Network Competition and Exclusive Contracts: Evidence from News Agencies

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This paper studies exclusive vertical contracts in network industries. The setting is the market for telegraphic news agencies in the early 20th-century United States, where the Associated Press (AP) granted member newspapers exclusive territory contracts that prevented later entrants from joining AP. I show that these contracts diverted excluded newspapers to AP's competing entrant, the United Press (UP). I develop and estimate a dynamic model of newspaper entry and news agency choice using novel historical data linking newspapers to news agency subscriptions, costs, and network coverage over time. I find that news agencies exhibit strong demand-side network effects and supply-side economies of scale. Counterfactual simulations show that removing AP's exclusive territory contracts causes UP to collapse. Removing exclusivity increases newspaper competition and consumer surplus, but reduces coverage in some markets. The results suggest that exclusive contracts can shape market structure in network industries not only by reducing competition, but also by sustaining an entrant competitor.

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1 INTRODUCTION

Exclusive vertical contracts can simultaneously shape competition among firms and among their suppliers. By foreclosing buyers from a supplier, they can reduce local competition. But those same excluded buyers can provide the scale a rival supplier needs to enter the market. When suppliers operate networks whose value and cost depend on scale, that scale can determine whether a competing supplier survives.

I study this force in the market for telegraphic news agencies. News agencies, or newswires, coordinate the collection and exchange of non-local news and deliver that news to downstream newspapers. In the early twentieth-century, the Associated Press (AP), the dominant U.S. news cooperative, granted member newspapers exclusive territory rights: once a newspaper joined AP, it could block later entrants in the same market from joining AP. These contracts remained in place from 1900 until the Supreme Court struck them down in the landmark antitrust case *AP v. United States* (1945).

I show that these contracts facilitated the growth of the AP's main rival, the United Press (UP). In the first decade after UP's founding in 1907, more than half of its circulation came from newspapers excluded from AP service. These newspapers were central to UP's scale, and by diverting them toward UP, AP exclusive territory contracts allowed the rival to survive.

Whether an entrant news agency survives depends on attaining sufficient scale. This reflects two features of news agencies. First, news agencies pool local reporting across newspapers in different locations to generate non-local news. This generates demand-side *network effects*, as the value of the network increases with scale. Second, news agencies pool resources to collect and transmit news over a national telegraph network. This creates supply-side *economies of scale*, as larger networks spread fixed costs among more newspapers and are therefore cheaper per member.

I quantify these forces using a dynamic model of newspaper entry and news agency membership, which I estimate using data on historical newspaper markets and newly assembled data on historical newswire networks. Newspapers earn variable profits from reader demand and advertising, reflecting preferences for news content and the value of access to a larger reporting network. Costs capture wire membership fees and economies of scale in news collection and transmission. A dynamic framework is necessary because membership decisions determine future local competition and network size, which in turn affect value, cost, and whether a news agency reaches viable scale. I use the model to evaluate counterfactuals that remove exclusive territories and solve for the resulting equilibrium network sizes.

The model estimates imply that both sides of the mechanism are quantitatively important. On the demand side, the estimates imply strong demand-side network effects. As UP grows, the advantage of AP declines sharply: for a monopoly newspaper, the variable-profit advantage of

joining AP falls by 85% from 1912 to 1940. By 1940, the two wires are nearly equivalent in profit terms, as UP reaches comparable scale. On the cost side, wire-membership costs exhibit strong economies of scale. For the median city, per-capita AP and UP costs fall by about 82 and 89 percent between 1912 and 1940 as the networks expand. These patterns point to the importance of scale in this industry, and that early UP members both increase the network's news value and help subsidize other entrants.

In a counterfactual that removes exclusive contract and resolves the model while holding fixed UP's initial 1908 network, I find that UP collapses and virtually no newspaper chooses UP after 1912. This reflects a feedback mechanism in which scale affects both value and cost. As early members no longer join the network, the value of the network declines and per-member costs rise, reducing incentives to join. Because newspapers are forward-looking, they anticipate further declines in network size due to other newspapers' wire membership decisions, which amplifies the reduction in scale and leads to a collapse in membership.

A decomposition exercise shows that both demand- and cost-side scale effects are important, but supply-side economies of scale play the dominant role. When both network effects and economies of scale are shut down—so that value and cost evolve exogenously—UP retains about 70 percent of its 1940 size. When only network effects are present, it retains about 60 percent. By contrast, when only economies of scale are present, UP collapses, indicating that cost-side scale effects are the more important feedback loop in this setting.

Regarding competition among downstream newspapers, removing territorial exclusivity allows second entrants to obtain AP service, raising the share of markets with multiple newspapers and multiple wired papers. Consumer surplus increases, particularly in larger markets most likely to see a second newspaper with telegraphic news. However, exclusivity also affects downstream market structure. By protecting incumbent newspapers, it strengthens incentives to invest in wire service, so removing exclusivity weakens first-mover incentives and reduces coverage in some markets.

Together with the cooperative structure of AP, these results explain why exclusive territories were adopted and maintained despite sustaining rival expansion by UP. Large-city newspapers were central to financing the organization and dominated its governance, and these were precisely the members most exposed to entry by competing newspapers. Exclusivity expanded the network—raising news value and lowering costs by encouraging initial entry—while protecting rents in large markets by deterring second entry. As a result, exclusive territory contracts increased membership value for incumbent members, and these gains outweighed the costs of facilitating UP's growth.

These results suggest that, for policy, evaluating exclusive contracts requires accounting for their effects on equilibrium market structure, not just local foreclosure. In network industries, exclusivity can determine whether a rival supplier survives, so focusing only on reduced competition in affected markets can misstate welfare effects. From a firm's perspective, this reflects competing

incentives: exclusivity strengthens entry incentives by protecting local entrants, but also reallocates demand across suppliers, potentially sustaining a smaller rival.

Related Literature

The theoretical literature on exclusive vertical contracts suggests that they can have ambiguous welfare effects: they may encourage entry and protect investments, but may also soften competition or foreclose rivals (Asker and Bar-Isaac 2014, Fumagalli and Motta 2006, Segal and Whinston 2000, Bernheim and Whinston 1998, Rey and Stiglitz 1995, Aghion and Bolton 1987). This debate is mirrored in legal attitudes toward these contracts. [1] A growing empirical literature studies these effects in specific markets and quantifies the opposing welfare implications of exclusivity (Schneier 2025, Yuan 2025, Lee et al. 2021, Sinkinson 2020, Asker 2016, Nurski and Verboven 2016, Lee 2013).[2] I provide empirical evidence that exclusive contracts can reallocate demand across suppliers and increase rivals' entry incentives. A related mechanism appears in Sinkinson (2020), who shows that exclusivity can increase upstream entry incentives even while softening downstream competition in a static setting.

The paper also relates to a literature on network and platform competition (Lee 2014, Evans and Schmalensee 2014, Rochet and Tirole 2002). Lee (2013) is especially close: in a setting with dynamic consumers and network effects, he shows that exclusive contracts help entrant platforms by allowing them to differentiate from incumbents. I study a different mechanism: exclusivity helps an entrant not by increasing differentiation, but by reallocating downstream firms into the network when scale determines viability.

I also contribute to the literature on newspapers and media competition by explicitly modeling the vertical structure of the news market and the market structure of news agencies. The closest paper is Gentzkow, Shapiro, and Sinkinson (2014), who study newspapers' choices of political ideology in 1924. I extend their model and data to allow newspapers to choose among competing news agency bundles and to make entry decisions in a setting where newspapers compete not only for readers and advertisers, but also for access to telegraphic news supplied by rival upstream agencies. More broadly, the paper relates to a literature on how newspapers use content from news agencies (Angelucci, Cage, and Sinkinson 2023, Djourelova 2023, Cage, Herve, and Viaud 2019, Chiou and Tucker 2017) by studying the industrial organization of the agencies themselves. My

[1] Legal attitudes toward exclusionary vertical practices have greatly changed over time, in part due to changes in the theoretical and empirical understanding of these contracts. Early cases such as *United States v. Terminal Railroad Association* (1912) imposed access obligations on essential facilities, while later decisions such as *Verizon v. Trinko* (2004) limited such duties. Recent matters such as *FTC v. Microsoft and Activision Blizzard* (2023) and *US v. Google* (2023) revolve around similar concerns.

[2] See Lafontaine and Slade (2008) for a survey of this debate and Lee, Whinston, and Yurukoglu (2021) for that of theoretical models and recent structural empirical work on vertical contracting. For the closely related debate on the effects of exclusive franchising on welfare, see Lafontaine and Slade (2014) and Lafontaine and Scott Morton (2010).

paper complements Tiew (2024) who studies dynamic newspaper competition during the industry's later decline, whereas I focus on the growth of the news agency industry in the earlier period.

Methodologically, the paper builds on the empirical literature on dynamic industry structure and estimation. The model of newspaper entry and wire membership is closest to Igami and Uetake (2019), whose finite-horizon framework I extend to incorporate network effects and economies of scale that link markets through shared network size.[3]

Roadmap

Section 2 describes the history of news agencies. Section 3 describes the data. Section 4 presents the descriptive evidence that motivates the structural analysis. Section 5 presents the empirical model. Section 6 describes the estimation procedure, results, and model fits. Section 7 presents the counterfactual simulations. Section 8 concludes.

2 Setting

2.1 News Agencies

News agencies, or newswires, coordinate the collection of national, international, and other non-local news and deliver that news to newspapers via the telegraph. In the language of vertical relations, they are "upstream" suppliers of an input to downstream newspaper firms. In this paper, I focus on the rivalry between the Associated Press (AP), the dominant cooperative, and the United Press (UP), its main entrant rival.[4]

Telegraphic news was a meaningful quality upgrade for newspapers. News agencies supplied timely non-local news that would otherwise have been costly to gather for the vast majority of US newspapers (Lee 1937, Schwarzlose 1989). In the study period, telegraphic news accounted for about one quarter of newspaper content (*AP v. US* 1945). Contemporary publishers described wire service as essential because a small newspaper could not afford its own national or foreign

[3]The finite-horizon framework is especially useful because the setting is inherently nonstationary: membership decisions affect future value and cost. Similar models have been applied in other nonstationary settings, including investment and rollout of new technologies (Elliott, 2022; Wilson, 2021; Yang, 2020) or expiring patents (Mohapatra and Zhang, 2024).

[4]News agencies are distinct from feature syndicates. News agencies cover hard news while feature syndicates focus on human interest stories, columns, fiction, and comics (Guarneri 2017, Lee 1937). The definition used in this paper also does not cover supplemental news agencies that specialized in one particular news area such as financial news agencies (e.g. Bloomberg) or picture agencies (e.g. Getty Images).

correspondents and could not survive on local news alone.[5] A newspaper without a wire could rely on its own correspondents, local news, or delayed republication of yesterday's non-local news, but these were poor substitutes for a full telegraphic service.

News agencies produced the news by pooling reporting across many newspapers and bureaus. Member newspapers were obligated to supply local news from their own territories, while agency-employed reporters gathered regional, national, and foreign news. The agency then redistributed this combined report across its network to local bureaus, which selected the subset of news relevant to each local circuit for dissemination to nearby members.

