

Radio

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Abstract

This chapter surveys the literature on the economics of radio, focusing on the broadcast industry in the United States. The first parts of the chapter provide a history of the radio industry and its regulation, and a guide to the data available for empirical research. The next part surveys the large empirical literature analyzing the effects of the wave of consolidation that took place after the Telecommunications Act of 1996, explaining which empirical results appear robust (for example, the effects of local consolidation on programming differentiation) and which remain unclear (for example, the effects of consolidation on advertising prices and quantities). The remaining parts survey the literatures on whether there are too many radio stations; the strategies that stations use to boost the effectiveness of advertising; the effects of non-commercial stations on the commercial sector; and, the interaction between the radio and music industries, including payola and copyright issues. The chapter emphasizes several topics that seem ripe for additional research.

Keywords: radio, two-sided markets, advertising, mergers, variety, product differentiation, synergies, localism, payola, copyright

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4.1 Introduction

Even though the inventor Thomas Edison argued in 1922 that radio was a “craze [that] will soon fade”¹, radio has proved to be a medium of enduring popularity. In the United States, where almost everyone now has access to more modern media alternatives, 92% of the population still listens to the radio every week and the average listener tunes in for 2.5 hours each day (Arbitron, 2013). U.S. radio advertising revenues in 2013 were almost \$15 billion, or roughly 75% of local TV advertising revenues.² In developing countries, broadcast radio remains the primary means of accessing news and information for millions of people because radios are cheap and require little infrastructure or literacy to operate. For example, in Kenya 87% of households own a radio, while only 47% own televisions (Bowen and Goldstein, 2010). Radio programming is also often argued to have significant effects on a country’s culture: in the US, the development of personality-driven talk radio has been cited as a primary cause of political polarization (Hillard and Keith (2005), p. 80) and a perceived narrowing of playlists on music stations has often been blamed for the problems faced by the music industry (Marcus, 2008). The importance of radio has led governments in many countries to tightly regulate or directly provide programming.

This chapter aims to introduce the reader to the economics of the radio industry and to describe empirical research that has tried both to understand these economics and to use radio as a setting to examine broader questions to do with two-sided markets, the effects of competition on product variety and deregulation. It will emphasize that our understanding is far from complete in many areas, and that recent changes to local media markets provide new questions to study and mean

¹ <http://rockradioscrapbook.ca/quotes> (accessed February 27, 2014)

² <http://www.biakelsey.com/Company/Press-Releases/140326-WTOP-Leads-Radio-Station-Revenues-for-Fourth-Consecutive-Year.asp> and [http://www.biakelsey.com/Company/Press-Releases/140424-Local-Television-Revenue-Expected-to-Reach-Over-\\$20-Billion-in-2014.asp](http://www.biakelsey.com/Company/Press-Releases/140424-Local-Television-Revenue-Expected-to-Reach-Over-$20-Billion-in-2014.asp) (accessed February 14, 2015)

that answers to existing questions based on historical data may no longer be appropriate. The focus will be on the broadcast (free-to-air) radio industry in the United States in the last 25 years, but I will explain the history of the industry from its inception so that contemporary issues can be placed in their historical context. Indeed, understanding the history is necessary to understand why many reforms that might seem natural to economists have aroused controversy. At certain points I will also mention how the radio industry in the US differs from the radio industries in other countries, for example in the role of publicly-funded radio. I will also describe some of the challenges faced by the contemporary broadcast radio industry given the growing importance satellite and online radio platforms, and non-radio digital media that have successfully captured a large share of both local and national advertising dollars.

Like broadcast television, important features of the broadcast radio industry are that (a) stations operate as two-sided platforms, attracting listeners with free programming and selling these audiences to advertisers who reach listeners with commercials or sponsored programming; (b) some types of programming – typically news and educational programming – might be considered merit or partially public goods; (c) the marginal cost of reaching additional listeners within a given coverage area is essentially zero; and (d) entry is limited by constraints on the broadcast spectrum available for radio stations to use, and stations must coordinate their frequencies and coverage areas in order for their broadcasts to be audible for listeners. This last point naturally creates a role for licensing and regulating stations. The fact that spectrum is seen as public, not private, property has also been used to argue that radio stations should operate, in the words of the 1927 Radio Act, for the “public convenience, interest or necessity”, leading to a

degree of content regulation that has never been applied to the US newspaper industry (at least outside of wartime).

While broadcast radio and television share these important economic characteristics, there are at least two significant differences between the media. First, radio is a much more portable medium with the majority of listening taking place outside of the home, a pattern that has become even more pronounced in recent years and for younger listeners.³ The peak hours of radio listening are during the day, and especially during the morning and evening drivetime periods, whereas, since the late 1950s, television has dominated in the evening primetime period.⁴ Portability also explains why most radio listening is still accounted for by traditional over-the-air broadcasts, whereas most television viewed in the US is delivered via cable or satellite even though broadcast stations remain popular. Second, the fixed costs of operating a radio station are low and the spectrum constraints are weak enough that local markets can be served by quite a large number of stations.⁵ For example, in 2002 Duncan's *American Radio* market guide estimated that there were 23 viable radio stations in the Washington DC market (with another 7 marginal stations), compared with 13 local television stations.⁶ In Billings,

³ In Spring 2007, Arbitron identified 40% of listening as taking place at home. The remainder was split roughly equally between in car and at work. Figures from Arbitron's Radio Listening Trends reports <http://wargod.arbitron.com/scripts/ndb/ndbradio2.asp> (accessed February 18, 2014). By 2011, the share taking place at home had fallen to 36%, (Arbitron, 2011), and for listeners aged 18-34 it was estimated to be 28% in 2014 (Nielsen, 2014).

⁴ The data comes from Arbitron's Radio Listening Trends reports <http://wargod.arbitron.com/scripts/ndb/ndbradio2.asp> (accessed February 18, 2014).

⁵ Many interesting questions in television arise from the vertical relationships between content providers and platform operators (such as cable companies). See the chapter by Armstrong and Crawford in this volume for an in depth discussion. Vertical issues also exist radio – with syndicated programming being broadcast on stations owned by many different companies, and major station owners also producing some of this programing – it has not be the focus of attention in the economics literature.

⁶ Duncan identified 'viable' stations as those with signals that reached a large proportion of the market and had at least a 1% share of listening. Most markets have a number of smaller stations listed in their

Montana there were 12 viable radio stations, compared to only 4 TV stations, with one viable radio station for every 8,736 residents aged 12 and above. In this sense, one might hope for quite competitive economic outcomes without regulation.

The costs of providing programming also differ across the media. Television production is typically expensive, so that smaller stations must rely on large amounts of programming provided by the networks or syndication. In radio, producing local programming is potentially quite cheap, especially as stations are currently only charged a small proportion of their revenues for the rights to perform music (see section 4.9.2 for a discussion of licensing arrangements). I will return to the question of whether local programming is necessarily desirable below. One consequence is that stations are able to vary their programming in response to the local competitive landscape, and in the last two decades this has resulted in the emergence of quite narrow programming formats, which may, for example, offer only a particular kind of rock music or serve listeners with a particular religious adherence. However, in spite of this cost structure and these patterns, there is an active debate about whether the types of programming that stations provide is optimal, both in the sense of whether it is of the optimal quality or whether stations offer too much of the same types of music (Future of Music Coalition, 2003).

The structure of this chapter is as follows. Section 2 provides a brief history of the broadcast radio industry in the US, from its inception to the present. Section 3 discusses the data that has been used in empirical research. Section 4 outlines some of the economic theory that can be used to understand the possible effects of mergers in the radio industry. Section 5, divided into

Arbitron market reports that can be considered marginal. Additional low power stations would typically have too few listeners to be listed by Arbitron at all.

four parts, describes empirical research examining the effects of ownership deregulation and the subsequent consolidation that took place in the 1990s and early 2000s. Section 6 looks at the question of whether there are too many stations in most radio markets. Sections 7 through 9 examine strategies that stations use to make sure listeners hear their commercials, the effects of public radio and the effects of radio on political outcomes and its interactions with the music industry. Section 10 concludes.

4.2 A Brief History of the Radio Industry in the United States

As we shall see below, some of the most interesting economic questions in the context of the contemporary radio industry concern the effects of ownership consolidation and corporate control; the response of the medium to new competitors and opportunities created by technological change; the tension that can exist between exploiting economies of scope and serving local demand; and, the appropriate role for regulation in any industry that is far from being a natural monopoly but which makes use of public airwaves. Interestingly, many of these questions are recurrent themes in the history of the broadcast radio industry in the US, and this brief history is intended to help place contemporary issues in context.⁷

Radio technologies had been developed for maritime and military purposes in the years leading up to and during World War I, and, under the Radio Act of 1912, there were over 13,000 licensed amateur radio operators in the US by 1917. KDKA in Pittsburgh was the first US station to provide a regular programming schedule in November 1920. KDKA was owned by Westinghouse, which viewed the provision of programming as a natural way to drive sales of its radio receivers. Westinghouse, together with General Electric and AT&T, formed the Radio

⁷ The facts in this section can be found in Albarran and Pitts (2001) unless otherwise noted.

Corporation of America (RCA) in 1919. Similarly, New York station WEAJ, in 1922 the first station to broadcast a commercial (for an apartment complex in Jackson Heights, with the developer paying the station \$100), was owned by AT&T, which claimed a monopoly on producing transmission equipment (Hillard and Keith (2005), p. 26). After KDKA's success there was a rapid growth of the industry, with 622 stations licensed to provide general broadcasts by the end of 1922.

Unfortunately, these stations were licensed to just two frequencies (750 kHz and 833 kHz), so that there was considerable interference and many stations were regularly inaudible. Despite this problem, sales of radio receivers grew rapidly and Commerce Secretary Herbert Hoover organized a series of "radio conferences" in the mid-1920s in an attempt to bring some organization and co-ordination to the industry. Hoover's power to allocate stations to specific frequencies and time-slots was successfully challenged in court. This led Congress to pass the Radio Act of 1927, which created the Federal Radio Commission (FRC), succeeded by the Federal Communications Commission (FCC) under the Communications Act of 1934, with the power to issue and deny licenses and regulate the industry with the goal of making sure that the industry operated for the "public convenience, interest or necessity"⁸.

At this point, one could have imagined radio developing in at least two different ways. One way might have involved a large number of local stations operating largely or completely independently. An alternative would have been for national networks to provide common programming through a small number of powerful stations. The latter was the successful model from the late 1920s through to the 1950s. RCA launched its NBC network in 1926, with the

⁸ Communications Act of 1934, ch. 652, § 303 (codified in 47 U.S.C. § 303, 1994).

programming being provided to local affiliates through special telephone wires provided by AT&T. RCA added a second NBC network two months later, with the networks being known as the Red and Blue networks. CBS entered in 1927, followed by a cooperative network, the Mutual Broadcasting System, in 1934. The FRC supported the development of national networks through its licensing policies. In particular, it licensed a relatively small number of 50,000 watt “clear channel” stations. These could reach hundreds of thousands or millions of listeners, especially at night when their AM signals would travel further as they reflected off the Kennelly-Heaviside layer in the atmosphere. This was important in making big-city programming available to rural listeners, and 21 out of the 24 initial clear channel assignments went to network affiliates. Local stations were licensed but typically they were restricted to operate at much lower powers, such as 250 or 500 watts, with hours of operation limited to the daytime when most family listening took place in the evening. The network structure was very successful in commercial terms and radio spread rapidly. By 1935, 60% of American households owned radios, and, because listening to the radio was free once the receiver had been purchased, the medium flourished during the Depression.

Network programming was initially oriented towards music (classical, dance and jazz) but over time comedy shows and drama played an increasing role. The networks also carried a very large number of commercials, which was perhaps natural at a time when national and regional brands were starting to develop, radio was the only national medium and the networks formed a concentrated oligopoly where competition for listeners may have been limited. In 1932 CBS and NBC carried 12,546 commercial interruptions in 2,365 hours of programming, an average of 5.3

interruptions per hour. In comparison, Sweeting (2006, 2009) found that music stations in the period 1998-2001 carried between 2 or 3 commercial breaks per hour.

More surprisingly, the networks did not initially broadcast much news programming. In 1933 NBC and CBS agreed with the American News Publishers Association and the wire services, in what was known as the “Biltmore program” (after the New York hotel in which the deal was negotiated), that they would forgo developing their own news-gathering organizations and instead carry only two five-minute newscasts every day, with each news item limited to 30 words, and to not carry news that was less than 12 hours old (Barnouw (1968), p. 20)!⁹ For the networks, there were probably two economic motivations for what to us now seems a startling agreement. First, they may have wanted to avoid starting a race between themselves in programming quality that would likely increase their costs quite dramatically, especially if they tried to cover local news. Second, radio stations relied on newspapers to publish their schedules and so needed their co-operation. Indeed, when WOR in New York starting running its own extended newscasts that proved to be popular with listeners, the newspaper association tried to pressure their New York members not to publish WOR’s schedule. However, they refused to do so as WOR was owned by R.H. Macy’s, the department store, one of the biggest newspaper advertisers in the city (Barnouw (1968), p. 21). This example, the willingness of large companies, such as Esso, to sponsor radio news shows, and the desire of non-network stations to use news to compete for listeners undermined the Biltmore program and by the late 1930s all of the radio networks had their own news departments. However, there was also a trend towards newspapers taking over

⁹ While the Biltmore program may seem surprising to us, in the UK the BBC also carried a very limited amount of news and did not develop its own news department when it was first created because of pressure from newspapers. See <http://en.wikipedia.org/wiki/BBC>, accessed February 28, 2014.

radio stations. In 1940 one-third of all radio stations were owned by newspapers, and in 100 US cities local newspapers owned the city's only radio station.

While radio continued to grow into the 1950s, when it began to face increasing competition from television, which was operated by the same networks, federal regulations started to impose important limits on the networks in the 1940s. In 1941 the FCC issued its *Report on Chain Broadcasting* (the network structure was referred to as 'chain broadcasting' because the links were AT&T's telephone cables). This led to new rules that made ties between stations and networks non-exclusive (allowing affiliated stations to buy programming from multiple networks), prevented the networks from demanding options on large amounts of station time (which allowed stations to develop their own programming) and shortened the length of time that a station was bound by a network contract from five years to one year (Hillard and Keith (2005), pp. 50-52). It also prohibited licenses from being issued to stations that were affiliated with a network organization that maintained more than one network, which was true of NBC.

When the new rules were upheld by the Supreme Court in 1943, NBC divested the Blue network which became ABC (Hillard and Keith (2005), p. 52). The shift of regulation towards favoring independent broadcasters continued until the 1980s. For example, in 1975 the FCC prohibited a newspaper from owning broadcast stations (radio or TV) in the same market (Gomery, 2002), a rule that was only relaxed in 2007 when the FCC adopted an approach of considering cross-ownership on a case-by-case basis (FCC, 2010), partly because of the declining finances of the newspaper industry.

The FCC also used regulations to promote locally produced and focused programming. In 1946 the Main Studio Rule required stations to have their main studio in their city of license, while Program Origination rules required that at least 50% of programming was locally produced, although this was achieved initially by airing local programming outside of primetime (Hillard and Keith (2005), p. 46; Silverman and Tobenkin, 2001). In 1950 an FCC *Report and Order* defined radio transmission as an “opportunity which provides for the development and expression of local interests, ideas, and talents for the production of programs of special interest to a particular community ... a station cannot serve as a medium for local self-expression unless it provides a reasonably accessible studio for the origination of local programs” (Hillard and Keith (2005), p. 48).

