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Abstract

Although the 1960s race riots have gone down in history as America's most violent and destructive ethnic civil disturbances, a single common factor able to explain their insurgence is yet to be found. Using a novel data set on the universe of radio stations airing black-appeal programming, the effect of media on riots is found to be sizable and statistically significant. A marginal increase in the signal reception from these stations is estimated to lead to a 7% and 15% rise in the mean levels of the likelihood and intensity of riots, respectively. Several mechanisms behind this result are considered, with the quantity, quality, and the length of exposure to radio programming all being decisive factors.

JEL classification: J15, N92, L82, D74
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The masses of African Americans who have been deprived of educational and economic opportunity are almost totally dependent on radio as their means of relating to the society at large. They do not read the newspapers . . . . Television speaks not to their needs, but to upper middle class America. One need only recall the Watts tragedy and the quick adaptation of the "Burn Baby Burn" slogan to illustrate the pervasive influence of the radio announcer on the community.

— Martin Luther King Jr., *keynote address, National Association of Radio and Television Announcers Convention*, Atlanta, September 28, 1967

And the young people would have their portable radios, and the signal for them to come out of the basements en masse was "All Men Are Made by God." When I played that song, that would be the signal for them to come out, which they did. And it sort of put things in a tizzy . . . . So it worked very well, and they never knew how we pulled it off.

— The Reverend Erskine Fausch, *Black Radio: Telling It Like It Was, 8-10*, July, 1995

1 Introduction

The race riots of the 1960s marked a watershed moment in the plight for equal freedom, civil, and voting rights of African Americans. In the eight-year period between 1964 and 1971, 752 riots occurred. These totaled to 1,802 days of civil unrest, leading to 228 deaths, 12,741 injuries, 69,099 arrests, as well as 15,835 episodes of arson and other destructive events.[1] For their frequency and destructiveness, the 1960s riots have been studied in depth by both policy-makers and scholars alike and, mainly due to their apparent unpredictability, explaining the causes of such riots has been the primary focus of analysis. Notwithstanding the fact that numerous theoretical and empirical explanations have been put forward in this literature over the past fifty years, no consensus has yet emerged on what drove the race riots of the 1960s.

In this paper, I build on existing anecdotal evidence to provide the first quantitative assessment of the role that the media has played in driving both the frequency and the severity of the race riots. In particular, using both cross-sectional and panel data sets, a single, well-identified driver is estimated to be a highly significant predictor for both the insurgence and the severity of riots: southern radio stations airing black-appeal programming, through their active and ingrained engagement in local African American communities, are the channel through which knowledge of random sparks happening within the county's boundaries reached a wide enough audience for riots to emerge. For their ability to coordinate subsequent protests and demonstrations, these radio stations also played a key role in affecting the conflicts' overall destructiveness.

To quantify the role played by black-appeal radio stations, a novel and comprehensive list of all stations active in 1964 is collected, along with information on the location, power, and

[1] In the U.S. South alone, during 465 days of riots spread across 189 individual events, 30 people lost their lives, while 2,290 got injured and 8,980 were arrested.

frequency of each antenna. These variables, in conjunction with geographic information system applications, are then used as inputs in a model of electromagnetic signal propagation to estimate the transmission of radio waves across the U.S. South. In the main analysis, the exogeneity of the treatment variable is validated by showing that the variation in the reception of the radio signal is uncorrelated to all those county-level characteristics that might have had a significant effect on riots. Subsequently, the reception of the signal from a black-appeal radio station is found to be a strong and robust predictor of both more frequent and more severe disturbances. Importantly, this effect remains robust to the inclusion of a wide array of controls, and to the use of either propensity score analysis, regression-discontinuity design, instrumental variables specifications, and panel techniques.[2] In the preferred specification, a marginal increase in the share of the county receiving the signal from a black-appeal radio station is estimated to lead to a 7% and 15% rise in the mean levels of the likelihood and intensity of riots, respectively.

To shed light on the underlying mechanisms at play, information is also collected on both the type of programming aired by each station and on the share of black-appeal programming in the weekly schedule. Furthermore, by leveraging on the fact that most of these stations tended to be relatively small and poorly funded, and were thus active for only a handful of years, the list of all black-appeal radio stations is also assembled for 1968. Firstly, the results are driven by the subset of radio stations that devoted a larger fraction of their weekly schedule to airing black-appeal programs: the quantity of programming mattered. Secondly, even within the subset of stations exclusively airing black-appeal programs, only the stations that aired more politically charged content had a meaningful impact on the emergence of riots: the content of programming mattered. Lastly, by exploiting the idiosyncratic survival rate of radio stations, it emerges that only those stations that stayed in operation for longer had a robust effect on the likelihood and severity of riots, while those stations that either quickly shut down or only subsequently opened up had no meaningful impact: the resilience of radio stations mattered.

The contributions of this paper are three-fold, and span several fields of research. First, by demonstrating that black-appeal radio stations were important actors in developing ethnic conflicts, this paper provides a direct empirical application to the theoretical argument stating that individuals prefer to obtain like-minded information from media, and that these biased media outlets can exert a non-trivial persuasion effect (Knight and Tribin 2019). In fact, while there exists an extensive literature on the effect played by either the television or the print media,

[2] Instrumental variables specifications are based on the two-stage least squares (2SLS) regression analysis, while panel techniques on the generalized difference-in-differences – two-way fixed effect – framework.

relatively less is known on the impact of radio in affecting people's attitudes toward social and political issues.[3] Among the existing studies finding a robust effect of radio on political participation, Yanagizawa-Drott (2014) provides evidence that historical variation in the hate-radio station RTLM contributed to the Rwandan genocide, by leading to persuasion and imitation by neighboring communities. In post-genocide Rwanda, Blouin and Mukand (2019) instead find that exposure to the government Radio Rwanda leads to higher inter-ethnic trust and cooperation as well as lower ethnic salience. In the context of the Nazi-fascist occupation of Italy between 1943 and 1945, Gagliarducci et al. (2018) show that BBC counter-propaganda, through Radio Londra, significantly affected the intensity of the resistance movement against the Nazi occupation and fascist regime, while Adena et al. (2015) find a strongly positive effect of the Nazi radio propaganda on the popular support to the Nazi regime.[4] Although all these studies point to the significant persuasion exerted by radio, they do so by analyzing one single radio station at a time. This paper adds a layer of complexity by considering the effect of all those radio stations that aired at least 12 hours of black-appeal programming a week: 200 stations in 1964 and 157 additional ones in 1968. The variation stemming from this large set of stations can be exploited to more precisely pin down the persuasion effect of radio. In particular, in the context under consideration, black-appeal radio stations could be expected to have exerted a significant effect on riots, by coordinating and pooling local African American communities, when: i) radio stations are more ingrained in the local community (proxied by the share of airtime devoted to black-appeal programming or by the length of operation of radio stations); and ii) radio stations more openly discuss political topics in their programs. This paper finds support to both of these hypotheses.

Second, this paper sheds light on over fifty years of debate seeking to isolate the common drivers of the 1960s race riots. Since the early work by Spilerman (1970, 1971, 1972, 1976), a wide array of theoretical explanations for both the frequency and destructiveness of riots have been put forward and empirically tested (Bryan 1979, McPhail and Wohlstein 1983, and McPhail 1994). And although these lied across a wide spectrum ranging from structural strain arguments (Smelser 1962) to absolute and relative deprivation (Downes 1968 and Gurr 1968), to lack of political representation (Lieberson and Silverman 1965), only two variables were ever found to satisfactorily explain most of the variation in riots observed across cities: the size of the non-white population

[3] Knight and Tribin (2018), Knight and Tribin (2019), Snyder and Strömberg (2010), Gentzkow and Shapiro (2010), and Puglisi and Snyder (2015) all analyze the impact of television or the print media.

[4] Olken (2009) is the first paper to study the effect of heterogeneity of signal transmission on economic outcomes, finding that the Indonesian radio and television both lowered participation in social organizations and self-reported trust. Garcia-Arenas (2016) documents that free media, in the form of an American radio broadcasting in Russia, can play an important role in the political processes of a regime change, while DellaVigna et al. (2014) present evidence on the effect of Serbian public radio on Croatian nationalism.

and a regional dummy indicator. That is, except for these two variables, both the occurrence and the severity of riots remain uncorrelated to all other indicators of city-level heterogeneity. More recently, starting with the observation that upheavals tend to cluster geographically and temporally, diffusion models assess whether riots are indeed more likely as a result of contagion from similar events, by exploiting functional forms for both spatial and temporal proximity (Myers 1997 and Myers 2010).[5] Through quantifying the role exerted by black-appeal radio stations in channeling the information of single sparks and in coordinating protests, this paper lends support to this diffusion argument. It does so by directly measuring the relevance of such communication networks through testing the role of radio stations on the emergence and severity of riots. Riots ought not to be treated as unpredictable and random events, for the nexus between isolated sparks and full-blown riots is provided by the presence of black-appeal radio stations. Analyzing the local media is important, as it further controls for the fact that most of the 1960s riots tended to be relatively small events that likely did not receive neither national nor regional media coverage.

Third, this paper contributes to the literature studying the social and economic consequences of the 1960s race riots in the short, medium, and long-run. With riots taking place mostly in African American neighborhoods, Collins and Margo (2007) and Collins and Smith (2007) find that these civil disturbances led to a statistically significant and large fall in the value of African American property. The 1960s riots are also associated with long-term changes in the ethnic composition of cities, through their role in the *white flight* observed across urban hubs (Boustan 2010 and Collins and Margo 2007), and in worsening the labor market outcomes of African Americans (Collins and Margo 2004).[6] For a lack of an identifiable common driver, all these studies have resulted in treating race riots as if generating from a black-box when, however, these ought not to be treated as unpredictable or idiosyncratic events. Augmenting these *ex-post* evaluations with the mechanisms linking single sparks to full-blown civil disturbances might lead to additional insights, that are specific to those communities with access to these radio stations. For instance, for their ingrained presence across African American communities, black-appeal radio stations might have had a long-lasting social and economic impact above and beyond the insurgence of riots. In communities deeply affected by riots, radio stations could have contributed to increased participation in post-riot reconstruction efforts, while reducing the salience of ethnicity and augmenting inter-ethnic

[5]Instead of diffusion models, Olzak and Shanahan (1996) and Myers (1997) have considered competition models: by focusing on differences in the labor market among cities, they try to explain race riots as a result of changes in the level of competition for jobs. In this paper, the share of African Americans in the county population, state fixed effects, and several indicators of labor market tightness are included in all specifications.

[6]Earlier attempts to quantitatively measure the economic consequences of the 1960s riots are found in Frey (1979) and Kelly and Snyder (1980).

trust.

The remainder of the paper is organized as follows. Section 2 presents the institutional framework, with a particular emphasis on the role of the radio industry, black-appeal radio stations, and race riots in the U.S. South. Section 3 describes the data set assembled for this study, including a description of the novel and comprehensive list of radio stations and race riots. Section 4 constitute the main body of analysis. After documenting the exogeneity of radio signals (Section 4.1), Section 4.2 analyzes the effect of radio stations on the frequency and severity of riots, with these results validated also through the use of instrumental variables in Section 4.3. Section 4.4 considers the role played by the content of the programming aired by the radio stations in driving the overall results, and panel techniques in Section 4.5 allow to both reinforce the main results while highlighting additional underlying mechanisms at play. Section 5 concludes.

2 Institutional context

The 1960s has gone down in history as a decade of radical and extreme changes, with episodes and trends that arose during that era still resonating today. Across civil and voting rights, African Americans made historic gains toward legal equality, while race riots caused persistent divisions within and between cities. The radio represented the dominant *mass medium* of the age, and black-appeal radio stations started to establish themselves as the most influential communication tool among African American communities. In this section, an overview of these decisive factors is presented.

2.1 The pervasiveness of radio in the U.S.

Up until the revolution brought by the television in the early 1970s, radio broadcasting was arguably the cheapest and preferred source of entertainment across American households. As the first electronic *mass medium* technology, its entry was far from smooth: due to financial crises, wars, high cost of early radio sets and the need for their continuous maintenance, it was not until the 1950s that most households could afford one. In fact, if one had to pay over \$1,200 (in constant 2019 dollars) to own a radio receiver in 1925 and \$1,150 in 1930, \$720 were instead needed in 1940 and "only" \$275 in 1950 (Sterling and Kittross 2002). By 1950, 92.6% of all American households did own at least one radio receiver, and by 1960 this figure had risen to 96.3%, remaining stable at 98.6% between 1965 and 1975. The average number of radio sets owned by each household also rose steadily, from 2.1 in 1950 to 3.7 in 1960, 4.1 in 1965, 5.1 in 1970 and 5.6 in 1975 (U.S.

Bureau of the Census 1982). Thus, during the period considered in this paper, a combination of lower costs of production, higher purchasing power, and improved technology meant that radio sets were available in almost every household: by the early 1960s, radio had successfully ended the print monopoly of mass media.

The key determinant in driving the results of this paper is whether (and to what extent) black-appeal radio stations were an important source of knowledge and information for African Americans during the sample period under consideration. Indeed, black-appeal radio stations could have had an impact on the behavior of African Americans only if: i) African Americans tuned in regularly to listen to these stations, and ii) the messages aired by these black-oriented stations were well-received by their audiences. As data to empirically prove both of these points have never been systematically collected, in the following subsection, I document the ingrained and pervasive role of black-appeal radio stations using a broad array of surveys and anecdotal evidence.

2.1.1 Black-appeal radio stations

The first radio station to broadcast an all-black programming schedule was WDIA-AM in Memphis, Tennessee, in 1948. Quickly thereafter, as more (white) entrepreneurs realized the potential for this market, many stations started to include an increasing amount of black-appeal programming in their schedule, although these stations did very little in addressing controversial topics (Barlow 1999 and Halper 2014). In the 1960s, the scenario radically changed. With race relations becoming more salient, these stations began to more willingly air controversial topics, openly discussing the struggles for civil and voting rights. A larger number of (still almost exclusively white-owned) black-appeal radio stations were set up, and more *general-market* (an epithet for white-oriented) radio stations began to shift their content toward black-oriented formats (Kahlenberg 1966 and Jeter 1981).[7]

But how relevant were these radio stations in shaping African Americans' attitudes across the U.S. South? First of all, during the period under investigation, radio remained the preferred mass medium among African Americans. From a survey conducted in 1961 and 1962 across twenty cities in the U.S. South, it emerged that 78.2% of African Americans did listen to the radio regularly, while a substantial share did not read any newspapers or magazines (31.0% and

[7]This move was driven by two factors: i) advertising revenues from undifferentiated programming started to fade, as the television began to provide the same service, but with images; and ii) with African Americans' total income quadrupling from $3 billion to $12 billion between 1940 and 1950, the business industry started to selectively target this growing consumer market by advertising through black-appeal radio stations. However, even in 1968, there are only five radio stations licensed to African Americans (Broadcasting 1972).

54.6%, respectively).[8] This same survey was further taken by 264 African American students and, in line with expectations, the proportion of those not reading any newspapers or magazines fell to 8.0% and 6.5%, respectively, while those frequently listening to the radio increased to 83.0%. Interestingly, the survey also asked 694 white adults about their behavior in how they access the media. Of these, only 58.4% claimed that they listen to the radio regularly, about 20 (25) percentage points less than the sample of African American adults (students). White adults also read more newspapers and magazines, with only 13.0% and 33.1% not reading any. A nation-wide study conducted by the Opinion Research Corporation found that, while 71% of African Americans listen to the radio, only 57% of whites does so, with the former group also watching less television and reading fewer daily newspapers and magazines. Lastly, a Harvard Business Review study further agreed that African Americans spent most of their media time listening to the radio.[9]

Having established that radio was the most important source of information and entertainment within the African American community, it is important to demonstrate that, within the universe of radio stations, African Americans preferred to listen to black-appeal radio stations and, secondly, that their thoughts and beliefs were significantly shaped by this type of stations. In this respect, a 1963 study carried out by KZEY-AM, a black-appeal radio station located in Beaumont, Texas, showed that 90% of African Americans who responded to the survey had a working radio in the household, and that 78% had listened to it on that given day (Sponsor 1964). Of these, 78% said that the station they listened to was a black-appeal one, 13% a *general-market* one, while 9% could not recall the type of radio station that they listened to. Furthermore, 80% of the respondents said that they would most likely buy products or services if they were advertised over a black-appeal radio station, with only 20% doing so if they were aired on television. In fact, advertising aired on black-appeal radio stations was able to drive twice as many purchases among African Americans compared to *general-market* radio stations, with the latter having the same effect on persuading either a white or an African American listener.[10] African Americans were also able to recall more commercials if those were aired by black-oriented radio stations compared to *general-market* radio stations, while whites could recall significantly fewer ads.