This function of pooling reporting is the source of the paper's demand-side network effect: a larger network had access to more local news. Each member newspaper was both a consumer and a producer of news: members were obligated to file local dispatches to the pool, so adding a member in a new city meant every other member gained a correspondent in that city. The value of the network to each member therefore increased with the number of members contributing local news.[6]

To distribute news, agencies relied on telegraph networks linking major bureaus and local circuits. These networks were leased on an ongoing basis from telegraph companies (e.g. Western Union). This system had two sources of cost-side economies of scale. First, there were common national transmission costs of getting the report to bureau cities, so a larger network could spread those costs across more newspapers. Second, there were local economies of scale, since the cost of serving a newspaper fell with the number of nearby newspapers connected to the same bureau.

Among the US news agencies, the Associated Press was organized in 1900 and was the dominant news agency during the period I study. It was a cooperative owned by its member newspapers, which elected a board that determined AP policy - a board composed predominantly of owners of large-city newspapers. These large-city newspapers were exactly those with the greatest likelihood to see a rival newspaper entrant and thus have incentives to maintain exclusive territory contracts.[7]

[5]For example, Harris Ellsworth, publisher of the Roseburg News-Review, wrote that "It is absolutely essential that a small daily newspaper have a reliable wire news service." Earl Hanway, publisher of the Casper Tribune-Herald, wrote that "A news service [...] is one of the essentials to the life of a newspaper," and that "it is equally important that its cost is not more than a small paper can pay." Other publishers similarly stressed that no small paper could afford correspondents outside its own locality and that local news alone was insufficient.

[6]F. W. Brinkerhoff of The Pittsburg Headlight, testified that AP's 28 afternoon members in Kansas gave "every afternoon Associated Press member in Kansas twenty-eight staff correspondents" who "practically cover Kansas." The findings of fact in *AP v. US* (1945) state the mechanism formally: "The effect of this arrangement is to make each member newspaper reporter also a reporter for AP." AP's own Board described the local news obligation as "quite as valuable as the weekly sum [each member] pays as his share of the expenses of the organization." Tom H. Keene of the Elkhart Daily Truth quantified the counterfactual: "If South Bend failed to protect us by its Associated Press wire, The Daily Truth would be compelled to have a correspondent in South Bend, and this one correspondent would cost my paper nearly one-half as much as the whole Associated Press wire service costs."

[7]Small-city newspapers were only weakly represented in this governance structure. It was not until 1936 that smaller-city members secured 3 reserved seats on what had previously been a 15-member board, and board representation remained disproportionately concentrated in large-city newspapers (Schwarzlose 1974) .

The United Press was founded in 1907 by E. W. Scripps as a commercial rival to the AP. UP's early growth was supported by its ability to serve papers that could not obtain AP service, Scripps-owned newspapers, and his personal fortunes. Internal correspondence among UP's proprietors in 1912 reveals that the organization was only breaking even thanks to what they described as a "large subsidy" from Scripps. In his own words, Scripps thought that AP's exclusive territory contracts created "a monopoly that would make it impossible for any new paper to be started" in cities with AP members; and so he wanted to make it possible for "any other man to found a newspaper in any city in the Union." (McCabe 1951).

A third news agency featured in *AP v. US* (1945) was the International News Service (INS). INS was not a rival comparable to UP in the business of telegraphic news. From the beginning, it shared management with Hearst's feature syndicate and blended news dispatches with feature and syndicated content rather than matching the hard-news coverage of AP and UP (Schwarzlose 1989).[8] By the end of the study period, 11 percent of US dailies were INS members, compared with 61 percent for AP and 43 percent for UP. Because of this difference in product and scale, I do not treat INS as a competitor comparable to AP and UP in the paper's main analysis.

2.2 Exclusive Contracts

A key institution in AP's growth was its exclusive territory contract. AP enforced these contracts through "protest rights," which allowed a member newspaper to veto the admission of a competing AP entrant in the same market.[9]

The scope of these rights and the definition of the relevant market changed over time. When AP was organized in 1900, protest rights were extended only to 260 newspapers and varied in geographic radius, applicability across times of publication, and carve-outs for nearby cities. Beginning in 1915, the exclusion radius narrowed for most members to a uniform 10-mile rule (Silberstein-Loeb 2012). A 1928 internal reform extended protest rights to all members with at least 5 years of tenure and limited them to the same time of publication within a 10-mile radius. Because these rights applied only against later entrants, they did not eliminate multiple AP papers in cities that already had them at founding.[10]

Exclusive territory contracts stood until *AP v. US* (1945), when the Supreme Court found them illegal. The court had to consider harms from contracts "plainly designed in the interest of preventing competition" against potential benefits from these contracts, such as "foster[ing] [...]

[8] INS also reflected Hearst's politics more directly than AP or UP, including strongly pro-German positions across the World Wars (Nasaw 2013). This stance was so extreme that INS was kicked off the Allied cables during its attempts to report on World War I (*International News Service v. Associated Press* 1918).

[9] A protest right could be overcome by an 80 percent vote of the membership. This occurred 6 times out of 97 attempts (*AP v. US* 1945).

[10] In my data, of AP's 332 founding markets in 1900, 38 had more than one AP newspaper.

the growth of [other] news agencies" such as UP.

AP defended protest rights as necessary to preserve newspapers' incentive to join the cooperative, contribute local news, and invest in telegraphic news. At the same time, member newspapers valued these contracts as protection against local competition. The cooperative structure of AP therefore helps explain why the organization maintained contracts that protected incumbent newspapers even at the cost of creating room for UP.[11]

While UP did not have formal exclusive contracts, it used "asset value" contracts that protected incumbent subscribers, requiring a second UP newspaper entering the same market to compensate the first for the loss of exclusivity. These clauses preserved the value of being the first local subscriber without formally excluding later subscribers (Aghion and Bolton 1987).

In addition to its exclusive territory contracts, AP also attempted to impose exclusive dealing. From 1900 to 1915, its bylaws authorized the board to prohibit members from purchasing news from rival agencies such as UP. This provision was repealed after Attorney General T. W. Gregory, in 1915, issued an opinion that he intended to challenge it under the Sherman Antitrust Act while indicating that AP's territorial exclusivity was permissible. This position preserved AP's exclusive territories and allowed its newspapers to bundle UP service, and it defined the legal environment that persisted until *AP v. US* (1945).

The repeal of exclusive dealing allowed AP members to "bundle" AP and UP services. Bundling was common in my data: in 1940, 43 percent of UP-affiliated newspapers also belonged to AP. The value of such bundling is an empirical question. It may have improved newspaper quality for readers, or it may have strengthened incumbents' market power by denying rivals access to telegraphic news. [12]

3 Data

The analysis combines four sources of data. The first is the United States Newspaper Panel from Gentzkow, Shapiro, and Sinkinson (2014, GSS), with information on circulation, subscription prices, advertising rates, and time-of-publication for the universe of US daily newspapers in elec-

[11] AP's General Manager Kent Cooper argued that if AP were compelled to serve all comers,"the incentive of each member to contribute his time, effort and money" would disappear. James Todd, the publisher of the Moberly Monitor-Index, put the competitive logic more bluntly: a paper "fighting for its livelihood" was "entitled to some protection" for its investment. The publisher of the Chicago Tribune argued to fellow AP members that if these rights were waived, the "asset value of your membership would be affected and your own property rights might be similarly imperiled at any time."

[12] In an affidavit, Thomas M. McNicholas of the Nashville Tennessean states "In a large number of cities in the United States effective monopolization of the business of publishing a daily newspaper has been obtained by AP members, (a) by holding membership in The Associated Press, thereby barring a competitor from obtaining its service, and (b) by entering into contracts with both the United Press Associations and International News Service under which any new subscriber to their services would have to pay tribute to the AP member subscribing to the other two services."

tion years. The second is a dataset of news-agency records on AP, UP, and INS membership, contracts, membership fees, and operational costs. The third is a panel of newspaper advertising quantity between 1932 and 1940. The fourth is a set of data on newsprint mills and capacity from which I construct city-year delivered newsprint prices.

3.1 Newspaper characteristics data

The main newspaper panel comes from the United States Newspaper Panel of Gentzkow, Shapiro, and Sinkinson (2014, GSS). The panel reports circulation, subscription prices, advertising rates, political affiliation, and time-of-publication for US daily newspapers in election years. My period of study covers 1900 to 1940.

I define a newspaper's home market as its city and time of publication, so morning and evening newspapers in the same city are treated as distinct markets. During the study period, news agencies treated morning, evening, and Sunday newspapers as distinct competitive "fields." News agency membership, exclusive territory contracts, and cost assessments were field-specific, so city and time of publication define the relevant unit of competition from the perspective of newswire membership.

To construct each newspaper's share in its home market, I scale circulation by 75 percent, following GSS (2014), which documents that roughly three quarters of the average newspaper's circulation is within its home market. I measure the potential readership in each market as city population scaled by the adult share of the US population in this period (60 percent; Hobbs and Stoops 2002). A summary statistics table for the demand-estimation sample is reported in the Appendix.

3.2 News agency data

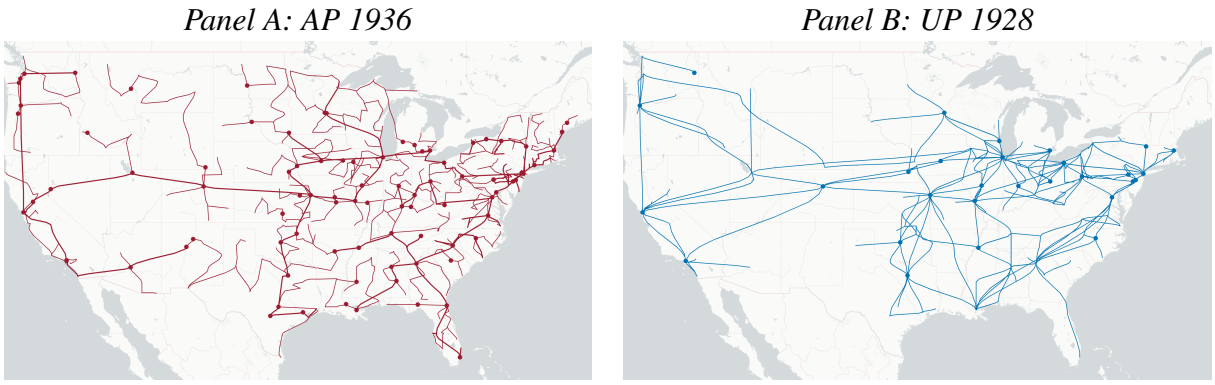
My data on news-agency membership come from the transcript of record in Associated Press v. United States (1945). In connection with that case, AP, UP, and INS reported the names, locations, time of publication, and initial subscription dates of their English-language daily newspaper clients in the United States as of 1941. These records identify the 1941 membership and the first observed join date for each surviving subscriber, but they do not directly record newspapers that had changed names, merged, or exited by 1941. I therefore manually trace mergers, temporary subscription interruptions, and changes in name or ownership to group-related newspaper titles into a single "franchise." This franchise is the relevant unit of membership for the evolution of the news-agency networks, because membership is carried through these changes and the associated network effects

and scale economies are preserved.[13]

I also collect archival data on news-agency payments, costs, and contracts. These include AP and UP internal records and observed payment data from several archival sources, including the universe of AP assessments in 1926. I use these materials to validate the model's estimated wire costs.