Faced by the expansion of television, with largely national programming, in the 1950s, a focus on local service was a natural commercial response too. At the same time, the spread of portable transistor radios and the development of car radios also led radio stations to focus more on daytime programming rather than trying to compete with television during primetime. While the 1950s is often viewed as a time of decline for radio, and it certainly did lose listeners to television, the industry did not decline financially. Radio’s total advertising revenues increased from \$624 million to \$692 million over the decade. The networks’ share of those revenues did, however, fall dramatically, from 25% to only 6% during the same time period (Sterling and Kitross (2002), p. 362).

The new focus also shifted the type of programming that stations offered towards music, first with the development of the Middle of the Road format, offering a wide range of music with

broad appeal, and then to the development of the Top 40 programming with a limited playlist of songs played frequently.¹⁰ This way of programming, combined with the fact that radio was the primary way in which listeners could learn about new songs, meant that it was very valuable for musicians and record-labels to secure places for their songs in the rotation. Therefore it is not surprising that the 1950s saw a number of so-called “payola” scandals where DJs were found to have accepted payments in return for playing particular songs (see Section 4.9.2 for more details).

The 1960s and 1970s also saw the steady transition of radio listeners from the AM band to the FM band, with FM first accounting for the majority of listenership in 1978. As well as the greater sound quality of FM (FM stereo broadcasts were allowed after 1961, while AM stereo was only approved in 1980), the rise of FM was also helped by a freeze on issuance of new AM licenses in the mid-1960s because of concerns about crowding and interference on the AM band.

The rise of FM was associated with two significant changes in radio programming. First, greater sound quality aided the rise of music programming, and there was a particularly rapid growth in the number of specialized music formats, many of them orientated towards rock music which was relatively little played on the MOR and Top 40 stations on the AM band. On the AM band, stations began to specialize into News, Talk, Sports and, at least in some regions of the country, commercial Religious programming. Second, the growth of FM listenership contributed to the rise of public radio broadcasting in the US, as a portion of the FM band (88.1 to 91.9) had been reserved for noncommercial broadcasters since 1945, whereas there was no similar reservation of

¹⁰ The name ‘Top 40’ is often attributed to the fact the jukeboxes held 40 records, and it was from seeing how jukebox users chose the same songs repeatedly that radio programmers started developing the format.

AM spectrum.¹¹ The 1967 Public Broadcasting Act led to the creation of the Corporation for Public Broadcasting, with National Public Radio (NPR) being created in 1971.

In the 1970s the FCC also enforced rules that required commercial stations to allocate 6-8% of their broadcasting time to public affairs. Since 1949 the so-called “Fairness Doctrine” required stations to “devote a reasonable percentage of their broadcasting time to the discussion of public issues of interest in the community served by their stations and that such programs be designed so that the public has a reasonable opportunity to hear different opposing positions on the public issues of interest and importance in the community” (Hillard and Keith (2005), p. 60).¹²

While most academic work on the radio industry has focused on what happened following the 1996 Telecommunications Act, this Act was only one of a series of deregulatory reforms that started under the Carter Administration, and which relaxed both regulations on ownership and regulations on programming content.

In 1987 the Fairness Doctrine was removed, under pressure from broadcasters who believed that it violated their rights under the First Amendment and tended to increase production costs. The rise of political, personality-driven talk radio on AM stations, involving controversial personalities such as Rush Limbaugh, is often attributed to the demise of the Fairness Doctrine

¹¹ The FCC first reserved spectrum for non-commercial educational radio use in 1938 (41–42 MHz band), before changing the reserved band to 88–92 MHz in 1945 (<http://transition.fcc.gov/osp/inc-report/INoC-31-Nonprofit-Media.pdf>, accessed February 15, 2015).

¹² Specifically in 1974 the FCC argued that previously it had not exercised its powers because broadcast stations had followed the spirit of the Fairness Doctrine voluntarily, but “would future experience indicate that [voluntary compliance] is inadequate, either in its expectations or in its results, the Commission will have the opportunity—and the responsibility—for such further reassessment and action as would be mandated.” (FCC, 1974).

(Soley, 1999).¹³ The main studio rule, which was also seen as being expensive for stations to implement (Silverman and Tobenkin, 2001), was relaxed so that broadcasters were only required to have a local studio *capable* of producing programming rather than actually using it. This started a trend towards more stations being operated remotely, and this trend was strengthened as it became possible to provide programming to local stations via satellite. The FCC also abandoned rules about regulating the amount of local content.

Changes in ownership rules involved a steady progression towards more relaxed standards. Prior to 1984, a broadcaster was limited to own nationally a maximum of 7 AM stations, 7 FM stations and 7 TV stations *nationally* (“the rule of the 7s”). That year the caps were raised to 12, 12 and 12, then in 1992 to 18, 18 and 12 respectively. The 1996 Act removed national ownership limits for radio stations entirely (FCC, 2010).

At the local level, prior to 1992 a broadcaster was allowed to own at most one AM station and one FM station, even in the largest markets where there might be 50 or more local stations. The 1992 reform relaxed these restrictions so that three stations (with at most two on one band) could be owned in markets with less than 14 stations, and up to four stations in larger markets (as long as they had a combined audience share of less than 25%). The 1996 Act relaxed the rules so that firms could own five stations where three could be owned before, and up to eight stations in larger markets.

¹³ In response to a Supreme Court ruling that the FCC was not required to enforce the Fairness Doctrine, both houses of Congress passed new legislation requiring the FCC to do so. However President Reagan vetoed this bill.

The 1996 Act was followed by a tidal wave of consolidation with 4,000 stations (out of 11,000) changing hands within 2 years and concentration increasing rapidly at both the local and national level (Hillard and Keith (2005), p. 72). For example, in the largest ten radio markets the average 4-firm concentration ratio (based on audience shares) increased from 0.61 in March 1996 to 0.82 in March 2001, while across all markets the average ratio reached 0.93 (these and the following figures are taken from FCC (2001)). This represented a significant tightening of the oligopoly structure of local radio markets. At a national level, in March 1996 CBS Radio was the largest station owner (by revenues) with revenues of \$496 million (6% of the industry total) and 39 stations, and it was focused in the largest markets. In March 2001 Clear Channel Communications had revenues of \$3.4 billion (26.2%) and owned 972 stations spread across the complete range of market sizes. It would have owned even more stations except for divestitures required by the Department of Justice in analyzing mergers such as its mammoth 2000 merger with AM/FM Inc., where the firms were required to sell 99 stations in 27 markets (US Department of Justice, 2000a). In practice, therefore, one might view the regular antitrust laws, which, when applied to radio, were focused entirely on the possibility that broadcasters might exercise market power over *advertisers*, as being as much of a barrier to concentration as FCC regulations designed to promote media plurality and to make sure that stations would serve the public interest of their *listeners* and the public more broadly. This represented a dramatic change from the situation 30 years earlier.

While many of these policy changes reflected the general move towards deregulation that affected industries from airlines to electricity, it also reflected the fact that from the early 1980s radio was facing pressure as audiences declined. Radio listening peaked in 1982 when people

listened for 18.2% of the time, but, they listened only 10.3% of the time in 2012.¹⁴ On the other hand, financially the industry as a whole performed relatively well both before and immediately after deregulation. In nominal terms, industry revenues rose from \$2.7 billion in 1981 (Duncan's Spring 1981 Market Report p.70, taken from numbers reported by the FCC which used to collect station financial information), \$8.0 billion in 1991, \$11.4 billion in 1996, \$17.1 billion in 2000 (numbers from Duncan's 2001 Market Guide, p. 7).

While most academic research has ended around 2006, it is worth noting a number of recent developments, many of them associated with media convergence, that may have changed the economics of the industry.

First, the Great Recession had a large impact on advertising revenues. BIA/Kelsey estimates that industry revenues fell from \$18.1 billion in 2006 to \$13.3 billion in 2009, and had only recovered to \$14.9 billion in 2013.¹⁵ This decline was associated with the bankruptcy of several large radio groups, such as Citadel Broadcasting, that had bought stations at significant multiples of revenues during the boom, and major layoffs at others, including Clear Channel (re-named as iHeartMedia in 2014).¹⁶ Partly because of financial pressures, station transactions have

¹⁴ Statistics based on Arbitron estimates for people aged 12 and above on and the hours of 6am to midnight (Radio Research Consortium, 2012).

¹⁵ <http://www.biakelsey.com/Events/Webinars/Tracking-the-Broadcast-Industry-MAPro.pdf> and <http://www.biakelsey.com/Company/Press-Releases/140326-WTOP-Leads-Radio-Station-Revenues-for-Fourth-Consecutive-Year.asp> (accessed February 14, 2015).

¹⁶ <http://www.cbsnews.com/news/radio-giant-citadel-declares-bankruptcy/> (accessed February 15, 2015) and http://www.nytimes.com/2009/04/30/business/media/30clear.html?_r=0 (accessed February 15, 2015).

continued to happen at a relatively rapid rate (for example, BIA/Kelsey recorded 869 station ownership changes in 2010).¹⁷

Second, while stations still derive the vast majority of their revenues from broadcast advertising, online advertising (whether in the form of website banners, email advertising or audio ads placed in the online audio stream) are becoming progressively more important, and bring radio stations into much more immediate competition with other local media that also compete online. Online distribution may also weaken some of the traditional barriers dividing geographic markets. For example, BIA/Kelsey estimates that online advertising accounts for 4% of radio industry revenues in 2014, and forecasts them to grow at 10% per year over the next 4 years, compared to 2% for traditional revenues.¹⁸

Third, non-broadcast sources of audio programming have become more numerous. Satellite radio has increasingly penetrated, particularly into vehicles. Since 2005 satellite has offered channels providing local weather and traffic information in larger urban areas. However, satellite radio has grown much more slowly than its initial backers hoped, and in 2013 only 10% of car listeners reported that they used satellite radio all or most of the time compared with 58% for regular AMFM radio (Edison Research, 2013).¹⁹ Internet radio services, including Pandora's

¹⁷ <http://www.biakelsey.com/Events/Webinars/Tracking-the-Broadcast-Industry-MAPro.pdf> (accessed February 14, 2015)

¹⁸ <http://www.biakelsey.com/Company/Press-Releases/140326-WTOP-Leads-Radio-Station-Revenues-for-Fourth-Consecutive-Year.asp> (accessed February 15, 2015).

¹⁹ In its prospectus for an IPO in 1999, XM radio, one of the two satellite radio companies at that time, cited estimates that 43 million people would be willing to pay \$200 for a satellite radio and XM's monthly subscription fee (<http://www.nasdaq.com/markets/ipos/filing.ashx?filingid=1004217>, accessed March 20, 2015). By 2008, XM Sirius, formed when the two companies merged, has 19 million subscribers (<http://www.forbes.com/sites/greatspeculations/2013/04/12/can-sirius-xm-tune-in-big-subscriber-growth-this-year/>, accessed March 20, 2015).

music streaming service, also provide a threat although traditional broadcasters have tried to develop online services to exploit the medium. For example, Clear Channel's platform, iHeart Radio, carries both terrestrial stations and offers services that allow users to create their own playlists that are designed to compete with Pandora. In 2013, 45% of the population reported listening to online radio in the last month, and these people listened for an average of 12 hours per week. The threat that Pandora offers to traditional radio's revenues, as well as its listenership, has also increased as the platform now sells local advertising in large markets.²⁰ At the same time, however, broadcast stations have exploited new technology to proliferate their channels, both by offering channels in HD, and using translator and booster stations to offer more programming to their broadcast stations.²¹

Finally, while syndicated political talk radio, usually of a conservative bent, was one of the big growth areas of radio programming in the 1990s and early 2000s, especially for AM stations, it may now be in retreat.²² While personalities such as Rush Limbaugh and Sean Hannity attract widespread media attention, pressure from social media has also made some advertisers reluctant to advertise on their programs, causing a shift back to less controversial News or music programming.²³

²⁰ http://www.crainsnewyork.com/article/20140421/MEDIA_ENTERTAINMENT/304209988/pandora-unleashes-sales-force-on-local-market (accessed February 14, 2015).

²¹ For example, AM stations use FM translators to put AM programming onto the FM band, while boosters are sometimes used to carry FM signals into places where FM signals cannot easily be received because of terrain. However, these services can also be used to carry programming that the station is carrying on its HD channels rather than on its primary AM or FM channel, and they are not included in the station counts used to determine whether a station satisfies ownership caps (conversation with Mark Fratrick of BIA/Kelsey, February 13, 2015).

²² The number of stations carrying political talk radio increased from 400 in 1990 to 1,400 in 2006 (<http://www.stateofthedia.org/2007/radio-intro/talk-radio/>, accessed February 15, 2015).

²³ <http://www.wsj.com/articles/talk-radios-advertising-problem-1423011395> (article February 6, 2015, accessed February 15, 2015).

4.3 Data

To study any industry in detail requires reliable data, and this is especially important when trying to study and interpret *changes over time* as much of the empirical literature on radio has tried to do. In this section I identify some of the sources that have been used most frequently by empirical researchers, and try to indicate some of the issues that need to be considered when using them.

Unfortunately for researchers, the FCC stopped collecting information on advertising revenues and programming content in the early 1980s. In its recent work on the industry the FCC has relied primarily on the radio version of BIA/Kelsey's *Media Access Pro* database (BIA hereafter).²⁴ This data has also been used by academic researchers, including Jeziorksi (2014a,b) and Sweeting (2009, 2013), who have focused on the post-1996 period. This database contains Arbitron (now Nielsen)²⁵ station ratings data for at least the Spring and Fall reporting periods each year, including some measures for demographic sub-groups, detailed programming format classifications, technical information (e.g., licensed transmitter power, signal coverage, including contour maps), information on station personnel and BIA's estimates of annual station, as well as market, revenues. As one would expect, these revenue estimates are closely related to audience size, market share and format but it is unclear whether this relationship reflects a very close relationship that exists in reality or just the relationship that BIA assumes when making its estimates. The database also contains a detailed ownership and transaction history for each

²⁴ <http://www.biakelsey.com/Broadcast-Media/Media-Access-Pro> (accessed March 1, 2015).

²⁵ Nielsen purchased Arbitron in 2013, re-branding Arbitron as Nielsen Audio (<http://www.nielsen.com/us/en/press-room/2013/nielsen-acquires-arbitron.html> , accessed February 15, 2015). As all of the work discussed in this chapter used data prior to 2013, I will refer to 'Arbitron' data.

station, dating back to well before 1996. For some transactions a price is recorded, but when groups of stations, possibly from different markets, are traded it may be very difficult to impute a price for each station. Recent additions to the BIA database include information on HD and multicast programming, and market-level estimates of online revenues.

Arbitron estimates commercial station ratings in over 270 geographic markets (the exact set of smaller markets are changed over time due to changes in market population). Arbitron markets are smaller than the Designated Marketing Areas (DMAs) used to analyze local television markets, and many of them coincide almost exactly with the Metropolitan Statistical Areas used by the US Census (Arbitron, 2009). Listening in rural areas outside of these urban markets is unmeasured. As part of its surveys, Arbitron also collects data on non-commercial listening. Examples of this data are available through the Radio Research Consortium (<http://www.rrconline.org>). While simple market share data is reported on a number of radio-related websites, detailed data for listening by specific demographics, which is valuable to advertisers who want to target specific population groups, is available through BIA subscriptions and through Arbitron.

The traditional way that Arbitron has measured audiences is by recruiting a sample of the population and getting them to complete diaries that record stations that they listened to for at least five minutes during quarter-hour periods. An obvious concern is that diary data may contain systematic misreporting, especially when listeners change stations frequently and may not always be aware of exactly which station they are listening to. In response to this concern, as well as a desire to get data to advertisers and stations more quickly, Arbitron began to switch to

using electronic Portable People Meters (PPMs) in larger urban markets in 2010.²⁶ This technology is able to record the programming that the wearer is exposed to, but of course not all people actively take in the programming that they are exposed to. For example, many people may encounter radio programs when they are at a dentist's office, for example, without actively listening to it.