[8] The African American adult sample had information on 618 respondents with some coverage on all the 11 states of the former Confederacy (Matthews and Prothro 2006). It included the following counties: Elmore, Montgomery (AL); Clark, Pulaski (AK); Leon, Manatee, Sarasota (FL); Gwinnett, Jeff Davis (GA); East Carroll (LA); Walthall (MS); Forsyth, Pitt (NC); Lexington, Richland (SC); Hickman (TN); Erath, Harris, Taylor (TX); Pulaski (VA).

[9] The latter two studies are cited by Sponsor (1964) and by *The New York Times* on October 11, 1964.

[10] This survey was conducted at the height of the civil rights movement by the Center for Research in Marketing, Peekskill, N.Y. It found that 90% of African Americans would support a product boycott if it were backed by one of the major civil rights organizations, such as the NAACP, the Urban League, CORE, SNCC, and SCLC.

Besides surveys, there is also a significant amount of anecdotal evidence supporting the view that African Americans were more responsive to the information conveyed by black-appeal radio outlets, compared to either *general-market* ones or the television. Interviewed by Sponsor (1964), Bob Dore, who owned a company representing the interests of more than three dozens black-appeal radio stations in the U.S. South, stated that "when a Negro hears a commercial in *general-market* radio, he's not sure it's meant for him. When he hears one on a Negro station, he knows it's meant for him. Sure, there may come a day when there's no need for 'Negro radio' as we know it now. But that day, despite all the progress that has been made by U.S. Negroes and all the progress they will make in the near future, is still a long way off." Interviewed by *The New York Times* in 1964, Graeme Zimmer of Continental Broadcasting, a division of Rollins Broadcasting, Inc., which operated five black-appeal radio stations, said that "Negro-programmed radio is the only media that reaches the Negro every day with what he wants to hear and know." Similarly, Harry Novik, general manager of the black-appeal radio station WLIB-AM in Harlem, said that "the Negro-oriented station has a personal relationship with local Negro communities that is unknown in general radio."

All in all, the above-mentioned evidence, based on surveys and anecdotes, has indicated that, during the 1960s: i) African Americans relied on the radio as the leading source of information and entertainment; ii) within the radio industry, preference leaned strongly toward black-appeal radio stations; and that iii) these stations had a significance influence on the behavior of its audience.

2.2 The race riots of the 1960s

During the 1960s, the U.S. was shaken by violent and destructive civil outbursts. These disturbances, which occurred in years already defined by watershed events related to both civil and voting rights (the Civil Rights Act and the Voting Rights Act were passed in 1964 and 1965, respectively), marked a period of drastic changes in the race relations across and within American cities. And although ethnic conflicts, demonstrations, and protests already emerged in the first half of the twentieth century, the concentration of the 1960s riots, both in terms of their intensity, frequency, and geographic distribution, made them entirely unique and unprecedented events.

Importantly for this study, which seeks to quantify the effect stemming from black-appeal radio stations, the 1960s race riots emerged, almost exclusively, within African American communities. And although sociologists tend to classify the 1960s riots with the term *black aggression*, attacking whites was not the aim of these riots; rather, as identified in the Kerner Commission report, "while the civil disorders of 1967 were racial in character, they were not interracial. The 1967 disorders, as well as earlier disorders of the recent period, involved action within Negro neighborhoods against symbols of white American society – authority and property – rather than against white persons." Further, that the 1960s race riots could have been affected by radio stations so entrenched in the local community is reinforced by the fact that the background of these disorders was characterized by heavily localized and county-specific features. From the report, these include "severely disadvantaged conditions for Negroes, especially as compared with those for whites; a local government often unresponsive to these conditions; Federal programs which had not yet reached a significantly large proportion of those in need; and the resulting reservoir of pervasive and deep grievance and frustration in the ghetto." Black-appeal radio stations are necessary, albeit not sufficient for riots to emerge. Radio stations acted as a coordination device by propagating the knowledge of the first spark, with the latter in itself remaining a random event: "At some point in the mounting tension, a further incident – in itself often routine or even trivial – became the breaking point, and the tension spilled over into violence."[11]

3 Data

This paper estimates the persuasion effect that black-appeal radio stations had on African American communities in the U.S. South, through their role in spurring and coordinating the extensive and the intensive margins of the 1960s race riots. To carry out this analysis, a rich novel data set has been built, and its key elements are described below.

3.1 Black-appeal radio stations

A novel and comprehensive data set on black-appeal radio stations active in both 1964 and 1968 has been assembled by combining different historical sources of the media industry. To the best of my knowledge, this is the most complete set of information on black-appeal radio stations that has ever been used in the empirical literature.

To construct the 1964 sample, the primary source is the once-per-annum report titled *Negro Market*, published by *Sponsor*, a magazine primarily concerned with the media advertising industry. From early 1950s until mid-1960s, *Sponsor* has been the first and most reliable magazine to present detailed statistics and analyses on African Americans' role and impact in shaping the media (chiefly radio) industry, although it did so for the sake, and from the eyes, of the advertising

[11]See pages 107-109 of the U.S. National Advisory Commission on Civil Disorders (1968). Chaired by Otto Kerner, it is now more commonly known as the Kerner Commission report.

industry, which constituted the magazine's key readership. Starting in 1952, *Sponsor* began to publish the report *Negro Market* and, by early 1960s, it further included the *Directory of Major Negro-Appeal Radio Stations in the United States*. However, it is only with the 1964 publication that this list includes all those stations with a significant amount of black-appeal programming to be safely classified as black-programmed radio stations (Sponsor 1964). In particular, out of the close to 500 stations that *Sponsor* mentions to be having some appeal to the African American community in 1964, only 200 southern stations enter this list by airing at least 12 hours of black-appeal programming a week and, of these, 59 are reported to be 100% black-appeal stations.[12]

Sponsor ceased to exist in 1964. Therefore, to construct the 1968 sample of black-appeal radio stations, the *Spot Radio Rates and Data* publication by *Standard Rate & Data Service, Inc.* (*SRDS*) is instead considered. Besides *SRDS* being a traditional source of reliable market data in the media industry, its 1968 directory (titled *Radio Stations Regularly Scheduling Negro Programs*) is the only one that, to the best of my knowledge, in these immediate post-1964 years, reports not only a list of black-appeal radio stations, but also the total number of hours airing such programs. From the directory available in the 1968, information on all radio stations that broadcast at least 12 hours of black-appeal programming has been collected and digitized (Spot Radio Rates and Data 1968).[13] In 1968, there were 157 southern stations airing at least 12 hours of black-appeal programming a week and, of these, 59 were 100% black-appeal. And although the total number of radio stations that exclusively targeted African Americans is the same for both years in the sample, there is a considerable degree of variation across counties and states over time. Table 2.1.1 presents a summary of the radio stations used in this study.

3.2 Coverage of the radio signal: the Irregular Terrain Model

For each station in the data set, information on the location, frequency, and strength of each radio tower (200 in 1964 and 157 in 1968), have been used to construct the predicted spatial propagation of the radio signal. The model used to predict coverage is the Irregular Terrain Model (ITM), in conjunction with publicly available Shuttle Radar Topography Mission (SRTM) terrain data. To

[12]For each station, information on the strength of each radio tower (in watts, *w*, or kilowatts, *kw*) and its frequency (in kilocycles per second, *kc*) is obtained. These are both important elements to construct the dispersion of the signal using the Irregular Terrain Model. In the event of gaps in the 1964 directory, supplementary information has been obtained from: i) earlier publications of *Sponsor*'s *Negro Market*; ii) the 1964 edition of the *Broadcasting Yearbook*; and iii) the 1964 edition of the *North American Radio-TV Station Guide*.

[13]Other lists of black-appeal radio stations are included in: i) the *Broadcasting Yearbook*; ii) the *Billboard* magazine; and iii) the *Cash Box* magazine. However, in all of these, there is no information on the amount of airtime that is devoted to black-appeal programming. Further, when cross-checking these directories, it resulted that many of the included stations had very little content of black-oriented programming to justify their inclusion to the list (for more on this, see Jeter 1981).

make the estimated coverage from ITM and SRTM operational for this study, three geographic information system (GIS) applications (Google Earth, ArcGIS, and QGIS) have all been used. In particular, these applications have been exploited to geocode and georeference the signal coverage of each radio station with the counties of the U.S. South.[14]

To address the role that topography has in this physical model of electromagnetic signal propagation, variables related to the surface over which the signal travels have been constructed and are also included in the analysis as controls. Furthermore, the predicted free-space (line of sight) coverage signal is included as an additional regressor in this study: for each radio station, it is the expected coverage if there were no obstacles to the propagation of the radio waves. In practice, there are a number of elements (e.g., buildings, mountains, parks, but also the air and the curvature of the earth) that make the signal decay faster. By further including the free-space signal as an additional regressor, the role of topography is further taken into consideration, and the estimated effect is obtained only out of the variation in signal reception that is due to topography.

3.3 The race riots of the 1960s

Starting with the early 1970s, sociologists have started to collect information from media outlets and government agencies in order to systematically study the riots of the 1960s. Among others, the sources exploited for these studies include the *Riot Data Review* compiled by the Lemberg Center for the Study of Violence at Brandeis University, the Congressional Quarterly's *Civil Disorder Chronology* of 1967, the Kerner Commission report of 1968, and newsclips from both the *New York Times* and *Washington Post*. As all these sources are based on either different definitions of riots, different samples or time horizons, this paper is based on a combination of all these four different sources, by following the approach firstly carried out by Spilerman (1970), and subsequently refined by Carter (1986).[15] Spilerman's definition of a race riot being a spontaneous event, which involved at least 30 people, some of whom African Americans, resulting in either aggressive behavior, looting, or property damage, has become the standard academic definition in studying the 1960s riots. Importantly, this definition excludes all the protests which could have been resulted from (or being nonetheless directly related to) civil rights activism and protests, by considering only disturbances that occurred outside of school settings and civil rights demonstrations. In this paper,

[14]In this study, the tool provided by Nautel, a manufacturer in radio broadcasting, is used to obtain the predicted coverage of each station in the sample. As a reference on the ITM, see Hufford (2002). As for the SRTM, see Farr et al. (2007). The SRTM was flown on an 11-day mission by the Space Shuttle Endeavour in February 2000. It acquired topographic data to build digital elevation models on a near-global scale.

[15]Carter (1986) refined the original data set by including all race riots until 1971. Since then, Carter's refinement over Spilerman's has become the new academic standard.

I exploit Carter's original data set and focus on both the extensive and the intensive margins of race riots.

As for the extensive margin, I consider the likelihood that a county experiences a riot, by focusing on the share of race riots, defined as the total number of riots in county c in state s, standardized by the total number of riots in all southern counties:

$$Extensive\ Margin_{c,s} = 100 \cdot \left[\frac{\sum_r^R Riot_{r,c,s}}{\sum_c \sum_r^R Riot_{r,c,s}} \right] \tag{1}$$

The intensive margin is instead based on a cumulative index of riot severity:

$$Intensive\ Margin_{c,s} = \sum_r^R Severity\ Index_{r,c,s} = 100 \cdot \left[\sum_{i=1}^{5} \left(\frac{X_{i,r,c,s}}{X_{i,T}} \right) \right] \tag{2}$$

where, $X_{i,r,c,s}$ is one of the five indicators of severity collected by Carter (1986), for each riot r that occurred in county c and state s. These are: i) days of rioting; ii) number of deaths; iii) injuries; iv) arrests; and v) episodes of arson reported by police during the riot. $X_{i,T}$ is the sum of each indicator i across all the riots that occurred in the U.S. South during 1964-1971 (e.g., the 2,290 injuries or the 8,980 arrests). For each riot r, the sum of all the five ratios (one for each indicator i) is then the severity index associated with that given riot: $Severity\ Index_{r,c,s}$.[16] To allow for the possibility that more than one riot r could have occurred within a given county, the sum of this index across all the riots that occurred in county c and state s is considered to form the cumulative index of severity: $Intensive\ Margin_{c,s}$.

When measuring the impact of media on riots using a panel dimension, I augment the data set of Carter (1986) with the information on riots collected in Olzak (2015). The latter is similarly based on Spilerman (1970), but considers all race conflicts during the period 1954-1992. Further, it differs from Carter (1986) on the source of information used (Olzak 2015 only considers the *New York Times*) and on the definition of what constitutes a race riot: a demonstration where at least fifty people participated, with some form of violence, and lasting for at least two hours. In this study, information on the period 1960-1963 available from Olzak (2015) is added to the one previously considered (1964-1971). Before doing so, the correspondence between the two data sets

[16] That is, the severity of riot r is the proportion of all days of rioting that occurred during riot r, plus the proportion of all deaths, plus the proportion of all injuries, plus the proportion of all arrests, plus the proportion of all episodes of arson. Correspondingly, summed over all riots in the sample, $Severity\ Index_{r,c,s}$ equals 500 to reflect the five indicators of severity, as the index is also multiplied by 100. In constructing this severity index, I closely follow Collins and Margo (2004) and Collins and Margo (2007).

has been carefully cross-checked.[17]

3.4 Other controls and summary statistics

Summary statistics on all variables included in this study are presented in Table A.1. In line with knowledge on how radio waves propagate over land and water, treated counties (i.e., those receiving the signal of black-appeal radio stations) are smaller and have both fewer rivers and lakes, while being less mountainous. These counties have larger shares of African Americans in the total population (also measured through the share of non-white households) and are more likely to be covered by the VRA in 1965. They are also more populous (higher density) and have a larger manufacturing sector, along with a more ingrained presence of historically black colleges and universities (HBCUs), and with a larger fraction of the population enrolled in school. On the other hand, the two groups are more similar along other indicators of socio-economic development, such as the unemployment rate, as well as poverty and income levels. Birth rates, the age distribution, the average number of members in the households, and median school years are similar between the two groups. Indicators for the standard of living also tend to be comparable: the share of farms with electricity, and the share of households with television sets, radio sets, and cars. Treated counties have smaller agricultural and mining sectors and have fewer farms (measured as either the land covered by farms or through an indicator of agricultural productivity). They also have less per-capita expenditures on highways. Regarding indicators of ethnic conflicts pre-1964, the counts of lynchings against African Americans are similar between the two groups, while treated counties experienced more episodes of anti-black activism, and had more local branches of both the National Association for the Advancement of Colored People (NAACP) during 1957-1964 and the Ku Klux Klan (KKK) during 1925-1940.

Some of these differences are statistically significant and large in magnitude. To address this potential endogeneity threat, which would inevitably lead to biased estimates, several techniques are considered in the rest of the paper. Among these, Appendix B firstly considers propensity score methods to balance the sample along observable characteristics; secondly, it presents a regression-discontinuity design, comparing counties within a 15-mile radius from a radio station; and, lastly, it restrict the sample to the set of counties in which African Americans are a minority

[17] Firstly, as presented in Appendix C, while using the definition found in Olzak (2015) leads to fewer and more severe riots during 1964-1971, all the results of the paper still hold if this sample is considered. Secondly, one of the five indicators of severity (episodes of arson) is not available in Olzak (2015). Reassuringly, in the sample based on the period 1964-1971, the correlation between the episodes of arson and the remaining four other indicators of severity is relatively strong. Then, using four instead of five indicators of severity in the panel version of the intensive margin reassuringly remains an inconsequential, albeit necessary, adjustment.

of the population. Reassuringly, the main results of the paper remain robust in all these more demanding specifications.

4 The voice of black-appeal radio stations

Radio is found to have shaped the behavior of its listeners in an important way: black-appeal radio stations, especially those more ingrained in the local communities they served, significantly led to more frequent and more severe riots. This result also depends on the length of operation of radio stations and on the amount of coverage of political events. Importantly, a unique driver of riots is uncovered in the data, and robust quantitative evidence to this claim is presented in this section.

4.1 Media and county characteristics

This study exploits signal reception of black-appeal radio stations as an exogenous determinant of media bias through radio listenership. The identification strategy is modeled through both cross-sectional and panel frameworks, along with intrumental variables, propensity score matching techniques, and regression-discontinuity designs, and it is based on the county-level variation in the signal reception of black-appeal radio stations. The exposure to the signal received from black-appeal radio stations is computed either as a continuous statistics (the share of the county being covered) or through a dummy indicator equal to one if the majority of the county is covered.[18]

As a first step in ensuring that the requirements for a successful identification of the effects are met, it remains to be verified that radio coverage (the independent variable in the main analysis) is unrelated to all the county-level characteristics that might also have had an effect on the dependent variables (the extensive and intensive margins of race riots). I hereby propose a specification to formally assess whether the exposure to black-appeal radio stations is balanced with respect to a wide array of pre-period county-level controls.

