Introduction: The Radio Act of 1927 Turns 90

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The U.S. Radio Act of 1927 defined how wireless users would obtain access to airwaves, creating a “public interest” allocation system for radio spectrum. That regime lives to this day. The Act was seen as an important political event—its passage was reported on the front page of the *New York Times* the day after President Calvin Coolidge signed it into law—but its deep and lasting significance could scarcely have been contemplated. While radio broadcasting had already become the first mass market electronic communications platform, with about five million households owning (then expensive) AM radio receivers, neither the age of television nor the smartphone revolution were yet visible. Satellites did not circle the earth and the terms “cellular phone,” “hi-fi,” “wi-fi” and “mobile broadband” had not been coined.

But when they were, the 1927 Radio Act still reigned. Traditional interpretations, as supplied by the U.S. Supreme Court, credit the Act with enabling the evolution of wireless services. The thinking was that decentralized bandwidth choices dealing with conflicts among rival spectrum users could not provide the coordination necessary. Endemic spillovers, in the form of interference between stations, would drown out competing activities. Chaos would dissipate the value of the resource, a market failure that could be (and was) remedied by administrative control.

The Radio Act declared that all airwave access must be authorized by the federal government according to “public interest, convenience or necessity.” The standard would be applied by the Federal Radio Commission. The agency was reconstituted as the Federal Communications Commission in the 1934 Communications Act which incorporated, virtually word for word, the 1927 Radio Act. The law deemed that five commissioners, not private firms or entrepreneurs, would determine which technologies, business models, and services were worth the cost they would incur in blocking competing wireless applications.

Coase (1959) objected to the logic of the market failure argument, imagining that conflicts in radio frequency space might be efficiently regulated by markets. Property rights to competing bands would unlock incentives to discover relevant information and to optimize resource use via gains from trade. Costs and benefits would

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become more transparent via the bids made for ownership rights. As a practical matter, Coase was uncertain that decentralized markets would outperform administrative allocations, but he stressed that as a matter of theory the categorical dismissal of markets was incorrect. The efficient policy depended on how various rule regimes, such as property rights or commission regulation, operated and the transaction costs they incurred. Chief among these were welfare losses from deterring technologies that, under distinct rules, might be accommodated. The pronouncement of “failure” for markets needed to be symmetrically assessed against regulatory alternatives. That insight, the central point of his famous 1960 essay, “The Problem of Social Cost,” became widely influential in welfare economics and beyond (Coase 1960).

And, over time, the idea that property rights might more effectively govern wireless markets gained ground. With slow and gradual deregulatory moves, FCC regulators (with regulators around the world) made spectrum use rights more flexible. Licenses became increasingly permissive, as did constraints placed on wireless devices deployed in key unlicensed bands (with power limits keeping applications localized). By the late 1980s, cellular telephone carriers were authorized to select their own technologies, design their own network architectures, add services (texting to voice, and then broadband data), and experiment with distinct business models—no “public interest” vote by Commissioners needed.

Policy makers acknowledged and then applauded this trend. With the success of increasingly open markets, the constraints levied by the allocation structure of the 1927 Act became more costly and more obvious. By 2010, the Federal Communications Commission’s National Broadband Plan (FCC 2010) documented how delays from lackluster spectrum allocations had harmed the economy, and advocated market-based mechanisms to push spectrum into higher-valued uses. Specifically, it called for a two-sided auction in which, first, TV station licensees participate in a reverse auction, selling their broadcasting rights back to the FCC such that, second, mobile carriers could bid for new, flexible-use licenses allotted the TV airwaves made vacant. Bidding in the innovative mechanism took place in 2016–2017, with about \$20 billion in bids collected in the forward, and about \$10 billion paid to exiting TV broadcasters in the reverse. The transactions will make about 70 MHz of the 294 MHz in the TV Band available for higher valued uses. What is of historic note is that the “public interest” allocation process was formally rejected by policy makers themselves. The regulators charged with determining spectrum use decided that one application was obsolete but could not—for political reasons—be administratively changed. License holders had to be vested with property rights and then paid to cooperate.