One result of this difference in what is being recorded is that PPMs have led to higher estimates of station 'cume' ratings (the proportion of the population who listen to a station for at least five minutes during a particular daypart), but station shares, the average proportion of the population listening to a station at any given time, remained pretty much the same as diarists actually reported the stations that they listened to a lot quite accurately. The relationship between shares and cume is potentially important because, as will be discussed below, listeners who only listen to a single station (single-homing) may be much more valuable to stations than listeners who multi-home. There has been no formal research to date into whether this change in measurement technology has led to changes in station programming, even though, as will be discussed in Section 4.5.2, its introduction was especially controversial with minority-oriented broadcasters whose estimated ratings fell. In Section 4.7, I will also cite some evidence that suggests that PPM data may, for example, change traditional perceptions about how listeners respond to commercials. PPM may also have made it more attractive for stations to have 'special programming' segments (for example, a high profile sports event), as the more accurate PPM data allows them to make a more convincing case to advertisers that people actually listen to it.²⁷

²⁶ Unless otherwise noted, This discussion is based on "Arbitron PPM President Pierre Bouvard: "It's Radio's Turn to Eat at the Adult's Table", *Radio Ink*, August 1 2009, article by Reed Bunzel. <http://www.radioink.com/listingsEntry.asp?ID=370205>, accessed February 18, 2014.

²⁷ Conversation with Mark Fratrick of BIA/Kelsey, February 13, 2015.

To look at quarters before 1996 researchers cannot make use of BIA, but widespread use has been made of Duncan's *American Radio* quarterly Reports and annual Market Guides. Duncan ceased publication in 2002, but most of the reports back through the 1970s are available in pdf format, together with a wealth of information from other publications, on the website <http://www.americanradiohistory.com>. The Duncan reports contain Arbitron ratings and estimates of station revenues (see Duncan's 2002 Market Guide for a discussion of the sources used for these estimates). Some of Duncan's revenue numbers actually come from stations that simply passed on the revenue numbers calculated by the auditing firms that provide revenue information to licensing organizations such as ASCAP and BMI. Duncan also contains contemporary station ownership information and information on recent sales.

The Duncan reports also contain station format information. One thing to be aware of when using format information in Duncan (a caveat which may also be relevant for BIA) is that Duncan's format classification became finer over time. For example, Duncan's *American Radio* market report publications had 10 format categories in 1977, 12 in 1986, 21 in 1995 and 37 in 1998. In part this is to capture changes in radio station programming, as music formats did become increasingly specialized, partly because regulatory changes meant that stations did not have to broadcast a certain amount of news programming, but it also may reflect the fact that over time it became easier for Duncan to collect more detailed information on what stations were doing.

While the BIA or Duncan revenue estimates are useful, they do not facilitate estimation of fundamental demand and supply relationships in advertising markets, as they do not distinguish between the prices at which advertisers purchased commercials and the quantities of advertising that are sold. A common source of price data is ‘SQAD’ estimates of CPMs (the cost of reaching a thousand listeners) and CPPs (the cost of reaching one ratings point of listeners), which are based on actual transactions reported by media buyers.²⁸ This data is available at the market level, broken down by demographics and daypart. One limitation of this data is that it is not station-specific, so estimating the number of commercials by simply dividing estimated station revenues by prices (which researchers do in many contexts to estimate quantities) requires the strong assumption that different stations charge the same prices per listener. Such an assumption is likely incorrect, given an older literature noting that per-listener prices tend to increase with market share (Fisher et al., 1980) and the ability of station groups to potentially extract more surplus by bundling commercials. In addition, using average prices across stations will tend to make it harder to identify the effects of particular station mergers, especially when the number of stations is large.

Data on the quantity of commercials aired is more difficult to find, and typically relies on creating or identifying detailed airplay data. Knowing whether the quantity of commercials has increased or decreased is potentially important for understanding how consolidation has affected the welfare of advertisers. For example, Duncan (2004), p. 5, argues that most of the growth in radio industry revenues in the mid- and late-1990s, when rapid consolidation happened, was “caused by expanded inventory of radio spots. The healthy economy used up the increased

²⁸ Details of this data is available at <http://sqad.com/products/#spot-radio>. SQAD data also appears in the Standard Rate and Data Service reports <http://next.srds.com/for-media/premium-data>.

inventory but only at compressed prices”. As part of its 2006 media ownership review, the FCC commissioned a detailed analysis of airplay data that recorded information on many different types of content, including the amount of time spent on commercials. This data on 1,014 stations has been used by Chipty (2007) and Mooney (2010a). The limitations are that it contains information only on a single cross-section and that because the material was collected by a team of listeners, there is only two hours of programming for each station. As a result there may be considerable noise in inferring the average behavior of each station even at the time that the cross-section was taken. Sweeting (2009, 2010) uses panel data from 1998-2001 that was collected by Mediabase, an electronic monitoring service that compiles data on the airplay of contemporary music stations. In this data, the start time of each song is recorded, together with information on whether commercials or recorded promotional material appeared between the songs. This data allows for a rich analysis of the music that is played, and provides some measure of the amount of time that individual stations spent on commercials for a large number of hours, where the length of the commercials is imputed from the time between songs.

Unfortunately, I am unaware of systematic sources of information looking at the use of syndicated programming, which plays a very important role in political and sports talk radio, but also provides significant amounts of morning drive, evening and weekend programming on music radio stations. Potentially this type of data could be used to understand the effects of vertical integration as some of the main station owners also own producers of syndicated programming such as Premiere Radio Networks (Clear Channel). I am also unaware of any systematic data on which stations that are operated remotely or use voice-tracking, with the exception of one case-study mentioned in Section 4.5.3 below. This type of data would be very

important in an analysis of localism or of the effects of the changing interpretation of the main studio rule. Below I describe some work that has been undertaken on voice tracking based on case-studies of individual markets.

4.4 The Effects of Industry Consolidation on Market Outcomes: Theoretical Considerations

Given the rapid consolidation of the radio industry following the 1996 Telecommunications Act, most empirical work on radio has focused on trying to identify how consolidation has affected market outcomes, either in the market for advertising, where the outcomes include the prices and quantities of commercials and the welfare of advertisers, or the market for listeners, where the outcomes also include the available degree of programming variety. In this Section I briefly review the theoretical literature that predicts how consolidation should affect these outcomes. Readers should consult the chapters by Anderson and Jullien, and Foros, Kind and Sørsgard in the current volume for a more detailed discussion of the theory, including for cases where listeners pay for access to programming.

At the most basic level, how consolidation should affect the quantities and prices of commercials will depend on whether merged firms have more incentives to try to exercise market power in the market for listeners, where an increase in the ‘price’, which is the nuisance value of advertising which listeners have to listen to, will be associated with an increase in the quantity of commercials or the market for advertisers, where an increase in the price will be associated with a decrease in the quantity of commercials. The two-sided nature of the market means that one

side may benefit from a merger that creates market power even in the absence of cost synergies. I now follow Anderson et al. (2012) who provide a concise description of different types of modeling assumptions under which mergers may lead to market power being exercised primarily over one side of the market.

The most well-known model in the literature is the Anderson and Coate (2005) model of competition between symmetric horizontally differentiated stations. Listeners are assumed to dislike commercials and to single-home, meaning that they listen to at most one station. Stations choose how many advertisements to carry, where the market price of a listener declines in the number of commercials, reflecting the fact that advertisers are likely to be differentiated with some advertisers valuing reaching consumers more than others. Denoting the revenue per listener on station i as $R_i(a_i)$ and the number of listeners as $N_i(a_i, a_{-i})$ then the first order condition determining i 's optimal number of ads can be expressed as

$$\frac{R_i'(a_i)}{R_i(a_i)} = - \frac{N_i'(a_i, a_{-i})}{N_i(a_i, a_{-i})}$$

which implies that the elasticity of the revenue per listener will be set equal to the elasticity of the number of listeners with respect to the number of commercials aired. Under the standard assumption that the left-hand side of this equation is decreasing in a_i , a merger between all of the stations in this model will lead to *more* commercials being aired. This happens because, in this model, each station is always a monopolist in selling its listeners to advertisers, so that competition between stations is only for listeners and not for advertisers. Therefore, after a merger there is only increased market power in the listening market and the number of

commercials will tend to increase.²⁹ Because advertising quantities are strategic complements in this model, a partial merger will also lead to an increase in the number of commercials played on all stations, and a fall in the per-listener price paid by advertisers.

While the focus of the Anderson and Coate model is on advertising quantities, one can also ask what this pricing rule implies for how much stations want to differentiate from each other. Considering the simplified example of a two-station Hotelling line model of differentiation and assuming that only listeners care about programming differentiation i.e., from an advertiser's perspective a listener to a Rock station is as valuable as a listener to a Sports station, there are two quite standard forces at work. First, there is an incentive for independent stations to gravitate towards the center of the line in order to take listeners from the other station, increasing the value of their commercials. This is consistent with the logic of Steiner's (1952) analysis where he argued that advertiser-funded television would lead to programming that is too similar in the sense that stations would cater to the modal taste. However, a second incentive can operate in the other direction. Assuming that locations are chosen prior to the number of commercials being chosen, stations have an incentive to strategically differentiate so that they are less close substitutes for listeners, which reduces the elasticity of demand and allows them to play more commercials. As in standard formulations of the Hotelling line model with price competition between firms, excessive product differentiation may result, and a merger might be expected to reduce differentiation of stations' programming.

²⁹ In contrast, an increase in the number of competing stations will tend to reduce how many commercials are played in equilibrium, by increasing the elasticity of listener demand for each station.

Anderson et al. (2012) emphasize that a couple of different changes to the Anderson and Coate model may cause mergers to have quite different effects on advertising prices. Particularly relevant for radio is what happens when stations set a price per commercial to advertisers but at least some listeners ‘multi-home’, meaning that they choose to listen to more than one station. Suppose that advertisers value reaching a consumer once, but do not value reaching them additional times. A multi-homing listener can be reached through either station, which are then perfect substitutes from the perspective of advertisers who want to reach these listeners. In this case, a radio company can only extract value from advertisers for listeners who are exclusive to its stations.³⁰ If a merger makes more listeners exclusive to a single company then it is natural to expect that advertising prices will increase after a merger even if the number of commercials played on each station remains unchanged. The effect on advertising quantities will depend on the specific assumptions that are made about the heterogeneity of advertiser demands, the ability of stations to discriminate between different advertisers when setting prices and how listeners respond to advertising congestion on different stations.³¹

How does multi-homing affect incentives to strategically differentiate programming? Under the assumption that listeners will multi-home less when stations are more differentiated, Anderson et

³⁰ This logic ignores the fact that when an advertiser runs an ad on a station it may fail to reach a specific listener if, at the time that the ad is run, that listener is not tuned in. However even in a more general set-up that accounts for this (Ambrus et al. (2013) is an example), multi-homing will tend to reduce the marginal value of running an ad on an additional station. Of course, if hearing a commercial multiple times in different contexts reinforces the message being conveyed by the advertiser then the logic would reverse and multi-homing listeners would become more valuable.

³¹ Cunningham and Alexander (2004) present a model, based on a representative listener framework, which can generate a variety of effects on the quantity of commercials. Ambrus et al. (2013) develop a model of competition between media platforms where some consumers and advertisers multi-home. They show that under a variety of conditions listeners the quantity of commercials aired is the same when platforms compete or when they are owned by the same firm, and that the quantity of commercials may rise after entry. They present some evidence for the latter effect on cable television channels.

al. (2012) suggest that, if multi-homing listeners are less valuable, the incentive for competing stations to strategically differentiate will be strengthened. In this case, a merger between stations, which will reduce competition in the advertising market over multi-homing consumers, might be expected to make programming more similar.

In the context of radio it is not clear to me that the assumption that differentiation will reduce multi-homing is valid. When choosing which stations to preset on their car radios, for example, people may choose to have stations that are relatively different in order to cater to different moods at different times of the day (e.g., a favorite News station, a Sports station, a Lite Adult Contemporary station and a Top 40 station), while tending not to pre-program multiple stations that are very similar in nature. In this case, one might expect that the desire to avoid multi-homing might lead to at least some pairs of competing stations becoming very similar. Unfortunately, this is a conjecture and very little is known about the empirical relationship between programming variety and multi-homing, even though the theory clearly indicates that it is important.³²

On the question of whether multi-homing could lead to a common owner choosing to make its stations more similar than competing owners would, it is true that owners often choose to operate multiple local stations in similar formats. Berry and Waldfogel (2001) note this empirical pattern in the context of their examination of how consolidation affects product variety, where

³² In the context of the local newspaper industry Gentzkow et al. (2013) estimate a model of demand that allows for multi-homing and for how multi-homing across newspapers owned by different firms reduces the amount that newspapers can extract from advertisers, and how this affects incentives for product differentiation. To do so they use data from the 1920s and information from a number of surveys of readership that measure multi-homing. Arbitron's individual market reports do contain some of this information in the form of 'cume duplication' tables.

they find that 27% of randomly drawn pairs of local sibling (commonly owned) stations are in similar but not identical formats (e.g., Adult Contemporary and Hot Adult Contemporary), compared with 18% of randomly drawn local station pairs (ownership ignored). However, at the same time, they are less likely to operate them in exactly the same format, suggesting that a common owner's preferred strategy balances some incentive to cluster stations, which may be generated by economies of scope or a desire to deter entry, and incentives to differentiate in order to avoid excessive cannibalization.^{33,34}

4.5 Empirical Evidence on the Effects of Ownership Consolidation in Radio

The rapid growth of empirical research in Industrial Organization in the 1990s coincided with the consolidation of the radio industry following the various rounds of ownership deregulation. Radio was therefore a natural place for researchers to look at when trying to understand several different effects that mergers might have. I have divided this section into four parts. Sections 4.5.1 and 4.5.2 consider the effects of consolidation in local markets on outcomes in the advertising market and programming respectively. Sections 4.5.3 and 4.5.4 describe the more limited work that has tried to pinpoint the effects of consolidation at the national level and the size of cost efficiencies that consolidation may have realized.

³³ Sweeting (2005) reports an Infinity Programming Director in Cleveland, quoted in Billboard on October 14, 2000, describing how "I initially made that mistake when I was programming KPNT (The Point) in St. Louis. We made sure The Point and [sister station] The River were programmed so far away from each other that you could drop something in the middle of them and that's what the competition wants you to do."

³⁴ Of course, if a common owner does feel threatened by the possibility that other firms will program their stations too close to one of their existing stations then this would cast doubt on the argument that competing owners naturally want to differentiate to reducing multi-homing.

4.5.1 Empirical Evidence on the Effects of Local Market Consolidation on the Advertising Market

A number of papers, taking markedly different approaches, have tried to test whether increased ownership concentration in local radio markets has increased or decreased the price an advertiser must pay to reach a listener. Initially this literature was motivated by the fact that the antitrust analysis of radio mergers by the Department of Justice was focused on the welfare of advertisers, as the only customers of broadcast radio stations who actually make monetary payments (Klein, 1997). More recently, this literature might also be useful be motivated as a horse-race of whether models that assume that listeners single-home, which predict mergers will lower advertising prices, or models that assume multi-homing, which can make the opposite prediction, give a more accurate description of the industry.

Most of the literature has focused on trying to establish the *average* relationship between consolidation and advertising prices, although the ambiguity of the theory suggests that we might well expect to see significant positive effects in some settings and significant negative effects in others. Distinguishing these cases would potentially be important given the given the fact that mergers are analyzed on a case-by-case basis and that the authorities are often able to negotiate carefully targeted divestitures (e.g., Department of Justice, 2000a), and, as we shall see, two recent structural papers find evidence of differential effects.