Firstly, I include state fixed effects in order to control for the most persistent structural differences across states in the U.S. South. Secondly, in order to capture the reliance of the ITM on geographic features, in all the specifications that follow, I consider a vector of controls that are

[18] As discussed in Sections 3.2 and Appendix D, the coverage of the radio signal is modeled through the Irregular Terrain Model (ITM), in conjunction with publicly available Shuttle Radar Topography Mission (SRTM) terrain data and with geographic information systems (GIS), where the resulting output of electromagnetic signal propagation inherently depends on the earth surface, topographic characteristics and the frequency and power of the radio towers.

topographic in nature. In particular, since the electromagnetic signal propagates differently over land and water, as well as deviating when hitting large obstacles (such as mountains or hills), these county-level variables include the size of lakes, the length of rivers, the overall size of the county, the presence of National Parks and of mountains, and a dummy indicator for those counties facing the sea.[19] And besides being key inputs in constructing the expansion and propagation of radio waves trough the ITM, including these topographic variables in the specifications might also help to account for all the unobserved differences in political or social organizations between, say, mountainous counties and their maritime counterparts, or between counties extensively covered by forests or lakes. This further lends support to the validity of the analysis, as these differences might also be important in how riots emerge and evolve.

Then, in order to test for the orthogonality between the radio signal reception and a range of socio-economic county characteristics, I estimate the following regression for the cross-section of southern counties:

$$Radio\ Signal_{c,s} = \alpha_s + \mathbf{X}_{c,s}\gamma_1 + \mathbf{Topography}_{c,s}\gamma_2 + \epsilon_{c,s} \tag{3}$$

In this model, the dependent variable, $Radio\ Signal_{c,s}$, measures whether county c in state s is exposed to a black-appeal radio station (either through a continuous variable or as a dummy indicator of coverage), $\mathbf{Topography}_{c,s}$ is a vector including the full set of geographic controls just discussed, and α_s are state fixed effects. If the exposure to black-appeal radio stations is to be balanced with respect to pre-period county characteristics, which are represented by the vector $\mathbf{X}_{c,s}$, then the vector of estimated coefficients γ_1 should be indistinguishable from zero.[20]

Table 1 reports the coefficients γ_1 of Eq. 3 estimated through OLS. The first two columns of Table 1 suggest that, after controlling for state fixed effects and for the set of topographic indicators, the degree to which a southern county receives the signal from any black-appeal radio station (measured as either a dummy indicator, as in column (1), or through a continuous variable, as in column (2)) is unrelated to twenty-four of the included variables, with only one control predicting coverage. In particular, the only control reaching significance at conventional levels

[19] I have constructed these topographic variables using the ArcGIS application, extracting information from the shapefiles downloaded from Natural Earth. Data on the list of coastal counties has been constructed from information available from the U.S. Census. See Appendix A for further details on the variables' sources and definitions. To see the differential effect of land and water on the propagation of the radio signal, see the zoomed-in image of the coverage of two black-appeal stations in Virginia (WBCR-AM in Christianburg and WRAP-AM in Norfolk) presented in Map (c) of Fig. A.1.

[20] In this and all subsequent analyses, standard errors are robust and adjusted for clustering at the county level, and the regressions are weighted by 1960 population.

is the one measuring the share of households with a television handset in 1960. And if any of the included controls were to be relevant in predicting radio signal reception, television ownership is arguably the most plausible one: after controlling for all other county-level socio-economic variables, more television sets (which remained a significant investment in 1960) could be expected to be purchased in counties with better signal reception.[21]

Importantly, whether or not a county receives the radio signal from a black-appeal radio station is not related to pre-existing measures of ethnic conflicts in the county. The p-value from a joint F-test of the lynching variable, the counts of episodes of anti-black activism, and the location of both NAACP branches and of KKK's Klaverns is 0.72 for column (1) and 0.57 for column (2), thus indicating that the estimated coefficients on these variables are jointly indistinguishable from zero. This goes some way forward in addressing the threat of reverse causality by showing that more black-appeal radio stations were not set up as a response to more conflicts in the first half of the twentieth century (nor in the first half of the 1960s). This, and the fact that no other pre-period control is correlated with the propagation of radio waves, in turn ought to provide support in claiming the exogeneity of radio coverage in the subsequent analyses of this paper.

As a way to directly assess how each of the twenty-six controls affects the main dependent variables of this paper, the specification presented in Eq. 3 is again estimated, this time including as dependent variables either the intensive margin of riots (column (3) of Table 1), or the extensive margin (column (4)). It is striking to observe the extent to which most of the controls that were not relevant in predicting coverage from the radio signal (columns (1) and (2)), now reach significance at conventional levels. In particular, it is reassuring to notice that the pre-1964 measures of race conflicts seem to have a persistent effect on the dependent variables of columns (3) and (4): more lynchings of African Americans and more frequent episodes of anti-black activism translate into fewer riots during the period 1964-1971, perhaps due to more stringent law enforcement in these counties. On the other hand, localities with a more pervasive presence of the KKK exhibit both stronger and more frequent episodes of race riots, with the presence of NAACP branches working to counteract this effect.[22]

Lastly, and in line with expectations and anecdotal evidence, more race riots are observed

[21]Taking Chicago and 1954 as the representative city and year: a television set (table model, VHF) cost $204.39 and, to repair it (replacing the transformer), it cost $23.05. A radio set (table model) cost $24.12 and a newspaper (daily edition, on the street) cost $0.05. In 2020 prices (using changes in the CPI), these correspond to about $1,954, $220, $231, and $0.50. The original prices have been reported in U.S. Bureau of Labor Statistics (1956).

[22]The p-value from a joint F-test of the lynching variable, the counts of episodes of anti-black activism, the location of NAACP branches, and the location of the Klaverns of the KKK is 0.03 for column (3) and 0.00 for column (4). Consequently, the estimates of the coefficients on these variables are jointly significantly different from zero.

in those counties that are more densely populated and that have a larger fraction of African Americans in the total population. The fact that these controls are significant only with respect to race riots and not with the radio signal reception shows just how important it is to include them when seeking to quantify the impact that black-appeal radio stations had on both the likelihood and on the intensity of race riots. Furthermore, some of these estimated coefficients move in opposite directions between columns (1)-(2) and columns (3)-(4), making their inclusion even more important.[23] Using alternative specifications, the effect of media on riots is tested throughout the rest of the paper.

4.2 Media and race riots

In Section 4.1, the key independent variable of interest is shown to be orthogonal to the full set of pre-period county characteristics. This, along with the fact that many of these controls instead do affect race riots directly, provides support in exploring whether black-appeal radio stations had an effect in spurring the 1960s race riots in a full specification with state fixed effects, socio-economic and topographic controls, as well as pre-1964 measures of ethnic conflicts. Correspondingly, the following regression is estimated, based on the cross-sectional differences in signal reception across southern counties:

$$Race\ Riots_{c,s} = \alpha_s + \beta_1 Radio\ Signal_{c,s} + \mathbf{X}_{c,s}\gamma_1 + \epsilon_{c,s} \tag{4}$$

where now $\mathbf{X}_{c,s}$ includes both the vector of pre-period county-level characteristics considered in Eq. 3 and also the the full set of topographic variables. $Race\ Riots_{c,s}$ represents either the extensive or the intensive margins of the 1960s race riots, constructed using the definitions described in Section 3.3, while the independent variable of interest, $Radio\ Signal_{c,s}$, corresponds to either the dummy indicator or the continuous variable for the coverage of the radio signal from black-appeal radio stations.[24]

Eq. 4 is estimated separately over five different samples of radio stations, according to the share of their weekly programming that is devoted to airing black-appeal programs. In the analysis, the following five brackets are considered: i) all the southern stations with at least 12 hours of black-appeal programming, from as little as 4% of black-appeal content to 100% (200 stations);

[23]For instance, the pre-period pro-African American activism proxied by the location of NAACP's branches is positively (albeit insignificantly) correlated with black-appeal radio stations, while having a negative effect on the magnitude and frequency of race riots.

[24]Similarly to Eq. 3, α_s are state fixed effects, while standard errors are robust and adjusted for clustering at the county level, and the regressions are weighted by 1960 population.

ii) all stations with at least 25% of black-appeal content (148 stations); iii) at least 50% (121 stations); iv) at least 75% (65 stations); and v) the subset of stations exclusively airing programs that are of interest to African Americans (59 stations).[25] Estimating Eq. 4 separately for each bracket is motivated by the *a-priori* expectation that, if black-appeal radio stations mattered for the likelihood and for the severity of race riots, then this effect ought to increase with the extent of being entrenched and ingrained in the local African American communities, as proxied by the percentage of the total airtime that is devoted to programs that are of interest to African Americans.

This is exactly what is found in Table 3, where the coefficient β_1 from estimating Eq. 4 is presented, separately for each bracket, separately for the two definitions of signal coverage (dummy and continuous indicators), and also separately for the two dependent variables of interest: the likelihood of riots (columns (1) to (5)) and the intensity of riots (columns (6) to (10)). Considering all 200 stations first, the dummy indicator of coverage associated with *any* black-appeal radio station leads to about 0.02% higher likelihood of experiencing a riot and an additional 1.39% in the severity of riots, with only the latter coefficient reaching (marginal) significance. Importantly, restricting the sample to those radio stations that dedicate more airtime to black-appeal programming has a marked impact on the β_1 estimates, with coefficients that both grow in magnitude and are more precisely estimated. For instance, receiving the signal from a 100% black-appeal radio station leads to a 0.37% increase in the share of riots and a 4.69% rise in the intensity of riots.

The estimates behave in a similar fashion if radio coverage is measured through a continuous statistics, rather than through a dummy indicator. Significant coefficients on the extensive and intensive margins of riots are obtained only for the top brackets of radio stations (above 75% and 50% of black-appeal content, respectively), and this further highlight that the persuasion effect of media is channeled through radio outlets that are more deeply rooted in the local communities. As for the magnitude of the effect, Panel B of Table 3 indicates that a 1% increase in the county's share that is covered by a 100% black-appeal radio station translates into 0.01% more frequent and 0.06% more severe riots. However, as there is a substantial amount of southern counties that never experience any race riots, it is interesting to consider the mean levels: a marginal increase in the share of the county covered by a 100% black-appeal radio station is then found to lead to a 7% and 15% increase in the mean levels of the likelihood and intensity of riots, respectively.

As presented in Section 4.1, radio signal coverage is orthogonal to a wide array of pre-period

[25]See Table 2.1.1 for a summary of the information collected on black-appeal radio stations in 1964 and 1968, by state.

controls. However, in order to further address any additional concerns on the validity of the identification strategy, a term that ought to truly isolate the variation in the waves' propagation that is due to the role of topography alone is further included in Eq. 4. This indicator, $Unobstructed\ Signal_{c,s}$, measures the counterfactual signal propagation of each radio station had there not been any physical obstacles (i.e., with a direct line of sight) between each station's tower and each receiver.[26] Correspondingly, after the inclusion of $Unobstructed\ Signal_{c,s}$ as an additional regressor, the β_1 coefficient now captures the effect of topography alone, alleviating any remaining concern on the exogeneity in the signal's idiosyncrasies. And except for $Unobstructed\ Signal_{c,s}$, all terms in Eq. 5 reflect those found in Eq. 4:

$$Race\ Riots_{c,s} = \alpha_s + \beta_1 Radio\ Signal_{c,s} + \beta_2 Unobstructed\ Signal_{c,s} + \mathbf{X}_{c,s}\gamma_1 + \epsilon_{c,s} \tag{5}$$

Table 4 presents the estimated coefficients β_1. The impact of black-appeal radio stations, which is now estimated only out of the variation in topography, remains strong and robust.[27] The firm similarity between the β_1 coefficients estimated using Eq. 4 and Eq. 5 would suggest that the idiosyncrasy of the topography across southern counties is key in driving the results and, consequently, this should further provide support to the exogeneity of the media variable used. This is relevant also given the fact that the vector of geographic controls (statistics for the size of land, lakes, rivers, mountains, and parks, as well as coastal and state indicators) is always included in all specifications.

These estimates consistently point to a scenario in which black-appeal radio stations significantly matter in the likelihood and intensity of riots, and more so as their role in the local community rises. In what follows, for their larger role in spurring civil disorders, the focus is restricted to the 100% black-appeal radio stations. As a first check of the main results, in Table 5, the robustness of the β_1 coefficients is assessed in a series of alternative specifications. In columns (1) and (5), Eq. 5 is estimated using only state fixed effects, with the exclusion of the $Unobstructed\ Signal_{c,s}$ variable, the full set of pre-period topographic and socio-economic controls, and also the four measures of pre-1964 ethnic conflicts. Across all specifications, the coefficients

[26] In a similar fashion, Olken (2009) also includes the predicted would-be signal had there not been any obstacles.

[27] If anything, the β_1 coefficient is somewhat larger in the specification with the intensity of riots, leading to an 18% increase in the mean level of the dependent variable in the specification with 100% black-appeal radio stations. The β_2 coefficient is positive in the specification with the extensive margin of riots, while it moves in the opposite direction as for the intensity of riots. In both cases the magnitudes are significantly smaller compared to their β_1 counterparts, and are also estimated with less precision, suggesting that it is indeed the variation due to topography between transmitting and receiving locations that is driving the main results of the effect of media on the 1960s race riots.

are highly significant and larger than those obtained from the preferred full specification of Eq. 5. This upward omitted variable bias is partially addressed by the inclusion of topographic controls and measures of pre-period ethnic conflicts (columns (2) and (6)). Lastly, in both columns (3) and (7) – corresponding to Eq. 3 – and columns (4) and (8) – Eq. 5 –, the four indicators of pre-period conflicts all play a significant and robust role. The standardized count of lynchings against African Americans, the count of anti-black protests, and the number of local branches of the NAACP all worked against further ethnic conflicts. On the other hand, a more pervasive presence of the KKK is associated with both more frequent and more destructive civil disturbances. A possible explanation for these results is that the former three factors all contributed to improving the underlying adverse conditions and grievances that often constituted the background of disorder in the riot cities (as it emerges from the report of the Kernel Commission), while the latter worsened it. That is, the positive change that was demanded by rioters had already occurred in the cities that experienced pre-riot protests, and this likely led to increased trust between African Americans and whites and increased interracial communication, lowering the chances of future disorders. On the other hand, the presence of white extremist groups (proxied by the presence of a Klavern) led to the surge of African American extremist group, rising the likelihood of riots.

Another way to check for the soundness of the main results is to consider propensity score techniques. In Appendix B.1, propensity scores are constructed for both the subset of treated and untreated counties as a function of the underlying observables.[28] As shown in Table B.2, regardless of which propensity score framework is considered (e.g., stratification, matching, trimming, or even a combination of stratification and trimming), the estimated coefficients maintain a remarkable degree of stability, in terms of sign, magnitude, and significance.[29] Stability of the coefficients is also observed through a regression-discontinuity design presented in Appendix B.2, where only counties within a 15-mile radius from a radio station are considered, and also in Appendix B.3, where the analysis is replicated on the subset of counties in which African Americans are a minority of the population.

The balance obtained from these more demanding specifications highlights that the results presented thus far are not reliant on the heterogeneity of covariates in the sample of southern counties, and are instead picking up the effect of something more deeply rooted: the impact of

[28]Propensity scores allow to test for the stability of the main estimates to varying levels of balance in the data and, importantly, to check whether there are any remaining biases in the more general, and arguably less demanding and less stringent, specifications that have been presented in this Section.

[29]For instance, matching treated and untreated counties using a very stringer caliper of 0.1 (column (3) of Table B.2), which drastically lowers the observations used from 1,022 to 213, only marginally changes the estimates of the dummy indicator's effect on the severity of riots, from 4.9% to 5.5%.

black-appeal radio stations. However, in order to address other important remaining issues (such as measurement errors in the construction of the independent variable; and unobserved or omitted factors), in Section 4.3 an instrumental variables approach, based on two-stage least squares, is considered.

4.3 IV regressions

Measurement errors in the radio signal's coverage could threaten the accuracy of the whole analysis.[30] In fact, this type of error, which is inherently untestable, would lead to OLS estimates on *all* included regressors to be both biased and inconsistent. As a first, although arguably informal, attempt to provide support to the accuracy of the radio signal variables, Appendix D shows that the areas generated through the ITM well coincide with the ones that radio stations were reporting as their actual coverage. That is, through the direct visual comparison with historical sources, the ITM is shown to be a reasonably good predictor of the actual waves' propagation. However, in order to address any remaining inaccuracy in the process generating the radio signals, or in the measurement of the inputs feeding into the ITM (such as the location of radio towers, their frequency or power), an instrumental variables (IV) method is now considered.

In addition to measurement errors, the use of IV techniques further allows to address the problem of unobservable, as well as omitted, factors. That is, although Table 1 showed that radio signals are orthogonal to pre-period county characteristics, latent factors might still affect both the dependent and independent variables. These correlations could then make OLS estimates unreliable and could thus constitute an additional potential cause for concern in the identification of the true effect.