Bureaus were the connection points through which newspapers received AP and UP service. In both agencies, trunk lines connected major bureau cities, and regional or state circuits then linked smaller subscribers to those bureaus. I therefore use leased-wire maps to recover the relevant bureau geography for each newspaper. These maps, collected from internal communications and public materials such as promotional circulars, show telegraph connections between cities and identify bureau nodes. In the empirical implementation, I treat bureau locations as fixed based on the last-available AP map and assign each newspaper to its nearest bureau on the leased-wire network. The number of same-wire newspapers connected to that bureau serves as a proxy for local connection density in the wire-cost specification. Figure 1 shows two examples.

FIGURE 1: MAPS OF LEASED WIRES



Note: These are maps of the leased telegraph line system for each news agency. Lines denote telegraph connections. Dots denote bureaus operated by each news agency at the time. Panel A depicts the Associated Press's network in 1936, including national trunk lines which are bold. This particular AP map was submitted as evidence in *AP v. US* (1945) and printed in Lee (1937). Panel B depicts the United Press's network in 1928. Duplicated connections are possible due to the likely inclusion of both Day and Night wires. This particular map was printed on the back of UP's stationery in 1928 and reprinted in many UP newspapers as part of UP's advertising campaign in 1929.

3.3 NEWSPAPER ADVERTISING QUANTITY

To measure advertising quantity, I digitize the Annual Linage Supplement published by Editors and Publishers for 1932, 1936, and 1940. The source reports "linage," the quantity of advertising sold measured in lines of print. Merged with posted advertising rates from the newspaper panel, these

[13]The trajectory of new agency memberships in this dataset is similar to the other membership and network sources I collect, including contemporary directories, promotional materials, and internal agency records. The details of this data construction and validation are reported in the Online Appendix.

data allow me to construct newspaper-level advertising revenue for a large subset of newspapers, covering 37 percent of newspaper-year observations in 1932, 1936, and 1940.

I construct advertising revenue by multiplying posted advertising rates by observed advertising quantity. Relative to the 1928 Inland Press Cost and Revenue Survey, also provided by GSS (Gentzkow et al. 2014), this measure overstates realized advertising revenue.[14] I therefore rescale posted-rate revenue using the median ratio of survey revenue to constructed revenue within ad-price-type by market-size cells.[15] For years before 1932, I also use aggregate newspaper advertising revenue data from Lee (1937). Section 6 describes how I use these aggregates in the estimation of advertising revenue.

3.4 Newsprint

I construct a city-year panel of delivered newsprint prices using the Lockwood Directories of the Paper and Stationery Trades, which report mill locations and capacities for 1900, 1910, 1920, and 1930. Over this period, newsprint capacity shifts toward the Northeast and Northwest United States, with increased Canadian supply coming online by the 1930s. For 1930 to 1940, I hold capacities fixed at 1930 levels, consistent with limited new entry in this period (Kellogg 1948). I use these prices as an input-cost instrument for newspaper subscription prices.

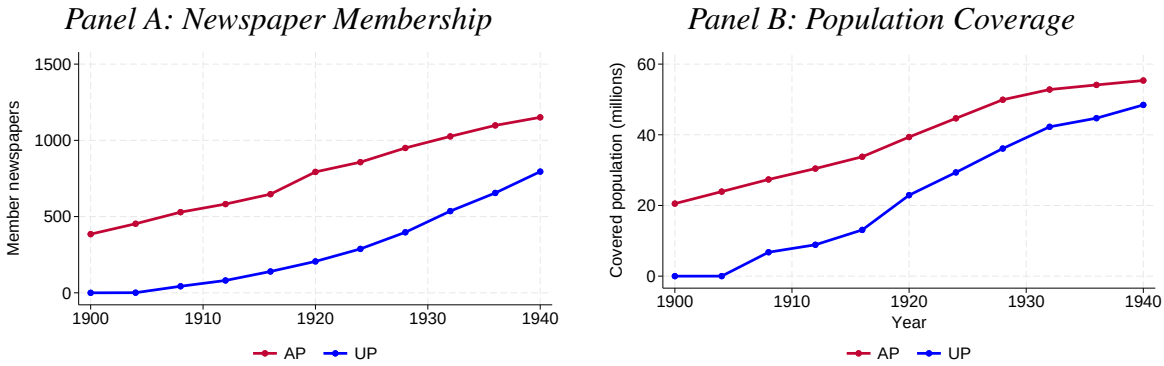
4 Descriptive Evidence

This section documents the descriptive facts relevant for exclusive territory and exclusive dealing. AP was the dominant incumbent network, and UP's later expansion came largely through second-newspaper entry and later bundling in AP-incumbent markets.

[14] The Inland Press Cost and Revenue Survey reports realized advertising revenue and circulation for an anonymized non-random sample of newspapers.

[15] In broad terms, realized revenue is only about 5 percent of posted-rate revenue for newspapers in small markets and about 10 percent in larger markets, where large markets are cities in the top quintile of the city-population distribution. Tiew (2024) also finds a large gap where the survey-to-posted ratio is 3% for the period from 1932 to 1992. This pattern likely reflects the fact that advertising rates were often individually negotiated and could involve steep discounts relative to posted rates.

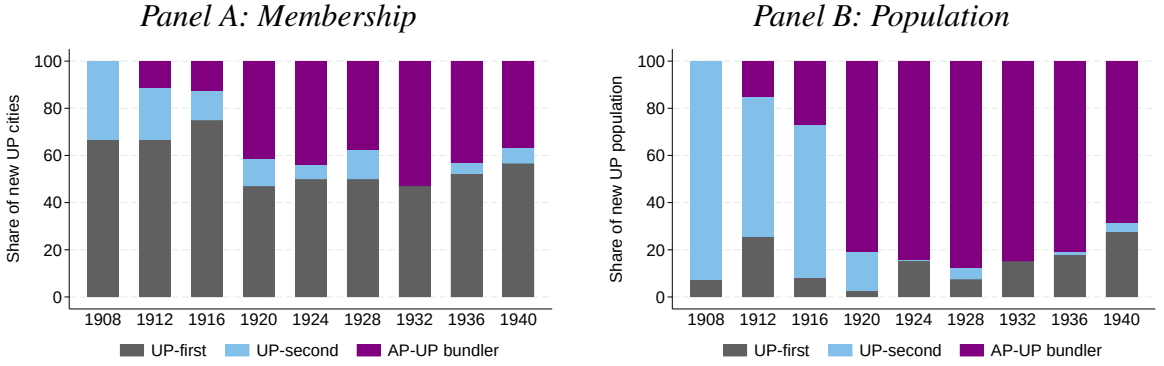
FIGURE 2: NEWS AGENCY MEMBERSHIP



Note: Newspaper panel data are from Gentzkow, Shapiro, and Sinkinson (2014) and are available for election years. Initial news agency subscription dates are from *Associated Press v. United States* (1945).

Figure 2 describes the growth of the two news agencies. AP was by far the dominant network at the beginning of the sample, but UP gradually caught up over time. When UP first appeared in the data in 1908, it already had 43 affiliated newspapers, many of which were Scripps-owned. Because these initial UP members reflected the expansion of a preexisting chain rather than independent subscription decisions, I do not use the 1908 UP rollout to identify newswire membership decisions.

FIGURE 3: COMPOSITION OF NEW UP MEMBERSHIP



Note: Panel A decomposes new UP membership in the period ending in that year into three categories. UP-first: markets where UP was the first wire. UP-second: markets where the UP newspaper was a second paper entering a market with an existing and different AP paper. AP-UP bundler: AP newspapers that added UP. Panel B weights by city population. Newspaper panel data are from Gentzkow, Shapiro, and Sinkinson (2014) and are available for election years. News agency subscription dates are from *Associated Press v. United States* (1945).

Figure 3 shows that the economically important part of UP's growth came largely in places where AP was already present. While there were many UP-first markets, they were disproportionately small: once weighted by city population, most of UP's covered population came from places where AP was already present. A similar pattern holds when we account for circulation instead of

population: the share of UP circulation from UP-second markets started high at 64% in 1908 and remained 49% in 1916.

This occurred through two channels. First, many UP members were second newspapers to carry telegraphic news in markets where an incumbent paper already held AP service, consistent with AP's exclusive-territory restrictions diverting other papers toward UP. This is especially important in the first two periods in the data. Second, AP-UP bundling rose sharply after the 1915 Attorney General opinion challenging AP's exclusive-dealing restrictions, suggesting that many newspapers sought to carry both services. Together, these patterns imply that the legal treatment of exclusivity could materially affect UP's growth by affecting its ability to retain early members and spread costs across the network.

5 Empirical Model

In this section, I develop a model of newspaper and news agencies to capture the forces of demand-side network effects and supply-side economies of scale. I focus on these forces as they are uniquely important to the economics of news agencies, thus abstracting from other forces that were previously studied in the literature on the economics of newspapers.

First, I present a model of per-period profits for newspapers, which nests a model of reader demand for newspapers, a model of newspaper advertising revenue, and a pricing model. The resulting profits then represent payoffs in a dynamic entry model where newspaper incumbents and entrants successively make choices over entering and newswire membership. Each subsection first lays out the notation and then discusses the economic interpretation.

5.1 Setup

I consider geographic-time of publication markets $m \in \{1, \ldots, M\}$ spanning finitely many discrete time periods $t \in \{1, \ldots, T\}$. I refer to the set of incumbent newspapers for each market-period combination as $\mathcal{J}_{mt}$, the number of incumbent newspapers as J_{mt}, and cap the potential number of newspapers for each market-period at J^{max}. Newspapers carry a newswire bundle W_{jmt} over news agencies $w \in \{\text{AP}, \text{UP}\}$ where W_{jmt} can be the empty set.

5.2 Variable profit

5.2.1 Reader demand

Reader demand follows a logit discrete choice demand system Berry (1994). Each household i in a market m at time t chooses between a newspaper j or the outside option of not buying a newspaper.

The household maximizes the following utility equation across those options,

$$u_{ijmt} = \alpha p_{jmt} + g\left(W_{jmt}\right) + \beta_{\text{INS}}\, INS_{jmt} + X_{mt}^{\top}\gamma + \overline{\xi}_{jm} + \xi_{jmt} + \epsilon_{ijmt} \tag{1}$$

where α is a coefficient on the newspaper's annual subscription price p_{jmt}, $g\left(W_{jmt}\right)$ is a household's valuation over newspaper j's newswire bundle W_{jmt}, INS_{jmt} is an indicator for whether the newspaper carries the International News Service, X_{mt} is a vector of observable demographic characteristics for market m at time t, $\overline{\xi}_{jm}$ is an unobserved vertical quality component of the newspaper that persists over time, ξ_{jmt} is an idiosyncratic vertical quality component of the newspaper for each period, and ϵ_{ijmt} is a type-I extreme value error for each household.

I write the newswire component of utility by the four possible AP-UP bundles: no wire, AP only, UP only, and AP-UP:

$$g\left(W_{jmt}\right) = \begin{cases} 0 & \text{if } W_{jmt} = \emptyset \\ \beta_0 + \beta_1 n_t^{AP} & \text{if } W_{jmt} = \{\text{AP}\} \\ \beta_0 + \beta_1 n_t^{UP} & \text{if } W_{jmt} = \{\text{UP}\} \\ 2\beta_0 + \beta_1 (n_t^{AP} + (1-\kappa) n_t^{UP}) & \text{if } W_{jmt} = \{\text{AP}, \text{UP}\} \end{cases},$$

where β_1 scales the network strength of a wire n_t^W and $\beta_0$acts as an intercept, and κ denotes the degree of content overlap between AP and UP. In my main implementation, n_t^W is the logarithm of the number of newspapers carrying the wire.