The approach that most researchers have taken is to use a ‘reduced-form analysis’ where advertising prices are regressed on measures of ownership concentration. Brown and Williams

(2002) use a panel of data from 1996 to 2001, a period when local concentration, ownership concentration at the national level and real radio advertising prices all increased substantially. They regress the market-level, SQAD-estimated advertising price per 1,000 listeners aged 18-49 on measures of local concentration and ownership by national radio firms, market fixed effects and proxies for local advertising demand, such as market population and real income, and, to capture changes in national demand, either time effects or national GDP growth. They find that increases in local market concentration, as measured by revenue-based Herfindahl-Hirschmann Indices (HHI), are positively correlated with changes in local advertising prices, but that these changes only explain around 5% of the large increase in advertising prices during the period of their data.³⁵ They find that greater ownership by large national radio companies is associated with lower advertising prices. However, as they note, to interpret this second correlation it is important to recognize that SQAD-estimated prices are largely based on prices charged to regional and national advertisers who may be simultaneously buying commercials in several markets. The fact that national radio firms reduce prices to these buyers, with whom they may enjoy some economies of scope by selling commercials in many markets simultaneously, does not necessarily imply that they also reduce prices to local advertisers. This matters because local advertisers account for the majority of station revenues (2006 BIA data would put the average at around 70%, and it has subsequently risen to around 75%³⁶), and one might imagine that local advertisers are less able to substitute to other media than national advertisers.

³⁵ As part of its investigation into the merger between Global Radio and the Guardian Media Group's radio business, the UK Competition Commission (2013) performed a detailed price-concentration analysis, and found that "the presence of fewer good radio alternatives, and/or where the radio alternatives are not as good, is associated with higher advertising prices" (Appendix I, p. 11). Unfortunately the magnitudes are not disclosed in the published report for confidentiality reasons.

³⁶ Conversation with Mark Fratrick of BIA/Kelsey, February 13, 2015.

Chipty (2007) also estimates reduced-form regressions to examine the relationship between concentration and advertising prices, using a cross-section of data from 2006, but also using a wider range of SQAD prices (for example for different dayparts, and measures based on both costs per thousand listeners and costs per share point) than Brown and Williams. Chipty finds no significant relationship between local concentration and her measures of advertising prices, but, like Brown and Williams, she finds a weak negative correlation between ownership by national radio firms at the local level and prices, once she controls for market demographics. However, this carries the same caveat about interpretation as the Brown and Williams study, and in fact, using a sample of data on programming content, she shows that there is no significant relationship between the national ownership and the quantity of advertising on the radio, whereas a general decline in advertising prices would have led one to expect an increase in the amount of advertising. Sweeting (2008) does find a positive effect of ownership by large, national radio companies on the number of minutes of advertising using a panel of playlist data from relatively large music stations during the time period 1998 to 2001. The effect is of moderate size: around 0.6 more minutes of commercials per hour, or roughly 5% of the average commercial load for one of the stations in the sample.³⁷ Consistent with the lack of price effects of changes in local concentration in the other reduced form papers, Sweeting finds no significant effects of changes in local concentration on how many commercials are played. Therefore one can summarize the reduced-form literature as finding no significant effects of local consolidation, and some

³⁷ Sweeting's analysis is based on imputing the number of minutes of commercials using gaps between songs when some commercials were being played. It is therefore possible that this result instead reflects the fact that national owners tend to insert more non-commercial talk programming (for example, promotions, sponsorship information) around commercial breaks rather than increases in the length of breaks themselves. Sweeting also looks at hours outside the morning drivetime period, which has been the focus of other studies.

evidence that national consolidation raised advertising quantities and reduced prices to national advertisers.

Two recent papers, Mooney (2010b) and Jeziorski (2014a), have taken structural approaches to understanding the relationships between local concentration and market power in the advertising and listening markets. The potential advantage of structural approaches is that they may be able to disentangle complicated relationships in the limited available data by imposing the structure of an economic model and assumptions about firm behavior, and they can also allow us to translate changes in the amount or price of advertising into effects on welfare. On the other hand, the conclusions may depend on how modeling assumptions made by the researcher interpret the data. This may be particularly true in this case, as, for example, the models used both assume that listeners single-home, by estimating discrete-choice models of listener demand, rather than explicitly modeling the possibility of multi-homing. Unlike in standard Anderson and Coate-style theoretical models with single-homing listeners, however, they allow for the price of advertising on a particular station to depend on the quantities of commercials that are aired on all stations, so that, potentially, a common owner might restrict the quantity of commercials to raise advertising prices. Therefore, even though listeners single-home, it is not imposed by construction that station mergers should lead to more commercials being aired.³⁸

Jeziorski (2014a) estimates an equilibrium model of a two-sided market using a panel of data from 1996 to 2006. The data includes market-level SQAD advertising price estimates, Arbitron data on station audiences and BIA data on station formats, ownership and BIA's estimates of

³⁸ On the other hand, a valid objection is that these models do not provide an explicit rationale for why stations would be substitutes for advertisers.

station revenues. Jeziorski estimates that local consolidation led to quite large, 17%, reductions in the amount of advertising heard by the average listener, with corresponding a 6.5% increase in per-listener advertising prices. These changes are estimated to be largest in smaller markets, where the advertiser demand for radio advertising is estimated to be less elastic, reflecting the fact that there may be more limited alternatives to radio for advertisers in smaller cities. As I will return to Section 4.5.2, the effects on listeners can be quite complicated because of the way that a common owners may re-distribute commercials across stations, and the way that changes in advertising quantities interact with changes in station formats.

Mooney (2010b) estimates a similar type of model using data from 1998 and 2003, and reaches the conclusion that, on average, the effect of increased concentration was to increase the quantity of advertising. The overall conclusion about how advertising changed is therefore the opposite of Jeziorski. The difference may be due to the fact that the papers treat what is known about the quantity of commercials quite differently. Jeziorski assumes that the quantity of advertising on each station can be calculated using BIA's estimates of station revenues, SQAD advertising prices (per-share point) and station ratings. Mooney assumes that it is not observed. Instead she matches a moment based on the average amount of advertising reported in Sweeting (2008). Sweeting's measure is based on a sample of successful music stations, so it may not be representative of the industry as a whole.³⁹ Jeziorski's approach has the potential advantage that it creates an advertising quantity variable for almost all stations (BIA does not provide revenue

³⁹ Jeziorski estimates that stations played, on average, 37.5 minutes of commercials per day between 1996 and 2006. This estimate is much lower than estimates based on airplay data (e.g., Sweeting, 2010)) or contemporaneous industry reports (Radio and Records, April 21, 2000 cited by SchardtMedia, http://schardtmedia.org/?page_id=80, accessed February 21, 2015) that indicate that stations played around 12 minutes of commercials per hour on average in 2000 and 2001. Of course, for the conclusions of the study, what would matter is if differences between imputed and actual quantities vary systematically with station ownership or over time.

estimates for some smaller stations, but for this exercise this problem should not be too important) that can be used in estimation of listener and advertiser demand. In contrast Mooney's estimates are likely to be more dependent on the assumed structure of the model to give predictions about how the quantity of commercials varies across stations and over time. However, Jeziorski's approach obviously depends on any systematic errors in the revenue estimates and SQAD prices not being correlated with changes in consolidation.⁴⁰ Future work using better data on the quantity of commercials could clearly help us to understand what the true relationships are with more confidence.

While they may disagree on the direction of the average effects, both papers emphasize that the effects of consolidation may be heterogeneous, causing significant increases in advertising prices in situations where advertisers' demand is less elastic. Mooney finds that this is likely to be the case for minority populations, which radio might be more effective at reaching than other media. In Mooney (2010a) she finds additional support for this conclusion using the advertising quantity data reported by Chipty (2007), which suggests that when a single firm owns a group of Urban stations, which appeal to black audiences, they tend to restrict how many commercials are played. Jeziorski estimates that advertiser demand is less elastic in smaller markets, where there may be fewer media alternatives. Both papers therefore make the plausible point that some mergers may be much more troubling from an antitrust perspective than others, and they give some guidance on where (smaller markets or minority-focused stations) the antitrust authorities should look for problems or require stronger evidence of efficiencies.

⁴⁰ As discussed in Section 4.3, SQAD prices may be more reflective of the prices paid by national advertisers, who disproportionately advertise on stations owned by large firms, rather than those paid by local advertisers.

There have been no academic studies of what has happened to advertising prices after 2006. However, discussions with at least one industry expert indicate that the quantity of commercials aired on most stations may have fallen quite significantly to around 8 minutes per hour in 2015, from the 12 or more minutes per hour observed around 2000.⁴¹ Understanding whether this change has been driven by the exercise of market power, or changes in demand, as listeners or advertisers have become more able to substitute to other media seems to present an interesting topic for future research that could also help to improve our understanding of what happened in earlier years.

4.5.2 Empirical Evidence on the Effects of Local Market Consolidation on Product Differentiation and Variety

Another strand of the empirical literature has studied the relationship between local market ownership concentration and either the aggregate variety of programming that is available or measures of differentiation between different stations. These studies have been motivated by the fact that, even though antitrust analysis of radio mergers has focused on advertising price effects, changes in product variety or positioning may themselves have large effects on listener welfare as well as affecting how mergers change advertising prices. In addition, changes in station programming occur quite frequently, although format changes can be costly (Sweeting (2013) and Jeziorski (2014b) provide estimates of these costs). Another motivation comes from the perception that radio programming has become more homogenous across the country in the last

⁴¹ Conversation with John Lund of Lund Media Research, February 20, 2015. As will be discussed in Section 4.7.4, Clear Channel was one of the first firms to explicitly have a policy of reducing the number of commercials, with its ‘Less is More’ strategy in 2004.

two decades, and there is interest in testing whether the popular presumption that this is due to the increasing role of media conglomerates such as Clear Channel is correct.⁴²

Before discussing the empirical evidence in more detail, it is worth pointing out that one can think of measuring differentiation or variety in radio programming in a number of different ways. In a standard, two-firm Hotelling line model it is usual to think of an increase in the degree of differentiation between the firms as synonymous with an increase in variety. But things become potentially more complicated when we enrich the model so that it can more realistically be applied to radio markets. For example, within many formats in large urban markets, there are three or more stations. How should we measure variety when some sub-groups of stations are quite similar to each other? Even more importantly, how should we account for the fact that a given station may play several different programs and, in the case of music stations, hundreds of songs in the course of a single day? For example, if two stations both use identical playlists with 500 songs, but rarely play the same songs at the same time, is there more or less variety than if the stations use two playlists that do not overlap at all but only have 50 songs each? In the empirical literature, a number of different metrics have been used, and some of the differences in the results may reflect these choices.

Berry and Waldfogel (2001) examine how ownership concentration affects aggregate variety using quasi-experimental variation created by the 1996 Telecommunications Act. While the Act raised the limit on how many stations a single firm could own in all markets, the increases were greater in larger markets, or more specifically markets with more stations. For example, in

⁴² Future of Music Coalition (2003) provide evidence that formats have become increasingly homogenous and link this to consolidation. Foege (2009) argues that Clear Channel, in particular, has been responsible for a decline in the variety on radio.

markets with more than 45 stations (true of the largest US cities such as New York and Chicago), the limit increased from 4 stations to 8 stations, while in markets with 15 to 30 stations, the limit only increased from 4 stations to 6 stations.⁴³ Berry and Waldfogel therefore try to infer the effect of increases in common station ownership by examining how variety, measured by a count of the number of programming formats available in a market, based on format definitions in Duncan's *American Radio* publications, changed differentially across markets of different sizes between Spring 1993 and Spring 1997, around the time of the Act. This identification strategy assumes, of course, that other formatting trends affected markets of different sizes in the same way over this time period.⁴⁴ Their results are consistent with ownership concentration increasing variety, although they also show that firms owning multiple stations tend to cluster stations in similar, but not identical, formats (for example, Soft Adult Contemporary and Hot Adult Contemporary). At the same time, in their working paper (Berry and Waldfogel, 1999b), they find no effect of ownership on total listenership, using the same identification strategy.

In contrast, Sweeting (2010) uses detailed station-level playlist and station-level Arbitron audience data for a sample of contemporary music stations to examine how common ownership affects product differentiation between particular stations and station-level audiences. The focus is on stations in the same broadly defined format category (part of BIA's detailed format

⁴³ Originally the rules were defined using so-called 'contour rules' that examined how many stations' signal coverage areas overlapped. However, these rules were fairly opaque to apply which created a degree of legal uncertainty for firms considering ownership transactions. In 2003 the FCC decided to use station counts based on Arbitron market definitions. See, FCC Report, Order and Notice of Proposed Rule Making 03-127 (http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-03-127A1.pdf, accessed January 2, 2014). However, this change led to some strategic manipulations of which stations were included in Arbitron local markets, so some additional rules were introduced (see discussion in <http://www.commlawblog.com/tags/arbitron-market-definition/>, accessed January 2, 2014).

⁴⁴ Berry and Waldfogel try to address this using earlier data and a difference-in-difference-in-difference specification. However, the possibility that there were some changes in formatting or music classification that particularly affected the largest radio markets in the mid-1990s remains a potential concern.

classification system), which collects together stations in similar formats. For example, the ‘Adult Contemporary’ format category contains formats such as Adult Contemporary, Soft AC, Lite AC, Lite Rock and Soft Rock. The identification strategy involves looking at how the similarity of station playlists, measured in various ways, changes when pairs, or small groups, of stations become commonly owned or cease to be commonly owned.⁴⁵ Consistent with the spirit of Berry and Waldfogel’s results, in the sense they view the driving force behind increased variety as a desire to avoid audience cannibalization, Sweeting finds that common owners tend to differentiate their stations. He also finds that the merging stations tend to significantly increase their combined audience.

However, Sweeting also shows that, at the same time, common owners make at least some of their stations more similar to stations owned by other firms, and that the listenership of these stations tends to fall, by about as much as the merging stations gain, so that when one looks at format listening as a whole ownership consolidation is not associated with significant changes, consistent with Berry and Waldfogel’s (2001) listenership result. To capture the intuition for what seems to happen, suppose that there are three independent stations, A, B and C, arranged in a two-dimensional product space, and that initially they are arranged symmetrically (say, at the vertices of an equilateral triangle). Following a merger between the owners of stations A and B, suppose that the new common owner differentiates them by moving B further away from A.

⁴⁵ One approach defines different artists as different dimensions of the product space, and then uses a station’s playlist to identify a location in this high-dimensional space. The difference between two playlists can be measured by the angle between the location vectors at the origin. Alternative approaches include simply looking at the proportion of playtime devoted to artists who are not played at all on other stations, and, for small groups of stations, the total number of different artists played. In a working paper (Sweeting, 2004), Sweeting also projected the main artists in a format category into a two-dimensional space and then placed the stations in this product space based on the artists appearing on their playlists. All of these measures produce qualitatively similar results.

Potentially it could do so by making the station more differentiated from C as well, but the data suggests that it actually makes at least one of its stations more similar to C than it was pre-merger, to try to take listeners from C, as might happen in a spatial model where price competition is relatively limited, and, as seems plausible for radio, there is limited to scope to increase total radio or format listenership by introducing completely new programming.⁴⁶

Sweeting's results come with the caveat that there is no quasi-experimental variation in ownership at the station level. Reassuringly however, the patterns in the data are quite similar looking at both changes in local market structure that result from very large national transactions involving many hundreds of stations in different markets and different formats, such as the 2000 AMFM-Clear Channel transaction, and local transactions involving trades of stations in an individual market. For large transactions, the claim that an omitted variable that was causing changes in differentiation to occur could also have caused the change in ownership seems particularly unlikely.