Importantly, in what follows, all of the included instruments affect the proportion of counties exposed to the radio signals, while remaining uncorrelated with all those unobservable factors determining either the extensive or intensive margins of riots.[31] By being correlated with the radio signals while being uncorrelated with the error term, the proposed instruments could be treated

[30] Measurement errors in deriving the main explanatory variable of interest could arise through three likely channels. First, the data set on black-appeal radio stations, constructed through the collection of several historical sources on the media industry in the 1960s could have resulted in some inconsistency when these sources were combined. Second, the individual sources themselves could have reported somewhat incorrect statistics. Intrinsically, this is due to the survey nature through which they obtained information on each radio station. Third, the ITM, although being based on a wide array of inputs, might not have precisely estimated the propagation of these radio waves. Every effort to minimize all these potential risks has been carefully followed.

[31] The degree to which the instruments are sufficiently correlated with the independent variable is measured through Stock-Yogo tabulations based on the Cragg-Donald statistic, computed by looking at the goodness-of-fit of the first stage regressions relating radio signal's coverage to the entire set of instruments. See Stock and Yogo (2005).

as valid ones.[32] Following Strömberg (2004), the instruments exploit natural characteristics of the counties, and ought to gauge the extent to which radio waves propagate through the ground and through the air. As waves propagate differently according to topography, these instruments include: i) a measure of ground conductivity at the county-seat, available from the U.S. Federal Communications Commission (FCC);[33] and ii) a list of variables affecting the degree to which the signal propagates through the air: the size of the county; the total length of the county covered by rivers; the total area of the county covered by lakes; an indicator for the presence of National Parks in the county; the height of all the mountains above 800m; an indicator for all the coastal counties.[34] An additional instrument takes into account the decisive role played by Historically Black Colleges and Universities (HBCUs) in the often successful setup and running of many black-appeal radio stations (Barlow 1999). In particular, in order to measure the pervasiveness and relevance of HBCUs in the U.S. South, the instrument includes an indicator based on their enrollment statistics.

The IV results are presented in Table 6, separately for the extensive and intensive measures of race riots. For ease of comparability, the OLS coefficients are presented in columns (1) and (3). In columns (2) and (4), the IV coefficients estimated from the two-stage least squares (2SLS) computational method using the instruments on topography and on HBCUs are considered. The IV estimates of the effect of black-appeal radio stations are larger than the OLS estimates, and this is especially the case for the dummy indicator of coverage (about 3.5 times larger). For the continuous measure, the IV estimates are about 2.5 times larger than the corresponding OLS estimates. These larger IV estimates could mean that OLS specifications are suffering from downward asymptotic bias. This bias could be driven by lower measures of coverage obtained from the ITM in the subset of counties experiencing race riots. Alternatively, it could be due to any unobserved factors that are positively related to radio signal propagation and negatively related to race riots. Therefore, either working through measurement errors or latent factors, these results suggest that the OLS estimates measure a lower bound for the true effect of receiving radio signals

[32] As all the IV equations are overidentified, the independence of the set of instruments from the error process is (partially) tested, through the Sargan test, by regressing the residuals from each two-stage least squares (2SLS) regression on all the included instruments.

[33] I would like to thank David Strömberg for supplying the data set on ground conductivity. *Ceteris paribus*, radio waves travel further when ground conductivity, which itself depends on the terrain, is higher. Ground conductivity is used by the FCC in prediciting the propagation of AM radio signals. As estimated by the FCC, throughout the U.S., ground conductivity ranges between 0.5 and 30 millimhos (or millisiemens) per meter, while the conductivity of seawater is estimated at 5,000 millimhos per meter, resulting in the best propagation of AM signals. The reason why radio waves travel further the higher the statistic for ground conductivity is due to the fact that radio waves, when travelling along the surface of the earth, generate a current in the terrain. Thus, if the terrain has poor conductivity characteristics, these currents create resistive heating that dissipates the strength of the signal.

[34] This vector of instruments corresponds to the topographic controls used in the rest of the analysis.

on the extensive and intensive margins of race riots.

4.4 The political content of black-appeal radio stations

Radio stations affect the behavior of their audience through the content they air. That is, although the aggregate effect on riots has been shown to be consistently strong and robust across the board, within-group differences could still exist and might depend on the stations' programming.[35] Out of the 59 stations that exclusively aired black-appeal programs, comprehensive information on the content of their weekly programming has been collected for 57 of them. Then, a statistics measuring the political content of each station's programming is computed as the ratio of the sum of the total weekly hours airing programs of news, interviews, religion, and public service, divided by the total weekly hours of all programs in the station.[36]

To disentangle whether the positive effect on riots depends on the political content aired by radio stations, the following specification is estimated:

$$Race\ Riots_{c,s} = \alpha_s + \delta_1 High\ Political\ Radio_{c,s} + \delta_2 Low\ Political\ Radio_{c,s} + \mathbf{X}_{c,s}\gamma_1 + \epsilon_{c,s} \quad (6)$$

where $\mathbf{X}_{c,s}$ includes both the vector of pre-period county-level characteristics and the full set of topographic variables. It further includes the share of the county that is covered by the unobstructed radio signals (i.e., with a free line of sight) of stations with either a high or low level of political content programming. Then, δ_1 measures the effect on riots stemming for a marginal increase in the county's share covered by the signal from a 100% black-appeal radio station lying in the top tertile of the distribution of political content ($High\ Political\ Radio_{c,s}$), while δ_2 measures the effect on riots from less politically-charged programming ($Low\ Political\ Radio_{c,s}$).

As depicted on the left-hand side of Figure 1, the content of the programming does have an important effect on the likelihood of a city experiencing a riot. In fact, it is only in the subset of counties receiving the signal from a 100% black-appeal radio station with a high level of political

[35] This heterogeneity in the effect, if it exists, could be due to the radio stations being either more inclined in talking about the ethnic conflicts happening locally or in neighboring counties, or in simply having the infrastructure to actually monitor the events as they evolved.

[36] The remaining categories include: music, sports, and a category including any other types of programming. The political content variable in these 100% black-appeal radio stations ranges from 7% to 89% of the total weekly programming. Importantly, with a median at 32% in this spectrum of political content, there is enough idiosyncrasy across stations to estimate the differential effect on race riots stemming from the content of radio programs. In this paper, the threshold used is set at the 66^{th} percentile, and it divides the stations into those that fall in the lower two tertiles and in the upper tertile of the distribution of this political participation statistics. Importantly, all the following results remain robust to alternative choices of the cut-off (e.g., being above or below the 75^{th} percentile of the distribution). Reassuringly, moving from the top tertile (66^{th} percentile) to the top quartile (75^{th} percentile) only changes the results marginally.

content programming, that a riot does emerge. The coefficient on the other 100% black-appeal radio stations, albeit positive, does not reach statistical significance at conventional levels. On the other hand, as shown on the right-hand side of Figure 1, there is not a meaningful difference on the severity of riots between the two categories of radio stations. The point estimate of the coefficient on the $High\ Political\ Radio_{c,s}$ variable is somewhat higher than the one of $Low\ Political\ Radio_{c,s}$, although not statistically so. Thus, the type of programming does not have an effect on the severity of riots, while the differential effect on the extensive margin of riots is more clearly evident.

This result goes some way further in addressing the long-lasting debate on what are the common factors able to transform a single, isolated spark into a full-blown riot. Building on diffusion models, and on anecdotal and qualitative evidence, word of mouth could be thought of a likely mechanism able to channel the information of a single event to a wide enough audience for a riot to emerge (Myers 1997 and Myers 2010). In this paper, word of mouth is identified with black-appeal radio stations. And, as shown in this section, the fact that a positive and statistically significant result is obtained only in the subset of radio stations with a meaningful degree of political content in their programming means that the initial information on the spark (e.g., a protest, an unlawful arrest, or any other unfair violent act) was powerfully and effectively conveyed by those black-appeal radio stations that were either more interested in political events (i.e., more willing to talk about these civil disturbances as they began), or that had the infrastructure to closely follow the upheaval in their infancy. Other types of radio stations, although still exclusively catering an African American audience, were not able to diffuse the information quickly enough for a riot to emerge, and consequently the ethnic turmoil faded without transforming into a fully developed riot.

This view could also be reconciled with the observation that there seems not be a significant difference in the effect of the content of programming on the intensive margin of riots, with all types of 100% black-appeal radio stations being associated with more severe disturbances. It could be expected that, once a riot has indeed emerged, black-appeal radio stations start conveying information on the riot at different levels, according to the degree to which they cater the African American community. And those 100% black-appeal radio stations, regardless of their predetermined level of political involvement, start to discuss the riot at greater length and more in depth than a station with a smaller fraction of black-appeal programming. For the former type of stations, the initial level of political content matters less, as all these stations (even those that are mainly interested in airing music and sports) start to openly discuss these conflicts.

4.5 Time variation in the exposure to radio: 1964 and 1968

The results presented thus far, using either OLS, IV, propensity score analyses, or a regression-discontinuity design, are all based on the cross-sectional variation of the radio signals' coverage across southern counties in 1964. The results paint a consistent picture: black-appeal radio stations had a significant and sizable effect on both the extensive and intensive margins of the 1960s race riots. In this section, the variability in the survival rate of radio stations is exploited to assess whether their effect on riots varied depending on the length to which stations stayed in operation. That is, it could well be that the length of the exposure matters on the ability of black-appeal radio stations to have: i) a large enough listenership base to have a meaningful impact on riots; ii) the infrastructure to follow the events as they evolved; or iii) a sufficient revenue stream to be willing to tackle the most controversial topics. To systematically tackle this question, pre-1964 information on riots has been obtained in order to cover the whole period 1960-1971. Considering a longer time series on riots allows to more precisely rule out that the results that have been uncovered in the rest of the paper could be attributed to other pre-existing variations across southern counties. In particular, although black-appeal radio stations were active even before 1964, the *ex-ante* expectation of no pre-1964 effect is supported by qualitative evidence that these stations did very little in addressing controversial topics, with racism seldom discussed during the 50s and early 60s (Barlow 1999 and Halper 2014). Then, if black-appeal radio stations are found to have an effect on pre-1964 indicators of riots, then this would confound the validity of the whole analysis.

As a first step in this direction, the following event study specification is estimated:

$$Race\ Riots_{c,s,t} = \alpha_{s,t} + \alpha_c + \sum_{n=1960-61}^{1970-71} \beta_{1n} D_n^t Radio\ Signal_{c,s,1964} + \mathbf{X}_{c,s,t}\gamma_1 + \epsilon_{c,s,t} \tag{7}$$

where, compared to Eq. 5, the coefficient measuring the effect of radio station is allowed to vary between 1960 and 1971. The dependent variable, $Race\ Riots_{c,s,t}$, represents the time series of either the extensive or intensive margins of riots, where $\alpha_{s,t}$ and α_c are state-year interactions and county fixed effects, respectively. D_n^t is an indicator equal to one whenever $n = t$, $\mathbf{X}_{c,s,t}$ includes the year interactions of all controls (topographic, socio-economic, and the pre-period measures of conflict) as well as the signal's unobstructed propagation for each radio station.[37]

[37] To allow for sufficient power, the effect of the $Radio\ Signal_{c,s,1964}$ is estimated separately for six different brackets (1960-61, 1962-63, 1964-65, 1966-67, 1968-69, and 1970-71). Further, as county fixed effects are included, the interaction with the term 1962-63 is omitted (i.e., all coefficients are measured relative to this reference point).

Figure 2 plots the coefficient β_{1n} for each n from 1960-61 until 1970-71. The estimates indicate that, in the pre-1964 period, the relationship between media and riots is indistinguishable from zero for either treated or untreated counties (those receiving or not receiving the radio signal, respectively). However, after 1964, a different pattern emerges: the impact of media on riots becomes positive and this relationship is steeper in the subset of counties that are exposed to the 100% black-appeal radio stations. Nevertheless, this larger effect (expressed as the difference in the gradient between treated and untreated counties) is not immediate and seems to slowly build up in 1966-67, peak in 1968-69, before fading somewhat in 1970-71.

To further study this non-linearity in the effect of media on riots, the complete list of black-appeal radio stations has been assembled also for 1968.[38] Then, exploiting information on black-appeal radio stations in both 1964 and 1968, the treatment is analyzed through the lenses of a two-way fixed effects (generalized difference-in-differences) model. It is specified as:

$$Race\ Riots_{c,s,t} = \alpha_{s,t} + \alpha_c + \beta_1 Active\ Radio_{c,s,t} + \epsilon_{c,s,t} \tag{8}$$

where now the independent variable of interest, $Active\ Radio_{c,s,t}$, includes information on the radio stations from both years and, specifically, it is set equal to one when the county is treated (i.e., where the majority of the county receives the signal from the black-appeal radio station). Alternatively, using a continuous measure, it is set equal to the exact share of the county receiving the signal in any given year. In both cases, the treatment variable is otherwise set equal to zero.[39] Then, by allowing counties to freely go on/off treatment, Table 7 presents the estimated coefficient β_1. Across all specifications, black-appeal radio stations are found to have a highly significant and positive effect: the switch toward treatment is associated with a rise of 0.15% in the likelihood of riots and 0.87% in the severity of riots. Alternatively, a marginal rise in the share of the county covered by radio waves is found to lead to a 15% and 28% increase in the mean levels of the extensive and intensive margins of riots. However, by comparing the point estimates of Table 7 with the ones estimated in earlier sections, it emerges that the newly estimated effects

[38] There were 157 active stations in 1968, compared to the 200 stations that existed in 1964. The turnover was high: in 1968, 80 were newly established stations and only 77 carried over from 1964. Focusing on 100% black-appeal radio stations, there were 59 such stations in either 1964 or 1968 but, importantly, as shown in Table A.2, these 59 stations are *not* the same, and there is a substantial degree of variation across both southern counties and states to be able to study the effect of the length of the exposure on riots. In particular, of the 59 stations active in 1968, 45 carried over from the previous period.

[39] State-year interactions and county fixed effects are still shown as $\alpha_{s,t}$ and α_c, and they automatically control for all the time-invariant characteristics of the county and of the state, including their pre-period mean levels. For more on the generalized difference-in-differences technique, see Bertrand, Duflo, and Mullainathan (2004) and Hansen (2007).

are smaller in magnitude. One possible explanation for this reduction is that the $Active\ Radio_{c,s,t}$ variable does not allow for the build up of the effect over time. To allow for this non-linear effect, two additional specifications are then considered. The first includes leads in the two-way fixed effects model, while the second directly allows for the effect of media to vary depending on the idiosyncratic survival rate of stations.

In Table 8, the generalized difference-in-differences model presented in Eq. 8 is augmented with two additional terms: $Lead_{1,c,s,1964}$ and $Lead_{2,c,s,1964}$. That is, the counties that are exposed to black-appeal radio stations in 1964 (either through the dummy indicator or through the continuous statistics) are now assumed to have received the same treatment also in 1962-63 and in 1960-61, respectively. Performing this placebo test of the effect allows to check for differential outcomes in the pre-treatment period. In all specifications, the estimates on $Lead_{2,c,s,1964}$ are indistinguishable from zero, and the absence of a significant effect on this counterfactual scenario reinforces the validity of the main estimates of the paper. $Lead_{1,c,s,1964}$ is instead found to be negative: that is, the would-be treated counties were actually experiencing fewer and less severe riots in the two years before 1964. The positive effect found from 1964 onward could then be considered as a lower bound of the true effect of being exposed to black-appeal radio stations.

To allow for both non-linearities and for the build-up of the effect over time, Eq. 9 splits the aggregate effect into three components: from the stations that were active both in 1964 and 1968, the ones that closed down in 1968, or that opened up in 1968. For ease of comparability, columns (1) and (5) of Table 9 show the aggregate effect. The remaining columns allow for three variations of the following specification, estimated on the 1964-1971 sample:

$$Race\ Riots_{c,s} = \alpha_s + \beta_1 Always\ On_{c,s} + \beta_2 Switch\ Off_{c,s} + \beta_3 Switch\ On_{c,s} + \mathbf{X}_{c,s}\gamma_1 + \epsilon_{c,s} \quad (9)$$

And although there is substantial variability in the number of counties that stop receiving the signal and those that start receiving the signal in 1968, all the effect on riots is concentrated in the subset of counties receiving the radio signal throughout the whole period. That is, the coefficient on $Switch\ Off_{c,s}$ and $Switch\ On_{c,s}$ are estimated to be indistinguishable from zero, while β_1 closely corresponds to the coefficient estimated when no distinction is made on the survival rate of stations. The length of exposure is important: black-appeal radio stations active in both years had a larger impact on the likelihood of riots and on their severity. As they stayed in operation for longer, they likely had a more robust revenue stream, a wider audience, and a better infrastructure and more independence to deal with controversial topics such as civil disorders.