The overlap parameter κ captures the returns to a newspaper bundling both AP and UP. Since UP is always the smaller network in the data, an AP-UP newspaper gets the full value of AP but only a fraction $1-\kappa$ of its standalone value, where $\kappa \in [0, 1]$.

Equation 1 yields a mean utility $\overline{u}_{jmt}$ for each newspaper j. The share of potential readers that buys newspaper j after integrating over idiosyncratic preference shocks, s_{jmt}, follows the familiar logit probabilities.[16] The number of annual subscriptions for each newspaper j, q_{jmt}, is its market share s_{jmt} multiplied by the number of potential readers in the market Pop_{mt}.

5.2.2 Advertising revenue

I model a newspaper's per-reader advertising revenue as

$$\log a_{jmt} = \lambda_0 + \lambda_1 \log s_{jmt} + \lambda_2 \log \text{Pop}_{mt} + X_{mt}^{\top}\lambda_3 + \iota_{jmt}, \tag{2}$$

[16] From Berry (1994), $s_{jt} = \frac{\exp(\overline{u}_{jmt})}{1+\sum_{k\in\mathscr{J}_{mt}}\exp(\overline{u}_{kmt})}$.

where λ_0 is a constant, λ_1 is a coefficient on the natural logarithm of the newspaper's reader market share s_{jmt}, λ_2 is a coefficient on the natural logarithm of the number of potential readers in the market Pop_{mt}, $\lambda_3$is a vector of coefficients on market characteristics X_{mt}, and ι_{jmt} is an error term that is identically and independently distributed across market-years.

5.2.3 Pricing

Given a vector of reader subscription prices $\mathbf{p}_{mt}$, an incumbent newspaper j earns variable profit

$$v_{jmt}\left(p_{jmt}, \mathbf{p_{-j,mt}}\right) = \left[p_{jmt} - MC_{jmt} + a_{jmt}\left(p_{jmt}, \mathbf{p_{-j,mt}}\right)\right] q_{jmt}\left(p_{jmt}, \mathbf{p_{-j,mt}}\right),$$

where p_{jmt} is the firm's own price, $\mathbf{p}_{-j,mt}$ is the vector of other firms' prices, MC_{jmt} is a per-reader marginal cost, and a_{jmt} is per-reader advertising revenue, which depends on readership and therefore on the price vector.

I assume that a price vector $\mathbf{p}^*_{mt}$ is a Nash equilibrium if, for each newspaper j,

$$p^*_{jmt}\left(\mathbf{p}^*_{\mathbf{-j,mt}}\right) \in \arg\max_{p} v_{jmt}\left(p, \mathbf{p}^*_{\mathbf{-j,mt}}\right), \tag{3}$$

which yields equilibrium variable profits $v^*_{jmt} \equiv v_{jmt}\left(\mathbf{p}^*_{mt}\right)$ for each incumbent newspaper j.

5.2.4 Discussion

NETWORK STRENGTH. This specification makes three important choices about how newswire membership translates into reader value. First, I use paper count rather than population coverage in the baseline because the economic object of interest is the number of member newspapers contributing their local reporting to the wire, not the number of readers living in the places they serve. The relevant extensive margin here is adding reporting locations: if a wire is missing coverage of a particularly newsworthy place, it can in principle send a reporter there, whereas more population in an already-covered place does not necessarily create a new source of news.

Second, I allow for diminishing returns to bundling through κ, which captures the incremental value of adding one wire to the other. In practice, κ is identified from changes in prices and market shares when a newspaper adds UP to an existing AP subscription. In the Online Appendix, I show that κ can be derived from a model in which AP and UP's news coverage overlaps on a fraction κ of the smaller wire's covered topics.

Third, I use a logarithmic transformation as a parsimonious way to allow diminishing returns to additional members. The choice of logarithmic scaling is not innocuous when wire membership has an important extensive margin (e.g. whether population enters in raw counts or millions; Chen and Roth 2024). In practice, the data do not contain enough independent variation to separately

identify the overall level of network value, the overlap parameter, and an intercept.

The Online Appendix discusses alternative normalizations of this specification replacing paper count with population-based measures, varying the treatment of overlap, and including different measures of the extensive margin. The results are similar across specifications: the intercept that reflects the extensive margin is rarely distinguishable from zero, and the implied paths of network value and bundling value over time are similar.

Finally, in the demand specification, INS enters as a constant addition to reader utility rather than through the network-value term, because, as discussed in Section 2, INS did not follow the same network structure as the other news agencies in its news production.

ADVERTISING REVENUE. The advertising specification is similar to Fan (2013) and Rysman (2004), but instead of estimating a structural advertiser-demand equation, I estimate per-reader advertising revenue directly. For the present application, the key object is simply how per-reader advertising revenue varies with market share, since that affects newspapers' incentives to cut price or invest in quality. I also abstract from competition in the advertising market, consistent with the assumption that each reader buys at most one newspaper.[17]

5.3 DYNAMIC MODEL OF NEWSPAPER ENTRY AND NEWS AGENCY MEMBERSHIP

5.3.1 Timing

I adapt the stochastically alternating moves game developed in Igami and Uetake (2019) to model newspaper entry over time and newswire membership choices. Time is discrete and has a finite horizon, with periods indexed by $t = 1, \ldots, T$. Periods alternate between two types. I refer to odd periods as *Entry* periods, in which a potential entrant may enter the market, and to even periods as *Update* periods, in which incumbents may adjust their newswire bundles. I interpret each model period as two calendar years. Variable profits and costs are realized only at the end of *Update* periods. Thus, *Entry* periods are intermediate stages in which entry decisions are made and are included only to simplify the notation.

At the start of the game, the AP and UP wire-cost functions are taken as given, with cost parameters described below. In each period, the following happens in order:

1. Nature chooses a mover.

[17] I assume that each reader buys at most one newspaper because I do not observe reader multihoming. That margin is more important in settings such as GSS (2014), where morning and evening newspapers compete directly, than in my setting, where they are separate markets. I also do not observe multihoming behavior that varies with AP and UP membership or over time.

(a) In an *Entry* period, a new potential entrant newspaper j^+ becomes active and becomes this period's mover if $J_{mt} < J^{max}$. Otherwise, the game skips this period.

(b) In an *Update* period, nature selects an incumbent $j \in \mathscr{J}_{mt}$. If there are two incumbents, I assume that each is selected with probability $1/2$; if there is one incumbent, it is selected with probability 1. Otherwise, the game skips this period.

2. The mover draws shocks related to one-time sunk costs relevant only to decisions for this particular period, η_{jmt}.

3. The mover makes its choice. The mover chooses from the feasible set of newswire bundles $W \subseteq \overline{W}_{jmt}$ which depends on the exclusive-contracting regime in place and incumbents' current newswire bundles.

   (a) In an *Entry* period, the entrant chooses whether to enter with a newswire bundle W or to stay out of the market. If the entrant stays out, it "dies" and is removed from the game.

   (b) In an *Update* period, the incumbent selected by nature chooses whether to add a news agency to its current newswire bundle.

4. Only in an *Update* period, period-specific idiosyncratic demand shifters ξ_{jmt} are realized, and all active newspapers (including j^+ if it entered) set prices simultaneously according to equation 3, earn variable profits, and pay fixed costs.

I assume that a period T^{Lock} between 1 and T serves as a "lock-in" period, after which no further entry or newswire-membership changes can occur. From T^{Lock} onward, newspapers continue to earn variable profits given the locked-in market structure, but the state no longer evolves through firms' discrete choices. In the estimation, I assume that the locked-in market structure persists for six additional calendar years, or three model periods, so newspapers behave as if they look ahead through 1952 and expect no further changes in entry or AP-UP membership after lock-in. As in Igami and Uetake (2019), this assumption supplies a tractable terminal condition for the dynamic model and allows the game to be solved by backward induction.

5.3.2 Choices and payoffs

Each period, the mover makes a choice of newswire bundle W. The feasible set of newswire bundles available to the mover, denoted as $\overline{W}_{jmt}$, is determined by two factors: the exclusive contracting regime currently in effect and incumbents' current newswire bundles. Newswire membership is irreversible: once a newspaper joins a newswire, it cannot later drop it. The choice set for an entrant also includes $W = \text{Out}$, denoting not entering.

The continuation value from choosing bundle W at time t is given by

$$V^*_{jmt}(W) = \begin{cases} \sum_{s=t}^{T} \delta^{s-t} \mathbb{E}\left[\pi_{jms}\right] + \eta_{jmt}(W) & W \neq \text{Out} \\ \eta_{jmt}(Out) & W = \text{Out} \end{cases}, \tag{4}$$

where π_{jms} is total per-period profit, δ is the per-period discount factor, which I set to 0.9, and $\eta_{jmt}(W)$ is a choice-specific private payoff shock specific to bundle W. The expectation $\mathbb{E}\left[\pi_{jms}\right]$ is taken over future market structures and future states, conditional on beliefs specified below. The per-period total profit π is

$$\pi_{jms} = \begin{cases} 0 & \textit{Entry} \text{ period} \\ \mathbb{E}_\xi\left[v_{jms}(W_j, W_{-j})\right] - WC_{jms}(W_j, W_{-j}; \tau) - FC_{jms} & \textit{Update} \text{ period} \end{cases}$$

where v_{jms} is variable profit as defined in Section 5.2, FC denotes the per-period fixed cost, and WC denotes the per-period newswire costs and is a function of the assessment schedules τ. The expectation $\mathbb{E}_\xi$ is taken over idiosyncratic period-specific demand shocks.

FIXED COSTS AND NEWSWIRE COSTS For an active newspaper, I write per-period ongoing costs in per-capita terms. These costs have two components: fixed operating cost and newswire membership cost. I allow fixed costs to vary across three eras and with market size,

$$\frac{FC_{mt}}{Pop_{mt}} = \theta_{FC,e(t)} + \theta_{pop} \log Pop_{mt},$$

where $e(t) \in \{\text{early}, \text{mid}, \text{late}\}$[18].

For each wire $w \in \{AP, UP\}$, per-capita membership cost is

$$\frac{WC^w_{mt}}{Pop_{mt}} = \theta_{pop_wc} \log Pop_{mt} + \frac{\theta_{coop,w}}{(WirePop^w_t)^\lambda} + \frac{\theta_{bureau}}{N^w_{bureau,mt}},$$

where $WirePop^w_t$ is the population covered by the wire w, and $N^w_{bureau,mt}$ is the number of member newspapers sharing the relevant bureau connection. Thus, larger wire networks and greater bureau sharing reduce per-capita newswire costs, with separate cooperative-sharing parameters for AP and UP. The specification captures two cost-side scale economies: a network-wide component shared across member newspapers in the wire, reflecting national and international news collection and trunk-line costs, and a local bureau component shared across newspapers tied to the same bureau connection, reflecting local telegraph-circuit costs.

[18] In the estimation, "early" refers to 1916 and 1920, "mid" refers 1924 and 1928, and "late" refers to the Depression-era years 1932, 1936, and 1940.