In noting the 90th Anniversary of the Radio Act, articles in this Special Issue of the Review recognize both the importance of the law and the dramatic economic development in the wireless sector it regulates. The Act was heavily influenced by Herbert Hoover who, as Secretary of Commerce, 1921–1928, was the first regulator of broadcast radio (under minimalist authorizations awarded Commerce in the 1912 Radio Act). Babette Boliek considers why pro-competition rules were not the focus of the 1927 legislation, and why *ex ante* regulation, based on “public interest” licensing, constituted the chief policy strategy. Her argument is that the decline in antitrust enforcement in the 1920s, combined with the influence of the “progressive

movement,” shaped policy thinking. Hoover’s preference for administrative jurisdiction in a new agency, rather than court enforcement, drove radio rules in a distinct (and less competitive) direction. Even when the shortcomings of this approach were revealed, path dependency steered markets for decades to come.

My essay deals, in parallel fashion, with the policy choice made in 1927. A new era of spectrum scarcity was launched by Westinghouse’s innovative “broad” casting model—one-way, point-to-multipoint, emitting from a high transmitter to receivers all around—in late 1920. The immediate popularity of the new wireless service triggered market entry, forcing conflicts, and prompting the Commerce Department to enforce priority-in-use rules adopted from common law. This afforded stability for investments, both by stations and buyers of household radios, but had a political liability: they implied open competition. To pre-empt additional entry, incumbent commercial radio station owners promoted the idea of a “public interest” test for broadcasting rights. Policy makers, led by Hoover, embraced the approach to acquire more discretion over license rents and broadcast content. The opening sentence of the 1927 Radio Act explicitly prohibits the assertion of “vested” rights in frequencies, forcing band allocations into a rent-seeking rivalry officiated by the FCC—the “political spectrum” (Hazlett 2017).

In this issue, scholars take up two specific aspects of the outcome of the Radio Act. Sarah Oh examines patents in the United States to gain insight to how property rights might impact innovation in wireless markets. By examining a database with over 500,000 radio patents, she finds that terms like “interference” and “sensor” tend to be more frequently used in patents that discuss the terms “licensed” and “unlicensed” (apparent references to different spectrum rights allocations). This is consistent with the idea that inventors are responding to constraints erected by policy measures. Most interesting is the possibility that such a large dataset may be used for further investigation on the impact of incentives yielded by the regulatory structure.

Glenn Woroch then takes us back to where we began: competition policy. While the Sherman Act approach was not taken in the 1927 Radio Act, competition rules have gained force within the spectrum regulation system. As rights have been liberalized—particularly in mobile services markets served by cellular networks—regulations have naturally migrated from prescriptive rules that mandate particular services or technologies. But *ex ante* rule makings remain, focusing on concentration ratios. In designing band plans, license auctions, and merger reviews the FCC has imposed “spectrum screens” to limit input aggregations.

Woroch investigates the relationship between outputs and mobile market concentration in the United States. By consensus, the relationship is non-linear. Regulators, both those governing mergers (either at the Department of Justice or the Federal Trade Commission) and the Federal Communications Commission (with jurisdiction over license transfers), see horizontal mergers as being of little concern up to some critical value. In 2011, for instance, the DOJ and FCC moved to block the proposed AT&T-Mobile deal, combining the second- and fourth-largest national networks. Given that there were four large national carriers, the regulatory action revealed that policy makers saw a “4-to-3” transaction as risking anti-consumer output restriction.

Woroch's investigation quantifies the benefits of deconcentration in the spectrum (MHz) dimension. Using reduced form equations estimated across approximately 700 local U.S. mobile markets, output (measured in subscriber penetration) tends to increase with concentration throughout the sample. The findings suggest that policy makers may have under-appreciated the gains from economies of scale. The efficiencies associated with additional capacity for existing carriers are substantial, and cast doubt on simple applications of the conduct-structure-performance paradigm. Given the binding constraints now applied, it is an assessment with broad implications for economic welfare.

More such research lies ahead. Thanks to the long march of technology, aided and abetted by the increasing openness of markets, policy margins are shifting. The 90th anniversary of the signing of the 1927 Radio Act is an opportune moment to reflect on the mysteries surrounding the origins, and impacts, of spectrum policy.

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