PNAS NEXUS

PNAS Nexus, 2025, **4**, pgae511

https://doi.org/10.1093/pnasnexus/pgae511
Advance access publication 28 January 2025
Brief Report

How digital paywalls shape news coverage

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Edited By Noshir Contractor

Abstract

The internet has significantly transformed how news is produced, consumed, and distributed. As a result, the news industry has transitioned from ad-supported to subscription-based models regulated by digital paywalls. In the light of this disruption, it is crucial to investigate not only how news consumers adapt to this change but also how economic incentives shape content coverage. We analyzed the staggered adoption of digital paywalls by 17 regional US newspapers over 17 years in a difference-in-difference framework to examine the impact of paywall adoption on topical news content coverage. Our results reveal a small but significant decrease in local and soft news coverage, with varying effects across different urban contexts. Specifically, local news coverage experienced a more substantial decline in smaller cities (population < 500,000) and regions experiencing an influx of younger residents (age < 40 years). Conversely, soft news coverage increased in areas with a younger demographic influx, indicating a strategic shift by newspapers to cater to digital-savvy audiences and adapt to changing consumption patterns. Our findings underscore the delicate balance between financial imperatives and editorial choices in the newspaper industry and highlight the need for ongoing research into the effects of digital monetization strategies on journalistic content creation, media plurality, and civic accountability.

Keywords: news media, digital paywall, digitization, internet impact

Introduction

The transition from print to digital media has not only transformed how news is consumed but also significantly altered the economic foundations of the industry. Newspapers have traditionally relied on revenue from circulation and print advertisements, but they are now struggling because more people are using digital media and mobile devices instead of subscribing to print newspapers. This shift has led to a sharp decrease in print circulation and a substantial drop in print advertising revenue, with a 75% decline since the early 2000s and a 60% reduction in industry employment (1). This change has triggered a financial crisis in the industry and concerns over public access to diverse, high-quality news. Digital advertising has not lived up to its potential as a new source of revenue for newspapers. This is mainly because big tech companies like Meta and Google have eroded newspapers' pricing power and diminished digital advertising returns (2, 3). Consequently, most newspapers have moved to subscription-based models regulated by digital paywalls for financial sustenance (4, 5).

Digital Paywalls are a price discrimination mechanism for sorting readers according to their willingness-to-pay. They provide unfettered access to content to paid subscribers, while non-subscribers can access a small number (potentially none) of free articles each time period. The efficient design of digital paywalls is complex and involves several critical decisions (4), including pricing (6), content exclusivity (7), and balancing free and paid content (8, 9). These tradeoffs can be summarized via Arrow's Information Paradox—on the one hand, the newspapers cannot give too little content for free since it would prevent the readers from appreciating the journalistic quality of a newspaper's content, but on the other hand, they cannot also give too much content for free since it would obviate the need to subscribe (10).

There have been concerns that the economic incentives behind these walled gardens may lead newspapers to prioritize content appealing to their core audience (paid subscribers) only, possibly undermining broader public interest journalism and civic accountability. In this context, we investigate how digital paywalls could impact topical content coverage, particularly local and soft news. Local news, defined as articles covering issues directly relevant to a newspaper's core geographic readership area, is essential for community information and civic engagement, but has declined despite its critical role in informing the public about local governance and events (11). This decline is partly due to media consolidation, which has prioritized operational efficiency over the essential civic duty of informing the public. Similarly, soft news (12), which includes entertainment-oriented or human interest stories without immediate political significance (such as entertainment, lifestyle, and sports), holds a significant place in the media landscape. This type of news, often engaging and resonating on a personal and cultural level, plays a crucial role in

Competing Interest: The authors declare no competing interests.
Received: May 18, 2024. **Accepted:** October 8, 2024