For a newspaper carrying bundle W, per-capita newswire cost is summed across each newswire in its bundle, $WC_{jmt}(W) = \sum_{w \in W} WC^w_{mt}$.

ERROR STRUCTURE The private payoff shock $\eta_{jmt}(W)$ follows a generalized extreme value distribution with a nested logit structure.[19] I partition the choice set into a non-wire nest (stay-out and in-market without a wire) and a wire nest (bundles including AP or UP). The wire nest has dissimilarity parameter $\mu \in (0, 1]$, which governs the correlation of unobserved payoff shocks across wire options.

5.3.3 Beliefs

When making entry or wire-adoption decisions, each firm forms expectations over the opponent's future actions using the equilibrium strategy profile implied by backward induction. Market-level state variables that affect flow payoffs (city population and news agency network scale) follow deterministic paths taken from observed historical values; in the counterfactual simulations, I allow news agency scale to evolve endogenously.

A source of uncertainty concerns the quality of potential entrants. I assume that prior to entry, neither the entrant nor the incumbent knows the entrant's quality $\overline{\xi}_{jm}$. Each potential entrant then draws $\bar{\xi}_{jm} \in \{\bar{\xi}^L, \bar{\xi}^M, \bar{\xi}^H\}$ with equal probability from similar entrants.[20] Both the entrant and the incumbent integrate over this distribution when forming expectations.

5.3.4 Equilibrium

Given this parametrization, for a given mover and realization of shocks, the mover's optimal choice of newswire bundle solves

$$W^* = \arg \max_{W \in \overline{W}_{jmt}} V^*_{jmt}(W). \tag{5}$$

That is, the mover selects the feasible bundle that maximizes the stream of discounted payoffs from choosing W. The ex-ante probability that the mover chooses W, after integrating over the choice-specific payoff shocks, follows the familiar logit choice probability expression. The Online Appendix writes these choice probabilities and the corresponding likelihood contribution explicitly.

[19] Let $V^*_{jmt}(W)$ denote the deterministic component of the continuation value from choosing bundle W. The choice probability is $P(W) = \frac{\exp(V^*(W))}{(D_0 + D_1^\mu)}$ for entry/out choices and $\frac{\exp(V^*(W)/\mu)}{D_1^{\mu-1}/(D_0+D_1^\mu)}$ for wire bundles, where $D_0 = \sum_{W \in \mathcal{B}_0} \exp(V^*(W))$ and $D_1 = \sum_{W \in \mathcal{B}_1} \exp(V^*(W)/\mu)$. When $\mu = 1$ this reduces to the standard logit.

[20] The discrete support corresponds to the lower tercile, median, and upper tercile of paper quality among observed entrants of the same entry order (first/second), era (entrants ending in 1908-1920, 1924-1932, and 1936-1940 respectively), and city-population quintile. The entrant's potential marginal cost is the median of that cell.

As in Igami and Uetake (2019), the game is a finite sequence of discrete choice problems, each of which has a unique solution. Thus, conditional on a given set of beliefs over future network evolution, every game has a unique equilibrium.

5.3.5 Discussion

WIRE COSTS. The AP bylaws describe member payments as combining a general charge with charges for local service and leased-wire circuits, and the Associated Press (1984) internal history reports that this basic payment structure was maintained through the study period. This structure is corroborated by my data of the wire assessments: wire costs combined a network-wide component with local circuit charges, with separate morning and evening fields inside a city.

I use this evidence to motivate a wire-cost specification in which a newspaper's cost of carrying a newswire varies with local market population, national network paper count, and local bureau sharing. I assume that the local circuit costs is shared equally among newspapers connected to the same bureau.

In the cooperative cost-sharing term,λ captures how the average cost of a news agency membership scales with the size of its network. The total cost of the cooperative component for a newspaper can be decomposed into:

$$\theta_{coop,w} \times \underbrace{\frac{Pop_{mt}}{WirePop_t^w}}_{\text{cost sharing}} \times \underbrace{(WirePop_t^w)^{1-\lambda}}_{\text{returns to scale}}.$$

This reduced-form relationship separates proportional cost sharing across members from how total expenditure of the news agency varies with network size. An estimate of $\lambda > 1$ implies scale economies—member costs fall faster than under proportional cost sharing—consistent with increases in efficiency. By contrast, $\lambda < 1$ implies weaker scale economies, indicating that the wire increases investment or faces coordination costs as it grows.

ERROR STRUCTURE The nesting parameter μ governs substitution across wire options but is not identified from the estimation data. Entrants effectively face two nested choices of whether to enter and whether to take a wire. μ governs the degree of business stealing across wires: when AP is removed from the choice set, how many papers choose to stay out vs. pick up UP. However, the variation in whether AP is available in the choice set comes from whether a previous entrant already holds AP under exclusive contracts, which is the same margin the counterfactual alters.

Identifying μ therefore requires information on the relative substitutability of AP and UP from outside the model. I interpret the two nests as corresponding to distinct cost categories: the non-wire nest reflects setup costs in operating a newspaper such as building, distribution, and local

reporting, while the wire nest reflects the costs of operating a telegraph connection and transmitting the news. To the extent that unobserved shocks scale with the costs associated with each decision, μ can be disciplined by the relative magnitude of these cost categories in accounting data. I calibrate μ accordingly in the empirical implementation.

6 Estimation

6.1 Reader demand

6.1.1 Estimation

I estimate reader demand in the newspaper-market-year sample described in Section 3. For each newspaper, I observe its market share, annual subscription price, and newswire bundle. Equation 1 then implies an estimable mean-utility equation linking observed market shares to price and newswire characteristics similar to Berry (1994).[21]

Price instrument. I instrument for subscription price with the price of newsprint for each city-year. Newsprint was a major input into newspaper production: Ferguson (1930) reports that it accounted for 14 to 37 percent of a newspaper's total operating costs. Changes in delivered newsprint prices therefore shift newspapers' marginal costs and, in turn, subscription prices.

The identifying variation comes from changes in the capacity and location of North American newsprint mills and from changes in transport costs over time. Over this period, changes in mill locations were driven by input costs: production moved from the U.S. interior to northeastern and northwestern Canada (including Newfoundland) due to proximity to spruce timber, cheap hydroelectric power, and the removal of the U.S. tariff on Canadian imports (Wallace 1935).

I construct a city-year panel of delivered newsprint prices using data on mill capacities, locations, and rail freight rates, as described in Section 3. I model freight costs as a linear function of distance and a constant loading cost using a 1939 cross-section of origin–destination freight rates from the US Department of Commerce (Margolin and McLendon 1952), scaled across years using the national-average railroad freight cost series from the NBER. I combine mill capacities, transport costs, and city-level demand in a spatial price-equilibrium model (Enke 1951; Samuelson 1952) that minimizes total newsprint transportation cost across the economy. I then calibrate the model to match average wholesale newsprint prices for each year, standardize these prices, and interact them with year to allow for differential pass-through across time. Details of the model and implementation are provided in the Online Appendix.

[21] $\overline{u}_{jmt} = \alpha p_{jmt} + g\left(W_{jmt}\right) + \beta_{\text{INS}}\, INS_{jmt} + X_{mt}^{\top}\gamma + \overline{\xi}_{jm} + \xi_{jmt}$, where $\overline{u}_{jmt} = \log s_{jmt} - \log s_{0mt}$.

NEWSWIRE STRENGTH. Identification of newswire value comes from changes over time in newspapers' market shares as the AP and UP networks evolve. A natural concern is that newspapers carrying AP or UP may differ systematically in unobserved quality, so changes in market share could reflect selection rather than the value of the wire itself. I address this concern by estimating equation (1) with newspaper fixed effects $\overline{\xi}_{jm}$, which absorb time-invariant newspaper quality. Since I observe newspapers over time, this panel structure separates persistent differences in newspaper quality, such as reputation or reporting ability, from changes associated with its newswire bundle and network growth. A remaining concern is that newspapers joining a newswire may also invest over time in other dimensions of quality, which would bias the estimated network effects. In the Online Appendix, I show that the results are robust to allowing each newspaper to have its own linear time trend, which captures the possibility that some newspapers improve systematically over time for reasons unrelated to AP or UP.

MARKET CHARACTERISTICS AND TIME VARIATION. The demand specification also includes controls for common market characteristics and time variation. I include year-by-edition fixed effects, population-decile fixed effects, and a direct control for the natural logarithm of city population. These controls absorb broad changes in newspaper demand over time and across market size classes, so the coefficients on price and newswire characteristics are identified from residual within-newspaper variation after conditioning on these broader demand conditions.

6.1.2 Results

In the first stage, delivered city-year newsprint prices strongly predict subscription price, with first-stage F-statistic around 47 across the three specifications. The estimated price coefficient is negative, implying that higher subscription prices reduce readership. More importantly, network strength enters positively and consistently in all three specifications, while the coefficients on the AP-UP wire intercepts are small and imprecisely estimated but centered around zero. These estimates imply that readers value larger wire networks, and that this conclusion is not sensitive to whether the specification includes no wire intercept, an indicator for carrying at least one wire, or the number of wires carried. When the network terms are converted into 1928-dollar equivalents using the estimated price coefficient, the value of AP rises from about \$2.12 in 1916 to \$2.25 in 1940, while the value of UP rises from about \$1.74 to \$2.16 over the same period. These are sizable demand shifters relative to the sample's median subscription price of approximately \$7.50.

The overlap parameter κ is 0.85 (s.e. 0.10) in the preferred specification, which implies that AP and UP content largely overlaps from readers' perspective, with bundling delivering only a modest gain in reader value beyond carrying AP alone. This result is robust across specifications and suggests that reader demand alone is unlikely to explain the prevalence of bundling in the

TABLE 1: READER DEMAND ESTIMATES

		(1)	(2)	(3)
Variable	Parameter	No dummy	Any wire	Num. wires
Price	α	-0.134	-0.134	-0.134
		(0.018)	(0.018)	(0.018)
Network strength	β_1	0.045	0.038	0.032
		(0.003)	(0.022)	(0.020)
Indicator for at least one wire	β_0^{any}		0.041	
			(0.135)	
Number of wires	β_0^{num}			0.080
				(0.123)
Redundancy	κ	0.846	0.815	1.170
		(0.107)	(0.171)	(0.717)
INS	β_{INS}	0.265	0.264	0.264
		(0.041)	(0.041)	(0.041)
Log city population	γ_{pop}	-0.520	-0.519	-0.518
		(0.057)	(0.057)	(0.057)
Franchise FE		Yes	Yes	Yes
Year $\times$ Time of Publication FE		Yes	Yes	Yes
Pop Decile FE		Yes	Yes	Yes
F		47.56	47.49	47.46
Observations		16,672	16,672	16,672

Notes: Table reports the count-based logit IV demand specification under three alternative AP-UP wire-intercept controls: no wire intercept, an "any wire" intercept, and a "number of wires" intercept. Wire controls refer only to AP and UP; INS enters separately as its own indicator. The specification includes franchise fixed effects, year $\times$ edition fixed effects, population-decile fixed effects, and log city population. Subscription price is instrumented with year-interacted delivered city-year newsprint prices. Standard errors clustered by city-year are in parentheses.

data. Other considerations - such as hedging against service disruptions, editorial preferences, or strategic motivations regarding foreclosure of rival papers - likely played an important role in bundling decisions.