Subsequent research using station-level data on programming content has found results consistent with the claim that common owners differentiate their stations when they are in the same or similar formats. For example, Chipty (2007), using her cross-section of data collected by the FCC, finds some evidence that this is true for both music and non-music (e.g., news and sports) programming. On the other hand, recent results using stations' reported format labels, such as Waldfogel (2010a) who examines how ownership affected news programming in 2005 and 2007, have tended to find weaker relationships. As well as reflecting the fact that format

⁴⁶ Studies by Borenstein (1986) and Rogers and Woodbury (1996), using data from prior to ownership deregulation support the contention that there is significant cannibalization both within programming formats and at the aggregate level.

names are necessarily coarse measures of content (for example, a politically right-leaning and a politically left-leaning talk station might be quite different, but both would usually be reported as being in the ‘Talk’ format), this pattern may also reflect the fact that the type of detailed format names used in this type of study could often reflect differences in station marketing rather than real differences in content. From a research perspective, the fact that format names may be of limited use for some questions of interest is unfortunate because these labels are much more accessible to researchers than airplay data.⁴⁷

As mentioned in the previous sub-section, Jeziorski (2014a) quantifies the welfare effects of changes in consolidation between 1996 and 2006. His structural model allows him to identify effects that come through station owners being able to change their station formats. The effects, and the implications for welfare, are quite complicated because common owners are predicted to engage in some redistribution of commercials across stations (see his Table 15 for a full breakdown of the results). Jeziorski estimates that, holding advertising quantities fixed, the increase in format variety between 1996 and 2006 would have raised listener welfare by 0.3%. Changes in advertising quantities – where owners of multiple stations tend to redistribute commercials towards their more popular stations – tend to slightly reduce the gain to listeners (so their welfare only goes up by 0.2%), but advertiser surplus falls substantially by 21.4% as advertising prices rise and listeners redistribute across stations to avoid commercials.⁴⁸ In

⁴⁷ Of course format labels are useful for asking questions about the provision of (say) News, classical music or Spanish-language programming where a coarse classification is sufficient. One should, however, be aware that format classifications can, in some ways, be both too coarse but also sometimes too fine. For example, Soft Rock and Soft AC stations often have almost indistinguishable playlists.

⁴⁸ One feature of Jeziorski’s model that leads to this result is that common owners can increase the price of advertising by redistributing commercials from their least popular to most stations even if this increases the total number of advertising exposures. This would not be possible if the advertising price per 1,000 was assumed to be declining in the number of exposures.

contrast, advertiser welfare would only fall by 5%, and listener welfare would be essentially unchanged, if advertising quantities were allowed to change with formats held fixed. Unfortunately, because listeners do not pay a price for listening to the radio it is not possible to compare the effects on listeners and advertisers in dollar terms. However, for both sides of the market Jeziorski's results suggest that welfare effects that come through changes in product positioning are greater than the changes that come through advertising prices when programming is held fixed. This is an important conclusion, which is also consistent with the results of Fan (2013) from local newspaper markets, as most merger analyses consider only price and quantity changes, treating product varieties as given.

A separate but related strand of the literature has examined how well radio serves minority audiences, and how this may have been influenced by ownership consolidation. This is partly motivated by the concern in early theoretical work, such as Steiner (1952), that competing media outlets would provide insufficiently differentiated programming as they competed for the ears or eyes of the majority. A different concern is that large, publicly-traded corporations may be less willing or able to serve minority audiences than local broadcasters and/or businesses owned by minorities, an issue which may be compounded by the fact that minority listeners may be less valued by potential advertisers. In the 1970s the government started the Minority Telecommunications Development Program (MTDP) to facilitate minority ownership of broadcast stations⁴⁹, and as part of its 2004 decision requiring the FCC to re-examine a number of relaxations to ownership rules for radio and television stations, the Court of Appeals for the

⁴⁹ http://en.wikipedia.org/wiki/Minority_ownership_of_media_outlets_in_the_United_States (accessed February 25, 2014)

Third Circuit re-affirmed the validity of promoting minority ownership as a goal for media policy.⁵⁰

One reason why this question is interesting is that the black and Hispanic populations tend to have different programming tastes to the rest of the population. For example, around 50% of black (Hispanic) listening is to stations in Urban (Spanish-language) formats, whereas Urban stations account for less than 5% of non-black listening and Spanish-language stations, unsurprisingly, attract almost no non-Hispanic listeners.⁵¹ As part of his research on preference externalities, Waldfogel (2003) shows that increases in the number of blacks or Hispanics in a market has a large and statistically significant effect on the number of Urban or Spanish-language stations, so that it is minority populations in markets where they really are minorities that are most likely to be underserved. One issue that has affected minority-oriented stations in recent years has been the introduction of the Arbitron's Portable People Meter measurement technology. PPM estimates of Spanish-language and Urban station listenership were significantly lower than estimates based on more traditional diaries, and industry experts have suggested that these lower estimates, by making advertisers less willing to pay for commercial time, may have led to a significant reduction in the number of minority stations in recent years.⁵²

This leaves open the question of whether station ownership affects the extent to which minorities are served, as stations owned by non-minorities might still seek to serve minority audiences. Siegelman and Waldfogel (2001), using data from the 1990s, and Waldfogel (2011b), using data

⁵⁰ 373 F.3d 372, p. 35.

⁵¹ Religious programming also attracts large minority audiences. See Arbitron (2012b,c) for details on format listenership for minority groups.

⁵² Conversation with John Lund of Lund Media Research, February 20, 2015. See Napoli (2010) for an extended discussion of controversies regarding PPM.

from 2005 to 2009, provide some results. They show that while there may be no general relationship between ownership concentration and the provision of minority programming, when minorities actually own stations the number of stations targeted at minorities tends to increase. This, of course, suggests the need to better understand how allowing greater consolidation affects the number of stations that are minority-owned. Here, evidence presented by pressure groups, such as Free Press (2007), suggest that minority groups only control a relatively small proportion of radio stations even in markets where minorities actually constitute a large majority of the population.⁵³ The lack of female ownership or control is also more striking with only 6% of stations owned by females and less than 5% of stations being owned by companies with a female CEO.⁵⁴ This is surprising in the sense that women make the vast majority of retail purchases and it is these shoppers that advertisers would really like to reach.

One consequence of pressure to expand minority ownership in the face of increasing consolidation of the radio industry has been the licensing “Low Power FM” stations, most recently under the Local Community Radio Act of 2010.⁵⁵ These stations have limited range (typically around 5 miles), but around 759 of these stations are currently on-air.⁵⁶ With the exception of Brand (2004), who describes an earlier program for licensing these stations in the early 2000s, there has been no research studying how successful these stations have been at

⁵³ Table 22 of Free Press (2007) indicates that only Laredo, TX, where 95% of the population is minority has a majority of stations owned by minorities. Overall, 7.7% of full-power commercial stations are owned by minorities. Unfortunately, the FCC only started tracking racial and ethnic ownership after 1996, so it is not possible to do a comparison with the period prior to the Telecommunications Act.

⁵⁴ On the other hand, Radio One, a market leader in the Urban format was founded by a black female who remains President of the company (http://en.wikipedia.org/wiki/Cathy_Hughes, accessed February 27, 2014).

⁵⁵ http://en.wikipedia.org/wiki/Low-power_broadcasting (accessed February 25, 2014).

⁵⁶ This number is taken from the LPFM database at <http://www.angelfire.com/nj2/piratejim/lpfm.html> (accessed February 25, 2014).

expanding diversity of ownership or programming, and, indeed, there is almost no data available on how many listeners these stations have been able to capture.

4.5.3 Empirical Evidence on the Effects of National Consolidation on Listeners and Advertisers

In line with the vast majority of the literature, so far I have concentrated on how *local* ownership consolidation affects programming content and equilibrium advertising quantities and prices. On the other hand, consolidation at the national level, by firms owning stations in many local markets, may also have important effects. Unfortunately these questions have not really been studied even though the phenomenon that chains are active in many different local markets is a common feature of retail industries, and, because of a tradition of regulating national ownership, radio appears to be a good setting for looking at the effects of chain ownership.

There are at least two ways in which national ownership might have quite positive effects on at least one side of the market. First, national owners may be able to sell advertising more efficiently to large regional or national advertisers by using national sales teams, possibly by bundling commercials across different stations.⁵⁷ This may tend to increase the equilibrium amount of advertising, as suggested by some of the evidence in Section 5.1, although it may squeeze the amount of time available to local advertisers. National advertisers may also benefit from firms developing a set of radio ‘brands’ that appeal to similar listeners across the country,

⁵⁷ The UK Competition Commission’s (2013) report on the merger of Global Radio and Guardian Media Group provides a discussion of how Global served large, national advertisers through a specialized sales force. It also sold advertising time to national advertisers for some small radio firms. Smaller advertisers would negotiate with stations directly.

so that ads can be tailored to match programming in a natural way.⁵⁸

Second, national owners may be able to increase programming quality for listeners, especially if their stations are concentrated in similar formats. One way they might do this, as laid out in a model in Sweeting (2004), would be by pooling the results of their (imperfect) research into what listeners want to hear from across many different markets, so that in the end they are more likely to pick better music selections.⁵⁹

However, there are also models where this type of homogenization is much less desirable. In a model with two manufacturers and two retail outlets located in different local markets, Inderst and Shaffer (2007) show how a multimarket retailer may choose to inefficiently single source products for markets with different tastes in order to extract more rents from manufacturers in a bargaining game. They argue that this type of single-sourcing could lead to more negative welfare consequences than within-market concentration, consistent with the evidence cited above that changes in product characteristics can have larger welfare effects than changes in pricing. This model could potentially apply to radio if we replace ‘retailer’ with ‘station’ and ‘manufacturers’ with the ‘producers of syndicated programming’. At least in music radio, however, one reason why this model may not work is that music has traditionally been licensed

⁵⁸ For example, in its report on the Global Radio and Guardian Media Group merger, the UK Competition Commission (2013) noted that “one agency said that Global had shown its commitment to building and investing in strong national brands that could compete against the BBC for listeners and that this had helped to make commercial radio more attractive to advertisers. Another large agency said that Global had contributed significantly to a revitalized radio industry making radio attractive to advertisers through an increase in audiences, better quality programming and easier access to larger audiences through branded networks.” (p. 87).

⁵⁹ This model is consistent with the fact that the CEO of Clear Channel estimated that it spent \$70 million on music research (Rolling Stone.com, August 13, 2004) and that programmers in different markets at large companies usually hold weekly conference calls to discuss what they are adding to playlists (an article in Billboard, November 16 2000 discussed how this worked at Infinity Radio).

using blanket licenses issued by ASCAP, SESAC or BMI, with terms that do not vary across companies, thereby removing the bargaining stage that drives Inderst and Shaffer's results.⁶⁰

An alternative story would be that national owners reduce quality because, by doing so, they can reduce production costs using methods that might not be feasible for independent stations. An example here is the use of 'voice-tracking' where a DJ located in one city can produce pre-recorded programming to be aired in a number of other, usually smaller, cities, but which still 'sounds local' in the sense that listeners are not told that the programming is pre-recorded and produced outside the market, and may contain references to local places or events.^{61,62}

There are two divergent attitudes to voice-tracking. The first view is that it allows high-quality talent to be used in smaller markets, where talent of this type could never be afforded if the presenter had to be physically present in the market where the broadcast was aired. The alternative view is that even if the outside presenter is skilled, some important element of quality must be lost when the presenter is not familiar with the local market or simply that many listeners would dislike the fact that the programming is produced outside the market if they were actually aware of it. While it may be hard to rationalize why consumers should dislike the fact

⁶⁰ As will be discussed in Section 4.9.2, the use of general blanket licenses has recently begun to change as some large radio station owners, such as Clear Channel, have struck deals regarding fees for performance rights with record labels. Therefore one might believe that even if the insights of the Inderst and Shaffer model have not been relevant in the past, they may be in the future.

⁶¹ For an example of how Clear Channel used voice tracking in the early 2000s see "Clear Channel Uses High-Tech Gear to Perfect the Art of Sounding Local", Wall Street Journal, February 25, 2002 (<http://online.wsj.com/news/articles/SB1014589283422253080>, accessed January 2, 2014).

⁶² The use of pre-recorded programming is not new, as stations have used pre-recorded programming since the 1970s. However, prior to 1987, the FCC required that a majority of non-network programming should be produced at a local studio (FCC Report on Broadcast Localism and Notice of Proposed Rule-Making 07-218, 2007, p. 15, http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-07-218A1.pdf, accessed January 2, 2014). Recent technical innovations have also made it much easier to attain a local sound more efficiently using out of market presenters (for example, allowing a three hour music show to be produced in less than half an hour).

that presenters are outside of the market *per se*, such preferences are not necessarily invalid and it provides a possible explanation for the fact that broadcasters try to disguise the fact that out-of-market presenters are being used. A practical concern is that when all programming is produced outside of the market and stations are operated remotely, they may not be able to provide vital information in the case of sudden local emergencies.⁶³

The welfare issues associated with voice-tracking may differ quite substantially across programming formats. In music formats, any loss of welfare will likely depend on whether the pre-recorded programming contains a selection of music that is appropriate for the market. As long as it does so, and in fact music selection can vary across markets even if the DJ's talk segments are being voice-tracked, the fact that the presenter is based elsewhere is unlikely to affect quality very much, if at all.

Empirical evidence on homogenization and the use of out of market programming is extremely limited. Hood (2007) provides a detailed case-study of news programming over one week in one medium-sized market in the Western US, where the news stations primarily used newscasts produced from outside the market. Stations missed important local stories such as local flooding and a forest fire. It would obviously be interesting to assess the importance of local news coverage from a welfare perspective, but this will be difficult because the effects of local residents lacking adequate information about local issues may only show up slowly in

⁶³ The example that is usually cited is a train derailment near Minot, North Dakota that led to a poisonous gas cloud spreading towards the town. All six local stations were owned by Clear Channel and operated remotely, and local emergency services were unable to get information broadcast in a timely fashion. One person died and 1,000 people were injured in the disaster (Klinenberg, 2007).

measurable outcomes such as participation in local elections (see Section 4.9.1 for some related discussion).⁶⁴

Sweeting (2004) provides some evidence on whether firms that own stations in the same format but different geographic markets homogenize their playlists, using his panel of airplay data over the period 1998 to 2001. The results indicate that common owners do tend to increase the amount of playlist overlap, but the effects are quite small in magnitude. An interesting case study involves Clear Channel's 'KISS-FM' stations, in the Top 40/Contemporary Hit Radio format.⁶⁵ Clear Channel developed the KISS-FM brand and stations in multiple markets had almost identical logos and websites. However, stations' playlists displayed significant differences across stations. For example, in the first week of November 2001, KZZP-FM in Phoenix, AZ played 159 different songs (i.e., artist-song title combinations). However, only 49 of these songs were also played on the similarly-branded KIIS-FM in Los Angeles, CA. At the same time, KIIS played 109 songs that were not played at all on KZZP. One can infer that these differences reflect the fact that tailoring playlists to meet local tastes or local competition remains important. Sweeting (2004) also shows that stations owned by the largest national radio companies were able to increase commercial loads without losing listeners. This suggests that changes in programming tended to increase the quality of stations for listeners, at least on average.⁶⁶

⁶⁴ Schulhofer-Wohl and Garrido (2013) provide an interesting analysis of the effects of a closure a local newspaper in Cincinnati.

⁶⁵ While KISS-FM is a Top 40/CHR brand primarily developed by Clear Channel, the station KISS-FM, based in San Antonio, TX (ironically Clear Channel's home city), is not a Clear Channel station and is in the Rock format.

⁶⁶ Of course, it is possible that national firms are more able to tailor programming to attract the average listener, whereas they may reduce quality for music-lovers who desire greater variety in the music that they hear.

