in prices (or revenue per artist) could be linked to a stronger superstar effect in the 1990s. He used a novel measure of star quality: the number of millimeters of print that are devoted to each artist in The Rolling Stone Encyclopedia.

He found that the return to superstardom has indeed increased over time, but that the timing does not coincide with the increase in ticket prices. We must thus look elsewhere for explanations.

THE WORLD OF RADIO BROADCASTING

Ever since radio broadcasts started in the early 1920s, the business of radio has been intertwined with that of music. 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. Radio is an important part of record promotion, and composers can garner substantial royalties from a hit song on the air.

Under Section 106 of the United States Copyright Act, to play a copyrighted song on the radio or to press it on a compilation CD,
one must acquire the relevant license from the copyright owner. Artists generally contract with music publishing firms, which are often affiliated with their record companies, to collect their publishing income. The traditional split between the publisher and the songwriter is 50/50.

Different uses of a musical work are covered by different rights that must be purchased separately. The reproduction right is the exclusive right of a copyright owner to authorize the mechanical reproduction of the work in a record, cassette or CD.

The public performance right gives the copyright owner the exclusive right to authorize the use of the musical work in radio and television broadcasts, jukeboxes, restaurants, theater and so on. Because searching and bargaining between each copyright owner and publisher would be extremely costly, and because individual owners could not possibly monitor all radio stations to enforce their rights, licenses are handled by performance rights organizations (PROs). These PROs issue public performing licenses to broadcasters and establishment owners, then monitor and survey broadcasts to determine the amount of airplay for each composition, and remunerate the copyright owners.

Performing rights also cover cellular phone ringtones. In 2003, ringtones were a $2.5 billion industry worldwide. PROs have struck deals with the ringtone providers, and now compensate composers for each ringtone downloaded. On its Web site, BMI, an American performing rights organization, claims to have deals with 175 ringtone providers, reaching more than 90 percent of U.S. cellphone subscribers. BMI’s payments are 5 cents per ringtone download, split evenly between the publisher and the composer.

In the United States there are three performing rights organizations: ASCAP, BMI and Sesac. All offer blanket licenses, which grant the right to use all the songs in their respective catalogs. Artists and composers can sign on with only one PRO, while radio stations can contract with multiple PROs.
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 persuade publishers to become members. Only in 1921 did it write its first royalty checks.

That is also the time radio broadcasting began, creating a whole new market for ASCAP compositions overnight. Broadcasters, however, were loath to pay for the performing rights, arguing that, once they owned a copy of the record, they were allowed to do whatever they pleased with it. By 1932, the radio lobby had persuaded seven states to outlaw ASCAP.

Andrew Kleit notes that ASCAP’s license rate rose from 2 percent to 7.5 percent 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 Inc. (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 each 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. The current basic rate is just under 2 percent of the advertising revenue for radio stations. BMI is a nonprofit owned by broadcasters, which represents approximately 300,000 songwriters, composers and music publishers in all musical genres, and its Web site boasts a repertory of about 4.5 million compositions. BMI’s blanket license rate for radio stations is about 1.6 percent of 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 percent (compared with ASCAP’s 54 percent and BMI’s 43 percent). In contrast to BMI and ASCAP, Sesac is a for-profit private licensor. It currently represents some 8,000 publishers and writers and has a repertory of more than 200,000 compositions. Sesac, which specializes in country and Latin music, also charges fees for blanket licenses based on factors, including market size and the station’s standard advertising rates.

While law articles on the topic abound, few have been written about the economics of performing rights. One notable exception is by Stanley Besen, Sheila Kirby and Steven Salop, which offers a model to explain why copyright collectives are formed, how they differ. The different uses of a musical work are covered by different rights that must be purchased separately.
operate and how they may compete. They start with the assumption that the cost for individual copyright owners to collect fees from individual broadcasters is prohibitively high, justifying the formation of the collective to save costs. A collective also gives the copyright owners the possibility of cooperative price setting, and thus some market power in bargaining with big broadcasters.

Why three organizations came to coexist in the United States is still something of a mystery. Besen, Kirby and Salop suggest that perhaps ASCAP miscalculated its hold on the market. By requesting excessive fees, ASCAP led excluded songwriters and broadcasters to form a collective of their own.

The United States is by far the largest market for music publishing. In 2001, the performance-based revenues alone reached almost $1 billion, with total publishing income touching almost $2 billion – some 29 percent of world publishing income. By comparison, Germany, the second biggest market, generated total publishing income of just over $800 million.

PROs have agreements with their affiliates in other countries to share revenues. They collect revenues from abroad for their national members, as well as collecting in the United States on behalf of foreign PROs. Overall, the United States exports more music than it imports.