5 Conclusions

In this paper, a mechanism able to explain both the location of civil ethnic disturbances, as well as their severity, is proposed and empirically tested. Black-appeal radio stations, through their active and ingrained role within African American communities across southern counties, were the link allowing small, individual, and isolated events to reach a wide enough audience for large-scale race riots to emerge. For their ability to coordinate subsequent protests, these stations also significantly affected the 1960s riots' overall destructiveness. This result lends empirical support to the theoretical argument linking individual preferences to like-minded information from media, with non-trivial persuasion effects exterted by such biased media outlets. This paper also sheds light on a long-standing debate on what constituted the driving channel behind the 1960s riots by isolating, for the first time, a single and well-identified factor.

The county exposure to the signal of each radio station is measured through a model of electromagnetic signal propagation in conjunction with geographic information system applications exploiting information on each station's antenna. The impact of black-appeal radio stations on the 1960s race riots is then identified through alternative techniques, based on both cross-sectional and panel data sets. Exploiting county-level variations, a marginal increase in the share of the county receiving the signal from a black-appeal radio station increases by 15% and 7% the mean levels of the intensity and likelihood of riots, respectively. A consistent story is found using either OLS, propensity score analyses, regression-discontinuity designs, instrumental variables specifications, and panel techniques.

Black-appeal radio stations significantly changed the fabric of southern counties, through their sizable and robust impact on the likelihood and on the severity of the 1960s race riots. By analyzing the individual features of each station, this paper has touched upon possible mechanisms at play, based on both the quantity and quality of programming, as well as on the survival rate of stations. Firstly, measuring the relevance of black-appeal radio stations as deeply important institutions in the local communities they served, all the aggregate results are concentrated in the subset of stations airing a significant amount of black-appeal content. Secondly, by studying the content of each station's programming, it emerges that not only the amount of airtime, but also the type of programming mattered in an important way: having an apparatus already set up and in place to air more politically charged content, allowed only a subset of stations to make a meaningful impact on the emergence of riots, by effectively conveying information on disturbances as soon as they erupted. Lastly, the length of operation mattered, with those stations that either quickly shut down or only subsequently opened up leading to no meaningful contribution to race riots.

Several additional avenues for research appear worth exploring. First, black-appeal radio stations in southern counties might be systematically different from those set up elsewhere in the United States. And as large riots have also emerged in the North of the country, an interesting question is whether the impact of radio stations is found to be similar to the one unveiled in this paper, or whether additional channels become important. Second, as the 1960s riots have been found to have had large and significant consequences on several economic outcomes in the affected cities, it remains to be tested whether such outcomes have also depended on the presence of black-appeal radio stations, with the latter perhaps acting as a backstop in the otherwise strongly negative effects of riots. Third, black-appeal radio stations might have had spillover effects into other important dynamics at play during the 1960s. Through their highly effective engagement of the local communities, they could have had important effects on the progress observed across voting and civil rights, by rising voter registrations and leading to more African American candidates in local elections. All these questions are left to further research.

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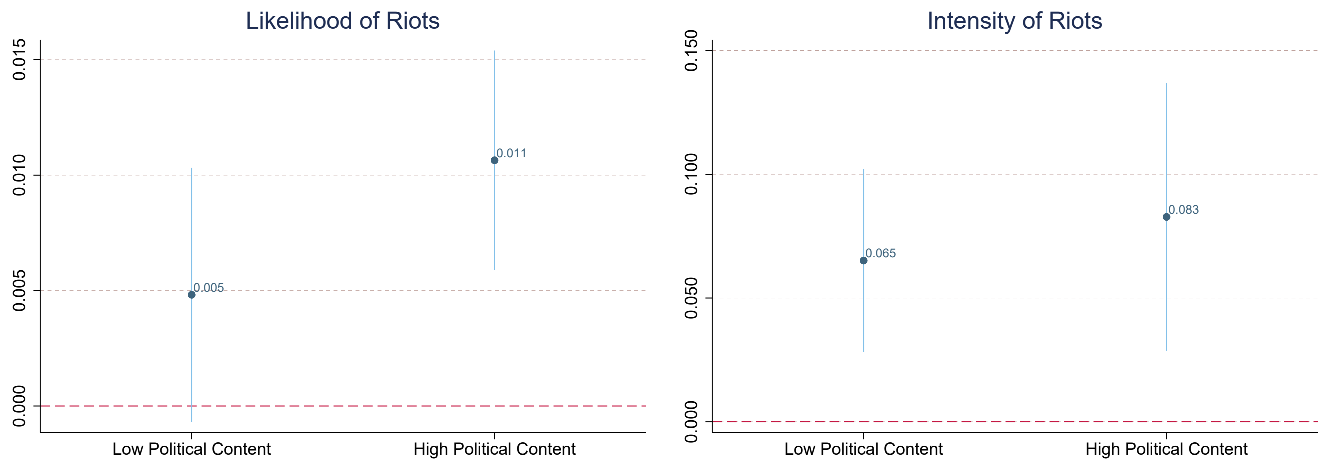
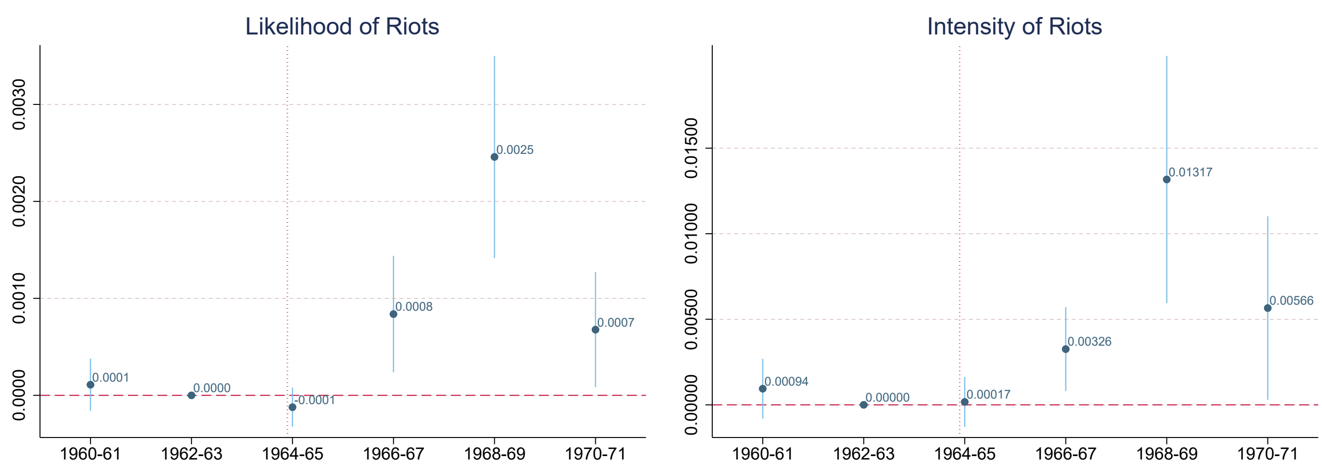
Figure 1: The political content of radio stations' programming



The two figures plot the δ_1 and δ_2 coefficients estimated from the specification presented in Eq. 6. The confidence intervals shown are set at the 90% level of statistical significance.

Figure 2: Event study of the effect of radio stations on riots



The two figures plot the β_{1n} coefficients estimated from the specification presented in Eq. 7. The confidence intervals shown are set at the 90% level of statistical significance.

Table 1: The determinants of radio signals and riots

	Radio Signal		Race Riots	
	Dummy (1)	Continuous (2)	Likelihood (3)	Intensity (4)
Share of African Americans, 1960	0.005	0.519	0.033***	0.179**
	(0.006)	(0.421)	(0.012)	(0.076)
VRA coverage in 1965	–0.106	–13.638	–0.314*	–2.292
	(0.130)	(10.650)	(0.173)	(1.647)
Population density, 1960	0.238	19.068	0.755**	7.943***
	(0.210)	(13.465)	(0.342)	(2.940)
Manufacturing size, 1960	–0.003	–0.067	–0.001	–0.147*
	(0.004)	(0.271)	(0.006)	(0.079)
Agriculture size, 1960	0.000	0.191	–0.002	–0.063
	(0.004)	(0.244)	(0.006)	(0.046)
Mining size, 1950	–0.002	0.121	0.013**	–0.031
	(0.004)	(0.280)	(0.006)	(0.066)
Agricultural intensity, 1960	–0.003	–0.004	–0.022**	–0.121
	(0.004)	(0.325)	(0.011)	(0.105)
Unemployment rate, 1960	0.016	1.239	–0.021	–0.093
	(0.014)	(1.030)	(0.023)	(0.201)
Share of families in poverty, 1960	–0.013	–0.670	–0.005	–0.413*
	(0.013)	(1.024)	(0.024)	(0.227)
Median family income, 1960	–0.000	0.005	–0.000	–0.004*
	(0.000)	(0.014)	(0.000)	(0.002)
Birth rate, 1960	0.000	0.266	–0.003	–0.121
	(0.004)	(0.303)	(0.007)	(0.082)
Household members, 1960	0.167	3.660	–0.833***	–2.258
	(0.168)	(9.516)	(0.317)	(2.559)
Size of farms, 1959	–0.001	0.009	–0.004	–0.044*
	(0.001)	(0.098)	(0.003)	(0.025)
Nonwhite households, 1950	0.005	0.356	–0.008	0.002
	(0.006)	(0.448)	(0.011)	(0.075)
Farms w. electricity, 1954	0.004	–0.027	0.008	–0.021
	(0.003)	(0.247)	(0.009)	(0.131)
Households w. tv, 1960	0.006*	0.463**	0.004	0.091*
	(0.003)	(0.216)	(0.006)	(0.053)
Households w. two or more cars, 1960	0.001	0.349	0.014	0.147*
	(0.005)	(0.313)	(0.009)	(0.075)
Older than 65 years, 1960	0.023	1.560	–0.098**	–0.266
	(0.015)	(0.977)	(0.043)	(0.296)
Expenditure on highways, 1962	–0.017	–0.393	–0.013	0.012
	(0.017)	(1.603)	(0.043)	(0.311)
Median school years, 1960	0.032	0.916	–0.011	–0.948*
	(0.041)	(2.909)	(0.079)	(0.524)
Enrolled in school, 1950	–0.001	–0.032	–0.003*	0.001
	(0.001)	(0.070)	(0.001)	(0.012)
Lynchings of Afr. Am., 1902-1964	–0.168	–11.652	–0.695**	–2.791
	(0.129)	(8.518)	(0.290)	(2.761)
Anti-black activism, 1960-1964	–0.001	–0.036	–0.038**	–0.616**
	(0.012)	(0.746)	(0.019)	(0.239)
NAACP branches, 1957-1964	0.039	3.936	–0.242**	–1.632**
	(0.056)	(3.998)	(0.099)	(0.804)
KKK Klaverns, 1925-1940	0.031	1.741	0.489***	1.826**
	(0.036)	(2.916)	(0.139)	(0.837)
State fixed effects	Yes	Yes	Yes	Yes
Topographic controls	Yes	Yes	Yes	Yes
Mean dep. var.	0.153	16.053	0.004	0.084
Adj. R-Square	0.44	0.50	0.65	0.46
N	1022	1022	1022	1022

Robust standard errors in parenthesis are adjusted for clustering at the county level. ***, **, and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. All regressions include state fixed effects and topographic variables.

Table 2: The race riots, 1964-1971

	1964	1965	1966	1967	1968	1969	1970	1971	Total
Panel A. Race Riots in the U.S.									
Number of riots	11	11	53	158	289	124	68	38	752
Days of riots	34	20	109	408	739	284	126	82	1,802
People killed	2	35	11	83	66	13	13	5	228
People injured	996	1,132	525	2,801	5,302	861	710	414	12,741
People arrested	2,917	4,219	5,107	17,011	31,680	4,730	2,027	1,408	69,099
Episodes of arson	238	3,006	812	4,627	6,041	369	283	459	15,835
Intensity of Riots	*0.16*	*0.50*	*0.28*	*1.35*	*1.96*	*0.37*	*0.23*	*0.15*	*5.00*
Panel B. Race Riots in the U.S. South									
Number of riots	1	0	10	26	74	35	17	26	189
Days of riots	3	0	17	47	227	74	39	58	465
People killed	0	0	0	3	11	3	10	3	30
People injured	15	0	36	164	1,463	91	223	298	2,290
People arrested	465	0	207	1,176	4,373	1,070	720	969	8,980
Episodes of arson	0	0	10	322	1,139	81	113	291	1,956
Intensity of Riots	*0.07*	*0.00*	*0.08*	*0.57*	*2.56*	*0.46*	*0.65*	*0.61*	*5.00*
Panel C. Race Riots in the U.S. South, by State									
Alabama	0	0	3	1	1	2	1	0	8
Arkansas	0	0	0	1	8	2	1	0	12
Florida	1	0	4	5	16	7	5	12	50
Georgia	0	0	3	4	7	0	3	5	22
Louisiana	0	0	0	3	1	2	4	1	11
Mississippi	0	0	0	1	3	1	0	2	7
North Carolina	0	0	0	2	14	8	2	3	29
South Carolina	0	0	0	0	4	4	0	0	8
Tennessee	0	0	0	3	7	3	0	3	16
Texas	0	0	0	2	4	4	0	0	10
Virginia	0	0	0	4	9	2	1	0	16

Table 3: The effect of radio stations on riots

	Likelihood of Riots					Intensity of Riots				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Black-Appeal Radio Stations: Dummy Variable										
100%	0.371**					4.814***				
	(0.182)					(1.177)				
> 75%		0.366**					4.757***			
		(0.181)					(1.177)			
> 50%			0.184					2.583***		
			(0.136)					(0.814)		
> 25%				0.078					1.580**	
				(0.128)					(0.799)	
> 0%					0.021					1.393*
					(0.126)					(0.757)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Topographic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Socio-Economic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-VRA Conflict	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Var.	0.413	0.413	0.413	0.413	0.413	0.084	0.084	0.084	0.084	0.084
Adj. R-Square	0.66	0.66	0.65	0.65	0.65	0.50	0.50	0.47	0.47	0.47
N	1022	1022	1022	1022	1022	1022	1022	1022	1022	1022
Panel B: Black-Appeal Radio Stations: Continous Variable										
100%	0.006**					0.064***				
	(0.003)					(0.016)				
> 75%		0.006**					0.064***			
		(0.003)					(0.016)			
> 50%			0.004					0.036**		
			(0.002)					(0.014)		
> 25%				0.002					0.021	
				(0.002)					(0.015)	
> 0%					0.001					0.017
					(0.002)					(0.016)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Topographic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Socio-Economic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-VRA Conflict	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Var.	0.413	0.413	0.413	0.413	0.413	0.084	0.084	0.084	0.084	0.084
Adj. R-Square	0.67	0.67	0.65	0.65	0.65	0.50	0.50	0.47	0.47	0.46
N	1022	1022	1022	1022	1022	1022	1022	1022	1022	1022

Robust standard errors in parenthesis are adjusted for clustering at the county level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All regressions include state fixed effects, topographic variables, socio-economic controls, and pre-VRA measures of conflict.

Table 4: The effect of radio stations and the free-space signal on riots

	Likelihood of Riots					Intensity of Riots				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Black-Appeal Radio Stations: Dummy Variable & Free-Space Dummy Signal										
100%	0.324*					5.087***				
	(0.183)					(1.242)				
> 75%		0.314*					4.960***			
		(0.179)					(1.228)			
> 50%			0.164					2.778***		
			(0.133)					(0.790)		
> 25%				0.078					1.973***	
				(0.122)					(0.717)	
> 0%					0.033					1.840***
					(0.122)					(0.697)
Free-Space Signal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Topographic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Socio-Economic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-VRA Conflict	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Var.	0.413	0.413	0.413	0.413	0.413	0.084	0.084	0.084	0.084	0.084
Adj. R-Square	0.66	0.66	0.65	0.65	0.65	0.50	0.50	0.48	0.47	0.47
N	1022	1022	1022	1022	1022	1022	1022	1022	1022	1022
Panel B: Black-Appeal Radio Stations: Continuous Variable & Free-Space Continuous Signal										
100%	0.006*					0.076***				
	(0.003)					(0.019)				
> 75%		0.005*					0.073***			
		(0.003)					(0.019)			
> 50%			0.004					0.043**		
			(0.003)					(0.017)		
> 25%				0.003					0.033**	
				(0.002)					(0.016)	
> 0%					0.002					0.029
					(0.002)					(0.018)
Free-Space Signal	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Topographic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Socio-Economic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-VRA Conflict	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Var.	0.413	0.413	0.413	0.413	0.413	0.084	0.084	0.084	0.084	0.084
Adj. R-Square	0.67	0.67	0.65	0.65	0.65	0.51	0.51	0.48	0.47	0.47
N	1022	1022	1022	1022	1022	1022	1022	1022	1022	1022

Robust standard errors in parenthesis are adjusted for clustering at the county level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All regressions include state fixed effects, topographic variables, socio-economic controls, pre-VRA measures of conflict, and the unobstructed radio signals.