4.5.4 Economies of Scale and Scope

As well as understanding the effects of increased consolidation on advertisers and listeners, another strand of the literature has sought to provide estimates of the cost-side benefits to consolidation, which are relevant for welfare calculations even if consumers on neither side of the market are affected. Cost-side efficiencies potentially provide an explanation for why there was such rapid local consolidation after the 1996 Telecommunications Act given the fact that the empirical evidence indicates that the effects on both programming and advertising markets may have been relatively small.

The legislation was also partly motivated by a desire to allow owners, especially in smaller markets, to exploit economies of scale from operating multiple stations allowing more stations to remain open in the face of declining radio listening and the recession of the early 1990s. Sources of possible economies might include lower costs of selling radio advertising time in the form of multi-station packages, lower costs of increasing programming quality and lower fixed costs of operating as a result of being able to share employees and managers across stations.⁶⁷

As in the vast majority of industries, the costs of running radio stations cannot be observed directly both because accounting data is insufficiently detailed and, even when it is available, it

⁶⁷ Some direct evidence that some economies of scope from operating multiple local stations comes from the fact that an owner often operates multiple stations from the same location. For example, the 2010 Broadcasting & Cable Yearbook (R.R. Bowker (2010)) lists all four of the Infinity's FM stations that were licensed to the city of Boston as having their studio at the same address. Jeziorski (2014b) provides several interesting statistics on decreases in employment in the radio industry after 1996.

does not classify costs in the way an economist might want to do so.⁶⁸ Therefore it is only possible to learn about efficiencies from using information on other choices (advertising loads, formatting choices, ownership transactions), a structural model and assumptions on equilibrium behavior to infer what costs must have been to justify these choices. To date there has been no attempt to link the estimates to specific programming practices, such as voice tracking or remote operation, and doing so would be an interesting direction for future research to understand the welfare benefits, as well as costs, of these controversial innovations.

Jeziorski (2014a,b) provide recent examples of the structural approach to estimating synergies. In both cases, only synergies from local consolidation are considered. As part of his model of the advertising market, Jeziorski (2014a) allows firms that own multiple stations in the same format in the same market to have a lower marginal cost of selling advertising. He estimates that these efficiencies are significant (reducing marginal costs by 20%), an effect that is identified by the fact that commonly owned stations appear to reduce advertising quantities (recall the discussion in Section 4.3 and 4.5.1 about how these are imputed) less than market power considerations alone would predict.

Jeziorski (2014b) estimates the fixed cost synergies associated with operating multiple stations in the same market and in the same market-format using a model of endogenous mergers and product repositioning.⁶⁹ He finds that both types of efficiency are substantial. In particular, the fixed cost of operating a second station in the same local market is estimated to be only 44% of

⁶⁸ Audley and Boyer (2007) do provide some estimates of the different costs of running radio stations of different sizes in Canada.

⁶⁹ In Jeziorski (2014b) marginal cost efficiencies in selling advertising time are not considered, so some of these efficiencies may be attributed to fixed costs.

the fixed cost of operating the first station, although the synergies become smaller when more stations are added, while operating a second station in the same format is estimated to reduce fixed costs by an additional 38%. The dollar value of these proportional efficiencies are estimated to vary greatly with market size, as per station fixed costs, for independent owners, are estimated to be more than \$10 million in the largest markets, but less than \$100,000 in small markets.

Three features of the data and the model lead to the large percentage estimates of synergies. First, there was rapid consolidation in the period after 1996, and, while this pattern can partly be rationalized by market power motivations, the fixed cost synergies provide an additional motivation, in particular for adding a second station. Second, firms were more likely to buy, and maintain, additional stations that were in the same format as their existing stations than would be justified by revenue maximization given the estimated parameters. Third, multi-station firms choose not to take stations off-air even though they are cannibalizing audiences. This final source of identification is problematic, as the FCC would likely have removed the licenses of firms that kept stations off the air and re-issued them to competitors. This threat would likely remove the incentive to take stations off-air even without synergies.

O’Gorman and Smith (2008) estimate large efficiencies from operating multiple stations in the same local market using a static model where firms choose how many stations to operate. For example, their estimates imply that operating a second station only incurs an additional fixed costs equal to around 50% of the cost of operating one station. This estimate is therefore quite consistent with Jeziorski’s, although their model is far simpler. However, this model also fails to

account for the fact that if one firm does not to operate a station, the FCC would likely license a competitor to do so. Based on a dynamic model estimated using only information on format switching decisions, and not merger decisions, Sweeting (2013) also finds some evidence of efficiencies of operating multiple local stations in the same format, although they are generally not statistically significant and they are smaller than those in Jeziorski.⁷⁰

Less attention has been given to the question of whether there are substantial cost benefits to operating stations across different markets, either because they can share programming or some aspects of management (e.g., programming or news directors). These benefits would be interesting to understand given the growth of large, national radio companies described in the introduction and the emergence of firms that specialize in particular formats, such as Radio One in the Urban format or Univision Radio in Spanish-language formats.

4.6 Excess Entry

While most of the empirical literature has focused on understanding the effects of consolidation, a separate literature has asked whether, from a social welfare perspective, there are simply too many stations or too many stations of a particular type. As well as the fact that there are many stations in most radio markets, two features of the radio industry, lead one to expect that “excess entry”, in the sense of Mankiw and Whinston (1986), is likely: radio listenership is relatively inelastic, so new stations typically gain audience at the expense of existing ones, and many station costs are fixed, in the sense of not varying directly with the number of listeners served.

⁷⁰ For computational reasons, Sweeting also ignores observations where a firm moves multiple stations at the same time. However, as many of these moves involve moving stations into the same format, including these in the estimation would likely produce larger estimates of efficiencies. Therefore Sweeting’s estimates are almost certainly underestimates.

The first papers in this literature, Borenstein (1986) and Rogers and Woodbury (1996), used limited data on station listening in local radio markets to show strong evidence of business (audience) stealing in the listener market both at the aggregate level and within specific programming formats.

Berry and Waldfogel (1999a) estimated an endogenous entry model, combined with a model of post-entry competition where stations compete symmetrically for listeners and advertising prices decline in the number of listeners, using a cross-section of data from 1993. Stations are treated as being independent, which is also a reasonable simplifying assumption given that the data come from before the Telecommunications Act (although after ownership rules began to be relaxed). They ignore the value of product variety to listeners because, without prices, they cannot estimate listener welfare in dollars. Under their assumptions and ignoring integer constraints, excess entry is implied, so the interest in their results comes from the fact that they estimate that the degree of excess entry is really large. For example, they estimate that welfare would have been maximized by reducing the number of stations in San Diego market from 31 to 9, and in Jackson, MS from 17 to 3.

Two limitations of this analysis are that it is assumed that, having entered, all stations have the same quality and are symmetrically horizontally differentiated, and that all stations pay the same fixed costs from entering. In practice, this is not an appropriate assumption because while stations may pay similar prices for licenses (of a given power and signal coverage) and transmission equipment, they may then invest very different amounts in programming quality. A

better model of the industry is therefore one which fixed costs are largely endogenous and determined in equilibrium. A recent paper by Berry et al. (2013) addresses some of these limitations by allowing for endogenous entry, format differentiation and endogenous quality choices in certain formats, such as News/Talk, where they allow stations to choose to be either high or low quality (to be high quality requires a higher fixed cost). Using this more general framework, they estimate that there is still substantial excess entry and also excess investment in quality. The intuition for the latter is quite similar to the logic for why there is excess entry. When total listening (or format listening) is fairly inelastic, when a station invests in higher quality it is largely going to be gaining listeners, and their associated advertising revenues, from other stations. This type of business stealing, for quality improvement rather than entry, still implies that there will be excessive investment from a social perspective. Overall they find that welfare would be increased by reducing the number of both high and low quality stations by around one-half in formats where there tends to be more than one station in a market.

One could imagine relaxing their remaining assumptions in several directions. For example, a more realistic model of the advertising market might allow advertisers to benefit when they can reach homogenous audiences that can only be achieved when there are many stations offering niche programming. Alternatively, one might model investment in programming quality in a richer way to capture the fact that there is a lot of persistent heterogeneity in the audiences of stations in the same format. For example, in markets with multiple News stations in Fall 2006, the leading station has, on average, an audience that is two-and-a-half times as large as the second-ranked station, and in 82% of these markets the same station was the leader ten years

earlier. Of course, a model of programming investments could also be used to extend our understanding of how consolidation has affected listeners and advertisers.⁷¹

Another interesting direction would be to analyze whether, even though there may be excess entry into radio markets as a whole, certain formats are underserved. Underprovision could result from listeners in these formats being less valued by advertisers; extra fixed costs that make it too costly for any firms to serve them in small markets; or, some extra social value to the programming that firms and listeners may not internalize. As mentioned in Section 4.5.2, this question has arisen in relation to minorities, and I will return to it in Section 4.8 when considering the role of non-commercial broadcasters.

4.7 Strategies for Retaining Listeners

As mentioned many times already, the business model of commercial radio is to sell audiences to advertisers. A challenge for this model is that listeners typically do not want to listen to commercials, and so may seek to avoid them, potentially undermining the value of a station's advertising inventory (interested readers should read the chapter on "Recent Developments in Mass Media" in this volume). The problem is even more severe for radio stations, especially music stations, than for local television stations because radio listeners are usually less concerned about missing the programming immediately following the break, so they may be more willing to switch stations.⁷² Indeed, when there are several stations playing similar music programming it is quite plausible that a listener who switches to avoid an ad will never return. If multi-homing

⁷¹ For example, in the structural models of Jeziorski (2014b), Mooney (2010b) and Sweeting (2013) station quality is treated as exogenous even if it can vary over time.

⁷² Television programmers try to exploit the fact that viewers will not want to miss the conclusion of a show by scheduling more frequent breaks towards the end of a program (Epstein, 1998).

listeners are more valued than single-homing listeners, then station-switching may be even more of a commercial problem. In this section, I will review evidence on how widespread station-switching and commercial avoidance really are, before considering strategies that stations may use to limit switching.

The traditional view of people in the industry is that avoidance of commercial breaks is widespread. An Arbitron-sponsored survey by Generali et al. (2011) found that 362 advertising agency executives reported that they believe that station audiences are, on average, 32% lower during commercial breaks than in the minutes leading up to the break, while station managers believe that they are 22% lower. Empirical evidence supported this view. For example, Abernethy (1991) placed cassette recorders in the cars of a sample of listeners and found that, on average, listeners switch 29 times per hour, primarily in response to commercials. Dick and McDowell (2003) estimate that in-car listeners missed half of the commercials that they would hear if they did not switch stations. These statistics on in-car listeners are relevant because about 35% of listening takes place in-car⁷³, with an even higher proportion during the morning and afternoon drivetime periods. In-car listeners have been estimated to be more than twice as likely to switch during commercials breaks than listeners who are at home or at work.⁷⁴

⁷³ This statistic is based on 2007 listening and data reported in Arbitron's Persons Using Radio report (<http://wargod.arbitron.com/scripts/ndb/ndbradio2.asp> , accessed January 3, 2014). The number is similar in earlier years.

⁷⁴ MacFarland (1997), p. 89, reports that, based on a 1994 survey, 70% of in-car listeners switch at least once during a commercial break compared with 41% and 29% of listeners who are at home or at work respectively.

On the other hand, Generali et al. (2011) claim that confidential Portable People Meter data shows that there is much less ad avoidance.⁷⁵ They estimate that, on average, only 7% of the audience is lost during a commercial break, and only 4% during breaks that are three minutes or shorter. However, the fall in audience is greater for listeners aged 18-34 (11%), which is one of the demographics most-valued by advertisers, and for music stations (12%, vs. only 1% for ‘spoken word’ stations).⁷⁶ Given the difference between these estimates and both industry perceptions and earlier results, it seems clear that more analysis of how much avoidance of commercials takes place, and who avoids them, would be valuable.

Based on the traditional perception, Brydon (1994), an advertising consultant, argues that “for advertisers, the key point is this: if, at the touch of a button, you can continue to listen to that [music] for which you tuned in, why should you listen to something which is imposing itself upon you, namely a commercial break?” He suggests that either stations should play very short breaks which would not make switching worthwhile or stations should “transmit breaks at universally agreed uniform times. Why tune to other stations if it’s certain that they will be broadcasting commercials as well?”. Unfortunately explicit coordination between stations is both potentially a violation of the antitrust laws, and, from a practical perspective, the fact that most stations in larger markets do not use pre-recorded programming makes it difficult to coordinate by starting and ending commercial breaks at precisely the same times. However, it is still plausible that stations might try to align their commercial breaks as much as possible even if

⁷⁵ As noted in Section 4.3, PPMs measure any contact the wearer has with commercial radio (for example, at the dentist’s office), rather than active listening. The earlier cited estimates are likely to be focused on active listeners.

⁷⁶ Unfortunately the study does not break out avoidance by location, but it does find that avoidance is particularly low during the morning drivetime period. This may be explained by many music stations carrying more talk programming during the morning drive than they do at other times of the day.

they cannot do so either explicitly or perfectly.

In aggregate, stations do tend to play commercials at the same time. Based on Sweeting (2009), Figure 1 shows how many music stations played commercials each minute between 5 and 6 pm, using data from the first week of each month in 2001. At least fifteen times more stations play commercials at 5:23, 5:37 and 5:52 than play them at 5:05. An obvious question is whether this pattern arises from a desire to coordinate on playing commercials at the same time or some exogenous factor that makes playing commercials at these times (and at similar times in other hours) especially attractive. Two such factors can be identified from radio programming manuals and discussions with radio programmers. First, listeners tend to switch on around the start of the hour, and they tend to be particularly likely to switch stations if they hear a commercial as soon as they switch on (Keith, 2000). Therefore stations avoid playing commercials at the top of the hour. Second, the way that Arbitron has traditionally measured station ratings means that a station's ratings may be increased if it keeps listeners over the quarter-hours (Warren (2001), pp. 23-24).⁷⁷

[FIGURE 1 ABOUT HERE]

Sweeting (2006, 2009) analyzes how far this pattern is driven by stations trying to coordinate stations using his sample of airplay logs from contemporary music stations. These logs identify not only the songs that are played, but also where commercial breaks or promotions are placed

⁷⁷ To be precise a station is credited with a listener for a quarter hour if that listener listens to the station for at least five minutes during the quarter hour. Therefore a listener who keeps listening between 5:25 and 5:35 can count as much as one who listens from 5:15 to 5:45.

between songs. One can then use information on when songs started and the length of songs to estimate whether stations in a market were playing commercials at the same time.

Sweeting (2006) presents a model where stations may either want to coordinate on breaks, which follows from the logic above, or they may want to have commercials at different times. As he shows, this could happen if stations, instead of trying to maximize the audience of their commercials, try to maximize their average audience. It is not unreasonable that this could be stations' objective, as Arbitron reports measures of average audience size, not the audience of the commercials.⁷⁸ Average audience may increase if stations play commercials at different times when coordination results in some listeners switching off the radio. These models give different comparative statics for how the degree of overlap should vary with observable market characteristics, such as the number of stations, station ownership structure and asymmetries in station listenership. In both cases the relationships should be stronger when listeners are more inclined to switch stations when they hear commercials, as they are during the afternoon drivetime, when there are many in-car listeners and few of the music stations in Sweeting's sample have talk programming.

The empirical evidence lines up fairly consistently in favor of the version of the model where stations prefer to play commercials at the same time even when exogenous factors that make some times good for playing commercials in all markets are controlled for. This suggests both that strategic factors contribute to the degree of overlap observed in the data and, perhaps more interestingly from an economic perspective, that, despite the fact that advertisers cannot directly

⁷⁸ Arbitron continues to aggregate PPM data into average quarter-hour listening data for advertisers, even though much finer data is collected.

observe how many people listen to their commercials, stations do appear to act to increase the audiences of the commercials, even if this might reduce their average audience. One reason for this may be that local advertisers actually have a good sense of how ads on different stations affect their sales⁷⁹, and this effectiveness determines how willing they are to pay for future advertising time. If this is the case, stations will want to maximize how many people actually hear their commercials.