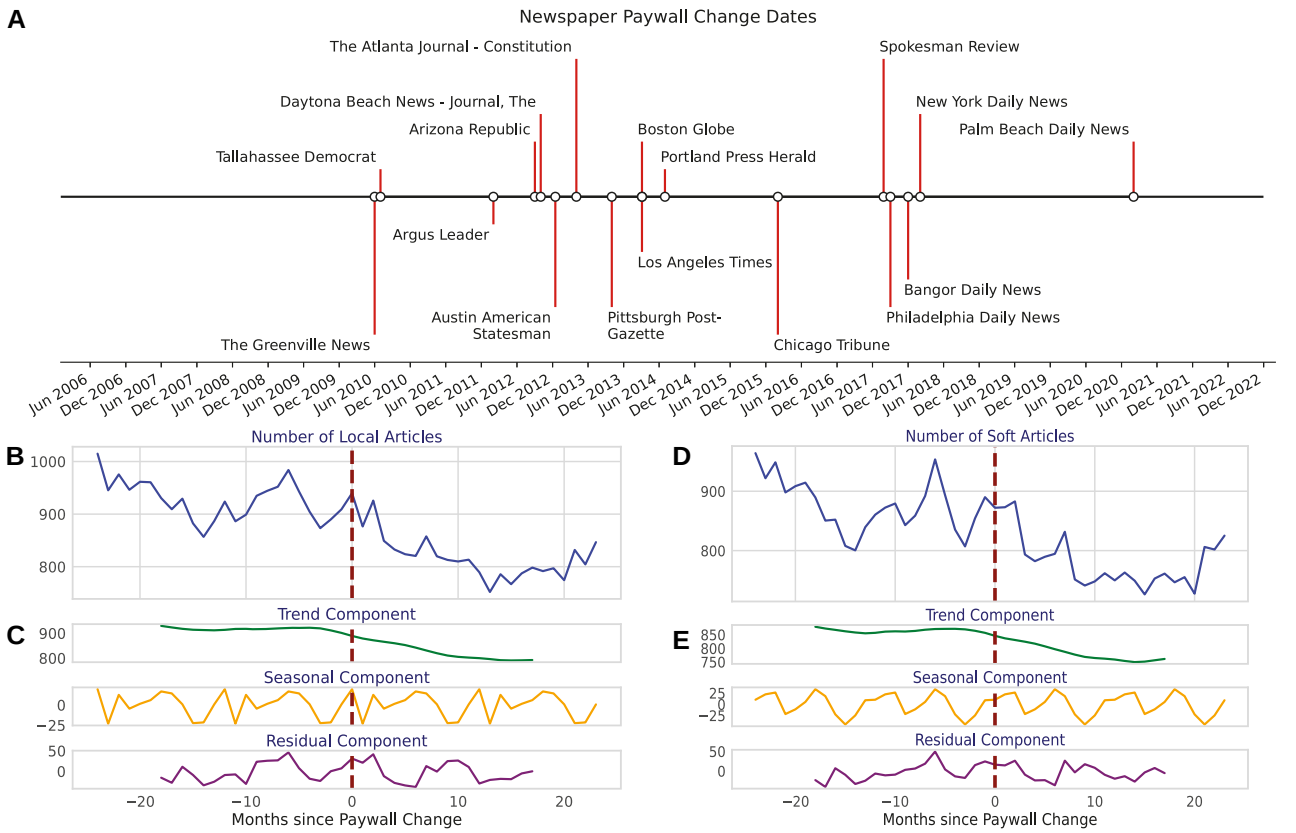

Fig. 1. A) Timeline of digital paywall adoption by different newspapers. All newspapers adopted a digital paywall, but at a different time. Model-free evidence: B) Number of Local News Articles published (averaged across all the newspapers), C) Decomposed time-series from panel (B) into its Seasonality, Trend, and Residual components. D) Number of Soft News Articles published (averaged across all the newspapers), E) Decomposed time-series from panel (D) into its Seasonality, Trend, and Residual components.

attracting and retaining readers. As the competition in the media ecosystem intensifies, the ability of soft news to engage readers becomes a pivotal differentiator for outlets (13). As a result, soft news, once viewed as less serious or "lowbrow," has now emerged as a strategic element in media strategies (14, 15). Therefore, we examine whether digital paywalls encourage investment in local and soft news as a subscriber attraction and retention strategy or contribute to a further decline in such content.