Table 5: The stability of the effect of radio stations on riots

	Likelihood of Riots				Intensity of Riots			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: 100% Black-Appeal Radio Stations: Dummy Variable								
Radio signal	0.950***	0.532***	0.371**	0.324*	7.472***	5.714***	4.814***	5.087***
	(0.201)	(0.198)	(0.182)	(0.183)	(1.749)	(1.553)	(1.177)	(1.242)
Free-space signal				0.144*				–0.855
				(0.076)				(0.655)
Share of Afr. Am.			0.031**	0.029**			0.149*	0.163**
			(0.012)	(0.012)			(0.076)	(0.076)
VRA coverage			–0.227	–0.219			–1.159	–1.204
			(0.152)	(0.153)			(1.318)	(1.326)
Lynchings		–0.835***	–0.648**	–0.664**		–6.039**	–2.187	–2.095
		(0.318)	(0.257)	(0.258)		(2.435)	(2.428)	(2.410)
Anti-black acts		0.010	–0.042**	–0.039*		–0.148	–0.660***	–0.675***
		(0.013)	(0.021)	(0.020)		(0.160)	(0.230)	(0.237)
NAACP branches		0.039	–0.271***	–0.278***		0.037	–2.003**	–1.961**
		(0.156)	(0.099)	(0.099)		(0.986)	(0.825)	(0.808)
KKK Klaverns		0.477***	0.468***	0.469***		1.841*	1.556*	1.548*
		(0.169)	(0.140)	(0.140)		(1.055)	(0.843)	(0.838)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Topographic	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Socio-Economic	No	No	Yes	Yes	No	No	Yes	Yes
Pre-VRA Conflict	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Adj. R-Square	0.31	0.51	0.66	0.66	0.27	0.36	0.50	0.50
N	1134	1134	1022	1022	1134	1134	1022	1022
Panel B: 100% Black-Appeal Radio Stations: Continuous Variable								
Radio signal	0.013***	0.008***	0.006**	0.006*	0.097***	0.078***	0.064***	0.076***
	(0.002)	(0.002)	(0.003)	(0.003)	(0.022)	(0.019)	(0.016)	(0.019)
Free-space signal				0.001				–0.019**
				(0.001)				(0.010)
Share of Afr. Am.			0.030**	0.029**			0.141*	0.170**
			(0.012)	(0.012)			(0.075)	(0.076)
VRA coverage			–0.194	–0.194			–1.015	–1.003
			(0.156)	(0.156)			(1.327)	(1.320)
Lynchings		–0.770***	–0.628**	–0.635**		–5.736**	–2.083	–1.892
		(0.291)	(0.255)	(0.255)		(2.302)	(2.489)	(2.398)
Anti-black acts		0.012	–0.038*	–0.037*		–0.120	–0.619***	–0.647***
		(0.012)	(0.021)	(0.020)		(0.152)	(0.227)	(0.229)
NAACP branches		–0.009	–0.283***	–0.285***		–0.278	–2.070***	–2.012**
		(0.148)	(0.099)	(0.099)		(0.880)	(0.802)	(0.799)
KKK Klaverns		0.469***	0.467***	0.468***		1.842*	1.592*	1.560*
		(0.168)	(0.142)	(0.142)		(1.025)	(0.826)	(0.816)
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Topographic	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Socio-Economic	No	No	Yes	Yes	No	No	Yes	Yes
Pre-VRA Conflict	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Adj. R-Square	0.33	0.53	0.67	0.67	0.27	0.38	0.50	0.51
N	1134	1134	1022	1022	1134	1134	1022	1022

Robust standard errors in parenthesis are adjusted for clustering at the county level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All regressions include state fixed effects. Topopgrahic variables are included in columns (2)-(4) and (6)-(8). Socio-economic controls are included in columns (3)-(4) and (7)-(8). Pre-VRA measures of conflict are included in columns (2)-(4) and (6)-(8). The unobstructed radio signals are included in columns (4) and (8).

Table 6: IV (2SLS) estimates of the effect of radio stations on riots

	Likelihood of Riots		Intensity of Riots	
	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
Panel A: 100% Black-Appeal Radio Stations: Dummy Variable				
Predicted signal	0.325*	1.161*	5.090***	19.059***
	(0.183)	(0.693)	(1.243)	(6.036)
Underid. *LM*-stat				
χ^2		15.904		15.904
p-value		0.044		0.044
Weak id. *F*-stat				
F		10.644		10.644
Overid. *J*-stat				
χ^2		8.848		6.621
p-value		0.264		0.469
Free-Space Signal	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
Topographic	Yes	Yes	Yes	Yes
Socio-Economic	Yes	Yes	Yes	Yes
Pre-VRA Conflict	Yes	Yes	Yes	Yes
Adj. R-Square	0.66	0.58	0.50	0.18
N	1021	1021	1021	1021
Panel B: 100% Black-Appeal Radio Stations: Continuous Variable				
Predicted signal	0.006*	0.015*	0.076***	0.196***
	(0.003)	(0.008)	(0.019)	(0.063)
Underid. *LM*-stat				
χ^2		22.314		22.314
p-value		0.004		0.004
Weak id. *F*-stat				
F		12.777		12.777
Overid. *J*-stat				
χ^2		11.936		9.422
p-value		0.103		0.224
Free-Space Signal	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes
Topographic	Yes	Yes	Yes	Yes
Socio-Economic	Yes	Yes	Yes	Yes
Pre-VRA Conflict	Yes	Yes	Yes	Yes
Adj. R-Square	0.67	0.61	0.51	0.36
N	1021	1021	1021	1021

Robust standard errors in parenthesis are adjusted for clustering at the county level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All regressions include state fixed effects. All regressions include state fixed effects, topographic variables, socio-economic controls, pre-VRA measures of conflict, and the unobstructed radio signals.

Table 7: Generalized diff-in-diff estimates of the effect of radio stations on riots

	Likelihood of Riots	Intensity of Riots
	(1)	(2)
Panel A: 100% Black-Appeal Radio Stations: Dummy Variable		
Black radio in 1964 and 1968	0.1525***	0.8748***
	(0.0424)	(0.2952)
County Fixed Effects	Yes	Yes
State-Year Fixed Effects	Yes	Yes
Mean Dep. Var	0.0550	0.0141
Adj. R-Square	0.20	0.12
N	6804	6804
Panel B: 100% Black-Appeal Radio Stations: Continuous Variable		
Black radio in 1964 and 1968	0.0021***	0.0153***
	(0.0006)	(0.0057)
County Fixed Effects	Yes	Yes
State-Year Fixed Effects	Yes	Yes
Mean Dep. Var	0.0550	0.0141
Adj. R-Square	0.20	0.13
N	6804	6804

Robust standard errors in parenthesis are adjusted for clustering at the county level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 8: Generalized diff-in-diff estimates of the effect of radio stations on riots, with leads

	Likelihood of Riots			Intensity of Riots		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: 100% Black-Appeal Radio Stations: Dummy Variable						
Black radio in 1964 and 1968	0.1525***	0.1211***	0.1481***	0.8748***	0.6174**	0.8667***
	(0.0424)	(0.0403)	(0.0425)	(0.2952)	(0.2904)	(0.2736)
1964 radio in 1962		–0.0809**			–0.6632***	
		(0.0340)			(0.2429)	
1964 radio in 1960			–0.0114			–0.0207
			(0.0333)			(0.2794)
County Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.20	0.20	0.20	0.12	0.12	0.12
N	6804	6804	6804	6804	6804	6804
Panel B: 100% Black-Appeal Radio Stations: Continuous Variable						
Black radio in 1964 and 1968	0.0021***	0.0017***	0.0020***	0.0153***	0.0141**	0.0170**
	(0.0006)	(0.0006)	(0.0006)	(0.0057)	(0.0071)	(0.0071)
1964 radio in 1962		–0.0010**			–0.0028	
		(0.0004)			(0.0050)	
1964 radio in 1960			–0.0003			0.0041
			(0.0005)			(0.0053)
County Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-Square	0.20	0.20	0.20	0.13	0.13	0.13
N	6804	6804	6804	6804	6804	6804

Robust standard errors in parenthesis are adjusted for clustering at the county level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 9: Early adopters, early exiters, and late adopters

	Likelihood of Riots				Intensity of Riots			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
All active in 1964	0.0065**	0.0064**			0.0776***	0.0774***		
	(0.0030)	(0.0030)			(0.0208)	(0.0208)		
Always on			0.0065**	0.0064**			0.0773***	0.0771***
			(0.0029)	(0.0029)			(0.0206)	(0.0207)
Switch off			0.0178	0.0178			0.0544	0.0531
			(0.0196)	(0.0196)			(0.0616)	(0.0625)
Switch on		−0.0041		−0.0043		−0.0161		−0.0156
		(0.0033)		(0.0033)		(0.0268)		(0.0267)
Free-Space Signal 1964	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Free-Space Signal 1968	No	Yes	No	Yes	No	Yes	No	Yes
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Topographic	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pre-VRA Conflict	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mean Dep. Var.	0.4131	0.4131	0.4131	0.4131	0.0845	0.0845	0.0845	0.0845
Adj. R-Square	0.54	0.54	0.54	0.54	0.39	0.39	0.39	0.39
N	1134	1134	1134	1134	1134	1134	1134	1134

Robust standard errors in parenthesis are adjusted for clustering at the county level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All regressions include state fixed effects, topographic variables, pre-VRA measures of conflict, and unobstructed radio signals in 1964 and 1968.

A Data sources and variable definitions

Race riots of the 1960s.

Likelihood of riots: the share of all the riots that occurred in a county, standardized by the total number of riots in all southern counties. When considering the period 1964-1971, the denominator refers to the total number of riots that occurred in the U.S. South during 1964-1971. In this case, the data set is based on the information collected by Carter (1986). When considering the longer period 1960-1971, the denominator refers to the total number of riots that occurred in the U.S. South during 1960-1971. In this longer period, the data set is based on the information collected by Carter (1986) for 1964-1971, and by Olzak (2015) for 1960-1963.

Intensity of riots: it is constructed as the Severity Index proposed by Collins and Margo (2004) and Collins and Margo (2007). When considering the period 1964-1971, the five indicators of severity that are used to construct this index are: the length of the riot, the number of deaths, injuries, arrests, and the episodes of arson. When considering the longer period 1960-1971, the indicator measuring the episodes of arson is omitted and the remaining four categories are the ones included in the index. This is to ensure consistency between the data sets collected by Carter (1986) and Olzak (2015).

Black-appeal radio stations.

Black-appeal radio stations in 1964: it includes the list of 200 radio stations that aired a minimum of 12 hours of black-appeal programming a week. The data set is based on the information collected by *Sponsor* magazine, and published in its report *Negro Market*. In case of missing information, other sources used are: i) publications from previous neighboring years of *Sponsor*'s *Negro Market*; ii) the 1964 edition of the *Broadcasting Yearbook*, a yearly directory published by *Broadcasting* magazine; and iii) the 1964 edition of the *North American Radio-TV Station Guide*.

Black-appeal radio stations in 1968: it includes the list of 157 radio stations that aired a minimum of 12 hours of black-appeal programming a week. It is obtained from the 1968 *Standard Rate and Data Service (SRDS)* publication by *Spot Radio*.

Topographic variables (also used as instruments).

County area: the total area (in squared miles) of the county, obtained from the County and

City Data Book Consolidated File, County Data 1947-1977 (U.S. Department of Commerce 1978).

Length of rivers: the total length (in miles) of the county that is covered by rivers. The raster file is obtained from Natural Earth, and ArcGIS is used by the author to obtain this statistics.

Area of lakes: the total area (in squared miles) of the county that is covered by lakes. The raster file is obtained from Natural Earth, and ArcGIS is used by the author to obtain this statistics.

National Parks: a dummy variable equal to one if there is at least one National Park in the county. The raster file is obtained from Natural Earth, and ArcGIS is used by the author to obtain this statistics.

Height of mountains above 800m: the height (in meters) of all the mountains above 800m. The raster file is obtained from Natural Earth, and ArcGIS is used by the author to obtain this statistics.

Coastal county: a dummy variable equal to one for the counties that are along the coast, obtained from the U.S. Census.

Socio-economic variables.

Share of the African American population, 1960: the share of the African American population in the total population in 1960, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977 (U.S. Department of Commerce 1978).

VRA coverage, 1965: a dummy variable equal to one for the counties covered by Section 5 of the Voting Rights Act in 1965, and equal to zero otherwise. The counties of six states (Alabama, Georgia, Louisiana, Mississippi, South Carolina, and Virginia) were fully covered. On the other hand, Arkansas, Florida, Tennessee, and Texas were not covered. Of the 100 counties in North Carolina, 39 were the covered ones: Anson, Beaufort, Bertie, Bladen, Camden, Caswell, Chowan, Cleveland, Craven, Cumberland, Edgecombe, Franklin, Gaston, Gates, Granville, Greene, Guilford, Halifax, Harnett, Hertford, Hoke, Jackson, Lee, Martin, Nash, Northampton, Onslow, Pasquotank, Perquimans, Person, Pitt, Robeson, Rockingham, Scotland, Union, Vance, Washington, Wayne, Wilson.

Total population, 1960: the total population in 1960, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977 (U.S. Department of Commerce 1978).

Population density, 1960: the population density in 1960, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977 (U.S. Department of

Commerce 1978).

Size of manufacturing, 1960: the share of the manufacturing sector in the total production system in 1960, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977 (U.S. Department of Commerce 1978).

Size of agriculture, 1960: the share of the agricultural sector in the total production system in 1960, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977 (U.S. Department of Commerce 1978).

Size of mining, 1960: the share of the mining sector in the total production system in 1960, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977 (U.S. Department of Commerce 1978).

Agricultural intensity, 1960: the maximum potential cotton yield (the cotton suitability index) in 1960, at the county level. The data set is based on the information collected by Hornbeck and Naidu (2014).

Unemployment rate, 1960: the unemployment rate in 1960, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977 (U.S. Department of Commerce 1978).

Share of families below the poverty line, 1960: the share of families with an income less than USD3,000 in 1960, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977 (U.S. Department of Commerce 1978).

Median family income, 1960: the median income per household in 1960, at the county level, using 1960 USD, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977 (U.S. Department of Commerce 1978).

Birth rate, 1960: the birth rate in 1960, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977 (U.S. Department of Commerce 1978).

Members of the households, 1960: the average number of members in each household in 1960, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977 (U.S. Department of Commerce 1978).

Size of farms, 1959: the share of the land used in farming in 1959, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977.

Non-white households, 1950: the share of households that are non-white in 1950, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977.

Farms with electricity, 1954: the share of farms with electricity in 1954, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977.

Households with televisions, 1960: the share of households with at least one television set in 1960, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977.

Households with two or more cars, 1960: the share of households with at least two cars in 1960, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977.

Population above 65 years, 1960: the share of the population that is at least 65 years of age in 1960, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977.

Expenditure on highways, 1962: the expenditure on highways by the local government in 1962, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977. This statistics is considered in its per capita form, dividing the total figure by the county population in 1960.

Median school years, 1960: the median years of schooling of the population that is at least 25 years of age in 1960, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977.

School enrollment, 1950: the share of the population between 14 and 17 years of age that is enrolled in schooling in 1950, at the county level, is obtained from the County and City Data Book Consolidated File, County Data 1947-1977.

Pre-1964 measures of ethnic conflicts.

Lynchings of African Americans, 1902-1964: the counts of all episodes of African American lynching occurred in each county from 1902 until 1964, standardized by the African American population in the county in 1960. Information on each episode of lynching is obtained from the project *Monroe Work Today.* It provides information on the name, race, sex, location, alleged crime, and original source. When information on the county was not reported, the mapping is made by the author. The choice to start the counts from 1902 is driven by two considerations: i) in 1901, anti-lynching measures were presented to Congress for the first time (since then, about 240 anti-lynching bills have been proposed); ii) in May 1902, during a speech at Arlington, Virginia, President Theodore Roosevelt Jr. openly condemned the act of lynching, and this was the first time that a President ever made a statement against it.

Anti-black activism, 1960-1964: the counts of anti-African American events that occurred between 1960 and 1964, as reported by the Dynamics of Collective Action Dataset by States and Cities. The mapping to counties is made by the author.

NAACP branches, 1957-1964: the average number of counts of local branches of the National Association for the Advancement of Colored People (NAACP) active in each county between 1957 and 1964. The information on the location of local branches of the NAACP is obtained from the University of Washington's project *Mapping American Social Movements Through the 20th Century*, which reports the municipality. The mapping to counties is made by the author.