Sweeting (2009) takes the analysis further by building a semi-structural model of the commercial timing decisions, in the form of a coordination game, that allows for the performance of counterfactuals.⁸⁰ In particular he considers what would happen if each station internalized the externality that its timing decisions imposes on other stations. For example, if station A does not play its commercials at the same time as station B then as well as reducing the audience for its own commercials it will also reduce the audience of B's commercials. The estimates suggest that while the preference to coordinate commercials has quite limited effects on the timing of commercials in equilibrium, in the sense that non-strategic factors lead to the basic pattern shown in Figure 1, commercials would overlap almost perfectly if these externalities were internalized, at least during drivetime hours. This also suggests another route through which ownership consolidation – which should incentivize and facilitate more coordination – should be profitable.

⁷⁹ For example, if listeners have to make a telephone call to make a purchase, then it is quite common for an advertiser to list different numbers on different stations so that they can monitor where their adverts are most effective.

⁸⁰ A motivation of doing so is that, in common with many discrete choice games, the game has multiple equilibria when strategic incentives are strong enough. The paper shows how the existence of multiple equilibria, here in the form of stations coordinating on playing commercials at slightly different times in different markets, helps to identify the strategic parameters.

Of course, there are other strategies that station may try to use to increase the effectiveness of ads although these have not received attention in the economics literature. An interesting issue here is that ads that are effective, in the sense that listeners can recall the product being advertised, may not be ads that listeners particularly like, creating a balancing act for stations who want to both carry effective commercials and also encourage listener loyalty. A set of studies have looked at different aspects of Clear Channel's 'Less is More' strategy, which was introduced in 2004 in order to try to reduce audience perceptions of advertising clutter.⁸¹ The strategy had three components: (i) reducing the total number of minutes of advertising; (ii) reducing the number of commercial breaks (or 'pods') so that there were fewer interruptions to programming; and, (iii) increasing the number of shorter commercials (e.g., 30-seconds) at the expense of traditional 60-second commercials. Together these strategies would allow Clear Channel to potential carry as many or more advertisements using a smaller number of commercial minutes.

Allan (2005) used laboratory experiments to compare the effectiveness of 30 and 60 second commercials on listener recall of the brand being described, finding that the shorter commercials are only half as effective, even though the price of these slots was believed to be 60-70% of that for the longer commercial.⁸² Potter (2009) also finds that listener become more disengaged when there are more commercials within a pod, and that more, but shorter, ads lead to listeners overestimating the total time spent listening to commercials. Potter et al. (2008) report the results from experiments that show that distributing the same number of commercials in a greater

⁸¹ "A Radio Giant Moves to Limit Commercials", New York Times, July 19, 2004, <http://www.nytimes.com/2004/07/19/business/media/19adcol.html>, accessed January 3, 2014.

⁸² "Clear Channel Changes Its Tune on Radio Strategy", New York Times, February 14, 2008, <http://online.wsj.com/news/articles/SB120295626450067289>, accessed January 3, 2014.

number of advertising pods leads listeners to perceiving that there are more commercials and displaying greater irritation at them, but that it also leads to superior recall.

4.8 Non-Commercial Radio and the Effects of Competition Between Non-Commercial and Commercial Broadcasters

In most countries some of the oldest and still most successful radio stations are publicly owned, with prominent examples including the national and local radio channels of the British Broadcasting Corporation (BBC) and the Canadian Broadcasting Corporation (CBC).⁸³ While these broadcasters also carry entertainment programming that is very similar to that aired by commercial broadcasters, they also usually have objectives to provide cultural services that could be viewed as merit goods or public goods, which commercial broadcasters might be expected to underprovide. For example, Section 4 of the BBC's current charter lists the purposes of the BBC as being: "(a) sustaining citizenship and civil society; (b) promoting education and learning; (c) stimulating creativity and cultural excellence; (d) representing the UK, its nations, regions and communities; (e) bringing the UK to the world and the world to the UK; (f) in promoting its other purposes, helping to deliver to the public the benefit of emerging communications technologies and services and, in addition, taking a leading role in the switchover to digital television."⁸⁴

⁸³ The BBC was, however, initially established a private corporation created by the Post Office and a consortium of equipment manufacturers. In 1927 a Royal Charter was issued establishing the BBC as a public corporation that should act independently of the government.

⁸⁴ http://downloads.bbc.co.uk/bbctrust/assets/files/pdf/about/how_we_govern/charter.pdf (accessed February 28, 2014).

Non-commercial radio in the US has had a somewhat different history, but the importance of non-commercial radio has increased quite dramatically in the last 30 years. In this section I briefly describe the development of non-commercial radio in the US and what is known about how competition with non-commercial radio may have affected the commercial sector.

While many universities were amongst the earliest institutions to create radio stations, in the 1920s and 1930s most educational broadcasters were squeezed out as the networks and other commercial interests competed for AM licenses. Therefore, in 1941 the FCC reserved part of the FM spectrum (88.1-91.9) that was just starting to be used for “noncommercial educational” use. However, non-commercial radio only really became strongly established in the US following the 1967 Public Broadcasting Act which created the Corporation for Public Broadcasting (CPB), which distributed federal funds, in the form of grants, to noncommercial stations meeting certain criteria.

Non-commercial stations can be divided into four groups (Albarran and Pitts (2001), p. 134). The first type, which includes the largest and well-known ‘public’ radio stations, consisting of about 560 stations in 1999, are CPB-qualified and members of National Public Radio (NPR), which produces news programming and operates a satellite distribution network on behalf of its members. Most public radio stations are in news-related formats, and these account for the vast majority of public radio listening, but there are also significant numbers of Classical, Jazz and Adult Album Alternative stations.⁸⁵ As well as CPB grants, public stations are funded by listener and member donations, and donations from both non-profit and for-profit companies that

⁸⁵ Arbitron (2012a) estimates that News, Classical, Jazz and AAA stations accounted for 49.0%, 16.2%, 4.1% and 6.3% of public radio listening in Fall 2011. The remainder was accounted for by stations using a mixture of programming in different formats, such as News during the day and music in the evening.

can sponsor or underwrite programming. The remaining types of non-commercial stations, amounting to around 2,000 stations but accounting for a much smaller share of listening, are: non-commercial religious stations, often affiliated with a network such as the Christian Broadcasting Network; student or campus stations, many of which operate on low power⁸⁶; and, community stations not affiliated with an educational establishment, many of which are run and operated by volunteers.

Since the 1980s public radio audiences have grown significantly, even though commercial radio audiences have been falling. The Radio Research Consortium (2012) estimates that the number of people listening to public radio for at least a quarter-hour each week increased from 5.3 million in 1980 to a peak of 31.6 million in 2011. Public radio has been particularly successful in attracting older and higher-income listeners. For example, Arbitron (2012a) estimates that 86% of the audience of public News stations is above age 35, with 50% of listeners having annual household incomes greater than \$75,000 and 70% of them having a college degree. In many college towns, including Madison, WI and Ann Arbor, MI, the public radio station is the largest or second-largest station in the market across all formats.⁸⁷ The ability of public radio to attract high-income audiences provides a particular challenge for commercial radio, as these listeners should be particularly valuable to advertisers.

⁸⁶ Campus radio stations should be distinguished from large public radio stations that operate in association with universities such as WUNC-FM in Raleigh/Durham and WAMU-FM in Washington DC. In the last few years there has been a rapid growth of low power FM stations following the Local Community Radio Act of 2010. See FCC (2012) for more details.

⁸⁷ Author's calculations based on 2014 data available at <http://www.rrconline.org/reports/pdf/Fa14%20eRanks.pdf> (public stations) and <http://ratings.radio-online.com/cgi-bin/rol.exe/arb581> (commercial stations) (both accessed Mar 18, 2015).

One natural question is whether the existence of non-commercial radio stations ‘crowds-out’ commercial stations. There is excess demand for commercial licenses in larger urban markets, so the focus is, instead, on whether public stations crowd out commercial stations from particular formats.⁸⁸ Berry and Waldfogel (1999c) use a cross-section of data from 1993 to examine whether local public classical and jazz stations crowd out commercial stations in the same formats. A pre-requisite for crowding out is that public and commercial stations compete for the same listeners, and they show that there is evidence that the presence of public classical or jazz stations reduces the audience size of commercial stations in these formats, and that in the classical format, the music selections of commercial and non-commercial stations are quite similar, suggesting that substitution and, therefore, crowd-out are plausible. They also find that crowd-out is likely to be concentrated in the largest radio markets, because it is only in these markets where commercial jazz and (especially) classical stations are found even when public stations are absent.⁸⁹

How important are these results? On the one hand, if the number of stations is fixed, crowd-out in a particular format implies that listeners in other formats will be benefitting from greater commercial station variety. On the other hand, these results do suggest valuable public funds are being spent providing programming that the market would likely provide anyway, and which

⁸⁸ For example, The Department of Justice has argued that spectrum constraints prevent new entry of FM stations in medium-sized markets such as Harrisburg, PA and Colorado Springs, CO (Department of Justice, 2000b). Of course, given excess demand for licenses, the reservation of spectrum for non-commercial stations is almost certainly crowding out commercial programming.

⁸⁹ For classical programming they find evidence of crowd-out for markets in the two largest population quintiles in their sample. These were markets with populations above 561,000 in 1993. In 2013, the Syracuse, NY radio market had a population of 567,000 (Nielsen Fall 2013 Market Survey Schedule and Population Rankings).

also may be consumed disproportionately by more affluent groups in the population who do not lack for access to many kinds of media.

Waldfogel (2011b) revisits these questions using data from 2005 to 2009. The results are broadly similar, suggesting, for example, that the presence of a public classical station reduces the expected number of commercial classical stations by between 0.3 and 0.4 in large markets. However, unlike the earlier research, this paper also finds some evidence of crowding out of news stations. Given that public news stations and commercial news stations, which often mix personality-based talk programming and quick-fire headline reporting, tend to sound quite different this effect is more surprising. At the same time, the different political orientation of public stations and most commercial talk radio, this result is also potentially important.

The focus of the crowding-out literature to date has been on competition for listeners. However, although they are subject to regulations on exactly what messages they can carry⁹⁰, non-commercial stations also compete for advertising in the form of program underwriting and sponsorship. Interesting evidence on this aspect of competition between public and commercial stations may come in the future from Canada, where the Canadian Radio, Television and Telecommunications Commission (CRTC) is going to allow CBC stations to carry four minutes of commercials per hour for three years, at which point CBC will have to prove that this is not harming either programming quality or commercial stations.⁹¹

⁹⁰ <http://transition.fcc.gov/osp/inc-report/INoC-31-Nonprofit-Media.pdf> (accessed February 27, 2014).

⁹¹ Decision reported in “Ads Coming to CBC Radio 2 in October”, *The Globe and Mail*, August 19, 2013 (<http://www.theglobeandmail.com/report-on-business/ads-coming-to-cbc-radio-2-in-october/article13842467/>, accessed January 3, 2014).

4.9 Effects of Radio on the Music Industry, and Cultural and Political Outcomes

In many countries, one of the main roles of publicly funded broadcasters is to support local culture, music and language. For example, the CRTC requires that at least 50% of the popular music aired on CBC Radio and its French language counterpart Radio-Canada are Canadian, based on a precise set of definitions of what constitutes Canadian music, with the aim of introducing listeners to new Canadian music and artists and supporting a vibrant Canadian music industry.⁹² These mandates on the public sector are also often supported by local content regulations on commercial stations. For example, commercial stations in Canada must make sure that at least 35% of their popular music is Canadian⁹³, while all Canadian stations are required to have active local studio facilities which rules out the possibility of programming stations solely using voice-tracked satellite programming.

Of course, one should ask the question of how local content regulations affect welfare. Richardson (2004) argues, using a Hotelling line model, that requiring that commercial stations provide local content will tend to reduce the total amount of music variety that is available on the radio and reduce total welfare. On the other hand, it may be argued that in the long-run consumers will benefit from the promotion of a vibrant local music industry, as this will increase

⁹² http://www.crtc.gc.ca/eng/cancon/r_cdn.htm (accessed December 30, 2013). CBC claims that at least 99% of its content is Canadian (<http://www.cbc.radio-canada.ca/en/explore/who-we-are-what-we-do/>), although it is not clear how it defines Canadian for the purposes of this claim. The CRTC's website explains that content regulations, which originated in the 1972 Broadcasting Act, are aimed at ensuring that the broadcasting system encourages "the development of Canadian expression by: providing a wide range of programming that reflects Canadian attitudes, opinions, ideas, values and artistic creativity; displaying Canadian talent in entertainment programming; and offering information and analysis concerning Canada and other countries from a Canadian point of view." (<http://www.crtc.gc.ca/eng/cancon/mandate.htm>).

⁹³ http://www.crtc.gc.ca/eng/cancon/r_cdn.htm (accessed December 30, 2013). A diverse set of other countries, including France, South Africa, Nigeria and the Philippines, also have quotas for local content during at least some hours of the day (Bernier (2012), p. 7).

both the variety and quality of the music that is available. Consistent with this, Ferreira and Waldfogel (2013) provide evidence that sales of local music increased after local content regulations were introduced in Canada, France, Australia and New Zealand, although whether this is associated with increases in the total quantity and quality of local music that is produced is obviously difficult to test.

However, even absent explicit content regulation, it is interesting to understand the broader effects of radio programming. The two dimensions that have attracted most of the attention in the literature are how News and Talk programming may affect political outcomes, and how music airplay affects the demand for music in the form of CD or digital sales.

4.9.1 Politics⁹⁴

As discussed in Prat and Strömberg (2011), there are various possible ways in which the media might affect public policy or political outcomes. For example, news coverage might affect voter turnout or affect the advantage associated with incumbency by making voters more aware of candidates and the issues involved in elections, even if it does not change the decisions actually made by policy-makers. On the other hand, the threat of criticism by local media outlets could help to reduce corruption but it could also lead to policy-makers choosing policies that favor the interests of the firms or individuals who own local media outlets.

The empirical evidence on the interactions between radio and politics or policy-making is somewhat more limited than the evidence concerning television and newspapers (e.g.,

⁹⁴ Readers should also consult the chapter by David Strömberg in this volume on media coverage and its influence on government.

DellaVigna and Kaplan, 2007, Obholzer-Gee and Waldfogel, 2006). This is especially true for recent years in the US.

Looking at the 1930s, when the coverage of radio was spreading quickly and economic policy was being revolutionized, Strömberg (2004) provides evidence that counties where there was a greater penetration of radio were able to secure a statistically and economically significant larger share of the New Deal relief funds distributed by state governments, with especially large effects for rural counties. At the same time, increased radio penetration also tended to increase voter turnout, which helps to explain why governors might want to favor these counties when distributing funds.⁹⁵ These relationships hold up when Strömberg instruments for the penetration of radio using exogenous factors affecting the quality of reception, and the finding of local effects is especially interesting given that radio programming in the 1930s was not especially local or focused on news coverage, as discussed in Section 4.2. Ferraz and Finan (2008) provide additional evidence on how local radio can affect electoral outcomes using data from Brazilian municipalities around the 2004 election. They show that when federal government audits uncovered corruption, incumbent mayors were less likely to get re-elected, but that this effect was significantly larger when there was a local radio station to report the results. At the same time, non-corrupt incumbents were more likely to get re-elected when the municipality had a local station.