We analyze a comprehensive dataset of 17 major regional US newspapers from 2006 to 2022 to investigate how the staggered adoption of paywalls has impacted local and soft news coverage, providing insights crucial for media companies, policymakers, and stakeholders in the digital era. Our overall objective is to offer a nuanced understanding of how digital paywalls influence news coverage and provide valuable insights into strategic decisions shaping the news landscape.

Results

Figure 1A illustrates the timeline of paywall adoption across our sample of newspapers, all of which implemented an all-or-nothing paywall model where non-subscribers could not access any articles for free. Figure 1B–E presents model-free evidence, revealing a clear downward trend in both local and soft news article publication relative to paywall adoption dates. The slight dip observed before paywall imposition might reflect anticipation effects or broader financial challenges. Newsrooms facing budget constraints, staff reductions, or declining revenues may have reduced article production even before formally implementing paywalls.

To quantify the impact of paywall imposition on these trends, we employed a staggered difference-in-difference analysis using a Poisson two-way fixed-effects (TWFE) regression. This approach is well suited for modeling count data, such as the number of articles published. Our TWFE model incorporated newspaper fixed-effects to account for newspaper-specific idiosyncrasies in content coverage and time dummies to control for temporal fluctuations in local and soft news coverage, allowing us to isolate the effect of paywall implementation.

The results shown in Fig. 2A–F illustrate a nuanced picture of the impact of digital paywall implementation on news coverage. We observe a reduction of 5.1% ($P < 0.001$) in the publication of local news articles post-paywall implementation, suggesting a noteworthy contraction in local news output (Fig. 2A). This reduction likely stems from a strategic shift by newspapers to prioritize content that is more effective in driving subscription revenues, potentially at the cost of traditional local news coverage. For soft news (characterized by entertainment and lifestyle content), the decline is more modest at 2.2% ($P < 0.05$) (Fig. 2D). This relatively smaller reduction suggests a sustained emphasis on soft news, possibly due to its effectiveness in engaging a broad readership and its alignment with digital consumption trends. These patterns indicate a substantive, albeit differential, impact of paywalls on news content, reflecting the underlying economic incentives driving editorial decisions.

The analysis further reveals heterogeneous effects of paywall adoption across different urban contexts. In smaller cities

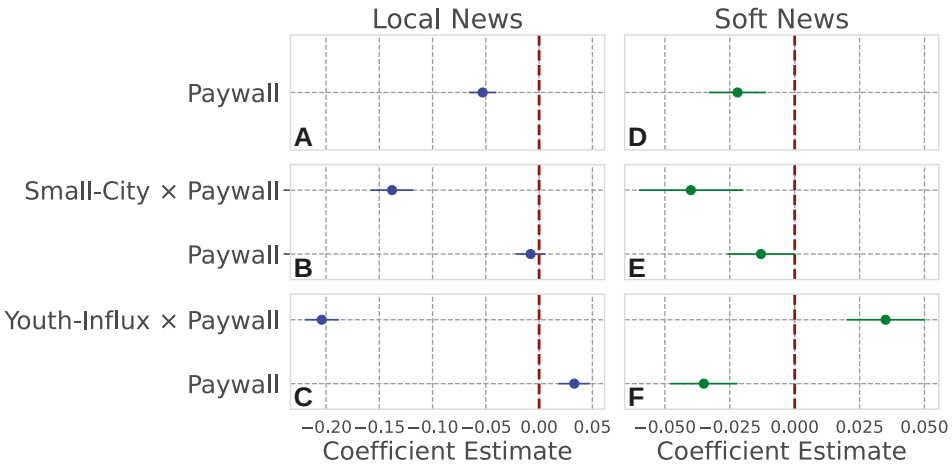

Fig. 2. Poisson Regression Point Estimates for Impact of Paywall on coverage of Local News (A–C) and Soft News (D–F). The results are the estimates of a Two-Way Fixed Effects (TWFE) regression with newspaper and month-fixed effects (Details in Supplementary Material). The standard errors are heteroskedasticity consistent.