KKK Klaverns, 1925-1940: the average number of counts of Ku Klux Klan groups (known as Klaverns) active in each county between 1925 and 1940. Information on the location of each Klavern is obtained from the Virginia Commonwealth University's project *Mapping the Second Ku Klux Klan*, which lists the location of each headquarter in a latitude and longitude format. The mapping to counties is made by the author.

Instrumental variables.

HBCUs enrollment, 1976: an indicator for either low, medium, or high enrollment in Historically Black Colleges and Universities (HBCUs). The list of HBCUs active in 1960 is obtained from HBCU Lifestyle. The enrollment statistics refer to 1976 and it is available from U.S. Department of Education, National Center for Education Statistics (2004).

Ground conductivity: a measure of ground conductivity at the county seat, available from the Federal Communications Commission, Media Bureau, Audio Division, M3 Map of Effective Ground Conductivity in the U.S.A.

Table A.1: Summary statistics

	With Radio		Without Radio	
	Mean	St. Dev.	Mean	St. Dev.
Race Riots				
Likelihood of riots, 1964-1971	0.15	0.51	0.03	0.21
Intensity of race riots, 1964-1971	0.83	4.04	0.06	0.84
Topographic Variables (Also Instruments)				
County area (*squared miles*)	523.44	275.38	737.08	531.36
Length of rivers (*miles*)	17.51	17.35	22.57	22.74
Area of lakes (*squared miles*)	4.72	13.29	9.48	24.17
National Parks (*dummy variable*)	0.06	0.24	0.05	0.22
Height of mountains above 800m (*meters*)	0.00	0.00	20.73	201.56
Coastal county (*dummy variable*)	0.11	0.32	0.10	0.30
Socio-Economic Variables				
Share of Afr. Am. (%), 1960	33.77	18.43	14.50	16.45
VRA coverage (*dummy variable*), 1965	0.77	0.42	0.31	0.46
Population density (%), 1960	0.20	0.70	0.12	0.58
Size of manufacturing (%), 1960	23.49	11.29	18.96	13.20
Size of agriculture (%), 1960	18.05	13.67	20.30	12.81
Size of mining (%), 1960	0.77	2.34	3.46	7.54
Agricultural intensity	0.70	0.65	1.09	5.02
Unemployment rate (%), 1960	4.92	1.76	4.95	2.23
Share of families in poverty (%), 1960	45.93	15.21	44.80	15.25
Median family income (*1960 $*), 1960	3358.73	1167.83	3420.05	1187.47
Birth rate (%), 1960	18.86	5.79	17.54	6.27
Members of the households (*counts*), 1960	3.72	0.49	3.46	0.52
Size of farms (%), 1959	53.29	23.08	61.08	29.50
Non-white households (%), 1950	32.06	17.72	13.76	15.48
Farms with electricty (%), 1954	85.64	19.63	87.88	16.93
Households with televisions (%), 1960	71.91	13.48	71.85	14.23
Households with two or more cars (%), 1960	18.05	6.23	19.75	8.70
Population above 65 years (%), 1960	8.46	2.47	10.16	3.69
Expenditure on highways (*1960 $*), 1962	1.47	1.31	2.04	1.68
Median school years, 1960	8.54	1.41	8.78	1.50
Enrolled in school (%), 1950	70.32	20.70	62.96	30.16
Pre-Radio Conflicts				
Lynchings of African Americans (%), 1902-1964	0.03	0.08	0.03	0.16
Anti-black activism (*counts*), 1960-1964	0.34	2.13	0.05	0.62
NAACP branches (*counts*), 1957-1964	0.53	0.67	0.27	0.51
KKK Klaverns (*counts*), 1925-1940	0.17	0.51	0.10	0.37
Instruments				
Enrolment HBCUs (*dummy variable*), 1976	0.22	0.69	0.04	0.31
Households with radio (%), 1950	86.25	11.33	88.43	11.42
Ground conductivity	4.41	3.71	9.05	8.56
Counties	524		616	

The set of counties under the *With Radio* category includes those counties with at least 50 percent of the county being covered by the radio signal in either 1964 or 1968. Conversely, *Without Radio* includes those counties where less than 50% of the total land receives the radio signal.

Table A.2: Characteristics of black-appeal radio stations (1964 and 1968)

	Power (avg., w)	Black-Appeal (avg., %)	Number of Stations, by Black-Appeal Content				
			>0%	>25%	>50%	>75%	100%
1964							
Alabama	1420	61	22	19	18	7	7
Arkansas	1821	49	7	4	4	2	2
Florida	2655	64	21	15	14	11	10
Georgia	2018	49	28	17	14	9	7
Louisiana	1525	55	20	16	13	5	5
Mississippi	1903	44	18	12	7	3	3
North Carolina	1298	49	21	15	7	6	6
South Carolina	2426	56	17	13	12	5	4
Tennessee	7850	66	15	13	12	5	5
Texas	1633	53	15	10	9	5	5
Virginia	1938	65	16	14	11	7	5
1968							
Alabama	5321	65	14	9	8	8	8
Arkansas	9625	57	6	3	3	3	3
Florida	2817	60	15	8	8	8	6
Georgia	2489	47	23	10	8	8	8
Louisiana	2818	49	11	5	4	4	4
Mississippi	7500	34	16	6	3	3	3
North Carolina	1283	42	23	9	7	7	6
South Carolina	4750	37	18	6	4	4	4
Tennessee	13750	84	8	8	7	6	5
Texas	1269	55	13	6	6	6	6
Virginia	2200	67	10	7	6	6	6

B Robustness checks

An important threat for the identification of the results is that the two set of counties (those exposed and those not exposed to black-appeal radio stations) might be significantly different along several observable characteristics. By leading to biased estimates, this would then inevitably invalidate the analysis. To address this concern, I hereby present three methods that ought to assess the stability of the results presented in the paper.

B.1 Propensity score analysis

The first set of results are obtained from propensity score stratification and matching techniques. These methods are both based on constructing, for each county and from the set of available controls, a propensity score measuring the likelihood of receiving the treatment. Then, restricting the analysis to the comparison of those counties receiving the radio signal with those not receiving it, but that nonetheless hold very similar propensity scores, delivers unbiased estimates of the true effect of treatment (Rosenbaum and Rubin 1983). Varying degrees in the balancing of the propensity scores then allows to test for the stability of the estimates to different levels of balance in the data and, consequently, to check whether there are indeed biases in the more general specifications of the paper.[40]

Table B.1 lists the ten covariates with the largest standardized differences between the two sets of counties. Importantly, the two variables with the largest imbalance include those summarizing the ethnicity of the population: those counties exposed to black-appeal radio stations had, on average, significantly more African Americans in the population. Furthermore, they had a larger presence of the NAACP and they were more likely to be covered by the Voting Rights Act of 1965.

Propensity scores are firstly calculated through a logistic regression and then, in order to move from skewed to normal distributions, the log of the odds of the propensity scores (also known as the linear predictor) is computed. The distribution of this statistic, which is plotted in Figure B.1, highlights that treated counties tend to have higher propensity scores and are more densely concentrated around the mean (i.e., lower variance).[41] Stratification and matching techniques are then applied to the main specification of the paper after balancing the sample on the propensity scores. In particular, stratification allows to estimate the effect of being exposed to the radio signal

[40] The exposure to the radio signals is based on the dummy indicator, but similar results are obtained if the continuous measure (reflecting the actual share of coverage) is used instead.

[41] A Hosmer-Lemeshow test to check the quality of the logistic model employed to construct the propensity score highlights that the specification is well-specified: an Hosmer-Lemeshow $\chi^2(8)$ value of 12.58 validates the goodness-of-fit of the model.

by comparing treated and untreated counties within each strata. In this paper, stratifying the sample into quintiles reaches a high level of balance in the covariates: as shown in column (6) of Table B.1, there is no significant imbalance in the standardized differences between the two groups, with all the controls now deviating by 0.15 standard deviations or less.[42] Besides stratification, propensity scores can be exploited to balance the sample also through matching techniques. In this paper, the chosen algorithm ensures that the observations in matched pairs hold propensity scores falling within an arbitrarily small range (known as caliper).[43] Inevitably, this method throws away all those treated counties for which a valid match with untreated counties lying within the specified caliper cannot be found. However, by exploiting only the relatively better matches, the balance between the two sets of counties is of a much superior quality: with a demanding caliper of 0.1, the standardized differences reported in column (9) of Table B.1 perform slightly better than stratification, and markedly better than the original sample, with differences in the means across all covariates ranging at around 0.08 standard deviations or less.

In Table B.2, the main effect estimated in the paper is compared to the one estimated through propensity score analysis. By means of comparison, column (1) reports the main coefficient already presented in the paper (Table 4). Then, in columns (2) and (3), the same specification is run after either stratifying the sample into quintiles or matching counties by their propensity scores (and imposing a caliper of 0.1). And although the sample size is reduced by about 80% in the latter model, the estimates are very robust across both specifications. Furthermore, the cross-sectional regression is also estimated by either trimming the sample to its common support (column (4)) or by excluding, on top of the stratification into quintiles, the largest outliers in the sample (column (5)).[44] And although both techniques lead to a considerably smaller sample size (reduced by about 20%), the estimated coefficients remain broadly robust, in terms of both magnitude and significance.

[42] Dividing the distribution into five parts (quintiles) is the smallest level of stratification which allows to have at least one observation in each stratum. As shown by Cochran (1968), balancing the sample using five strata is expected to eliminate, on average, around 90% of the overall confounding.

[43] Matching could also be carried out by ensuring that a match is found for each and every treated county. In this paper, I prefer to consider the more stringent type of matching based on setting a caliper, constraining the difference in the propensity scores of treated and untreated counties to lie within a predetermined range. However, similar and robust results still hold with the less stringent type of matching algorithm.

[44] In the former model, the included counties are those whose propensity scores lie within the range at which both sets are observed. In the latter model, the specification excludes both those untreated counties that have very high values of propensity scores (above the $100 - \sigma^{th}$ percentile) and those treated counties that have extremely low propensity scores (below the σ^{th} percentile). In this paper, I let σ be one and thus trim at the 1^{st} percentile, removing those observations whose propensity scores are below the 1^{st} percentile of the treated sample or above the 99^{th} percentile of the untreated sample.

B.2 Geographic regression discontinuity design

In Appendix B.1, balancing the sample on its observable covariates reduced the bias in the estimates of the effect. However, the choices leading to the set up of a black-appeal radio station in any given county could still be driven by factors that are both unobservable and county-specific, and the propensity score analysis might not entirely abate these confounding factors.

To correct for this omitted variable bias, the analysis of the paper is carried out using the sample of southern counties lying within a 15-mile radius from any of the radio stations exclusively airing black-appeal programming. This is in the spirit of a regression-discontinuity design. The county where each station lies is also excluded from the analysis, as this addresses the concern that specific factors leading to the set up of the station might exist, and that these factors could also be correlated with the frequency and the severity of the race riots of the 1960s. On the other hand, whether neighboring counties are able to receive the radio signal is entirely dependent on exogenous features, such as the topography and the characteristics of the terrain.

Therefore, comparing treated and untreated counties spanning the border with the county having the 100% black-appeal radio station (or by lying nonetheless within a 15-mile radius from such radio station) allows to drastically reduce the heterogeneity in the covariates, while estimating the effect of radio on riots by exploiting the exogenous variation in the propagation of radio waves. In fact, as shown in Fig. B.2, the difference between treated and untreated counties is indistinguishable from zero in all but three variables. Importantly, the share of African Americans in the population is found to be strongly balanced between the two sets of counties.

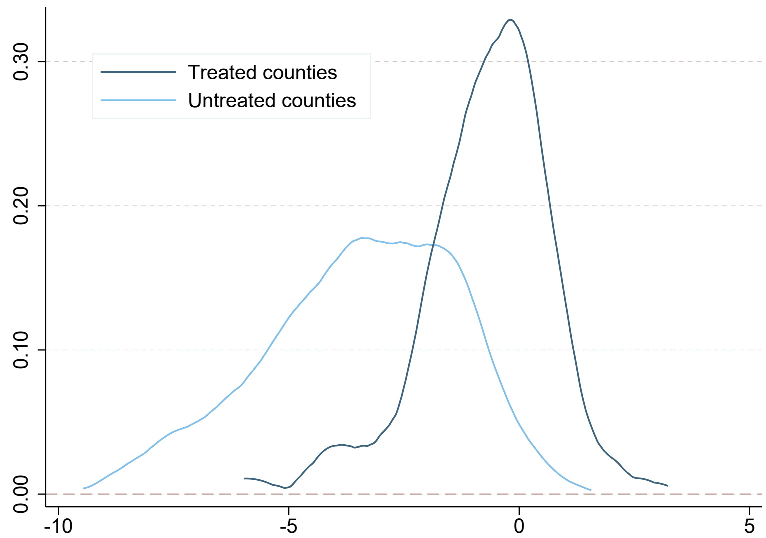
Table B.3 presents the estimation results using this regression-discontinuity design. Despite the significant reduction in the sample size (this restricted sample comprising 150 southern counties), all the main results remain broadly robust. This provides further evidence that the main estimates of the paper are isolating the true effect of black-appeal radio stations on the 1960s race riots.

B.3 Minority black counties

In Appendix B.1 and Appendix B.2, propensity scores and a regression-discontinuity design are used to balance the sample along its observable characteristics. Reassuringly, all results remain stable to different degrees of balance in the data. However, the location of black-appeal radio stations might still be endogenous and might depend on the share of African Americans in the population. In order to address this threat, the specifications of the paper are estimated over the subset of counties with an African American population that is below 50% in 1960. If radio is found to have a robust effect even when the analysis is restricted to this subset of counties, then this provides an additional check to the validity of the treatment effect uncovered in the rest of the paper.

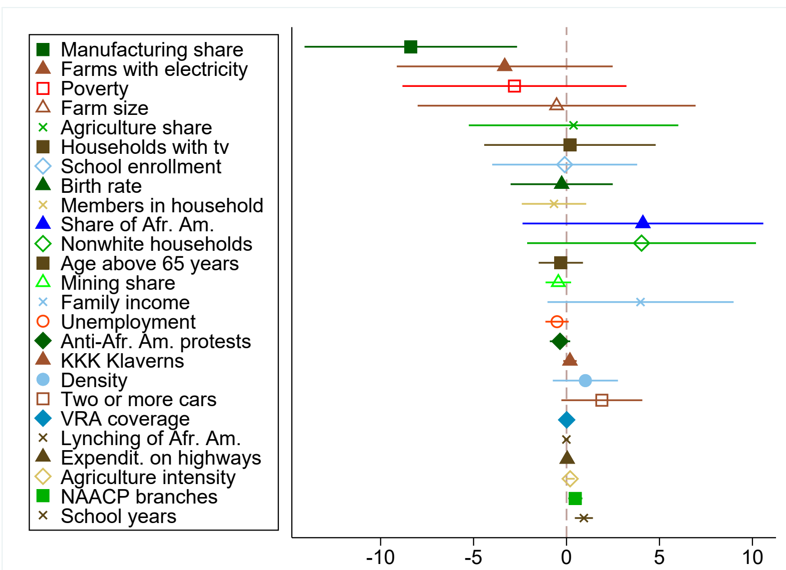
Table B.4 presents all the main results of the paper when the sample is restricted to those counties in which African Americans represent a minority of the population. Reassuringly, across all panels, the estimates are very similar in both magnitude and significance to the ones found in the more general specifications reported in the paper.

Figure B.1: Distribution of the log of the propensity score's odds, by treatment status



The figure presents the distribution of the logs of the odds of the propensity score, with the latter statistics computed – separately for treated and untreated counties – from a logistic regression based on the full set of covariates.

Figure B.2: Balance in the values of the covariates, 15-mile radius



The figure presents the estimated coefficients obtained by regressing each variable on the coverage indicator, topographic variables, and state fixed effects. Robust standard errors are adjusted for clustering at the county level, and confidence intervals are set at the 95% level of statistical significance.