4.9.2 Contemporary Music

⁹⁵ Gentzkow (2006) shows that the spread of television after the Second World War was associated with significant decline in turnout, suggesting that local newspapers and radio provided more informative coverage of local politics and political issues. It is, however, unclear whether local radio plays the same role today as Snyder and Strömberg (2010) suggest that neither radio listening or TV viewing are correlated with whether US citizens know information about their congressmen.

Radio can potentially play two quite different roles vis-à-vis sales of music. On the one hand, listening to music on the radio can be a substitute for listening to music that has been purchased⁹⁶, but, on the other hand, being played on the radio may increase the demand for a particular piece of music either because listening to a song on the radio increases the utility of listening to it at other times or because it makes listeners aware of songs that they would not otherwise know anything about. Therefore when reading this literature it is important to take note of whether papers are trying to measure the effect of airplay on total music purchases, where substitution is likely, or for particular songs, where one might expect to find that airplay increases sales.

Liebowitz (2004) provides empirical evidence that, when looking at sales of pre-recorded music in aggregate, radio and music sales are substitutes, although the evidence comes from the growth of radio in the US in the 1920s and 1930s and the emergence of commercial radio in the UK in the 1970s and 1980s, and so may not reflect the way that the radio and music markets interact today. Dertouzos (2008), in a study sponsored by the National Association of Broadcasters, provides evidence for the fact that airplay increases the sales of the songs that are played. Bandoowala (2010), using data for New Zealand, finds that airplay has a positive effect on the digital sales of the songs that are being played, while having no effect on aggregate digital sales.

One might also be interested in why airplay increases sales of the music that is played. Hendricks and Sorensen (2009) suggest that radio plays a key informative role in introducing consumers to new music. They show that when an artist has a successful second or third album, this increases the sales of the artist's first album, suggesting that consumers failed to buy the first album when it was released because they were not aware of it, and they attribute this ignorance

⁹⁶ For example, someone driving to work in their car might either listen to music on the radio or on a CD.

to the narrow playlists of most radio stations.⁹⁷ However, one might also explain this pattern by arguing that listening to an artist on the radio and from a CD or digital recording are simply complements, so that when the artist receives more airplay consumers want to buy more of their music. It is also unknown whether the success of a later album might lead a station to play more of an artist's back catalog.

The relationships between broadcast radio and the music industry are likely to be changing because of innovation both in the production and distribution of music (digitization) and the growth of internet and satellite alternatives to broadcast radio. Waldfogel (2012) investigates these changes using an exceptionally long panel of data covering 1980 to 2010. He argues that prior to digitization recording, promotion and distribution were expensive and this led to a concentrated music recording industry that heavily promoted a relatively narrow range of music. In contrast, the last decade has seen an increase in the total amount of music that has been released especially by independent (indie) labels, and some of it has been commercially successful even though it has received relatively little airplay on broadcast radio. However, these songs have sometimes been played heavily on internet radio providers such as Pandora and last.fm.

⁹⁷ While this explanation may be correct, it is worth noting that stations' playlists involve many more songs than is widely believed. Based on his playlist panel from contemporary music stations, covering 1998 to 2001, Sweeting (2008) reports that music stations play an average of 177 different artists (standard deviation 67) during a five day (Monday-Friday) week. Even in the 'Contemporary Hit Radio/Top 40' format, the KISS-FM stations described in Section 5.3, which are representative of the format, play more than 150 different artist-song title combinations. On the other hand, the most popular artists on each station do receive a disproportionate amount of airplay: on average, the 20 most played artists in each station week account for 47% of spins (on average, a station has 1,367 spins in a five day week).

One reason why it is interesting to identify how airplay affects sales of music, is because it has implications for how one might expect money to flow between the industries. If radio airplay increases the sales, or concert demand, of the music that is played, then we would expect that performers and recording companies would be willing to pay radio stations in order to be played, in the same way that consumer package goods manufacturers may pay grocery stores slotting allowances to be prominently displayed in stores, or might pay a magazine to carry an advert or a free sample of the product. The incentives to pay for airplay are strengthened by the fact that the playlist capacity of broadcast stations is limited. The fact that some recording companies have been willing to pay has given rise to the controversial practice of ‘payola’ within the radio industry. On the other hand, if music plays a key role in attracting listeners and advertisers to the station, while possibly depressing music sales, then we might expect that radio stations should provide compensation to the music industry for using its creations. This issue has recently attracted significant policy attention as the music industry has pushed for broadcast stations to be made to pay for the ‘performance rights’ to the music that they play. Performers and the recording companies own these rights, and they are distinct from the ‘composition rights’, owned by the composers and music-writers, that stations have traditionally paid for. However, even if the artists played were to receive compensation, this would not compensate the artists that are not aired, but whose sales might be reduced by airplay.

Coase (1979) provides a fascinating history of payola on radio and television, making it clear that the music industry paid performers to advertise their music long before the development of radio. The practice of payola is distinguished from other types of promotional activity by the

fact that the audience is not informed of the fact that a payment has been made to secure the airplay, as they would be songs were aired in promotional ‘infomercials’.

From an economic perspective, there are potentially efficiency arguments for why music publishers should be able to pay for airplay. In particular, if some music publishers are particularly efficient at producing music, or have private information about the fact their songs are likely to be popular with listeners, then one might expect that some type of auction of the radio station’s airplay capacity would achieve an efficient allocation of airtime amongst different songs. This auction would also provide station owners with strong incentives to increase their audiences in order to increase the value of their airtime to the music industry as well as non-music advertisers.⁹⁸ However, there are several arguments that can be made for why airplay time should not be sold to music companies. First, it might increase the costs of creating and distributing new music, and could allow dominant music companies to exclude weaker rivals by locking up all of the available airtime. Second, listeners may be misled if they believe that a station is choosing music based on its objective assessment of quality rather than the price that is paid, and they might prefer a system where a station does try to provide an objective assessment.⁹⁹

After a range of Congressional investigations into payola on both radio and television in the late 1950s, the FCC issued a new set of regulations in 1960 to regulate payola, and in particular

⁹⁸ To the extent that listeners to music radio like music and dislike standard commercials, one would expect listeners would prefer an arrangement where it was recording companies that purchased advertising time on the radio.

⁹⁹ Coase (1979) describes how it was the Federal Trade Commission, rather than the Federal Communications Commission, that initially intervened against the practice of payola on the basis that it was a deceptive practice.

introduced an explicit requirement that stations had to inform listeners when songs were aired of any consideration that either the station or its employees had received in return.^{100,101} This rule is consistent with the logic of the economic argument that listeners are only really likely to be harmed when they are not made aware of the fact that the content has partly been chosen because the recording company is paying for it. Renhoff (2010) examines how the characteristics of the weekly Billboard Hot 100 airplay charts changed around the time of these regulations, although the analysis is limited by being based on a single time-series, from January 1959 to December 1961, where it is unclear exactly how the set of available music that might have entered the charts was changing over time. He finds evidence that, after the regulations, more songs by smaller labels appeared in the top 100 and that there were more frequent changes in which song was ‘Number 1’ in the charts. However, a measure of music variety, created based on artist characteristics, declines after the change, suggesting at least the possibility that larger labels may be less able or less willing to market more innovative music when it is harder for them to pay for airplay.

Despite the rules and the changing structure of the music industry, concerns about payola persist and some have alleged that consolidation in the radio industry has allowed payola to flourish (Future of Music Coalition, 2003). In 2005 then New York AG Elliot Spitzer investigated the behavior of several music labels, including Sony BMG, and found that they did offer stations significant financial and non-financial inducements, either directly or through so-called

¹⁰⁰ Restrictions on payola apply to broadcast stations. Cable stations, such as MTV, are able to have contracts with labels which give them preferential access to the label’s content.

¹⁰¹ In March 2015, a group of the largest broadcasters approached the FCC to request changes in the disclosure rules for paid programming, so that they would not have announce the payments on-air at the time that the programming was broadcast (see http://www.nytimes.com/2015/03/17/business/media/radio-broadcasters-seek-changes-in-disclosure-rules-for-paid-programming.html?_r=1, accessed March 19, 2015).

independent promoters, and that they also conspired with stations to offer fictitious promotions, such as a competition to receive tickets to a Celine Dion concert in Las Vegas, when in fact the award might be actually be made to a station employee.¹⁰² After this investigation the FCC came to agreements¹⁰³ with the four large radio companies, Clear Channel, Entercom, Citadel and CBS Radio, in which they agreed to new restrictions on their relationships with recording companies and they agreed to devote a share of their airtime to music produced by independent labels. However, Future of Music Coalition (2008, 2009) suggest that after the agreement the vast majority of songs on commercial music radio were still produced by the major recording companies, suggesting either that these relationships persist, or that financial inducements were not responsible for the pattern of programming.¹⁰⁴

The claim that broadcast radio tends to increase the sales of music has been one argument for why in the US broadcast stations have not had to pay for the performance rights to the music that they play. This position is, however, somewhat anomalous, as broadcast stations in many other countries do pay for performance rights and, since the 1994 Digital Performance Rights Act, cable, internet and satellite radio stations in the US have been paying quite substantial fees for performance rights. In 2009 the Performance Rights Act was introduced into Congress, with some support from both parties and the Obama Administration, to make commercial broadcast music stations pay for performance rights. In line with how music stations pay for composition rights, it was envisaged that music stations would pay a proportion of their advertising revenues

¹⁰² <http://www.ag.ny.gov/press-release/sony-settles-payola-investigation>, accessed December 29, 2013.

¹⁰³ For example, <http://transition.fcc.gov/eb/Orders/2007/FCC-07-28A1.html> with Citadel Broadcasting. Future of Music Coalition (2009) discusses the airplay provisions of the agreement.

¹⁰⁴ Future of Music Coalition (2009) finds that independent labels secure substantially more airtime on non-commercial Rock stations. Of course, it is also plausible that non-commercial stations appeal to listeners with different music tastes to mainstream commercial radio.

for so-called ‘blanket licenses’ which would give them the rights to air music in any of the repertoires owned by organizations such as ASCAP, BMI or SESAC. Non-commercial and stations playing only small amounts of music were to be exempted.

The effects on the radio industry of having to pay for performance rights would obviously depend on how expensive these blanket licenses would be (US Government Accountability Office, 2010). Currently, stations pay about 1-2% of their revenues for composition rights, but the charges for performance rights might be much greater, potentially as high as 25% based on how much is paid by cable, internet and satellite services.¹⁰⁵ Audley and Boyer (2007) and Watt (2010) provide potential methodologies for assessing the value of music to radio in order to set appropriate performance rights fees.

One likely effect of introducing performance rights fees would be that some stations would switch from music to non-music formats, which could potentially affect the welfare of listeners, advertisers who want to reach the types of consumers who tend to listen to music, and the music industry itself if aggregate music airplay and the number of people listening to music radio was reduced. Sweeting (2013) uses a dynamic model of station format choice to try to predict how large this type of supply-side substitution effect would be in both the short-run, for example in

¹⁰⁵ See for example, <http://www.broadcastlawblog.com/2010/03/articles/music-rights/copyright-royalty-board-approves-settlement-for-sound-recording-royalty-rates-for-new-subscription-services-any-hints-as-to-what-a-broadcast-performance-royalty-would-be/> (accessed December 5, 2010). XM Sirius paid 8% of its subscription revenues for performance rights in 2010-12, even though some of its programming is not musical, and this fee included a discount recognizing that satellite radio was struggling to become established (Federal Register vol. 75, p. 5513 (2010-02-03)). Companies providing audio programming on cable pay 15% of revenues (Federal Register vol. 75, p. 14075 (2010-03-24)). Pandora, the leading internet radio service, pays 25% of its revenue or 1/12 of a cent per song, whichever is greater. However, because its revenues are low the absolute amount of money paid by Pandora in performance rights is controversially small given the number of songs that it (<http://www.businessweek.com/articles/2013-07-01/should-pandora-pay-less-in-music-royalties>, accessed December 31, 2013).

the two to three years after fees were introduced (assuming that they arrived as an unanticipated shock), and in the long-run. The size and distribution of format switching costs plays a key role in the analysis, as they might also following mergers or other types of market shocks. Even though performance rights fees are not observed in the data, the size of switching costs are potentially identified from how many and how quickly stations switch in response to changes in the demand for different formats driven, for example, by changes in market demographics such as the growth of Hispanic populations in many cities.

Sweeting's results suggest that in the long-run (e.g., after 20 years) the number of music stations would fall by around 9.5% if fees equal to 10% of music station revenues were introduced, with most of this adjustment happening within 2 to 3 years. One factor limiting how many stations switch to non-music formats is that the types of listeners who are most valued by advertisers (for example, whites aged 25-49) have relatively strong preferences for music programming, so that when some stations switch to non-music programming the audience of the remaining music stations tends to increase, offsetting the effects of fees, although in aggregate the post-fee revenues of the industry tend to fall. The paper does not address the question of whether, in the long-run, this fall in revenues would tend to reduce the quality of broadcast radio, or the total number of stations.

While the Performance Rights Act was not passed, it remains quite possible that similar legislation will be passed in the future, allowing for the predictions of the model to be tested and an investigation of whether other margins adjust as well. At the same time, a trend has begun to evolve where major radio companies, most notably Clear Channel, have started to strike private

deals with both major recording labels, such as Warner Bros., and some smaller independent labels, where the radio companies do pay for performance rights on broadcast stations but also receive lower rates for performance rights for their online media services (for example, Clear Channel's iHeartRadio), which is rapidly growing.¹⁰⁶ While private deals potentially provide an alternative to federal legislation, they may also come to favor larger companies, who can realize economies of scale in negotiating contracts, on both sides of the market.

4.10 Conclusions

This chapter has summarized a wide range of research on the radio industry. Most of the research in the mainstream economics literature has focused on understanding the effects of the rapid consolidation in local radio markets that took place after the Telecommunications Act of 1996. The main conclusions from this literature are that owners tried to reduce the extent to which their stations cannibalize each other's audiences and that they benefitted from some economies of scope at the local level from being able to operate multiple stations. It is much less clear how local consolidation affected the welfare of advertisers, as it is unclear whether it has had a significant affect on the quantity of commercials that stations play or advertising prices; or of listeners, as it is unclear whether, in markets taken as a whole, the quality and overall variety of programming were affected. One might view this lack of a clear conclusion on welfare effects as disappointing given the amount of careful empirical work that has tried to look at ownership in the radio industry, but it could simply reflect the fact that there have been different effects in different parts of the industry and that, to date, researchers have not been able to fully develop

¹⁰⁶ <http://www.nytimes.com/2013/09/13/business/media/clear-channel-warner-music-deal-rewrites-the-rules-on-royalties.html> (accessed December 31, 2013) and <http://www.nytimes.com/2012/06/11/business/media/radio-royalty-deal-offers-hope-for-industrywide-pact.html> (accessed December 31, 2013).

empirical models, or access the appropriate data, that can account for the type of complicated multi-homing patterns, by both listeners and advertisers, that exist in radio markets.

There are many other possible topics for research that have hardly been touched on at all, and it is appropriate to list a couple of them here. First, how does radio fit into the modern media landscape? Both antitrust policy and FCC regulations place constraints on concentration in radio that may be less appropriate in an era when competition from other media for both listeners attention and advertising dollars is becoming increasingly fierce. This increased competition might imply, for example, that common station ownership, either locally or nationally, may have quite different effects today than it had in the late 1990s. Second, what value do listeners, or society as a whole, place on local programming? Radio has moved from being dominated by national networks to being a local medium, and, in the last 20 years, it has moved back towards a national model even if much of the programming can be made to “sound local” due to the clever use of voice-tracking technology. This is especially important to understand in the context of local news programming, and its possible effects on political participation and civic engagement.

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Figure 1: Proportion of Music Stations Playing Commercials in a Minute 5-6pm Based on Data in December 2001

Source: Sweeting 2009