6.2 Advertising Revenue

6.2.1 Estimation

I estimate equation 2 on the advertising sample described in Section 2 using two-stage least squares. The dependent variable is the logarithm of per-reader advertising revenue, and the key regressor is the logarithm of a newspaper's own market share. Identification comes from variation across newspapers and over time in reader market share and market size. Newspapers with larger readership may earn lower advertising revenue per reader, either due to advertisers' difficulty to target their desired demographics (Chandra 2009), or because the marginal reader may be more likely to consume other media such as magazines or radio, making their impressions less valuable to advertisers (Gentzkow, Shapiro, Yang, and Yurukoglu 2022). Larger markets may support systematically different advertising conditions.

A concern, however, is that readership is endogenous in the advertising equation: newspapers may have unobserved attributes that both attract more readers and earn higher advertising revenue per reader (e.g. staff productivity across the newsroom and the advertising department). To address this problem, I instrument for readership using the newspaper quality term recovered from the reader-demand model together with indicators for the number of newspapers in the city market. I further include controls for the logarithm of city population, interactions between time of publication and an indicator for cities in the top quintile of the population distribution, and state and year fixed effects. The exclusion restriction is that persistent unobserved quality that shifts reader demand does not directly affect advertising quantity.

An additional step is needed to propagate the advertising equation back to years without linage data (before 1932). To recover year fixed-effects for 1912-1928, I combine the estimated cross-sectional coefficients with external aggregate advertising-revenue targets from Lee (1937). In the years 1932-1940, I compare model-predicted aggregate advertising revenue to the Lee targets to calibrate a common scaling factor. I then recover each pre-1932 year effect as the value that makes the model's aggregate predicted advertising revenue match the corresponding Lee target in 1928 dollars. This extrapolation assumes that the cross-sectional relationship between readership, market characteristics, and advertising revenue is stable over time, while aggregate time variation is captured by the calibrated year effects.

TABLE 2: ADVERTISING REVENUE ESTIMATES

Variable	Parameter	OLS	IV
Log market share	λ_1	-0.233	-0.093
		(0.028)	(0.033)
Log city population	λ_2	0.086	0.116
		(0.030)	(0.030)
Observations		1,686	1,686

Notes: Table reports estimates for log per-reader advertising revenue. Column 1 reports the OLS specification. Column 2 reports the preferred IV specification. All specifications include state and year fixed effects, time-of-publication $\times$ large-market controls, and log city population. In the IV specification, the endogenous regressor is log own market share. Market share is instrumented with the newspaper fixed effect recovered from the reader-demand model together with indicators for the number of newspapers in the city market. Standard errors clustered by city-year are in parentheses. The first-stage F-statistic in column 2 is 514.1.

6.2.2 Results

The preferred IV estimates imply that per-reader advertising revenue declines with readership scale. The coefficient on log market share is -0.093, so larger newspapers earn less advertising revenue per reader, but the negative relationship is substantially weaker once readership is instrumented. Per-reader advertising revenue also rises with city size. For the median newspaper, per-reader advertising revenue is about \$9 in 1916 and \$15 in 1940, both in 1928 dollars.

These estimates imply that a 1 percent increase in market share raises total advertising revenue by only 0.91 percent. This advertising elasticity is important for a newspaper's decision to invest in a more valuable newswire bundle or lower subscription price: these choices raise readership, but when per-reader advertising revenue declines with readership, part of that gain is offset on the advertising side.

Together with the reader demand estimates and the pricing model, these cost estimates allow us to quantify the value of wire membership. Consider a typical morning newspaper market (e.g. Cleveland, OH). A monopolist carrying AP earns about 19 percent more in total variable profit per capita than one with no wire service; carrying UP raises profit by about 17 percent. Carrying both wires yields a 23 percent gain, less than the sum of the individual premia because the second wire's news content largely overlaps with the first. Under duopoly, competition compresses these gains to roughly 15, 13, and 17 percent for AP, UP, and both wires, respectively. Across the entire sample, the variable-profit advantage of AP falls from 4.6% in 1912 to 0.7% in 1940.

6.3 Entry Estimation

6.3.1 Estimation

Given the estimated reader demand and advertising parameters, I recover the static profit components for each newspaper-year. Together with equations 1 and 2, these parameters imply subscription revenue and per-reader advertising revenue for each newspaper-year. I then use the pricing first-order conditions in equation 3 to back out implied marginal costs and equilibrium variable profits for each newspaper as a function of its wire bundle, newspaper characteristics, and market characteristics. These equilibrium variable profits are the key inputs into the dynamic entry-and-membership estimation, as they determine each newspaper's per-period payoff given its wire bundle and market structure. The Online Appendix describes the construction of the estimation sample and the static-profit approximation used to evaluate flow payoffs.

I estimate the fixed cost and wire cost parameters by maximum likelihood across decisions in equation 5. The market-time panel begins in the period ending in 1912. This restriction avoids applying the later-period entry model to UP's founding members, who were largely newspapers closely tied to the Scripps organization and may have followed a different decision process. For each candidate parameter vector, I solve each newspaper's finite-horizon entry and AP-UP membership problem by backward induction from the final period and evaluate the likelihood of the observed transitions in the market-time panel, using the dynamic choice probabilities from Section 5.3.4 and the beliefs assumption described there. Fixed costs are identified by observed entry patterns across market characteristics and over time, while wire-cost parameters are identified by AP-UP membership transitions as market size, overall network scale, and the local density of newspapers belonging to a given network evolve.

Lastly, I calibrate $\mu = 0.25$ to reflect the relative magnitude of wire-related costs and newspaper operational costs. AP weekly assessment records in 1926 and the Inland Press Association's 1924 cost survey imply a per-reader wire-to-fixed cost ratio ranging from 26% to 5% across circulation bins, with larger newspapers having a lower ratio. This is from mid-sample data; the ratio may have been higher in the early period when both newswires networks were smaller. Moreover, wire membership entailed costs beyond the weekly assessment by the newswires on the newspaper itself, including one-time investments and long-term contractual commitments, so the accounting ratio likely understates the economic cost of the wire decision. The Online Appendix reports robustness of the supply estimation and counterfactual results across values of μ.

6.3.2 *Results*

TABLE 3: ENTRY AND MEMBERSHIP COST ESTIMATES

Component		Estimate	SE
Newspaper fixed cost			
Era intercept, θ_{FC}	1912–1920	2.869	(0.109)
	1924–1928	4.457	(0.209)
	1932–1940	5.334	(0.080)
Log city population, θ_{pop}	Morning	−0.748	(0.039)
	Evening	−0.991	(0.039)
Newswire membership cost			
Log city population, $\theta_{\text{pop,wc}}$		−0.129	(0.013)
Cooperative sharing, θ_{coop}	AP, morning	4.755	(0.722)
	AP, evening	3.381	(0.530)
	UP, morning	1.387	(0.104)
	UP, evening	0.883	(0.055)
Coop. population elasticity, λ	AP	1.469	(0.136)
	UP	0.766	(0.075)
Bureau sharing, θ_{bureau}		0.032	(0.004)
Markets		2,045	
Negative log-likelihood		39,256.49	

Notes: Table reports estimates from the dynamic entry-and-membership specification. The model fixes the discount factor at $\beta = 0.9$ and $\mu = 0.25$. Standard errors clustered by market are reported in parentheses and are conditional on the estimated demand and advertising parameters.

Estimates imply substantial per-capita fixed costs of newspaper operation, with higher cost levels in the later eras. Differences across cities in per-capita fixed cost are driven by market population, with larger markets facing lower fixed cost per capita and therefore better able to support newspaper entry.

Newswire membership costs also exhibit strong scale economies: the cost of carrying a wire falls with city population, with the size of the cooperative network, and with the number of newspapers sharing a bureau. Differences across cities in these costs are driven primarily by remoteness and bureau sharing: more remote cities, which are cities whose newspapers share a bureau with fewer other papers, face higher wire costs.

AP's cooperative-sharing coefficients are substantially larger than UP's (4.76 versus 1.39 for morning editions; 3.38 versus 0.88 for evening), potentially reflecting UP's cost efficiencies or Scripps' financial subsidies to the organization. However, AP's cooperative population elasticity implies genuine increasing returns to cooperative scale: as AP's member population doubles, this

cost component falls by more than half. UP's elasticity implies more modest scale economies. This potentially reflects UP's status as a for-profit organization that may have strategically priced to capture surplus from network growth rather than passing it through as cost reduction.

For a sense of the magnitude of these estimates, table 4 reports these cost estimates for three cities chosen at the 25th, 50th, and 75th percentiles of AP wire cost in 1912. Cross-sectional variation in wire costs reflects differences in remoteness and in the number of newspapers sharing bureau costs, and variation over time comes from changes in the AP and UP membership scale.

TABLE 4: COST EVOLUTION FOR EXAMPLE CITIES

		Fixed cost	AP wire cost	UP wire cost
Durham, NC	1912	2.65	1.15	1.24
	1940	3.95	0.26	0.20
Columbus, OH	1912	0.96	1.27	1.42
	1940	3.08	0.23	0.16
Pueblo, CO	1912	2.04	1.46	1.61
	1940	4.40	0.47	0.40

Notes: Entries are per-capita costs in 1928 dollars. Cities are chosen at the 25th (Durham), 50th (Columbus), and 75th (Pueblo) percentile of AP wire cost in 1912, then tracked through 1940. Fixed costs rise over time as the era dummies shift upward. Wire costs fall as each service's subscriber network expands and per-capita bureau costs decline. Columbus, a large city, has a low per-capita fixed cost because the fixed cost of entry is spread over a larger readership base.

At the median example city (Columbus, OH), AP and UP wire costs are comparable in 1912, with UP being slightly higher. By 1940, both have fallen sharply as each service's subscriber base expanded: AP wire cost drops to \$0.23 and UP to \$0.16, declines of over 80 percent. The pattern is similar across cities of different sizes, though the level varies: Pueblo, a smaller and more remote city, faces wire costs roughly 25 percent higher than Durham throughout the period.

6.4 MODEL FIT

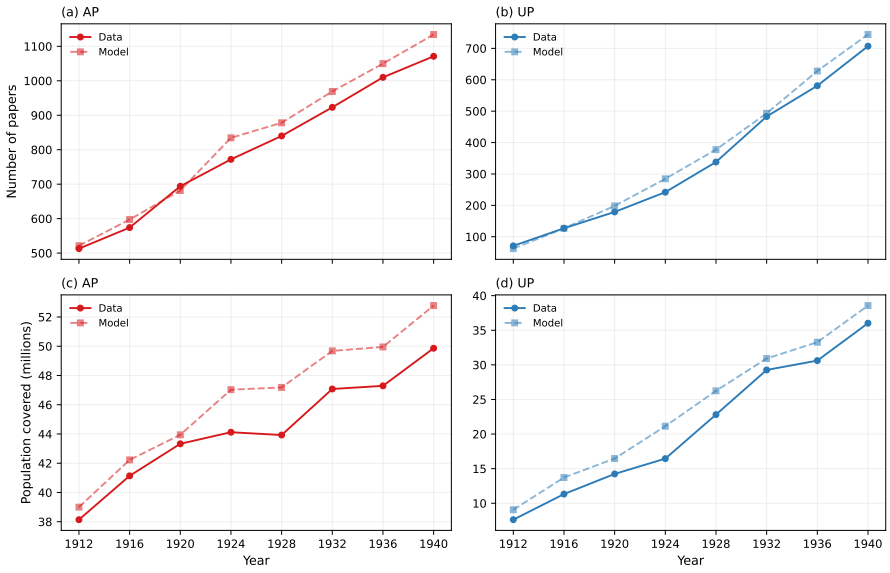
Table 5 and figure 4 report fit for the dynamic entry and wire membership model, evaluating the model's predicted choices conditional on the observed market structure in the previous period. Because the counterfactuals operate through newspapers' entry and wire-membership choices, the key fit objects are the time path of market structure and the evolution of AP and UP memberships.