Table B.1: Standardized differences in the means, by treatment status

	Sample			Stratification			Matching		
	Mean Treat (1)	Mean Untreat (2)	Stand. Diff. (3)	Mean Treat (4)	Mean Untreat (5)	Stand. Diff. (6)	Mean Treat (7)	Mean Untreat (8)	Stand. Diff. (9)
Nonwhite households, 1950	34.96	20.29	0.84	34.96	34.16	0.05	33.91	33.81	0.01
Share of Afr. Am., 1960	36.27	21.47	0.81	36.27	35.42	0.05	35.07	34.99	0.00
NAACP branches, 1957-1964	0.81	0.32	0.75	0.81	0.74	0.12	0.77	0.72	0.07
Median income, 1960	3968.29	3322.05	0.54	3968.29	3812.20	0.13	3873.15	3891.36	-0.01
Older than 65 years, 1960	7.99	9.65	-0.54	7.99	8.14	-0.05	8.03	8.21	-0.06
VRA coverage	0.72	0.48	0.50	0.72	0.71	0.02	0.72	0.68	0.07
Household poverty, 1960	39.1	46.57	-0.49	39.10	40.87	-0.12	40.22	40.15	0.01
Population density, 1960	0.45	0.11	0.38	0.45	0.31	0.15	0.33	0.37	-0.03
Expenditure on highways, 1962	1.35	1.85	-0.31	1.35	1.38	-0.02	1.41	1.29	0.08
Household members, 1960	3.70	3.58	0.26	3.70	3.71	-0.02	3.71	3.69	0.04

This table lists the ten covariates with the largest standardized differences in the means between treated and untreated counties. The standardized differences are also reported after the sample is balanced on its propensity scores.

Table B.2: Propensity score analysis

		Propensity Score Analysis: Intensity of Riots			
	Not Balanced (1)	Stratification in quintiles (2)	Matching caliper 0.1 (3)	Common support (4)	Stratification & trimming (5)
Predicted signal	5.087***	4.247***	3.254*	5.176***	3.519***
	(1.242)	(1.182)	(1.673)	(1.358)	(0.943)
Free signal	Yes	Yes	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes
Topographic	Yes	Yes	Yes	Yes	Yes
Socio-economic	Yes	Yes	Yes	Yes	Yes
Pre-VRA conflict	Yes	Yes	Yes	Yes	Yes
Mean dep. var.	0.004	0.004	0.013	0.005	0.003
Adj. R-Square	0.50	0.44	0.49	0.44	0.49
N	1022	1022	225	871	873

Robust standard errors in parenthesis are adjusted for clustering at the county level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All regressions include state fixed effects, topographic variables, socio-economic controls, pre-VRA measures of conflict, and the unobstructed radio signals.

Table B.3: The effect of radio stations on riots in neighboring counties

	Likelihood of Riots		Intensity of Riots	
	(1)	(2)	(3)	(4)
Panel A: 100% Black-Appeal Stations				
Dummy	0.329*		0.666**	
	(0.184)		(0.290)	
Continuous		0.008**		0.011**
		(0.003)		(0.004)
Adj. R-Square	0.53	0.60	0.30	0.29
N	150	150	150	150
Panel B: 100% Black-Appeal Stations & Free-Space Signal				
Dummy	0.329*		0.669**	
	(0.185)		(0.292)	
Continuous		0.008**		0.012**
		(0.003)		(0.005)
Adj. R-Square	0.53	0.60	0.29	0.29
N	150	150	150	150
Panel C: IV (2SLS)				
Dummy	0.822**		0.834**	
	(0.359)		(0.423)	
Continuous		0.013***		0.012**
		(0.004)		(0.005)
Adj. R-Square	0.38	0.56	0.30	0.30
N	148	148	148	148
Panel D: Generalized Difference-in-Differences				
Dummy	0.057		0.111*	
	(0.038)		(0.057)	
Continuous		0.001*		0.001
		(0.001)		(0.001)
Adj. R-Square	0.52	0.52	0.25	0.25
N	900	900	900	900

Robust standard errors in parenthesis are adjusted for clustering at the county level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All regressions include state fixed effects, and all the controls that are not balanced in the sample: the share of the manufacturing sector; the median school years of the population above 25y; and the location of the NAACP branches.

Table B.4: The effect of radio stations on riots in minority-African American counties

	Likelihood of Riots		Intensity of Riots	
	(1)	(2)	(3)	(4)
Panel A: 100% Black-Appeal Stations				
Dummy	0.409**		5.339***	
	(0.199)		(1.253)	
Continuous		0.006**		0.067***
		(0.003)		(0.016)
Adj. R-Square	0.67	0.68	0.52	0.52
N	897	897	897	897
Panel B: 100% Black-Appeal Stations & Free-Space Signal				
Dummy	0.370*		5.752***	
	(0.203)		(1.333)	
Continuous		0.006*		0.081***
		(0.003)		(0.020)
Adj. R-Square	0.67	0.67	0.52	0.53
N	897	897	897	897
Panel C: IV (2SLS)				
Dummy	1.195*		16.707***	
	(0.666)		(5.183)	
Continuous		0.014*		0.164***
		(0.008)		(0.056)
Adj. R-Square	0.60	0.63	0.33	0.43
N	896	896	896	896
Panel D: Generalized Difference-in-Differences				
Dummy	0.152***		0.875***	
	(0.042)		(0.295)	
Continuous		0.002***		0.015***
		(0.001)		(0.006)
Adj. R-Square	0.20	0.20	0.12	0.13
N	6804	6804	6804	6804

Robust standard errors in parenthesis are adjusted for clustering at the county level. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. All regressions include state fixed effects, topographic variables, socio-economic controls, and pre-VRA measures of conflict.

C Alternative data on race conflicts

As mentioned in Section 3.3, Olzak (2015) collected information on all ethnic conflicts that occurred during the period 1954-1992, including riots, meetings, rallies, spontaneous disruptions, boycotts, conflicts at the workplace, and episodes of picketing and ethnic vandalism. Compared to Carter (1986), Olzak (2015) considered the *New York Times* as the main source of information, and defined a race riot as a demonstration involving at least fifty people, with some form of violence, and lasting at least two hours. In this study, Carter (1986)'s data set forms the basis to construct the main dependent variables, but Olzak (2015) is also considered when panel techniques, rather than cross-sectional analyses, are used on a time series spanning 1960-1971. However, before augmenting the information available from Carter (1986) on 1964-1971 with the one from Olzak (2015) on 1960-1963, the similarity between these two sources is considered.

Firstly, a summary of all ethnic conflicts is presented in Table C.1, separately by year, type of conflict, and state. Focusing on race riots (Panel B), the bulk of episodes occurred within the period 1964-1971, even according to the definition used by Olzak (2015). Still, there is a non-trivial amount of riots happening between 1960 and 1963 to justify extending the time series to cover the full period 1960-1971. In Table C.2, the impact of the full array of twenty-five controls on the likelihood and intensity of either all ethnic conflicts (columns (1)-(2)) and race riots (columns (3)-(4)) is presented. Similarly to the results shown in columns (3) and (4) of Table 1 (based on Carter (1986)), a large set of controls (including the share of African Americans in the county population, as well as the indicators of pre-period conflicts) are found to be important determinants of both the frequency and destructiveness of ethnic disorders. Lastly, replicating the main specifications presented in the paper using dependent variables based on Olzak (2015) do not alter the overall persistently strong effect of being exposed to black-appeal radio stations.[45]

In Fig. C.1, the two data sets are plotted against both the counts of episodes of riots and their severity. And although Olzak (2015) might understate the actual number of riots (by considering only the *New York Times* and by imposing a threshold of minimum 50 participants), while Carter (1986) might overstate them (by including more sources and by allowing for a slightly weaker definition of riots), the overlap between the two sources (especially in the years 1964-1966) is reassuring.

[45] These results have not been reported for space considerations. Cunningham and Gillezeau (2018) also compares the information on race riots available from Carter (1986) and Olzak (2015).

Table C.1: The race riots, using Olzak (2015) data, 1960-1975

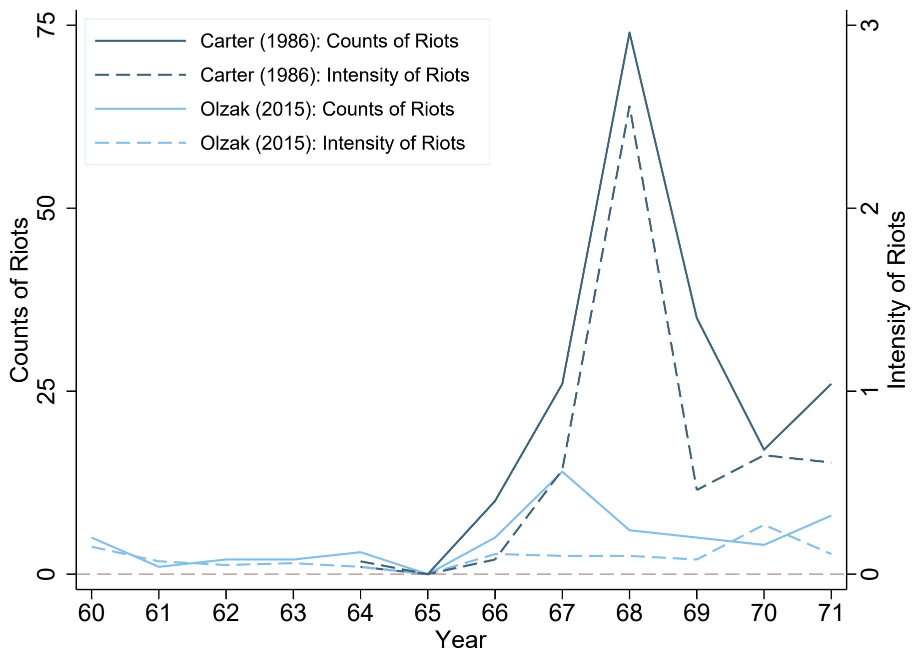
	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	Total
Panel A. Aggregate Race Conflicts in the U.S. South																	
Total Number	163	74	24	27	31	43	26	31	27	25	17	22	9	0	4	3	526
Days of conflict	277	548	95	30	39	67	40	956	37	35	30	49	14	0	4	3	2224
People killed	1	0	1	404	1	1	1	2	5	1	11	1	5	0	0	0	434
People injured	181	30	5	113	131	23	51	84	80	47	140	37	49	0	0	2	973
People arrested	1473	1147	378	2543	1020	1060	93	291	400	326	772	479	22	0	36	5	10045
Size of conflict	382	174	68	96	89	112	78	89	87	85	56	65	30	0	12	10	1433
Severity Index	*0.73*	*0.51*	*0.14*	*1.38*	*0.32*	*0.24*	*0.14*	*0.61*	*0.21*	*0.16*	*0.30*	*0.16*	*0.09*	*0.00*	*0.01*	*0.01*	*5.00*
Panel B. Race Riots in the U.S. South																	
Total Number	5	1	2	7	3	0	5	14	6	5	4	8	3	0	0	0	63
Days of conflict	24	1	2	7	3	0	7	23	15	7	14	26	5	0	0	0	134
People killed	1	0	0	1	0	0	1	2	4	1	11	0	4	0	0	0	25
People injured	60	5	1	68	14	0	35	81	25	46	138	22	48	0	0	0	543
People arrested	412	48	56	223	19	0	83	273	250	198	100	286	22	0	0	0	1970
Size of conflict	21	5	8	32	10	0	16	44	19	18	13	26	11	0	0	0	223
Severity Index	*0.63*	*0.06*	*0.08*	*0.47*	*0.10*	*0.00*	*0.27*	*0.74*	*0.53*	*0.36*	*0.91*	*0.50*	*0.35*	*0.00*	*0.00*	*0.00*	*5.00*
Panel C. Meetings and Rallies in the U.S. South																	
Total Number	105	45	15	15	11	20	3	8	12	9	8	3	6	0	3	1	264
Days of conflict	124	52	28	18	12	37	3	9	13	11	10	3	9	0	3	1	333
People killed	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
People injured	0	1	0	7	0	0	0	0	0	0	0	0	1	0	0	0	9
People arrested	903	1051	307	1601	357	1046	0	11	18	53	670	0	0	0	24	0	6041
Size of conflict	247	100	42	51	30	69	12	22	41	31	27	12	19	0	9	5	717
Severity Index	*0.87*	*0.58*	*0.19*	*1.17*	*0.14*	*0.38*	*0.03*	*0.06*	*0.10*	*0.09*	*0.18*	*0.03*	*1.16*	*0.00*	*0.03*	*0.01*	*5.00*
Panel D. Race Riots in the U.S. South, by State																	
Alabama	1	0	0	5	1	0	0	3	0	0	0	0	0	0	0	0	10
Arkansas	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Florida	1	0	0	0	0	0	3	2	1	3	3	3	0	0	0	0	16
Georgia	0	0	2	0	0	0	2	2	0	0	1	3	0	0	0	0	10
Louisiana	1	0	0	0	0	0	0	2	0	1	0	0	1	0	0	0	5
Mississippi	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
North Carolina	0	1	0	1	0	0	0	2	1	0	0	1	2	0	0	0	8
South Carolina	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tennessee	1	0	0	1	0	0	0	2	1	1	0	1	0	0	0	0	7
Texas	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2
Virginia	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	3

Table C.2: The determinants of all conflicts and riots, using Olzak (2015) data, 1964-1971

	All Race Conflicts		Race Riots	
	Intensity (1)	Likelihood (2)	Intensity (3)	Likelihood (4)
Share of African Americans, 1960	0.065***	0.209*	0.072***	0.254*
	(0.023)	(0.109)	(0.028)	(0.132)
VRA coverage in 1965	–0.548**	0.347	0.041	1.624
	(0.245)	(1.456)	(0.431)	(2.946)
Population density, 1960	–0.263	0.518	–0.185	–1.347
	(0.704)	(3.355)	(0.762)	(2.688)
Manufacturing size, 1960	–0.015	–0.062	–0.006	–0.073
	(0.011)	(0.051)	(0.015)	(0.068)
Agriculture size, 1960	–0.014	–0.117	–0.014	–0.072
	(0.011)	(0.082)	(0.014)	(0.064)
Mining size, 1950	0.006	0.025	0.007	0.005
	(0.010)	(0.053)	(0.012)	(0.061)
Agricultural intensity, 1960	–0.015	–0.002	–0.036	–0.203*
	(0.020)	(0.111)	(0.028)	(0.120)
Unemployment rate, 1960	0.006	–0.514	0.033	–0.112
	(0.051)	(0.314)	(0.072)	(0.293)
Share of families in poverty, 1960	–0.006	0.138	–0.004	–0.033
	(0.044)	(0.242)	(0.049)	(0.191)
Median family income, 1960	–0.000	–0.000	–0.000	–0.001
	(0.001)	(0.003)	(0.001)	(0.003)
Birth rate, 1960	–0.002	–0.016	–0.022	–0.117
	(0.015)	(0.070)	(0.022)	(0.083)
Household members, 1960	–0.695	–5.129*	–0.975	–7.225**
	(0.554)	(2.727)	(0.754)	(3.535)
Size of farms, 1959	–0.005	–0.028	–0.004	–0.039
	(0.006)	(0.032)	(0.008)	(0.037)
Nonwhite households, 1950	–0.035*	–0.117	–0.033	–0.108
	(0.020)	(0.111)	(0.023)	(0.115)
Farms w. electricity, 1954	–0.030	–0.282	0.006	0.059
	(0.026)	(0.204)	(0.024)	(0.078)
Households w. tv, 1960	0.024**	0.251*	0.013	0.068
	(0.011)	(0.141)	(0.014)	(0.073)
Households w. two or more cars, 1960	0.030*	0.157*	0.048**	0.134
	(0.017)	(0.083)	(0.023)	(0.095)
Older than 65 years, 1960	–0.098	–0.754**	–0.126	–0.918*
	(0.073)	(0.383)	(0.105)	(0.491)
Expenditure on highways, 1962	–0.097*	–0.494	–0.073	0.200
	(0.053)	(0.457)	(0.083)	(0.555)
Median school years, 1960	0.097	–0.092	0.067	–0.721
	(0.132)	(0.713)	(0.231)	(0.858)
Enrolled in school, 1950	–0.004	–0.022*	–0.005	–0.013
	(0.002)	(0.013)	(0.003)	(0.013)
Lynchings of Afr. Am., 1902-1964	–1.284**	–6.838**	–1.765**	–7.938**
	(0.577)	(3.231)	(0.699)	(3.144)
Anti-black activism, 1960-1964	0.113***	0.183	–0.001	–0.164
	(0.042)	(0.301)	(0.045)	(0.154)
NAACP branches, 1957-1964	–0.372**	–1.747**	–0.468**	–2.012**
	(0.169)	(0.756)	(0.205)	(0.895)
KKK Klaverns, 1925-1940	0.747***	3.484***	0.710**	4.341***
	(0.260)	(1.052)	(0.316)	(1.457)
State fixed effects	Yes	Yes	Yes	Yes
Topographic controls	Yes	Yes	Yes	Yes
Mean dep. var.	0.004	0.088	0.004	0.088
Adj. R-Square	0.61	0.39	0.46	0.48
N	1022	1022	1022	1022

Robust standard errors in parenthesis are adjusted for clustering at the county level. ***, **, and * indicate statistical significance at the 1%, 5% and 10% levels, respectively. All regressions include state fixed effects and topographic variables.

Figure C.1: The race riots of the 1960s: Olzak (2015) and Carter (1986) data



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