**Payola**

Payola is the practice of giving cash or gifts to radio stations in exchange for airplay. It could be argued that payola is a benign practice that creates a market for radio play, a market in which the amount paid by the record company to the radio station becomes the price. It is thereby akin to advertising and promotion. Why, then, has it been illegal for almost half a century?

Consider an analogous situation in which a professor bribes the editor of the *American Economic Review* to publish his article. The professor is willing to pay, since a publication is good for career advancement and eventually translates into higher future earnings. But *AER* readers would get less value in a world allowing payola because they 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 quality. One could argue that radio stations should similarly screen radio quality, especially since the right to broadcast is licensed by the government.

Ronald Coase traces payola as far back as 1867 in England. Of course, back then the payments were made to public performers in return for playing a song from the publisher’s catalog. The agents involved in this business were referred to as song-pluggers, and it became commonplace for vaudeville singers to be compensated for adding specific songs to their repertoires.

When radio came of age, song-pluggers turned to big bands performing live on radio.
stations to plug their songs. And then, when records largely replaced live music on the air, radio stations and their employees were approached by record companies to play their songs. Early on, payola was viewed as an impediment to competition. Attempts were made to outlaw the practice, but these 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 Federal Communications Commission and the Federal
Trade Commission about payola and other deceptive practices, urging a Congressional inquiry. Most of the pressure to outlaw payola came from ASCAP, which lost half its market share to BMI-licensed rock records from small independent record labels during the 1950s.

After Congress outlawed payola in 1960, program directors took over the playlists and left the disc jockeys out of the loop. The pay-for-play business did not stop there, however. 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 locus of payola transactions.

Ronald Coase saw 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 went on to argue that such a payment system “is both natural and desirable,” and that a ban on payola undermines economic efficiency.

Independent record promoters can be benignly compared to food and beverage distributors who pay for placement on grocery shelves. But Eric Boehlert warns that “radio isn’t really retail,” adding: “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 now sell their product.”

Boehlert 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 assume that big record companies have a financial advantage in playing this game, James Surowiecki argues that the big players already have the biggest names in show business, the biggest sales staff and the connections that go with them. Independent record promoters could thus enable small labels to get their artists on the radio, much the way payola helped propel rock ‘n’ 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.”

**Digital recordings in the Internet era**

With the advent of new technologies like 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 protection. The act requires digital transmissions of sound recordings to be appropriately licensed.

Interestingly, this license is administered by SoundExchange, a nonprofit organization created by the Recording Industry Association of America rather than the performing
rights organizations. Between 1996 and March 
2000, 80 million performances were licensed 
by SoundExchange. Half of the revenue went 
to the record company (not the publisher), 45 
percent to the featured musicians and vocal-
ists, and 5 percent to an escrow fund for dis-
tribution to the non-featured artists.

Another law, the Digital Millennium Copy-
right Act of 1998, was designed to implement 
two 1996 World Intellectual Property Organi-
zation Treaties dealing with copyrights in a 
digital environment. It restricts the use of 
technologies to copy and transmit copy-
righted works by making it illegal to circum-
vent measures put in place to guarantee the 
copyrights.

**FILE SHARING AND**
**OTHER NEW TECHNOLOGIES**

Broadcasting, first via radio, jukeboxes and 
movies, and then through television, cable 
television and satellite television and, very re-
cently, via Internet Webcasts, has allowed 
music to reach ever more listeners. Sound re-
cording has also evolved, with new formats 
(and new playback machines) being intro-
duced, and most often completely replacing 
the earlier generations.

Recordings began with Edison’s cylinders 
and Berliner’s gramophone. Then came vinyl 
33-1/3 rpm records, 45 rpm singles, eight-
track tapes and cassette tapes, and Sony’s 
Walkman. Records, as we know them today in 
the form of laser compact discs, were intro-
duced in the mid-1980s. By 1992, CD sales 
had eclipsed cassette sales in the United 
States. Since 2000, CDs have accounted for 
more than 90 percent of the market, whether 
one looks at total value of records sold or 
number of units shipped.

The supremacy of the compact disc is now 
threatened by a new format: the MP3, a stan-
dardized file format that compresses digital 
audio data to enable more music to fit on a 
disc.

Along with the spread of broadband Inter-
net connections, file sharing and peer-to-peer 
(P2P) software, MP3 players have drastically 
grown in popularity. The actual number of 
song downloads is impossible to pin down, 
but estimates suggest that more than one bil-
lion songs are downloaded each week.