TABLE 5: MARKET STRUCTURE: MODEL FIT

	Data (%)	Model (%)	Diff. (pp)
Empty	13.1	14.1	+1.1
One newspaper	80.5	76.5	−4.1
Two newspapers	6.4	9.4	+3.0
AP only	37.6	36.3	−1.2
UP only	12.0	10.4	−1.6
AP and UP on different papers	1.8	1.7	−0.1

Note: Fraction of market-years in each category, averaged across all years with observed data (1916–1940). A market is a city × field (morning/evening) pair with capacity for two newspapers. "Data" is observed from the entry sample; "Model" is the predicted distribution from the entry model at estimated parameters. The model slightly overpredicts entry (two-newspaper markets) and slightly underpredicts single-newspaper markets. Wire service adoption rates are well matched, including the key competitive margin of AP and UP on different papers.

FIGURE 4: WIRE COVERAGE FIT OVER TIME



Note: This figure compares the actual and one-period-ahead predicted time path of AP and UP coverage under the preferred dynamic entry-and-membership specification. The top row reports the number of newspapers carrying each wire, and the bottom row reports the total population covered by those newspapers. Predicted values are constructed from the model's post-decision action probabilities, conditional on the observed market structure in the previous period, and aggregated to the market-year level. The predicted series is evaluated on the GOF sample, so the number of markets is slightly smaller than in the full descriptive panel.

The model matches the one-period-ahead evolution of market structure well. Pooling across all market-years, it reproduces the fraction of empty, one-newspaper, and two-newspaper markets to within 1–3 percentage points. The model overpredicts second entrants: two-newspaper markets are 3 percentage points more common than in the data. This excess entry is concentrated in non-wire

newspapers; the model slightly underpredicts both AP-only and UP-only markets (by 1.2 and 1.6 percentage points respectively). The overprediction of entry is a consequence of limited business stealing between newspapers, consistent with previous work, and the assumption that fixed costs are symmetric between first and second entrants.

The model also tracks the evolution of AP and UP memberships well, both in the number of newspapers carrying each wire and in the population covered by those newspapers. Observed AP and UP weekly payment data provide an external validation of the model's predicted costs of newspaper membership in these newswires. The model tracks the cross-sectional variation in these payments: the correlation between model-implied costs and observed payments is 0.65 for AP in 1926 and 0.80 for UP in 1926–1932.[22] The full comparison is reported in the Online Appendix.

Taken together, these fit exercises indicate that the model captures the main dynamic margins through which exclusivity affects the evolution of AP and UP across markets. Additional validation of the implied marginal costs and static profit objects is reported in the Online Appendix.

7 COUNTERFACTUALS

7.1 FRAMEWORK

The counterfactual asks what would have happened to AP, UP, and newspaper markets had newspapers been free to join either news agency. To answer this, I iterate the model forward from the observed 1908 distribution of market states, solving for a fixed point in network beliefs. Because a newspaper's payoff from becoming a member of AP or UP depends on the expected national scale of each network and on the local bureau-sharing conditions implied by network membership, the simulation solves for a fixed point in beliefs over yearly AP and UP membership and population coverage. Beginning from the observed network paths as initial beliefs, each iteration solves each newspaper's dynamic problem by backward induction, integrates over the state distribution to compute expected entry and wire-membership probabilities, aggregates these into updated AP and UP network paths, and repeats until the implied network paths are consistent with the beliefs used to solve the dynamic problems.

The forward iteration is run on the market-time panel used in dynamic estimation. To map these choices back into national AP and UP scale, I add back the residual membership and population coverage observed outside the estimation sample and hold those residual components fixed over the iteration. These residual markets are primarily the larger markets that lie outside the dynamic estimation sample, as discussed in Section 6. The resulting fixed point determines the evolution of

[22] Direct evidence on early UP pricing is limited: only 15 cities have both AP and UP assessment data in 1911, all belonging to very large markets. In this sample, UP's annual assessment is close to AP's, with a median UP-to-AP ratio of 0.86 and a mean of 0.97.

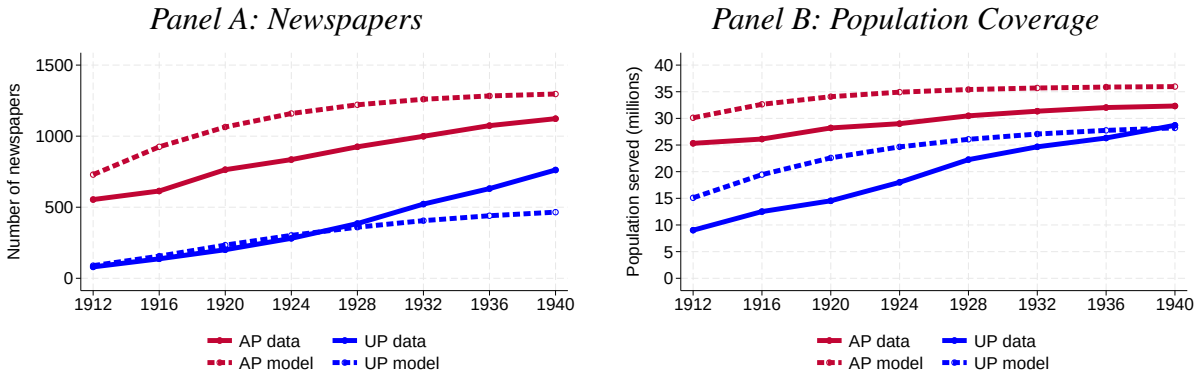
AP and UP within the modeled markets while preserving the observed out-of-model component of each network. This assumption is conservative with respect to UP's decline under the counterfactual, because it holds fixed UP membership in the large markets outside the modeled sample even when AP exclusive territories are removed.

Multiple equilibria are possible due to differences in initial beliefs, which can coordinate newspapers to one wire over another. For the baseline iterations, I set starting beliefs to the realized patterns in the data, and for the counterfactual, I initialize beliefs from the baseline fixed point.[23]

7.2 Baseline and Counterfactual Networks

Figure 5 plots observed and predicted AP and UP membership.

Figure 5: Predicted News Agency Membership

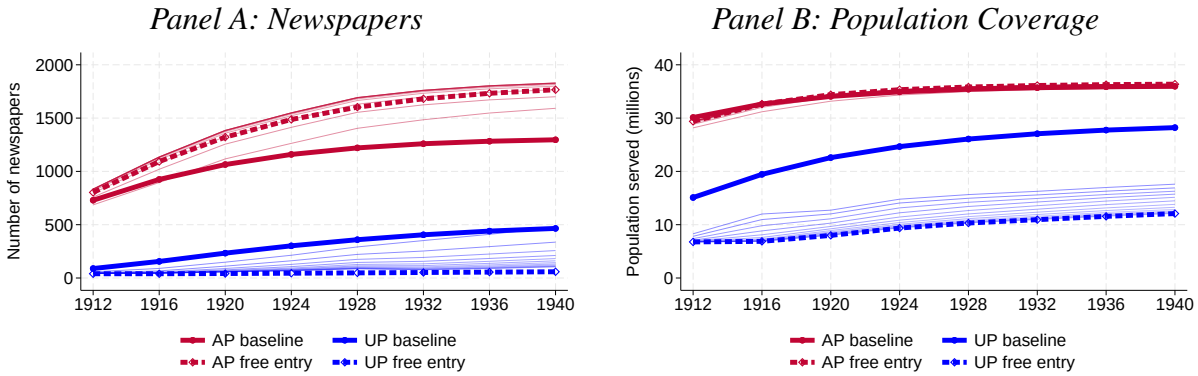


Note: This figure plots the observed and predicted paths of AP and UP networks under the baseline (exclusive contracts) regime. Panel A shows the number of newspapers carrying each wire. Panel B shows the total population served by each wire's member newspapers. Solid lines denote observed values; dashed lines denote model predictions. The model is iterated forward from the observed 1912 distribution of market states, solving for a fixed point in beliefs over each wire's national membership and population coverage. Membership and population outside the estimation sample are held fixed at observed levels.

The model overpredicts early adoption for both services: newspapers in the model are able to fully internalize future network growth and join early, while actual historical take-up was likely slowed by coordination frictions and uncertainty over wire viability. Importantly for the counterfactual exercise, the model captures both the relative level and growth trajectory of each wire.

[23] Conditional on beliefs and realized shocks, each newspaper solves a single-agent dynamic decision problem, so within-market choices are unique. But markets are linked through network effects and scale economies, and firms move without observing other markets' shocks, so different starting beliefs can support different equilibrium paths.

FIGURE 6: COUNTERFACTUAL NEWS AGENCY MEMBERSHIP



Note: This figure compares the predicted paths of AP and UP networks under the baseline (exclusive territory contracts) and counterfactual (no exclusive territory contracts) regimes. Panel A shows the number of newspapers carrying each wire service. Panel B shows the total population served by each wire's member newspapers. Solid lines denote the baseline regime; dashed lines denote the counterfactual. Both regimes are iterated forward from the observed 1912 distribution of market states, solving for a fixed point in beliefs over each wire's national membership and population coverage. Light traces show convergence from the predicted baseline membership path to the free-entry fixed point. Membership and population outside the estimation sample are held fixed at observed levels across both regimes.

Figure 6 presents the main counterfactual: the evolution of both networks when exclusive territory contracts are removed. Without exclusivity, UP membership collapses to its fixed 1908 founding membership: virtually no paper ever picks UP after 1912. AP gains substantially as its newspaper membership increases by 36 percent. AP population coverage, however, increases by only 1 percent, because most of the new AP members are in cities where AP already had an incumbent.

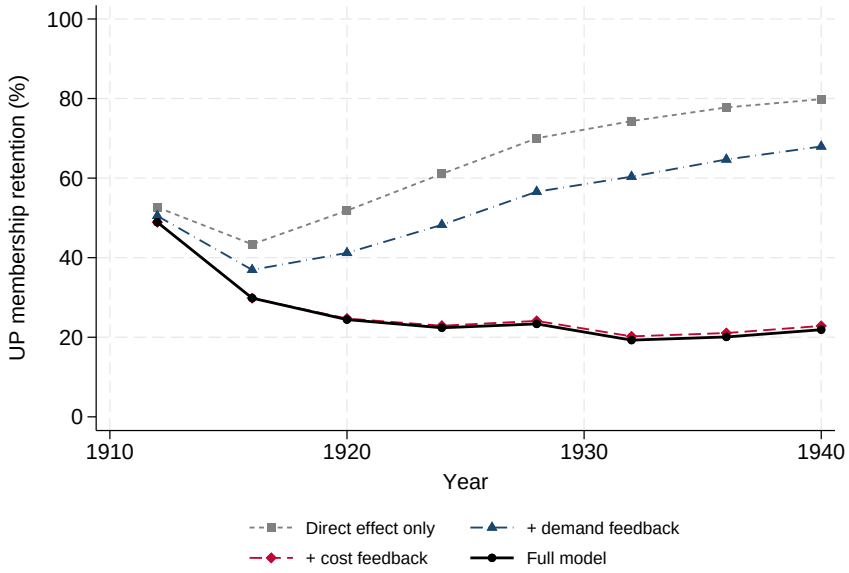
One clue to the mechanism behind UP's collapse is the composition of its early membership: most of UP's initial members are second newspapers in markets where AP already has a newspaper. To highlight the importance of these members, in a counterfactual that removes exclusive contracts but seeds UP with its observed early adopters in those markets, UP still reaches 37 percent of its 1940 baseline newspaper membership, indicating that exclusive territory contracts matter not only for UP's initial takeoff but for sustaining its long-run growth.