(population below 500,000), the contraction in local news coverage is markedly larger, with a 12.8% decrease ($P < 0.001$) (Fig. 2B). This suggests a more pronounced realignment of content priorities in these settings, possibly influenced by economic considerations under the new monetization strategy. Additionally, in urban areas experiencing an influx of younger residents (below 40 years of age), the decline in local news is similarly substantial, at 19.1% ($P < 0.001$) (Fig. 2C). This pattern points to an adaptive response by newspapers, aligning their content strategies with the preferences of a younger, digitally oriented demographic.

In contrast, the dynamics of soft news coverage exhibit a divergent trend. While there is a decrease of 3.9% ($P < 0.001$) in soft news coverage in smaller cities (Fig. 2E), cities experiencing a demographic shift towards a younger population show a 3.5% ($P < 0.001$) increase in soft news coverage (Fig. 2F). This increase potentially reflects newspapers' strategic adaptation in these regions to cater to the content preferences of a younger audience, who likely favor more diverse and digitally accessible forms of news and entertainment.

Overall, our findings provide rigorous evidence of the variable impact of digital paywall implementation on different types of news coverage. These outcomes are shaped by factors such as city size and demographic composition, underscoring the complex interplay between economic imperatives and editorial strategies in the evolving landscape of the news industry.

Discussion

Our study uncovers the impact of digital paywalls on local and soft news coverage in US newspapers, revealing a moderate overall decline with significant variations based on urban scale and demographic shifts. The sharp decrease in local news in smaller cities and areas with younger populations post-paywall suggests a strategic shift towards content that retains subscribers, potentially at the expense of hyperlocal journalism essential for civic engagement. While the overall 5.1% drop in local news may seem modest, it represents a significant shift in the information ecosystem of local communities and indicates a trend that, over time, could compound and lead to substantial cumulative effects. This trend raises concerns about the implications for media plurality and local governance transparency, potentially resulting in decreased political participation, reduced government accountability, and a weakening of community bonds.

Our findings underscore the complex trade-offs inherent in paywall adoption, as newspapers balance financial sustainability with journalistic integrity. Future research could offer deeper insights into these trends through in-depth interviews with newspaper executives, examining internal deliberations and strategic shifts. A granular analysis of content strategies and audience responses would help assess the impact on reader retention and societal engagement. Additionally, longitudinal studies of local news coverage trends and alternative journalism models could enrich the discourse. Such research is crucial for preserving diverse, representative journalism in an era dominated by financial imperatives.

Overall, while paywalls offer a lifeline, their subtle reshaping of editorial priorities risks gradually degrading media's democratic responsibilities. As news organizations walk this tightrope between sustainability and pluralistic representation, informed public policy measures could help reinstate balance. Further research unpacking the complex incentive structures at play would inform the ongoing discourse on safeguarding access to public interest journalism in the digital age.

Supplementary Material

Supplementary material is available at *PNAS Nexus* online.

Funding

The authors declare no funding.

Author Contributions

P.S.D. and L.H. conceived the research; P.S.D. designed the empirical study and wrote the paper. A.P. performed the empirical analysis.

Data Availability

Raw data are available from ProQuest (https://www.proquest.com). The data preprocessing scripts as well, the derived news

article embeddings, and the R analysis script is available at https://doi.org/10.7302/k5rj-3n91.

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