Record companies and copyright holders 
deplore the practice, alleging that file sharing 
is responsible for declining album sales and 
lower profits. The Recording Industry Associ-
ation of America 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 individ-
ual users.

**Does file sharing lower CD sales?**

The impact of MP3 file sharing and other 
forms of music piracy on CD sales is not ob-
vious on its face. Various effects point in op-
posing directions.

The value of recording sales has indeed de-
clined in recent years, after peaking in 1999 in 
the United States and in 1995 worldwide. 
Sales have since dropped an average of 7 per-
cent annually in the United States, and the 
picture is similar in other countries.

At least for the United States, the down-
turn coincides with the start of Napster and 
the introduction of portable MP3 players, like 
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?

There have been periods of sharp declines 
in sales before, however. In the late 1970s and 
early 1980s, sales plummeted (though not as 
sharply as in the last few years). Furthermore, 
the fact that the global decline began outside
the United States is suspicious because Internet technology was more widespread in this country than abroad in the 1990s. So before jumping to conclusions, one needs to consider other factors that affect record sales.

File sharing, or more broadly piracy, could increase or decrease CD sales. Napster and others in favor of file sharing defended the practice with what’s called the sampling argument. Sampling is thought to have a positive effect on CD sales by allowing potential customers to hear songs before they purchase them.

Stanley Liebowitz questions the force of the sampling argument, however. 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,” adding, “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.

Another effect, known as the substitution or replacement effect, clearly has a negative impact on sales, with music downloaded unambiguously replacing purchases. While MP3s and CDs are not perfect substitutes since CDs come in a package with the jacket and often have superior sound quality, we would nevertheless expect that if people can download a song at no cost, it will to a certain extent replace their purchases of music.

Another point to consider is that what has occurred is not just substitution of MP3 files for CDs, but a shift in leisure activities brought about by the new technologies that may have reduced the time people spend listening to pre-recorded music on any medium. Martin Peitz and Patrick Waelbroeck used survey data to conclude that “there is evidence that the increasing availability of broadband is changing the spare-time activities of consumers in favor of online activities.”

The first highly visible empirical study of the effect of illegal file sharing on CD sales was produced by the RIAA for the Napster trial. SoundScan’s chief executive, Michael Fine, had been engaged by the plaintiffs to produce evidence on the question. His main claim was that because sales declined more at stores near colleges and universities, and because college students are heavier downloaders than the rest of the population, file sharing must be the culprit. 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 without reducing total music sales.

One study that stands out from the others in terms of sophistication and data is by Felix Oberholzer and Koleman Strumpf. They had access to unique data on actual downloads and sales, whereas other researchers have mostly relied on small-scale survey data or national and international aggregates. They found that downloads had an insignificant effect on album sales. When comparing their

The actual number of song downloads seems to be impossible to pin down, but estimates suggest that more than one billion songs are downloaded each week.
estimates with the sharp drop in record sales, Oberholzer and Strumpf conclude that “at most, file sharing can explain a tiny fraction of this decline.”

**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 drastically in the near future. Michael Zhang says that the current music distribution system is inefficient and that peer-to-peer file sharing networks might be a solution. He predicts that “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.”

Amit Gayer and Oz Shy offer a model showing that artists’ revenues are greater under file sharing since 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, Ram Gopal, Sudip Bhattacharjee and G. Lawrence Sanders predict that sharing technologies will erode the superstar phenomenon in the music business – that top artists will actually lose from file sharing, while less popular artists may gain from the extra exposure and lower distribution costs provided by the Internet.

Legal issues are also prominent. Millions of people are infringing copyright laws, and the RIAA is actively suing users and P2P software companies alike. In the midst of all this, some are proposing new copyright systems. One possibility is a compulsory license system, much like existing performing rights system in which radio stations acquire blanket licenses to broadcast songs, and artists and publishers are compensated through a performing rights organization.

Napster is now back – as a legitimate service selling songs over the Internet. Its competitors include Apple’s iTunes and RealNetworks’ Rhapsody. Some offer a sort of rental service: for a monthly 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 cents or 99 cents per song, or $9.99 per album – and the tracks belong to the buyers forever.

These services initially were received lukewarmly: why pay for songs that are available 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, the University of Rochester, Cornell and George Washington, through which the students receive free subscriptions to the regular Napster service. Berkeley and the University of Minnesota have signed agreements with RealNetworks. Others, including Yale, Duke, Wake Forest and the University of Colorado, have a similar deal with Cdigix to receive movies as well as music.

One thing is surely certain: Rockonomics, propelled by a mix of rapid technological change, popular taste and intangible property rights, will remain a fertile field for economic researchers.