In addition to exclusive territory contracts, AP's bylaws from 1900 to 1915 gave the board power to ban members from bundling UP service with AP's. Attorney General T.W. Gregory forced the repeal of this provision in 1915, concluding that it violated the Sherman Act while leaving exclusive territory contracts intact. This decision mattered in the data, as the bulk of UP's new members after the repeal were AP bundlers.

The counterfactual framework allows us to put a magnitude on this policy intervention. In a counterfactual where the exclusive dealing clause was not repealed, UP retains 71 percent of its baseline membership. Exclusive dealing would have meaningfully constrained UP, but removing exclusive territories collapses the organization. Of all combinations of these two legal instruments,

the regime that prevailed — where exclusive territories were permitted and exclusive dealing prohibited — is the one under which UP grew the most.

FIGURE 7: DECOMPOSITION OF MECHANISMS



Note: This figure plots counterfactual UP membership under free entry, expressed relative to full model baseline membership under exclusivity. "Direct effect only" holds both wire costs and network values at their baseline paths. "+ demand feedback" lets network values respond to membership changes, lowering retention to about 68 percent. "+ cost
feedback" lets per-subscriber wire costs respond. “Full model” includes both feedback channels.

To isolate the forces behind UP’s collapse, I decompose the counterfactual into demand-side and cost-side feedback channels in Figure 7. I do so by, in turn, holding fixed the network’s value and membership costs at their predicted levels, rather than allowing them to adjust with newspapers’ membership decisions. When both channels are shut down and the value and cost of each network evolve exogenously as observed in the data, UP retains about 70 percent of its baseline membership even without exclusive territories. Allowing demand-side network effects to respond reduces retention to roughly 60 percent. In contrast, allowing cost-side economies of scale to respond drives UP membership down to about 20 percent of its baseline - nearly identical to the full counterfactual. Cost-side feedback is the dominant force in this setting: as UP loses members, per-subscriber costs rise, driving further exit.

7.3 COUNTERFACTUAL NEWSPAPER MARKET STRUCTURES, PROFIT, AND CONSUMER WELFARE

The previous subsection established that removing exclusive territory contracts would have collapsed UP while modestly expanding AP. These upstream changes reshape the downstream news-

paper market: which papers enter, which wires they carry, and what news reaches readers.

TABLE 6: COUNTERFACTUAL NEWSPAPER MARKET STRUCTURES

		Markets		Population	
		Baseline (%)	Δ (pp)	Baseline (%)	Δ (pp)
Newspapers	1	47.5	−1.2	29.6	−2.7
	2	22.3	+1.2	61.2	+2.7
Wired papers	1	42.9	−4.0	48.5	−13.1
	2	10.4	+4.1	35.9	+12.7
AP members	1	49.8	−10.8	74.9	−38.4
	2	1.4	+12.8	8.4	+38.5

Note: Each cell reports the percentage of market-years in that category, averaged across 1912–1940. A market is a city × field (morning/evening) pair with capacity for two newspapers. "Baseline" is the predicted equilibrium under the estimated exclusivity regime; "Δ" is the percentage-point change under free entry (no AP territorial exclusivity). "Markets" weights each market equally; "Population" weights by city population.

Table 6 decomposes these network changes into downstream market structures. Removing exclusive contracts increases newspaper competition: the share of population in two-newspaper markets rises by 2.7 percentage points, and the share in markets with two wired papers rises by 12.7 percentage points. Nearly all of this comes from second newspapers gaining access to AP, which was precisely what the exclusive territory contracts were designed to prevent.

However, removing exclusivity also weakens the incentive for first-mover investment in wire service. The population-weighted increase in markets with two wired papers (12.7 percentage points) falls short of the decrease in markets with one wired paper (13.1 percentage points), implying that some population shifts into markets with no wire service at all. This is because in the largest population quartile, the probability of entry each period into an empty market falls by 3 to 7 percent under free entry, while in smaller cities it is largely unchanged.

The weakened first-mover incentive in large cities reflects exclusivity acting as an entry subsidy. Under exclusive territories, entering a large city with AP guarantees a monopoly on AP service, because any future rival is blocked from joining. Under free entry, the eventual second entrant also gets AP, lowering expected duopoly profit for the first entrant and weakening the case for entering with wire service in the first place. Exclusive contracts thus had two opposing effects on newspaper investment in wire services: they blocked competition in markets that already had an AP incumbent, but they also encouraged investment in wire service in markets where the threat of future competition would otherwise have deterred it.

To examine incentives of AP incumbents, Table 7 shows the change in variable profit for news-

papers that were original AP members in 1900.

TABLE 7: PERCENT CHANGE IN AP INCUMBENT PROFIT UNDER FREE ENTRY

		Markets			Population		
		Bureau density			Bureau density		
		Few	Med.	Many	Few	Med.	Many
Market size	Small	−0.35	−0.65	−0.67	−0.44	−0.80	−0.84
	Medium	−1.21	−1.30	−1.44	−1.15	−1.50	−1.61
	Large	−2.57	−2.97	−3.43	−3.13	−2.78	−3.55

Note: Percentage change in per-firm variable profit for newspapers that were AP members in 1900, under free entry relative to the exclusivity baseline, pooled across all years (1912–1940). Rows are city population terciles; columns are bureau density terciles (mean number of AP bureaus serving the city). "Markets" weights each market equally; "Population" weights by city population.

Variable profit losses in a counterfactual without exclusive territory contracts increase sharply with city size: incumbents in large cities lose 2.6 to 3.6 percent relative to baseline, while those in small cities lose less than 1 percent. Losses also increase with bureau access, reflecting that incumbents in cities served by more AP bureaus face lower wire costs and therefore the greatest threat from a second AP entrant. This rationalizes the existence of exclusive territory contracts in this setting: the newspapers with the most to lose from removing exclusivity were precisely those who controlled the cooperative and had the power to maintain it.

TABLE 8: PERCENT CHANGE IN CONSUMER SURPLUS UNDER FREE ENTRY

		Bureau density		
		Few	Med.	Many
Market size	Small	1.06	1.19	1.29
	Medium	1.56	1.53	1.31
	Large	3.28	3.82	4.31

Note: Percentage change in population-weighted consumer surplus per capita under free entry relative to the exclusivity baseline, pooled across all years (1912–1940). Rows are city population terciles; columns are bureau density terciles (mean number of AP bureaus serving the city).

Table 8 reports the corresponding change in consumer surplus. Consumers gain across all market sizes, with the largest increases in large cities with high bureau density, where the second entrant is most likely to gain AP access. Despite the weakened first-mover incentive documented above, the competitive gains from removing exclusivity dominate in every subgroup. The overall effect of exclusive territory contracts on consumer welfare was unambiguously negative.

Two important margins are absent from these calculations. First, the reader demand model may not capture the full social value of news diversity. A market with two newspapers carrying different wire services may provide a broader range of perspectives or ideology than one with two AP papers, which may have externalities on political knowledge or civic participation, even if consumers do not fully internalize this distinction. Second, the counterfactual holds AP's organizational structure fixed. In the absence of UP as a competitor, AP's member newspapers - who govern the cooperative - would face strong incentives to restructure pricing or reduce investment in news gathering. The profit results in Table 7 provide a measure of these incentives and suggest that AP newspapers, in a counterfactual without UP as a competitor, would have considerable scope to extract rents as a monopoly.

8 Conclusions

This paper studies how exclusive contracts in the newspaper industry affected competition in both the downstream newspaper market and the upstream news-agency market. Exclusive territory contracts limited downstream newspaper competition but sustained upstream news-agency competition by channeling excluded newspapers toward the United Press. Removing these contracts collapses the UP through a feedback loop in which lost members raise per-subscriber costs, lower network value, and drive other entrants away. I find that exclusive territory contracts reduced consumer welfare, increased profits of AP incumbents, decreased competition between newspapers, but also increased wire adoption incentives for the first entrant in large cities. The newspapers with the most to lose from removing exclusivity - large-city AP incumbents - were those who governed the cooperative and maintained the contracts. More broadly, these finding suggests that evaluating exclusive contracts in network industries requires trading off competition across vertical segments: policies that increase downstream rivalry may reduce upstream entry, and vice versa.

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APPENDIX A: NOTATION

TABLE 9: MODEL NOTATION

Use	Symbol	Meaning
Indexing	m,M	markets and the number of markets
	t, T	periods and the last period
	j,$\mathcal{J}_{mt}$	newspapers and the set of incumbent newspapers
	i	households
	w	news agencies
Reader demand	u	reader utility
	p	annual subscription price
	W	newswire bundle
	$g(W)$	household valuation of newswire bundle
	n_t^w	network strength of wire
	κ	content overlap between AP and UP
	X	market-level demographics
	α	price coefficient
	β	newswire value coefficients
	γ	demographics coefficients
	$\overline{\xi}$	time-invariant unobserved newspaper quality
	ξ	time-varying unobserved newspaper quality
	ϵ	idiosyncratic reader preference shock
	s	newspaper market share
Advertising revenue	a	per-reader advertising revenue
	λ	advertising revenue coefficients
	ι	idiosyncratic advertising revenue shock
Pricing	v	per-period variable profit
	MC	per-reader marginal cost
Entry and membership	π	per-period total profit
	FC	per-period fixed cost
	WC	per-period newswire cost
	θ	cost function parameters
	$\overline{W}$	feasible set of newswire bundles
	τ	assessment schedules
	V^*	continuation value
	δ	discount factor
	η	choice-specific payoff shock
	λ	wire network scale elasticity

APPENDIX B: SUMMARY STATISTICS

TABLE 10: SUMMARY STATISTICS FOR THE DEMAND ESTIMATION SAMPLE

Panel A. Newspaper-year sample

Variable	Mean	SD	p25	Median	p75	p90
Circulation	14,760	41,072	1,950	3,978	10,066	30,247
Subscription price (1928 dollars)	7.44	2.38	5.73	7.42	9.05	10.40
Market share	0.314	0.186	0.175	0.275	0.417	0.576
City population	116,538	548,124	8,081	15,656	44,209	144,018
N	16,610					

Panel B. Market structure

Variable	Share
1 paper	0.807
2 papers	0.163
3+ papers	0.029
Market-years	13,448

Notes: Panel A reports summary statistics for the demand estimation sample. Subscription price is in 1928 dollars. Panel B reports the share of market-years with one, two, or three-plus newspapers. N is the number of newspaper-year observations. Market-years is the number of city-field-year markets.

ONLINE APPENDIX

The online appendix is available at https://qlquanle.github.io/newswires_oa.pdf.